CleanAir.

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Wheelabrator North Broward, Inc.
2600 Wiles Road
Pompano Beach, FL 33073

REPORT ON COMPLIANCE TESTING

Performed for:

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

Client Reference No: Service Agreement
CleanAir Project No: 12218-1
Revision 0: April 30, 2013

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: SB

Date: 4/30

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

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

Run No.		1	2	3	
Date (2013)		Mar 19	Mar 20	Mar 20	
Start Time (approx.)		12:58	07:43	10:17	
Stop Time (approx.)		15:14	09:55	12:28	
Total Duration of Test Run (min.)		136	132	131	
Net Sampling Time (min.)		125	125	125	
Sampling System Calibration Summary					
	Nozzle ID No:	2760-1	2760-1	2760-1	
D_n	Nozzle Diameter (in):	0.2760	0.2760	0.2760	
	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:	66-6	66-6	66-6	
Y_d	Meter Box Yd - Field Sheet	0.9854	0.9854	0.9854	
	Meter Box Yd - Database	0.9854	0.9854	0.9854	
	Meter Box ΔH@ - Field Sheet	1.8280	1.8280	1.8280	
	Meter Box ΔH@ - Database	1.8280	1.8280	1.8280	
QA/QC					
	Final Leak Check				
	(a) 4% of Sampling Rate (cfm)	0.0254	0.0266	0.0269	
	(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	0.0020	0.0030	
	Sample Volume				
	Minimum Volume Required (dscf)	60.00	60.00	60.00	
V_{mstd}	Actual Sample Volume (dscf)	74.997	80.149	79.723	
	Alternative Method 5 Post-Test Calibration (EPA ALT-009)				
$\sqrt{\Delta H_{avg}}$	Average of Square Root of ΔH (in. W.C.)	1.1239	1.1629	1.1747	
Y_{qa}	Alternative Meter Calibration Factor	0.9844	0.9644	0.9720	**Average**
	Variation from full-test Y_d (average ≤ ±5%)	-0.1%	-2.1%	-1.4%	**-1.2%**
	Mean Isokinetic Sampling Rate Variation				
	Minimum Allowable (%)	90	90	90	
	Maximum Allowable (%)	110	110	110	
%I	Actual Variation (%)	100.36	103.28	100.88	
	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 North Broward, Inc.
Clean Air Project No: 12218
Unit 1 FF Outlet

USEPA Method 29 (Mercury)
QA/QC Results

	Run No.	1	2	3	4	
	Date (2013)	Mar 19	Mar 20	Mar 20	Mar 20	
	Start Time (approx.)	12:58	07:43	10:17	12:52	
	Stop Time (approx.)	15:14	09:55	12:28	15:03	
	Total Duration of Test Run (min.)	136	132	131	131	
	Net Sampling Time (min.)	125	125	125	125	
	Sampling System Calibration Summary					
	Nozzle ID No:	2760-1	2760-1	2760-1	2760-1	
D_n	Nozzle Diameter (in):	0.2760	0.2760	0.2760	0.2760	
	Probe ID No:	67-8-16	67-8-16	67-8-16	67-8-16	
C_p	Pitot Coefficient:	0.8250	0.8250	0.8250	0.825	
	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)	0.0254	0.0266	0.0269	0.0277	
	(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	0.0020	0.0030	0.0030	
	Sample Volume					
	Minimum Volume Required (dscf)	60.00	60.00	60.00	60.00	
V_{mstd}	Actual Sample Volume (dscf)	74.997	80.149	79.723	81.036	
	Alternative Method 5 Post-Test Calibration (EPA ALT-009)					
$\sqrt{\Delta H_{avg}}$	Average of Square Root of ΔH (in. W.C.)	1.1239	1.1629	1.1747	1.1961	
Y_{qa}	Alternative Meter Calibration Factor	0.9844	0.9644	0.9720	0.9674	**Average**
	Variation from full-test Y_d (average ≤ ±5%)	-0.1%	-2.1%	-1.4%	-1.8%	**-1.4%**
	Mean Isokinetic Sampling Rate Variation					
	Minimum Allowable (%)	90	90	90	90	
	Maximum Allowable (%)	110	110	110	110	
%I	Actual Variation (%)	100.36	103.28	100.88	101.18	
	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 North 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 19	Mar 19	Mar 19	
Start Time (approx.)		08:15	09:48	11:19	
Stop Time (approx.)		09:15	10:48	12:19	
Total Duration of Test Run (min.)		60	60	60	
Net Sampling Time (min.)		60	60	60	
Sampling System Calibration Summary					
	Nozzle ID No:	N/A	N/A	N/A	
D_n	Nozzle Diameter (in):	N/A	N/A	N/A	
	Probe ID No:	66-4-7	66-4-7	66-4-7	
	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)	0.0228	0.0231	0.0231	
	(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)	0.0040	0.0030	0.0030	
	Sample Volume				
	Minimum Volume Required (dscf)	30.00	30.00	30.00	
V_{mstd}	Actual Sample Volume (dscf)	33.420	33.411	33.302	
	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	1.0336	1.0277	1.0271	**Average**
	Variation from full-test Y_d (average ≤ ±5%)	3.3%	2.7%	2.6%	**2.9%**

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Wheelabrator North 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 19	Mar 19	Mar 19	
	Start Time (approx.)	08:15	09:48	11:19	
	Stop Time (approx.)	09:15	10:48	12:19	
	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:	66-14	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)	0.0272	0.0273	0.0273	
	(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	0.0010	0.0010	
	Sample Volume				
	Minimum Volume Required (dscf)	30.00	30.00	30.00	
V_{mstd}	Actual Sample Volume (dscf)	39.511	39.719	39.551	
	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	0.9985	0.9938	0.9965	**Average**
	Variation from full-test Y_d (average ≤ ±5%)	1.1%	0.6%	0.9%	**0.8%**

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

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

Run No.		1	2	3	
	Date (2013)	Mar 19	Mar 19	Mar 19	
	Start Time (approx.)	07:54	10:35	13:25	
	Stop Time (approx.)	10:07	12:48	15:37	
	Total Duration of Test Run (min.)	133	133	132	
	Net Sampling Time (min.)	125	125	125	
	Sampling System Calibration Summary				
	Nozzle ID No:	0.2725-1	0.2725-1	0.2725-1	
D_n	Nozzle Diameter (in):	0.273	0.273	0.273	
	Probe ID No:	67-8-17	67-8-17	67-8-17	
C_p	Pitot Coefficient:	0.8240	0.8240	0.8240	
	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)	0.0212	0.0202	0.0208	
	(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	0.0060	
	Sample Volume				
	Minimum Volume Required (dscf)	30.00	30.00	30.00	
V_{mstd}	Actual Sample Volume (dscf)	64.613	61.068	61.775	
	Alternative Method 5 Post-Test Calibration (EPA ALT-009)				
$\sqrt{\Delta H_{avg}}$	Average of Square Root of ΔH (in. W.C.)	0.9322	0.8872	0.9018	
Y_{qa}	Alternative Meter Calibration Factor	1.0072	1.0093	1.0064	**Average**
	Variation from full-test Y_d (average ≤ ±5%)	0.2%	0.4%	0.1%	**0.3%**
	Mean Isokinetic Sampling Rate Variation				
	Minimum Allowable (%)	90	90	90	
	Maximum Allowable (%)	110	110	110	
%I	Actual Variation (%)	101.05	98.52	99.59	
	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 North Broward, Inc.
Clean Air Project No: 12218
Unit 2 FF Outlet

USEPA Method 29 (Mercury)
QA/QC Results

Run No.		1	2	3	4*	
Date (2013)		Mar 19	Mar 19	Mar 19	Mar 21	
Start Time (approx.)		07:54	10:35	13:25	12:05	
Stop Time (approx.)		10:07	12:48	15:37	14:26	
Total Duration of Test Run (min.)		133	133	132	141	
Net Sampling Time (min.)		125	125	125	125	
Sampling System Calibration Summary						
	Nozzle ID No:	0.2725-1	0.2725-1	0.2725-1	0.2760-1	
D_n	Nozzle Diameter (in):	0.2725	0.2725	0.2725	0.2760	
	Probe ID No:	67-8-17	67-8-17	67-8-17	67-8-21	
C_p	Pitot Coefficient:	0.8240	0.8240	0.8240	0.813	
	Meter Box ID. No:	61-11	61-11	61-11	66-22	
Y_d	Meter Box Yd - Field Sheet	1.0050	1.0050	1.0050	0.9972	
	Meter Box Yd - Database	1.0050	1.0050	1.0050	0.9972	
	Meter Box ΔH@ - Field Sheet	1.6964	1.6964	1.6964	1.8840	
	Meter Box ΔH@ - Database	1.6964	1.6964	1.6964	1.8840	
QA/QC						
	Final Leak Check					
	(a) 4% of Sampling Rate (cfm)	0.0212	0.0202	0.0208	0.0227	
	(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	0.0030	0.0060	0.0030	
	Sample Volume					
	Minimum Volume Required (dscf)	60.00	60.00	60.00	60.00	
V_{mstd}	Actual Sample Volume (dscf)	64.613	61.068	61.775	68.246	
	Alternative Method 5 Post-Test Calibration (EPA ALT-009)					
$\sqrt{\Delta H_{avg}}$	Average of Square Root of ΔH (in. W.C.)	0.9322	0.8872	0.9018	1.0332	
Y_{qa}	Alternative Meter Calibration Factor	1.0072	1.0093	1.0064	0.9935	**Average**
	Variation from full-test Y_d (average ≤ ±5%)	0.2%	0.4%	0.1%	-0.4%	**0.1%**
	Mean Isokinetic Sampling Rate Variation					
	Minimum Allowable (%)	90	90	90	90	
	Maximum Allowable (%)	110	110	110	110	
%I	Actual Variation (%)	101.05	98.52	99.59	99.02	
	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
Clean Air Project No: 12218
Unit 2 FF Outlet

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

	Run No.	1	2	3	
	Date (2013)	Mar 19	Mar 20	Mar 20	
	Start Time (approx.)	10:16	07:40	12:21	
	Stop Time (approx.)	14:38	11:59	16:40	
	Total Duration of Test Run (min.)	262	259	259	
	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:	67-8-21	67-8-21	67-8-21	
C_p	Pitot Coefficient:	0.813	0.813	0.813	
	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)	0.0206	0.0222	0.0227	
	(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)	0.002	0.003	0.002	
	Sample Volume				
V_{mstd}	Actual Sample Volume (dscf)	123.424	134.170	135.905	
	Alternative Method 5 Post-Test Calibration (EPA ALT-009)				
$\sqrt{\Delta H_{avg}}$	Average of Square Root of ΔH (in. W.C.)	0.9378	1.0111	1.0199	
Y_{qa}	Alternative Meter Calibration Factor	0.9944	0.9928	0.9835	**Average**
	Variation from full-test Y_d (average ≤ ±5%)	-0.3%	-0.4%	-1.4%	**-0.7%**
	Mean Isokinetic Sampling Rate Variation				
	Minimum Allowable (%)	90	90	90	
	Maximum Allowable (%)	110	110	110	
%I	Actual Variation (%)	100.2	101.1	100.7	
	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 North Broward, Inc.
Clean Air Project No: 12218
Unit 2 SDA Inlet

USEPA Method 26A (HCl)
QA/QC Results

	Run No.	1	2	3	
	Date (2013)	Mar 21	Mar 21	Mar 21	
	Start Time (approx.)	07:54	09:15	10:35	
	Stop Time (approx.)	08:54	10:15	11:35	
	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:	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)	0.0227	0.0226	0.0229	
	(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)	33.706	33.371	33.512	
	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	1.0287	1.0357	1.0268	**Average**
	Variation from full-test Y_d (average ≤ ±5%)	2.8%	3.5%	2.6%	**3.0%**

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Wheelabrator North 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 21	Mar 21	Mar 21	
	Start Time (approx.)	07:54	09:15	10:35	
	Stop Time (approx.)	08:54	10:15	11:35	
	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:	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)	0.0275	0.0276	0.0276	
	(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	0.0020	0.0020	
	Sample Volume				
	Minimum Volume Required (dscf)	30.00	30.00	30.00	
V_{mstd}	Actual Sample Volume (dscf)	40.902	40.828	40.468	
	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	1.0122	1.0105	1.0153	**Average**
	Variation from full-test Y_d (average ≤ ±5%)	0.7%	0.6%	1.0%	**0.8%**

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

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

Run No.		1	2	3	
Date (2013)		Mar 20	Mar 21	Mar 21	
Start Time (approx.)		12:35	07:42	10:15	
Stop Time (approx.)		14:50	09:54	12:27	
Total Duration of Test Run (min.)		135	132	132	
Net Sampling Time (min.)		125	125	125	
Sampling System Calibration Summary					
	Nozzle ID No:	0.2725-1	0.2725-1	0.2725-1	
D_n	Nozzle Diameter (in):	0.2725	0.2725	0.2725	
	Probe ID No:	67-8-16	67-8-17	67-8-17	
C_p	Pitot Coefficient:	0.8240	0.8240	0.8240	
	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)	0.0232	0.0217	0.0212	
	(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	0.0020	0.0040	
	Sample Volume				
	Minimum Volume Required (dscf)	30.00	30.00	30.00	
V_{mstd}	Actual Sample Volume (dscf)	67.841	66.724	64.750	
	Alternative Method 5 Post-Test Calibration (EPA ALT-009)				
$\sqrt{\Delta H_{avg}}$	Average of Square Root of ΔH (in. W.C.)	1.0321	0.9813	0.9603	
Y_{qa}	Alternative Meter Calibration Factor	0.9996	0.9891	0.9910	**Average**
	Variation from full-test Y_d (average ≤ ±5%)	0.9%	-0.1%	0.0%	**0.3%**
	Mean Isokinetic Sampling Rate Variation				
	Minimum Allowable (%)	90	90	90	
	Maximum Allowable (%)	110	110	110	
%I	Actual Variation (%)	98.16	100.46	99.93	
	Point-by-Point Isokinetic Variation				
	Number of points <90%	1	0	0	
	Number of points >110%	1	0	0	
	Number of points <80%	0	0	0	
	Number of points >120%	0	0	0	

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

USEPA Method 29 (Mercury)
QA/QC Results

Run No.		1	2	3	4*	
Date (2013)		Mar 20	Mar 21	Mar 21	Mar 21	
Start Time (approx.)		12:35	07:42	10:15	12:41	
Stop Time (approx.)		14:50	09:54	12:27	14:52	
Total Duration of Test Run (min.)		135	132	132	131	
Net Sampling Time (min.)		125	125	125	125	
Sampling System Calibration Summary						
	Nozzle ID No:	0.2725-1	0.2725-1	0.2725-1	0.2725-1	
D_n	Nozzle Diameter (in):	0.2725	0.2725	0.2725	0.2725	
	Probe ID No:	67-8-16	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:	66-11	66-11	66-11	66-11	
Y_d	Meter Box Yd - Field Sheet	0.9906	0.9906	0.9906	0.9906	
	Meter Box Yd - Database	0.9906	0.9906	0.9906	0.9906	
	Meter Box ΔH@ - Field Sheet	1.8274	1.8274	1.8274	1.8274	
	Meter Box ΔH@ - Database	1.8274	1.8274	1.8274	1.8274	
QA/QC						
	Final Leak Check					
	(a) 4% of Sampling Rate (cfm)	0.0232	0.0217	0.0212	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)	0.0030	0.0020	0.0040	0.0030	
	Sample Volume					
	Minimum Volume Required (dscf)	60.00	60.00	60.00	60.00	
V_{mstd}	Actual Sample Volume (dscf)	67.841	66.724	64.750	66.789	
	Alternative Method 5 Post-Test Calibration (EPA ALT-009)					
$\sqrt{\Delta H_{avg}}$	Average of Square Root of ΔH (in. W.C.)	1.0321	0.9813	0.9603	1.0009	
Y_{qa}	Alternative Meter Calibration Factor	0.9996	0.9891	0.9910	0.9951	**Average**
	Variation from full-test Y_d (average ≤ ±5%)	0.9%	-0.1%	0.0%	0.5%	**0.3%**
	Mean Isokinetic Sampling Rate Variation					
	Minimum Allowable (%)	90	90	90	90	
	Maximum Allowable (%)	110	110	110	110	
%I	Actual Variation (%)	98.16	100.46	99.93	100.02	
	Point-by-Point Isokinetic Variation					
	Number of points <90%	1	0	0	0	
	Number of points >110%	1	0	0	0	
	Number of points <80%	0	0	0	0	
	Number of points >120%	0	0	0	0	

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Wheelabrator North 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 20	Mar 20	Mar 20	
	Start Time (approx.)	08:13	09:39	11:00	
	Stop Time (approx.)	09:13	10:39	12:00	
	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:	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)	0.0228	0.0230	0.0232	
	(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_{msld}	Actual Sample Volume (dscf)	33.301	33.294	33.271	
	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	1.0311	1.0301	1.0248	**Average**
	Variation from full-test Y_d (average ≤ ±5%)	3.0%	2.9%	2.4%	**2.8%**

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Wheelabrator North 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 20	Mar 20	Mar 20	
	Start Time (approx.)	08:13	09:39	11:00	
	Stop Time (approx.)	09:13	10:39	12:00	
	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:	85-2	85-2	85-2	
Y_d	Meter Box Yd - Field Sheet	1.0039	1.0039	1.0039	
	Meter Box Yd - Database	1.0039	1.0039	1.0039	
	Meter Box ΔH@ - Field Sheet	1.7413	1.7413	1.7413	
	Meter Box ΔH@ - Database	1.7413	1.7413	1.7413	
	QA/QC				
	Final Leak Check				
	(a) 4% of Sampling Rate (cfm)	0.0273	0.0280	0.0282	
	(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	0.0010	
	Sample Volume				
	Minimum Volume Required (dscf)	30.00	30.00	30.00	
V_{mstd}	Actual Sample Volume (dscf)	39.982	40.532	40.609	
	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	1.0121	0.9957	0.9903	**Average**
	Variation from full-test Y_d (average ≤ ±5%)	0.8%	-0.8%	-1.4%	**-0.5%**

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Nozzle Calibration Sheet

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

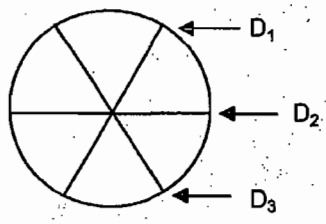
Caliper ID 1215 6068

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
0.2720-1	0.2720	0.2725	0.2720	0.0005	0.2720
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

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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

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CDS005G-Caliper.xls,

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	776.806	10.106	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	1.69835

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)

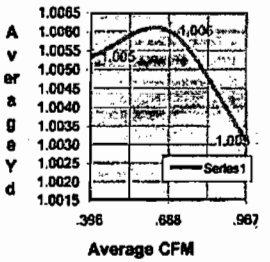
Equations

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

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

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

Average YD vs. Average CFM



Vacuum Gauge

Standard (in.Hg)	Gauge (in.Hg)
5.2	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

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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. 5B 4/10/13 ~~6184~~ 6184-11 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		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	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

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

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

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

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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_{ds} 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)

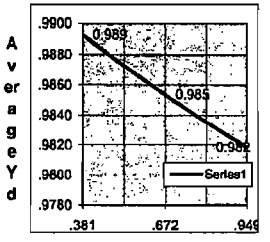
Equations

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

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

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

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

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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

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.

Barom. Press. (P_b) 29.44 in. Hg

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:	66-14	**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

12.47

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)

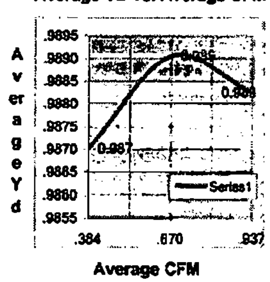
Equations

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

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

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

Average YD vs. Average CFM



Vacuum Gauge

Standard (In.Hg)	Gauge (In.Hg)
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

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

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Nomenclature

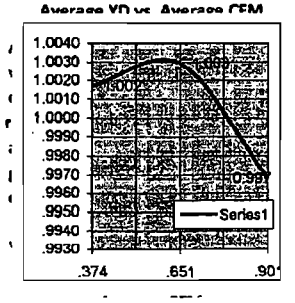
P_b	Barometric Pressure (in. Hg)
Q	Flow Rate (cfm)
ΔH	Orifice Pressure differential (in. H_2O)
ΔP	Inlet Pressure Differential (in. H_2O)
V_d	Gas Meter Volume - Dry (ft^3)
V_{ds}	Standard Meter Volume - Dry (ft^3)
T_d	Average Meter Box Temperature (°F)
T_o	Outlet Meter Box Temperature (°F)
T_{ds}	Average 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:	Marlin 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 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	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_{ds} 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

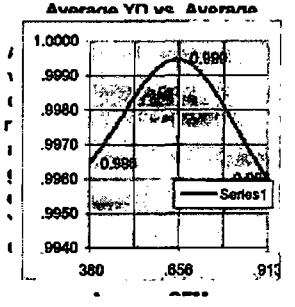
P_b	Barometric Pressure (in. Hg)
Q	Flow Rate (cfm)
ΔH	Orifice Pressure differential (in. H_2O)
ΔP	Inlet Pressure Differential (in. H_2O)
V_d	Gas Meter Volume - Dry (ft^3)
V_{ds}	Standard Meter Volume - Dry (ft^3)
T_d	Average Meter Box Temperature (°F)
T_o	Outlet Meter Box Temperature (°F)
T_{ds}	Average 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

Calibrated by: O.Lavrov

Date: 10/12/12

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	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

Calibrated By: JH Metrology

Calibration Report No: 1000164078

Serial No: T-279500

Date Calibrated: 8/20/2012

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

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

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

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

CleanAir ENGINEERING

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 (ft³)			Meter Box Gas Volume (ft³)			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	1.7838
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

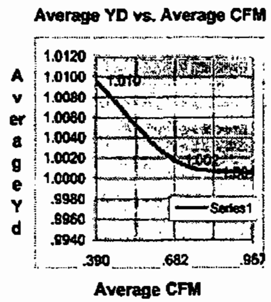
- P_b Barometric Pressure (in. Hg)
- Q Flow Rate (cfm)
- ΔH Orifice Pressure differential (in. H_2O)
- ΔP Inlet Pressure Differential (in. H_2O)
- V_d Gas Meter Volume - Dry (ft³)
- V_{ds} Standard Meter Volume - Dry (ft³)
- T_d Average Meter Box Temperature (°F)
- T_o Outlet Meter Box Temperature (°F)
- 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)
5.3	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 ☑ 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	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

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

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

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

CleanAir ENGINEERING

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.**

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

All specifications are from EPA-600/4-76-005 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.**

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

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

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.**

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

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

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 3.1

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

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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 ✗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

METROLOGY

Certificate of Calibration

2033001737

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.

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Approved by: Vice President

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

Date: Aug 19, 2012

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 uncertaintles 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 13:08:36

Date: Aug 19, 2012

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

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

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:** TR00070277

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)

First Triad Analysis

OXYGEN
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 %

CARBON DIOXIDE
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 = 0.999999
Constants: A = -0.01175689
B = 1.000226328 C = 0
D = 0 E = 0

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: ALM040868 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	17Aug2016	K026052	23.04 %	CARBON DIOXIDE
NTRM 2350	01Dec2011	K016398	23.20 %	OXYGEN

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
PIR/2000/809015	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			Second Triad Analysis	Calibration Curve
Date: 29Nov2011	Response Unit: MV			Concentration = A+Bx+Cx2+Dx3+Ex4
Z1=0.00000	R1=98.20000	T1=86.20000		r=0.999986
R2=98.20000	Z2=0.00000	T2=86.20000		Constants: A=-0.00224432
Z3=0.00000	T3=86.20000	R3=98.20000		B=0.138734928 C=-0.0004576
Avg. Concentration:	17.90 %			D=1.39269E-05 E=0

OXYGEN

Date: 29Nov2011	Response Unit: %			Concentration = A+Bx+Cx2+Dx3+Ex4
Z1=0.00000	R1=23.20000	T1=18.15000		r=0.999999
R2=23.20000	Z2=0.00000	T2=18.15000		Constants: A=-0.00577277
Z3=0.00000	T3=18.15000	R3=23.20000		B=0.999884783 C=0
Avg. Concentration:	18.14 %			D=0 E=0

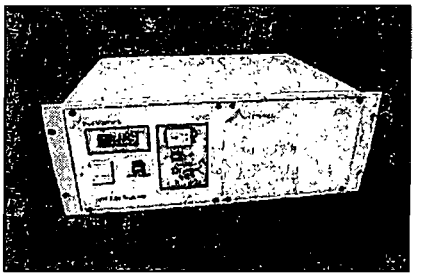
Special Notes: DELIVER ON DOC# 44063869

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.

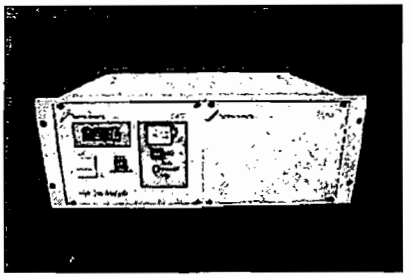
Rental/Application Notes:

- 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.

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: SB

Date: 4/30

CleanAir.

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

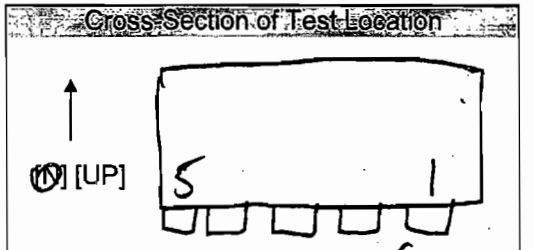
UNIT: 1 **RUN:** 1

FIELD DATA SHEET

Client	WHEELABRATOR	Project No.	12277
Plant	NORTH SHOWARD	Date	3-19-13
Meter Operator	ST		
Probe Operator	WB		

Meter Box	66-6	Sample Box No.	M-01
Meter Y_d	0.9854	Meter $\Delta H_@$	1.8896
K Factor	2.86	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]	First point all the way [N] [Out]
-9.8	10	of page	

Amb. Temp. (°F)	81	Bar. Press.	29.90 [in. Hg] [mbar]
Probe I.D. No.	67-8-16		
Liner Material	GLASS		

Filter No.	E45-02		
Thimble No.	NA		
Nozzle Diameter	0.2760	Nozzle I.D.	2760-1

Start Time	12:58	Stop Time	15:14 / 13:14 SB 3/19/13

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	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
				44240			250	250							
P-1	5	0.48	1.40	47.61		306	251	252	54	83	78	5	7.9		
2	10	0.43	1.20	50.77		305	252	254	54	86	79	5	7.8		
3	15	0.33	0.94	53.47		302	251	252	54	88	79	5	7.9		
4	20	0.49	1.40	56.76		305	250	250	52	90	80	6	7.7		
5	25	0.61	1.70	60.47		305	250	250	53	91	81	6	7.5		ΔV = -.27
P-1	30	0.48	1.40	64.08		305	249	250	53	92	83	6	7.3		
2	35	0.37	1.10	67.08		305	250	251	54	93	83	5	7.8		
3	40	0.35	1.00	69.96		304	251	251	55	93	84	5	7.9		
4	45	0.42	1.20	73.00		306	250	249	56	94	85	5	7.8		
5	50	0.50	1.40	76.39		305	250	250	58	94	85	5	7.4		ΔV = -.31
P3-1	55	0.44	1.30	79.90		304	249	250	50	95	86	5	7.5		
2	60	0.37	1.10	82.87		304	251	250	50	96	87	5	7.6		
	Total	7.9235	15.400	79.390		3656				1095	996				
	Average	0.6645	1.2709			304.4000				90.0600					

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

CleanAir ENGINEERING

QA/QC SA
Date 3-19-13

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

UNIT: 1 RUN:

FIELD DATA SHEET

Client	WHEELABRATOR	Project No.	12218
Plant	NORTH BROWARD	Date	3-19-13
Meter Operator	SS		
Probe Operator	MB		

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. 82.870 [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
PS-3	65	0.47	1.20	85.90	304	251	251	47	97	87	5	7.5		
4	70	0.48	1.40	89.3	305	250	251	47	98	88	6	7.6		
5	75	0.54	1.50	92.71	304	250	250	46	98	89	6	7.9		ΔV = -.28
PS-1	80	0.35	1.00	95.80	303	250	251	46	94	89	5	7.7		
2	85	0.38	1.10	98.86	304	250	250	48	95	87	5	7.6		
3	90	0.44	1.30	101.98	305	251	250	50	97	88	5	7.8		
4	95	0.50	1.40	105.37	305	251	250	50	97	88	5	7.7		
5	100	0.54	1.50	108.92	304	250	250	52	99	89	6	7.8		ΔV = -.35
PS-1	105	0.32	0.92	111.77	304	250	250	54	96	89	6	7.9		
2	110	0.43	1.20	114.80	304	250	250	56	98	90	6	7.7		
3	115	0.45	1.30	118.04	304	251	251	57	99	90	6	7.8		
4	120	0.49	1.40	121.48	304	250	250	58	99	90	6	7.8		
5	125	0.50	1.40	124.84	304	250	251	59	99	90				
	Total	8.6884	16.6200		3954				1167	1062	N/A			
	Average								1166	1152				

* Sum of square roots.

Circle correct bracketed units on data sheet.

CleanAir ENGINEERING

QA/QC MB Date 3-19-13

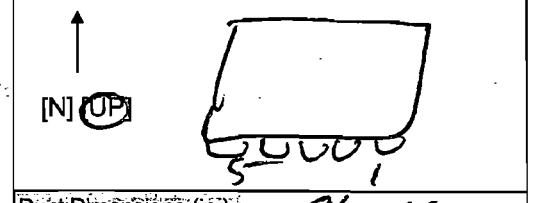
TEST LOCATION: RF Outlet Particulate/Metals TESTING METHOD: 5/29 PAGE 1 OF 2

UNIT: 1 RUN: 2

FIELD DATA SHEET

Client	[illegible] Laboratory	Project No.	12218
Plant	N. Brunswick	Date	3/20/13
Meter Operator			C. Bitner
Probe Operator			C. Bitner

Cross Section of Test Location



Amb. Temp. (°F)	70	Bar. Press	29.80 (in. Hg) [mbar]
Probe I.D. No		67-8-16	
Liner Material		Glass	

Meter Box	66-6	Sample Box No.	M9
Meter Y_d	0.985	Meter $\Delta H_@$	1.8250
K-Factor	2.82	Pitot C_p	0.828
Leak Rate Before	0.000 [cfm] [L/min] @	15	(in. Hg)
Leak Rate After	0.000 [cfm] [L/min] @	10	(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	First point all the way
-10.4	10.0	(in) [Out] of page	(In) [Out]

Filter No.	845-04		
Thimble No.	N/A		
Nozzle Diameter	0.260	Nozzle I.D.	2760

Start Time:	7143	Stop Time:	9:55

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] 128.315	Stack Temp. T_s (°F)	Probe T_p (°F) Set Points 280	Filter T_f (°F) 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	0.38	1.1	131.28	306	255	259	62	70	69	5.0	8.7	N/A	
2	10	0.42	1.2	134.39	305	254	252	53	73	69	5.0	8.9		
3	15	0.47	1.3	137.62	304	252	250	50	76	70	5.5	8.0		
4	20	0.55	1.6	141.18	304	250	250	49	79	70	6.5	8.8		
5	25	0.51	1.4	144.52	304	250	251	52	81	71	6.0	8.9		144.605
4-1	30	0.42	1.2	147.71	304	249	250	54	80	72	5.5	8.9		-0.085
2	35	0.42	1.2	150.80	305	249	250	58	81	72	5.5	10.0		
3	40	0.51	1.4	154.20	306	250	250	60	83	73	6.0	9.6		
4	45	0.60	1.7	157.93	306	251	249	61	83	74	7.0	8.6		
5	50	0.58	1.6	161.575	305	250	250	63	84	74	6.5	9.0		161.590
3-1	55	0.46	1.3	164.86	305	250	248	63	82	74	5.5	9.6		-0.075
2	60	0.42	1.2	168.101	306	249	250	64	83	71	5.5	8.8		
	Total	0.6924		83.080					3937					
	Average	0.4	1.302		305.2				78.74					

Sum of square roots. 0.6924 1.302

Circle correct bracketed units on data sheet. 305.2 3960 78.74 1848

3/20/13

CleanAir ENGINEERING

QA/QC PB

Date 3/20/13

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

UNIT: 1 **RUN:** 2

FIELD DATA SHEET

Client	Wheelabrator	Project No.	1721F
Plant	N. Broward	Date	3/12/13
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. [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	0.80	1.4	171.43	306	251	250	64	83	75	6.0	9.0	pM	
4	70	0.60	1.7	175.18	307	250	250	64	85	76	7.0	9.3		
5	75	0.60	1.7	178.915	306	250	249	64	85	76	7.0	9.0		178.990
2-1	80	0.57	1.4	182.38	306	249	250	65	82	76	6.0	9.2		-0.075
2	85	0.41	1.2	185.57	306	249	250	65	84	76	5.5	9.3		
3	90	0.38	1.1	188.53	305	251	251	63	85	76	5.0	8.9		
4	95	0.51	1.4	191.94	305	251	251	61	85	77	6.0	9.8		195.600
1-	100	0.56	1.6	195.600	306	250	250	61	86	78	7.0	8.7		-0.05
1-1	105	0.40	1.1	198.64	305	252	250	62	85	78	5.5	9.1		
2	110	0.38	1.1	201.62	305	251	251	62	87	79	5.5	8.6		
3	115	0.38	1.1	204.62	303	250	249	64	88	79	5.5	9.4		
4	120	0.51	1.4	208.03	306	250	250	65	89	80	6.5	9.8		
5	125	0.58	1.6	211.680	306	249	251	65	89	80	7.0	9.2		
	Total	*												
	Average													

* Sum of square roots.

Circle correct bracketed units on data sheet.

CleanAir ENGINEERING

QA/QC RB

Date 3/12/13

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

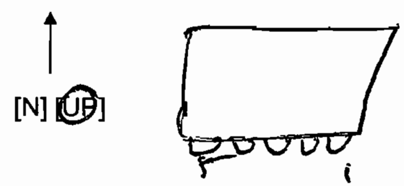
UNIT: 1 **RUN:** 3

FIELD DATA SHEET

Client	Wheelabrator	Project No.	12218
Plant	N. Broward	Date	3/20/13
Meter Operator	P. Bihun		
Probe Operator	P. Bihun		

Meter Box	66-6	Sample Box No.	M1
Meter Y_d	0.9854	Meter $\Delta H_@$	1.8280
K Factor	2.82	Pitot C_p	0.825
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 ☐		

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	10.0		

Amb. Temp (°F)	75	Bar. Press.	29.80 [in. Hg] [mbar]
Probe I.D. No.	67-8-16		
Liner Material	Glass		

Filter No.	e45-05	
Thimble No.	N/A	
Nozzle Diameter	0.2260	Nozzle I.D. 22607-1

Start Time:	10:17	Stop Time:	12:28

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] 212.400	Stack Temp. Ts (°F)	Probe T_c (°F) Set Points 250	Filter T_c (°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	0.41	1.2	215.52	304	253	256	65	82	81	5.5	9.4	N/A	
2	10	0.41	1.2	218.61	301	253	254	65	86	81	5.5	9.7		
3	15	0.55	1.6	222.22	305	253	253	61	88	81	7.0	9.5		
4	20	0.55	1.6	225.83	304	251	251	61	89	81	7.0	9.7		229.475
5	25	0.55	1.6	229.415	305	250	250	62	88	84	7.0	10.2		-0.06
4-1	30	0.48	1.4	232.87	305	249	250	64	87	81	6.0	9.7		
2	35	0.42	1.2	236.03	305	249	251	60	89	82	5.5	9.4		
3	40	0.51	1.4	239.44	306	251	250	54	90	83	6.0	9.9		
4	45	0.60	1.7	243.16	306	250	249	52	91	83	7.0	9.2		
5	50	0.57	1.6	246.810	305	250	250	52	93	83	7.0	9.3		
3-1	55	0.43	1.2	249.98	305	250	249	53	90	85	5.5	9.6		246.885
2	60	0.43	1.2	253.09	306	250	250	53	92	85	5.5	9.7		-0.045
	Total	17.120	34.690	84.105	7624				4417					
	Average	0.1409	1.3876		304.9600				88.3400					

SB 4/5/13 0.6981 — Sum of square roots. 14.9

Circle correct bracketed units on data sheet. 3661 2052

QA/QC PB
Date 9/20/13

CleanAir ENGINEERING

G-7

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

UNIT: 1 **RUN:** 3

FIELD DATA SHEET

Client	Whitehorse	Project No.	12218
Plant	N. Broward	Date	3/20/13
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	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. (ft^3) [L]	Stack Temp. T_s (°F)	Probe T_p (°F) Set Points	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
						250	250							
3	65	0.43	1.2	256.19	306	250	249	53	92	88	5.5	9.0	N/A	
4	70	0.52	1.5	259.70	305	250	251	57	93	86	6.5	8.9		
5	75	0.61	1.7	263.440	305	250	246	58	94	86	7.0	9.3		263.490
2-1	80	0.55	1.6	267.14	301	249	256	60	93	86	7.0	9.4		-0.05
2	85	0.45	1.3	270.44	305	250	251	62	95	87	6.0	10.3		
3	90	0.40	1.1	273.41	306	251	251	63	96	88	5.5	9.8		
4	95	0.51	1.4	276.81	306	250	249	63	95	88	6.5	9.4		
5	100	0.58	1.6	280.475	306	250	248	62	95	88	7.0	8.8		280.530
1-1	105	0.43	1.2	283.70	304	249	253	64	93	89	6.0	9.3		-0.055
2	110	0.43	1.2	286.85	304	249	250	62	95	89	6.0	9.5		
3	115	0.35	0.99	289.63	302	250	247	58	95	89	5.0	8.8		
4	120	0.50	1.4	293.09	304	251	249	58	95	89	6.5	9.4		
5	125	0.58	1.6	296.765	305	250	249	57	95	89	7.0	9.5		
	Total													
	Average													

* Sum of square roots.

Circle correct bracketed units on data sheet.

CleanAir. ENGINEERING

QA/QC PB

Date 3/20/13

Impinger Weight Sheet

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

802830|068 + 802830|135 Balance Calibration Check			
Balance ID	+L 07-04	Reference Weight Mass	500g
Reference Weight ID	6015C	Reference Weight Reading	499.8g SB 4/10

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. M1
Date 3-19-13		Lot No.		pH NA
Analyst DL+HN		Filter No. e45-02		Rinse NA

	Contents	Gross Weight (gm)	Tare Weight (gm)	Net Weight Gain (gm)	
Impinger 1	Empty	715.8	439.8	276.0	
Impinger 2	100 ml 5%HNO_3/10%H_2O_2	639.7	527.6	112.1	QA/QC SB
Impinger 3	100 ml 5%HNO_3/10%H_2O_2	578.1	543.7	34.4	Date 4/5
Impinger 4	Empty	449.2	443.5	5.7	
Impinger 5	100 ml 4%$KMnO_4$/10%H_2SO_4	540.7	533.4	7.3	Total Weight (gm)
Impinger 6	100 ml 4%$KMnO_4$/10%H_2SO_4	538.9	538.1	0.8	436.3
Impinger 7	≈250 g Silica Gel	758.8	741.4	17.4	453.7

Run No. 2	2	Filter Type Quartz		Sample Box No. M9
Date 3-20-13		Lot No.		pH NA
Analyst DL+HN		Filter No. e45-04		Rinse NA

	Contents	Gross Weight (gm)	Tare Weight (gm)	Net Weight Gain (gm)	
Impinger 1	Empty	720.7	457.8	262.9	
Impinger 2	100 ml 5%HNO_3/10%H_2O_2	698.4	556.8	141.9	QA/QC SB
Impinger 3	100 ml 5%HNO_3/10%H_2O_2	592.7	545.6	47.1	Date 3/20
Impinger 4	Empty	449.2	437.7	11.5	
Impinger 5	100 ml 4%$KMnO_4$/10%H_2SO_4	553.1	544.8	8.3	Total Weight (gm)
Impinger 6	100 ml 4%$KMnO_4$/10%H_2SO_4	553.9	549.5	4.4	475.8
Impinger 7	≈250 g Silica Gel	800.1	782.7	17.4	493.2

Run No. 3		Filter Type Quartz		Sample Box No. M1
Date 3/20/13		Lot No.		pH NA
Analyst DL		Filter No. e45-05		Rinse NA

	Contents	Gross Weight (gm)	Tare Weight (gm)	Net Weight Gain (gm)	
Impinger 1	Empty	707.5	443.1	264.4	
Impinger 2	100 ml 5%HNO_3/10%H_2O_2	655.9	530.6	125.3	QA/QC SB
Impinger 3	100 ml 5%HNO_3/10%H_2O_2	581.6	538.6	43.0	Date 3/20
Impinger 4	Empty	453.2	444.4	8.8	
Impinger 5	100 ml 4%$KMnO_4$/10%H_2SO_4	552.2	547.0	5.2	Total Weight (gm)
Impinger 6	100 ml 4%$KMnO_4$/10%H_2SO_4	538.2	534.8	3.4	450.1
Impinger 7	≈250 g Silica Gel	776.1	758.6	17.5	467.6

QA/QC SB
Date 3/20

CleanAir ENGINEERING

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

UNIT: 1 RUN: 4

FIELD DATA SHEET

Client	Whitlabrador	Project No.	12218
Plant	N. Broward	Date	3/20/13
Meter Operator		F. Bihun	
Probe Operator		F. Bihun	

Cross-Section of Test Location

Amb. Temp. (°F)	78	Bar. Press.	29.80 (in. Hg) [mbar]
Probe I.D. No.		67-8-16	
Liner Material		Glass	

Meter Box	66-6	Sample Box No.	M9		
Meter Y_d	0.9854	Meter $\Delta H_@$	1.8280		
K Factor	7.82	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:	X	After: Good ☑	Bad ☐		

Duct Dimensions (in.)	96x96		
Static Pres. ($in. H_2O$)	Port Len. (in.)	Gas Flow (in) [Out]	First point all the way (in) [Out]
-10.4	10.0	of page	

Filter No.	N/A		
Thimble No.	N/A		
Nozzle Diameter	0.2760	Nozzle I.D.	2760-1

Start Time	12:52	Stop Time	15:03

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
				297.135		250	252							
5-1	5	0.41	1.2	300.32	303	256	253	66	88	88	5.0	9.9	N/A	
2	10	0.43	1.2	303.49	305	258	254	66	90	88	5.0	9.7		
3	15	0.47	1.3	306.78	304	253	251	65	91	88	5.5	9.3		
4	20	0.52	1.5	310.30	305	251	251	63	93	88	6.0	8.8		
5	25	0.55	1.6	313.980	305	250	249	64	95	88	6.5	9.8		314.045
4-1	30	0.50	1.4	317.42	305	249	251	64	94	89	5.5	9.4		-0.035
2	35	0.43	1.2	320.59	305	249	250	63	95	90	5.0	9.9		
3	40	0.49	1.4	323.98	305	251	249	62	96	90	5.5	9.0		
4	45	0.62	1.8	327.82	306	251	248	62	99	91	7.0	10.0		
5	50	0.62	1.8	331.625	306	250	251	63	99	91	7.0	9.8		331.725
3-1	55	0.53	1.5	335.25	306	250	250	65	98	93	6.5	9.1		-0.05
2	60	0.45	1.3	338.57	308	250	251	65	101	94	5.5	9.3		
	Total	*17.1304		86.520					4251					
	Average	0.7092	1.4400		304.760				95.026					

Sum of square roots

Circle correct bracketed units on data sheet

17.2 3459 2217

CleanAir ENGINEERING

QA/QC PB

Date 3/20/13

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	N. Broward	Date	3/20/13
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 (ΔP_s) (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. T_s (°F)	Probe T_p (°F) Set Points 250	Filter T_f (°F) Set Points 250	Cond. Temp. T_{conn} (°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	0.47	1.3	341.85	305	251	251	66	100	94	5.5	9.3		
4	70	0.57	1.6	345.54	306	251	246	62	99	94	6.5	9.6		
5	75	0.62	1.8	349.42	306	250	249	55	100	94	7.0	9.4		349.485 −0.06
2-1	80	0.55	1.6	353.12	304	248	253	57	99	94	6.5	9.5		
2	85	0.43	1.2	356.33	305	249	246	59	99	95	5.5	9.9		
3	90	0.38	1.1	359.32	306	250	247	60	100	95	5.0	9.2		
4	95	0.55	1.6	362.99	306	251	252	62	100	95	7.0	9.2		
5	100	0.65	1.8	366.875	305	250	250	62	101	96	7.5	9.3		366.970
1-1	105	0.43	1.2	370.30	303	249	254	64	99	95	6.0	9.6		0.095
2	110	0.43	1.2	373.49	304	250	251	62	100	96	6.0	8.9		
3	115	0.40	1.1	376.48	303	250	252	57	100	96	5.5	9.1		
4	120	0.55	1.6	380.14	303	250	250	57	100	96	7.0	8.9		
5	125	0.60	1.7	383.895	304	251	250	58	101	96	7.0	9.0		
	Total	*												
	Average													

* Sum of square roots.

Circle correct bracketed units on data sheet.

PB 3/20/13

QA/QC PB
Date 3/20/13

CleanAir ENGINEERING

Impinger Weight Sheet

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

80281068	Balance Calibration Check		
Balance ID	TL07-64	Reference Weight Mass	500.0g
Reference Weight ID	60150	Reference Weight Reading	499.8g

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. ~~M9~~ M9
Date 3/20/13		Lot No.		pH NA
Analyst DL		Filter No.		Rinse NA

	Contents	Gross Weight (gm)	Tare Weight (gm)	Net Weight Gain (gm)	
Impinger 1	Empty	754.0	455.7	298.3	
Impinger 2	100 ml 5%HNO_3/10%H_2O_2	672.7	546.3	126.4	QA/QC SB
Impinger 3	100 ml 5%HNO_3/10%H_2O_2	566.1	534.7	31.4	Date 4/5
Impinger 4	Empty	441.8	437.3	4.5	
Impinger 5	100 ml 4%$KMnO_4$/10%H_2SO_4	543.2	542.3	0.9	Total Weight (gm)
Impinger 6	100 ml 4%$KMnO_4$/10%H_2SO_4	524.2	524.0	0.2	461.7
Impinger 7	≈ 250 g Silica Gel	773.8	754.2	19.6	481.3

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 4/5

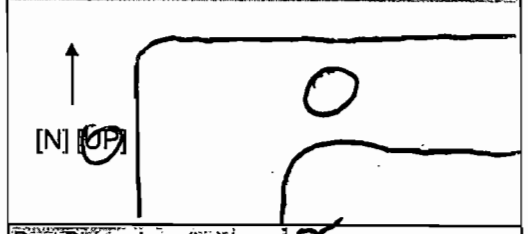
TEST LOCATION: INLET HCL TESTING METHOD: 26A PAGE 1 OF 1

UNIT: 1 RUN: 1

FIELD DATA SHEET

Client	WHEELABRATOR	Project No.	1207B
Plant	NORTH BROWARD	Date	3-19-13
Meter Operator	SJ		
Probe Operator	SJ		

Cross-Section of Test Location



Amb. Temp. (°F)	75	Bar. Press.	29.80 [in. Hg] [mbar]
Probe I.D. No.	66-4-7		
Liner Material	GLASS		

Meter Box	66-18	Sample Box No.	B-14
Meter Y_d	1.0009	Meter $\Delta H_@$	1.965
K Factor	NA	Pitot C_p	0.834
Leak Rate Before	0.003 [cfm] [Lpm]	@	16 (in. Hg)
Leak Rate After	0.004 [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

Duct Dimensions (in.)	105		
Static Pres (in. H_2O)	-1.1	Port Len. (in.)	14
Gas Flow [In] [Out]	of page	First point all the way [In] [Out]	

Start Time	8:15	Stop Time	9:15

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. 913.11 [ft^3] [L]	Stack Temp. T_s (°F)	Probe T_p (°F) Set Points 355	Filter T (°F) Set Points 355	Cond. Temp. T_o (°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	5	NA	1.20	915.98	476	354	356	54	77	68	4	NA		
	10		1.20	918.84	468	356	357	54	79	77	4			
	15		1.20	921.67	472	354	356	54	82	77	6			
	20		1.20	924.57	471	355	354	55	82	77	7			
	25		1.20	927.45	469	354	356	56	83	78	8			
	30		1.20	930.33	470	355	353	56	83	78	9			
	35		1.20	933.15	470	354	356	57	83	78	10			
	40		1.20	936.02	470	355	354	58	84	79	11			
	45		1.20	939.80	475	356	355	58	84	80	12			
	50		1.20	941.64	472	356	354	59	84	79	13			
	55		1.20	944.47	471	355	356	60	83	80	14			
	60		1.20	947.31	470	354	355	60	84	80	15			
	Total	*	34.200		5654				988	931				
	Average		1.2000		471.1667					79.9583				

* Sum of square roots.

Circle correct bracketed units on data sheet.

CleanAir ENGINEERING

QA/QC SB

Date 3/19

TEST LOCATION: INLET HCL TESTING METHOD: M26A PAGE 1 OF 1

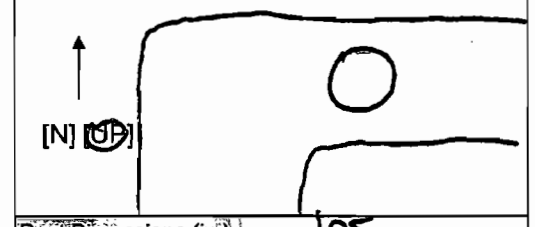
UNIT: 1 RUN: 2

FIELD DATA SHEET

Client	WHEELABRATOR	Project No.	12218
Plant	NORTH BROWARD'S	Date	3-19-13
Meter Operator			SJ
Probe Operator			SJ

Meter Box	66-18	Sample Box No.	S-6
Meter Y_d	1.0008	Meter $\Delta H@$	1.9165
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 ☐	

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]
-1.3	14		

Amb. Temp. (°F)	78	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: 9:48 Stop Time: 10:48

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 949.400 [m^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
P-1	5	NA	1.20	952.30	478	356	354	54	86	82	3	6.9		
	10		1.20	955.17	479	355	351	53	88	82	4	6.7		
	15		1.20	958.04	479	355	355	53	89	83	5	6.9		
	20		1.20	960.90	480	355	353	53	90	84	6	7.2		
	25		1.20	963.69	484	355	355	54	90	84	7	7.3		
	30		1.20	966.62	481	355	354	54	90	84	8	7.4		
	35		1.20	969.54	476	355	355	56	91	85	9	7.2		
	40		1.20	972.41	476	356	355	52	91	85	10	7.2		
	45		1.20	975.27	483	355	355	54	90	85	11	7.3		
	50		1.20	978.13	481	355	355	56	89	85	12	7.3		
	55		1.20	980.98	479	354	357	56	88	84	13	7.4		
↓	60	↓	1.20	984.01	477	355	354	56	88	85	14	7.4		
	Total	*			5754				1070	1008				
	Average		1.2000		479.5000					86.5833				

* Sum of square roots

Circle correct bracketed units on data sheet.

CleanAir ENGINEERING

QA/QC Date 3-19-13

TEST LOCATION: INLET HCL TESTING METHOD: M26A PAGE 1 OF 1

UNIT: 1 RUN: 3

FIELD DATA SHEET

Client	WHEELABRATOR	Project No.	12218
Plant	North Broward	Date	3-19-13
Meter Operator		SJ	
Probe Operator		SJ	

Cross-Section of Test Location

[N] (UP)

Duct Dimensions (in.) 105

Amb. Temp. (°F)	78	Bar. Press.	29.80	[in Hg] [mbar]
Probe I.D. No.	G6-4-7			
Liner Material	GLASS			

Meter Box	66-19	Sample Box No.	
Meter Y_d	1.0008	Meter $\Delta H_@$	1.9165
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 ☐	

Static Pres (in. H_2O)	Port Len. (in.)	Gas Flow [In] [Out] of page	First point all the way [In] [Out]
-1.2	14		

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

Start Time:	11:19	Stop Time	12:19

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_{cn} (°F)	DGM Inlet $T_{m\,in}$ (°F)	DGM Outlet $T_{m\,out}$ (°F)	Pump Vacuum (in Hg)	Oxygen Indication approx. (% dv)	☐ Amb Filter ☐ Dioxin Trap ☐	Notes
				995.670		355	355							
1-1	5	NA	1.20	999.60	491	356	356	52	88	86	3	7.4		
	10			991.52	484	355	354	54	89	86	4	7.4		
	15			994.37	491	355	353	55	90	86	5	7.5		
	20			997.11	485	354	354	55	91	86	6	7.5		
	25			1000.00	493	355	355	55	92	88	7	7.6		
	30			1002.91	491	356	355	56	92	88	7	7.6		
	35			1005.75	494	355	354	56	93	89	8	7.5		
	40			1009.68	492	354	355	57	93	89	9	7.6		
	45			1011.60	491	355	355	58	94	89	10	7.5		
	50			1014.40	493	355	354	59	94	89	12	7.5		
	55			1017.39	491	355	355	59	94	90	13	7.5		
↓	60	↓	↓	1020.38	492	354	353	60	94	90	14	7.6		
				34.710										
	Total	*	11.2000		5794				1104	1055				
	Average				482.833				89.958					

* Sum of square roots.

Circle correct bracketed units on data sheet.

SJ 4/5/13

482.250

QA/QC 84

Date 3-19-13

CleanAir ENGINEERING

Impinger Weight Sheet

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

8028101068 + 8028101135 Balance Calibration Check			
Balance ID	T107-04	Reference Weight Mass	500.0g
Reference Weight ID	60150	Reference Weight Reading	499.8g SB 4/10

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. B14
Date 3/19/13	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	482.7	460.1	22.6	
Impinger 2	100 mL 01.N H2SO4	628.6	540.3	88.3	QA/QC SB
Impinger 3	100 mL 01.N H2SO4	582.3	551.8	30.5	Date 3/19
Impinger 4	Empty	447.4	442.5	4.9	
Impinger 5	Silica Gel	777.5	763.2	14.3	Total Weight (gm)
Impinger 6					146.3
Impinger 7					160.6

Run No. 2	Filter Type Quartz		Sample Box No. B6
Date 3/19/13	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	521.0	452.5	68.5	
Impinger 2	100 mL 01.N H2SO4	617.0	548.3	68.7	QA/QC SB
Impinger 3	100 mL 01.N H2SO4	555.5	543.5	12.0	Date 3/19
Impinger 4	Empty	483.9	481.4	2.5	
Impinger 5	Silica Gel	776.9	765.0	11.9	Total Weight (gm)
Impinger 6					151.7
Impinger 7					163.6

Run No. 3	Filter Type Quartz		Sample Box No. B14
Date 3/19/13	Lot No.		pH NA
Analyst DL	Filter No. NA		Rinse NA

	Contents	Gross Weight (gm)	Tare Weight (gm) (HH 3/19/13)	Net Weight Gain (gm)	
Impinger 1	50 mL 0.1N H2SO4	523.8	~~449.6~~ 461.9	61.9	
Impinger 2	100 mL 01.N H2SO4	618.1	~~558.2~~ 544.7	73.4	QA/QC SB
Impinger 3	100 mL 01.N H2SO4	579.0	~~539.0~~ 567.1	11.9	Date 3/19
Impinger 4	Empty	445.9	~~444.6~~ 444.3	1.6	
Impinger 5	Silica Gel	787.8	~~764.5~~ 777.4	10.4	Total Weight (gm)
Impinger 6					148.8
Impinger 7					159.2

QA/QC SB
Date 3/19

CleanAir ENGINEERING

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

UNIT: 1 RUN: 1

FIELD DATA SHEET

Client	WHEELABRATOR	Project No.	12218
Plant	NORTH BROWARD	Date	3/19/13
Meter Operator	WAYNE BONNY		
Probe Operator	—		

Cross-Section of Test Location

Duct Dimensions (in.)	96×96		
Static Pres ($in. H_2O$)	-9.2	Port Len. (in.)	10
Gas Flow	[In] [Out] of page	First point all the way	[In] [Out]

Amb. Temp. (°F)	71	Bar. Press.	29.80 [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	0.002 [cfm] [Lpm] @ 15 (in. Hg)		
Leak Rate After	0.001 [cfm] [Lpm] @ 10 (in. Hg)		
Pitot Leak Check Before	Good ☑ Bad ☐	After	Good ☑ Bad ☐

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

Start Time	0810	Stop Time	0915

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. 279.615 [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
3-1	5	N/A	1.5	283.07	301	298	305	55	76	73	4	8.6		
	10		1.5	286.44	301	298	295	50	77	73	4	8.4		
	15		1.5	289.81	299	296	305	47	81	74	4	9.1		
	20		1.5	293.20	300	293	309	47	81	74	4	9.5		
	25		1.5	296.61	301	288	306	48	81	75	4	9.1		
	30		1.5	300.02	300	285	296	51	81	75	4	9.2		
	35		1.5	303.44	300	284	299	54	81	75	4	8.4		
	40		1.5	306.83	300	287	300	56	82	75	4	9.1		
	45		1.5	310.21	301	292	305	56	82	75	4	8.9		
	50		1.5	313.59	301	295	304	58	84	75	4	8.3		
	55		1.5	316.98	301	298	304	59	85	76	4	9.5		
	60		1.5	320.400	302	299	298	61	86	76	4	8.7		
	Total			40.785	3607				977	896				
	Average		1.5*		300.58				81.416					

* Sum of square roots.

Circle correct bracketed units on data sheet.

CleanAir. ENGINEERING

QA/QC WB
Date 3/19/13

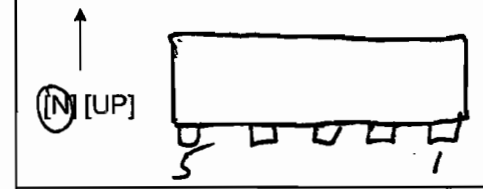
TEST LOCATION: FF OUTLET HCL **TESTING** **METHOD:** 26A **PAGE** 1 **OF** 1

UNIT: 1 **RUN:** 2

FIELD DATA SHEET

Client	WHEELABRATOR	Project No.	12218
Plant	NORTH BROWARD	Date	3/19/13
Meter Operator	WAYNE BENNETT		
Probe Operator			

Cross-Section of Test Location



Amb. Temp. (°F)	74	Bar. Press.	29.80 (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	0.002 [cfm] [Lpm]	@	15 (in. Hg)
Leak Rate After	0.001 [cfm] [Lpm]	@	10 (in. Hg)
Pitot Leak Check Before	[ ]	After: Good [ ]	Bad [ ]

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]

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

Start Time:	0948	Stop Time:	1048

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. 322.48 [ft^3] [L]	Stack Temp. T_s (°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	326.85	302	299	295	57	75	74	4	9.2		
|	10	|	1.5	329.38	302	298	307	51	76	74	4	8.5		
|	15	|	1.5	332.74	301	298	300	46	79	74	4	8.5		
|	20	|	1.5	336.11	301	299	308	45	81	74	4	8.4		
|	25	|	1.5	339.22	303	300	306	45	81	74	4	9.2		
|	30	|	1.5	342.87	302	299	300	47	83	75	4	9.1		
|	35	|	1.5	346.26	302	300	297	50	83	75	4	8.5		
|	40	|	1.5	349.66	301	301	306	56	84	75	4	8.5		
|	45	|	1.5	353.13	301	300	305	63	83	76	4	9.0		
|	50	|	1.5	356.59	302	288	307	64	81	75	4	8.6		
|	55	|	1.5	360.01	303	286	301	64	81	75	4	8.3		
|	60	|	1.5	363.445	301	288	304	65	80	74	4	9.0		
|		|												
	Total	*		40.965	3621				967	895				
	Average		1.5		301.75				27.583					

* Sum of square roots.

Circle correct bracketed units on data sheet.

CleanAir ENGINEERING

QA/QC W.B

Date 3/19/13

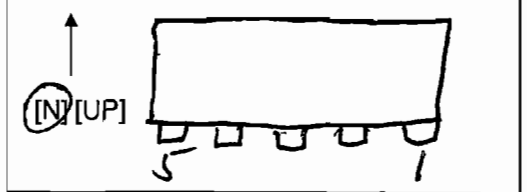
TEST LOCATION: PF OUTLET HCL TESTING METHOD: 26A PAGE 1 OF 1

UNIT: 1 RUN: 3

FIELD DATA SHEET

Client: WHEELABRATOR	Project No.: 12218
Plant: SOUTH BROWARD	Date: 3/19/13
Meter Operator: WAYNE BOURY	
Probe Operator: —	

Cross-Section of Test Location



Amb. Temp. (°F): 76	Bar. Press.: 29.80 (in. Hg) [mbar]
Probe I.D. No.: 67-4-3	
Liner Material: GLASS	

Meter Box: 66-14	Sample Box No.:		
Meter Y_d: 0.9879	Meter $\Delta H_@$: 1.8015		
K Factor: —	Pitot C_p: —		
Leak Rate Before: .003 [cfm] [Lpm]	@ 13 (in. Hg)	Filter No.: —	
Leak Rate After: 0.001 [cfm] [Lpm]	@ 10 (in. Hg)	Thimble No.: —	
Pitot Leak Check Before: ☐ After: Good ☐ Bad ☐		Nozzle Diameter: —	Nozzle I.D.: —

Duct Dimensions (in.):	96 × 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: 1119	Stop Time: 1219

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. 364,830 [ft^3] [L]	Stack Temp. T_s (°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. (%, dy)	☐ Amb. Filter ☐ Dioxin Trap	Notes
3-1	5	N/A	1.5	368.32	301	291	303	57	78	76	4	9.3		
	10		1.5	371.70	302	293	305	51	80	77	4	9.6		
	15		1.5	375.07	303	293	300	46	81	76	4	8.9		
	20		1.5	378.46	302	292	304	46	81	76	4	8.9		
	25		1.5	381.84	303	300	303	47	82	77	4	8.9		
	30		1.5	385.26	303	300	295	48	82	77	4	8.5		
	35		1.5	388.70	303	294	305	50	82	77	4	8.7		
	40		1.5	392.10	302	296	302	52	83	77	4	9.0		
	45		1.5	395.50	303	300	296	54	83	77	4	9.0		
	50		1.5	398.95	302	300	299	54	84	78	4	8.4		
	55		1.5	402.36	302	298	298	55	84	78	4	8.9		
↓	60	↓	1.5	405.770	302	301	303	57	84	79	4	9.1		
	Total			40.94	3628				984	925				
	Average		1.5*		302.33				79,5416					

* Sum of square roots.

Circle correct bracketed units on data sheet.

CleanAir ENGINEERING

QA/QC V.B

Date 3/19/13

Impinger Weight Sheet

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

	802810135	Balance Calibration Check	
Balance ID	TL 07-04	Reference Weight Mass	500 g
Reference Weight ID	60150	Reference Weight Reading	499.8 g 4/10 SB

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 3-19-13		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	488.1	446.4	41.7	
Impinger 2	100 mL 01.N H2SO4	700.2	561.0	139.2	QA/QC SB
Impinger 3	100 mL 01.N H2SO4	574.1	539.5	SB 4/5/13 ~~39.6~~ 34.6	Date 3/19
Impinger 4	Empty	446.8	439.9	6.9	
Impinger 5	Silica Gel	764.9	750.8	14.1	Total Weight (gm)
Impinger 6					~~227.4~~ 222.4
Impinger 7				SB 4/5/13 ~~241.5~~ 236.5	

Run No. 2	2	Filter Type Teflon Mat		Sample Box No. B1
Date 3-19-13		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	497.1	454.6	43.1	
Impinger 2	100 mL 01.N H2SO4	650.7	544.2	106.5	QA/QC SB
Impinger 3	100 mL 01.N H2SO4	582.2	535.2	47.0	Date 3/19
Impinger 4	Empty	482.8	464.6	18.2	
Impinger 5	Silica Gel	781.3	758.8	22.5	Total Weight (gm)
Impinger 6					214.8
Impinger 7					237.3

Run No. 3	3	Filter Type Teflon Mat		Sample Box No. B24
Date 3-19-13		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	493.7	449.6	44.1	
Impinger 2	100 mL 01.N H2SO4	694.6	558.2	136.4	QA/QC SB
Impinger 3	100 mL 01.N H2SO4	571.3	539.0	32.3	Date 3/19
Impinger 4	Empty	449.3	441.6	7.7	
Impinger 5	Silica Gel	777.1	764.5	12.6	Total Weight (gm)
Impinger 6					220.5
Impinger 7					233.1

QA/QC SB
Date 3/19

CleanAir ENGINEERING

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

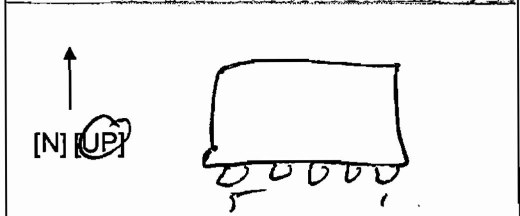
UNIT: 2 **RUN:** 1

FIELD DATA SHEET

Client	Wheelabrator	Project No.	12218
Plant	N. Broward	Date	3/12/13
Meter Operator	P. Bihun		
Probe Operator	P. Bihun		

Meter Box	61-11	Sample Box No.	M3
Meter Y	1.0050	Meter ΔH@	1.6664
K Factor	2.45	Pitot Cp	0.824
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 ☐		

Cross-Section of Test Location



Duct Dimensions (in.)	96x96		
Static Pres (in. H2O)	Port Len. (in.)	Gas Flow [In] [Out] of page	First point all the way [In] [Out]
-8.7	10.0		

Amb. Temp. (°F)	74	Bar. Press.	29.80 [in. Hg] [mbar]
Probe I.D. No.	678-17		
Liner Material	Glass		

Filter No.	C44-43
Thimble No.	N/A
Nozzle Diameter	.2725
Nozzle I.D.	2725-1

Start Time:	7:54	Stop Time:	10:07

Traverse Point Number	Min/pt 5 Elapsed Time	Velocity Head ΔP (in. H2O)	Orifice Setting ΔH (in. H2O)	Gas Sample Volume Vm [ft³] [L]	Stack Temp. Ts (°F)	Probe Tp (°F)	Filter T (°F)	Cond. Temp. Tc (°F)	DGM Inlet Tm(in) (°F)	DGM Outlet Tm(out) (°F)	Pump Vacuum (in.Hg)	Oxygen Indicator approx. (%dv)	Amb Filter / Dioxin Trap	Notes
				Init. Vol. 255.345		Set Points 250	250							
5-1	5	0.32	0.78	257.87	305	251	252	66	77	77	5.0	7.7	N/A	
2	10	0.33	0.81	260.40	306	251	252	66	79	76	5.0	7.7		
3	15	0.37	0.91	263.08	305	251	249	66	80	76	5.5	7.6		
4	20	0.39	0.96	265.87	306	250	251	64	81	76	6.0	7.3		
5	25	0.39	0.96	268.670	306	250	253	62	83	77	6.0	7.8		268.720 (-0.05)
4-1	30	0.40	0.98	271.52	306	248	250	62	82	76	6.0	7.7		
2	35	0.37	0.91	274.22	307	249	253	62	84	77	6.0	7.6		
3	40	0.32	0.78	276.75	306	252	253	62	85	78	5.0	7.1		
4	45	0.33	0.81	279.30	306	251	247	63	85	78	5.0	6.9		
5	50	0.29	0.71	281.705	305	250	248	63	87	79	4.5	7.4		281.770 (-0.065)
3-1	55	0.38	0.93	284.57	305	249	251	65	85	79	5.1	7.9		
2	60	0.35	0.86	287.16	306	250	253	64	88	80	5.0	7.0		
Total		[illegible]	21.020	16.310	3649					4167				
Average		0.5947	0.8720		305.9600				83.3400					

Sum of square roots. 10.4 Circle correct bracketed units on data sheet. 3669 1925

QA/QC PB
Date 3/19/13

CleanAir ENGINEERING

TEST LOCATION: RP Outlet **Particulate / Metals TESTING** **METHOD:** 5 12g **PAGE** 2 **OF** 2

UNIT: 2 **RUN:** 1

FIELD DATA SHEET

Client	Wheelabrator	Project No.	12218
Plant	N. Broward	Date	3/19/13
Meter Operator		R. Bihun	
Probe Operator		R. Bihun	

Meter Box		Sample Box No.	
Meter γ		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	(m^3) [L]	Stack Temp. T_s (°F)	Probe T_p (°F) Set Points 250	Filter T_f (°F) Set Points 252	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	0.35	0.86	289.79		306	251	247	65	88	80	5.0	7.7	n/a	
4	70	0.35	0.86	292.43		306	250	250	64	88	80	5.0	7.1		
5	75	0.34	0.83	295.040		307	250	249	64	89	81	5.0	6.9		295.040
2-1	80	0.34	0.83	297.68		305	249	253	65	87	82	5.0	7.6		-0.04
2	85	0.37	0.91	300.41		307	250	252	65	89	82	5.1	6.8		
3	90	0.43	1.1	303.39		307	251	252	65	90	82	6.5	7.6		
4	95	0.40	0.98	306.23		307	250	250	64	91	83	6.0	6.9		
5	100	0.45	1.1	309.210		307	250	249	62	91	83	7.0	6.4		309.280
1-1	105	0.30	0.74	311.71		304	249	248	63	90	83	5.0	6.6		-0.07
2	110	0.23	0.56	313.81		305	249	249	63	91	83	4.0	6.7		
3	115	0.36	0.88	316.51		307	250	254	64	91	84	5.0	6.2		
4	120	0.35	0.86	319.16		306	251	251	63	92	85	5.0	7.4		
5	125	0.37	0.91	321.850		306	250	250	63	92	85	6.0	6.4		
	Total														
	Average														

* Sum of square roots.

Circle correct bracketed units on data sheet.

CleanAir ENGINEERING

QA/QC PB

Date 3/19/13

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

UNIT: 2 RUN: 2

FIELD DATA SHEET

Client	Wheelabrator	Project No.	12218
Plant	N. Broward	Date	3/19/13
Meter Operator	P. Bikun		
Probe Operator	P. Bikun		

Meter Box	61-11	Sample Box No.	M9
Meter Y_d	1.0050	Meter $\Delta H_@$	1.6864
K Factor	2.50	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]

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]
-9.2	10.0		

Amb. Temp. (°F)	74	Bar. Press	29.80 [in. Hg] [mbar]
Probe I.D. No.	67-8-17		
Liner Material	Glass		

Filter No.	e45-01		
Thimble No.	N/A		
Nozzle Diameter	0.2725	Nozzle I.D.	2725-1

Start Time:	10:35	Stop Time:	12:48

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] 322.205	Stack Temp. T_s (°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
3-1	5	0.32	0.80	324.77	306	250	252	66	85	83	3.0	7.3	N/A	
2	10	0.35	0.84	327.36	305	255	250	64	86	83	3.0	6.1		K=2.40
3	15	0.31	0.74	329.80	305	254	253	62	88	83	3.0	6.6		
4	20	0.31	0.74	332.25	305	251	254	60	89	83	3.0	7.3		
5	25	0.31	0.74	334.685	305	250	250	60	90	84	3.0	7.2		334.730 -0.045
2-1	30	0.38	0.91	337.43	304	250	254	63	90	84	3.0	7.6		
2	35	0.42	1.0	340.28	305	250	252	62	92	84	3.0	7.8		
3	40	0.38	0.91	343.03	306	251	255	62	92	84	3.0	7.8		
4	45	0.38	0.91	345.77	306	250	252	63	92	84	3.0	7.8		
5	50	0.36	0.86	348.400	306	250	252	64	92	85	3.0	7.0		348.450 -0.205
1-1	55	0.23	0.55	350.55	302	249	248	65	90	84	2.0	7.5		
2	60	0.23	0.55	352.65	302	250	252	66	90	84	2.0	7.5		
	Total	* 14.3324		63.275	305.250									
	Average	0.5733	0.7912		304.8				88.460					

* Sum of square roots. 9.55

Circle correct bracketed units on data sheet. 3657 2081

CleanAir ENGINEERING

QA/QC PB

Date 3/19/13

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

UNIT: 2 **RUN:** 2

FIELD DATA SHEET

Client	Wheelabrator	Project No.	12218
Plant	N. Broward	Date	3/19/13
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 ☐	

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 / 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_p (°F) 250	Cond. Temp. T_o (°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	0.33	0.79	315.17	304	252	250	66	91	84	3.0	7.1	N/A	
4	70	0.38	0.91	357.90	306	251	249	57	92	85	3.0	6.9		
5	75	0.43	1.0	360.740	306	250	251	50	93	85	3.1	7.0		360.830
6-1	80	0.34	0.82	363.42	306	248	253	56	91	86	3.0	6.9		-0.09
2	85	0.33	0.79	365.95	306	250	251	56	93	86	3.0	6.6		
3	90	0.31	0.74	368.42	305	251	251	56	94	87	3.0	7.1		
4	95	0.33	0.79	371.00	305	250	254	49	94	87	3.0	7.4		
5	100	0.32	0.77	373.510	306	250	247	49	95	87	3.0	7.3		373.510
6-1	105	0.30	0.72	375.96	306	249	253	52	92	87	3.0	7.0		-0.04
2	110	0.32	0.77	378.49	306	250	255	53	94	87	3.0	7.1		
3	115	0.30	0.72	380.91	306	251	248	53	95	88	3.0	6.6		
4	120	0.31	0.74	383.39	306	250	252	52	96	88	3.0	7.1		
5	125	0.28	0.67	385.705	306	251	250	52	96	89	3.0	6.5		
	Total													
	Average													

* Sum of square roots.

Circle correct bracketed units on data sheet.

CleanAir ENGINEERING

QA/QC RB

Date 3/19/13

G - 25

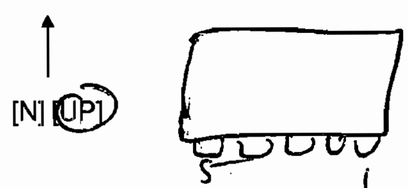
TEST LOCATION: TF Outlet — Particulate/Metals TESTING — METHOD: 5/29 — PAGE 1 OF 2

UNIT: 2 RUN: 3

FIELD DATA SHEET

Client	Wheelabrator	Project No.	12218
Plant	N. Broward	Date	3/19/13
Meter Operator	P. Bihuy		
Probe Operator	P. Bihuy		
Meter Box	61-11	Sample Box No.	M3
Meter Y_d	1.000	Meter $\Delta H_@$	1.6464
K-Factor	2.45	Pitot C_p	0.824
Leak Rate Before	0.001 [cfm] [Lpm]	@	15 (in. Hg)
Leak Rate After	0.006 [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]	First point all the way [In] [Out]
-8.6	10.0	of page	

Amb. Temp (°F)	78	Bar. Press.	29.80 [in. Hg] [mbar]
Probe I.D. No.	67-8-17		
Liner Material	Glass		
Filter No.	04503		
Thimble No.	N/A		
Nozzle Diameter	0.2725	Nozzle I.D.	2725-1
Start Time:	13:25	Stop Time:	15:37

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] 386.761	Stack Temp T_s (°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	0.31	0.76	389.32	306	249	255	66	92	90	3.0	7.2	N/A	
2	10	0.31	0.76	391.83	306	280	256	66	94	91	3.0	7.4	↓	
3	15	0.36	0.88	394.52	307	251	255	66	96	91	3.0	6.8		
4	20	0.37	0.91	397.27	307	257	251	62	98	91	3.5	6.8		
5	25	0.31	0.76	399.790	305	250	250	58	99	92	3.0	6.9		399.855
4-1	30	0.31	0.76	402.40	305	250	250	60	99	93	3.0	7.9		-0.065
2	35	0.33	0.81	404.93	307	250	255	61	101	94	3.0	7.5		
3	40	0.32	0.78	407.48	307	250	250	61	101	94	3.0	6.8		
4	45	0.35	0.86	410.14	307	250	250	60	101	94	3.5	7.4		
5	50	0.30	0.74	412.635	307	250	249	60	101	94	3.0	6.6		412.705
3-1	55	0.33	0.81	415.30	306	250	250	63	99	94	3.0	7.2		-0.07
2	60	0.32	0.78	417.84	306	250	250	64	99	93	3.0	6.5		
	Total	*		64.955					4831					
	Average	0.5755	0.8176		305.760				96.6200					

* Sum of square roots. 9.61

Circle correct bracketed units on data sheet.

3676 2291

CleanAir ENGINEERING

QA/QC PB
Date 3/19/13

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

UNIT: 2 **RUN:** 3

FIELD DATA SHEET

Client	Wheelabrator	Project No.	12918
Plant	N. Broward	Date	3/19/13
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 T_s (°F)	Probe T T_p (°F) Set Points 250	Filter T 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	45	0.34	0.83	420.47	306	251	249	65	100	93	3.1	7.0	N/A	
4	70	0.33	0.81	423.09	307	251	251	61	100	94	3.5	6.1		
5	75	0.37	0.91	425.845	307	250	249	53	100	94	3.1	5.5		425.820
2-1	80	0.31	0.76	428.38	305	249	250	58	99	94	3.0	7.3		-0.025
2	85	0.31	0.76	430.90	306	249	252	55	100	94	3.0	6.3		
3	90	0.33	0.81	433.49	306	250	251	57	101	95	3.5	6.8		
4	95	0.43	1.1	436.52	306	251	248	56	103	95	4.0	7.5		
5	100	0.45	1.1	439.545	307	250	248	56	103	95	4.0	7.2		439.545
1-1	105	0.23	0.56	441.74	300	250	249	60	101	95	3.0	7.2		-0.048
2	110	0.24	0.59	443.93	301	249	250	62	101	95	3.0	7.7		
3	115	0.31	0.76	446.45	305	250	250	63	101	95	3.5	7.8		
4	120	0.37	0.91	449.20	306	251	250	64	101	95	4.0	7.6		
5	125	0.38	0.93	~~452~~	306	250	250	64	101	95	4.0	7.7		
	Total			451.975										
	Average			[illegible]										

* Sum of square roots.

Circle correct bracketed units on data sheet.

CleanAir ENGINEERING

QA/QC PB

Date 3/19/13

Impinger Weight Sheet

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

Balance Calibration Check			
Balance ID	TL07-04	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.	M3
Date	3-19-13	Lot No.		pH NA	
Analyst	HN	Filter No.	e44-43	Rinse NA	

	Contents	Gross Weight (gm)	Tare Weight (gm)	Net Weight Gain (gm)	
Impinger 1	Empty	709.4	462.0	247.4	
Impinger 2	100 ml 5%HNO_3/10%H_2O_2	655.8	541.0	114.8	QA/QC SB
Impinger 3	100 ml 5%HNO_3/10%H_2O_2	578.0	547.5	30.5	Date 3/19
Impinger 4	Empty	432.0	422.3	9.7	
Impinger 5	100 ml 4%$KMnO_4$/10%H_2SO_4	649.0	643.6	5.4	Total Weight (gm)
Impinger 6	100 ml 4%$KMnO_4$/10%H_2SO_4	543.7	541.7	2.0	409.8
Impinger 7	≈250 g Silica Gel	770.3	752.5	17.8	427.6

Run No.	2	2	Filter Type Quartz		Sample Box No.	M9
Date	3-19-13		Lot No.		pH NA	
Analyst	HN / DL		Filter No.	e45-01	Rinse NA	

	Contents	Gross Weight (gm)	Tare Weight (gm)	Net Weight Gain (gm)	
Impinger 1	Empty	700.3	453.2	247.1	
Impinger 2	100 ml 5%HNO_3/10%H_2O_2	642.7	553.0	89.7	QA/QC SB
Impinger 3	100 ml 5%HNO_3/10%H_2O_2	570.5	542.7 DC 3/20/13	27.8	Date 3/19
Impinger 4	Empty	440.5	435.2	5.3	
Impinger 5	100 ml 4%$KMnO_4$/10%H_2SO_4	557.2	553.5	3.7	Total Weight (gm)
Impinger 6	100 ml 4%$KMnO_4$/10%H_2SO_4	538.7	537.3	1.4	375.0
Impinger 7	≈250 g Silica Gel	783.0	766.0	17.0	392.2

Run No.	3	3	Filter Type Quartz		Sample Box No.	M3
Date	3-19-13		Lot No.		pH NA	
Analyst	HN / DAN L		Filter No.	e45-03	Rinse NA	

	Contents	Gross Weight (gm)	Tare Weight (gm)	Net Weight Gain (gm)	
Impinger 1	Empty	727.1	464.0	263.1	
Impinger 2	100 ml 5%HNO_3/10%H_2O_2	643.5	544.0	99.5	QA/QC SB
Impinger 3	100 ml 5%HNO_3/10%H_2O_2	570.8	548.8	22.0	Date 3/20
Impinger 4	Empty	426.2	423.9	2.3	
Impinger 5	100 ml 4%$KMnO_4$/10%H_2SO_4	644.3	642.3	2.0	Total Weight (gm)
Impinger 6	100 ml 4%$KMnO_4$/10%H_2SO_4	548.4	546.5	1.9	390.8
Impinger 7	≈250 g Silica Gel	781.9	769.5	12.4	403.2

QA/QC SB
Date 3/20

CleanAir ENGINEERING

TEST LOCATION: FF outlet **METALS/PART 24 TESTING** **METHOD** 8/5-29 **PAGE** 1 **OF** 2

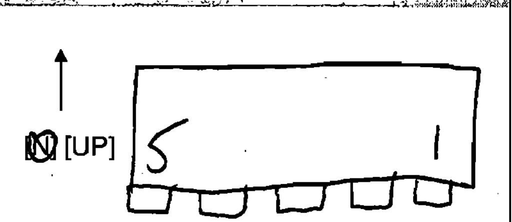
UNIT: 2 **RUN:** 4

FIELD DATA SHEET

Client	Wheelabrator	Project No.	12218
Plant	North Broward	Date	3-21-13
Meter Operator	SS		
Probe Operator	WB		

Meter Box	66-22	Sample Box No.	M-9
Meter Y_d	0.9972	Meter $\Delta H_@$	1.8840
K Factor	2.72	Pitot C_p	0.813
Leak Rate Before	0.002 [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.): 96x96

Static Pres (in. H_2O)	Port Len (in.)	Gas Flow [In] [Out] of page	First point all the way [In] [Out]
-9.4	10	[Out]	[In]

Amb. Temp. (°F)	71	Bar. Press.	29.75 [in. Hg] [mbar]
Probe I.D. No.	67-826		
Liner Material	GLASS		
Filter No.	NA		
Thimble No.	NA		
Nozzle Diameter	SB ~~.2775~~ 3/21 0.2760	Nozzle I.D.	~~2775-1~~ SB 3/21 0.2760-1
Start Time:	12:05	Stop Time:	14:26

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. 044.400 [ft³] [L]	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
P1-1	5	0.15	0.41	46.20	300	250	251	52	76	75	2	7.8		
2	10	0.15	0.41	47.97	298	251	250	52	77	76	2	8.0		
3	15	0.37	1.00	50.66	301	250	251	53	77	76	3	8.2		
4	20	0.46	1.30	53.86	304	251	252	53	80	76	4	8.3		
5	25	0.53	1.40	57.01	304	250	251	53	84	78	4	7.7		ΔV=-.25
P2-1	30	0.45	1.20	60.25	306	251	252	54	84	79	4	7.6		
2	35	0.48	1.30	63.27	305	252	250	54	86	80	4	7.6		
3	40	0.50	1.40	66.48	306	251	252	56	86	80	4	6.8		
4	45	0.48	1.30	69.71	305	250	251	56	87	81	4	7.2		
5	50	0.45	1.20	72.68	304	252	252	56	89	82	4	7.4		ΔV=-.34
P3-1	55	0.38	1.00	75.73	305	253	251	49	88	83	4	7.8		
2	60	0.39	1.10	78.66	305	252	252	49	87	83	4	7.7		
	Total	7.4644	13.0200	70.810	3643				1001	949				
	Average	0.6270	1.0840		304.0000				84.4400					

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

QA/QC SB
Date 3-21-13

G - 28

CleanAir ENGINEERING

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

UNIT: 2 **RUN:** 4

FIELD DATA SHEET

Client	WHEELABRATOR	Project No.	12218
Plant	NORTH BROWARD	Date	3-21-13
Meter Operator		SJ	
Probe Operator		SJ	

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. 78.660 (ft³) [L]	Stack Temp. Ts (°F)	Probe Tp (°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
P3-3	65	0.40	1.10	81.46	305	252	251	47	88	83	4	7.5		
4	70	0.42	1.10	84.36	305	251	250	47	88	83	4	7.6		
5	75	0.41	1.10	87.22	303	252	251	46	88	83	4	7.7		ΔV = -.18
P4-1	80	0.39	1.10	90.26	304	250	252	50	89	85	4	7.4		
2	85	0.40	1.10	93.13	305	251	252	51	89	85	4	8.2		
3	90	0.40	1.10	95.95	305	250	251	52	90	85	4	8.0		
4	95	0.45	1.20	98.98	305	252	250	52	91	85	4	7.9		
5	100	0.44	1.20	102.04	305	251	252	54	91	85	4	6.8		ΔV = -.16
P5-1	105	0.38	1.00	104.90	304	250	251	55	91	86	4	8.0		
2	110	0.40	1.10	107.77	304	252	250	56	91	87	4	7.9		
3	115	0.36	0.99	110.56	304	250	251	56	90	87	4	7.7		
4	120	0.37	1.00	113.34	304	251	250	56	90	86	4	7.6		
5	125	0.37	1.00	116.14	304	252	251	56	90	86	4	7.4		
	Total	8.2098	14.0800		3957				1166	1106				
	Average													

* Sum of square roots.

Circle correct bracketed units on data sheet.

CleanAir ENGINEERING

QA/QC 84

Date 3-21-13

Impinger Weight Sheet

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

	8028/0 1135+1068	Balance Calibration Check	
Balance ID	TL 67-04	Reference Weight Mass	500.0g
Reference Weight ID	6015C	Reference Weight Reading	499.8g 3/9/10

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. M9
Date 3/2/13	Lot No.		pH NA
Analyst DL	Filter No.		Rinse NA

	Contents	Gross Weight (gm)	Tare Weight (gm)	Net Weight Gain (gm)	
Impinger 1	Empty	771.5	457.4	314.1	
Impinger 2	100 ml 5%HNO_3/10%H_2O_2	667.4	558.5	108.9	QA/QC SB
Impinger 3	100 ml 5%HNO_3/10%H_2O_2	562.7	547.3	15.4	Date 3/21
Impinger 4	Empty	440.8	438.9	1.9	
Impinger 5	100 ml 4%$KMnO_4$/10%H_2SO_4	544.7	543.5	1.2	Total Weight (gm)
Impinger 6	100 ml 4%$KMnO_4$/10%H_2SO_4	534.1	534.0	0.1	441.6
Impinger 7	≈250 g Silica Gel	785.5	773.8	11.7	453.3

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 3/21

Impinger Weight Sheet

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

Balance Calibration Check			
Balance ID	8028010168 5B 4/10	Reference Weight Mass	500g
Reference Weight ID	6015 0	Reference Weight Reading	499.8

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. D4
Date 3-19-13	Lot No.		pH NA
Analyst HN / DL	Filter No. NA		Rinse NA

	Contents	Gross Weight (gm)	Tare Weight (gm)	Net Weight Gain (gm)	
Impinger 1	Empty	1362.7	642.9	719.8	
Impinger 2	100 ml HPLC Water	566.5	564.1	2.4	QA/QC SB
Impinger 3	100 ml HPLC Water	551.9	551.4	0.5	Date 3/20
Impinger 4	Empty	425.0	419.0	6.0	
Impinger 5	Trap # T1640-010	342.2	317.8	24.4	Total Weight (gm)
Impinger 6	Silica Gel	818.3	762.1	56.2	753.1
Impinger 7					809.3

Run No. 2	Filter Type Rinsed Glass Fiber		Sample Box No. D3
Date 3/20/13	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	1424.8	639.6	785.2	
Impinger 2	100 ml HPLC Water	567.2	~~565.5~~ 500.5	1.7	QA/QC SB
Impinger 3	100 ml HPLC Water	543.8	524.8	19.0	Date 3/20
Impinger 4	Empty	435.2	429.4	5.8	
Impinger 5	Trap # T1640-007	363.4	339.5	23.9	Total Weight (gm)
Impinger 6	Silica Gel	798.1	739.2	58.9	835.6
Impinger 7					894.5

Run No. 3	Filter Type Rinsed Glass Fiber		Sample Box No. D1
Date 3/20/13	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	1410.8	~~805.2~~ 632.5	778.3	
Impinger 2	100 ml HPLC Water	538.3 ~~541.5~~ SB	538.0	0.2	QA/QC SB
Impinger 3	100 ml HPLC Water	541.5 ~~425.9~~ 3/20	536.4	5.1	Date 3/20
Impinger 4	Empty	425.9	424.3	1.6	
Impinger 5	Trap # T1640-008	420.5	383.0	37.5	Total Weight (gm)
Impinger 6	Silica Gel	861.6	805.2	56.4	822.7
Impinger 7					879.1

QA/QC SB
Date 3/20

CleanAir ENGINEERING

TEST LOCATION: INLET HCL TESTING METHOD: M26A PAGE 1 OF 1

UNIT: 2 RUN: 1

FIELD DATA SHEET

Client	WCEC/ARAPAHOE	Project No.	12218
Plant	NORTH BOULDER	Date	3-21-13
Meter Operator	SJ		
Probe Operator	SJ		

Cross-Section of Test Location

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

Meter Box	66-19	Sample Box No.	B-14
Meter Y_d	1.0068	Meter $\Delta H_@$	1.9165
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]	First point all the way [In] [Out]
-1.5	14	of page	

Start Time: 7:54 Stop Time: 8:54

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 134.360 [ft³] [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
1-1	5	NA	1.20	137.31	508	356	358	54	74	72	3	NA		
	10			139.95	505	355	356	52	74	72	3			
	15			142.58	504	356	355	51	74	72	5			
	20			145.42	501	354	357	52	73	71	5			
	25			148.17	501	355	353	53	72	70	6			
	30			150.92	502	355	355	53	72	70	7			
	35			153.81	504	355	354	54	74	70	8			
	40			156.70	505	356	355	55	75	70	10			
	45			159.58	503	355	355	56	75	71	11			
	50			162.49	504	355	355	58	75	71	12			
	55			165.43	503	355	352	59	74	72	13			
	60	↓	↓	168.37	504	354	354	60	74	72	14	↓		
	Total	*		34.070	6044				886	853				
	Average		1.2000		503.667				73.4583					

Sum of square roots.

Circle correct bracketed units on data sheet.

CleanAir ENGINEERING

QA/QC SJ

Date 3-21-13

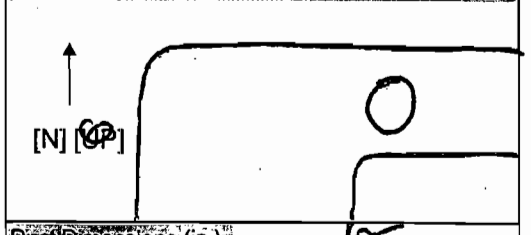
TEST LOCATION: INLET HCL TESTING METHOD: M26A PAGE 1 OF 1

UNIT: 2 RUN: 2

FIELD DATA SHEET

Client	WHEELABRATOR	Project No.	12218
Plant	NORTH BROWARD	Date	3-21-13
Meter Operator		SJ	
Probe Operator		SJ	

Cross-Section of Test Location



Amb. Temp. (°F)	68	Bar. Press.	29.75 [in Hg] [mbar]
Probe I.D. No.		66-4-7	
Liner Material		GLASS	

Meter Box	66-18	Sample Box No.			
Meter Y_d	1.0008	Meter $\Delta H_@$	1.9165		
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	☐

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	[In]	[Out]

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

Start Time	9:15	Stop Time	10:15

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. 171.900 [ft³] [L]	Stack Temp. Ts (°F)	Probe T_p Set Points (°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
P1-1	5	NA	1.20	174.78	498	355	354	52	76	74	3	6.1		
	10			177.65	499	356	355	50	77	74	4	6.0		
	15			180.33	499	355	355	50	77	73	5	5.5		
	20			183.01	500	354	356	51	76	73	6	5.2		
	25			185.70	499	354	355	52	75	73	7	5.8		
	30			188.59	499	355	354	54	75	73	8	6.1		
	35			191.48	500	354	355	55	76	73	11	5.5		
	40			194.35	502	354	356	56	77	73	12	5.7		
	45			197.21	504	355	354	56	78	74	13	5.6		
	50			200.06	502	354	356	58	78	74	14	5.9		
	55			202.91	503	356	355	59	77	73	15	5.7		
↓	60	↓	↓	205.79	502	355	354	60	77	73	16	5.6		
	Total	*		33.890	6007				919	880				
	Average		1.2000		500.583				74.958					

* Sum of square roots.

Circle correct bracketed units on data sheet.

CleanAir ENGINEERING

QA/QC SH
Date 3-21-13

TEST LOCATION: INLET HCL TESTING METHOD: M26A PAGE 1 OF 1

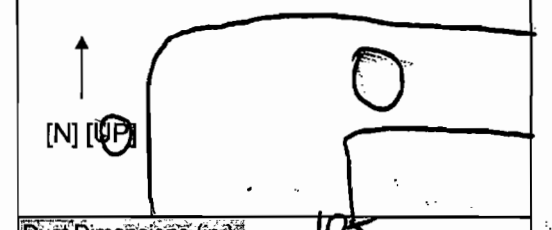
UNIT: 2 RUN: 3

FIELD DATA SHEET

Client	WHEELABRATOR	Project No:	1228
Plant	NORTH BROWARD	Date	3-21-13
Meter Operator			SJ
Probe Operator			SJ

Meter Box	66-T	Sample Box No	
Meter Y_d	0.9998	Meter $\Delta H_@$	1.9165
K Factor	NA	Pitot C_p	0.834
Leak Rate Before	0.003 [cfm] [Lpm] @	16	(in. Hg)
Leak Rate After	0.003 [cfm] [Lpm] @	8	(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]
-1.4	14		

Amb. Temp. (°F)	69	Bar. Press.	29.75 [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: 10:35 Stop Time: 11:35

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. 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
				211.900			355	355							
P1-1	5	NA	1.20	214.78		502	355	355	50	80	75	4	6.4		
	10			217.65		503	356	354	50	81	75	4	6.2		
	15			220.84		502	357	355	50	81	76	4	5.8		
	20			223.40		503	356	354	51	82	77	5	5.9		
	25			226.24		505	355	353	51	82	78	7	6.1		
	30			229.12		506	354	352	51	82	78	8	6.2		
	35			231.97		507	355	354	52	82	78	9	6.4		
	40			234.83		506	355	355	52	82	78	10	6.3		
	45			237.68		502	353	354	52	84	79	12	6.1		
	50			240.54		503	354	355	54	85	80	13	5.8		
	55			243.40		504	355	356	56	86	81	14	5.6		
	60			246.28		503	354	354	56	86	82	15	5.9		
													6.2		
			1.2000	34.380		6046				993	937				
			Sum of square roots			503.8333					80.4167				

QA/QC Date 3-21-13

Impinger Weight Sheet

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

	802810T135+1068	Balance Calibration Check	
Balance ID	TL07-04	Reference Weight Mass	500.0g
Reference Weight ID	60150	Reference Weight Reading	499.8g SB 4/10

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 3-21-13		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	496.7	460.7	36.0	
Impinger 2	100 mL 01.N H2SO4	658.0	542.9	115.1	QA/QC SB
Impinger 3	100 mL 01.N H2SO4	583.8	565.6	18.2	Date 3/21
Impinger 4	Empty	446.8	444.6	2.2	
Impinger 5	Silica Gel	809.4	799.1	10.3	Total Weight (gm)
Impinger 6					171.5
Impinger 7					181.8

Run No. 2	2	Filter Type Quartz		Sample Box No. B6
Date 3-21-13		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	489.3	456.5	32.8	
Impinger 2	100 mL 01.N H2SO4	653.1	553.6	99.5	QA/QC SB
Impinger 3	100 mL 01.N H2SO4	569.9	538.0	31.9	Date 3/21
Impinger 4	Empty	489.8	483.3	6.5	
Impinger 5	Silica Gel	815.0	802.4	13.4	Total Weight (gm)
Impinger 6					170.7
Impinger 7					184.1

Run No. 3	3	Filter Type Quartz		Sample Box No. B14
Date 3-21-13		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	480.6	454.3	26.3	
Impinger 2	100 mL 01.N H2SO4	649.0	542.7	106.3	QA/QC SB
Impinger 3	100 mL 01.N H2SO4	601.5	570.0	31.5	Date 3/21
Impinger 4	Empty	452.1	444.2	7.9	
Impinger 5	Silica Gel	822.6	809.4	13.2	Total Weight (gm)
Impinger 6					172.0
Impinger 7					185.2

QA/QC SB
Date 3/21

CleanAir. ENGINEERING

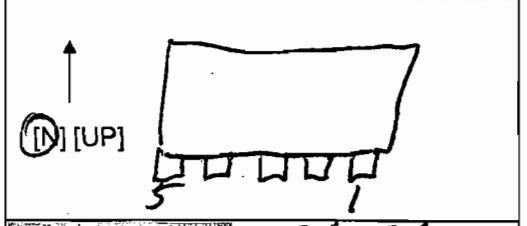
TEST LOCATION: FF OUTLET HCL **TESTING** **METHOD:** 26A **PAGE** 1 **OF** 1

UNIT: 2 **RUN:** 2

FIELD DATA SHEET

Client	WHEELABRATOR	Project No.	12218
Plant	NORTH BROWARD	Date	3/21/13
Meter Operator	WAYNE BERRY		
Probe Operator	—		

Cross-Section of Test Location



Amb. Temp. (°F)	64	Bar. Press.	29.75 (in. Hg) [mbar]
Probe I.D. No.	67-4-3		
Liner Material	GLASS		

Meter Box	61-11	Sample Box No.	B-01
Meter Y	1.00570	Meter $\Delta H_@$	1.6964
K-Factor	—	Pitot C_{p}	—
Leak Rate Before	0.003 [cfm] [Lpm]	@	15 (in. Hg)
Leak Rate After	0.002 [cfm] [Lpm]	@	7 (in. Hg)
Pitot Leak Check Before	✓	After	✓ ☐ 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]
-9.5	10		[In]

Start Time:	0915	Stop Time:	1015

Traverse Point Number	Min of 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. 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
				494.600		300	300							
1-1	5	N/A	1.5	498.10	306	300	301	58	75	71	4	6.4		
	10		1.5	501.57	306	300	300	51	77	72	4	7.8		
	15		1.5	504.92	306	300	301	46	80	72	4	8.1		
	20		1.5	508.39	306	300	298	47	82	72	4	8.0		
	25		1.5	511.84	306	299	299	50	82	72	4	6.6		
	30		1.5	515.31	306	300	299	57	83	73	4	7.7		
	35		1.5	518.78	305	300	300	58	83	73	4	7.4		
	40		1.5	522.26	306	301	300	59	84	74	4	7.6		
	45		1.5	525.71	306	301	300	61	84	74	4	8.1		
	50		1.5	529.16	306	301	300	63	84	74	4	7.6		
	55		1.5	532.58	306	300	301	58	85	75	4	7.6		
✓	60	✓	1.5	536.055	307	300	302	55	84	75	4	7.6		
	Total	*		41.4550	3672.0				983.0	877.0				
	Average		1.5		306.0				77.5000					

* Sum of square roots.

Circle correct bracketed units on data sheet.

CleanAir ENGINEERING

QA/QC W.B

Date 3/21/13

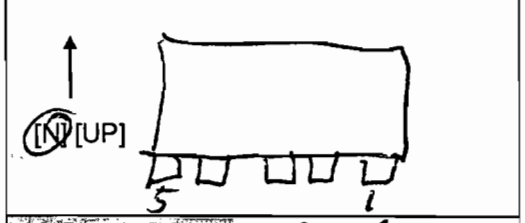
TEST LOCATION: EF OUTLET HCL TESTING METHOD: 26A PAGE 1 OF 1

UNIT: 2 RUN: 3

FIELD DATA SHEET

Client	WHEELABRATOR	Project No.	12218
Plant	NORTH BROWARD	Date	3/21/13
Meter Operator	WAYNE BEARY		
Probe Operator	—		

Cross-Section of Test Location



Amb. Temp. (°F)	64	Bar. Press.	29.75 (in. Hg) [mbar]
Probe I.D. No.		67-4-3	
Liner Material		GLASS	

Meter Box	61-11	Sample Box No.	B-24
Meter Y_d	1.0050	Meter $\Delta H_@$	1.6964
K-Factor	—	Pitot C_p	—
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 ☐

Duct Dimensions (in.)	96 X 96		
Static Pres ($in. H_2O$)	-9.4	Port Len. (in.)	10
Gas Flow	(In) [Out]	First point all the way	(In) [Out]
	of page		

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

Start Time:	1035	Stop Time:	1135

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] 537.190	Stack Temp. T_s (°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	540.65	305	299	307	56	79	74	4	8.1		
	10		1.5	544.05	306	300	303	51	80	75	4	7.9		
	15		1.5	547.50	307	301	301	48	84	75	4.5	7.7		
	20		1.5	550.92	307	300	300	52	85	76	5	7.6		
	25		1.5	554.37	307	300	300	59	86	76	5	7.4		
	30		1.5	557.86	306	300	300	60	87	76	5	7.1		
	35		1.5	561.33	306	300	300	62	88	78	5	7.3		
	40		1.5	564.80	306	301	300	63	88	78	5	7.3		
	45		1.5	568.27	307	299	300	64	88	78	5	7.0		
	50		1.5	571.72	306	300	300	65	89	79	5	7.4		
	55		1.5	575.16	306	300	300	63	89	79	5	6.8		
	60		1.5	578.585	306	301	300	61	89	80	5	6.3		
	Total			41.3950	3675.0				1032.0	924.0				
	Average		1.5		306.2500				81.5000					

* Sum of square roots.

Circle correct bracketed units on data sheet.

CleanAir ENGINEERING

QA/QC W.D.

Date 3/21/13

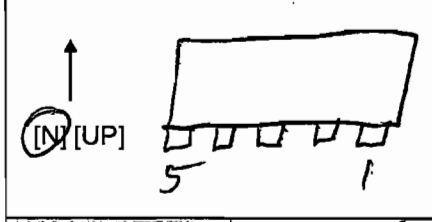
TEST LOCATION: EF OUTLET HCL TESTING METHOD: 26A PAGE 1 OF 1

UNIT: 2 RUN: 1

FIELD DATA SHEET

Client	WHEELABRATOR	Project No.	12218
Plant	NORTH BROWARD	Date	3/21/13
Meter Operator	WAYNE BOHM		
Probe Operator	—		

Cross-Section of Test Location



Amb. Temp. (°F)	67	Bar. Press.	29.75 (in. Hg) [mbar]
Probe I.D. No.	67-4-3		
Liner Material	GLASS		

Meter Box	61-11	Sample Box No.	B-24
Meter Y_d	1.0050	Meter $\Delta H_@$	1.6964
K Factor	—	Pitot C_p	—
Leak Rate Before	0.003 (cfm) [Lpm]	@	15 (in. Hg)
Leak Rate After	0.003 [cfm] [Lpm]	@	7 (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. (ΔP) (in. H_2O)	Port Len. (in.)	Gas Flow [In] [Out] of page	First point all the way [In] [Out]		
-9.8	10				

Start Time:	0754	Stop Time:	0854

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. 452.555 (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
3-1	5	P/A	1.5	456.01	308	300	301	58	71	69	4	8.1		
	10		1.5	459.39	307	300	301	53	73	69	4	7.1		
	15		1.5	462.76	307	301	300	51	76	69	4	7.4		
	20		1.5	466.16	307	301	301	56	78	70	4	7.4		
	25		1.5	469.63	307	299	299	63	79	70	5	7.9		
	30		1.5	473.13	307	300	300	63	80	71	5	8.7		
	35		1.5	476.60	306	300	300	63	81	71	5	7.9		
	40		1.5	480.04	307	300	300	64	81	71	5	7.3		
	45		1.5	483.48	307	300	300	64	81	71	5	7.3		
	50		1.5	486.93	308	300	299	64	82	72	5	6.8		
	55		1.5	490.39	308	300	301	65	82	72	5	7.4		
	60		1.5	493.870	307	299	300	65	82	72	5	7.6		
	Total	*		41.3150	3686.0				946.0	847.0				
	Average		(1.5)		(307.166)				(74.708)					

* Sum of square roots.

Circle correct bracketed units on data sheet.

CleanAir ENGINEERING

QA/QC WB

Date 3/21/13

Impinger Weight Sheet

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

	802810 1135+1068	Balance Calibration Check	
Balance ID	TL 07-04	Reference Weight Mass	500.0 g
Reference Weight ID	60150	Reference Weight Reading	499.8 g 4/10

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 3-21-13		Lot No.		pH
Analyst HW/DL		Filter No. NA		Rinse NA

	Contents	Gross Weight (gm)	Tare Weight (gm)	Net Weight Gain (gm)	
Impinger 1	50 mL 0.1N H2SO4	481.6	450.4	31.2	
Impinger 2	100 mL 01.N H2SO4	699.8	558.9	140.9	QA/QC SB
Impinger 3	100 mL 01.N H2SO4	597.7	544.3	53.4	Date 3/21
Impinger 4	Empty	462.5	442.0	20.5	
Impinger 5	Silica Gel	718.7	696.7	22.0	Total Weight (gm)
Impinger 6					246.0
Impinger 7					268.0

Run No. 2	2	Filter Type Teflon Mat		Sample Box No.
Date 3-21-13		Lot No.		pH
Analyst HW/DL		Filter No. NA		Rinse NA

	Contents	Gross Weight (gm)	Tare Weight (gm)	Net Weight Gain (gm)	
Impinger 1	50 mL 0.1N H2SO4	482.4	454.0	28.4	
Impinger 2	100 mL 01.N H2SO4	687.4	548.0	139.4	QA/QC JB
Impinger 3	100 mL 01.N H2SO4	621.4	558.7	62.7	Date 3/21
Impinger 4	Empty	486.1	467.2	18.9	
Impinger 5	Silica Gel	705.1	686.9	18.2	Total Weight (gm)
Impinger 6					249.4
Impinger 7					267.6

Run No. 3		Filter Type Teflon Mat		Sample Box No.
Date 3/21/13		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	480.2	450.6	29.6	
Impinger 2	100 mL 01.N H2SO4	709.6	567.2	142.4	QA/QC SB
Impinger 3	100 mL 01.N H2SO4	604.9	542.3	62.6	Date 3/21
Impinger 4	Empty	459.3	442.6	16.7	
Impinger 5	Silica Gel	736.4	718.7	17.7	Total Weight (gm)
Impinger 6					251.3
Impinger 7					269.0

QA/QC SB
Date 3/21

CleanAir. ENGINEERING

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

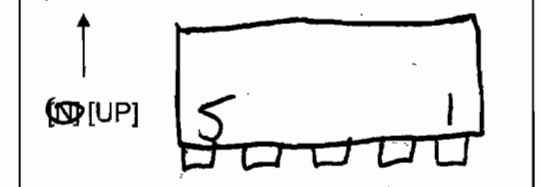
UNIT: 3 **RUN:** 1

FIELD DATA SHEET

Client	WHEELABRATOR	Project No.	228
Plant	NORTH BROWARD	Date	3-20-13
Meter Operator		ST	
Probe Operator		WB	

Meter Box	66-11	Sample Box No.	
Meter Y_{qc}	0.9906	Meter $\Delta H_@$	1.8274
K Factor	2.55	Pitot C_p	0.824
Leak Rate Before	0.0030 [cfm] [Lpm] @	15	(in. Hg)
Leak Rate After	0.0030 [cfm] [Lpm] @	16	(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]	First point all the way [In] [Out]
-9.1	10	of page	

Amb. Temp. (°F)	88	Bar. Press.	29.80 [in. Hg] [mbar]
Probe I.D. No.	67-8-16		
Liner Material	GLASS		

Filter No.	NA	E45-06	
Thimble No.	NA		
Nozzle Diameter	.375	Nozzle I.D.	.375-1

Start Time:	12:35	Stop Time:	14:55

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. 0 [L] 562.900	Stack Temp. Ts (°F)	Probe T_p (°F) Set Points 250	Filter T_f (°F) Set Points 250	Cond Temp T_{sc} (°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	0.22	0.56	565.39	300	252	253	52	87	89	4	8.2		
2	10	0.18	0.46	567.28	305	251	254	52	88	89	4	8.4		
3	15	0.28	0.71	569.53	310	252	250	52	89	89	4	8.3		
4	20	0.35	0.99	571.85	309	250	251	50	90	89	4	7.7		
5	25	0.45	1.20	574.89	307	251	250	50	91	89	5	8.1		*K = 2.66
2-1	30	0.57	1.50	578.47	310	252	251	52	92	89	5	8.2		ΔV = -.18
2	35	0.50	1.30	581.62	310	251	250	52	94	89	5	8.1		
3	40	0.46	1.20	584.71	310	250	250	53	95	90	5	8.4		
4	45	0.38	0.99	587.61	311	252	251	54	96	91	5	9.0		
5	50	0.48	1.30	590.90	311	250	251	55	97	92	5	8.1		ΔV = -.23
3-1	55	0.31	0.81	593.38	310	252	250	55	98	95	5	7.9		
2	60	0.48	1.20	596.49	310	252	252	56	98	95	5	7.9		
	Total	7.3841	12.1200	72.350	3703				1115	1086				
	Average	0.6371	1.0930		309.5200				96.8200					

Sum of square roots.

Circle correct bracketed units on data sheet.

CleanAir ENGINEERING

QA/QC BA

Date 3-20-13

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

UNIT: 3 RUN: 1

FIELD DATA SHEET

Client	WHEELABRATOR	Project No.	12218
Plant	NORTH BROWARD	Date	3-20-13
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 ☐	

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	0.2725	Nozzle I.D. 0.2725-1

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. 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/furan ☐	Notes
				596.480			250	250							
P3-3	65	0.45	1.20	599.62		310	252	251	46	102	98	5	8.3		
4	70	0.43	1.10	602.52		310	251	250	44	103	99	5	8.2		
5	75	0.38	0.99	605.30		311	252	250	45	105	100	5	8.0		ΔV=-.23
P4-1	80	0.45	1.26	608.60		311	251	250	48	101	100	5	8.2		
2	85	0.45	1.20	611.65		311	250	251	49	101	100	5	8.1		
3	90	0.42	1.10	614.62		310	252	251	49	100	100	5	7.9		
4	95	0.40	1.00	617.50		311	250	252	50	100	100	5	7.8		
5	100	0.37	0.96	620.22		310	250	251	52	102	102	5	7.9		
P5-1	105	0.52	1.40	623.33		311	251	252	54	103	102	6	7.8		*IC=2.65
2	110	0.51	1.40	626.96		310	252	251	56	104	101	6	7.6		ΔV=-.11
3	115	0.48	1.30	630.15		310	250	250	56	104	101	6	7.9		
4	120	0.40	1.10	633.34		310	252	251	58	105	101	6	7.9		
5	125	0.37	0.98	636.00		310	251	250	58	105	101	6	8.1		
	Total	8.5423	14.9300			4035				1335	1305				
	Average														

* Sum of square roots.

Circle correct bracketed units on data sheet.

CleanAir ENGINEERING

QA/QC SB
Date 4/22

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

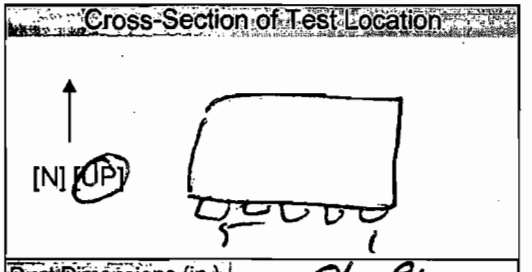
UNIT: 3 **RUN:** 2

FIELD DATA SHEET

Client	Wheelabrator	Project No.	12218
Plant	N. Broward	Date	7/21/13
Meter Operator	P. Bilyeu		
Probe Operator	P. Bilyeu		

Meter Box	66-U	Sample Box No.	M1
Meter Y_d	0.9906	Meter $\Delta H@$	1.8274
K Factor	2.57	Pitot C_p	0.824
Leak Rate Before	0.002 (cfm) [Lpm] @	15	(in. Hg)
Leak Rate After	0.002 (cfm) [Lpm] @	20	(in. Hg)
Pitot Leak Check Before: [X]	After: Good [X]	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]
-10.0	10.0		

Amb. Temp. (°F)	67	Bar. Press.	29.75 (in. Hg) [mbar]
Probe I.D. No.	47 ST 17		
Liner Material	Glass		

Filter No.	648-07		
Thimble No.	N/A		
Nozzle Diameter	0.2725	Nozzle I.D.	2725-1

Start Time:	7:42	Stop Time:	9:54

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
	5			636.490		250	250							
5-1	5	0.44	1.1	639.41	307	253	255	60	66	65	4.5	8.6	N/A	
2	10	0.49	1.3	642.62	308	254	251	57	67	66	5.0	8.5		
3	15	0.42	1.1	645.51	308	253	253	55	68	66	4.5	8.8		
4	20	0.38	0.98	648.25	308	251	251	53	69	66	4.5	8.5		650.975
5	25	0.37	0.95	650.918	308	249	251	53	69	66	4.5	8.0		-0.06
4-1	30	0.48	1.2	654.02	306	249	250	56	69	67	5.0	8.6		
2	35	0.50	1.2	657.10	307	249	250	56	70	66	5.0	8.9		
3	40	0.46	1.1	659.97	308	251	248	57	71	66	4.5	8.3		
4	45	0.38	0.98	662.72	308	251	253	58	71	67	4.5	7.9		
5	50	0.35	0.90	665.330	308	250	251	58	71	67	4.0	8.3		665.380
3-1	55	0.35	0.90	668.00	306	249	252	60	69	67	4.0	8.3		-0.05
2	60	0.44	1.1	670.89	308	250	252	61	70	67	4.5	7.9		
	Total	* 15.3792	58	4/5/13 671.670										
	Average	0.4494	0.9932		306.280				68.5000					

Sum of square roots: 0.9752 → 12.01

Circle correct bracketed units on data sheet. 36.90

1626

QA/QC PB

Date 7/24/13

CleanAir ENGINEERING

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

UNIT: 3 RUN: 2

FIELD DATA SHEET

Client Wheelabrator	Project No. 12268		
Plant N. Broward	Date 3/21/13		
Meter Operator	P. [illegible]		
Probe Operator	P. [illegible]		
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 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) 71	DGM Outlet $T_{m\,out}$ (°F) 67	Pump Vacuum (in.Hg)	Oxygen Indicator approx (%,dv)	☐ Amb Filter ☐ Dioxin Trap ☐	Notes
3	65	0.40	1.0	673.66	308	251	250	60	[illegible]	[illegible]	4.5	7.8	N/A	
4	70	0.35	0.90	676.27	307	250	250	61	71	67	4.5	8.1	↓	
5	75	0.35	0.90	678.880	308	250	247	61	71	67	4.5	8.4		678.93
2-1	80	0.54	1.3	682.11	307	249	251	62	70	67	5.5	8.5		-0.05
2	85	0.44	1.1	~~685.00~~ 685.000 ft³	307	250	251	61	71	67	5.0	8.2		
3	90	0.39	1.0	687.77	305	251	247	62	72	68	4.5	8.0		
4	95	0.38	0.98	690.50	309	250	250	62	72	68	4.5	8.5		
5	100	0.37	0.95	693.125	307	249	253	63	72	68	4.5	8.3		693.235
1-1	105	0.18	0.46	695.05	293	249	254	64	70	68	3.5	9.0		-0.060
2	110	0.18	0.46	696.88	292	250	252	64	70	68	3.5	7.4		
3	115	0.28	0.72	699.17	307	249	255	65	70	68	4.0	8.0		
4	120	0.35	0.90	701.77	307	250	252	65	70	68	4.5	8.1		
5	125	0.35	0.90	704.380	307	251	252	65	70	68	4.5	7.8		
	Total	*												
	Average													

*Sum of square roots.

Circle correct bracketed units on data sheet.

PB 3/21/13

QA/QC PB

Date 3/21/13

CleanAir ENGINEERING

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

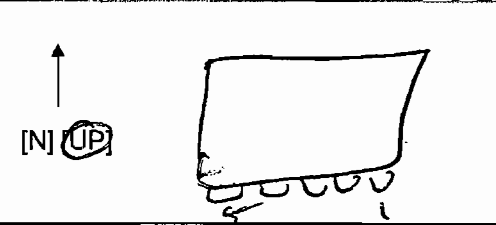
UNIT: 3 **RUN:** 3

FIELD DATA SHEET

Client	Wheelabrator
Project No.	12218
Plant	N. Broward
Date	3/21/13
Meter Operator	P. Bihun
Probe Operator	P. Bihun

Meter Box	66-11	Sample Box No.	M3
Meter Y_d	0.9986	Meter $\Delta H_@$	1.8274
K Factor	2.57	Pitot C_p	0.824
Leak Rate Before	0.006 [cfm] [Lpm]	@	15 (in. Hg)
Leak Rate After	0.004 [cfm] [Lpm]	@	10 (in. Hg)
Pitot Leak Check Before: [X]	After: Good [X] Bad [ ]		

Cross-Section of Test Location



Duct Dimensions (in.): 56x96

Static Pres (in. H_2O)	Port Len. (in.)	Gas Flow [In] [Out]	First point all the way [In] [Out] of page
-8.8	10.0	In	In

Amb. Temp. (°F)	70	Bar. Press	29.71 (in. Hg) [mbar]
Probe I.D. No.	67-8-17		
Liner Material	Glass		

Filter No.	e45-09		
Thimble No.	N/A		
Nozzle Diameter	0.2728	Nozzle I.D.	2728-1

Start Time	10:15	Stop Time	12:27

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
				704.850		250	250							
5-1	5	0.45	1.2	707.97	308	247	246	64	69	69	5.0	7.9	N/A	
2	10	0.46	1.2	711.04	307	253	251	60	71	69	5.0	7.8		
3	15	0.40	1.0	713.79	306	256	255	58	72	69	4.5	7.9		
4	20	0.39	1.0	716.55	307	251	254	59	73	69	4.5	7.2		
5	25	0.36	0.93	719.230	307	249	249	61	72	69	4.0	8.5		719.265
4-1	30	0.43	1.1	722.13	306	249	253	62	72	69	4.5	8.3		-0.035
2	35	0.44	1.1	724.99	307	250	252	63	73	70	4.5	7.6		
3	40	0.40	1.0	727.77	308	251	251	64	74	70	4.5	7.9		
4	45	0.37	0.95	730.47	308	251	255	64	74	70	4.0	7.8		
5	50	0.35	0.90	733.045	308	250	252	64	75	71	4.0	8.5		733.125
3-1	55	0.35	0.90	735.74	307	248	250	62	74	71	4.0	8.2		-0.08
2	60	0.42	1.1	738.64	308	250	249	58	74	71	4.5	7.4		
	Total	14.9853	SB 4/5/13	33.790										
	Average	0.5986	0.9372		305.9600				74.3800					

Sum of square roots. 0.5986 | 0.9404

Circle correct bracketed units on data sheet. 3687 | 1770

new general datasheet. December 2006
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QA/QC PB
Date 3/21/13

CleanAir ENGINEERING

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

UNIT: 3 **RUN:** 3

FIELD DATA SHEET

Client	Weyerhaeuser	Project No.	12218
Plant	N. Bonneville	Date	3/21/13
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 ☐	

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.	(ft^3) [L]	Stack Temp. T_s (°F)	Probe T_p (°F) Set Points 280	Filter T_f (°F) 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	0.36	0.93	741.33		308	251	255	55	76	71	4.0	7.4	Amb	
4	70	0.31	0.80	743.79		308	250	249	54	76	72	4.0	7.4		
5	75	0.30	0.77	746.210		307	250	250	54	76	72	4.0	7.6		746.228
6	80	0.48	1.2	749.33		307	249	250	55	76	73	5.0	8.6		-0.065
2	85	0.42	1.1	752.23		308	250	250	57	79	74	5.0	7.4		
3	90	0.44	1.1	755.11		308	251	250	58	80	75	5.0	8.2		
4	95	0.44	1.1	758.01		310	251	248	60	81	76	5.0	7.7		
5	100	0.41	1.1	760.955		308	249	251	60	82	77	5.0	7.8		761.045
4	105	0.13	0.33	762.88		287	249	250	62	79	78	3.0	7.5		-0.046
2	110	0.13	0.33	764.13		288	250	252	63	80	78	3.0	8.2		
3	115	0.25	0.64	766.33		307	250	253	64	79	79	4.0	8.1		
4	120	0.31	0.80	768.80		308	250	252	65	81	79	4.0	7.9		
5	125	0.36	0.93	771.498		308	251	250	65	81	79	4.0	7.6		
	Total														
	Average														

* Sum of square roots.

Circle correct bracketed units on data sheet.

CleanAir ENGINEERING

QA/QC PB

Date 3/21/13

Impinger Weight Sheet

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

9028101135+1068	Balance Calibration Check		
Balance ID	TL07-04	Reference Weight Mass	500.0g
Reference Weight ID	60156	Reference Weight Reading	499.8g SB 4/10

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. M3
Date		Lot No.		pH NA
Analyst DL		Filter No. e45-06		Rinse NA

	Contents	Gross Weight (gm)	Tare Weight (gm)	Net Weight Gain (gm)	
Impinger 1	Empty	757.9	467.1	290.8	
Impinger 2	100 ml 5%HNO_3/10%H_2O_2	650.4	545.5	104.9	QA/QC SB
Impinger 3	100 ml 5%HNO_3/10%H_2O_2	566.9	551.0	15.9	Date 3/20
Impinger 4	Empty	426.5	424.9	1.6	
Impinger 5	100 ml 4%$KMnO_4$/10%H_2SO_4	647.0	644.5	2.5	Total Weight (gm)
Impinger 6	100 ml 4%$KMnO_4$/10%H_2SO_4	550.4	549.3	1.1	416.8
Impinger 7	≈250 g Silica Gel	792.7	781.6	11.1	427.9

Run No. 2		Filter Type Quartz		Sample Box No. M1
Date 3/21/13		Lot No.		pH NA
Analyst DL		Filter No. e45-07		Rinse NA

	Contents	Gross Weight (gm)	Tare Weight (gm)	Net Weight Gain (gm)	
Impinger 1	Empty	666.3	443.3	223.0	
Impinger 2	100 ml 5%HNO_3/10%H_2O_2	658.7	530.3	128.4	QA/QC SB
Impinger 3	100 ml 5%HNO_3/10%H_2O_2	581.7	538.5	43.2	Date 3/21
Impinger 4	Empty	452.6	444.1	8.5	
Impinger 5	100 ml 4%$KMnO_4$/10%H_2SO_4	547.3	544.1	3.2	Total Weight (gm)
Impinger 6	100 ml 4%$KMnO_4$/10%H_2SO_4	539.9	537.5	2.4	408.7
Impinger 7	≈250 g Silica Gel	812.2	792.5	19.7	428.4

Run No. 3		Filter Type Quartz		Sample Box No. M3
Date 3/21/13		Lot No.		pH NA
Analyst DL		Filter No. e45-09		Rinse NA

	Contents	Gross Weight (gm)	Tare Weight (gm)	Net Weight Gain (gm)	
Impinger 1	Empty	715.6	465.9	249.7	
Impinger 2	100 ml 5%HNO_3/10%H_2O_2	660.3	545.9	114.4	QA/QC SB
Impinger 3	100 ml 5%HNO_3/10%H_2O_2	578.7	551.5	27.2	Date 3/21
Impinger 4	Empty	428.2	424.6	3.6	
Impinger 5	100 ml 4%$KMnO_4$/10%H_2SO_4	645.6	645.1	0.5	Total Weight (gm)
Impinger 6	100 ml 4%$KMnO_4$/10%H_2SO_4	550.5	549.9	0.6	396.0
Impinger 7	≈250 g Silica Gel	808.1	791.9	66.2 16.2 SB 3/21	412.2

QA/QC SB
Date 3/21

CleanAir. ENGINEERING

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

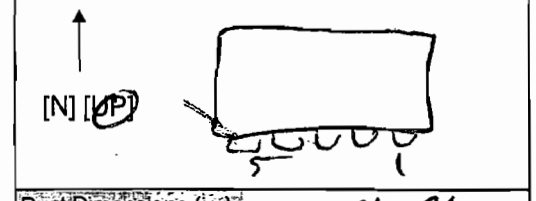
UNIT: 3 RUN: 4

FIELD DATA SHEET

Client	Wheelabrator	Project No.	12218
Plant	N. Broward	Date	3/21/13
Meter Operator		R. Bihun	
Probe Operator		R. Bihun	

Meter Box	66-11	Sample Box No.	N1
Meter Y_d	0.9906	Meter $\Delta H_@$	1.8274
K-Factor	2.662	Pitot C_p	0.824
Leak Rate Before	0.003 [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.)	96x96		
Static Pres ($in. H_2O$)	Port Len. (in.)	Gas Flow [In] [Out]	First point all the way [In] [Out]
-9.3	10.0	of page	

Amb. Temp. (°F)	75	Bar. Press.	29.75 (in. Hg) [mbar]
Probe I.D. No.		67-F-17	
Liner Material		Glass	

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

Start Time:	12:41	Stop Time:	14:52

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 Int. Vol. (ft³) [L]	Stack Temp. T_s (°F)	Probe T_p (°F) Set Points 280	Filter T_f (°F) Set Points 250	Cond. Temp. T_{sc} (°F)	DGM Inlet T_{min} (°F)	DGM Outlet T_{mout} (°F)	Pump Vacuum (in. Hg)	Oxygen Indicator approx (%dv)	☐ Amb. Filter ☐ Dioxin Trap ☐	Notes
				771.780										
5-1	5	0.40	1.0	774.660	308	249	247	63	80	80	4.5	7.8	N/A	
2	10	0.40	1.10	777.46	308	251	253	52	82	80	4.5	7.5		
3	15	0.33	0.87	780.08	308	255	253	50	81	81	4.0	7.8		
4	20	0.38	1.0	782.63	308	252	255	50	83	81	4.0	7.7		785.445
5	25	0.37	0.97	785.375	309	250	249	52	84	81	4.5	7.2		-0.04
4-1	30	0.50	1.3	788.62	308	248	252	59	83	82	5.0	7.7		
2	35	0.49	1.3	791.79	310	250	250	59	85	82	5.0	7.9		
3	40	0.44	1.2	794.88	309	251	250	59	86	82	5.0	8.2		
4	45	0.36	0.94	797.61	308	250	250	60	85	83	4.5	8.2		
5	50	0.33	0.87	800.200	309	250	250	62	85	83	4.0	6.9		800.250
3-1	55	0.47	1.2	803.32	308	250	254	64	84	83	5.0	7.3		-0.05
2	60	0.41	1.1	806.28	308	249	247	57	86	83	5.0	8.1		
	Total	15.4363		69.745	7101				4211					
	Average	0.6173	1.0092		308.040				84.220					

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

12.75 7101 1985

QA/QC PB
Date 3/21/13

CleanAir ENGINEERING

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

UNIT: 3 RUN: ~~3~~ 4

FIELD DATA SHEET

Client	Wheelabrator	Project No.	12218
Plant	N. Broward	Date	3/21/13
Meter Operator		P. Bihuy	
Probe Operator		P. Bihuy	

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]	First point all the way [In] [Out]
		of page	

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. T_s (°F)	Probe T_p (°F) Set Points 250	Filter T_f (°F) 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	0.41	1.1	809.16	308	251	250	51	85	83	5.0	7.8	N/A	
4	70	0.38	1.0	811.94	308	251	249	50	86	83	4.5	7.7		
5	75	0.34	0.89	814.561	309	249	251	50	86	84	4.5	8.2		814.561
2-1	80	0.43	1.1	817.56	308	249	249	53	85	84	5.0	8.5		Decde
2	85	0.45	1.2	820.64	310	249	248	53	86	84	5.5	8.0		
3	90	0.40	1.1	823.56	310	252	250	54	86	85	5.0	8.3		
4	95	0.37	0.97	826.29	310	251	251	57	86	84	4.5	8.1		
5	100	0.35	0.92	828.915	308	250	249	60	89	85	4.5	8.1		829.015
1-1	105	0.22	0.58	831.13	304	249	255	62	87	86	3.5	8.0		Decde
2	110	0.28	0.73	833.49	304	249	252	62	87	86	4.0	8.1		
3	115	0.30	0.79	835.99	307	251	251	62	86	86	4.5	8.0		
4	120	0.38	1.0	838.76	307	250	251	63	87	86	5.0	8.8		
5	125	0.41	1.1	841.738	307	251	250	63	87	86	5.5	8.6	✓	
	Total	*												
	Average													

* Sum of square roots.

Circle correct bracketed units on data sheet.

CleanAir ENGINEERING

QA/QC PB

Date 3/21/13

Impinger Weight Sheet

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

	80281011354 1068	Balance Calibration Check	
Balance ID	TL 07-04	Reference Weight Mass	500g
Reference Weight ID	6015c	Reference Weight Reading	499.8g 3B 4/10

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	3-21-13	Lot No.		pH NA
Analyst AW		Filter No. E45-12		Rinse NA

	Contents	Gross Weight (gm)	Tare Weight (gm)	Net Weight Gain (gm)	
Impinger 1	Empty	772.4	443.1	329.3	
Impinger 2	100 ml 5%HNO_3/10%H_2O_2	601.1	530.9	70.2	QA/QC SB
Impinger 3	100 ml 5%HNO_3/10%H_2O_2	547.3	538.0	9.3	Date 3/21
Impinger 4	Empty	445.7	443.9	1.8	
Impinger 5	100 ml 4%$KMnO_4$/10%H_2SO_4	545.5	543.0	2.5	Total Weight (gm)
Impinger 6	100 ml 4%$KMnO_4$/10%H_2SO_4	540.2	539.7	0.5	413.6
Impinger 7	≈ 250 g Silica Gel	825.6	812.2	13.4	427.0

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 3/21

CleanAir ENGINEERING

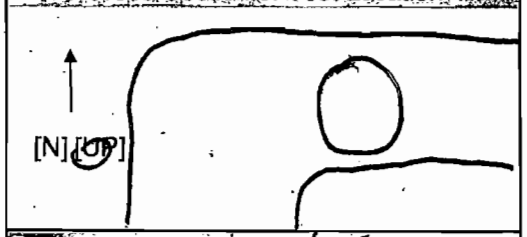
TEST LOCATION: INLET HCL TESTING METHOD: M26A PAGE 1 OF 1

UNIT: 3 RUN: 1

FIELD DATA SHEET

Client	WHEELABRATOR	Project No.	12217
Plant	NORTH BROWARD	Date	3-20-13
Meter Operator	SJ		
Probe Operator	SJ		

Cross-Section of Test Location



Amb. Temp. (°F)	80	Bar. Press.	29.80 [in. Hg] [mbar]
Probe I.D. No.	66-L-7		
Liner Material	GLASS		

Meter Box	66-19	Sample Box No.	B6
Meter Y_d	1.0009	Meter $\Delta H_@$	1.965
K Factor	NA	Pitot C_p	0.834
Leak Rate Before	0.003 [dm] [Lpm] @	5	([in. Hg])
Leak Rate After	0.003 [dm] [Lpm] @	18	(in. Hg)
Pitot Leak Check Before: ☑	After: Good ☑ Bad ☐		

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]
-1.3	14		

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

Start Time	8:13	Stop Time	9:13

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. 22.300	V_m [ft^3] [L]	Stack Temp. T_s (°F)	Probe T_p Set Points (°F)	Filter T_f Set Points (°F)	Cond. Temp. T_{sc} (°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
Pt 1	5	NA	1.20	25.15		492	356	357	53	82	77	3	6.3		
	10			28.03		491	356	358	54	84	78	4	6.2		
	15			30.85		493	355	356	54	85	79	5	5.9		
	20			33.67		492	355	354	55	86	79	6	5.7		
	25			36.51		490	356	355	56	86	80	6	6.2		
	30			39.43		489	354	355	56	87	80	8	6.4		
	35			42.21		484	354	354	56	87	80	10	6.5		
	40			45.15		485	355	355	56	87	81	12	6.6		
	45			48.00		484	354	353	58	87	81	12	6.8		
	50			50.95		487	354	354	58	87	81	14	5.9		
	55			53.71		484	355	350	58	87	82	14	5.8		
	60			56.57		488	354	355	58	87	82	15	6.3		
	Total	*		34.270		5858				1032	960				
	Average		1.2000			488.167				86	80				

Sum of square roots.

Circle correct bracketed units on data sheet.

83.00

SB 3/20/13

QA/QC SF

Date 3/20-13

CleanAir ENGINEERING

TEST LOCATION: INLET HCL TESTING METHOD: M26A PAGE 1 OF 1

UNIT: 3 RUN: 2

FIELD DATA SHEET

Client	WHEELABRATOR	Project No.	12418
Plant	NORTH BROWARD	Date	3-20-13
Meter Operator	SF		
Probe Operator	SF		

Cross-Section of Test Location

[N] [UP]

Duct Dimensions (in.) 105

Amb. Temp. (°F)	84	Bar. Press.	29.80 [in. Hg] [mbar]
Probe I.D. No.	66-4-7		
Liner Material	GLASS		

Meter Box	66-18	Sample Box No.	B14
Meter Y_d	1.0037	Meter $\Delta H_@$	1.9165
K Factor	NA	Pitot C_p	0.834
Leak Rate Before	0.003 [cfm] [Lpm]	@	16 (in. Hg)
Leak Rate After	0.003 [cfm] [Lpm]	@	8 (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
-1.2	14	[In] [Out] of page	[In] [Out]

Start Time	9:39	Stop Time	10:39

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. 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
				59.200			355	355							
P1-1	5	NA	1.20	62.10		496	354	356	48	86	83	3	7.3		
	10			64.90		497	355	355	49	86	82	3	7.2		
	15			67.72		496	356	356	46	90	83	5	7.3		
	20			70.54		497	354	359	49	90	83	6	7.2		
	25			73.37		499	355	357	51	91	84	7	7.3		
	30			76.21		500	356	358	52	91	84	9	7.0		
	35			79.13		491	355	356	53	90	85	11	7.1		
	40			82.10		496	356	354	54	90	85	12	7.2		
	45			85.05		497	355	355	54	90	86	13	7.2		
	50			87.96		498	355	356	55	90	86	14	7.3		
	55			90.84		498	355	358	56	90	86	15	6.4		
	60			93.71		499	356	356	56	90	86	15	6.2		
	Total	*		34.50		5971				1074	1012				
	Average		1.2000			497.5833				86.9167					

* Sum of square roots.

Circle correct bracketed units on data sheet.

CleanAir. ENGINEERING

QA/QC SA

Date 3-20-13

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new general datasheet, December 2006

TEST LOCATION: INLET **HCL** **TESTING** **METHOD:** M26A **PAGE** 1 **OF** 1

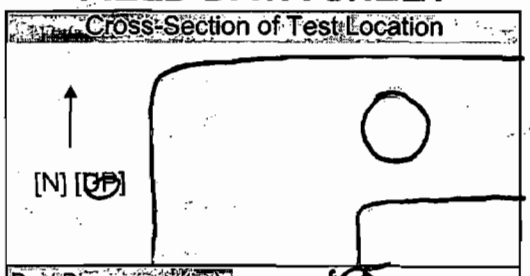
UNIT: 3 **RUN:** 3

FIELD DATA SHEET

Client	WHEELABRATOR	Project No.	12019
Plant	NORTH BLOWARDS	Date	3-20-13
Meter Operator	SS		
Probe Operator	SS		

Meter Box	66-19	Sample Box No.	
Meter Y_d	1.008	Meter $\Delta H_@$	1.965
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 ☐			

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]
-1.2	14		

Amb. Temp. (°F)	95	Bar. Press.	29.80 [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: 11:00 Stop Time: 12:00

Traverse Point Number	Min. per Point / Elapsed Time	Velocity Head ΔP (in. H_2O)	Orifice Setting ΔH (in. H_2O)	Gas Sample Volume V_m Init. Vol. (ft³)	Stack Temp. Ts (°F)	Probe T_p (°F) Set Points	Filter T_f (°F) Set Points	Cond. Temp. T_{cond} (°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
				95.100		355	355							
A-1	5	NA	1.20	98.13	494	356	358	52	92	86	3	7.2		
	10			101.07	493	355	354	52	92	87	4	7.0		
	15			103.90	495	354	353	53	94	88	5	7.3		
	20			106.76	500	355	354	54	96	88	6	7.4		
	25			109.62	501	354	355	55	96	89	7	7.5		
	30			112.48	503	354	356	55	96	90	8	7.6		
	35			115.37	502	355	355	56	96	90	9	7.5		
	40			118.26	503	353	354	56	96	90	10	7.2		
	45			121.15	505	354	355	57	96	90	11	7.3		
	50			124.09	504	355	354	58	97	90	12	7.4		
	55			127.00	503	356	353	58	97	90	13	7.6		
	60			129.92	502	355	354	59	97	90	14	7.5		
	Total			34.820	6005				1145	1067				
	Average		1.2000		500.417				95.208					

Sum of square roots.

Circle correct bracketed units on data sheet.

CleanAir ENGINEERING

QA/QC JB

Date 3/20

Impinger Weight Sheet

Client Wheelabrator		Unit Name / Location	Unit 3 SDA Inlet
Plant North Broward	Job No. 12218	Method	Modified 26A

Balance Calibration Check			
Balance ID	802810713S+ 1068 TL-04	Reference Weight Mass	500.0g
Reference Weight ID	60156	Reference Weight Reading	499.8g SB 4/10

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	3-20-13		Lot No.		pH NA
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	477.0	456.1	20.9	
Impinger 2	100 mL 01.N H2SO4	653.3	553.1	100.2	QA/QC SB
Impinger 3	100 mL 01.N H2SO4	581.3	538.5	42.8	Date 3/20
Impinger 4	Empty	492.2	483.1	9.1	
Impinger 5	Silica Gel	793.3	776.7	16.6	Total Weight (gm)
Impinger 6					173.0
Impinger 7					189.6

Run No.	2	2	Filter Type Quartz		Sample Box No. B14
Date	3-20-13		Lot No.		pH NA
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	532.8	463.5	69.3	
Impinger 2	100 mL 01.N H2SO4	632.1	544.0	88.1	QA/QC
Impinger 3	100 mL 01.N H2SO4	583.1	566.6	16.5	Date
Impinger 4	Empty 3/20 HW	~~799.6~~ 447.0	444.6	3.0	
Impinger 5	Silica Gel	799.4	787.8	11.8	Total Weight (gm)
Impinger 6					176.9
Impinger 7					188.7

Run No.	3	3	Filter Type Quartz		Sample Box No. B6
Date	3-20-13		Lot No.		pH NA
Analyst	DC		Filter No. NA		Rinse NA

	Contents	Gross Weight (gm)	Tare Weight (gm)	Net Weight Gain (gm)	
Impinger 1	50 mL 0.1N H2SO4 522.7	~~522.7~~ 522.7 DC 3/21/13	458.4	64.3	
Impinger 2	100 mL 01.N H2SO4	627.5	552.4	75.1	QA/QC SB
Impinger 3	100 mL 01.N H2SO4	550.3	537.6	12.7	Date 3/20
Impinger 4	Empty	484.9	482.8	2.1	
Impinger 5	Silica Gel	802.3	792.8	9.5	Total Weight (gm)
Impinger 6					154.2
Impinger 7					163.7

QA/QC ~~SB~~
Date 3/20

CleanAir. ENGINEERING

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

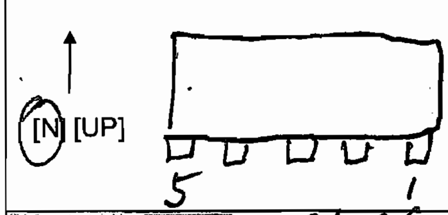
UNIT: 3 **RUN:** 1

FIELD DATA SHEET

Client	WHEELABRATOR	Project No.	12218
Plant	NORTH BROWARD	Date	3/20/13
Meter Operator	WAYNE BONAR		
Probe Operator	—		

Meter Box	85-2	Sample Box No.	B-01
Meter Y_d	1.0039	Meter $\Delta H_@$	1.7413
K Factor	—	Pitot C_p	—
Leak Rate Before	.003 [cfm] [Lpm] @ 15 (in. Hg)		
Leak Rate After	0.001 [cfm] [Lpm] @ 10 (in. Hg)		
Pitot Leak Check Before	☐ After: Good ☐ Bad ☐ N/A		

Cross-Section of Test Location



Duct Dimensions (in.)	91x96		
Static Pres (in. H_2O)	Port Len (in.)	Gas Flow [In] [Out] of page	First point all the way [In] [Out]
-8.0	10	[In]	[In]

Amb. Temp. (°F)	70	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:	0813	Stop Time:	0913

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 [ft³] [L] Init. Vol 406.230	Stack Temp. Ts (°F)	Probe T_p (°F) Set Points 300	Filter T (°F) Set Points 300	Cond. Temp. T_c (°F) 80	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	409.60	312	288	297	53	76	75	4	6.4		
	10		1.5	412.95	311	289	298	45	77	75	4	7.5		
	15		1.5	416.29	312	291	299	41	82	76	4	7.6		
	20		1.5	419.66	312	292	298	42	85	77	4	7.8		
	25		1.5	423.05	312	293	298	48	88	78	4	6.5		
	30		1.5	425.80	311	294	299	53	89	79	4	6.5		
	35		1.5	429.95	312	295	300	62	91	80	4	7.5		
	40		1.5	433.45	312	296	299	63	92	81	4	7.4		
	45		1.5	436.88	311	297	300	64	92	82	4	6.8		
	50		1.5	440.29	311	293	300	64	91	82	4	7.0		
	55		1.5	443.73	311	298	300	65	91	83	4	7.0		
	60		1.5	447.230	311	299	300	59	91	83	4	6.5		
	Total	*		41.000	3738				954	951				
	Average		1.5		311.5				79.375		58			

* Sum of square roots. Circle correct bracketed units on data sheet. 83.166 4/5/13

QA/QC W.B.
Date 3/20/13

CleanAir ENGINEERING

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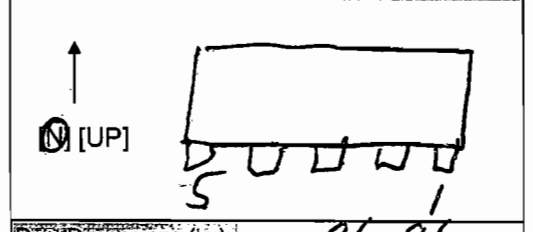
TEST LOCATION: FF OUTLET HCl **TESTING METHOD:** 26A **PAGE** 1 **OF** 1

UNIT: 3 **RUN:** 2

FIELD DATA SHEET

Client	WHEELABRATOR	Project No.	12218
Plant	SOUTH BROWARD	Date	3/20/13
Meter Operator	WAYNE BERRY		
Probe Operator			

Cross-Section of Test Location



Amb. Temp. (°F)	75	Bar. Press.	29.80 (in. Hg) [mbar]
Probe I.D. No.		67-4-3	
Liner Material		GLASS	

Meter Box	85-2	Sample Box No.	B-24
Meter Y_d	1.0039	Meter $\Delta H@$	1.7413
K Factor		Pitot C_p	—
Leak Rate Before	0.002 [cfm] [Lpm]	@	15 (in. Hg)
Leak Rate After	0.002 [cfm] [Lpm]	@	16 (in. Hg)
Pitot Leak Check Before:	A	After: Good	Bad

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

Duct Dimensions (in.)	96×96		
Static Pres ($in. H_2O$)	Port Len. (in.)	Gas Flow [In] [Out]	First point all the way [In] [Out]
-8.8	10	of page	

Start Time	0939	Stop Time	1039

Traverse Point Number	Min/pt 6.0 Elapsed Time	Velocity Head ΔP ($in. H_2O$)	Orifice Setting ΔH ($in. H_2O$)	Gas Sample Volume V_m Init. Vol. [ft^3] [L] 443.760 447.600	Stack Temp Ts (°F)	Probe T_p (°F) Set Points 300	Filter T_f (°F) Set Points 300	Cond. Temp T_c (°F) 50	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	451.20	312	293	297	64	84	83	4	8.8		
	10		1.5	454.66	312	291	297	64	86	83	4	8.5		
	15		1.5	458.04	314	291	298	63	89	83	4	8.9		
	20		1.5	461.48	313	292	298	65	90	84	4	8.1		
	25		1.5	465.02	313	292	298	65	92	84	4	8.0		
	30		1.5	468.55	313	294	299	62	93	85	4	7.8		
	35		1.5	472.10	313	295	299	63	93	85	4	8.6		
	40		1.5	475.64	313	296	300	63	93	86	4	8.0		
	45		1.5	479.15	312	297	299	65	95	86	4	7.4		
	50		1.5	482.66	312	298	299	62	93	86	4	7.9		
	55		1.5	486.17	313	298	300	61	92	86	4	8.1		
	60		1.5	489.685	313	299	299	60	92	86	4	7.6		
	Total	*		41.925	3753				1092	1017				
	Average		1.5		312.75				87.875					

* Sum of square roots.

Circle correct bracketed units on data sheet.

CleanAir. ENGINEERING

QA/QC WB
Date 3/20/13

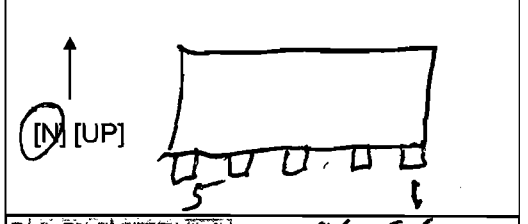
TEST LOCATION: F. FOUNTAIN HCL TESTING METHOD: 26A PAGE 1 OF 1

UNIT: 3 RUN: 3

FIELD DATA SHEET

Client	WHOLESALE	Project No.	12218
Plant	NORTH BROWARD	Date	3/20/13
Meter Operator	WAYNE BOWLY		
Probe Operator	—		

Cross-Section of Test Location



Amb. Temp. (°F)	78	Bar. Press.	29.80 [in. Hg] [mbar]
Probe I.D. No.	67-4-3		
Liner Material	GLASS		

Meter Box	85-2	Sample Box No.	B-01
Meter Y_d	1.0039	Meter $\Delta H_@$	1.748
K Factor	—	Pitot C_p	—
Leak Rate Before	0.002 [cfm] [Lpm] @	15	(in. Hg)
Leak Rate After	0.001 [cfm] [Lpm] @	15	(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]
-9.1	10	0 of page	

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

Start Time	1100	Stop Time	1200

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. 490.170 [ft^3] [L]	Stack Temp T_s (°F)	Probe T_p (°F) Set Points 300	Filter T_f (°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	493.68	312	288	298	55	89	85	4	8.3		
	10		1.5	497.15	312	291	295	49	91	86	4	7.3		
	15		1.5	500.64	313	293	297	46	94	86	4	7.1		
	20		1.5	504.14	313	294	298	47	95	87	4	9.0		
	25		1.5	507.66	314	295	297	50	97	88	4	8.4		
	30		1.5	511.21	314	296	299	53	97	89	4	8.8		
	35		1.5	514.76	313	297	298	59	98	89	4	8.8		
	40		1.5	518.30	314	297	298	64	98	90	4	8.9		
	45		1.5	521.87	314	298	299	63	98	90	4	8.9		
	50		1.5	525.41	314	298	299	63	99	91	4	8.4		
	55		1.5	528.97	313	299	299	63	99	92	4	8.5		
	60		1.5	532.535	313	299	300	63	101	93	4	7.8		
	Total	*		42.365	31'					5B	4/3/13			
	Average		1.5		313.25				92.565					

* Sum of square roots.

Circle correct bracketed units on data sheet. 92.583

QA/QC WB

Date 4/20/13

CleanAir ENGINEERING

Impinger Weight Sheet

Client Wheelabrator		Unit Name / Location	Unit 3 FF Outlet
Plant North Broward	Job No. 12218	Method	Modified M26A

Balance Calibration Check			
Balance ID	802810113541068 SN 4110	Reference Weight Mass	500.0
Reference Weight ID	60150	Reference Weight Reading	499.8

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	3-20-13		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	458.0	34.4	
Impinger 2	100 mL 01.N H2SO4	683.3	546.5	136.8	QA/QC SB
Impinger 3	100 mL 01.N H2SO4	593.2	536.3	56.9	Date 3/20
Impinger 4	Empty	494.1	468.6	25.5	
Impinger 5	Silica Gel	801.9	780.8	21.1	Total Weight (gm)
Impinger 6					253.6
Impinger 7					274.7

Run No.	2	2	Filter Type Teflon Mat		Sample Box No. B24
Date	3-20-13		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	501.0	451.4	49.6	
Impinger 2	100 mL 01.N H2SO4	698.0	562.3	135.7	QA/QC SB
Impinger 3	100 mL 01.N H2SO4	593.5	541.1	52.4	Date 3/20
Impinger 4	Empty	454.9	443.0	11.9	
Impinger 5	Silica Gel	791.4	776.7	14.7	Total Weight (gm)
Impinger 6					249.6
Impinger 7					264.3

Run No.	3	3	Filter Type Teflon Mat		Sample Box No. B-1
Date	3-20-13		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	489.2	457.1	32.1	
Impinger 2	100 mL 01.N H2SO4	672.8	546.0	126.8	QA/QC SB
Impinger 3	100 mL 01.N H2SO4	589.6	533.4	56.2	Date 3/20
Impinger 4	Empty	486.2	468.1	18.1	
Impinger 5	Silica Gel	816.9	802.0	14.9	Total Weight (gm)
Impinger 6					233.2
Impinger 7					248.1

QA/QC SB
Date 3/20

CleanAir ENGINEERING

Visible Emissions Observation Form

CLIENT/OWNER	PROJECT NUMBER	OBSERVATION DATE	START TIME	END TIME
Wheelabrator	12218	3/20/13	923	1123

PLANT	UNIT	RUN
North Broward	1	1

PROCESS EQUIPMENT	OPERATING MODE
Baghouse	Continuous

CONTROL EQUIPMENT	OPERATING MODE
Baghouse	continuous

DESCRIBE EMISSION POINT: exhaust vent

HEIGHT ABOVE GROUND LEVEL	DISTANCE FROM OBSERVER
100 ft.	120 ft.

HEIGHT RELATIVE TO OBSERVER	DIRECTION FROM OBSERVER
35 ft	west

DESCRIBE EMISSIONS: no plume

EMISSION COLOR	PLUME TYPE: CONTINUOUS ☒ (NA) FUGITIVE ☐ INTERMITTENT ☐
clear	

WATER DROPLETS PRESENT	IF WATER DROPLET PLUME
YES ☐ NO ☒	ATTACHED ☐ (NA) DETACHED ☐

POINT IN PLUME AT WHICH EMISSIONS WERE DETERMINED: Stack exit

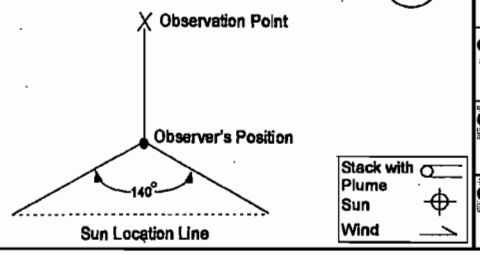
DESCRIBE BACKGROUND: Blue Sky

WIND SPEED	WIND DIRECTION
0-5 MPH	South

AMBIENT TEMPERATURE	RELATIVE HUMIDITY
75 °F	

SEC / MIN	15	30	45	60	SEC / MIN	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



RANGE OF OPACITY READINGS

MINIMUM	MAXIMUM
0	0

OBSERVER'S NAME (PRINT): Daniel Luckhard

OBSERVER'S SIGNATURE	DATE
Daniel	3/20/13

CERTIFIED BY	DATE
Heromet	3/2013

COMMENTS

QA/QC SB Date 4/22

CleanAir. ENGINEERING

Visible Emissions Observation Form

CLIENT/OWNER	PROJECT NUMBER
Wheelabrator	12218

PLANT	UNIT	RUN
North Broward	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	IF WATER DROPLET PLUME:
YES ☐ NO ☐	ATTACHED ☐ DETACHED ☐

POINT IN PLUME AT WHICH EMISSIONS WERE DETERMINED

DESCRIBE BACKGROUND

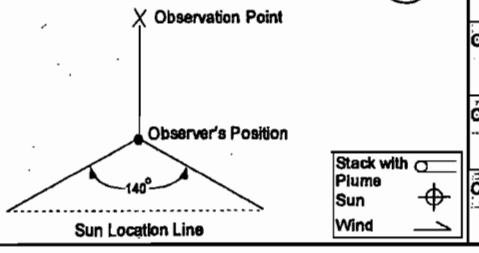
WIND SPEED	WIND DIRECTION

AMBIENT TEMPERATURE	RELATIVE HUMIDITY

OBSERVATION DATE	START TIME	END TIME
3/20/13	923	1123

SEC / MIN	15	30	45	60	SEC / MIN	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



RANGE OF OPACITY READINGS	
MINIMUM	MAXIMUM
0	0

OBSERVER'S NAME (PRINT)	
Daniel Luckhard	
OBSERVER'S SIGNATURE	DATE
[signature]	3/20/13
CERTIFIED BY	DATE
Accumet	3/2013

COMMENTS

QA/QC [initials] Date 7/2

CleanAir ENGINEERING

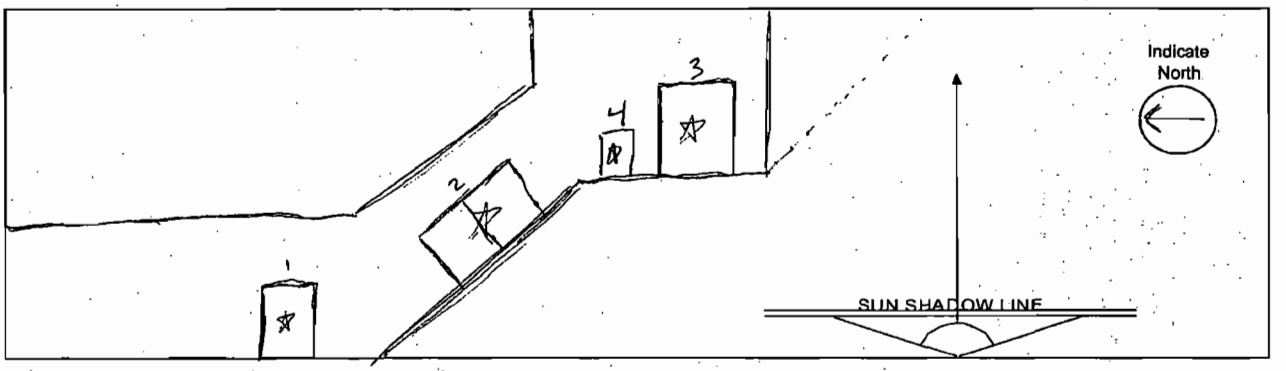
EPA METHOD 22
Fugitive or Smoke Emission Inspection
Outdoor Location

Job No.	12218	Date	3-21-13
Client	Wheelabrator	Observer	A. Obuchowski
Plant	N. Broward	Affiliation	

Industry	waste to energy	Process Unit	Baghouse enclosure

Precipitation	NONE	Wind Direction	NNW
Sky Conditions	SUNNY	Wind Speed	10-15 mph

Sketch process unit: Indicate observer position relative to source and sun. Indicate potential emission points and/or actual emission points.



☆ Potential emission points

OBSERVATIONS

Comments	Clock Time	Observation Period Duration (min : sec)	Accumulated Emission Duration (min : sec)
Doors remained closed for 60 mins.	Start 09:08	~~09:07~~ 3-21 20:00	0
	Stop 09:28		
	Start 09:33	20:00	0
	Stop 09:53		
	Start 09:58	20:00	0
	Stop 10:18		
	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 [signature]
Date ~~3~~ 21-13

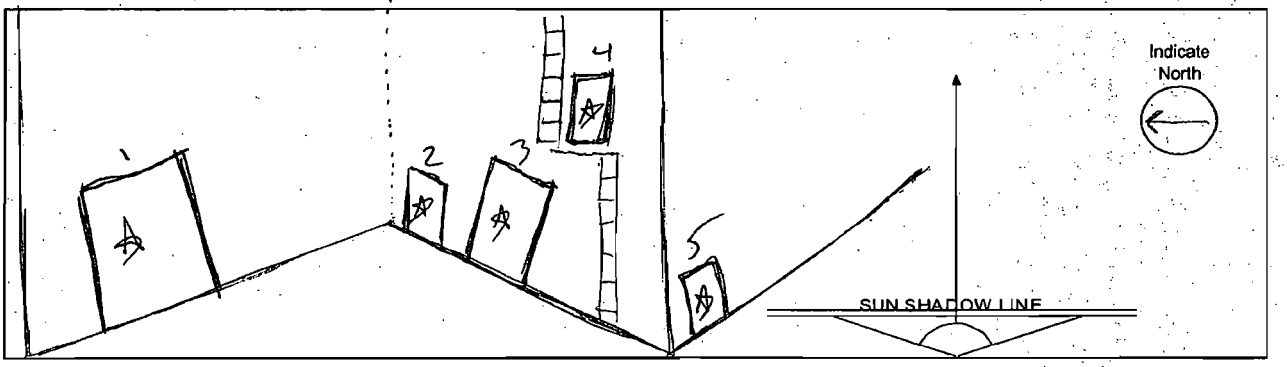
EPA METHOD 22
Fugitive or Smoke Emission Inspection
Outdoor Location

Job No.	12218	Date	3-21-13
Client	Wheelabrator	Observer	A. Obuchowski
Plant	N. Broward	Affiliation	

Industry	waste-to-energy	Process Unit	ASH conveyor / Baghouse enclosure

Precipitation	none	Wind Direction	N
Sky Conditions	sunny	Wind Speed	5-10 mph

Sketch process unit: Indicate observer position relative to source and sun. Indicate potential emission points and/or actual emission points.



★ Potential emission points

OBSERVATIONS

Comments	Clock Time	Observation Period Duration (min sec)	Accumulated Emission Duration (min sec)
door 1 open 10:26-10:32	Start 10:24	20:00	0
	Stop 10:44		
	Start 10:49	20:00	0
	Stop 11:09		
	Start 11:14	20:00	0
	Stop 11:34		
	Start		
	Stop		
	Start		
	Stop		
	Start		
	Stop		

Note: Rest breaks must be taken every 15 to 20 minutes for 5 to 10 minutes.

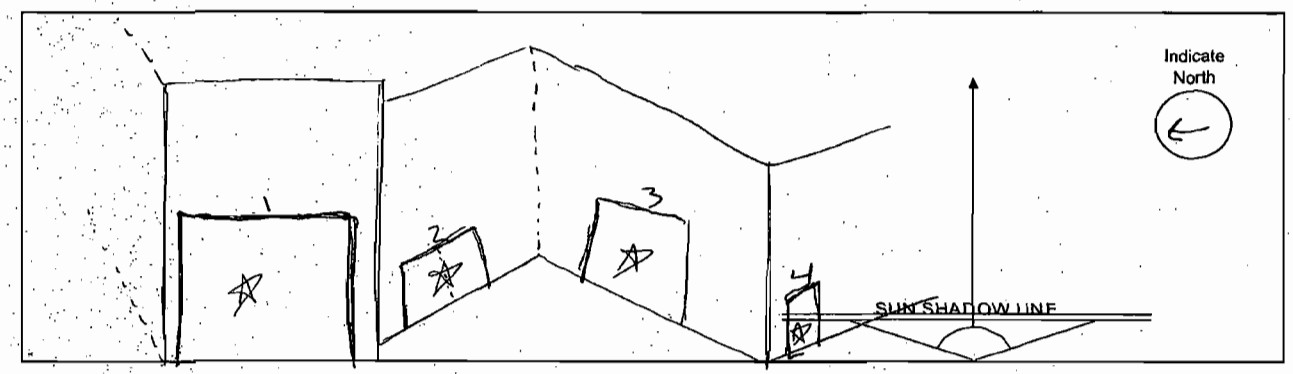
CleanAir ENGINEERING

QA/QC
Date 3-21-13

EPA METHOD 22
Fugitive or Smoke Emission Inspection
Outdoor Location

Job No	12218	Date	3-21-13
Client	Wheelabrator	Observer	A. Obuchowski
Plant	N. Broward	Affiliation	
Industry	waste-to-energy	Process Unit	Ash unloading
Precipitation	NONE	Wind Direction	NNW
Sky Conditions	SUNNY	Wind Speed	5-10 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)
door 1 open	Start	11:40	20:00	0
11:45 - 11:51	Stop	12:00		
12:17 - 12:18	Start	12:05	20:00	0
12:41 - 12:49	Stop	12:25		
	Start	12:30	20:00	0
	Stop	12:50		
	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 Date 3-21-13

FIELD DATA PRINTOUTS

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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: SB

Date: 4/30

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 North Broward, Inc.	Bar. Press. (in. Hg):	29.80
Project No:	12218	Static P:	-9.8
Source Area (ft^2):	64.00000	O_2 (dry volume %):	8.67
Meter Operator:	S. Joint 473	CO_2 (dry volume %):	10.65
Probe Operator:	W. Berry 456	N_2+CO (dry volume %):	80.68
Test Date:	3/19/13		
Start Time:	12:58		
Stop Time:	15:14	H_2O (condensate, ml or gm):	436.3
Leak Rate Before:	0.003 cfm @ 15 "Hg	H_2O (silica, g):	17.4
Leak Rate After:	0.003 cfm @ 16 "Hg	Actual Moisture (%):	22.16

Nozzle ID No:	2760-1
Nozzle Diameter (D_n):	0.276
Probe ID No:	67-8-16
Pitot C_p:	0.825
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	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)	44.240	(°F)	(°F)	(°F)	($\sqrt{in.}$ H_2O)	(ft^3)	(%)
1-01	5.0	0.48	1.40	47.610	306	83	78	0.69	3.37	104.1
1-02	10.0	0.43	1.20	50.770	305	86	79	0.66	3.16	102.6
1-03	15.0	0.33	0.94	53.470	302	88	79	0.57	2.70	99.7
1-04	20.0	0.49	1.40	56.760	305	90	80	0.70	3.29	99.7
1-05	25.0	0.61	1.70	60.470	305	91	81	0.78	3.71	100.6
LEAK CHECK	25.0			60.740						
2-01	30.0	0.48	1.40	64.080	305	92	83	0.69	3.34	101.8
2-02	35.0	0.37	1.10	67.080	305	93	83	0.61	3.00	104.0
2-03	40.0	0.35	1.00	69.960	304	93	84	0.59	2.88	102.4
2-04	45.0	0.42	1.20	73.000	306	94	85	0.65	3.04	98.7
2-05	50.0	0.50	1.40	76.390	305	94	85	0.71	3.39	100.8
LEAK CHECK	50.0			76.700						
3-01	55.0	0.44	1.30	79.900	304	95	86	0.66	3.20	101.2
3-02	60.0	0.37	1.10	82.870	304	96	87	0.61	2.97	102.2
3-03	65.0	0.42	1.20	85.900	304	97	87	0.65	3.03	97.8
3-04	70.0	0.48	1.40	89.310	305	98	88	0.69	3.41	102.9
3-05	75.0	0.54	1.50	92.710	304	98	88	0.73	3.40	96.7
LEAK CHECK	75.0			92.990						
4-01	80.0	0.35	1.00	95.800	303	94	88	0.59	2.81	99.4
4-02	85.0	0.38	1.10	98.860	304	95	87	0.62	3.06	104.0
4-03	90.0	0.44	1.30	101.980	305	97	88	0.66	3.12	98.4
4-04	95.0	0.50	1.40	105.370	305	97	88	0.71	3.39	100.3
4-05	100.0	0.54	1.50	108.820	304	99	89	0.73	3.45	97.9
LEAK CHECK	100.0			109.170						
5-01	105.0	0.32	0.92	111.770	304	96	89	0.57	2.60	96.0
5-02	110.0	0.43	1.20	114.800	304	98	90	0.66	3.03	96.3
5-03	115.0	0.45	1.30	118.040	304	99	90	0.67	3.24	100.6
5-04	120.0	0.49	1.40	121.480	304	99	90	0.70	3.44	102.4
5-05	125.0	0.50	1.40	124.840	304	99	90	0.71	3.36	99.0
Final	125.0		1.27040	79.39000	304.40000	90.06000		0.66448	79.39000	
25 points sampled		Sq.Rt.ΔP								
QC-Check: Field Averages		0.6645	1.2704	79.3900	304.4000	90.0600				
		☑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 North Broward, Inc.	Bar. Press. (in. Hg):	29.80
Project No:	12218	Static P:	-10.4
Source Area (ft^2):	64.00000	O_2 (dry volume %):	9.27
Meter Operator:	P. Bihun 505	CO_2 (dry volume %):	9.99
Probe Operator:	P. Bihun 505	N_2+CO (dry volume %):	80.74
Test Date:	3/20/13		
Start Time:	07:43		
Stop Time:	09:55	H_2O (condensate, ml or gm):	475.8
Leak Rate Before:	0.007 cfm @ 15 "Hg	H_2O (silica, g):	17.4
Leak Rate After:	0.002 cfm @ 10 "Hg	Actual Moisture (%):	22.46

Nozzle ID No:	2760-1		
Nozzle Diameter (D_n):	0.276		
Probe ID No:	67-8-16		
Pitot C_p:	0.825		
Pitot Leak Check:	☑Pass ☐Fail		
Meter Box ID. No:	66-6		
Meter $\Delta H@$:	1.82800		
Meter Y_d:	0.98540		

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)	128.315	(°F)	(°F)	(°F)	($\sqrt{}$in. H_2O)	(ft^3)	(%)
5-01	5.0	0.38	1.10	131.280	306	70	69	0.62	2.97	105.3
5-02	10.0	0.42	1.20	134.390	305	73	69	0.65	3.11	104.7
5-03	15.0	0.47	1.30	137.620	304	76	70	0.69	3.23	102.4
5-04	20.0	0.55	1.60	141.180	304	79	70	0.74	3.56	104.1
5-05	25.0	0.51	1.40	144.520	304	81	71	0.71	3.34	101.1
LEAK CHECK	25.0			144.605						
4-01	30.0	0.42	1.20	147.710	304	80	72	0.65	3.11	103.5
4-02	35.0	0.42	1.20	150.800	305	81	72	0.65	3.09	103.0
4-03	40.0	0.51	1.40	154.200	306	83	73	0.71	3.40	102.6
4-04	45.0	0.60	1.70	157.930	306	83	74	0.77	3.73	103.8
4-05	50.0	0.58	1.60	161.515	305	84	74	0.76	3.58	101.3
LEAK CHECK	50.0			161.590						
3-01	55.0	0.46	1.30	164.860	305	82	74	0.68	3.27	103.8
3-02	60.0	0.42	1.20	168.010	306	83	75	0.65	3.15	104.5
3-03	65.0	0.50	1.40	171.430	306	83	75	0.71	3.42	104.1
3-04	70.0	0.60	1.70	175.180	307	85	76	0.77	3.75	104.0
3-05	75.0	0.60	1.70	178.915	306	85	76	0.77	3.73	103.5
LEAK CHECK	75.0			178.990						
2-01	80.0	0.51	1.40	182.380	306	82	76	0.71	3.39	102.1
2-02	85.0	0.41	1.20	185.560	306	84	76	0.64	3.18	106.6
2-03	90.0	0.38	1.10	188.530	305	85	76	0.62	2.97	103.2
2-04	95.0	0.51	1.40	191.940	305	85	77	0.71	3.41	102.3
2-05	100.0	0.56	1.60	195.600	306	86	78	0.75	3.66	104.7
LEAK CHECK	100.0			195.650						
1-01	105.0	0.40	1.10	198.640	305	85	78	0.63	2.99	101.1
1-02	110.0	0.38	1.10	201.620	305	87	79	0.62	2.98	103.1
1-03	115.0	0.38	1.10	204.620	303	88	79	0.62	3.00	103.6
1-04	120.0	0.51	1.40	208.030	306	89	80	0.71	3.41	101.7
1-05	125.0	0.58	1.60	211.680	306	89	80	0.76	3.65	102.1
Final	125.0		1.36000	83.08000	305.28000	78.74000		0.69237	83.08000	
25 points sampled		Sq.Rt.ΔP								
QC-Check: Field Averages		0.6924	1.3600	83.0800	305.2800	78.7400				
		☑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:	3	Analyte:	Particulate/Metals
Client:	Wheelabrator North Broward, Inc.	Bar. Press. (in. Hg):	29.80
Project No:	12218	Static P:	-10.4
Source Area (ft^2):	64.00000	O_2 (dry volume %):	9.32
Meter Operator:	P. Bihun 505	CO_2 (dry volume %):	9.55
Probe Operator:	P. Bihun 505	N_2+CO (dry volume %):	81.13
Test Date:	3/20/13		
Start Time:	10:17	H_2O (condensate, ml or gm):	450.1
Stop Time:	12:28	H_2O (silica, g):	17.5
Leak Rate Before:	0.004 cfm @ 15 "Hg	Actual Moisture (%):	21.63
Leak Rate After:	0.003 cfm @ 10 "Hg		

Nozzle ID No:	2760-1	Meter Box ID. No:	66-6
Nozzle Diameter (D_n):	0.276	Meter ΔH@:	1.82800
Probe ID No:	67-8-16	Meter Y_d:	0.98540
Pitot C_p:	0.825		
Pitot Leak Check:	☑Pass ☐Fail		

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			212.400						
5-01	5.0	0.41	1.20	215.520	304	82	81	0.64	3.12	103.2
5-02	10.0	0.41	1.20	218.610	305	86	81	0.64	3.09	101.9
5-03	15.0	0.55	1.60	222.220	305	88	81	0.74	3.61	102.7
5-04	20.0	0.55	1.60	225.830	304	89	81	0.74	3.61	102.5
5-05	25.0	0.55	1.60	229.415	305	88	81	0.74	3.58	102.0
LEAK CHECK	25.0			229.475						
4-01	30.0	0.48	1.40	232.870	305	87	81	0.69	3.40	103.4
4-02	35.0	0.42	1.20	236.030	305	89	82	0.65	3.16	102.6
4-03	40.0	0.51	1.40	239.440	306	90	83	0.71	3.41	100.4
4-04	45.0	0.60	1.70	243.160	306	91	83	0.77	3.72	100.9
4-05	50.0	0.57	1.60	246.810	305	93	83	0.75	3.65	101.3
LEAK CHECK	50.0			246.855						
3-01	55.0	0.43	1.20	249.980	305	90	85	0.66	3.13	99.9
3-02	60.0	0.43	1.20	253.090	306	92	85	0.66	3.11	99.3
3-03	65.0	0.43	1.20	256.190	306	92	85	0.66	3.10	98.9
3-04	70.0	0.52	1.50	259.700	305	93	86	0.72	3.51	101.7
3-05	75.0	0.61	1.70	263.440	305	94	86	0.78	3.74	100.0
LEAK CHECK	75.0			263.490						
2-01	80.0	0.55	1.60	267.140	305	93	86	0.74	3.65	102.9
2-02	85.0	0.45	1.30	270.440	305	95	87	0.67	3.30	102.5
2-03	90.0	0.40	1.10	273.410	306	96	88	0.63	2.97	97.6
2-04	95.0	0.51	1.40	276.810	306	95	88	0.71	3.40	99.2
2-05	100.0	0.58	1.60	280.475	306	95	88	0.76	3.67	100.3
LEAK CHECK	100.0			280.530						
1-01	105.0	0.43	1.20	283.700	304	93	89	0.66	3.17	100.6
1-02	110.0	0.43	1.20	286.850	304	95	89	0.66	3.15	99.8
1-03	115.0	0.35	0.99	289.630	302	95	89	0.59	2.78	97.4
1-04	120.0	0.50	1.40	293.090	304	95	89	0.71	3.46	101.7
1-05	125.0	0.58	1.60	296.715	305	95	89	0.76	3.63	99.0
Final	125.0		1.38760	84.10500	304.96000	88.34000		0.69807	84.10500	
25 points sampled		Sq.Rt.ΔP								
QC-Check: Field Averages		0.6981	1.3876	84.1050	304.9600	88.3400				
		☑Avg. OK	☑Avg. OK	☑Avg. OK	☑Avg. OK	☑Avg. OK				

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USEPA Method 3 Laboratory Data

Test Method: USEPA Methd 5/29 and 29
Analyte: Particulate/Metals and Mercury

Location: Unit 1 FF Outlet
Client: Wheelabrator North 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:		10.65000		8.67000	80.68000	30.05080	1.14836	☑ Fo value within expected range.
2	1							
	2							
	3							
	Avg.							
CEM or Other Avg:		9.99000		9.27000	80.74000	29.96920	1.16416	☑ Fo value within expected range.
3	1							
	2							
	3							
	Avg.							
CEM or Other Avg:		9.55000		9.32000	81.13000	29.90080	1.21257	☑ Fo value within expected range.
4	1							
	2							
	3							
	Avg.							
CEM or Other Avg:		9.75000		9.20000	81.05000	29.92800	1.20000	☑ Fo value within expected range.

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USEPA Method 4 Laboratory Data

Location: Unit 1 FF Outlet
Client: Wheelabrator North Broward, Inc.
Project No: 12218

Test Method: USEPA Methd 5/29 and 29
Analyte: Particulate/Metals and Mercury
Analyst: D. Luckhard
Analyst Emp No: 568

Test Run: 1

	Contents	Gross (gm)	Tare (gm)	Net (gm)
Impinger 1	Empty	715.8	439.8	276.0
Impinger 2	5%HNO3/10%H2O2	639.7	527.6	112.1
Impinger 3	5%HNO3/10%H2O2	578.1	543.7	34.4
Impinger 4	Empty	449.2	443.5	5.7
Impinger 5	4%KMnO4/10%H2SO4	540.7	533.4	7.3
Impinger 6	4%KMnO4/10%H2SO4	538.9	538.1	0.8
Impinger 7	Silica Gel	758.8	741.4	17.4
Impinger 8				

Rinse: (ml or gm)

		Field Data Check	
436.3	Liquid (gm)		
0.0	less rinse (gm)		
436.3	Net Liquid (gm)	436.3	☑ QA/QC OK
+ 17.4	Silica Gel (gm)	17.4	☑ QA/QC OK
453.7	Total Vlc (gm)	453.7	☑ QA/QC OK

Test Run: 2

	Contents	Gross (gm)	Tare (gm)	Net (gm)
Impinger 1	Empty	720.7	457.8	262.9
Impinger 2	5%HNO3/10%H2O2	698.4	556.8	141.6
Impinger 3	5%HNO3/10%H2O2	592.7	545.6	47.1
Impinger 4	Empty	449.2	437.7	11.5
Impinger 5	4%KMnO4/10%H2SO4	553.1	544.8	8.3
Impinger 6	4%KMnO4/10%H2SO4	553.9	549.5	4.4
Impinger 7	Silica Gel	800.1	782.7	17.4
Impinger 8				

Rinse: (ml or gm)

		Field Data Check	
475.8	Liquid (gm)		
0.0	less rinse (gm)		
475.8	Net Liquid (gm)	475.8	☑ QA/QC OK
+ 17.4	Silica Gel (gm)	17.4	☑ QA/QC OK
493.2	Total Vlc (gm)	493.2	☑ QA/QC OK

Test Run: 3

	Contents	Gross (gm)	Tare (gm)	Net (gm)
Impinger 1	Empty	707.5	443.1	264.4
Impinger 2	5%HNO3/10%H2O2	655.9	530.6	125.3
Impinger 3	5%HNO3/10%H2O2	581.6	538.6	43.0
Impinger 4	Empty	453.2	444.4	8.8
Impinger 5	4%KMnO4/10%H2SO4	552.2	547.0	5.2
Impinger 6	4%KMnO4/10%H2SO4	538.2	534.8	3.4
Impinger 7	Silica Gel	776.1	758.6	17.5
Impinger 8				

Rinse: (ml or gm)

		Field Data Check	
450.1	Liquid (gm)		
0.0	less rinse (gm)		
450.1	Net Liquid (gm)	450.1	☑ QA/QC OK
+ 17.5	Silica Gel (gm)	17.5	☑ QA/QC OK
467.6	Total Vlc (gm)	467.6	☑ QA/QC OK

Test Run: 4

	Contents	Gross (gm)	Tare (gm)	Net (gm)
Impinger 1	Empty	754.0	455.7	298.3
Impinger 2	5%HNO3/10%H2O2	672.7	546.3	126.4
Impinger 3	5%HNO3/10%H2O2	566.1	534.7	31.4
Impinger 4	Empty	441.8	437.3	4.5
Impinger 5	4%KMnO4/10%H2SO4	543.2	542.3	0.9
Impinger 6	4%KMnO4/10%H2SO4	524.2	524.0	0.2
Impinger 7	Silica Gel	773.8	754.2	19.6
Impinger 8				

Rinse: (ml or gm)

		Field Data Check	
461.7	Liquid (gm)		
0.0	less rinse (gm)		
461.7	Net Liquid (gm)	461.7	☑ QA/QC OK
+ 19.6	Silica Gel (gm)	19.6	☑ QA/QC OK
481.3	Total Vlc (gm)	481.3	☑ 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 North Broward, Inc.		Bar. Press. (in. Hg):	29.80	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 %):	7.86	Probe ID No: 66-4-7
Meter Operator:	S. Joint	473	CO_2 (dry volume %):	11.21	Pitot C_p: 0.834
Probe Operator:	S. Joint	473	N_2+CO (dry volume %):	80.93	Pitot Leak Check: ☑ Pass ☐ Fail
Test Date:	3/19/13				
Start Time:	08:15				
Stop Time:	09:15		H_2O (condensate, ml or gm):	146.3	Meter Box ID. No: 66-18
Leak Rate Before:	0.003 cfm	@ 16 "Hg	H_2O (silica, g):	14.3	Meter ΔH@: 1.91650
Leak Rate After:	0.004 cfm	@ 15 "Hg	Actual Moisture (%):	18.44	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			913.110						
1-01	5.0		1.20	915.980	476	77	68		2.87	
1-01	10.0		1.20	918.840	468	79	77		2.86	
1-01	15.0		1.20	921.670	472	82	77		2.83	
1-01	20.0		1.20	924.570	471	82	77		2.90	
1-01	25.0		1.20	927.450	469	83	78		2.88	
1-01	30.0		1.20	930.330	470	83	78		2.88	
1-01	35.0		1.20	933.150	470	83	78		2.82	
1-01	40.0		1.20	936.020	470	84	79		2.87	
1-01	45.0		1.20	938.800	475	84	80		2.78	
1-01	50.0		1.20	941.640	472	84	79		2.84	
1-01	55.0		1.20	944.470	471	83	80		2.83	
1-01	60.0		1.20	947.310	470	84	80		2.84	
Final	60.0		1.20000	34.20000	471.16667	79.95833			34.20000	
1 points sampled		Sq.Rt.ΔP								
QC-Check: Field Averages			1.2000	34.2000	471.1667	79.9583				
		☐ 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 SDA Inlet
Test Run: 2
Client: Wheelabrator North Broward, Inc.
Project No: 12218
Source Area (ft^2): 60.13205
Meter Operator: S. Joint 473
Probe Operator: S. Joint 473
Test Date: 3/19/13
Start Time: 09:48
Stop Time: 10:48
Leak Rate Before: 0.003 cfm @ 15 "Hg
Leak Rate After: 0.003 cfm @ 15 "Hg

Bar. Press. (in. Hg): 29.80
Static P: -1.3
O_2 (dry volume %): 8.22
CO_2 (dry volume %): 11.06
N_2+CO (dry volume %): 80.72
H_2O (condensate, ml or gm): 151.7
H_2O (silica, g): 11.9
Actual Moisture (%): 18.73

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: 66-18
Meter ΔH@: 1.91650
Meter Y_d: 1.00080

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)	949.400	(°F)	(°F)	(°F)	($\sqrt{in.}$ H_2O)	(ft^3)	(%)
1-01	5.0		1.20	952.300	478	86	82		2.90	
1-01	10.0		1.20	955.170	479	88	82		2.87	
1-01	15.0		1.20	958.040	479	89	83		2.87	
1-01	20.0		1.20	960.900	480	90	84		2.86	
1-01	25.0		1.20	963.690	484	90	84		2.79	
1-01	30.0		1.20	966.620	481	90	84		2.93	
1-01	35.0		1.20	969.540	476	91	85		2.92	
1-01	40.0		1.20	972.410	476	91	85		2.87	
1-01	45.0		1.20	975.270	483	90	85		2.86	
1-01	50.0		1.20	978.130	481	89	85		2.86	
1-01	55.0		1.20	980.980	479	88	84		2.85	
1-01	60.0		1.20	984.010	478	88	85		3.03	
Final	60.0		1.20000	34.61000	479.50000	86.58333			34.61000	
1 points sampled		Sq.Rt.ΔP								
QC-Check: Field Averages			1.2000	34.6100	479.5000	86.5833				
		☐ 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 North Broward, Inc.		Bar. Press. (in. Hg):	29.80	Nozzle ID No: N/A
Project No:	12218		Static P:	-1.2	Nozzle Diameter (D_n): N/A
Source Area (ft^2):	60.13205		O_2 (dry volume %):	7.94	Probe ID No: 66-4-7
Meter Operator:	S. Joint	473	CO_2 (dry volume %):	11.45	Pitot C_p: 0.834
Probe Operator:	S. Joint	473	N_2+CO (dry volume %):	80.61	Pitot Leak Check: ☑ Pass ☐ Fail
Test Date:	3/19/13				
Start Time:	11:19				
Stop Time:	12:19		H_2O (condensate, ml or gm):	148.8	Meter Box ID. No: 66-18
Leak Rate Before:	0.003 cfm	@ 15 "Hg	H_2O (silica, g):	10.4	Meter ΔH@: 1.91650
Leak Rate After:	0.003 cfm	@ 16 "Hg	Actual Moisture (%):	18.37	Meter Y_d: 1.00080

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)	985.670	(°F)	(°F)	(°F)	($\sqrt{}$in. H_2O)	(ft^3)	(%)
1-01	5.0		1.20	988.620	481	88	86		2.95	
1-01	10.0		1.20	991.520	484	89	86		2.90	
1-01	15.0		1.20	994.270	481	90	86		2.75	
1-01	20.0		1.20	997.110	485	91	86		2.84	
1-01	25.0		1.20	1000.000	483	92	88		2.89	
1-01	30.0		1.20	1002.910	481	92	88		2.91	
1-01	35.0		1.20	1005.750	484	93	88		2.84	
1-01	40.0		1.20	1008.680	482	93	89		2.93	
1-01	45.0		1.20	1011.600	481	94	89		2.92	
1-01	50.0		1.20	1014.400	482	94	89		2.80	
1-01	55.0		1.20	1017.390	481	94	90		2.99	
1-01	60.0		1.20	1020.380	482	94	90		2.99	
Final	60.0		1.20000	34.71000	482.25000	89.95833			34.71000	
1 points sampled		Sq.Rt.ΔP								
QC-Check: Field Averages			1.2000	34.7100	482.2500	89.9583				
		☐ 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 North 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:		11.21000		7.86000	80.93000	30.10800	1.16325	☑ Fo value within expected range.
2	1							
	2							
	3							
	Avg.							
CEM or Other Avg:		11.06000		8.22000	80.72000	30.09840	1.14647	☑ Fo value within expected range.
3	1							
	2							
	3							
	Avg.							
CEM or Other Avg:		11.45000		7.94000	80.61000	30.14960	1.13188	☑ 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 SDA Inlet
Client: Wheelabrator North 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	482.7	460.1	22.6
Impinger 2	100 ml 0.1N H2SO4	628.6	540.3	88.3
Impinger 3	100 ml 0.1N H2SO4	582.3	551.8	30.5
Impinger 4	Empty	447.4	442.5	4.9
Impinger 5	Silica Gel	777.5	763.2	14.3
Impinger 6				
Impinger 7				
Impinger 8				

Rinse: (ml or gm)

		Field Data Check	
146.3	Liquid (gm)		
0.0	less rinse (gm)		
146.3	Net Liquid (gm)	146.3	☑ QA/QC OK
+ 14.3	Silica Gel (gm)	14.3	☑ QA/QC OK
160.6	Total Vlc (gm)	160.6	☑ QA/QC OK

Test Run: 2

	Contents	Gross (gm)	Tare (gm)	Net (gm)
Impinger 1	50 ml 0.1N H2SO4	521.0	452.5	68.5
Impinger 2	100 ml 0.1N H2SO4	617.0	548.3	68.7
Impinger 3	100 ml 0.1N H2SO4	555.5	543.5	12.0
Impinger 4	Empty	483.9	481.4	2.5
Impinger 5	Silica Gel	776.9	765.0	11.9
Impinger 6				
Impinger 7				
Impinger 8				

Rinse: (ml or gm)

		Field Data Check	
151.7	Liquid (gm)		
0.0	less rinse (gm)		
151.7	Net Liquid (gm)	151.7	☑ QA/QC OK
+ 11.9	Silica Gel (gm)	11.9	☑ QA/QC OK
163.6	Total Vlc (gm)	163.6	☑ QA/QC OK

Test Run: 3

	Contents	Gross (gm)	Tare (gm)	Net (gm)
Impinger 1	50 ml 0.1N H2SO4	523.8	461.9	61.9
Impinger 2	100 ml 0.1N H2SO4	618.1	544.7	73.4
Impinger 3	100 ml 0.1N H2SO4	579.0	567.1	11.9
Impinger 4	Empty	445.9	444.3	1.6
Impinger 5	Silica Gel	787.8	777.4	10.4
Impinger 6				
Impinger 7				
Impinger 8				

Rinse: (ml or gm)

		Field Data Check	
148.8	Liquid (gm)		
0.0	less rinse (gm)		
148.8	Net Liquid (gm)	148.8	☑ QA/QC OK
+ 10.4	Silica Gel (gm)	10.4	☑ QA/QC OK
159.2	Total Vlc (gm)	159.2	☑ 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 1 FF Outlet	Test Method:	USEPA Method 26A
Test Run:	1	Analyte:	HCl
Client:	Wheelabrator North Broward, Inc.	Bar. Press. (in. Hg):	29.80
Project No:	12218	Static P:	-9.2
Source Area (ft^2):	64.00000	O_2 (dry volume %):	8.52
Meter Operator:	W. Berry 456	CO_2 (dry volume %):	10.61
Probe Operator:		N_2+CO (dry volume %):	80.87
Test Date:	3/19/13		
Start Time:	08:15	H_2O (condensate, ml or gm):	222.4
Stop Time:	09:15	H_2O (silica, g):	14.1
Leak Rate Before:	0.002 cfm @ 15 "Hg	Actual Moisture (%):	21.98
Leak Rate After:	0.001 cfm @ 10 "Hg		

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			279.615						
3-01	5.0		1.50	283.070	301	76	73		3.45	
3-01	10.0		1.50	286.440	301	77	73		3.37	
3-01	15.0		1.50	289.810	299	81	74		3.37	
3-01	20.0		1.50	293.200	300	81	74		3.39	
3-01	25.0		1.50	296.610	301	81	75		3.41	
3-01	30.0		1.50	300.020	300	81	75		3.41	
3-01	35.0		1.50	303.440	300	81	75		3.42	
3-01	40.0		1.50	306.830	300	82	75		3.39	
3-01	45.0		1.50	310.210	301	82	75		3.38	
3-01	50.0		1.50	313.590	301	84	75		3.38	
3-01	55.0		1.50	316.980	301	85	76		3.39	
3-01	60.0		1.50	320.400	302	86	76		3.42	
Final	60.0		1.50000	40.78500	300.58333	78.04167		0.00000	40.78500	
3 points sampled		Sq.Rt.ΔP								
QC-Check: Field Averages			1.5000	40.7850	300.5833	78.0416				
		☐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 26A
Test Run:	2	Analyte:	HCl
Client:	Wheelabrator North Broward, Inc.	Bar. Press. (in. Hg):	29.80
Project No:	12218	Static P:	-9.9
Source Area (ft^2):	64.00000	O_2 (dry volume %):	8.81
Meter Operator:	W. Berry 456	CO_2 (dry volume %):	10.50
Probe Operator:		N_2+CO (dry volume %):	80.69
Test Date:	3/19/13		
Start Time:	09:48		
Stop Time:	10:48	H_2O (condensate, ml or gm):	214.8
Leak Rate Before:	0.002 cfm @ 15 "Hg	H_2O (silica, g):	22.5
Leak Rate After:	0.001 cfm @ 10 "Hg	Actual Moisture (%):	21.95

Nozzle ID No:	N/A	Meter Box ID. No:	66-14
Nozzle Diameter (D_n):	N/A	Meter ΔH@:	1.80150
Probe ID No:	67-4-3	Meter Y_d:	0.98790
Pitot C_p:	N/A		
Pitot Leak Check:	☑Pass ☐Fail		

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			322.480						
3-01	5.0		1.50	326.850	302	75	74		4.37	
3-01	10.0		1.50	329.380	302	76	74		2.53	
3-01	15.0		1.50	332.740	301	79	74		3.36	
3-01	20.0		1.50	336.110	301	81	74		3.37	
3-01	25.0		1.50	339.220	303	81	74		3.11	
3-01	30.0		1.50	342.870	302	83	75		3.65	
3-01	35.0		1.50	346.260	302	83	75		3.39	
3-01	40.0		1.50	349.660	301	84	75		3.40	
3-01	45.0		1.50	353.130	301	83	76		3.47	
3-01	50.0		1.50	356.590	302	81	75		3.46	
3-01	55.0		1.50	360.010	303	81	75		3.42	
3-01	60.0		1.50	363.445	301	80	74		3.44	
Final	60.0		1.50000	40.96500	301.75000	77.58333		0.00000	40.96500	
3 points sampled		Sq.Rt.ΔP								
QC-Check: Field Averages			1.5000	40.9650	301.7500	77.5833				
		☐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 26A
Test Run:	3	Analyte:	HCl
Client:	Wheelabrator North Broward, Inc.	Bar. Press. (In. Hg):	29.80
Project No:	12218	Static P:	-9.9
Source Area (ft^2):	64.00000	O_2 (dry volume %):	9.06
Meter Operator:	W. Berry 456	CO_2 (dry volume %):	10.33
Probe Operator:		N_2+CO (dry volume %):	80.61
Test Date:	3/19/13		
Start Time:	11:19		
Stop Time:	12:19	H_2O (condensate, ml or gm):	220.5
Leak Rate Before:	0.003 cfm @ 13 "Hg	H_2O (silica, g):	12.6
Leak Rate After:	0.001 cfm @ 10 "Hg	Actual Moisture (%):	21.71

Nozzle ID No:	N/A	Pitot Leak Check:	☑ Pass ☐ Fail
Nozzle Diameter (D_n):	N/A		
Probe ID No:	67-4-3		
Pitot C_p:	N/A		
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			364.830						
3-01	5.0		1.50	368.320	301	78	76		3.49	
3-01	10.0		1.50	371.700	302	80	77		3.38	
3-01	15.0		1.50	375.070	303	81	76		3.37	
3-01	20.0		1.50	378.460	302	81	76		3.39	
3-01	25.0		1.50	381.840	303	82	77		3.38	
3-01	30.0		1.50	385.260	303	82	77		3.42	
3-01	35.0		1.50	388.700	303	82	77		3.44	
3-01	40.0		1.50	392.100	302	83	77		3.40	
3-01	45.0		1.50	395.500	303	83	77		3.40	
3-01	50.0		1.50	398.950	302	84	78		3.45	
3-01	55.0		1.50	402.360	302	84	78		3.41	
3-01	60.0		1.50	405.770	302	84	79		3.41	
Final	60.0		1.50000	40.94000	302.33333	79.54167		0.00000	40.94000	
3 points sampled		Sq.Rt.ΔP								
QC-Check: Field Averages			1.5000	40.9400	302.3330	79.5416				
		☐ 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 North 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:		10.61000		8.52000	80.87000	30.03840	1.16682	☑ Fo value within expected range.
2	1							
	2							
	3							
	Avg.							
CEM or Other Avg:		10.50000		8.81000	80.69000	30.03240	1.15143	☑ Fo value within expected range.
3	1							
	2							
	3							
	Avg.							
CEM or Other Avg:		10.33000		9.06000	80.61000	30.01520	1.14618	☑ 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 North 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	488.1	446.4	41.7
Impinger 2	100 ml 0.1N H2SO4	700.2	561.0	139.2
Impinger 3	100 ml 0.1N H2SO4	574.1	539.5	34.6
Impinger 4	Empty	446.8	439.9	6.9
Impinger 5	Silica Gel	764.9	750.8	14.1
Impinger 6				
Impinger 7				
Impinger 8				

Rinse: (ml or gm)

		Field Data Check	
222.4	Liquid (gm)		
0.0	less rinse (gm)		
222.4	Net Liquid (gm)	222.4	☑ QA/QC OK
+ 14.1	Silica Gel (gm)	14.1	☑ QA/QC OK
236.5	Total Vlc (gm)	236.5	☑ QA/QC OK

Test Run: 2

	Contents	Gross (gm)	Tare (gm)	Net (gm)
Impinger 1	50 ml 0.1N H2SO4	497.1	454.0	43.1
Impinger 2	100 ml 0.1N H2SO4	650.7	544.2	106.5
Impinger 3	100 ml 0.1N H2SO4	582.2	535.2	47.0
Impinger 4	Empty	482.8	464.6	18.2
Impinger 5	Silica Gel	781.3	758.8	22.5
Impinger 6				
Impinger 7				
Impinger 8				

Rinse: (ml or gm)

		Field Data Check	
214.8	Liquid (gm)		
0.0	less rinse (gm)		
214.8	Net Liquid (gm)	214.8	☑ QA/QC OK
+ 22.5	Silica Gel (gm)	22.5	☑ QA/QC OK
237.3	Total Vlc (gm)	237.3	☑ QA/QC OK

Test Run: 3

	Contents	Gross (gm)	Tare (gm)	Net (gm)
Impinger 1	50 ml 0.1N H2SO4	493.7	449.6	44.1
Impinger 2	100 ml 0.1N H2SO4	694.6	558.2	136.4
Impinger 3	100 ml 0.1N H2SO4	571.3	539.0	32.3
Impinger 4	Empty	449.3	441.6	7.7
Impinger 5	Silica Gel	777.1	764.5	12.6
Impinger 6				
Impinger 7				
Impinger 8				

Rinse: (ml or gm)

		Field Data Check	
220.5	Liquid (gm)		
0.0	less rinse (gm)		
220.5	Net Liquid (gm)	220.5	☑ QA/QC OK
+ 12.6	Silica Gel (gm)	12.6	☑ QA/QC OK
233.1	Total Vlc (gm)	233.1	☑ 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 North Broward, Inc.	Bar. Press. (in. Hg):	29.80
Project No:	12218	Static P:	-8.7
Source Area (ft^2):	64.00000	O_2 (dry volume %):	7.20
Meter Operator:	P. Bihun 505	CO_2 (dry volume %):	11.70
Probe Operator:	P. Bihun 505	N_2+CO (dry volume %):	81.10
Test Date:	3/19/13		
Start Time:	07:54		
Stop Time:	10:07	H_2O (condensate, ml or gm):	409.8
Leak Rate Before:	0.003 cfm @ 15 "Hg	H_2O (silica, g):	17.8
Leak Rate After:	0.003 cfm @ 10 "Hg	Actual Moisture (%):	23.75

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:	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			255.345						
5-01	5.0	0.32	0.78	257.870	305	77	77	0.57	2.53	102.2
5-02	10.0	0.33	0.81	260.400	306	79	76	0.57	2.53	100.9
5-03	15.0	0.37	0.91	263.080	305	80	76	0.61	2.68	100.8
5-04	20.0	0.39	0.96	265.870	306	81	76	0.62	2.79	102.2
5-05	25.0	0.39	0.96	268.670	306	83	77	0.62	2.80	102.2
LEAK CHECK	25.0			268.720						
4-01	30.0	0.40	0.98	271.520	306	82	76	0.63	2.80	101.1
4-02	35.0	0.37	0.91	274.220	307	84	77	0.61	2.70	101.2
4-03	40.0	0.32	0.78	276.750	306	85	78	0.57	2.53	101.7
4-04	45.0	0.33	0.81	279.300	306	85	78	0.57	2.55	100.9
4-05	50.0	0.29	0.71	281.705	305	87	79	0.54	2.40	101.1
LEAK CHECK	50.0			281.770						
3-01	55.0	0.38	0.93	284.510	305	85	79	0.62	2.74	100.9
3-02	60.0	0.35	0.86	287.160	306	88	80	0.59	2.65	101.4
3-03	65.0	0.35	0.86	289.790	306	88	80	0.59	2.63	100.6
3-04	70.0	0.35	0.86	292.430	306	88	80	0.59	2.64	101.0
3-05	75.0	0.34	0.83	295.040	307	89	81	0.58	2.61	101.2
LEAK CHECK	75.0			295.080						
2-01	80.0	0.34	0.83	297.680	305	87	82	0.58	2.60	100.7
2-02	85.0	0.37	0.91	300.410	307	89	82	0.61	2.73	101.4
2-03	90.0	0.43	1.10	303.390	307	90	82	0.66	2.98	102.6
2-04	95.0	0.40	0.98	306.230	307	91	83	0.63	2.84	101.2
2-05	100.0	0.45	1.10	309.210	307	91	83	0.67	2.98	100.1
LEAK CHECK	100.0			309.280						
1-01	105.0	0.30	0.74	311.710	304	90	83	0.55	2.43	99.8
1-02	110.0	0.23	0.56	313.850	305	91	83	0.48	2.14	100.3
1-03	115.0	0.36	0.88	316.510	307	91	84	0.60	2.66	99.8
1-04	120.0	0.35	0.86	319.160	306	92	85	0.59	2.65	100.5
1-05	125.0	0.37	0.91	321.880	306	92	85	0.61	2.72	100.4
Final	125.0		0.87280	66.31000	305.96000	83.34000		0.59475	66.31000	
25 points sampled		Sq.Rt.ΔP								
QC-Check: Field Averages		0.5947	0.8725	66.3100	305.9600	83.3400				
		☑ 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 2 FF Outlet
Test Run: 2
Client: Wheelabrator North Broward, Inc.
Project No: 12218
Source Area (ft^2): 64.00000
Meter Operator: P. Bihun 505
Probe Operator: P. Bihun 505
Test Date: 3/19/13
Start Time: 10:35
Stop Time: 12:48
Leak Rate Before: 0.003 cfm @ 15 "Hg
Leak Rate After: 0.003 cfm @ 15 "Hg

Bar. Press. (in. Hg): 29.80
Static P: -9.2
O_2 (dry volume %): 7.28
CO_2 (dry volume %): 11.73
N_2+CO (dry volume %): 80.99
H_2O (condensate, ml or gm): 375.0
H_2O (silica, g): 17.0
Actual Moisture (%): 23.20

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: 61-11
Meter $\Delta H@$: 1.69640
Meter Y_d: 1.00500

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)	322.205	(°F)	(°F)	(°F)	($\sqrt{in.}$ H_2O)	(ft^3)	(%)
3-01	5.0	0.32	0.80	324.770	306	85	83	0.57	2.57	102.1
3-02	10.0	0.35	0.84	327.360	305	86	83	0.59	2.59	98.4
3-03	15.0	0.31	0.74	329.800	305	88	83	0.56	2.44	98.3
3-04	20.0	0.31	0.74	332.250	305	89	83	0.56	2.45	98.6
3-05	25.0	0.31	0.74	334.685	305	90	84	0.56	2.44	97.8
LEAK CHECK	25.0			334.730						
2-01	30.0	0.38	0.91	337.430	304	90	84	0.62	2.70	97.9
2-02	35.0	0.42	1.00	340.280	305	92	84	0.65	2.85	98.3
2-03	40.0	0.38	0.91	343.030	306	92	84	0.62	2.75	99.7
2-04	45.0	0.38	0.91	345.770	306	92	84	0.62	2.74	99.3
2-05	50.0	0.36	0.86	348.400	306	92	85	0.60	2.63	97.9
LEAK CHECK	50.0			348.450						
1-01	55.0	0.23	0.55	350.550	302	90	84	0.48	2.10	97.7
1-02	60.0	0.23	0.55	352.658	302	90	84	0.48	2.11	98.1
1-03	65.0	0.33	0.79	355.170	304	91	84	0.57	2.51	97.7
1-04	70.0	0.38	0.91	357.900	306	92	85	0.62	2.73	98.9
1-05	75.0	0.43	1.00	360.740	306	93	85	0.66	2.84	96.6
LEAK CHECK	75.0			360.830						
4-01	80.0	0.34	0.82	363.420	306	91	86	0.58	2.59	99.2
4-02	85.0	0.33	0.79	365.950	306	93	86	0.57	2.53	98.1
4-03	90.0	0.31	0.74	368.420	305	94	87	0.56	2.47	98.6
4-04	95.0	0.33	0.79	371.000	305	94	87	0.57	2.58	99.8
4-05	100.0	0.32	0.77	373.510	306	95	87	0.57	2.51	98.6
LEAK CHECK	100.0			373.550						
5-01	105.0	0.30	0.72	375.960	306	92	87	0.55	2.41	98.0
5-02	110.0	0.32	0.77	378.490	306	94	87	0.57	2.53	99.5
5-03	115.0	0.30	0.72	380.910	306	95	88	0.55	2.42	98.1
5-04	120.0	0.31	0.74	383.390	306	96	88	0.56	2.48	98.8
5-05	125.0	0.28	0.67	385.705	306	96	89	0.53	2.32	96.9
Final	125.0		0.79120	63.27500	305.24000	88.46000		0.57329	63.27500	
25 points sampled		Sq.Rt.ΔP								
QC-Check: Field Averages		0.5733	0.7912	63.2750	305.2400	88.4600				
		☑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 North Broward, Inc.	Bar. Press. (in. Hg):	29.80
Project No:	12218	Static P:	-8.6
Source Area (ft^2):	64.00000	O_2 (dry volume %):	7.34
Meter Operator:	P. Bihun 505	CO_2 (dry volume %):	11.83
Probe Operator:	P. Bihun 505	N_2+CO (dry volume %):	80.83
Test Date:	3/19/13		
Start Time:	13:25		
Stop Time:	15:37	H_2O (condensate, ml or gm):	390.8
Leak Rate Before:	0.008 cfm @ 15 "Hg	H_2O (silica, g):	12.4
Leak Rate After:	0.006 cfm @ 10 "Hg	Actual Moisture (%):	23.50

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:	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			386.765						
5-01	5.0	0.31	0.76	389.320	306	92	90	0.56	2.56	102.3
5-02	10.0	0.31	0.76	391.830	306	94	91	0.56	2.51	100.2
5-03	15.0	0.36	0.88	394.520	307	96	91	0.60	2.69	99.5
5-04	20.0	0.37	0.91	397.270	307	98	91	0.61	2.75	100.2
5-05	25.0	0.31	0.76	399.790	305	99	92	0.56	2.52	100.0
LEAK CHECK	25.0			399.855						
4-01	30.0	0.31	0.76	402.400	305	99	93	0.56	2.54	100.9
4-02	35.0	0.33	0.81	404.930	307	101	94	0.57	2.53	97.1
4-03	40.0	0.32	0.78	407.480	307	101	94	0.57	2.55	99.3
4-04	45.0	0.35	0.86	410.140	307	101	94	0.59	2.66	99.1
4-05	50.0	0.30	0.74	412.635	307	101	94	0.55	2.50	100.4
LEAK CHECK	50.0			412.705						
3-01	55.0	0.33	0.81	415.300	306	99	94	0.57	2.60	99.7
3-02	60.0	0.32	0.78	417.840	306	99	93	0.57	2.54	99.2
3-03	65.0	0.34	0.83	420.470	306	100	93	0.58	2.63	99.5
3-04	70.0	0.33	0.81	423.090	307	100	94	0.57	2.62	100.6
3-05	75.0	0.37	0.91	425.845	307	100	94	0.61	2.76	99.9
LEAK CHECK	75.0			425.920						
2-01	80.0	0.31	0.76	428.380	305	99	94	0.56	2.46	97.4
2-02	85.0	0.31	0.76	430.900	306	100	94	0.56	2.52	99.8
2-03	90.0	0.33	0.81	433.490	306	101	95	0.57	2.59	99.2
2-04	95.0	0.43	1.10	436.520	306	103	95	0.66	3.03	101.6
2-05	100.0	0.45	1.10	439.545	307	103	95	0.67	3.03	99.2
LEAK CHECK	100.0			439.590						
1-01	105.0	0.23	0.56	441.740	300	101	95	0.48	2.15	98.2
1-02	110.0	0.24	0.59	443.930	301	101	95	0.49	2.19	98.0
1-03	115.0	0.31	0.76	446.450	305	101	95	0.56	2.52	99.5
1-04	120.0	0.37	0.91	449.200	306	101	95	0.61	2.75	99.5
1-05	125.0	0.38	0.93	451.975	306	101	95	0.62	2.78	99.1
Final	125.0		0.81760	64.95500	305.76000	96.62000		0.57545	64.95500	
25 points sampled		Sq.Rt.ΔP								
QC-Check: Field Averages		0.5755	0.8176	64.9550	305.7600	96.6200				
		☐ 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 North Broward, Inc.
Project No: 12218
Source Area (ft^2): 64.00000
Meter Operator: P. Bihun 505
Probe Operator: P. Bihun 505
Test Date: 3/21/13
Start Time: 12:05
Stop Time: 14:26
Leak Rate Before: 0.002 cfm @ 15 "Hg
Leak Rate After: 0.003 cfm @ 16 "Hg

Bar. Press. (in. Hg): 29.75
Static P: -9.4
O_2 (dry volume %): 7.20
CO_2 (dry volume %): 11.70
N_2+CO (dry volume %): 81.10
H_2O (condensate, ml or gm): 409.8
H_2O (silica, g): 17.8
Actual Moisture (%): 23.75

Nozzle ID No: 0.2760-1
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: 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			44.400						
1-01	5.0	0.15	0.41	46.200	300	76	75	0.39	1.80	104.2
1-02	10.0	0.15	0.41	47.970	298	77	76	0.39	1.77	102.2
1-03	15.0	0.37	1.00	50.660	301	77	76	0.61	2.69	99.2
1-04	20.0	0.46	1.30	53.860	304	80	76	0.68	3.20	105.8
1-05	25.0	0.53	1.40	57.010	304	84	78	0.73	3.15	96.5
LEAK CHECK	25.0			57.260						
2-01	30.0	0.45	1.20	60.250	306	84	79	0.67	2.99	99.4
2-02	35.0	0.48	1.30	63.270	305	86	80	0.69	3.02	96.9
2-03	40.0	0.50	1.40	66.480	306	86	80	0.71	3.21	101.0
2-04	45.0	0.48	1.30	69.710	305	87	81	0.69	3.23	103.5
2-05	50.0	0.45	1.20	72.680	304	89	82	0.67	2.97	97.9
LEAK CHECK	50.0			73.020						
3-01	55.0	0.38	1.00	75.730	305	88	83	0.62	2.71	97.2
3-02	60.0	0.39	1.10	78.660	305	87	83	0.62	2.93	103.9
3-03	65.0	0.40	1.10	81.460	305	88	83	0.63	2.80	97.9
3-04	70.0	0.42	1.10	84.360	305	88	83	0.65	2.90	99.0
3-05	75.0	0.41	1.10	87.220	303	88	83	0.64	2.86	98.7
LEAK CHECK	75.0			87.400						
4-01	80.0	0.39	1.10	90.260	304	89	85	0.62	2.86	101.0
4-02	85.0	0.40	1.10	93.130	305	89	85	0.63	2.87	100.1
4-03	90.0	0.40	1.10	95.950	305	90	85	0.63	2.82	98.3
4-04	95.0	0.45	1.20	98.980	305	91	85	0.67	3.03	99.5
4-05	100.0	0.44	1.20	102.040	305	91	85	0.66	3.06	101.6
LEAK CHECK	100.0			102.200						
5-01	105.0	0.38	1.00	104.900	304	91	86	0.62	2.70	96.3
5-02	110.0	0.40	1.10	107.770	304	91	87	0.63	2.87	99.7
5-03	115.0	0.36	0.98	110.560	304	90	87	0.60	2.79	102.2
5-04	120.0	0.37	1.00	113.340	304	90	86	0.61	2.78	100.6
5-05	125.0	0.37	1.00	116.140	304	90	86	0.61	2.80	101.3
Final	125.0		1.08400	70.81000	304.00000	84.44000		0.62697	70.81000	
25 points sampled		Sq.Rt.ΔP								
QC-Check: Field Averages		0.6270	1.0840	70.8100	304.0000	84.4400				
		☑ 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 2 FF Outlet
Client: Wheelabrator North 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:		11.70000		7.20000	81.10000	30.16000	1.17094	☑ Fo value within expected range.
2	1							
	2							
	3							
	Avg.							
CEM or Other Avg:		11.73000		7.28000	80.99000	30.16800	1.16113	☑ Fo value within expected range.
3	1							
	2							
	3							
	Avg.							
CEM or Other Avg:		11.83000		7.34000	80.83000	30.18640	1.14624	☑ Fo value within expected range.
4	1							
	2							
	3							
	Avg.							
CEM or Other Avg:		12.04000		7.36000	80.60000	30.22080	1.12458	☑ Fo value within expected range.

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USEPA Method 4 Laboratory Data

Test Method: USEPA Method 5/29 and 29
Analyte: Particulate/Metals and Mercury

Location: Unit 2 FF Outlet
Client: Wheelabrator North Broward, Inc.
Project No: 12218
Analyst: H. Nguyen
Analyst Emp No: 429

Test Run: 1

	Contents	Gross (gm)	Tare (gm)	Net (gm)
Impinger 1	Empty	709.4	462.0	247.4
Impinger 2	5%HNO3/10%H2O2	655.8	541.0	114.8
Impinger 3	5%HNO3/10%H2O2	578.0	547.5	30.5
Impinger 4	Empty	432.0	422.3	9.7
Impinger 5	4%KMnO4/10%H2SO4	649.0	643.6	5.4
Impinger 6	4%KMnO4/10%H2SO4	543.7	541.7	2.0
Impinger 7	Silica Gel	770.3	752.5	17.8
Impinger 8				

Rinse: (ml or gm)

		Field Data Check	
409.8	Liquid (gm)		
0.0	less rinse (gm)		
409.8	Net Liquid (gm)	409.8	☑ QA/QC OK
+ 17.8	Silica Gel (gm)	17.8	☑ QA/QC OK
427.6	Total Vlc (gm)	427.6	☑ QA/QC OK

Test Run: 2

	Contents	Gross (gm)	Tare (gm)	Net (gm)
Impinger 1	Empty	700.3	453.2	247.1
Impinger 2	5%HNO3/10%H2O2	642.7	553.0	89.7
Impinger 3	5%HNO3/10%H2O2	570.5	542.7	27.8
Impinger 4	Empty	440.5	435.2	5.3
Impinger 5	4%KMnO4/10%H2SO4	557.2	553.5	3.7
Impinger 6	4%KMnO4/10%H2SO4	538.7	537.3	1.4
Impinger 7	Silica Gel	783.0	766.0	17.0
Impinger 8				

Rinse: (ml or gm)

		Field Data Check	
375.0	Liquid (gm)		
0.0	less rinse (gm)		
375.0	Net Liquid (gm)	375.0	☑ QA/QC OK
+ 17.0	Silica Gel (gm)	17.0	☑ QA/QC OK
392.0	Total Vlc (gm)	392.0	☑ QA/QC OK

Test Run: 3

	Contents	Gross (gm)	Tare (gm)	Net (gm)
Impinger 1	Empty	727.1	464.0	263.1
Impinger 2	5%HNO3/10%H2O2	643.5	544.0	99.5
Impinger 3	5%HNO3/10%H2O2	570.8	548.8	22.0
Impinger 4	Empty	426.2	423.9	2.3
Impinger 5	4%KMnO4/10%H2SO4	644.3	642.3	2.0
Impinger 6	4%KMnO4/10%H2SO4	548.4	546.5	1.9
Impinger 7	Silica Gel	781.9	769.5	12.4
Impinger 8				

Rinse: (ml or gm)

		Field Data Check	
390.8	Liquid (gm)		
0.0	less rinse (gm)		
390.8	Net Liquid (gm)	390.8	☑ QA/QC OK
+ 12.4	Silica Gel (gm)	12.4	☑ QA/QC OK
403.2	Total Vlc (gm)	403.2	☑ QA/QC OK

Test Run: 4

	Contents	Gross (gm)	Tare (gm)	Net (gm)
Impinger 1	Empty	771.5	457.4	314.1
Impinger 2	5%HNO3/10%H2O2	667.4	558.5	108.9
Impinger 3	5%HNO3/10%H2O2	562.7	547.3	15.4
Impinger 4	Empty	440.8	438.9	1.9
Impinger 5	4%KMnO4/10%H2SO4	544.7	543.5	1.2
Impinger 6	4%KMnO4/10%H2SO4	534.1	534.0	0.1
Impinger 7	Silica Gel	785.5	773.8	11.7
Impinger 8				

Rinse: (ml or gm)

		Field Data Check	
441.6	Liquid (gm)		
0.0	less rinse (gm)		
441.6	Net Liquid (gm)	441.6	☑ QA/QC OK
+ 11.7	Silica Gel (gm)	11.7	☑ QA/QC OK
453.3	Total Vlc (gm)	453.3	☑ QA/QC OK

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Test Location: FF Outlet
Unit: 2 Run: 1

PCDD/PCDF Testing
FIELD DATA SHEET

Method: USEPA Method 23
Start Time: 10:16 Stop Time: 14:38

Client: Wheelabrator
Plant: North Broward
Meter Operator: A. Obuchowski (567)
Probe Operator: A. Obuchowski (567)
Meter Box: 66-22 Sample Box: D4
Meter Yd: 0.9972 Meter ΔH@: 1.8840
K Factor: 2.59 Pitot Cp: 0.813
Initial Leak Rate: 0.004 cfm @ 15.0"Hg
Final Leak Rate: 0.002 cfm @ 15.0"Hg
Pitot Leak Check ☑ Initial Final ☑ Pass ☐ Fail

Project No: 12218
Date: 03/19/13

Stack/Duct Dimensions: 96.0 in. x 96.0 in.
Stack/Duct Area: 64 sq.ft.
O_2 (dry volume %): 7.24
CO_2 (dry volume %): 11.85
N_2+CO (dry volume %): 80.91
H_2O (condensate, ml or gm): 753.1
H_2O (silica, g): 56.2
Actual Measured Moisture (%): 23.58

Probe I.D. No: 67-8-21
Liner Material: Pyrex Glass
Pitot Cp: 0.813

Meter Bar. Press. (in. Hg): 29.80
Location Bar. Press. (in. Hg): 29.80
Static Pressure (in. H2O): -8.7
Amb. Temp. (°F): 74

Nozzle ID No: 2722-1
Nozzle Dia (in.): 0.2722

Traverse Point Number	10.0 min/read Elapsed Time (min)	Velocity Head Δp (in. H_2O)	Orifice Setting ΔH (in. H_2O)	Gas Sample Volume V_m (ft^3)	Thermocouple Record: Stack t_S (°F)	Cond. t_C (°F)	DGM In $t_{M\,in}$ (°F)	DGM Out $t_{M\,out}$ (°F)	Probe t_P (°F)	Filter t_F (°F)	XAD Trap (°F)	Pump Vacuum (in. Hg)	Observed Oxygen, approx. (%,dv)	Notes:	Stack Velocity V_s (ft/sec)	Isokinetic Variation I (%)
	0.0			630.885					250	250						
5-01	10.0	0.34	0.92	636.140	304	56	87	82	251	250	55	7	6.6	200 cc/min igs	39.7	102.4
5-02	20.0	0.35	0.95	641.450	304	53	88	82	250	250	57	8	7.9	200 cc/min igs	40.3	101.9
5-03	30.0	0.3	0.81	646.420	304	56	87	82	250	251	60	7	7.2	200 cc/min igs	37.3	103.1
5-04	40.0	0.3	0.78	651.280	304	57	88	82	250	250	60	7	6.8	200 cc/min igs	37.3	100.7
5-05	50.0	0.26	0.67	655.765	303	61	89	83	250	252	58	6	7.2	200 cc/min igs	34.7	99.6
Port Chng	50.0	New Initial Vm		655.820												
4-01	60.0	0.35	0.91	661.050	304	64	85	83	250	250	62	8	8.2	200 cc/min igs	40.3	100.6
4-02	70.0	0.35	0.91	666.360	305	56	87	82	250	251	54	8	7.8	200 cc/min igs	40.3	102.1
4-03	80.0	0.35	0.91	671.580	305	56	87	82	250	250	55	8	7.5	200 cc/min igs	40.3	100.3
4-04	90.0	0.35	0.91	676.750	305	59	88	82	250	251	58	8	7.8	200 cc/min igs	40.3	99.3
4-05	100.0	0.33	0.85	681.810	304	63	89	83	249	249	64	8	7.8	200 cc/min igs	39.1	99.8
Port Chng	100.0	New Initial Vm		681.885												
3-01	110.0	0.24	0.62	686.200	304	65	86	83	250	249	65	6	7.0	200 cc/min igs	33.3	100.0
3-02	120.0	0.36	0.93	691.250	304	64	89	83	250	250	61	8	7.3	200 cc/min igs	40.8	95.4
3-03	130.0	0.35	0.91	696.480	304	63	89	83	250	250	62	8	8.0	200 cc/min igs	40.3	100.2
3-04	140.0	0.35	0.91	701.800	304	63	91	84	250	251	64	8	6.9	200 cc/min igs	40.3	101.6
3-05	150.0	0.35	0.91	706.915	304	65	92	87	250	249	65	8	7.6	200 cc/min igs	40.3	97.4
Port Chng	150.0	New Initial Vm		707.000												
2-01	160.0	0.39	1.0	712.490	304	63	93	86	250	250	58	8	7.1	200 cc/min igs	42.5	99.0
2-02	170.0	0.35	0.91	717.800	305	63	93	87	250	250	60	8	7.4	200 cc/min igs	40.3	101.0
2-03	180.0	0.36	0.93	723.160	304	65	94	88	250	250	63	8	7.6	200 cc/min igs	40.8	100.3
2-04	190.0	0.41	1.1	728.950	303	66	96	89	250	250	63	9	7.3	200 cc/min igs	43.6	101.3
2-05	200.0	0.46	1.2	734.960	304	62	96	89	250	250	55	9	6.9	200 cc/min igs	46.2	99.3
Port Chng	200.0	New Initial Vm		735.020												
1-01	210.0	0.17	0.44	738.590	302	63	93	90	245	250	60	5	7.9	200 cc/min igs	28.0	96.9
1-02	220.0	0.17	0.44	742.350	301	63	94	91	249	251	64	5	7.2	200 cc/min igs	28.0	101.8
1-03	230.0	0.37	0.96	747.710	300	65	94	91	250	250	65	8	8.3	200 cc/min igs	41.3	98.4
1-04	240.0	0.43	1.1	753.600	305	66	95	90	250	250	64	9	7.6	200 cc/min igs	44.7	100.7
1-05	250.0	0.49	1.3	759.900	304	65	95	90	250	250	59	10	8.1	200 cc/min igs	47.7	100.9
Avg/Tot/Rng	250.0	0.58036	0.89120	128.740	303.760	53-66	87.9800		245-251	249-252	54-65	10.0	7.5	041213 093841 N	39.5025	100.2

Meter Operator _____ Date _____

CleanAir.

Test Location: FF Outlet
Unit: 2 Run: 2

PCDD/PCDF Testing
FIELD DATA SHEET

Method: USEPA Method 23
Start Time: 07:40 Stop Time: 11:59

Client: Wheelabrator
Plant: North Broward
Meter Operator: A. Obuchowski (567)
Probe Operator: A. Obuchowski (567)
Meter Box: 66-22 Sample Box: D3
Meter Yd: 0.9972 Meter ΔH@: 1.8840
K Factor: 2.62 Pitot Cp: 0.813
Initial Leak Rate: 0.004 cfm @ 15.0"Hg
Final Leak Rate: 0.003 cfm @ 11.0"Hg
Pitot Leak Check ☑ Initial Final ☑ Pass ☐ Fail

Project No: 12218
Date: 03/20/13

Stack/Duct Dimensions: 96.0 in. x 96.0 in.
Stack/Duct Area: 64 sq.ft.
O_2 (dry volume %): 7.98
CO_2 (dry volume %): 11.15
N_2+CO (dry volume %): 80.87
H_2O (condensate, ml or gm): 835.6
H_2O (silica, g): 58.9
Actual Measured Moisture (%): 23.89

Probe I.D. No: 67-8-21
Liner Material: Pyrex Glass
Pitot Cp: 0.813

Meter Bar. Press. (in. Hg): 29.80
Location Bar. Press. (in. Hg): 29.80
Static Pressure (in. H2O): -9.7
Amb. Temp. (°F): 75

Nozzle ID No: 2722-1
Nozzle Dia (in.): 0.2722

Traverse Point Number	10.0 min/read Elapsed Time (min)	Velocity Head Δp (in. H_2O)	Orifice Setting ΔH (in. H_2O)	Gas Sample Volume V_m (ft^3)	Thermocouple Record: Stack t_S (°F)	Cond. t_C (°F)	DGM In $t_{M\,in}$ (°F)	DGM Out $t_{M\,out}$ (°F)	Probe t_P (°F)	Filter t_F (°F)	XAD Trap (°F)	Pump Vacuum (in. Hg)	Observed Oxygen, approx. (%,dv)	Notes:	Stack Velocity V_s (ft/sec)	Isokinetic Variation I (%)	√Δp
	0.0			760.670					250	250							
1-01	10.0	0.2	0.52	764.570	300	60	74	70	250	250	51	4	8.3	200 cc/min igs	30.5	101.4	0.447
1-02	20.0	0.14	0.37	767.620	300	56	75	71	250	250	49	3	8.9	200 cc/min igs	25.5	94.6	0.374
1-03	30.0	0.36	0.94	773.000	297	49	77	72	250	250	53	7	9.0	200 cc/min igs	40.8	103.7	0.600
1-04	40.0	0.49	1.3	779.210	304	49	82	74	250	250	60	9	8.9	200 cc/min igs	47.8	102.5	0.700
1-05	50.0	0.59	1.5	785.850	305	55	86	77	250	250	64	10	8.4	200 cc/min igs	52.5	99.3	0.768
Port Chng	50.0	New Initial Vm		786.030													
2-01	60.0	0.47	1.2	792.010	305	60	85	77	250	250	65	9	8.6	200 cc/min igs	46.8	100.2	0.686
2-02	70.0	0.47	1.2	798.040	305	64	87	78	251	251	57	9	8.3	200 cc/min igs	46.8	100.8	0.686
2-03	80.0	0.51	1.3	804.300	305	60	87	79	250	250	54	9	8.3	200 cc/min igs	48.8	100.4	0.714
2-04	90.0	0.46	1.2	810.380	304	63	89	80	250	250	62	9	8.5	200 cc/min igs	46.3	102.3	0.678
2-05	100.0	0.5	1.3	816.900	304	58	90	81	250	250	50	9	8.2	200 cc/min igs	48.3	105.1	0.707
Port Chng	100.0	New Initial Vm		817.110													
3-01	110.0	0.36	0.94	822.170	306	59	89	83	250	250	60	7	8.1	200 cc/min igs	41.0	96.0	0.600
3-02	120.0	0.42	1.1	827.990	305	61	89	83	250	249	63	8	8.7	200 cc/min igs	44.3	102.2	0.648
3-03	130.0	0.42	1.1	833.760	305	64	89	83	249	250	64	8	9.2	200 cc/min igs	44.3	101.4	0.648
3-04	140.0	0.4	1.0	839.340	305	66	90	83	250	250	66	8	7.9	200 cc/min igs	43.2	100.3	0.632
3-05	150.0	0.45	1.2	845.390	306	65	93	84	250	250	55	9	8.6	200 cc/min igs	45.9	102.3	0.671
Port Chng	150.0	New Initial Vm		845.630													
2-01	160.0	0.39	1.0	851.150	304	56	92	86	250	250	53	9	8.0	200 cc/min igs	42.6	100.0	0.624
2-02	170.0	0.35	0.91	856.480	305	56	92	86	250	250	53	7	8.1	200 cc/min igs	40.4	102.0	0.592
2-03	180.0	0.41	1.1	862.240	306	60	91	85	251	250	59	8	8.2	200 cc/min igs	43.8	102.1	0.640
2-04	190.0	0.41	1.1	868.000	306	65	92	86	250	249	63	8	7.4	200 cc/min igs	43.8	101.9	0.640
2-05	200.0	0.4	1.0	873.560	305	64	94	87	244	249	55	8	8.2	200 cc/min igs	43.2	99.2	0.632
Port Chng	200.0	New Initial Vm		873.670													
1-01	210.0	0.35	0.91	878.920	305	63	90	86	250	250	54	7	8.5	200 cc/min igs	40.4	100.6	0.592
1-02	220.0	0.35	0.91	884.230	305	63	90	86	250	250	56	7	8.3	200 cc/min igs	40.4	101.8	0.592
1-03	230.0	0.36	0.94	889.620	305	64	91	86	250	250	57	8	8.6	200 cc/min igs	41.0	101.8	0.600
1-04	240.0	0.37	0.97	895.070	305	58	90	86	249	250	49	8	7.5	200 cc/min igs	41.6	101.6	0.608
1-05	250.0	0.36	0.94	900.435	305	54	90	85	250	250	53	7	7.9	200 cc/min igs	41.0	101.5	0.600
Avg/Tot/Rng	250.0	0.62721	1.03800	139.025	304.280	49-66	84.5600		244-251	249-251	49-66	10.0	8.3	041213 063841 N	42.8407	101.0	2RSD 16.1%

Meter Operator _____ Date _____

CleanAir.

Test Location: FF Outlet
Unit: 2 Run: 3

PCDD/PCDF Testing
FIELD DATA SHEET

Method: USEPA Method 23
Start Time: 12:21 Stop Time: 16:40

Client: Wheelabrator
Plant: North Broward
Meter Operator: A. Obuchowski (567)
Probe Operator: A. Obuchowski (567)
Meter Box: 66-22 Sample Box: D4
Meter Yd: 0.9972 Meter ΔH@: 1.8840
K Factor: 2.59 Pitot Cp: 0.813
Initial Leak Rate: 0.003 cfm @ 15.0"Hg
Final Leak Rate: 0.002 cfm @ 12.0"Hg
Pitot Leak Check ☑ Initial Final ☑ Pass ☐ Fail

Project No: 12218
Date: 03/20/13

Stack/Duct Dimensions: 96.0 in. x 96.0 in.
Stack/Duct Area: 64 sq.ft.
O_2 (dry volume %): 7.99
CO_2 (dry volume %): 10.90
N_2+CO (dry volume %): 81.11
H_2O (condensate, ml or gm): 822.7
H_2O (silica, g): 56.4
Actual Measured Moisture (%): 23.34

Probe I.D. No: 67-8-21
Liner Material: Pyrex Glass
Pitot Cp: 0.813

Meter Bar. Press. (in. Hg): 29.80
Location Bar. Press. (in. Hg): 29.80
Static Pressure (in. H2O): -9.8
Amb. Temp. (°F): 80

Nozzle ID No: 2722-1
Nozzle Dia (in.): 0.2722

Traverse Point Number	10.0 min/read Elapsed Time (min)	Velocity Head Δp (in. H_2O)	Orifice Setting ΔH (in. H_2O)	Gas Sample Volume V_m (ft^3)	Thermocouple Record: Stack t_S (°F)	Cond. t_C (°F)	DGM In $t_{M\,in}$ (°F)	DGM Out $t_{M\,out}$ (°F)	Probe t_P (°F)	Filter t_F (°F)	XAD Trap (°F)	Pump Vacuum (in. Hg)	Observed Oxygen, approx. (%,dv)	Notes:	Stack Velocity V_s (ft/sec)	Isokinetic Variation I (%)	√Δp
	0.0			900.915					250	250							
1-01	10.0	0.15	0.39	904.670	300	65	85	85	255	255	63	3	9.0	200 cc/min igs	26.4	109.3	0.387
1-02	20.0	0.15	0.39	908.040	300	64	85	85	254	253	48	3	8.5	200 cc/min igs	26.4	98.1	0.387
1-03	30.0	0.4	1	913.550	303	62	85	84	250	250	47	7	8.9	200 cc/min igs	43.1	98.7	0.632
1-04	40.0	0.44	1.1	919.370	304	61	87	83	250	251	57	7	7.6	200 cc/min igs	45.3	99.4	0.663
1-05	50.0	0.48	1.2	925.380	304	63	87	83	249	250	60	7	8.6	200 cc/min igs	47.3	98.3	0.693
Port Chng	50.0	New Initial Vm		925.400													
2-01	60.0	0.52	1.3	931.730	305	66	86	83	250	253	65	8	8.9	200 cc/min igs	49.2	99.6	0.721
2-02	70.0	0.5	1.3	938.050	306	65	89	84	251	250	57	8	7.9	200 cc/min igs	48.3	101.1	0.707
2-03	80.0	0.52	1.3	944.410	306	66	94	87	250	250	68	8	8.6	200 cc/min igs	49.3	99.1	0.721
2-04	90.0	0.49	1.3	950.810	305	64	96	89	250	250	45	8	9.0	200 cc/min igs	47.8	102.3	0.700
2-05	100.0	0.56	1.5	957.630	306	61	95	90	250	250	49	9	7.5	200 cc/min igs	51.1	102.0	0.748
Port Chng	100.0	New Initial Vm		957.800													
3-01	110.0	0.26	0.67	962.400	305	64	90	88	250	251	57	5	8.7	200 cc/min igs	34.8	101.4	0.510
3-02	120.0	0.41	1.1	968.220	305	66	89	87	250	250	64	7	8.3	200 cc/min igs	43.7	102.4	0.640
3-03	130.0	0.39	1	973.780	304	65	91	87	251	250	52	7	8.1	200 cc/min igs	42.6	100.1	0.624
3-04	140.0	0.49	1.3	980.080	304	65	91	87	250	250	56	8	9.0	200 cc/min igs	47.8	101.2	0.700
3-05	150.0	0.45	1.2	986.140	306	60	92	88	250	250	47	8	7.7	200 cc/min igs	45.8	101.5	0.671
Port Chng	150.0	New Initial Vm		986.280													
4-01	160.0	0.37	0.96	991.760	305	61	92	89	250	250	52	6	8.3	200 cc/min igs	41.5	101.0	0.608
4-02	170.0	0.41	1.1	997.510	307	60	90	88	250	250	58	7	8.5	200 cc/min igs	43.8	101.2	0.640
4-03	180.0	0.4	1	1,003.100	306	64	92	88	251	250	65	7	8.9	200 cc/min igs	43.2	99.3	0.632
4-04	190.0	0.38	0.98	1,008.610	305	65	90	87	249	249	55	7	7.7	200 cc/min igs	42.1	100.6	0.616
4-05	200.0	0.38	0.98	1,014.110	305	64	91	87	250	250	52	7	8.0	200 cc/min igs	42.1	100.3	0.616
Port Chng	200.0	New Initial Vm		1,014.230													
5-01	210.0	0.44	1.1	1,020.030	306	55	90	86	250	250	50	7	8.0	200 cc/min igs	45.3	98.6	0.663
5-02	220.0	0.42	1.1	1,025.980	307	52	90	86	250	250	49	7	8.3	200 cc/min igs	44.3	103.6	0.648
5-03	230.0	0.41	1.1	1,031.710	307	55	89	85	250	249	51	7	7.8	200 cc/min igs	43.8	101.2	0.640
5-04	240.0	0.48	1.2	1,037.740	307	59	90	85	250	250	54	8	8.5	200 cc/min igs	47.4	98.3	0.693
5-05	250.0	0.36	0.93	1,043.080	306	62	90	85	250	250	63	7	8.3	200 cc/min igs	41.0	100.4	0.600
Avg/Tot/Rng	250.0	0.63459	1.06000	141.715	304.960	52-66	88.0400		249-255	249-255	45-68	9.0	8.3	041213 - 093841 K	43.3422	100.8	2RSD 17.9%

Meter Operator _____ Date _____

CleanAir.

Field Data Printout

Location:	Unit 2 SDA Inlet	Test Method:	USEPA Method 26A
Test Run:	1	Analyte:	HCl
Client:	Wheelabrator North Broward, Inc.	Bar. Press. (in. Hg):	29.75
Project No:	12218	Static P:	-1.5
Source Area (ft^2):	60.13205	O_2 (dry volume %):	6.38
Meter Operator:	S. Joint 473	CO_2 (dry volume %):	12.49
Probe Operator:	S. Joint 473	N_2+CO (dry volume %):	81.13
Test Date:	3/21/13		
Start Time:	07:54		
Stop Time:	08:54	H_2O (condensate, ml or gm):	171.5
Leak Rate Before:	0.003 cfm @ 15 "Hg	H_2O (silica, g):	10.3
Leak Rate After:	0.003 cfm @ 15 "Hg	Actual Moisture (%):	20.24

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:	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			134.300						
1-01	5.0		1.20	137.310	508	74	72		3.01	
1-01	10.0		1.20	139.950	505	74	72		2.64	
1-01	15.0		1.20	142.580	504	74	72		2.63	
1-01	20.0		1.20	145.420	501	73	71		2.84	
1-01	25.0		1.20	148.170	501	72	70		2.75	
1-01	30.0		1.20	150.920	502	72	70		2.75	
1-01	35.0		1.20	153.810	504	74	70		2.89	
1-01	40.0		1.20	156.700	505	75	70		2.89	
1-01	45.0		1.20	159.580	503	75	71		2.88	
1-01	50.0		1.20	162.490	504	75	71		2.91	
1-01	55.0		1.20	165.430	503	74	72		2.94	
1-01	60.0		1.20	168.370	504	74	72		2.94	
Final	60.0		1.20000	34.07000	503.66667	72.45833			34.07000	
1 points sampled		Sq.Rt.ΔP								
QC-Check: Field Averages			1.2000	34.0700	503.6667	72.4583				
		☐ 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 North Broward, Inc.	Bar. Press. (in. Hg):	29.75
Project No:	12218	Static P:	-1.5
Source Area (ft^2):	60.13205	O_2 (dry volume %):	6.08
Meter Operator:	S. Joint 473	CO_2 (dry volume %):	12.87
Probe Operator:	S. Joint 473	N_2+CO (dry volume %):	81.05
Test Date:	3/21/13		
Start Time:	09:15		
Stop Time:	10:15	H_2O (condensate, ml or gm):	170.7
Leak Rate Before:	0.003 cfm @ 15 "Hg	H_2O (silica, g):	13.4
Leak Rate After:	0.003 cfm @ 18 "Hg	Actual Moisture (%):	20.61

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:	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			171.900						
1-01	5.0		1.20	174.780	498	76	74		2.88	
1-01	10.0		1.20	177.650	499	77	74		2.87	
1-01	15.0		1.20	180.330	499	77	73		2.68	
1-01	20.0		1.20	183.010	500	76	73		2.68	
1-01	25.0		1.20	185.700	499	75	73		2.69	
1-01	30.0		1.20	188.590	499	75	73		2.89	
1-01	35.0		1.20	191.480	500	76	73		2.89	
1-01	40.0		1.20	194.350	502	77	73		2.87	
1-01	45.0		1.20	197.210	504	78	74		2.86	
1-01	50.0		1.20	200.060	502	78	74		2.85	
1-01	55.0		1.20	202.910	503	77	73		2.85	
1-01	60.0		1.20	205.790	502	77	73		2.88	
Final	60.0		1.20000	33.89000	500.58333	74.95833			33.89000	
1 points sampled		Sq.Rt.ΔP								
QC-Check: Field Averages			1.2000	33.8900	500.5833	74.9583				
		☐ 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:	3	Analyte:	HCl
Client:	Wheelabrator North Broward, Inc.	Bar. Press. (in. Hg):	29.75
Project No:	12218	Static P:	-1.4
Source Area (ft^2):	60.13205	O_2 (dry volume %):	6.47
Meter Operator:	S. Joint 473	CO_2 (dry volume %):	12.54
Probe Operator:	S. Joint 473	N_2+CO (dry volume %):	80.99
Test Date:	3/21/13		
Start Time:	10:35		
Stop Time:	11:35	H_2O (condensate, ml or gm):	172.0
Leak Rate Before:	0.003 cfm @ 16 "Hg	H_2O (silica, g):	13.2
Leak Rate After:	0.003 cfm @ 18 "Hg	Actual Moisture (%):	20.64

Nozzle ID No:	N/A	Meter Box ID. No:	66-18
Nozzle Diameter (D_n):	N/A	Meter ΔH@:	1.91650
Probe ID No:	66-4-7	Meter Y_d:	1.00080
Pitot C_p:	0.834		
Pitot Leak Check:	☑ Pass ☐ Fail		

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			211.900						
1-01	5.0		1.20	214.780	502	80	75		2.88	
1-01	10.0		1.20	217.650	503	81	75		2.87	
1-01	15.0		1.20	220.540	502	81	76		2.89	
1-01	20.0		1.20	223.400	503	82	77		2.86	
1-01	25.0		1.20	226.240	505	82	78		2.84	
1-01	30.0		1.20	229.120	506	82	78		2.88	
1-01	35.0		1.20	231.970	507	82	78		2.85	
1-01	40.0		1.20	234.830	506	82	78		2.86	
1-01	45.0		1.20	237.680	502	84	79		2.85	
1-01	50.0		1.20	240.540	503	85	80		2.86	
1-01	55.0		1.20	243.400	504	86	81		2.86	
1-01	60.0		1.20	246.280	503	86	82		2.88	
Final	60.0		1.20000	34.38000	503.83333	80.41667			34.38000	
1 points sampled		Sq.Rt.ΔP								
QC-Check: Field Averages			1.2000	34.3800	503.8333	80.4167				
		☐ 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 2 SDA Inlet
Client: Wheelabrator North 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:		12.49000		6.38000	81.13000	30.25360	1.16253	☑ Fo value within expected range.
2	1							
	2							
	3							
	Avg.							
CEM or Other Avg:		12.87000		6.08000	81.05000	30.30240	1.15152	☑ Fo value within expected range.
3	1							
	2							
	3							
	Avg.							
CEM or Other Avg:		12.54000		6.47000	80.99000	30.26520	1.15072	☑ 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 North 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	496.7	460.7	36.0
Impinger 2	100 ml 0.1N H2SO4	658.0	542.9	115.1
Impinger 3	100 ml 0.1N H2SO4	583.8	565.6	18.2
Impinger 4	Empty	446.8	444.6	2.2
Impinger 5	Silica Gel	809.4	799.1	10.3
Impinger 6				
Impinger 7				
Impinger 8				

Rinse: (ml or gm)

		Field Data Check	
171.5	Liquid (gm)		
0.0	less rinse (gm)		
171.5	Net Liquid (gm)	171.5	☑ QA/QC OK
+ 10.3	Silica Gel (gm)	10.3	☑ QA/QC OK
181.8	Total Vlc (gm)	181.8	☑ QA/QC OK

Test Run: 2

	Contents	Gross (gm)	Tare (gm)	Net (gm)
Impinger 1	50 ml 0.1N H2SO4	489.3	456.5	32.8
Impinger 2	100 ml 0.1N H2SO4	653.1	553.6	99.5
Impinger 3	100 ml 0.1N H2SO4	569.9	538.0	31.9
Impinger 4	Empty	489.8	483.3	6.5
Impinger 5	Silica Gel	815.8	802.4	13.4
Impinger 6				
Impinger 7				
Impinger 8				

Rinse: (ml or gm)

		Field Data Check	
170.7	Liquid (gm)		
0.0	less rinse (gm)		
170.7	Net Liquid (gm)	170.7	☑ QA/QC OK
+ 13.4	Silica Gel (gm)	13.4	☑ QA/QC OK
184.1	Total Vlc (gm)	184.1	☑ QA/QC OK

Test Run: 3

	Contents	Gross (gm)	Tare (gm)	Net (gm)
Impinger 1	50 ml 0.1N H2SO4	480.6	454.3	26.3
Impinger 2	100 ml 0.1N H2SO4	649.0	542.7	106.3
Impinger 3	100 ml 0.1N H2SO4	601.5	570.0	31.5
Impinger 4	Empty	452.1	444.2	7.9
Impinger 5	Silica Gel	822.6	809.4	13.2
Impinger 6				
Impinger 7				
Impinger 8				

Rinse: (ml or gm)

		Field Data Check	
172.0	Liquid (gm)		
0.0	less rinse (gm)		
172.0	Net Liquid (gm)	172.0	☑ QA/QC OK
+ 13.2	Silica Gel (gm)	13.2	☑ QA/QC OK
185.2	Total Vlc (gm)	185.2	☑ 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**
Analyte: **HCl**

Location: Unit 2 FF Outlet
Test Run: 1
Client: Wheelabrator North Broward, Inc.
Project No: 12218
Source Area (ft^2): 64.00000
Meter Operator: W. Berry 456
Probe Operator:
Test Date: 3/21/13
Start Time: 07:54
Stop Time: 08:54
Leak Rate Before: 0.003 cfm @ 15 "Hg
Leak Rate After: 0.003 cfm @ 7 "Hg

Bar. Press. (in. Hg): 29.75
Static P: -9.8
O_2 (dry volume %): 7.85
CO_2 (dry volume %): 11.25
N_2+CO (dry volume %): 80.90

H_2O (condensate, ml or gm): 246.0
H_2O (silica, g): 22.0
Actual Moisture (%): 23.57

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: 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			452.555						
3-01	5.0		1.50	456.010	308	71	69		3.45	
3-01	10.0		1.50	459.390	307	73	69		3.38	
3-01	15.0		1.50	462.760	307	76	69		3.37	
3-01	20.0		1.50	466.160	307	78	70		3.40	
3-01	25.0		1.50	469.630	307	79	70		3.47	
3-01	30.0		1.50	473.130	307	80	71		3.50	
3-01	35.0		1.50	476.600	306	81	71		3.47	
3-01	40.0		1.50	480.040	307	81	71		3.44	
3-01	45.0		1.50	483.480	307	81	71		3.44	
3-01	50.0		1.50	486.930	308	82	72		3.45	
3-01	55.0		1.50	490.390	308	82	72		3.46	
3-01	60.0		1.50	493.870	307	82	72		3.48	
Final	60.0		1.50000	41.31500	307.16667	74.70833		0.00000	41.31500	
3 points sampled		Sq.Rt.ΔP								
QC-Check: Field Averages			1.5000	41.3150	307.1667	74.7083				
		☐ 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 26A
Test Run:	2	Analyte:	HCl
Client:	Wheelabrator North Broward, Inc.	Bar. Press. (in. Hg):	29.75
Project No:	12218	Static P:	-9.5
Source Area (ft^2):	64.00000	O_2 (dry volume %):	7.45
Meter Operator:	W. Berry	CO_2 (dry volume %):	11.66
Probe Operator:		N_2+CO (dry volume %):	80.89
Test Date:	3/21/13		
Start Time:	09:15		
Stop Time:	10:15	H_2O (condensate, ml or gm):	249.4
Leak Rate Before:	0.003 cfm @ 15 "Hg	H_2O (silica, g):	18.2
Leak Rate After:	0.002 cfm @ 7 "Hg	Actual Moisture (%):	23.57

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:	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			494.600						
3-01	5.0		1.50	498.100	306	75	71		3.50	
3-01	10.0		1.50	501.510	306	77	72		3.41	
3-01	15.0		1.50	504.920	306	80	72		3.41	
3-01	20.0		1.50	508.390	306	82	72		3.47	
3-01	25.0		1.50	511.840	306	82	72		3.45	
3-01	30.0		1.50	515.310	306	83	73		3.47	
3-01	35.0		1.50	518.780	305	83	73		3.47	
3-01	40.0		1.50	522.260	306	84	74		3.48	
3-01	45.0		1.50	525.710	306	84	74		3.45	
3-01	50.0		1.50	529.160	306	84	74		3.45	
3-01	55.0		1.50	532.580	306	85	75		3.42	
3-01	60.0		1.50	536.055	307	84	75		3.47	
Final	60.0		1.50000	41.45500	306.00000	77.50000		0.00000	41.45500	
3 points sampled		Sq.Rt.ΔP								
QC-Check: Field Averages			1.5000	41.4550	306.0000	77.5000				
		☐ 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 North Broward, Inc.		Bar. Press. (in. Hg):	29.75	Nozzle ID No: N/A
Project No:	12218		Static P:	-9.4	Nozzle Diameter (D_n): N/A
Source Area (ft^2):	64.00000		O_2 (dry volume %):	7.24	Probe ID No: 67-4-3
Meter Operator:	W. Berry	456	CO_2 (dry volume %):	11.87	Pitot C_p: N/A
Probe Operator:			N_2+CO (dry volume %):	80.89	Pitot Leak Check: ☑Pass ☐Fail
Test Date:	3/21/13				
Start Time:	10:35				
Stop Time:	11:35		H_2O (condensate, ml or gm):	251.3	Meter Box ID. No: 61-11
Leak Rate Before:	0.002 cfm	@ 15 "Hg	H_2O (silica, g):	17.7	Meter ΔH@: 1.69640
Leak Rate After:	0.002 cfm	@ 15 "Hg	Actual Moisture (%):	23.83	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			537.190						
3-01	5.0		1.50	540.650	305	79	74		3.46	
3-01	10.0		1.50	544.050	306	80	75		3.40	
3-01	15.0		1.50	547.500	307	84	75		3.45	
3-01	20.0		1.50	550.920	307	85	76		3.42	
3-01	25.0		1.50	554.370	307	86	76		3.45	
3-01	30.0		1.50	557.860	306	87	76		3.49	
3-01	35.0		1.50	561.330	306	88	78		3.47	
3-01	40.0		1.50	564.800	306	88	78		3.47	
3-01	45.0		1.50	568.270	307	88	78		3.47	
3-01	50.0		1.50	571.720	306	89	79		3.45	
3-01	55.0		1.50	575.160	306	89	79		3.44	
3-01	60.0		1.50	578.585	306	89	80		3.43	
Final	60.0		1.50000	41.39500	306.25000	81.50000		0.00000	41.39500	
3 points sampled		Sq.Rt.ΔP								
QC-Check: Field Averages			1.5000	41.3950	306.2500	81.5000				
		☐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 North 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:		11.25000		7.85000	80.90000	30.11400	1.16000	☑ 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:		11.66000		7.45000	80.89000	30.16360	1.15352	☑ 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:		11.87000		7.24000	80.89000	30.18880	1.15080	☑ 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 North 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	481.6	450.4	31.2
Impinger 2	100 ml 0.1N H2SO4	699.8	558.9	140.9
Impinger 3	100 ml 0.1N H2SO4	597.7	544.3	53.4
Impinger 4	Empty	462.5	442.0	20.5
Impinger 5	Silica Gel	718.7	696.7	22.0
Impinger 6				
Impinger 7				
Impinger 8				

Rinse: (ml or gm)

		Field Data Check	
246.0	Liquid (gm)		
0.0	less rinse (gm)		
246.0	Net Liquid (gm)	246.0	☑ QA/QC OK
+ 22.0	Silica Gel (gm)	22.0	☑ QA/QC OK
268.0	Total Vlc (gm)	268.0	☑ QA/QC OK

Test Run: 2

	Contents	Gross (gm)	Tare (gm)	Net (gm)
Impinger 1	50 ml 0.1N H2SO4	482.4	454.0	28.4
Impinger 2	100 ml 0.1N H2SO4	687.4	548.0	139.4
Impinger 3	100 ml 0.1N H2SO4	621.4	558.7	62.7
Impinger 4	Empty	486.1	467.2	18.9
Impinger 5	Silica Gel	705.1	686.9	18.2
Impinger 6				
Impinger 7				
Impinger 8				

Rinse: (ml or gm)

		Field Data Check	
249.4	Liquid (gm)		
0.0	less rinse (gm)		
249.4	Net Liquid (gm)	249.4	☑ QA/QC OK
+ 18.2	Silica Gel (gm)	18.2	☑ QA/QC OK
267.6	Total Vlc (gm)	267.6	☑ QA/QC OK

Test Run: 3

	Contents	Gross (gm)	Tare (gm)	Net (gm)
Impinger 1	50 ml 0.1N H2SO4	480.2	450.6	29.6
Impinger 2	100 ml 0.1N H2SO4	709.6	567.2	142.4
Impinger 3	100 ml 0.1N H2SO4	604.9	542.3	62.6
Impinger 4	Empty	459.3	442.6	16.7
Impinger 5	Silica Gel	736.4	718.7	17.7
Impinger 6				
Impinger 7				
Impinger 8				

Rinse: (ml or gm)

		Field Data Check	
251.3	Liquid (gm)		
0.0	less rinse (gm)		
251.3	Net Liquid (gm)	251.3	☑ QA/QC OK
+ 17.7	Silica Gel (gm)	17.7	☑ QA/QC OK
269.0	Total Vlc (gm)	269.0	☑ 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 5/29
Test Run:	1	Analyte:	Particulate/Metals
Client:	Wheelabrator North Broward, Inc.		
Project No:	12218	Bar. Press. (in. Hg):	29.80
Source Area (ft^2):	64.00000	Static P:	-9.1
Meter Operator:	S. Joint 473	O_2 (dry volume %):	8.74
Probe Operator:	W. Berry 456	CO_2 (dry volume %):	10.18
Test Date:	3/20/13	N_2+CO (dry volume %):	81.08
Start Time:	12:35		
Stop Time:	14:50	H_2O (condensate, ml or gm):	416.8
Leak Rate Before:	0.003 cfm @ 15 "Hg	H_2O (silica, g):	11.1
Leak Rate After:	0.003 cfm @ 16 "Hg	Actual Moisture (%):	22.89

Nozzle ID No:	0.2725-1
Nozzle Diameter (D_n):	0.273
Probe ID No:	67-8-16
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			562.900						
1-01	5.0	0.22	0.56	565.390	300	87	89	0.47	2.49	115.7*
1-02	10.0	0.18	0.46	567.280	305	88	89	0.42	1.89	97.3
1-03	15.0	0.28	0.71	569.530	310	89	89	0.53	2.25	93.1
1-04	20.0	0.35	0.89	571.850	309	90	89	0.59	2.32	85.8*
1-05	25.0	0.45	1.20	574.880	307	91	89	0.67	3.03	98.7
LEAK CHECK	25.0			575.060						
2-01	30.0	0.57	1.50	578.470	310	92	89	0.75	3.41	98.8
2-02	35.0	0.50	1.30	581.620	310	94	89	0.71	3.15	97.3
2-03	40.0	0.46	1.20	584.710	310	95	90	0.68	3.09	99.3
2-04	45.0	0.38	0.99	587.610	311	96	91	0.62	2.90	102.3
2-05	50.0	0.48	1.30	590.800	311	97	92	0.69	3.19	100.1
LEAK CHECK	50.0			591.030						
3-01	55.0	0.31	0.81	593.380	310	98	95	0.56	2.35	91.2
3-02	60.0	0.48	1.20	596.480	310	98	95	0.69	3.10	96.8
3-03	65.0	0.45	1.20	599.620	310	102	98	0.67	3.14	100.6
3-04	70.0	0.43	1.10	602.520	310	103	99	0.66	2.90	94.9
3-05	75.0	0.38	0.99	605.300	311	105	100	0.62	2.78	96.5
LEAK CHECK	75.0			605.530						
4-01	80.0	0.45	1.20	608.600	311	101	100	0.67	3.07	98.4
4-02	85.0	0.45	1.20	611.650	311	101	100	0.67	3.05	97.7
4-03	90.0	0.42	1.10	614.620	310	100	100	0.65	2.97	98.5
4-04	95.0	0.40	1.00	617.500	311	100	100	0.63	2.88	97.9
4-05	100.0	0.37	0.96	620.220	310	102	102	0.61	2.72	95.7
LEAK CHECK	100.0			620.330						
5-01	105.0	0.52	1.40	623.550	311	103	102	0.72	3.22	95.7
5-02	110.0	0.51	1.40	626.960	310	104	101	0.71	3.41	102.2
5-03	115.0	0.48	1.30	630.150	310	104	101	0.69	3.19	98.6
5-04	120.0	0.40	1.10	633.340	310	105	101	0.63	3.19	107.8
5-05	125.0	0.37	0.98	636.000	310	105	101	0.61	2.66	93.5
Final	125.0		1.08200	72.35000	309.52000	96.82000		0.63705	72.35000	
25 points sampled		Sq.Rt.ΔP								
QC-Check: Field Averages		0.6371	1.0820	72.3500	309.5200	96.8200				
		☑ 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 North Broward, Inc.
Project No: 12218
Source Area (ft^2): 64.00000
Meter Operator: P. Bihun 505
Probe Operator: P. Bihun 505
Test Date: 3/21/13
Start Time: 07:42
Stop Time: 09:54
Leak Rate Before: 0.002 cfm @ 15 "Hg
Leak Rate After: 0.002 cfm @ 10 "Hg

Bar. Press. (in. Hg): 29.75
Static P: -10.0
O_2 (dry volume %): 7.98
CO_2 (dry volume %): 11.04
N_2+CO (dry volume %): 80.98
H_2O (condensate, ml or gm): 408.7
H_2O (silica, g): 19.7
Actual Moisture (%): 23.20

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			636.490						
5-01	5.0	0.44	1.10	639.410	307	66	65	0.66	2.92	101.2
5-02	10.0	0.49	1.30	642.620	308	67	66	0.70	3.21	105.3
5-03	15.0	0.42	1.10	645.510	308	68	66	0.65	2.89	102.2
5-04	20.0	0.38	0.98	648.250	308	69	66	0.62	2.74	101.8
5-05	25.0	0.37	0.95	650.915	308	69	66	0.61	2.66	100.3
LEAK CHECK	25.0			650.975						
4-01	30.0	0.45	1.20	654.020	306	69	67	0.67	3.04	103.8
4-02	35.0	0.50	1.20	657.100	307	70	66	0.71	3.08	99.6
4-03	40.0	0.46	1.10	659.970	308	71	66	0.68	2.87	96.7
4-04	45.0	0.38	0.98	662.720	308	71	67	0.62	2.75	101.9
4-05	50.0	0.35	0.90	665.330	308	71	67	0.59	2.61	100.7
LEAK CHECK	50.0			665.380						
3-01	55.0	0.35	0.90	668.000	306	69	67	0.59	2.62	101.2
3-02	60.0	0.44	1.10	670.890	308	70	67	0.66	2.89	99.6
3-03	65.0	0.40	1.00	673.660	308	71	67	0.63	2.77	100.0
3-04	70.0	0.35	0.90	676.270	307	71	67	0.59	2.61	100.7
3-05	75.0	0.35	0.90	678.880	308	71	67	0.59	2.61	100.7
LEAK CHECK	75.0			678.930						
2-01	80.0	0.54	1.30	682.110	307	70	67	0.73	3.18	98.9
2-02	85.0	0.44	1.10	685.000	307	71	67	0.66	2.89	99.5
2-03	90.0	0.39	1.00	687.770	308	72	68	0.62	2.77	101.1
2-04	95.0	0.38	0.98	690.500	309	72	68	0.62	2.73	101.0
2-05	100.0	0.37	0.95	693.175	307	72	68	0.61	2.67	100.2
LEAK CHECK	100.0			693.235						
1-01	105.0	0.18	0.46	695.050	293	70	68	0.42	1.81	96.6
1-02	110.0	0.18	0.46	696.880	292	70	68	0.42	1.83	97.3
1-03	115.0	0.28	0.72	699.170	307	70	68	0.53	2.29	98.7
1-04	120.0	0.35	0.90	701.770	307	70	68	0.59	2.60	100.3
1-05	125.0	0.35	0.90	704.380	307	70	68	0.59	2.61	100.7
Final	125.0		0.97520	67.67000	306.28000	68.50000		0.61517	67.67000	
25 points sampled		Sq.Rt.ΔP								
QC-Check: Field Averages		0.6152	0.9432	67.6700	306.2800	68.5000				
		☑Avg. OK	☐Avg. OK	☑Avg. OK	☑Avg. OK	☑Avg. OK				

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Field Data Printout

		Test Method:	**USEPA Method 5/29**
Location:	Unit 3 FF Outlet	**Analyte:**	**Particulate/Metals**
Test Run:	3		
Client:	Wheelabrator North Broward, Inc.	Bar. Press. (in. Hg): 29.75	Nozzle ID No: 0.2725-1
Project No:	12218	Static P: -8.8	Nozzle Diameter (D_n): 0.273
Source Area (ft^2):	64.00000	O_2 (dry volume %): 7.83	Probe ID No: 67-8-17
Meter Operator:	P. Bihun 505	CO_2 (dry volume %): 11.44	Pitot C_p: 0.824
Probe Operator:	P. Bihun 505	N_2+CO (dry volume %): 80.73	Pitot Leak Check: ☑ Pass ☐ Fail
Test Date:	3/21/13		
Start Time:	10:15	H_2O (condensate, ml or gm): 396.0	Meter Box ID. No: 66-11
Stop Time:	12:27	H_2O (silica, g): 16.2	Meter ΔH@: 1.82740
Leak Rate Before:	0.006 cfm @ 15 "Hg	Actual Moisture (%): 23.05	Meter Y_d: 0.99060
Leak Rate After:	0.004 cfm @ 10 "Hg		

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			704.850						
5-01	5.0	0.45	1.20	707.970	308	69	69	0.67	3.12	106.0
5-02	10.0	0.46	1.20	711.040	307	71	69	0.68	3.07	102.9
5-03	15.0	0.40	1.00	713.790	306	72	69	0.63	2.75	98.7
5-04	20.0	0.39	1.00	716.550	307	73	69	0.62	2.76	100.2
5-05	25.0	0.36	0.93	719.230	307	72	69	0.60	2.68	101.4
LEAK CHECK	25.0			719.265						
4-01	30.0	0.43	1.10	722.130	306	72	69	0.66	2.87	99.2
4-02	35.0	0.44	1.10	724.990	307	73	70	0.66	2.86	97.7
4-03	40.0	0.40	1.00	727.770	308	74	70	0.63	2.78	99.6
4-04	45.0	0.37	0.95	730.470	308	74	70	0.61	2.70	100.5
4-05	50.0	0.35	0.90	733.045	308	75	71	0.59	2.57	98.4
LEAK CHECK	50.0			733.125						
3-01	55.0	0.35	0.90	735.740	307	74	71	0.59	2.62	100.0
3-02	60.0	0.42	1.10	738.640	308	74	71	0.65	2.90	101.3
3-03	65.0	0.36	0.93	741.330	308	76	71	0.60	2.69	101.3
3-04	70.0	0.31	0.80	743.790	308	76	72	0.56	2.46	99.7
3-05	75.0	0.30	0.77	746.210	307	76	72	0.55	2.42	99.6
LEAK CHECK	75.0			746.275						
2-01	80.0	0.45	1.20	749.330	307	76	73	0.67	3.06	102.7
2-02	85.0	0.42	1.10	752.230	308	79	74	0.65	2.90	100.5
2-03	90.0	0.44	1.10	755.110	308	80	75	0.66	2.88	97.4
2-04	95.0	0.44	1.10	758.010	310	81	76	0.66	2.90	98.0
2-05	100.0	0.41	1.10	760.955	308	82	77	0.64	2.95	102.8
LEAK CHECK	100.0			761.015						
1-01	105.0	0.13	0.33	762.580	287	79	78	0.36	1.57	95.6
1-02	110.0	0.13	0.33	764.130	288	80	78	0.36	1.55	94.7
1-03	115.0	0.25	0.64	766.330	307	79	79	0.50	2.20	98.2
1-04	120.0	0.31	0.80	768.800	308	81	79	0.56	2.47	99.0
1-05	125.0	0.36	0.93	771.495	308	81	79	0.60	2.70	100.2
Final	125.0		0.94040	66.40500	305.96000	74.38000		0.59861	66.40500	
25 points sampled		Sq.Rt.ΔP								
QC-Check: Field Averages		0.5906	0.9372	66.4050	305.9600	74.3800				
		☐ 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 North Broward, Inc.	Bar. Press. (in. Hg):	29.75
Project No:	12218	Static P:	-9.3
Source Area (ft^2):	64.00000	O_2 (dry volume %):	8.74
Meter Operator:	P. Bihun 505	CO_2 (dry volume %):	10.18
Probe Operator:	P. Bihun 505	N_2+CO (dry volume %):	81.08
Test Date:	3/21/13		
Start Time:	12:41		
Stop Time:	14:52	H_2O (condensate, ml or gm):	416.8
Leak Rate Before:	0.003 cfm @ 15 "Hg	H_2O (silica, g):	11.1
Leak Rate After:	0.003 cfm @ 12 "Hg	Actual Moisture (%):	22.89

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	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)	771.780	(°F)	(°F)	(°F)	($\sqrt{}$in. H_2O)	(ft^3)	(%)
5-01	5.0	0.40	1.00	774.680	308	80	80	0.63	2.90	102.0
5-02	10.0	0.40	1.00	777.460	308	82	80	0.63	2.78	97.6
5-03	15.0	0.33	0.87	780.080	308	81	81	0.57	2.62	101.2
5-04	20.0	0.38	1.00	782.630	308	83	81	0.62	2.55	91.7
5-05	25.0	0.37	0.97	785.375	309	84	81	0.61	2.75	100.0
LEAK CHECK	25.0			785.415						
4-01	30.0	0.50	1.30	788.620	308	83	82	0.71	3.21	100.4
4-02	35.0	0.49	1.30	791.790	310	85	82	0.70	3.17	100.3
4-03	40.0	0.44	1.20	794.880	309	86	82	0.66	3.09	103.0
4-04	45.0	0.36	0.94	797.610	308	85	83	0.60	2.73	100.4
4-05	50.0	0.33	0.87	800.200	309	85	83	0.57	2.59	99.6
LEAK CHECK	50.0			800.250						
3-01	55.0	0.47	1.20	803.320	308	84	83	0.69	3.07	99.0
3-02	60.0	0.41	1.10	806.250	308	86	83	0.64	2.93	101.0
3-03	65.0	0.41	1.10	809.160	308	85	83	0.64	2.91	100.4
3-04	70.0	0.38	1.00	811.940	308	86	83	0.62	2.78	99.5
3-05	75.0	0.34	0.89	814.565	309	86	84	0.58	2.63	99.2
LEAK CHECK	75.0			814.625						
2-01	80.0	0.43	1.10	817.560	308	85	84	0.66	2.93	98.8
2-02	85.0	0.45	1.20	820.640	310	86	84	0.67	3.08	101.4
2-03	90.0	0.40	1.10	823.560	310	86	85	0.63	2.92	101.8
2-04	95.0	0.37	0.97	826.290	310	86	85	0.61	2.73	98.9
2-05	100.0	0.35	0.92	828.955	308	89	85	0.59	2.67	98.9
LEAK CHECK	100.0			829.015						
1-01	105.0	0.22	0.58	831.130	304	87	86	0.47	2.12	98.7
1-02	110.0	0.28	0.73	833.490	304	87	86	0.53	2.36	97.7
1-03	115.0	0.30	0.79	835.990	307	86	86	0.55	2.50	100.3
1-04	120.0	0.38	1.00	838.760	307	87	86	0.62	2.77	98.7
1-05	125.0	0.41	1.10	841.735	307	87	86	0.64	2.98	102.1
Final	125.0		1.00920	69.74500	308.04000	84.22000		0.61745	69.74500	
25 points sampled		Sq.Rt.ΔP								
QC-Check: Field Averages		0.6175	1.0092	69.7450	308.0400	84.2200				
		☑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 North 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:		10.18000		8.74000	81.08000	29.97840	1.19450	☑ Fo value within expected range.
2	1							
	2							
	3							
	Avg.							
CEM or Other Avg:		11.04000		7.98000	80.98000	30.08560	1.17029	☑ Fo value within expected range.
3	1							
	2							
	3							
	Avg.							
CEM or Other Avg:		11.44000		7.83000	80.73000	30.14360	1.14248	☑ Fo value within expected range.
4	1							
	2							
	3							
	Avg.							
CEM or Other Avg:		11.56000		7.77000	80.67000	30.16040	1.13581	☑ Fo value within expected range.

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USEPA Method 4 Laboratory Data

Test Method: USEPA Method 5/29 and 29
Analyte: Particulate/Metals and Mercury

Location: Unit 3 FF Outlet
Client: Wheelabrator North Broward, Inc.
Project No: 12218
Analyst: D. Luckhard
Analyst Emp No: 568

Test Run: 1

	Contents	Gross (gm)	Tare (gm)	Net (gm)
Impinger 1	Empty	757.9	467.1	290.8
Impinger 2	5%HNO3/10%H2O2	650.4	545.5	104.9
Impinger 3	5%HNO3/10%H2O2	566.9	551.0	15.9
Impinger 4	Empty	426.5	424.9	1.6
Impinger 5	4%KMnO4/10%H2SO4	647.0	644.5	2.5
Impinger 6	4%KMnO4/10%H2SO4	550.4	549.3	1.1
Impinger 7	Silica Gel	792.7	781.6	11.1
Impinger 8				

Rinse: (ml or gm)

		Field Data Check	
416.8	Liquid (gm)		
0.0	less rinse (gm)		
416.8	Net Liquid (gm)	416.8	☑ QA/QC OK
+ 11.1	Silica Gel (gm)	11.1	☑ QA/QC OK
427.9	Total Vlc (gm)	427.9	☑ QA/QC OK

Test Run: 2

	Contents	Gross (gm)	Tare (gm)	Net (gm)
Impinger 1	Empty	666.3	443.3	223.0
Impinger 2	5%HNO3/10%H2O2	658.7	530.3	128.4
Impinger 3	5%HNO3/10%H2O2	581.7	538.5	43.2
Impinger 4	Empty	452.6	444.1	8.5
Impinger 5	4%KMnO4/10%H2SO4	547.3	544.1	3.2
Impinger 6	4%KMnO4/10%H2SO4	539.9	537.5	2.4
Impinger 7	Silica Gel	812.2	792.5	19.7
Impinger 8				

Rinse: (ml or gm)

		Field Data Check	
408.7	Liquid (gm)		
0.0	less rinse (gm)		
408.7	Net Liquid (gm)	408.7	☑ QA/QC OK
+ 19.7	Silica Gel (gm)	19.7	☑ QA/QC OK
428.4	Total Vlc (gm)	428.4	☑ QA/QC OK

Test Run: 3

	Contents	Gross (gm)	Tare (gm)	Net (gm)
Impinger 1	Empty	715.6	465.9	249.7
Impinger 2	5%HNO3/10%H2O2	660.3	545.9	114.4
Impinger 3	5%HNO3/10%H2O2	578.7	551.5	27.2
Impinger 4	Empty	428.2	424.6	3.6
Impinger 5	4%KMnO4/10%H2SO4	645.6	645.1	0.5
Impinger 6	4%KMnO4/10%H2SO4	550.5	549.9	0.6
Impinger 7	Silica Gel	808.1	791.9	16.2
Impinger 8				

Rinse: (ml or gm)

		Field Data Check	
396.0	Liquid (gm)		
0.0	less rinse (gm)		
396.0	Net Liquid (gm)	396.0	☑ QA/QC OK
+ 16.2	Silica Gel (gm)	16.2	☑ QA/QC OK
412.2	Total Vlc (gm)	412.2	☑ QA/QC OK

Test Run: 4

	Contents	Gross (gm)	Tare (gm)	Net (gm)
Impinger 1	Empty	772.4	443.1	329.3
Impinger 2	5%HNO3/10%H2O2	601.1	530.9	70.2
Impinger 3	5%HNO3/10%H2O2	547.3	538.0	9.3
Impinger 4	Empty	445.7	443.9	1.8
Impinger 5	4%KMnO4/10%H2SO4	545.5	543.0	2.5
Impinger 6	4%KMnO4/10%H2SO4	540.2	539.7	0.5
Impinger 7	Silica Gel	825.6	812.2	13.4
Impinger 8				

Rinse: (ml or gm)

		Field Data Check	
413.6	Liquid (gm)		
0.0	less rinse (gm)		
413.6	Net Liquid (gm)	413.6	☑ QA/QC OK
+ 13.4	Silica Gel (gm)	13.4	☑ QA/QC OK
427.0	Total Vlc (gm)	427.0	☑ 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 North Broward, Inc.	Bar. Press. (in. Hg): 29.80	Nozzle ID No: N/A
Project No:	12218	Static P: -1.3	Nozzle Diameter (D_n): N/A
Source Area (ft^2):	60.13205	O_2 (dry volume %): 6.11	Probe ID No: 66-4-7
Meter Operator:	S. Joint 473	CO_2 (dry volume %): 12.83	Pitot C_p: N/A
Probe Operator:	S. Joint 473	N_2+CO (dry volume %): 81.06	Pitot Leak Check: ☑ Pass ☐ Fail
Test Date:	3/20/13		
Start Time:	08:13	H_2O (condensate, ml or gm): 173.0	Meter Box ID. No: 66-18
Stop Time:	09:13	H_2O (silica, g): 16.6	Meter ΔH@: 1.91650
Leak Rate Before:	0.003 cfm @ 15 "Hg	Actual Moisture (%): 21.13	Meter Y_d: 1.00080
Leak Rate After:	0.003 cfm @ 18 "Hg		

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			22.300						
1-01	5.0		1.20	25.150	492	82	77		2.85	
1-01	10.0		1.20	28.030	491	84	78		2.88	
1-01	15.0		1.20	30.850	493	85	79		2.82	
1-01	20.0		1.20	33.670	492	86	79		2.82	
1-01	25.0		1.20	36.510	490	86	80		2.84	
1-01	30.0		1.20	39.420	488	87	80		2.91	
1-01	35.0		1.20	42.210	484	87	80		2.79	
1-01	40.0		1.20	45.150	485	87	81		2.94	
1-01	45.0		1.20	48.000	484	87	81		2.85	
1-01	50.0		1.20	50.850	487	87	81		2.85	
1-01	55.0		1.20	53.710	484	87	82		2.86	
1-01	60.0		1.20	56.570	488	87	82		2.86	
Final	60.0		1.20000	34.27000	488.16667	83.00000			34.27000	
1 points sampled		Sq.Rt.ΔP								
QC-Check: Field Averages			1.2000	34.2700	488.1667	83.0000				
		☐ 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 North Broward, Inc.		Bar. Press. (in. Hg):	29.80	Nozzle ID No: N/A
Project No:	12218		Static P:	-1.2	Nozzle Diameter (D_n): N/A
Source Area (ft^2):	60.13205		O_2 (dry volume %):	7.31	Probe ID No: 66-4-7
Meter Operator:	S. Joint	473	CO_2 (dry volume %):	11.63	Pitot C_p: N/A
Probe Operator:	S. Joint	473	N_2+CO (dry volume %):	81.06	Pitot Leak Check: ☑ Pass ☐ Fail
Test Date:	3/20/13				
Start Time:	09:39				
Stop Time:	10:39		H_2O (condensate, ml or gm):	176.9	Meter Box ID. No: 66-18
Leak Rate Before:	0.003 cfm	@ 16 "Hg	H_2O (silica, g):	11.8	Meter ΔH@: 1.91650
Leak Rate After:	0.003 cfm	@ 18 "Hg	Actual Moisture (%):	21.06	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		1.20	59.200						
1-01	5.0		1.20	62.100	496	86	82		2.90	
1-01	10.0		1.20	64.900	497	86	82		2.80	
1-01	15.0		1.20	67.720	496	90	83		2.82	
1-01	20.0		1.20	70.540	497	90	83		2.82	
1-01	25.0		1.20	73.370	499	91	84		2.83	
1-01	30.0		1.20	76.210	500	91	84		2.84	
1-01	35.0		1.20	79.130	498	90	85		2.92	
1-01	40.0		1.20	82.100	496	90	85		2.97	
1-01	45.0		1.20	85.050	497	90	86		2.95	
1-01	50.0		1.20	87.960	498	90	86		2.91	
1-01	55.0		1.20	90.840	498	90	86		2.88	
1-01	60.0		1.20	93.710	499	90	86		2.87	
Final	60.0		1.20000	34.51000	497.58333	86.91667			34.51000	
1 points sampled		Sq.Rt.ΔP								
QC-Check: Field Averages			1.2000	34.5100	497.5833	86.9167				
		☐ Avg. OK	☑ Avg. OK	☑ Avg. OK	☑ Avg. OK	☑ Avg. OK				

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Field Data Printout

Location:	Unit 3 SDA Inlet	Test Method:	USEPA Method 26A
Test Run:	3	Analyte:	HCl
Client:	Wheelabrator North Broward, Inc.	Bar. Press. (in. Hg):	29.80
Project No:	12218	Static P:	-1.2
Source Area (ft^2):	60.13205	O_2 (dry volume %):	6.96
Meter Operator:	S. Joint 473	CO_2 (dry volume %):	12.11
Probe Operator:	S. Joint 473	N_2+CO (dry volume %):	80.93
Test Date:	3/20/13		
Start Time:	11:00	H_2O (condensate, ml or gm):	154.2
Stop Time:	12:00	H_2O (silica, g):	9.5
Leak Rate Before:	0.003 cfm @ 15 "Hg	Actual Moisture (%):	18.80
Leak Rate After:	0.003 cfm @ 18 "Hg		

Nozzle ID No:	N/A		
Nozzle Diameter (D_n):	N/A		
Probe ID No:	66-4-7		
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			95.100						
1-01	5.0		1.20	98.130	494	92	86		3.03	
1-01	10.0		1.20	101.070	493	92	87		2.94	
1-01	15.0		1.20	103.900	495	94	88		2.83	
1-01	20.0		1.20	106.760	500	96	88		2.86	
1-01	25.0		1.20	109.620	501	96	89		2.86	
1-01	30.0		1.20	112.480	503	96	90		2.86	
1-01	35.0		1.20	115.370	502	96	90		2.89	
1-01	40.0		1.20	118.260	503	96	90		2.89	
1-01	45.0		1.20	121.150	505	96	90		2.89	
1-01	50.0		1.20	124.080	504	97	90		2.93	
1-01	55.0		1.20	127.000	503	97	90		2.92	
1-01	60.0		1.20	129.920	502	97	90		2.92	
Final	60.0		1.20000	34.82000	500.41667	92.20833			34.82000	
1 points sampled		Sq.Rt.ΔP								
QC-Check: Field Averages			1.2000	34.8200	500.4167	92.2083				
		☐ 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 North 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:		12.83000		6.11000	81.06000	30.29720	1.15277	☑ Fo value within expected range.
2	1							
	2							
	3							
	Avg.							
CEM or Other Avg:		11.63000		7.31000	81.06000	30.15320	1.16853	☑ Fo value within expected range.
3	1							
	2							
	3							
	Avg.							
CEM or Other Avg:		12.11000		6.96000	80.93000	30.21600	1.15111	☑ 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 North 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	477.0	456.1	20.9
Impinger 2	100 ml 0.1N H2SO4	653.3	553.1	100.2
Impinger 3	100 ml 0.1N H2SO4	581.3	538.5	42.8
Impinger 4	Empty	492.2	483.1	9.1
Impinger 5	Silica Gel	793.3	776.7	16.6
Impinger 6				
Impinger 7				
Impinger 8				

Rinse: (ml or gm)

		Field Data Check	
173.0	Liquid (gm)		
0.0	less rinse (gm)		
173.0	Net Liquid (gm)	173.0	☑ QA/QC OK
+ 16.6	Silica Gel (gm)	16.6	☑ QA/QC OK
189.6	Total Vlc (gm)	189.6	☑ QA/QC OK

Test Run: 2

	Contents	Gross (gm)	Tare (gm)	Net (gm)
Impinger 1	50 ml 0.1N H2SO4	532.8	463.5	69.3
Impinger 2	100 ml 0.1N H2SO4	632.1	544.0	88.1
Impinger 3	100 ml 0.1N H2SO4	583.1	566.6	16.5
Impinger 4	Empty	447.0	444.0	3.0
Impinger 5	Silica Gel	799.6	787.8	11.8
Impinger 6				
Impinger 7				
Impinger 8				

Rinse: (ml or gm)

		Field Data Check	
176.9	Liquid (gm)		
0.0	less rinse (gm)		
176.9	Net Liquid (gm)	176.9	☑ QA/QC OK
+ 11.8	Silica Gel (gm)	11.8	☑ QA/QC OK
188.7	Total Vlc (gm)	188.7	☑ QA/QC OK

Test Run: 3

	Contents	Gross (gm)	Tare (gm)	Net (gm)
Impinger 1	50 ml 0.1N H2SO4	522.7	458.4	64.3
Impinger 2	100 ml 0.1N H2SO4	627.5	552.4	75.1
Impinger 3	100 ml 0.1N H2SO4	550.3	537.6	12.7
Impinger 4	Empty	484.9	482.8	2.1
Impinger 5	Silica Gel	802.3	792.8	9.5
Impinger 6				
Impinger 7				
Impinger 8				

Rinse: (ml or gm)

		Field Data Check	
154.2	Liquid (gm)		
0.0	less rinse (gm)		
154.2	Net Liquid (gm)	154.2	☑ QA/QC OK
+ 9.5	Silica Gel (gm)	9.5	☑ QA/QC OK
163.7	Total Vlc (gm)	163.7	☑ 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 North Broward, Inc.	Bar. Press. (in. Hg):	29.80
Project No:	12218	Static P:	-8.0
Source Area (ft^2):	64.00000	O_2 (dry volume %):	6.96
Meter Operator:	W. Berry 456	CO_2 (dry volume %):	12.11
Probe Operator:	W. Berry 456	N_2+CO (dry volume %):	80.93
Test Date:	3/20/13		
Start Time:	08:13		
Stop Time:	09:13	H_2O (condensate, ml or gm):	253.6
Leak Rate Before:	0.003 cfm @ 15 "Hg	H_2O (silica, g):	21.1
Leak Rate After:	0.001 cfm @ 10 "Hg	Actual Moisture (%):	24.43

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:	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			406.230						
3-01	5.0		1.50	409.600	312	76	75		3.37	
3-01	10.0		1.50	412.950	311	77	75		3.35	
3-01	15.0		1.50	416.290	312	82	76		3.34	
3-01	20.0		1.50	419.660	312	85	77		3.37	
3-01	25.0		1.50	423.050	312	88	78		3.39	
3-01	30.0		1.50	425.800	311	89	79		2.75	
3-01	35.0		1.50	429.950	312	91	80		4.15	
3-01	40.0		1.50	433.450	312	92	81		3.50	
3-01	45.0		1.50	436.880	311	92	82		3.43	
3-01	50.0		1.50	440.290	311	91	82		3.41	
3-01	55.0		1.50	443.730	311	91	83		3.44	
3-01	60.0		1.50	447.230	311	91	83		3.50	
Final	60.0		1.50000	41.00000	311.50000	83.16667			41.00000	
3 points sampled		Sq.Rt.ΔP								
QC-Check: Field Averages			1.5000	41.0000	311.5000	79.3750				
		☐ 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:	2	Analyte:	HCl
Client:	Wheelabrator North Broward, Inc.	Bar. Press. (in. Hg):	29.80
Project No:	12218	Static P:	-8.8
Source Area (ft^2):	64.00000	O_2 (dry volume %):	7.84
Meter Operator:	W. Berry 456	CO_2 (dry volume %):	11.26
Probe Operator:	W. Berry 456	N_2+CO (dry volume %):	80.90
Test Date:	3/20/13		
Start Time:	09:39		
Stop Time:	10:39	H_2O (condensate, ml or gm):	249.6
Leak Rate Before:	0.002 cfm @ 15 "Hg	H_2O (silica, g):	14.7
Leak Rate After:	0.002 cfm @ 10 "Hg	Actual Moisture (%):	23.48

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:	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			447.760						
3-01	5.0		1.50	451.200	312	84	83		3.44	
3-01	10.0		1.50	454.660	312	86	83		3.46	
3-01	15.0		1.50	458.040	314	89	83		3.38	
3-01	20.0		1.50	461.480	313	90	84		3.44	
3-01	25.0		1.50	465.020	313	92	84		3.54	
3-01	30.0		1.50	468.550	313	93	85		3.53	
3-01	35.0		1.50	472.100	313	93	85		3.55	
3-01	40.0		1.50	475.640	313	93	86		3.54	
3-01	45.0		1.50	479.150	312	95	86		3.51	
3-01	50.0		1.50	482.660	312	93	86		3.51	
3-01	55.0		1.50	486.170	313	92	86		3.51	
3-01	60.0		1.50	489.685	313	92	86		3.51	
Final	60.0		1.50000	41.92500	312.75000	87.87500			41.92500	
3 points sampled		Sq.Rt.ΔP								
QC-Check: Field Averages			1.5000	41.9250	312.7500	87.8750				
		☐ 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:	3				
Client:	Wheelabrator North Broward, Inc.		Bar. Press. (in. Hg):	29.80	Nozzle ID No: N/A
Project No:	12218		Static P:	-9.1	Nozzle Diameter (D_n): N/A
Source Area (ft^2):	64.00000		O_2 (dry volume %):	8.53	Probe ID No: 67-4-3
Meter Operator:	W. Berry	456	CO_2 (dry volume %):	10.80	Pitot C_p: N/A
Probe Operator:	W. Berry	456	N_2+CO (dry volume %):	80.67	Pitot Leak Check: ☑ Pass ☐ Fail
Test Date:	3/20/13				
Start Time:	11:00				
Stop Time:	12:00		H_2O (condensate, ml or gm):	233.2	Meter Box ID. No: 85-2
Leak Rate Before:	0.002 cfm	@ 15 "Hg	H_2O (silica, g):	14.9	Meter ΔH@: 1.74130
Leak Rate After:	0.001 cfm	@ 5 "Hg	Actual Moisture (%):	22.33	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			490.170						
3-01	5.0		1.50	493.680	312	89	85		3.51	
3-01	10.0		1.50	497.150	312	91	86		3.47	
3-01	15.0		1.50	500.640	313	94	86		3.49	
3-01	20.0		1.50	504.140	313	95	87		3.50	
3-01	25.0		1.50	507.660	314	97	88		3.52	
3-01	30.0		1.50	511.210	314	97	89		3.55	
3-01	35.0		1.50	514.760	313	98	89		3.55	
3-01	40.0		1.50	518.300	314	98	90		3.54	
3-01	45.0		1.50	521.870	314	98	90		3.57	
3-01	50.0		1.50	525.410	314	99	91		3.54	
3-01	55.0		1.50	528.970	313	99	92		3.56	
3-01	60.0		1.50	532.535	313	101	93		3.56	
Final	60.0		1.50000	42.36500	313.25000	92.58333			42.36500	
3 points sampled		Sq.Rt.ΔP								
QC-Check: Field Averages			1.5000	42.3650	313.2500	92.5830				
		☐ 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 North 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:		12.11000		6.96000	80.93000	30.21600	1.15111	☑ Fo value within expected range.
2	1							
	2							
	3							
	Avg.							
CEM or Other Avg:		11.26000		7.84000	80.90000	30.11520	1.15986	☑ Fo value within expected range.
3	1							
	2							
	3							
	Avg.							
CEM or Other Avg:		10.80000		8.53000	80.67000	30.06920	1.14537	☑ 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 FF Outlet
Client: Wheelabrator North 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	492.4	458.0	34.4
Impinger 2	100 ml 0.1N H2SO4	683.3	546.5	136.8
Impinger 3	100 ml 0.1N H2SO4	593.2	536.3	56.9
Impinger 4	Empty	494.1	468.6	25.5
Impinger 5	Silica Gel	801.9	780.8	21.1
Impinger 6				
Impinger 7				
Impinger 8				

Rinse: (ml or gm)

		Field Data Check	
253.6	Liquid (gm)		
0.0	less rinse (gm)		
253.6	Net Liquid (gm)	253.6	☑ QA/QC OK
+ 21.1	Silica Gel (gm)	21.1	☑ QA/QC OK
274.7	Total Vlc (gm)	274.7	☑ QA/QC OK

Test Run: 2

	Contents	Gross (gm)	Tare (gm)	Net (gm)
Impinger 1	50 ml 0.1N H2SO4	501.0	451.4	49.6
Impinger 2	100 ml 0.1N H2SO4	698.0	562.3	135.7
Impinger 3	100 ml 0.1N H2SO4	593.5	541.1	52.4
Impinger 4	Empty	454.9	443.0	11.9
Impinger 5	Silica Gel	791.4	776.7	14.7
Impinger 6				
Impinger 7				
Impinger 8				

Rinse: (ml or gm)

		Field Data Check	
249.6	Liquid (gm)		
0.0	less rinse (gm)		
249.6	Net Liquid (gm)	249.6	☑ QA/QC OK
+ 14.7	Silica Gel (gm)	14.7	☑ QA/QC OK
264.3	Total Vlc (gm)	264.3	☑ QA/QC OK

Test Run: 3

	Contents	Gross (gm)	Tare (gm)	Net (gm)
Impinger 1	50 ml 0.1N H2SO4	489.2	457.1	32.1
Impinger 2	100 ml 0.1N H2SO4	672.8	546.0	126.8
Impinger 3	100 ml 0.1N H2SO4	589.6	533.4	56.2
Impinger 4	Empty	486.2	468.1	18.1
Impinger 5	Silica Gel	816.9	802.0	14.9
Impinger 6				
Impinger 7				
Impinger 8				

Rinse: (ml or gm)

		Field Data Check	
233.2	Liquid (gm)		
0.0	less rinse (gm)		
233.2	Net Liquid (gm)	233.2	☑ QA/QC OK
+ 14.9	Silica Gel (gm)	14.9	☑ QA/QC OK
248.1	Total Vlc (gm)	248.1	☑ 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 NORTH BROWARD, INC.
Clean Air Project No: 12218
Location: Rolling Door/Door to Baghouse
Date (2013): March 21
Start Time: 9:08
End Time: 10:18

METHOD 22 FIELD DATA PRINTOUT

Run	Clock Time (start)	Observation Period (minutes)	Accumulated Emission Duration (seconds)
1	9:08 9:28	20	0
2	9:33 9:53	20	0
3	9:58 10:18	20	0

Total (% of observation time) = 0.0

Total (minutes) = 0.0

WHEELABRATOR NORTH BROWARD, INC.
Clean Air Project No: 12218
Location: Door to Baghouse / Ash Unloading
Date (2013): March 21
Start Time: 10:24
End Time: 11:34

METHOD 22 FIELD DATA PRINTOUT

Run	Clock Time (start)	Observation Period (minutes)	Accumulated Emission Duration (seconds)
1	10:24 10:44	20	0
2	10:49 11:09	20	0
3	11:14 11:34	20	0

Total (% of observation time) = 0.0

Total (minutes) = 0.0

WHEELABRATOR NORTH BROWARD, INC.
Clean Air Project No: 12218
Location: Ash Unloading Area
Date (2013): March 21
Start Time: 11:40
End Time: 12:50

METHOD 22 FIELD DATA PRINTOUT

Run	Clock Time (start)	Observation Period (minutes)	Accumulated Emission Duration (seconds)
1	11:40 12:00	20	0
2	12:05 12:25	20	0
3	12:30 12:50	20	0

Total (% of observation time) = 0.0

Total (minutes) = 0.0

Wheelabrator
CleanAir Project No. 12218
North Broward
FF Outlet, SDA Inlet

March 19, 2013
Start Time 12:13
Stop time 12:47

IGS Bag Analysis

		Channel 1 O2 FF Outlet %dv	Channel 2 CO2 FF Outlet %dv
Calibration Checks			
C_{oi}	Initial zero	0.002	0.004
C_{ui}	Initial upscale	9.444	9.681
C_{of}	Final zero	0.012	0.020
C_{uf}	Final upscale	9.431	9.642
C_{ma}	Actual gas value	9.520	9.530
		U1 R1 M26A OUTLET	
C_{Avg}	Average conc.	8.450	10.755
C_{Gas}	**Bias adjusted**	**8.52**	**10.61**
		U1 R2 M26A OUTLET	
C_{Avg}	Average conc.	8.738	10.640
C_{Gas}	**Bias adjusted**	**8.81**	**10.50**
		U1 R1 M26A INLET	
C_{Avg}	Average conc.	7.795	11.362
C_{Gas}	**Bias adjusted**	**7.86**	**11.21**
		U1 R2 M26A INLET	
C_{Avg}	Average conc.	8.148	11.210
C_{Gas}	**Bias adjusted**	**8.22**	**11.06**
		U1 R3 M26A OUTLET	
C_{Avg}	Average conc.	8.977	10.475
C_{Gas}	**Bias adjusted**	**9.06**	**10.33**
		U2 R1 5/29	
C_{Avg}	Average conc.	7.139	11.855
C_{Gas}	**Bias adjusted**	**7.20**	**11.70**
		U1 R3 M26A INLET	
C_{Avg}	Average conc.	7.871	11.604
C_{Gas}	**Bias adjusted**	**7.94**	**11.45**

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12:14:27	0.002	0.005	
12:14:42	0.001	0.006	
12:14:57	**0.002**	**0.004**	**ZERO**

Prepared by Clean Air Engineering Proprietary Software
SS CEM Version 06-2004a

Wheelabrator
CleanAir Project No. 12218
North Broward
FF Outlet, SDA Inlet

March 19, 2013
Start Time 12:13
Stop time 12:47

IGS Bag Analysis

	Channel 1 O2	Channel 2 CO2	
	FF Outlet %dv	FF Outlet %dv	
12:15:12	0.827	0.004	
12:15:27	14.244	0.057	
12:15:42	19.875	1.073	
12:15:57	18.737	13.373	
12:16:12	18.249	18.134	
12:16:27	18.203	18.705	
12:16:42	18.207	17.927	
12:16:57	18.169	17.932	
12:17:12	18.139	17.944	
12:17:27	**18.140**	**17.935**	**LINEARITY**
12:17:42	18.141	17.920	
12:17:57	18.143	17.924	
12:18:12	18.946	14.021	
12:18:27	15.663	5.813	
12:18:42	10.191	9.076	
12:18:57	9.490	9.713	
12:19:12	9.445	9.684	
12:19:27	9.442	9.681	
12:19:42	9.444	9.680	
12:19:57	**9.444**	**9.681**	**SPAN**
12:20:12	9.704	9.672	
12:20:27	16.909	4.420	
12:20:42	20.488	0.427	
12:20:57	20.758	0.138	
12:21:12	20.765	0.111	
12:24:22	8.450	10.755	
12:24:37	8.446	10.766	
12:24:52	8.445	10.771	
12:25:07	8.479	10.773	
12:24:07	8.476	10.726	
12:24:22	**8.450**	**10.755**	**U1 R1 M26A OUTLET**
12:24:37	8.446	10.766	
12:24:52	8.445	10.771	
12:25:07	8.479	10.773	
12:25:22	15.213	6.127	
12:25:37	20.217	0.637	
12:25:52	20.699	0.138	
12:26:07	20.525	0.117	
12:26:22	13.510	5.422	
12:26:37	9.220	10.065	
12:26:52	**8.738**	**10.640**	**U1 R2 M26A OUTLET**
12:27:07	8.706	10.686	

Wheelabrator
CleanAir Project No. 12218
North Broward
FF Outlet, SDA Inlet

March 19, 2013
Start Time 12:13
Stop time 12:47

IGS Bag Analysis

	Channel 1 O2	Channel 2 CO2	
	FF Outlet %dv	FF Outlet %dv	
12:27:22	8.705	10.690	
12:27:37	8.704	10.698	
12:27:52	8.704	10.700	
12:28:07	8.701	10.702	
12:28:22	12.725	8.250	
12:28:37	19.700	1.269	
12:28:52	20.670	0.175	
12:29:07	20.013	0.284	
12:29:22	11.586	7.193	
12:29:37	8.170	10.937	
12:29:52	7.823	11.324	
12:30:07	7.799	11.355	
12:30:22	7.793	11.361	
12:30:37	**7.795**	**11.362**	**U1 R1 M26A INLET**
12:30:52	7.795	11.363	
12:31:07	8.504	11.267	
12:31:22	17.049	4.179	
12:31:37	20.439	0.385	
12:31:52	20.701	0.128	
12:32:07	18.699	1.113	
12:32:22	10.393	8.646	
12:32:37	8.328	11.002	
12:32:52	**8.148**	**11.210**	**U1 R2 M26A INLET**
12:33:07	8.135	11.229	
12:33:22	8.135	11.235	
12:33:37	8.133	11.242	
12:33:52	12.019	8.913	
12:34:07	19.514	1.474	
12:34:22	20.651	0.188	
12:34:37	20.708	0.112	
12:34:52	15.594	3.569	
12:35:07	9.812	9.445	
12:35:22	9.036	10.386	
12:35:37	8.978	10.459	
12:35:52	8.974	10.471	
12:36:07	**8.977**	**10.475**	**U1 R3 M26A OUTLET**
12:36:22	8.976	10.479	
12:36:37	12.988	8.025	
12:36:52	19.762	1.209	
12:37:07	20.680	0.171	
12:37:22	20.727	0.109	
12:37:37	20.726	0.102	
12:37:52	18.081	1.518	

Wheelabrator
CleanAir Project No. 12218
North Broward
FF Outlet, SDA Inlet

March 19, 2013
Start Time 12:13
Stop time 12:47

IGS Bag Analysis

	Channel 1 O2	Channel 2 CO2	
	FF Outlet %dv	**FF Outlet %dv**	
12:38:07	9.412	9.342	
12:38:22	7.339	11.619	
12:38:37	7.137	11.827	
12:38:52	7.134	11.848	
12:39:07	7.140	11.855	
12:39:22	**7.139**	**11.855**	**U2 R1 5/29**
12:39:37	7.146	11.853	
12:39:52	7.143	11.852	
12:40:07	7.141	11.854	
12:40:22	12.107	8.794	
12:40:37	19.635	1.283	
12:40:52	20.642	0.181	
12:41:07	20.700	0.116	
12:41:22	19.138	0.813	
12:41:37	10.544	8.518	
12:41:52	8.103	11.318	
12:42:07	7.883	11.581	
12:42:22	**7.871**	**11.604**	**U1 R3 M26A INLET**
12:42:37	7.872	11.610	
12:42:52	7.925	11.616	
12:43:07	15.096	6.487	
12:43:22	20.192	0.692	
12:43:37	10.962	0.118	
12:43:52	0.785	0.039	
12:44:07	0.050	0.028	
12:44:22	0.016	0.024	
12:44:37	**0.012**	**0.020**	**ZERO**
12:44:52	0.012	0.018	
12:45:07	0.013	0.015	
12:45:22	0.502	0.015	
12:45:37	13.289	0.310	
12:45:52	14.363	3.981	
12:46:07	10.031	8.864	
12:46:22	9.465	9.570	
12:46:37	9.432	9.628	
12:46:52	9.429	9.636	
12:47:07	**9.431**	**9.642**	**SPAN**
12:47:22	9.437	9.645	
12:47:37	9.535	9.646	
12:47:52	16.346	4.971	

Wheelabrator
CleanAir Project No. 12218
North Broward
FF Outlet, SDA Inlet

March 19, 2013
Start Time 15:52
Stop time 16:21

IGS Bag Analysis

		Channel 1 O2 FF Outlet %dv	Channel 2 CO2 FF Outlet %dv
Calibration Checks			
C_{oi}	Initial zero	-0.006	0.007
C_{ui}	Initial upscale	18.062	17.669
C_{of}	Final zero	0.029	0.034
C_{uf}	Final upscale	18.026	17.633
C_{ma}	Actual gas value	18.100	17.900
		U1 R1 5/29	
C_{Avg}	Average conc.	8.645	10.512
C_{Gas}	**Bias adjusted**	**8.67**	**10.65**
		U2 R2 5/29	
C_{Avg}	Average conc.	7.267	11.570
C_{Gas}	**Bias adjusted**	**7.28**	**11.73**
		U2 R3 5/29	
C_{Avg}	Average conc.	7.323	11.677
C_{Gas}	**Bias adjusted**	**7.34**	**11.83**
		U2 R1 M23	
C_{Avg}	Average conc.	7.227	11.690
C_{Gas}	**Bias adjusted**	**7.24**	**11.85**

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15:53:53	12.463	0.068	
15:54:08	0.660	0.014	
15:53:53	12.463	0.068	
15:54:08	0.660	0.014	
15:54:23	0.014	0.010	
15:54:38	**-0.006**	**0.007**	**ZERO**
15:54:53	0.012	0.007	
15:55:08	9.604	3.682	
15:55:23	16.910	15.683	
15:55:38	17.882	18.258	
15:55:53	17.999	17.917	
15:56:08	18.049	17.934	
15:56:23	18.055	17.942	
15:56:38	18.055	17.958	
15:56:53	18.059	17.963	
15:57:08	**18.060**	**17.968**	**SPAN**

Wheelabrator
CleanAir Project No. 12218
North Broward
FF Outlet, SDA Inlet

March 19, 2013
Start Time 15:52
Stop time 16:21

IGS Bag Analysis

	Channel 1 O2 FF Outlet %dv	Channel 2 CO2 FF Outlet %dv	
15:57:23	18.064	17.971	
15:57:38	18.490	14.100	
15:57:53	12.585	8.459	
15:58:08	9.575	9.761	
15:58:23	9.332	9.829	
15:58:38	9.322	9.732	
15:58:53	**9.323**	**9.732**	**LINEARITY**
15:59:08	9.489	9.731	
15:59:23	15.825	7.655	
15:59:38	17.985	15.060	
15:59:53	18.049	17.364	
16:00:08	18.059	17.601	
16:00:23	18.063	17.642	
16:00:38	**18.062**	**17.669**	**CO2 SPAN**
16:00:53	18.164	17.574	
16:01:08	19.726	7.227	
16:01:23	17.135	3.603	
16:01:38	19.775	1.027	
16:01:53	13.927	4.733	
16:02:08	8.975	10.077	
16:02:23	8.661	10.494	
16:02:38	**8.645**	**10.512**	**U1 R1 5/29**
16:02:53	8.647	10.513	
16:03:08	14.283	6.857	
16:03:23	19.400	0.717	
16:03:38	10.184	8.136	
16:03:53	7.405	11.398	
16:04:08	7.277	11.559	
16:04:23	**7.267**	**11.570**	**U2 R2 5/29**
16:04:38	13.751	7.376	
16:04:53	20.114	0.566	
16:05:08	20.432	0.114	
16:05:23	12.430	5.889	
16:05:38	7.594	11.332	
16:05:53	**7.323**	**11.677**	**U2 R3 5/29**
16:06:08	7.316	11.695	
16:06:23	9.988	10.453	
16:06:38	19.178	1.739	
16:06:53	20.335	0.246	
16:07:08	16.598	2.424	
16:07:23	8.225	10.441	
16:07:38	7.260	11.646	
16:07:53	**7.227**	**11.690**	**U2 R1 M23**

Wheelabrator
CleanAir Project No. 12218
North Broward
FF Outlet, SDA Inlet

March 19, 2013
Start Time 15:52
Stop time 16:21

IGS Bag Analysis

	Channel 1 O2 FF Outlet %dv	Channel 2 CO2 FF Outlet %dv	
16:08:08	7.225	11.700	
16:08:23	12.502	8.437	
16:08:38	19.849	0.943	
16:08:53	19.324	6.337	
16:09:08	18.099	16.161	
16:09:23	18.002	17.544	
16:09:38	18.015	17.620	
16:09:53	**18.026**	**17.633**	**SPAN**
16:10:08	18.075	17.643	
16:10:23	16.571	7.477	
16:10:38	2.297	0.546	
16:10:53	0.083	0.057	
16:11:08	**0.029**	**0.034**	**ZERO**
16:11:23	2.012	0.032	
16:11:38	17.068	0.090	
16:11:53	20.365	0.111	

Wheelabrator
CleanAir Project No. 12218
North Broward
FF Outlet, SDA Inlet

March 20, 2013
Start Time 11:41
Stop time 12:33

IGS Bag Analysis

		Channel 1 O2 FF Outlet %dv	Channel 2 CO2 FF Outlet %dv
Calibration Checks			
C_{ol}	Initial zero	0.002	0.001
C_{ui}	Initial upscale	9.490	9.581
C_{of}	Final zero	0.021	0.007
C_{uf}	Final upscale	9.464	9.493
C_{ma}	Actual gas value	9.520	9.530
		U3 R1 M26A INLET	
C_{Avg}	Average conc.	6.088	12.837
C_{Gas}	**Bias adjusted**	**6.11**	**12.83**
		U3 R2 M26A INLET	
C_{Avg}	Average conc.	7.276	11.638
C_{Gas}	**Bias adjusted**	**7.31**	**11.63**
		U3 R1 M26A OUTLET	
C_{Avg}	Average conc.	6.935	12.118
C_{Gas}	**Bias adjusted**	**6.96**	**12.11**
		U3 R2 M26A OUTLET	
C_{Avg}	Average conc.	7.808	11.263
C_{Gas}	**Bias adjusted**	**7.84**	**11.26**
		U1 R2 5/29	
C_{Avg}	Average conc.	9.229	9.996
C_{Gas}	**Bias adjusted**	**9.27**	**9.99**
		U2 R2 M23	
C_{Avg}	Average conc.	7.944	11.160
C_{Gas}	**Bias adjusted**	**7.98**	**11.15**
		U3 R3 M26A OUTLET	
C_{Avg}	Average conc.	8.494	10.804
C_{Gas}	**Bias adjusted**	**8.53**	**10.80**
		U3 R3 M26A INLET	
C_{Avg}	Average conc.	7.944	11.303
C_{Gas}	**Bias adjusted**	**7.98**	**11.30**

Prepared by Clean Air Engineering Proprietary Software
SS CEM Version 06-2004a

Wheelabrator
CleanAir Project No. 12218
North Broward
FF Outlet, SDA Inlet

March 20, 2013
Start Time 11:41
Stop time 12:33

IGS Bag Analysis

	Channel 1 O2 FF Outlet %dv	Channel 2 CO2 FF Outlet %dv	
041013 093600			
11:42:09	-0.027	0.013	
11:42:24	-0.038	0.012	
11:42:39	-0.006	0.009	
11:42:09	-0.027	0.013	
11:42:24	-0.038	0.012	
11:42:39	-0.006	0.009	
11:42:54	0.001	0.001	
11:43:09	**0.002**	**0.001**	**ZERO**
11:43:24	0.001	0.002	
11:43:39	4.395	0.012	
11:43:54	17.663	4.531	
11:44:09	18.093	16.229	
11:44:24	18.034	17.705	
11:44:39	18.043	17.782	
11:44:54	18.075	17.795	
11:45:09	18.105	17.904	
11:45:24	**18.106**	**17.923**	**LINEARITY**
11:45:39	18.108	17.926	
11:45:54	18.108	17.931	
11:46:09	18.112	17.939	
11:46:24	18.112	17.940	
11:46:39	18.113	17.947	
11:46:54	18.116	17.949	
11:47:09	18.319	17.466	
11:47:24	17.577	6.374	
11:47:39	10.357	8.807	
11:47:54	9.472	9.669	
11:48:09	9.449	9.640	
11:48:24	9.482	9.581	
11:48:39	**9.490**	**9.581**	**SPAN**
11:48:54	9.491	9.578	
11:49:09	9.490	9.579	
11:49:24	10.365	9.419	
11:49:39	17.850	2.820	
11:49:54	9.393	9.023	
11:50:09	6.240	12.661	
11:50:24	**6.088**	**12.837**	**U3 R1 M26A INLET**
11:50:39	6.100	12.843	
11:50:54	6.109	12.834	
11:51:09	6.581	12.815	
11:51:24	16.872	4.735	
11:51:39	20.515	0.314	

Wheelabrator
CleanAir Project No. 12218
North Broward
FF Outlet, SDA Inlet

March 20, 2013
Start Time 11:41
Stop time 12:33

IGS Bag Analysis

	Channel 1 O2	Channel 2 CO2	
	FF Outlet %dv	FF Outlet %dv	
11:51:54	20.628	0.153	
11:52:09	18.413	1.205	
11:52:24	8.920	9.664	
11:52:39	7.338	11.556	
11:52:54	**7.276**	**11.638**	**U3 R2 M26A INLET**
11:53:09	7.276	11.642	
11:53:24	7.275	11.648	
11:53:39	7.275	11.649	
11:53:54	13.244	7.888	
11:54:09	20.175	0.743	
11:54:24	20.603	0.136	
11:54:39	12.254	6.145	
11:54:54	7.229	11.733	
11:55:09	6.944	12.096	
11:55:24	6.935	12.112	
11:55:39	**6.935**	**12.118**	**U3 R1 M26A OUTLET**
11:55:54	11.790	9.205	
11:56:09	19.862	1.064	
11:56:24	20.616	0.147	
11:56:39	20.231	0.169	
11:56:54	11.134	7.340	
11:57:09	7.960	11.052	
11:57:24	7.810	11.249	
11:57:39	7.808	11.261	
11:57:54	**7.808**	**11.263**	**U3 R2 M26A OUTLET**
11:58:09	7.786	11.266	
11:58:24	7.806	11.266	
11:58:39	9.982	10.368	
11:58:54	19.091	1.973	
11:59:09	20.582	0.219	
11:59:24	20.482	0.217	
11:59:39	19.947	0.289	
11:59:54	11.694	7.049	
12:00:09	9.334	9.844	
12:00:24	9.232	9.984	
12:00:39	9.230	9.993	
12:00:54	**9.229**	**9.996**	**U1 R2 5/29**
12:01:09	9.227	9.997	
12:01:24	10.567	9.578	
12:01:39	18.853	2.210	
12:01:54	20.606	0.186	<-- Paused at 12:02:00
12:04:50	20.672	0.085	
12:05:05	19.688	0.383	

Wheelabrator
CleanAir Project No. 12218
North Broward
FF Outlet, SDA Inlet

March 20, 2013
Start Time 11:41
Stop time 12:33

IGS Bag Analysis

	Channel 1 O2	Channel 2 CO2	
	FF Outlet %dv	FF Outlet %dv	
12:05:20	10.478	8.136	
12:05:35	8.063	11.000	
12:05:50	7.950	11.148	
12:06:05	7.944	11.159	
12:06:20	**7.944**	**11.160**	**U2 R2 M23**
12:06:35	7.943	11.167	
12:06:50	8.335	11.156	
12:07:05	17.265	4.176	
12:07:20	20.515	0.278	<-- Paused at 12:07:30
12:11:52	20.663	0.080	
12:12:07	19.791	0.381	
12:12:22	11.299	7.422	
12:12:37	8.624	10.599	
12:12:52	8.492	10.786	
12:13:07	**8.494**	**10.804**	**U3 R3 M26A OUTLET**
12:13:22	8.494	10.810	
12:13:37	8.494	10.814	
12:13:52	8.496	10.819	
12:14:07	8.496	10.824	
12:14:22	13.284	7.825	<-- Paused at 12:14:36
12:25:19	20.634	0.074	
12:25:34	20.636	0.073	
12:25:49	20.287	0.107	
12:26:04	11.518	7.048	
12:26:19	8.121	11.017	
12:26:34	7.947	11.282	
12:26:49	**7.944**	**11.303**	**U3 R3 M26A INLET**
12:27:04	7.947	11.310	
12:27:19	7.947	11.315	
12:27:34	8.030	11.321	
12:27:49	16.238	5.396	
12:28:04	17.945	0.373	
12:28:19	19.576	0.182	
12:28:34	18.639	0.133	
12:28:49	3.052	0.032	
12:29:04	0.098	0.014	
12:29:19	0.039	0.012	
12:29:34	0.014	0.012	
12:29:49	0.037	0.012	
12:30:04	0.027	0.008	
12:30:19	0.037	0.010	
12:30:34	**0.021**	**0.007**	**ZERO**
12:30:49	0.316	0.001	

Wheelabrator
CleanAir Project No. 12218
North Broward
FF Outlet, SDA Inlet

March 20, 2013
Start Time 11:41
Stop time 12:33

IGS Bag Analysis

	Channel 1 O2 FF Outlet %dv	Channel 2 CO2 FF Outlet %dv	
12:31:04	14.508	0.039	
12:31:19	20.371	0.080	
12:31:34	19.771	0.333	
12:31:49	11.524	7.050	
12:32:04	9.528	9.361	
12:32:19	**9.464**	**9.493**	**SPAN**
12:32:34	9.465	9.505	
12:32:49	9.467	9.511	
12:33:04	9.469	9.518	
12:33:19	11.499	8.694	
12:33:34	19.519	1.550	

Wheelabrator
CleanAir Project No. 12218
North Broward
FF Outlet, SDA Inlet

March 20, 2013
Start Time 16:29
Stop time 16:47

IGS Bag Analysis

		Channel 1 O2 FF Outlet %dv	Channel 2 CO2 FF Outlet %dv
Calibration Checks			
C_{oi}	Initial zero	0.019	0.009
C_{ui}	Initial upscale	18.062	17.919
C_{of}	Final zero	0.031	0.037
C_{uf}	Final upscale	18.053	17.902
C_{ma}	Actual gas value	18.100	17.900
		U1 R3 5/29	
C_{Avg}	Average conc.	9.309	9.567
C_{Gas}	**Bias adjusted**	**9.32**	**9.55**
		U1 R4 M29	
C_{Avg}	Average conc.	9.194	9.762
C_{Gas}	**Bias adjusted**	**9.20**	**9.75**
		U3 R1 5/29	
C_{Avg}	Average conc.	8.731	10.197
C_{Gas}	**Bias adjusted**	**8.74**	**10.18**
		U2 R3 M23	
C_{Avg}	Average conc.	7.980	10.916
C_{Gas}	**Bias adjusted**	**7.98**	**10.90**

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16:30:09	0.619	0.014	
16:30:24	0.151	0.012	
16:30:09	0.619	0.014	
16:30:24	0.151	0.012	
16:30:39	0.102	0.010	
16:30:54	0.022	0.012	
16:31:09	**0.019**	**0.009**	**ZERO**
16:31:24	1.875	0.010	
16:31:39	15.752	4.567	
16:31:54	17.849	16.327	
16:32:09	17.969	18.040	
16:32:24	18.079	18.001	
16:32:39	18.083	17.923	
16:32:54	18.073	17.928	
16:33:09	**18.062**	**17.919**	**SPAN**
16:33:24	18.095	17.945	

Wheelabrator
CleanAir Project No. 12218
North Broward
FF Outlet, SDA Inlet

March 20, 2013
Start Time 16:29
Stop time 16:47

IGS Bag Analysis

	Channel 1 O2	Channel 2 CO2	
	FF Outlet %dv	FF Outlet %dv	
16:33:39	18.372	17.216	
16:33:54	19.515	4.728	
16:34:09	11.791	7.013	
16:34:24	9.532	9.296	
16:34:39	9.438	9.419	
16:34:54	**9.438**	**9.422**	**LINEARITY**
16:35:09	10.528	9.164	
16:35:24	18.700	2.419	
16:35:39	19.664	0.503	
16:35:54	11.515	7.069	
16:36:09	9.416	9.431	
16:36:24	9.316	9.556	
16:36:39	**9.309**	**9.567**	**U1 R3 5/29**
16:36:54	10.172	9.396	
16:37:09	18.416	2.663	
16:37:24	20.534	0.207	
16:37:39	15.633	3.288	
16:37:54	9.704	9.101	
16:38:09	9.212	9.736	
16:38:24	**9.194**	**9.762**	**U1 R4 M29**
16:38:39	9.193	9.767	
16:38:54	10.610	9.308	
16:39:09	18.876	2.147	
16:39:24	20.389	-0.001	
16:39:39	20.508	0.102	
16:39:54	12.920	5.526	
16:40:09	8.975	9.873	
16:40:24	8.738	10.181	
16:40:39	**8.731**	**10.197**	**U3 R1 5/29**
16:40:54	8.728	10.180	
16:41:09	8.928	10.195	
16:41:24	17.057	4.277	
16:41:39	20.475	0.282	
16:41:54	20.628	0.105	
16:42:09	20.630	0.093	
16:42:24	20.484	0.090	
16:42:39	12.333	6.017	
16:42:54	8.241	10.583	
16:43:09	7.990	10.898	
16:43:24	**7.980**	**10.916**	**U2 R3 M23**
16:43:39	7.979	10.920	
16:43:54	11.840	8.738	
16:44:09	18.160	9.423	

Wheelabrator
CleanAir Project No. 12218
North Broward
FF Outlet, SDA Inlet

March 20, 2013
Start Time 16:29
Stop time 16:47

IGS Bag Analysis

	Channel 1 O2 FF Outlet %dv	Channel 2 CO2 FF Outlet %dv	
16:44:24	18.047	17.062	
16:44:39	18.034	17.851	
16:44:54	**18.053**	**17.902**	**SPAN**
16:45:09	18.063	17.907	
16:45:24	15.565	13.790	
16:45:39	2.617	1.936	
16:45:54	0.112	0.129	
16:46:09	0.034	0.051	
16:46:24	0.031	0.041	
16:46:39	**0.031**	**0.037**	**ZERO**
16:46:54	0.032	0.031	
16:47:09	0.028	0.029	

Wheelabrator
CleanAir Project No. 12218
North Broward
FF Outlet, SDA Inlet

March 21, 2013
Start Time 11:26
Stop time 12:02

IGS Bag Analysis

		Channel 1 O2 FF Outlet %dv	Channel 2 CO2 FF Outlet %dv
Calibration Checks			
C_{oi}	Initial zero	0.006	0.027
C_{ui}	Initial upscale	18.097	17.897
C_{of}	Final zero	0.035	0.024
C_{uf}	Final upscale	18.097	17.976
C_{ma}	Actual gas value	18.100	17.900
		U2 R1 M26A INLET	
C_{Avg}	Average conc.	6.388	12.525
C_{Gas}	**Bias adjusted**	**6.38**	**12.49**
		U2 R2 M26A INLET	
C_{Avg}	Average conc.	6.097	12.902
C_{Gas}	**Bias adjusted**	**6.08**	**12.87**
		U2 R1 M26A OUTLET	
C_{Avg}	Average conc.	7.858	11.282
C_{Gas}	**Bias adjusted**	**7.85**	**11.25**
		U2 R2 M26A OUTLET	
C_{Avg}	Average conc.	7.464	11.690
C_{Gas}	**Bias adjusted**	**7.45**	**11.66**
		U3 R2 M29	
C_{Avg}	Average conc.	7.987	11.075
C_{Gas}	**Bias adjusted**	**7.98**	**11.04**
		U2 R3 M26A OUTLET	
C_{Avg}	Average conc.	7.248	11.903
C_{Gas}	**Bias adjusted**	**7.24**	**11.87**
		U2 R3 M26A INLET	
C_{Avg}	Average conc.	6.486	12.569
C_{Gas}	**Bias adjusted**	**6.47**	**12.54**

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11:27:59	5.131	0.275
11:28:14	0.180	0.046
11:27:59	5.131	0.275

Wheelabrator
CleanAir Project No. 12218
North Broward
FF Outlet, SDA Inlet

March 21, 2013
Start Time 11:26
Stop time 12:02

IGS Bag Analysis

	Channel 1 O2	Channel 2 CO2	
	FF Outlet %dv	FF Outlet %dv	
11:28:14	0.180	0.046	
11:28:29	0.013	0.034	
11:28:44	**0.006**	**0.027**	**ZERO**
11:28:59	0.006	0.022	
11:29:14	0.006	0.020	
11:29:29	1.684	0.019	
11:29:44	16.049	0.476	
11:29:59	18.388	12.140	
11:30:14	18.131	16.970	
11:30:29	18.110	17.357	
11:30:44	18.771	14.334	
11:30:59	20.316	2.500	
11:31:14	20.574	0.226	
11:31:29	20.573	0.110	
11:31:44	20.563	0.104	
11:31:59	20.558	0.102	
11:32:14	20.555	0.102	
11:32:29	20.552	0.098	
11:32:44	20.134	1.574	
11:32:59	18.360	14.352	
11:33:14	18.018	17.849	
11:33:29	18.016	18.136	
11:33:44	18.028	18.167	
11:33:59	18.035	18.194	
11:34:14	18.040	17.952	
11:34:29	18.085	17.894	
11:34:44	**18.097**	**17.897**	**SPAN**
11:34:59	18.101	17.905	
11:35:14	18.103	17.904	
11:35:29	18.489	16.565	
11:35:44	16.378	6.336	
11:35:59	10.270	8.851	
11:36:14	9.592	9.459	
11:36:29	9.570	9.482	
11:36:44	**9.496**	**9.436**	**LINEARITY**
11:36:59	9.571	9.483	
11:37:14	10.965	9.034	
11:37:29	18.845	2.229	
11:37:44	20.575	0.202	
11:37:59	20.495	0.209	
11:38:14	13.035	5.417	
11:38:29	6.940	11.865	
11:38:44	6.413	12.491	

Wheelabrator
CleanAir Project No. 12218
North Broward
FF Outlet, SDA Inlet

March 21, 2013
Start Time 11:26
Stop time 12:02

IGS Bag Analysis

	Channel 1 O2 FF Outlet %dv	Channel 2 CO2 FF Outlet %dv	
11:38:59	6.391	12.521	
11:39:14	**6.388**	**12.525**	**U2 R1 M26A INLET**
11:39:29	6.387	12.529	
11:39:44	11.389	9.487	
11:39:59	19.586	1.328	
11:40:14	20.574	0.161	
11:40:29	19.650	0.394	
11:40:44	9.519	8.949	
11:40:59	6.310	12.630	
11:41:14	6.104	12.883	
11:41:29	**6.097**	**12.902**	**U2 R2 M26A INLET**
11:41:44	6.098	12.906	
11:41:59	6.099	12.912	
11:42:14	6.099	12.914	
11:42:29	9.767	10.951	
11:42:44	19.080	1.925	
11:42:59	20.582	0.188	
11:43:14	19.936	0.276	
11:43:29	11.064	7.589	
11:43:44	8.060	11.037	
11:43:59	7.867	11.270	
11:44:14	**7.858**	**11.282**	**U2 R1 M26A OUTLET**
11:44:29	7.857	11.286	
11:44:44	8.403	11.250	
11:44:59	17.195	4.113	
11:45:14	20.446	0.312	
11:45:29	19.814	0.335	
11:45:44	10.616	8.022	
11:45:59	7.654	11.447	
11:46:14	7.470	11.674	
11:46:29	**7.464**	**11.690**	**U2 R2 M26A OUTLET**
11:46:44	7.464	11.697	
11:46:59	7.464	11.697	
11:47:14	7.462	11.703	
11:47:29	7.650	11.702	
11:47:44	16.184	5.348	
11:47:59	20.370	0.424	
11:48:14	20.603	0.138	
11:48:29	17.727	1.700	
11:48:44	9.370	9.416	
11:48:59	8.059	10.985	
11:49:14	7.986	11.066	
11:49:29	7.988	11.070	

Wheelabrator
CleanAir Project No. 12218
North Broward
FF Outlet, SDA Inlet

March 21, 2013
Start Time 11:26
Stop time 12:02

IGS Bag Analysis

	Channel 1 O2	Channel 2 CO2	
	FF Outlet %dv	FF Outlet %dv	
11:49:44	**7.987**	**11.075**	**U3 R2 M29**
11:49:59	7.987	11.078	
11:50:14	7.988	11.078	
11:50:29	7.986	11.079	
11:50:44	14.227	6.946	
11:50:59	20.127	0.686	
11:51:14	20.581	0.129	
11:51:29	13.565	5.039	
11:51:44	7.755	11.257	
11:51:59	7.266	11.867	
11:52:14	**7.248**	**11.903**	**U2 R3 M26A OUTLET**
11:52:29	7.249	11.910	
11:52:44	7.249	11.913	
11:52:59	7.251	11.916	
11:53:14	7.251	11.920	
11:53:29	7.251	11.923	
11:53:44	7.252	11.921	
11:53:59	7.253	11.923	
11:54:14	7.253	11.924	
11:54:29	7.253	11.925	
11:54:44	7.253	11.923	
11:54:59	12.409	8.674	
11:55:14	19.806	1.133	
11:55:29	20.588	0.159	
11:55:44	19.946	0.260	
11:55:59	10.218	8.242	
11:56:14	6.720	12.253	
11:56:29	6.491	12.542	
11:56:44	6.486	12.560	
11:56:59	**6.486**	**12.569**	**U2 R3 M26A INLET**
11:57:14	6.486	12.570	
11:57:29	6.486	12.570	
11:57:44	6.489	12.572	
11:57:59	6.741	12.570	
11:58:14	15.945	5.616	
11:58:29	9.497	0.424	
11:58:44	0.506	0.057	
11:58:59	0.071	0.037	
11:59:14	0.043	0.031	
11:59:29	0.037	0.024	
11:59:44	**0.035**	**0.024**	**ZERO**
11:59:59	0.035	0.018	
12:00:14	0.037	0.018	

Wheelabrator
CleanAir Project No. 12218
North Broward
FF Outlet, SDA Inlet

March 21, 2013
Start Time 11:26
Stop time 12:02

IGS Bag Analysis

	Channel 1 O2 FF Outlet %dv	Channel 2 CO2 FF Outlet %dv	
12:00:29	9.245	0.206	
12:00:44	17.636	11.300	
12:00:59	18.044	17.259	
12:01:14	18.069	17.810	
12:01:29	18.081	17.882	
12:01:44	18.092	17.968	
12:01:59	**18.097**	**17.976**	**SPAN**
12:02:14	18.097	17.980	
12:02:29	18.101	17.982	
12:02:44	18.103	17.985	

Wheelabrator
CleanAir Project No. 12218
North Broward
FF Outlet, SDA Inlet

March 21, 2013
Start Time 14:46
Stop time 15:03

IGS Bag Analysis

		Channel 1 O2 FF Outlet %dv	Channel 2 CO2 FF Outlet %dv
Calibration Checks			
C_{oi}	Initial zero	-0.037	0.010
C_{ui}	Initial upscale	18.048	17.867
C_{of}	Final zero	-0.032	0.038
C_{uf}	Final upscale	18.046	17.831
C_{ma}	Actual gas value	18.100	17.900
		U2 R4 M29	
C_{Avg}	Average conc.	7.317	12.011
C_{Gas}	**Bias adjusted**	**7.36**	**12.04**
		U3 R3 5/29	
C_{Avg}	Average conc.	7.790	11.419
C_{Gas}	**Bias adjusted**	**7.83**	**11.44**
		U3 R4 M29	
C_{Avg}	Average conc.	7.730	11.531
C_{Gas}	**Bias adjusted**	**7.77**	**11.56**

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14:47:46	0.132	0.012	
14:47:46	0.132	0.012	
14:48:01	-0.035	0.010	
14:48:16	**-0.037**	**0.010**	**ZERO**
14:48:31	0.479	0.009	
14:48:46	14.317	0.364	
14:49:01	18.255	11.963	
14:49:16	18.077	17.143	
14:49:31	18.052	17.571	
14:49:46	18.049	17.781	
14:50:01	18.049	17.861	
14:50:16	**18.048**	**17.867**	**SPAN**
14:50:31	18.047	17.874	
14:50:46	19.057	11.328	
14:51:01	13.026	6.773	
14:51:16	9.748	9.252	
14:51:31	**9.557**	**9.440**	**LINEARITY**
14:51:46	9.550	9.446	
14:52:01	9.679	9.444	
14:52:16	16.950	4.339	
14:52:31	20.346	0.371	

Wheelabrator
CleanAir Project No. 12218
North Broward
FF Outlet, SDA Inlet

March 21, 2013
Start Time 14:46
Stop time 15:03

IGS Bag Analysis

	Channel 1 O2	Channel 2 CO2	
	FF Outlet %dv	FF Outlet %dv	
14:52:46	18.477	1.157	
14:53:01	9.242	9.672	
14:53:16	7.410	11.880	
14:53:31	**7.317**	**12.011**	**U2 R4 M29**
14:53:46	7.314	12.018	
14:54:01	8.216	11.873	
14:54:16	17.486	3.793	
14:54:31	20.437	0.260	
14:54:46	20.617	0.110	
14:55:01	20.565	0.095	
14:55:16	13.104	5.509	
14:55:31	8.199	10.907	
14:55:46	7.761	11.384	
14:56:01	7.793	11.416	
14:56:16	**7.790**	**11.419**	**U3 R3 5/29**
14:56:31	8.629	11.286	
14:56:46	17.571	3.655	
14:57:01	20.468	0.284	
14:57:16	20.619	0.109	
14:57:31	20.627	0.094	
14:57:46	20.626	0.091	
14:58:01	20.555	0.087	
14:58:16	13.009	5.601	
14:58:31	8.135	11.008	
14:58:46	7.744	11.500	
14:59:01	**7.730**	**11.531**	**U3 R4 M29**
14:59:16	7.727	11.537	
14:59:31	11.808	9.115	
14:59:46	19.582	1.372	
15:00:01	20.606	0.153	
15:00:16	20.296	1.232	
15:00:31	18.518	13.571	
15:00:46	18.078	17.479	
15:01:01	18.045	17.800	
15:01:16	18.044	17.826	
15:01:31	**18.046**	**17.831**	**SPAN**
15:01:46	17.946	17.665	
15:02:01	7.272	6.148	
15:02:16	0.475	0.538	
15:02:31	-0.016	0.070	
15:02:46	-0.035	0.044	
15:03:01	**-0.032**	**0.038**	**ZERO**
15:03:16	1.616	0.033	

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LABORATORY DATA

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: SB

Date: 4/30

CleanAir.

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Wheelabrator North 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 19	Mar 20	Mar 20
Start Time (approx.)			12:58	07:43	10:17
Stop Time (approx.)			15:14	09:55	12:28
	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)		0.00020	0.00030	0.00010
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)*		0.00020	0.00030	0.00010
	First Solvent Rinse				
	Acetone				
ρ_1	Density (g/mL)	0.785			
v_{s1}	Sample volume (mL)		186	110	66
v_{a1}	Aliquot volume (mL)	158	186	110	66
r_{a1}	Allquot residue mass (g)	0.00030	0.00120	0.00130	0.00170
r_{s1}	Sample residue mass (g)		0.00120	0.00130	0.00170
m_{b1}	Allowable blank correction (g)		0.00035	0.00021	0.00013
m_1	Net residue mass (g)		0.00085	0.00109	0.00157
	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)*		0.00085	0.00109	0.00157
m_T	*Total Gravimetric Result (g)*		0.00105	0.00139	0.00167
m_D	*Total Gravimetric Detection Limit g)*		0.00020	0.00020	0.00020
m_n	*Total Filterable Particulate Matter (g)*		0.00105	0.00139	0.00167
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

041213 095209

Wheelabrator North 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 19	Mar 19	Mar 19
Start Time (approx.)			07:54	10:35	13:25
Stop Time (approx.)			10:07	12:48	15:37
	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)		0.00120	0.00100	0.00110
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)*		0.00120	0.00100	0.00110
	First Solvent Rinse				
	Acetone				
ρ_1	Density (g/mL)	0.785			
v_{s1}	Sample volume (mL)		106	98	120
v_{a1}	Aliquot volume (mL)	158	106	98	120
r_{a1}	Aliquot residue mass (g)	0.00030	0.00210	0.00060	0.00230
r_{s1}	Sample residue mass (g)		0.00210	0.00060	0.00230
m_{b1}	Allowable blank correction (g)		0.00020	0.00019	0.00023
m_1	Net residue mass (g)		0.00190	0.00041	0.00207
	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)*		0.00190	0.00041	0.00207
m_T	*Total Gravimetric Result (g)*		0.00310	0.00141	0.00317
m_D	*Total Gravimetric Detection Limit g)*		0.00020	0.00020	0.00020
m_n	*Total Filterable Particulate Matter (g)*		0.00310	0.00141	0.00317
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 North 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 20	Mar 21	Mar 21
Start Time (approx.)			12:35	07:42	10:15
Stop Time (approx.)			14:50	09:54	12:27
	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)		nd	nd	0.00010
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)*		0.00010	0.00010	0.00010
	First Solvent Rinse				
	Acetone				
ρ_1	Density (g/mL)	0.785			
v_{s1}	Sample volume (mL)		154	80	100
v_{a1}	Aliquot volume (mL)	158	154	80	100
r_{a1}	Allquot residue mass (g)	0.00030	0.00160	0.00120	0.00170
r_{s1}	Sample residue mass (g)		0.00160	0.00120	0.00170
m_{b1}	Allowable blank correction (g)		0.00029	0.00015	0.00019
m_1	Net residue mass (g)		0.00131	0.00105	0.00151
	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)*		0.00131	0.00105	0.00151
m_T	*Total Gravimetric Result (g)*		0.00141	0.00115	0.00161
m_D	*Total Gravimetric Detection Limit g)*		0.00020	0.00020	0.00020
m_n	*Total Filterable Particulate Matter (g)*		0.00141	0.00115	0.00161
n_{MDL}	*Number of Non-Detectable Fractions*		1 out of 2	1 out of 2	N/A
DLC	*Detection Level Classification*		DLL	DLL	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 North 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 19	Mar 20	Mar 20
Start Time (approx.)		12:58	07:43	10:17
Stop Time (approx.)		15:14	09:55	12:28
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)	<0.2000	0.2790	<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)	<0.2000	0.2790	<0.2000

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Wheelabrator North 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 19	Mar 20	Mar 20
Start Time (approx.)		12:58	07:43	10:17
Stop Time (approx.)		15:14	09:55	12:28
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)	0.6394	0.5154	0.5608
m_{FB}	Matter collected in front half blank (µg)	0.4220	0.4220	0.4220
$m_{FB\text{-}allow}$	Allowable front half blank correction (µg)	0.4220	0.4220	0.4220
m_n	Total matter corrected for allowable blanks (µg)	0.2173	<0.2000	<0.2000

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Wheelabrator North 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 19	Mar 19	Mar 19
Start Time (approx.)		07:54	10:35	13:25
Stop Time (approx.)		10:07	12:48	15:37
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)	1.1982	1.1173	0.9498
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)	1.1982	1.1173	0.9498

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Wheelabrator North 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 19	Mar 19	Mar 19
Start Time (approx.)		07:54	10:35	13:25
Stop Time (approx.)		10:07	12:48	15:37
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)	8.3482	10.6992	7.5767
m_{FB}	Matter collected in front half blank (µg)	0.4220	0.4220	0.4220
$m_{FB\text{-}allow}$	Allowable front half blank correction (µg)	0.4220	0.4220	0.4220
m_n	Total matter corrected for allowable blanks (µg)	7.9262	10.2772	7.1546

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L

Prepared by Clean Air Engineering Proprietary Software
SS Metals-1 Version 2006-12c

Wheelabrator North 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 20	Mar 21	Mar 21
Start Time (approx.)		12:35	07:42	10:15
Stop Time (approx.)		14:50	09:54	12:27
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)	<0.2000	<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)	<0.2000	<0.2000	<0.2000

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Wheelabrator North 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 20	Mar 21	Mar 21
Start Time (approx.)		12:35	07:42	10:15
Stop Time (approx.)		14:50	09:54	12:27
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)	0.4072	0.4748	0.5020
m_{FB}	Matter collected in front half blank (µg)	0.4220	0.4220	0.4220
$m_{FB\text{-}allow}$	Allowable front half blank correction (µg)	0.4220	0.4220	0.4220
m_n	Total matter corrected for allowable blanks (µg)	<0.2000	<0.2000	<0.2000

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Wheelabrator North 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 19	Mar 20	Mar 20	Mar 20
Start Time (approx.)		12:58	07:43	10:17	12:52
Stop Time (approx.)		15:14	09:55	12:28	15:03
Sample Analysis					
m_{1b-S}	Fraction 1B Sample (µg)	<0.1000	<0.1000	<0.1000	<0.1000
m_{2b-S}	Fraction 2B Sample (µg)	3.0256	2.7628	2.5297	2.2635
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)	3.0256	2.7628	2.5297	2.2635
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)	3.0256	2.7628	2.5297	2.2635
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)	3.0256	2.7628	2.5297	2.2635
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 North 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 19	Mar 19	Mar 19	Mar 21
Start Time (approx.)		07:54	10:35	13:25	12:05
Stop Time (approx.)		10:07	12:48	15:37	14:26
Sample Analysis					
m_{1b-S}	Fraction 1B Sample (µg)	<0.1000	<0.1000	<0.1000	<0.1000
m_{2b-S}	Fraction 2B Sample (µg)	7.1159	6.2235	7.3137	4.8649
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)	7.1159	6.2235	7.3137	4.8649
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)	7.1159	6.2235	7.3137	4.8649
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)	7.1159	6.2235	7.3137	4.8649
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 North 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 20	Mar 21	Mar 21	Mar 21
Start Time (approx.)		12:35	07:42	10:15	12:41
Stop Time (approx.)		14:50	09:54	12:27	14:52
Sample Analysis					
$m_{1b\text{-}S}$	Fraction 1B Sample (µg)	<0.1000	<0.1000	<0.1000	<0.1000
$m_{2b\text{-}S}$	Fraction 2B Sample (µg)	5.5468	6.7204	7.0073	6.8956
$m_{3a\text{-}S}$	Fraction 3A Sample (µg)	<0.2000	<0.2000	<0.2000	<0.2000
$m_{3b\text{-}S}$	Fraction 3B Sample (µg)	<0.5000	<0.5000	0.7794	<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)	5.5468	6.7204	7.7867	6.8956
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)	5.5468	6.7204	7.7867	6.8956
Sample Corrected for Blank - Prorated Fractions					
$m_{n\text{-}1b}$	Fraction 1B (µg)	<0.1000	<0.1000	<0.1000	<0.1000
$m_{n\text{-}2b}$	Fraction 2B (µg)	5.5468	6.7204	7.0073	6.8956
$m_{n\text{-}3a}$	Fraction 3A (µg)	<0.2000	<0.2000	<0.2000	<0.2000
$m_{n\text{-}3b}$	Fraction 3B (µg)	<0.5000	<0.5000	0.7794	<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
20209

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The following data for Analytical Report 20209
has been reviewed for completeness, accuracy,
adherence to method protocol,
and compliance with quality assurance guidelines.

Review by:

Daphne Woodman, Chemist
April 4, 2013

Report Reviewed and Finalized By:

Ken Smith, Laboratory Director
April 4, 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	3.03	< 0.1	3.02	< 0.2	< 0.5	< 0.4
	#2		< 0.1	3.03	< 0.2	< 0.5	< 0.4
U1 FF Outlet R2	#1	2.76	< 0.1	2.86	< 0.2	< 0.5	< 0.4
	#2		< 0.1	2.67	< 0.2	< 0.5	< 0.4
U1 FF Outlet R3	#1	2.53	< 0.1	2.55	< 0.2	< 0.6	< 0.4
	#2		< 0.1	2.51	< 0.2	< 0.6	< 0.4
U1 FF Outlet R4	#1	2.26	< 0.1	2.29	< 0.2	< 0.5	< 0.4
	#2		< 0.1	2.24	< 0.2	< 0.5	< 0.4
U2 FF Outlet R1	#1	7.12	< 0.1	7.15	< 0.2	< 0.5	< 0.4
	#2		< 0.1	7.08	< 0.2	< 0.5	< 0.4
U2 FF Outlet R2	#1	6.22	< 0.1	6.25	< 0.2	< 0.5	< 0.4
	#2		< 0.1	6.20	< 0.2	< 0.5	< 0.4
U2 FF Outlet R3	#1	7.31	< 0.1	7.33	< 0.2	< 0.5	< 0.4
	#2		< 0.1	7.30	< 0.2	< 0.5	< 0.4
U2 FF Outlet R4	#1	4.86	< 0.1	4.92	< 0.2	< 0.5	< 0.4
	#2		< 0.1	4.81	< 0.2	< 0.5	< 0.4
U3 FF Outlet R1	#1	5.55	< 0.1	5.56	< 0.2	< 0.5	< 0.4
	#2		< 0.1	5.54	< 0.2	< 0.5	< 0.4
U3 FF Outlet R2	#1	6.72	< 0.1	6.79	< 0.2	< 0.5	< 0.4
	#2		< 0.1	6.65	< 0.2	< 0.5	< 0.4
U3 FF Outlet R3	#1	7.79	< 0.1	6.98	< 0.2	0.793	< 0.4
	#2		< 0.1	7.03	< 0.2	0.766	< 0.4
U3 FF Outlet R4	#1	6.90	< 0.1	6.93	< 0.2	< 0.5	< 0.4
	#2		< 0.1	6.86	< 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-O-R1 e20209-1 Catch, mg	U1-FF-O-R2 e20209-2 Catch, mg	U1-FF-O-R3 e20209-3 Catch, mg
Filter	0.2	0.3	0.1
Rinse	1.2	1.3	1.7
Total PM	1.4	1.6	1.8

Unit 1 - Summary of Method 29 Metals Analysis

Element	U1 FF Outlet R1 e20209-1 Total µg	U1 FF Outlet R2 e20209-2 Total µg	U1 FF Outlet R2 e20209-2 dup Total µg	U1 FF Outlet R3 e20209-3 Total µg
Cadmium	< 0.2	0.271	0.287	< 0.2
Lead	0.639	0.515	0.516	0.561

Summary of Analysis

Unit 2 - Summary of Method 5 Particulate Analysis

Fraction	U2-FF-O-R1 e20209-5 Catch, mg	U2-FF-O-R2 e20209-6 Catch, mg	U2-FF-O-R3 e20209-7 Catch, mg
Filter	1.2	1.0	1.1
Rinse	2.1	0.6	2.3
Total PM	3.3	1.6	3.4

Unit 2 - Summary of Method 29 Metals Analysis

Element	U2 FF Outlet R1 e20209-5 Total µg	U2 FF Outlet R2 e20209-6 Total µg	U2 FF Outlet R2 e20209-6 dup Total µg	U2 FF Outlet R3 e20209-7 Total µg
Cadmium	1.20	1.16	1.07	0.950
Lead	8.35	11.1	10.3	7.58

Summary of Analysis

Unit 3 - Summary of Method 5 Particulate Analysis

Fraction	U3-FF-O-R1 e20209-9 Catch, mg	U3-FF-O-R2 e20209-10 Catch, mg	U3-FF-O-R3 e20209-11 Catch, mg
Filter	< 0.1	< 0.1	0.1
Rinse	1.6	1.2	1.7
Total PM	1.6	1.2	1.8

Unit 3 - Summary of Method 29 Metals Analysis

Element	U3 FF Outlet R1 e20209-9 Total µg	U3 FF Outlet R2 e20209-10 Total µg	U3 FF Outlet R2 e20209-10 dup Total µg	U3 FF Outlet R3 e20209-11 Total µg
Cadmium	< 0.2	< 0.2	< 0.2	< 0.2
Lead	0.407	0.454	0.496	0.502

Summary of Analysis

Blanks - Summary of Method 5 Particulate Analysis

Fraction	Field Blank e20209-13 Catch, mg	Reagent Blank e20209-14 Catch, mg
Filter	0.7	NA
Rinse	0.7	0.3
Total PM	1.4	0.3

Blanks - Summary of Method 29 Metals Analysis

Element	Field Blank e20209-13 Total µg	Reagent Blank e20209-14 Total µg
Cadmium	< 0.2	< 0.2
Lead	0.225	0.422

ANALYTICAL NARRATIVE

Element One Analytical Narrative

Client:	Clean Air, IL	Element One #:	20209
Client ID:	12218/North Broward	Analyst:	KLS, LAL, & DBW
Method:	Methods 29 & 5	Dates Received:	03/25/13
Analytes:	PM, Cd, Pb & Hg	Dates Analyzed:	03/27/13-04/02/13

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 limits 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	0.3%	NA	NA	NA
U1 FF Outlet R2	NA	6.7%	NA	NA	NA
U1 FF Outlet R3	NA	1.5%	NA	NA	NA
U1 FF Outlet R4	NA	2.2%	NA	NA	NA
U2 FF Outlet R1	NA	1.0%	NA	NA	NA
U2 FF Outlet R2	NA	0.8%	NA	NA	NA
U2 FF Outlet R3	NA	0.3%	NA	NA	NA
U2 FF Outlet R4	NA	2.3%	NA	NA	NA
U3 FF Outlet R1	NA	0.4%	NA	NA	NA
U3 FF Outlet R2	NA	2.0%	NA	NA	NA
U3 FF Outlet R3	NA	0.8%	NA	3.4%	NA
U3 FF Outlet R4	NA	1.0%	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	96%	99%	93%	93%	94%
	#2	96%	96%	92%	92%	91%
U2 FF Outlet R3	#1	93%	95%	93%	95%	97%
	#2	94%	96%	91%	94%	95%
U3 FF Outlet R3	#1	89%	92%	96%	87%	103%
	#2	88%	91%	94%	85%	101%

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	6.1%	8.2%	NA
Lead	0.3%	7.1%	8.9%

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	92%	100%	94%
Lead	103%	106%	102%

Second Source Calibration Check Recoveries

(QC limits: ±10% for Second Source Continuing Check Standard)*

Element	1 ppb	50 ppb	100 ppb*	250 ppb
Cadmium	104%	98%	100%	103%
Lead	106%	103%	104%	101%

SAMPLE CUSTODY

20209

66-12218NB-9

CLIENT: Wheelabrator
PLANT: North Broward
PROJECT MANAGER: S. Brown
PROJECT: 12218NB
DEPT.: 66

CleanAir Engineering
300 West Wood Street
Palatine, IL 60067
800-627-0030 (phone)
847-991-3389 (fax)

ANALYTICAL METHOD	CONTAINER NUMBER	SAMPLE FRACTION
USEPA M-5/29	1	QUARTZ FILTER PETRI DISH

LAB ID NUMBER	DATE (2013)	TEST LOCATION	RUN NUMBER	SAMPLE MATRIX	NUMBER OF CONTAINERS	CONTAINER SEALED? LIQUID LEVEL MARKED?	ANALYSIS REQUESTED: Gravimetric	Metals	Mercury	Archive	ADDITIONAL INFORMATION
	3/19	Unit 1 FF Outlet	1	Quartz Filter No. 645-03	1		X	X	X		Metals include: Cadmium (Cd) Lead (Pb)
	3/20	Unit 1 FF Outlet	2	Quartz Filter No. 645-04	1		X	X	X		
	3/20	Unit 1 FF Outlet	3	Quartz Filter No. 645-05	1		X	X	X		
	3/20	Unit 1 FF Outlet	4	Quartz Filter	1				X		
		FF Outlet	Field Blank	Quartz Filter No. 645-06	1			X	X		
	3/19	Unit 2 FF Outlet	1	Quartz Filter No. 644-43	1		X	X	X		
	3/19	Unit 2 FF Outlet	2	Quartz Filter No. 645-01	1		X	X	X		
	3/19	Unit 2 FF Outlet	3	Quartz Filter No. 645-02	1		X	X	X		
	3/21	Unit 2 FF Outlet	4	Quartz Filter	1				X		
	3/20	Unit 3 FF Outlet	1	Quartz Filter No. 645-05	1		X	X	X		
	3/21	Unit 3 FF Outlet	2	Quartz Filter No. 645-07	1		X	X	X		
	3/21	Unit 3 FF Outlet	3	Quartz Filter No. 645-08	1		X	X	X		
	3/21	Unit 3 FF Outlet	4	Quartz Filter 645-	1				X		Combined Fractions

FORWARDING LAB
Element One, Inc
3339 D Carolina Beach Road
Wilmington, NC 28412
910-793-0128 (phone)
910-792-6053 (fax)

Relinquished By: (signature)	Date / Time	Relinquished By: (signature)	Date / Time	Relinquished By: (signature)	Date / Time
S. Brown					
Received By: (signature)	Date / Time	Received By: (signature)	Date / Time	Relinquished By: (signature)	Date / Time
Paula Smith Fisher	3-25-13 1138				

This form completed by: S. Brown
Signature Date

All samples for CAE 12218 NB rec. in good condition in Fisher Brand + QEC Level 2 containers
No empty received. PS 3-25-13 Rec. via Fedex

20209

CLIENT	Wheelabrator	PROJECT	12218NB	68-12218NB-10
PLANT	North Broward	DEPT.	68	
PROJECT MANAGER	S. Brown			

ANALYTICAL METHOD	CONTAINER NUMBER	SAMPLE FRACTION
USEPA M-5/29	2	FRONT HALF ACETONE RINSE 250 mL CLEAR GLASS

CleanAir Engineering
500 West Wood Street
Palatine, IL 60067
800-627-0033 (phone)
847-991-3385 (fax)

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
											Metals include:
	3/20	Unit 1 FF Outlet	1	Front Half Acetone Rinse, 250 mL Clear Glass	1		X	X	X		Cadmium (Cd) Lead (Pb)
	3/20	Unit 1 FF Outlet	2	Front Half Acetone Rinse, 250 mL Clear Glass	1		X	X	X		
	3/20	Unit 1 FF Outlet	3	Front Half Acetone Rinse, 250 mL Clear Glass	1		X	X	X		
	3/21	Field Blank	FB	Front Half Acetone Rinse, 250 mL Clear Glass	1		X	X	X		
	3/19	Unit 2 FF Outlet	1	Front Half Acetone Rinse, 250 mL Clear Glass	1		X	X	X		
	3/19	Unit 2 FF Outlet	2	Front Half Acetone Rinse, 250 mL Clear Glass	1		X	X	X		
	3/19	Unit 2 FF Outlet	3	Front Half Acetone Rinse, 250 mL Clear Glass	1		X	X	X		
	3/20	Unit 3 FF Outlet	1	Front Half Acetone Rinse, 250 mL Clear Glass	1		X	X	X		
	3/21	Unit 3 FF Outlet	2	Front Half Acetone Rinse, 250 mL Clear Glass	1		X	X	X		Combined Fractions
	3/21	Unit 3 FF Outlet	3	Front Half Acetone Rinse, 250 mL Clear Glass	1		X	X	X		

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S. Brown						S. Brown
Received By: (signature)	**Date / Time**	**Received By: (signature)**	**Date / Time**	**Relinquished By: (signature)**	**Date / Time**	**Signature / Date**
Paul Smith	3-25-13 1138					

20209

66-12218NB-11

CLIENT: Wheelabrator
PLANT: North Broward
PROJECT MANAGER: S. Brown
PROJECT: 12218NB
DEPT: 66

CleanAir Engineering
502 West Wood Street
Palatine, IL 60067
800-627-0333 (phone)
847-991-3385 (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.
8319-D Carolina Beach Road
Wilmington, NC 28412
910-793-0126 (phone)
910-792-8853 (fax)

LAB ID NUMBER	DATE (2013)	TEST LOCATION	RUN NUMBER	SAMPLE MATRIX	NUMBER OF CONTAINERS	CONTAINER SEALED? LIQUID LEVEL MARKED?	ANALYSIS REQUESTED: Gravimetric	Metals	Mercury	Archive	ADDITIONAL INFORMATION
	3/18	Unit 1 FF Outlet	1	Front Half HNO_3 Rinse, 250 mL HDLP	1		X	X			
	3/20	Unit 1 FF Outlet	2	Front Half HNO_3 Rinse, 250 mL HDLP	1		X	X			
	3/20	Unit 1 FF Outlet	3	Front Half HNO_3 Rinse, 250 mL HDLP	1		X	X			
	3/20	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			
	3/19	Unit 2 FF Outlet	1	Front Half HNO_3 Rinse, 250 mL HDLP	1		X	X			
	3/19	Unit 2 FF Outlet	2	Front Half HNO_3 Rinse, 250 mL HDLP	1		X	X			
	3/19	Unit 2 FF Outlet	3	Front Half HNO_3 Rinse, 250 mL HDLP	1		X	X			
	3/21	Unit 2 FF Outlet	4	Front Half HNO_3 Rinse, 250 mL HDLP	1			X			
	3/20	Unit 3 FF Outlet	1	Front Half HNO_3 Rinse, 250 mL HDLP	1		X	X			
	3/21	Unit 3 FF Outlet	2	Front Half HNO_3 Rinse, 250 mL HDLP	1		X	X			
	3/21	Unit 3 FF Outlet	3	Front Half HNO_3 Rinse, 250 mL HDLP	1		X	X			
	3/21	Unit 3 FF Outlet	4	Front Half HNO_3 Rinse, 250 mL HDLP	1			X			Composite Fractions

Metals include:
Cadmium (Cd)
Lead (Pb)

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S. Brown						S. Brown
Received By: (signature)	Date / Time	Received By: (signature)	Date / Time	Relinquished By: (signature)	Date / Time	Signature / Date
Paula Stuart	3-25-13 1138					

20209

CLIENT	Wheelabrator
PLANT	North Broward
PROJECT MANAGER	S. Brown
PROJECT	12216NB
DEPT.	60
	66-12216NB-12

CleanAir
500 West Wood Street
Palatine, IL 60067
800-627-0033 (phone)
847-991-3569 (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.
5319-D Carolina Beach Road
Wilmington, NC 28412
910-793-0128 (phone)
910-792-0953 (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
	3/19	Unit 1 FF Outlet	1	Impingers 1-3 Catch and Rinse, 1000 mL HDLP	1		X	X			
	3/20	Unit 1 FF Outlet	2	Impingers 1-3 Catch and Rinse, 1000 mL HDLP	1		X	X			
	3/20	Unit 1 FF Outlet	3	Impingers 1-3 Catch and Rinse, 1000 mL HDLP	1		X	X			Metals include: Cadmium (Cd) Lead (Pb)
	3/20	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			
	3/19	Unit 2 FF Outlet	1	Impingers 1-3 Catch and Rinse, 1000 mL HDLP	1		X	X			
	3/19	Unit 2 FF Outlet	2	Impingers 1-3 Catch and Rinse, 1000 mL HDLP	1		X	X			
	3/19	Unit 2 FF Outlet	3	Impingers 1-3 Catch and Rinse, 1000 mL HDLP	1		X	X			
	3/21	Unit 2 FF Outlet	4	Impingers 1-3 Catch and Rinse, 1000 mL HDLP	1			X			
	3/20	Unit 3 FF Outlet	1	Impingers 1-3 Catch and Rinse, 1000 mL HDLP	1		X	X			
	3/21	Unit 3 FF Outlet	2	Impingers 1-3 Catch and Rinse, 1000 mL HDLP	1		X	X			
	3/21	Unit 3 FF Outlet	3	Impingers 1-3 Catch and Rinse, 1000 mL HDLP	1		X	X			
	3/21	Unit 3 FF Outlet	4	Impingers 1-3 Catch and Rinse, 1000 mL HDLP	1			X			Combined Fractions

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[signature]	3-25-13 1138					

20209

66-12218NS-13

CLIENT: Wheelabrator
PLANT: North Broward
PROJECT MANAGER: S. Brown
PROJECT: 12218NB
DEPT: 66

CleanAir Engineering
500 West Wood Street
Palatine, IL 60067
800-627-6033 (phone)
847-991-3368 (fax)

ANALYTICAL METHOD	CONTAINER NUMBER	SAMPLE FRACTION
USEPA M-5/29	5A	IMPINGER 4 CATCH AND RINSE 250 mL HDLP

LAB ID NUMBER	DATE (2013)	TEST LOCATION	RUN NUMBER	SAMPLE MATRIX	NUMBER OF CONTAINERS	CONTAINER SEALED? LIQUID LEVEL MARKED?	ANALYSIS REQUESTED: Gravimetric	Metals	Mercury	Archive	ADDITIONAL INFORMATION
	3/19	Unit 1 FF Outlet	1	Impinger 4 Catch and Rinse, 250 mL HDLP	1			X			
	3/20	Unit 1 FF Outlet	2	Impinger 4 Catch and Rinse, 250 mL HDLP	1			X			
	3/20	Unit 1 FF Outlet	3	Impinger 4 Catch and Rinse, 250 mL HDLP	1			X			
	3/20	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			
	3/19	Unit 2 FF Outlet	1	Impinger 4 Catch and Rinse, 250 mL HDLP	1			X			
	3/19	Unit 2 FF Outlet	2	Impinger 4 Catch and Rinse, 250 mL HDLP	1			X			
	3/19	Unit 2 FF Outlet	3	Impinger 4 Catch and Rinse, 250 mL HDLP	1			X			
	3/21	Unit 2 FF Outlet	4	Impinger 4 Catch and Rinse, 250 mL HDLP	1			X			
	3/20	Unit 3 FF Outlet	1	Impinger 4 Catch and Rinse, 250 mL HDLP	1			X			
	3/21	Unit 3 FF Outlet	2	Impinger 4 Catch and Rinse, 250 mL HDLP	1			X			
	3/21	Unit 3 FF Outlet	3	Impinger 4 Catch and Rinse, 250 mL HDLP	1			X			
	3/21	Unit 3 FF Outlet	4	Impinger 4 Catch and Rinse, 250 mL HDLP	1			X			Combined Fractions

FORWARDING LAB
Element One, Inc.
6319-D Carolina Beach Road
Wilmington, NC 28412
910-793-0126 (phone)
910-793-6093 (fax)

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S. Brown						S. Brown
Received By: (signature)	Date / Time	Received By: (signature)	Date / Time	Relinquished By: (signature)	Date / Time	Signature / Date
	3/25/13 1138					

20209

CLIENT	Wheelabrator	PROJECT	12218NB
PLANT	North Broward	DEPT.	66
PROJECT MANAGER	S. Brown		

CleanAir Engineering
500 West Wood Street
Palatine, IL 60067
800-627-0033 (phone)
847-991-9385 (fax)

SS-12218NB-14

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.
5318-D Carolina Beach Road
Wilmington, NC 28412
910-793-0138 (phone)
910-792-6853 (fax)

LAB ID NUMBER	DATE (2013)	TEST LOCATION	RUN NUMBER	SAMPLE MATRIX	NUMBER OF CONTAINERS	CONTAINER SEALED? LIQUID LEVEL MARKED?	ANALYSIS REQUESTED: Gravimetric	Metals	Mercury	Archive	ADDITIONAL INFORMATION
	3/19	Unit 1 FF Outlet	1	Impingers 5-6 Catch and Rinse, 950 mL Amber Glass	1			X			
	3/20	Unit 1 FF Outlet	2	Impingers 5-6 Catch and Rinse, 950 mL Amber Glass	1			X			
	3/20	Unit 1 FF Outlet	3	Impingers 5-6 Catch and Rinse, 950 mL Amber Glass	1			X			
	3/20	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			
	3/19	Unit 2 FF Outlet	1	Impingers 5-6 Catch and Rinse, 950 mL Amber Glass	1			X			
	3/19	Unit 2 FF Outlet	2	Impingers 5-6 Catch and Rinse, 950 mL Amber Glass	1			X			
	3/19	Unit 2 FF Outlet	3	Impingers 5-6 Catch and Rinse, 950 mL Amber Glass	1			X			
	3/21	Unit 2 FF Outlet	4	Impingers 5-6 Catch and Rinse, 950 mL Amber Glass	1			X			
	3/20	Unit 3 FF Outlet	1	Impingers 5-6 Catch and Rinse, 950 mL Amber Glass	1			X			
	3/21	Unit 3 FF Outlet	2	Impingers 5-6 Catch and Rinse, 950 mL Amber Glass	1			X			
	3/21	Unit 3 FF Outlet	3	Impingers 5-6 Catch and Rinse, 950 mL Amber Glass	1			X			
	3/21	Unit 3 FF Outlet	4	Impingers 5-6 Catch and Rinse, 950 mL Amber Glass	1			X			Combined Fractions

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S. Brown						S. Brown
Received By: (signature)	Date / Time	Received By: (signature)	Date / Time	Relinquished By: (signature)	Date / Time	Signature / Date
	3/25/13 1130					

20209

66-12218NB-15

CLIENT	Wheelabrator	PROJECT	12218NB
PLANT	North Broward	DEPT.	66
PROJECT MANAGER	S. Brown		

CleanAir Engineering
905 West Wood Street
Palatine, IL 60067
800-627-2039 (phone)
847-991-3389 (fax)

ANALYTICAL METHOD	CONTAINER NUMBER	SAMPLE FRACTION
USEPA M-6/29	5C	IMPINGERS 5-6 8N HCL RINSE 250 mL AMBER GLASS

LAB ID NUMBER	DATE (2013)	TEST LOCATION	RUN NUMBER	SAMPLE MATRIX	NUMBER OF CONTAINERS	CONTAINER SEALED? LIQUID LEVEL MARKED?	ANALYSIS REQUESTED: Gravimetric	Metals	Mercury	Archive	ADDITIONAL INFORMATION
	3/19	Unit 1 FF Outlet	1	Impingers 5-6 8N HCl Rinse, 250 mL Amber Glass	1				X		
	3/20	Unit 1 FF Outlet	2	Impingers 5-6 8N HCl Rinse, 250 mL Amber Glass	1				X		
	3/20	Unit 1 FF Outlet	3	Impingers 5-6 8N HCl Rinse, 250 mL Amber Glass	1				X		
	3/20	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		
	3/19	Unit 2 FF Outlet	1	Impingers 5-6 8N HCl Rinse, 250 mL Amber Glass	1				X		
	3/19	Unit 2 FF Outlet	2	Impingers 5-6 8N HCl Rinse, 250 mL Amber Glass	1				X		
	3/19	Unit 2 FF Outlet	3	Impingers 5-6 8N HCl Rinse, 250 mL Amber Glass	1				X		
	3/21	Unit 2 FF Outlet	4	Impingers 5-6 8N HCl Rinse, 250 mL Amber Glass	1				X		
	3/20	Unit 3 FF Outlet	1	Impingers 5-6 8N HCl Rinse, 250 mL Amber Glass	1				X		
	3/21	Unit 3 FF Outlet	2	Impingers 5-6 8N HCl Rinse, 250 mL Amber Glass	1				X		
	3/21	Unit 3 FF Outlet	3	Impingers 5-6 8N HCl Rinse, 250 mL Amber Glass	1				X		
	3/21	Unit 3 FF Outlet	4	Impingers 5-6 8N HCl Rinse, 250 mL Amber Glass	1				X		Combined Fractions

Relinquished By: (signature)	Date / Time	Relinquished By: (signature)	Date / Time	Relinquished By: (signature)	Date / Time	This form completed by:
S. Brown						S. Brown
Received By: (signature)	**Date / Time**	**Received By: (signature)**	**Date / Time**	**Relinquished By: (signature)**	**Date / Time**	**Signature / Date**
[signature]	3-25-13 1138					

20209

CLIENT: Wheelabrator
PLANT: North Broward
PROJECT MANAGER: S. Brown
PROJECT: 12218NB
DEPT: 66

68-12218NB-16

CleanAir ENGINEERING
600 West Wood Street
Palatine, IL 60067
708-627-0033 (phone)
847-991-3285 (fax)

FORWARDING LAB
Element One, Inc.
6316-D Carolina Beach Road
Wilmington, NC 28412
910-793-0135 (phone)
910-792-6853 (fax)

ANALYTICAL METHOD	CONTAINER NUMBER	SAMPLE FRACTION
USEPA M-5/29	SEE BELOW (IF APPLICABLE)	REAGENT BLANKS

LAB ID NUMBER	DATE (2013)	TEST LOCATION	RUN NUMBER	SAMPLE MATRIX	NUMBER OF CONTAINERS	CONTAINER SEALED? LIQUID LEVEL MARKED?	ANALYSIS REQUESTED: Gravimetric	Metals	Mercury	Archive	ADDITIONAL INFORMATION
	3/19	Reagent Blank	All	Acetone (200 mL), Container 7; 250 mL Clear Glass	1		X	X	X		Metals reqd: Cadmium (Cd) Lead (Pb)
	3/19	Reagent Blank	All	3.1 N HNO_3 (500 mL), Container 8A: 1000 mL HDPE	1			X	X		
	3/19	Reagent Blank	All	DI Water (100 mL), Container 8B: 250 mL HDPE	1			X	X		
	3/19	Reagent Blank	All	5% HNO_3 / 10% H_2O_2 (200 mL), Container 9: 250 mL HDPE	1			X	X		
	3/19	Reagent Blank	All	4% $KMnO_4$ / 10% H_2SO_4 (100 mL), Container 10: 250 mL Amber Glass	1				X		
	3/19	Reagent Blank	All	DI Water (200 mL) / 6N HCl (25 mL), Container 11: 250 mL Amber Glass	1				X		
	3/19	Reagent Blank	All	Quartz Fibers (3), Container 17: 250 mL HDPE	1			X	X		

Also rec. Prep Blank
Acetone + FH HNO_3
Archive- per SW 3-25-13

Relinquished By: (signature)	Date / Time	Relinquished By: (signature)	Date / Time	Relinquished By: (signature)	Date / Time	This form completed by:
S. Brown						S. Brown
Received By: (signature)	Date / Time	Received By: (signature)	Date / Time	Relinquished By: (signature)	Date / Time	Signature / Date
[signature]	3-25-13 1138					

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-

$$\textbf{Spike (\%)} = \frac{\textbf{(Spiked Result (µg/L) – Sample Result (µg/L))}}{\textbf{Spike Amount (µg/L)}} \textbf{ X100}$$

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-

$$\textbf{RPD (\%)} = \frac{\textbf{(Duplicate Result (µg/L) - Sample Result (µg/L))}}{\textbf{Average (µg/L)}} \textbf{ X100}$$

Where-

Sample Result =Raw sample concentration (ppb)--*ICP-Data Sheet*

Duplicate Results=Raw sample concentration (ppb)--*ICP-Data Sheet*

Average= $\frac{\textit{(Duplicate + Sample Results)}}{2}$

element One **AIR TESTING SAMPLE SUBMISSION FORM** **Lab ID 20209**

FH / BH Combined

Analysis Due Date 04.02.13
QA/QC/Report Due Date 04.04.13

Client	Clean Air IL
Project No	12218 NB

Date Rec	03.25.13
Time Rec	1138

HNO_3 Lot: 111210	HF Lot: 638417	HCl Lot: 4112070	**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, 13-14 PM (Gravimetric on C2 Field Blank)

Runs / FB	Fil / Ace (FH) pH <2.0 Y / N		HNO_3 (FH) pH <2.0 (Y) / N		5% HNO_3/10% H_2O_2 (BH) pH <2.0 Y / N			HNO_3 (A) pH <2.0 (Y) / N		$KMnO_4$ (B) pH <2.0 (Y) / N		HCl (C) 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	45-02	186	190	100	730	365	50	110	200	375	500	220	400
2.D	45-04	110	125		770	385	↓	104		440	↓	220	
3.S	45-05	66	100		740	370	3-26-13	112		510	600	200	
4			185		750	740		108		365	500	200	
5	44-43	106	110		680	340	50	104		345		220	
6.D	45-01	98	140		660	330	↓	109		375		230	
7.S	45-03	120	100		680	340	↓	104		430		210	
8			160		750			108		385		210	
9	45-06	154	175		720	360	50	106		380		210	
10.D	45-07	80	105		700	350	↓	112		365		210	
11.S	45-09	100	130		690	345	↓	109		440		220	
12			95		710	3		106		430		210	
13	45-08		160	↓	300	150	50	102	↓	320	↓	230	↓

M-29 Reagent Blank

Lab ID	Fraction			BV, ml	FV, ml	Comments
14	C 7	FH	Acetone			
	C 8A	FH	0.1N HNO_3	325	100	Used 100 ml
	C 8A	A	0.1N HNO_3	325		
	C 8B	B	DI H_2O	245	100/33	Used 33 ml
	C 9	BH	5% HNO_3/10% H_2O_2	230	50	Used 115 ml
	C 10	B	4% $KMnO_4$/10%H_2SO_4	152	100/33	Used 100 ml
	C 11	C	8N HCl DI H_2O	240	400	
	C 12	FH	Filter			

Lab Communications (Continued on Sample Submission Page 2)
M29: Received C1, C2, C3, C4; C5A, C5B, C5C; RB C12, C7, C8A, C8B, C9, C10, C11—03.25.13 PDS----

SS Page 1 of 2
3/25/2013 3:53:24 PM
SS by
Labeled By/Date PDS 3.25.13

FH Prep By/Date LAL 3.29.13 A Prep By/Date LAL 3-26-13
BH Prep By/Date LAL (BH) 3-26-13 B Prep By/Date JWL 3-26-13
BH/FH Prep By/Date CAL 3-29-13 C Prep By/Date LAL 3-29-13
PM Prep By / Date LAL 3-26-13 ID Verification By/Date JWL 3-25-13

elementOne **Method 5 Particulate** Lab # 20209

Client Clean Air Page 1 of 2

Balance checks Date: 03.27.13 2 g = 1.9999
Date: 03.28.13 2 g = 2.0000
Date: 03.29.13 2 g = 2.0000

Acetone Concentration 9.51E-06 mg/mg

Filters

Sample ID #	Filter ID	Tin ID	A	B		B		B		
			Filter Tare, g	Date - 03.27.13 Initials - LAL		Date - 03.28.13 Initials - LAL		Date Initials		Catch Description and Loading
				Time	Filter Weight, g	Time	Filter Weight, g	Time	Filter Weight, g	
20209-1	e45-02	T-39	0.3471	12:30	0.3474	2:30	0.3473			
20209-2	e45-04	T-23	0.3358	12:30	0.3361	2:30	0.3362			
20209-3	e45-05	T-45	0.3404	12:30	0.3408	2:30	0.3405			
20209-5	e44-43	T-09	0.3403	12:30	0.3416	2:30	0.3416			
20209-6	e45-01	T-32	0.3378	12:30	0.3390	2:30	0.3388			
20209-7	e45-03	T-22	0.3464	12:30	0.3477	2:30	0.3475			
Client Blk										
E1 Blank										

Acetone Rinses

Sample ID #	Sample Volume, ml	Bag ID	C	D		D		D		
			Bag Tare, g	Date - 03.27.13 Initials - LAL		Date - 03.28.13 Initials - LAL		Date 03.25.13 Initials LAL		Catch Description and Loading
				Time	Bag & Sample Weight, g	Time	Bag & Sample Weight, g	Time	Bag & Sample Weight, g	
20209-1	186	501	10.4747	12:30	10.4767	2:30	10.4759	8:00	10.4759	
20209-2	110	X53	10.2552	12:30	10.2570	2:30	10.2565			
20209-3	66	515	10.1615	12:30	10.1642	2:30	10.1634	8:00	10.1632	
20209-5	106	X58A	10.6945	12:30	10.6970	2:30	10.6966			
20209-6	98	X87	10.7179	12:30	10.7191	2:30	10.7185	8:00	10.7185	
20209-7	120	X46	10.1789	12:30	10.1821	2:30	10.1812	8:00	10.1812	
Client Ace Blk	158	622	10.2810	12:30	10.2813	2:30	10.2814			
E1 Acetone Blank	100	625	10.2297	12:30	10.2296	2:30	10.2295			

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
20209-1	e45-02	0.3471	0.3473	0.2		501	10.4747	10.4759	1.2	1.4
20209-2	e45-04	0.3358	0.3361	0.3		X53	10.2552	10.2565	1.3	1.6
20209-3	e45-05	0.3404	0.3405	0.1		515	10.1615	10.1632	1.7	1.8
20209-5	e44-43	0.3403	0.3415	1.2		X58A	10.6945	10.6966	2.1	3.3
20209-6	e45-01	0.3378	0.3388	1.0		X87	10.7179	10.7185	0.6	1.6
20209-7	e45-03	0.3464	0.3475	1.1		X46	10.1789	10.1812	2.3	3.4
Client Blk						622	10.2810	10.2813	0.3	0.3
E1 Blank						625	10.2297	10.2295	< 0.1	< 0.1

Element One, Inc. Form 122 - Revision 2.01.24.12

elementOne **Method 5 Particulate** Lab # 20209

Client Clean Air Page 2 of 2

Balance checks Date: 03.27.13 2 g = 1.9999
Date: 03.28.13 2 g = 2.0000
Date: 03.29.13 2 g = 2.0000

Acetone Concentration 9.51E-06 mg/mg

Filters

Sample ID #	Filter ID	Tin ID	A	B		B		B		
			Filter Tare, g	Date - 03.27.13 Initials - LAL		Date - 03.28.13 Initials - LAL		Date Initials		Catch Description and Loading
				Time	Filter Weight, g	Time	Filter Weight, g	Time	Filter Weight, g	
20209-9	e45-06	T-14	0.3439	12:30	0.3435	2:30	0.3435			
20209-10	e45-07	T-01	0.3437	12:30	0.3435	2:30	0.3434			
20209-11	e45-09	T-83	0.3401	12:30	0.3402	2:30	0.3403			
20209-13	e45-08	T-88	0.3411	12:30	0.3418	2:30	0.3420			
Client Blk-14										
E1 Blank										

Acetone Rinses

Sample ID #	Sample Volume, ml	Bag ID	C	D		D		D		
			Bag Tare, g	Date - 03.27.13 Initials - LAL		Date - 03.28.13 Initials - LAL		Date Initials		Catch Description and Loading
				Time	Bag & Sample Weight, g	Time	Bag & Sample Weight, g	Time	Bag & Sample Weight, g	
20209-9	154	683	10.3486	12:30	10.3506	2:30	10.3502			
20209-10	80	662	10.0780	12:30	10.0794	2:30	10.0792			
20209-11	100	615	10.4689	12:30	10.4710	2:30	10.4706			
20209-13	60	581	10.2619	12:30	10.2628	2:30	10.2626			
Client Blk-14	158	622	10.2810	12:30	10.2813	2:30	10.2814			
E1 Acetone Blank	100	625	10.2297	12:30	10.2298	2:30	10.2295			

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
20209-9	e45-06	0.3439	0.3435	< 0.1		683	10.3486	10.3502	1.6	1.6
20209-10	e45-07	0.3437	0.3434	< 0.1		662	10.078	10.0792	1.2	1.2
20209-11	e45-09	0.3401	0.3402	0.1		615	10.4689	10.4706	1.7	1.8
20209-13	e45-08	0.3411	0.3418	0.7		581	10.2619	10.2626	0.7	1.4
Client Blk-14						622	10.2810	10.2813	0.3	0.3
E1 Blank						625	10.2297	10.2295	< 0.1	< 0.1

Element One, Inc. Form 123 - Revision 2.01.24.12

elementOne **Method 29 Microwave Worksheet** Lab ID # e 20209

Client: Olean air

Date Digested: 3-29-13 Initials: ADS Worksheet Prepared by: ADS

Auto Sample Loc.	Sample Lab ID	Sample Weight (g)	# of filters digested	Spike	Prep Volume (ml)	Weight In Micro / Weight Out Micro	Units
	LRB						
	LRB +						
	20209-1		1				
	-2						
	-3						
	-5						
	-6						
	-7						
	-9						
	-10						
	-11						
	-13						
	-14						
	-4				ADS		
	-8						
	-12						

2mLs HF (5112070), 6mL HNO_3 (1112110)
LRB + spiked w/ 100uL of 25ppm std A

Element One, Inc. Form 104 - Revision 1.0

Sample/Batch Report

Dapl UL 4/3/13

User Name: icp
Computer Name: ICP-MS
Sample File: C:\elandata_icp\Sample\Y2.sam
Report Date/Time: Wednesday, April 03, 2013 08:30:09

A/S Loc.	Batch ID	Sample ID	Description	Sample Type	Init. Quant.	Prep. Vol.	Aliquot Vol.	Diluted Vol.	Solids Ratio
5		QC Std 2		Sample					
403	x5	20217-1		Sample					
404	x5d	20217-1		Duplicate of 2					
405	x5	20217-2		Sample					
406	x5s	20217-2		Spike - 3 of 4					
1		QC std 1		Sample					
3		QC std 4		Sample					
5		QC Std 2		Sample					
203		20209-1		Sample					
204		20209-2		Sample					
205	d	20209-2		Duplicate of 10					
206		20209-3		Sample					
207	s	20209-3		Spike - 1 of 12					
208		20209-5		Sample					
209		20209-6		Sample					
210	d	20209-6		Duplicate of 15					
211		20209-7		Sample					
212	s	20209-7		Spike - 1 of 17					
213		20209-9		Sample					
214		20209-10		Sample					
215	d	20209-10		Duplicate of 20					
216		20209-11		Sample					
217	s	20209-11		Spike - 1 of 22					
218		20209-13		Sample					
219		20209-14		Sample					
220		20209-10		Sample					
221	d	20209-10		Duplicate of 26					
222		20209-13		Sample					
223		20209-14		Sample					

Dataset Report

User Name: icp
Computer Name: ICP-MS
Dataset File Path: C:\elandata_icp\DataSet\040213-4\
Report Date/Time: Wednesday, April 03, 2013 08:30:04

4/3/13

Autosampler Position: 223

The Dataset

Time	Sample ID	Batch ID	Read Type	Description	Init. Quant	Prep. Vol.	Aliquot. Vol.	Diluted Vol
13:45:24 Tue 02-Apr-13	Blank		Blank					
13:48:24 Tue 02-Apr-13	Standard 1		Standard #1					
13:50:24 Tue 02-Apr-13	Standard 2		Standard #2					
13:52:24 Tue 02-Apr-13	Standard 3		Standard #3					
13:54:25 Tue 02-Apr-13	QC Std 1		QC Std #1					
13:56:25 Tue 02-Apr-13	QC Std 2		QC Std #2					
13:58:26 Tue 02-Apr-13	QC Std 3		QC Std #3					
14:00:26 Tue 02-Apr-13	QC Std 4		QC Std #4					
14:02:27 Tue 02-Apr-13	QC Std 5		QC Std #5					
14:04:27 Tue 02-Apr-13	QC Std 6		QC Std #6					
14:06:27 Tue 02-Apr-13	QC Std 7		QC Std #7					
14:08:29 Tue 02-Apr-13	QC Std 9		QC Std #9					
14:10:29 Tue 02-Apr-13	QC Std 10		QC Std #10					
14:12:31 Tue 02-Apr-13	QC Std 2		Sample					
14:14:34 Tue 02-Apr-13	20217-1	x5	Sample					
14:16:34 Tue 02-Apr-13	20217-1	x5d	Duplicate of 15					
14:18:34 Tue 02-Apr-13	20217-2	x5	Sample					
14:20:34 Tue 02-Apr-13	20217-2	x5s	Spike - 3 of 17					
14:22:36 Tue 02-Apr-13	QC std 1		Sample					
14:24:36 Tue 02-Apr-13	QC std 4		Sample					
14:26:37 Tue 02-Apr-13	Blank		Blank					
14:28:08 Tue 02-Apr-13	Standard 1		Standard #1					
14:29:35 Tue 02-Apr-13	Standard 2		Standard #2					
14:31:04 Tue 02-Apr-13	Standard 3		Standard #3					
14:32:33 Tue 02-Apr-13	QC Std 1		QC Std #1					
14:34:02 Tue 02-Apr-13	QC Std 2		QC Std #2					
14:35:31 Tue 02-Apr-13	QC Std 3		QC Std #3					
14:37:02 Tue 02-Apr-13	QC Std 4		QC Std #4					
14:38:32 Tue 02-Apr-13	QC Std 5		QC Std #5					
14:40:01 Tue 02-Apr-13	QC Std 6		QC Std #6					
14:41:30 Tue 02-Apr-13	QC Std 7		QC Std #7					
14:43:00 Tue 02-Apr-13	QC Std 9		QC Std #9					
14:44:29 Tue 02-Apr-13	QC Std 10		QC Std #10					
14:46:00 Tue 02-Apr-13	QC Std 2		Sample					
14:47:31 Tue 02-Apr-13	20209-1		Sample					
14:49:00 Tue 02-Apr-13	20209-2		Sample					
14:50:29 Tue 02-Apr-13	20209-2	d	Duplicate of 36					
14:52:01 Tue 02-Apr-13	QC Std 1		QC Std #1					
14:53:30 Tue 02-Apr-13	QC Std 4		QC Std #4					
14:55:01 Tue 02-Apr-13	20209-3		Sample					
14:56:30 Tue 02-Apr-13	20209-3	s	Spike - 1 of 40					
14:57:59 Tue 02-Apr-13	20209-5		Sample					
14:59:28 Tue 02-Apr-13	20209-6		Sample					

15:00:57 Tue 02-Apr-13	20209-6	d	Duplicate of 43
15:02:26 Tue 02-Apr-13	20209-7		Sample
15:03:55 Tue 02-Apr-13	20209-7	s	Spike - 1 of 45
15:05:24 Tue 02-Apr-13	20209-9		Sample
15:06:53 Tue 02-Apr-13	20209-10		Sample
15:08:22 Tue 02-Apr-13	20209-10	d	Duplicate of 48
15:09:53 Tue 02-Apr-13	QC Std 1		QC Std #1
15:11:22 Tue 02-Apr-13	QC Std 4		QC Std #4
15:12:54 Tue 02-Apr-13	20209-11		Sample
15:14:23 Tue 02-Apr-13	20209-11	s	Spike - 1 of 52
15:15:52 Tue 02-Apr-13	20209-13		Sample
15:17:21 Tue 02-Apr-13	20209-14		Sample
15:18:52 Tue 02-Apr-13	QC Std 1		QC Std #1
15:20:21 Tue 02-Apr-13	QC Std 4		QC Std #4
08:19:43 Wed 03-Apr-13	20209-10		Sample
08:21:12 Wed 03-Apr-13	20209-10	d	Duplicate of 58
08:22:41 Wed 03-Apr-13	20209-13		Sample
08:24:09 Wed 03-Apr-13	20209-14		Sample
08:25:42 Wed 03-Apr-13	QC Std 1		QC Std #1
08:27:11 Wed 03-Apr-13	QC Std 4		QC Std #4

elementOne
Analyst:--DBW--

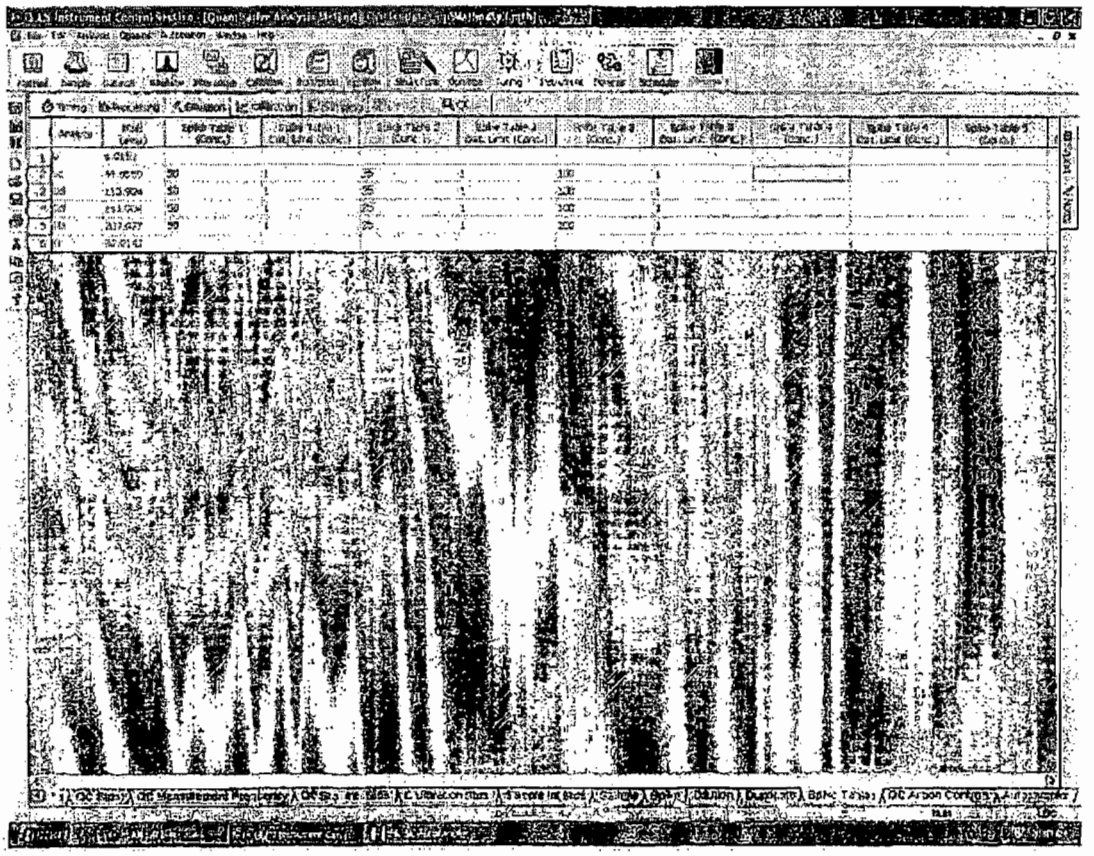
ICP-MS RUN SHEET
4/3/2013

Job Number:
14

A/S Loc.	Dilution	Sample ID	Client	Type	Weight (g)	Prep Vol (ml)
5		QC Std 2		Sample		
203		20209-1		Sample		100x2
204		20209-2		Sample		100x2
205	d	20209-2		Duplicate of 10		100x2
206		20209-3		Sample		100x2
207	s	20209-3		Spike - 1 of 12		100x2
208		20209-5		Sample		100x2
209		20209-6		Sample		100x2
210	d	20209-6		Duplicate of 15		100x2
211		20209-7		Sample		100x2
212	s	20209-7		Spike - 1 of 17		100x2
213		20209-9		Sample		100x2
214		20209-10		Sample		100x2
215	d	20209-10		Duplicate of 20		100x2
216		20209-11		Sample		100x2
217	s	20209-11		Spike - 1 of 22		100x2
218		20209-13		Sample		100x2
219		20209-14		Sample		100x2
220		20209-10		Sample		100x2
221	d	20209-10		Duplicate of 26		100x2
222		20209-13		Sample		100x2
223		20209-14		Sample		100x2

Spikes are post at 0.02mL of 25 ppm spiking solution lot 021413-A in a final volume of 10mL

Submitted for QC by:	Date/Time:		QC Review By:	Date/Time:	
DBW	4/3/13 8:31		DBW	4/3/13	1348
Re-Test Required:	No: ✓	Yes:	Comments:		
Resubmitted for QC by:	Date/Time:		QC Review:	By:	Date/Time:



Wednesday, Apr 03, 2013 08:50 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	1500	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	152	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	235	U	1	500	mg/L	0	1	250	100	50				0	50	100
Krypton	83															

elementOne **MERCURY BATCH DIGESTION - RUN WORKSHEET**

Date Prepared/Digested: 3-26-13 Prep By: LAL SIF File #: 032713-1
Block #1 Temperature: 73.89 Start Time: 5:55 Machine ID: #1
Block #2 Temperature: 93.18 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 #: ~~032~~ 4205419
2	0.004 ug	0.01ml		40	40	Working Standard
3	0.04 ug	0.10ml		40	40	Lot #: 032513-1 by: LAL
4	0.08 ug	0.20ml		40	40	Standard #2 (QC #2):
5	0.16 ug	0.40ml		40	40	Lot #: 032513-2
6	0.20ug	0.50ml		40	40	Standard #3 (QC #3):
						Lot #: 032513-3
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/JWL Date: 3.27.13 Time: 1:30
Final QC Review By: DBL Date: 3.27.13 Time: 1411
Comments: 20209-6AD@ 4mL

A/S	LAB #	Client	Wt/FV	Ali Used	ml used	Sample Vol, ml	Spike µg
9	20209-1BH				4	730	
10	-2BH					730	
11	-2BHD					↓	
12	-3BH					740	
13	-3BH+					↓	
14	-4BH					740	
15	-5BH					650	
16	-6BH					640	
17	-6BHD					↓	
18	-7BH					680	
19	-7BH+					↓	

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 #: 411207D

Persulfate Lot # 022813-4 $KMnO_4$ Lot # 022513-2 Hydrox Lot#: 022813-3

Clear samples after digestion with 3.2ml of Hydroxylamine solution.

Element One, Inc form 128-Revision 7.0 Page 1 of 4

elementOne **MERCURY BATCH DIGESTION - RUN WORKSHEET**

SIF File #: _____

A/S	LAB #	Client	Wt/FV	Ali Used	ml used	Sample Vol, ml	Spike µg
20	20209 - 8BH				4	750	
21	- 9BH					720	
22	- 10BH					700	
23	- 10BH D					↓	
24	- 11BH					690	
25	- 11BH +					↓	
26	- 12BH					710	
27	- 13BH					300	
28	- 14BH					230	
29	20209 - 1A					200	
30	- 2A						
31	- 2A D						
32	- 3A						
33	- 3A +						
34	- 4A						
35	- 5A						
36	- 6A						
37	- 6A D						
38	- 7A						
39	- 7A +						
40	- 8A						
41	- 9A						
42	- 10A						
43	- 10A D						
44	- 11A						
45	- 11A +						
46	- 12A						
47	- 13A						
48	- 14A					↓	
49	20209 - 1B					500	
50	- 2B						
51	- 2B D					↓	
52	- 3B					600	
53	- 3B +					↓	
54	- 4B				↓	500	

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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
55	20209-5B				4	500	
56	-6B				↓	↓	
57	-6BD				↓	↓	
58	-7B				↓	↓	
59	-7B+				↓	↓	
60	-8B				↓		
61	-9B				↓		
62	-10B				↓		
63	-10BD				↓		
64	-11B				↓		
65	-11B+				↓		
66	-12B				↓		
67	-13B				↓		
68	-14B				↓		
69	20196-3				2.5	1	
70	-3+				↓	↓	
71	-3				1.0	↓	
72	-3+				↓	↓	
73	20198/208 BLK				20	1	
74	BLK+				↓	↓	
75	20198-1				↓	↓	
76	-1+				↓	↓	
77	-2				↓	↓	
78	-2D				↓	↓	
79	20208				↓	↓	
80	-Dup				↓	↓	
81	17347-3 QC				.1	10	
82	L/C QC				1	1	
83	20180-5BH				1	370	
84	-6BH				↓	380	
85	-6BHD				↓	↓	
86	-8BH				↓	310	
87	20171-1B				4	500	
88	-2B				↓	600	
89	-2BD				↓	↓	

elementOne **MERCURY BATCH DIGESTION - RUN WORKSHEET**

Block #3 94.17

Date Prepared/Digested: 3-27-13 Prep By: JWL SIF File #: 032813-1

Block #1 Temperature: 94.83 Start Time: 5:55 Machine ID: HF 1

Block #2 Temperature: 94.29 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 #: 4206419
2	0.004 ug	0.01ml		40	40	Working Standard
3	0.04 ug	0.10ml		40	40	Lot #: 032513 1 by: LAL
4	0.08 ug	0.20ml		40	40	Standard #2 (QC #2):
5	0.16 ug	0.40ml		40	40	Lot #: 032513 2
6	0.20ug	0.50ml		40	40	Standard #3 (QC #3):
						Lot #: 032513 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: LAL Date: 3-28-13 Time: 12:06

Final QC Review By: DBJ Date: 3/29/13 Time: 9:00

Comments: 20214-2BHD @ 1mL, 8BHD @ 2mL, 15BH+ @ 1mL

A/S	LAB #	Client	Wt/FV	Ali Used	ml used	Sample Vol. ml	Spike µg
9	20209-1C				4	400	
10	-2C						
11	-2CD						
12	-3C						
13	-3C+						
14	-4C						
15	-5C						
16	-6C						
17	-6CD						
18	-7C						
19	-7C+				↓	↓	

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 #: 4112070

Persulfate Lot # 032513-8 $KMnO_4$ Lot # 022813-2 Hydrox Lot#: 022813-3

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	20209-8C				4	400	
21	-9C				↓	↓	
22	-10C						
23	-10CD						
24	-11C						
25	-11C+						
26	-12C						
27	-13C						
28	-14C				↓	↓	
29	20214-1BH				2	590	
30	-2BH				↓	550	
31	-2BHD					↓	
32	-3BH					540	
33	-3BH+				↓	↓	
34	-4BH				4	550	
35	-5BH				↓	550	
36	-5BHD					↓	
37	-6BH				↓	540	
38	-6BH+				↓	↓	
39	-7BH				2	550	
40	-8BH				↓	610	
41	-8BHD					↓	
42	-9BH				↓	540	
43	-9BH+				↓	↓	
44	-10BH				4	580	
45	-11BH				↓	570	
46	-11BHD					↓	
47	-12BH				↓	540	
48	-12BH+				↓	↓	
49	-13BH				2	530	
50	-14BH				↓	610	
51	-14BHD					↓	
52	-15BH				↓	560	
53	-15BH+				↓	↓	
54	-16BH				↓	530	

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elementOne **MERCURY BATCH DIGESTION - RUN WORKSHEET**

Block #3

Date Prepared/Digested: 3-27-13 Prep By: JWL SIF File #: 032713-2

Block #1 Temperature: 94.83 Start Time: 8:00 Machine ID: #3

Block #2 Temperature: 94.29 Stop Time: 10:15 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 #: 4205919
2	0.004 ug	0.01ml		40	40	Working Standard
3	0.04 ug	0.10ml		40	40	Lot #: 032613-1 by:
4	0.08 ug	0.20ml		40	40	Standard #2 (QC #2):
5	0.16 ug	0.40ml		40	40	Lot #: 032513-2
6	0.20ug	0.50ml		40	40	Standard #3 (QC #3):
						Lot #: 032513-3
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: LAL Date: 3-28-13 Time: 12:42

Final QC Review By: DBJ Date: 3/29/13 Time: 9:12

Comments:

A/S	LAB #	Client	Wt/FV	Ali Used	ml used	Sample Vol, ml	Spike ug
9	20209-6A				4	200	
10	-6AD						
11	20216 (1-8) BLK				20	1	
12	BLK SPK						
13	20216 (9-17) BLK						
14	BLK +						
15	20216 -1						
16	-2						
17	-2D						
18	-3						
19	-3+						

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 #* 111110 *HCl Lot #:* 4112070

Persulfate Lot # 032513-8 *$KMnO_4$ Lot #* 022813-2 *Hydrox Lot#:* 022813-3

Clear samples after digestion with 3.2ml of Hydroxylamine solution.

Element One, Inc form 128-Revision 7.0 Page 1 of 4

elementOne **MERCURY BATCH DIGESTION - RUN WORKSHEET**

Date Prepared/Digested: 4.2.13 Prep By: LAL/JWL SIF File #: 040213-1
Block #1 Temperature: 93.05 Start Time: 8:30 Machine ID: 1
Block #2 Temperature: 93.83 Stop Time: 10:45 Batch Analyst: LAL/JWL

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 #: 040213-1 by: JWL
4	0.08 ug	0.20ml		40	40	Standard #2 (QC #2):
5	0.16 ug	0.40ml		40	40	Lot #: 040213-2
6	0.20ug	0.50ml		40	40	Standard #3 (QC #3):
						Lot #: 040213-3
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: LAL/KLS/JWL Date: 4-2-13 Time: 4:15
Final QC Review By: DBL Date: 4/3/13 Time: 1007

Comments: 20176-Blk spk @ end of run. Rechecks 20213-3BH+ ~~[illegible]~~ 12BH + 20217-2+ @ 2mL

A/S	LAB #	Client	Wt/FV	Ali Used	ml used	Sample Vol, ml	Spike ug
9	20214-8FH				.05	100	
10	-8FHD				↓	↓	
11	20176-BLK				20	|	
12	-7				|	|	
13	-8				|	|	
14	-8 dup				|	|	
15	-9				|	|	
16	-9 spk				|	|	
17	20231-1				|	|	
18	-1 dup				↓	↓	
19	20213-1BH				2	710	

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 #* 1112 110 *HCl Lot #:* 4112070

Persulfate Lot # 032513-8 *$KMnO_4$ Lot #* 022813-2 *Hydrox Lot#:* 032513-4

Clear samples after digestion with 3.2ml of Hydroxylamine solution.

Turned in on Inst #7

elementOne **MERCURY BATCH DIGESTION - RUN WORKSHEET**

SIF File #: _____

A/S	LAB #	Client	WW/FV	Ali Used	ml used	Sample Vol. ml	Spike µg
55	20213-7A				4	200	
56	-8A				↓	↓	
57	-9A						
58	-10A						
59	-11A						
60	-11A dup						
61	-12A						
62	-12A spk						
63	-13A						
64	-14A						
65	-14A dup						
66	-15A						
67	-15A spk						
68	-16A						
69	-17A						
70	-18A				↓	↓	
71	20209-LRB				4	100	
72	-LRB+				1.6	↓	
73	-1FH				4		
74	-2FH				↓		
75	-2FH dup						
76	-3FH						
77	-3FH spk						
78	-4FH						
79	-5FH						
80	-6FH dup						
81	-6FH dup						
82	-7FH						
83	-7FH spk						
84	-8FH						
85	-9FH						
86	-10FH						
87	-10FH dup						
88	-11FH						
89	-11FH spk				↓	↓	

elementOne **MERCURY BATCH DIGESTION - RUN WORKSHEET**

SIF File #: _____

A/S	LAB #	Client	WI/FV	Ali Used	ml used	Sample Vol, ml	Spike µg
90	20209-12FH				4	100	
91	-13FH				↓	↓	
92	-14FH				↓	↓	
93	20223-1A				4	200	
94	-1Adup				↓		
95	-2A						
96	-2A spk				↓	↓	
97	19349-3QC				1	10	
98	LL QC				1	1	
99	20176-Blk spk				20	1	
100	20219 LRB				4	1	
101	LRB+				.2	↓	.1 ug spk
102	20219-1		.4748/50	4	.0380 .0380	1	LL
103	-1D		.4730/50	4	.0379	↓	
104	-2		.4947/50	4	.0396		
105	-2+		↓	↓	↓	↓	
106							

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PerkinElmer ELAN 6100 ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: Blank
Sample Da Tuesday, April 02, 2013 14:26:37
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	103339.3		ppb
|-	Sc	45	266941.5		ppb
|>	Rh	103	533836		ppb
|	Cd	111	63.2		ppb
|-	Cd	114	167.8		ppb
|>	Ho	165	1145720.6		ppb
|-	Pb	208	3809		ppb
	Kr	83	54.4		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: Standard 1
Sample Da Tuesday, April 02, 2013 14:28:06
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	106907.1		ppb
|-	Sc	45	272908.7		ppb
|>	Rh	103	548530.7		ppb
|	Cd	111	2789.2	1.03542	ppb
|-	Cd	114	6677.3	1.05983	ppb
|>	Ho	165	1240128.4		ppb
|-	Pb	208	52343.4	1.03996	ppb
	Kr	83	-118.7		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: Standard 2
Sample Da Tuesday, April 02, 2013 14:29:35
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	101896.3		ppb
|-	Sc	45	260855.7		ppb
|>	Rh	103	524961.7		ppb
|	Cd	111	259311.4	102.9545	ppb
|-	Cd	114	616060.5	104.8512	ppb
|>	Ho	165	1215152.6		ppb
|-	Pb	208	4756526.1	104.5813	ppb
	Kr	83	-16558.2		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: Standard 3
Sample Da Tuesday, April 02, 2013 14:31:04
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	109046.1		ppb
|-	Sc	45	290442.9		ppb
|>	Rh	103	576363.5		ppb
|	Cd	111	1380649.7	499.409	ppb
|-	Cd	114	3218114.9	499.0297	ppb
|>	Ho	165	1321392.1		ppb
|-	Pb	208	24667639	499.0837	ppb
	Kr	83	-90555.1		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 1
Sample Da Tuesday, April 02, 2013 14:32:33
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	109301.9		ppb
|-	Sc	45	288894.7		ppb
|>	Rh	103	587836.3		ppb
|	Cd	111	109.1	0.01399	ppb
|-	Cd	114	277.4	0.01404	ppb
|>	Ho	165	1194858.1		ppb
|-	Pb	208	5595.4	0.03551	ppb
	Kr	83	57		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 2
Sample Da Tuesday, April 02, 2013 14:34:02
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	117052.6		ppb
|-	Sc	45	308216.7		ppb
|>	Rh	103	620301		ppb
|	Cd	111	3171	1.04101	ppb
|-	Cd	114	7399.9	1.03804	ppb
|>	Ho	165	1329389.5		ppb
|-	Pb	208	57217	1.06216	ppb
	Kr	83	-154.4		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 3
Sample Da Tuesday, April 02, 2013 14:35:31
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	103505.7		ppb
|-	Sc	45	277286.1		ppb
|>	Rh	103	552407.1		ppb
|	Cd	111	683636	257.9789	ppb
|-	Cd	114	1601409.7	259.0575	ppb
|>	Ho	165	1244662.3		ppb
|-	Pb	208	11760363	252.5839	ppb
	Kr	83	-43244.2		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 4
Sample Da Tuesday, April 02, 2013 14:37:02
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	111009.9		ppb
|-	Sc	45	299447.6		ppb
|>	Rh	103	598679.6		ppb
|	Cd	111	286188.7	99.6357	ppb
|-	Cd	114	676314.4	100.9289	ppb
|>	Ho	165	1299061		ppb
|-	Pb	208	5048560.4	103.8309	ppb
	Kr	83	-18754.2		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 5
Sample Da Tuesday, April 02, 2013 14:38:32
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	115199.6		ppb
|-	Sc	45	311779.7		ppb
|>	Rh	103	631664.7		ppb
|	Cd	111	148844.3	49.10121	ppb
|-	Cd	114	348425.1	49.26795	ppb
|>	Ho	165	1337282.4		ppb
|-	Pb	208	2585475.2	51.62503	ppb
	Kr	83	53.8		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 6
Sample Da Tuesday, April 02, 2013 14:40:01
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	124216.7		ppb
|-	Sc	45	391226.9		ppb
|>	Rh	103	714477.7		ppb
|	Cd	111	1039.1	0.27864	ppb
|-	Cd	114	6042.6	0.72778	ppb
|>	Ho	165	1607897.7		ppb
|-	Pb	208	11224.4	0.09778	ppb
	Kr	83	70		mg/L

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Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 7
Sample Da Tuesday, April 02, 2013 14:41:30
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	120645.8		ppb
|-	Sc	45	391116.3		ppb
|>	Rh	103	711122.5		ppb
|	Cd	111	15011.7	4.37689	ppb
|-	Cd	114	41573.8	5.19712	ppb
|>	Ho	165	1566411.5		ppb
|-	Pb	208	15758.3	0.18011	ppb
	Kr	83	70.4		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 9
Sample Da Tuesday, April 02, 2013 14:43:00
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	108507.4		ppb
|-	Sc	45	353204.4		ppb
|>	Rh	103	692030.9		ppb
|	Cd	111	67.9	-0.00421	ppb
|-	Cd	114	17.2	-0.02585	ppb
|>	Ho	165	1410826		ppb
|-	Pb	208	10072.2	0.102	ppb
	Kr	83	38.1		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 10
Sample Da Tuesday, April 02, 2013 14:44:29
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	133965.9		ppb
|-	Sc	45	401432.8		ppb
|>	Rh	103	762697.8		ppb
|	Cd	111	146114	39.91635	ppb
|-	Cd	114	340696.2	39.8966	ppb
|>	Ho	165	1656029.8		ppb
|-	Pb	208	2937242.9	47.34013	ppb
	Kr	83	-41.8		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 2
Sample Da Tuesday, April 02, 2013 14:46:00
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	112551.2		ppb
|-	Sc	45	336902.7		ppb
|>	Rh	103	662886.4		ppb
|	Cd	111	3191.6	0.97906	ppb
|-	Cd	114	7699.6	1.01011	ppb
|>	Ho	165	1300396.8		ppb
|-	Pb	208	56841.6	1.08024	ppb
	Kr	83	-160.1		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: 20209-1
Sample Da Tuesday, April 02, 2013 14:47:31
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	120082.1		ppb
|-	Sc	45	401625.2		ppb
|>	Rh	103	655631.9		ppb
|	Cd	111	1548	0.46766	ppb
|-	Cd	114	1150.1	0.12849	ppb
|>	Ho	165	1472728.3		ppb
|-	Pb	208	180965.4	3.19682	ppb
	Kr	83	-362.2		mg/L

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Method 6020 & 200.8 Metals Summary Report
Sample ID: 20209-2
Sample Da Tuesday, April 02, 2013 14:49:00
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	116741.7		ppb
|-	Sc	45	333246.1		ppb
|>	Rh	103	649221.5		ppb
|	Cd	111	4290.7	1.3528	ppb
|-	Cd	114	8429.2	1.1323	ppb
|>	Ho	165	1418498.1		ppb
|-	Pb	208	141219.4	2.57341	ppb
	Kr	83	-229.9		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: 20209-2
Sample Da Tuesday, April 02, 2013 14:50:29
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	118849.6		ppb
|-	Sc	45	332011.7		ppb
|>	Rh	103	642397.3		ppb
|	Cd	111	4503.9	1.43721	ppb
|-	Cd	114	8638.5	1.17415	ppb
|>	Ho	165	1425528.8		ppb
|-	Pb	208	142334.3	2.58095	ppb
	Kr	83	-235.2		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 1
Sample Da Tuesday, April 02, 2013 14:52:01
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	108081.4		ppb
|-	Sc	45	290638.9		ppb
|>	Rh	103	598072.7		ppb
|	Cd	111	14	-0.01977	ppb
|-	Cd	114	18	-0.02541	ppb
|>	Ho	165	1192398.7		ppb
|-	Pb	208	921.4	-0.06824	ppb
	Kr	83	51.8		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 4
Sample Da Tuesday, April 02, 2013 14:53:30
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	106868.9		ppb
|-	Sc	45	290642.6		ppb
|>	Rh	103	590344		ppb
|	Cd	111	283975.3	100.2617	ppb
|-	Cd	114	661975.7	100.1951	ppb
|>	Ho	165	1268467		ppb
|-	Pb	208	4893633.7	103.0712	ppb
	Kr	83	-18389.7		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: 20209-3
Sample Da Tuesday, April 02, 2013 14:55:01
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	124215.5		ppb
|-	Sc	45	354643.5		ppb
|>	Rh	103	646802.9		ppb
|	Cd	111	1902.8	0.58863	ppb
|-	Cd	114	2073.1	0.25833	ppb
|>	Ho	165	1476875.3		ppb
|-	Pb	208	159789.8	2.80417	ppb
	Kr	83	-276.5		mg/L

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Method 6020 & 200.8 Metals Summary Report
Sample ID: 20209-3
Sample Da Tuesday, April 02, 2013 14:56:30
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	123150.6		ppb
|-	Sc	45	350455.6		ppb
|>	Rh	103	643881.9		ppb
|	Cd	111	142265.8	46.03724	ppb
|-	Cd	114	333418.7	46.2504	ppb
|>	Ho	165	1470956.8		ppb
|-	Pb	208	2984586.9	54.17328	ppb
	Kr	83	-278.2		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: 20209-5
Sample Da Tuesday, April 02, 2013 14:57:59
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	102639.4		ppb
|-	Sc	45	370196.5		ppb
|>	Rh	103	535027		ppb
|	Cd	111	15436.5	5.99115	ppb
|-	Cd	114	35004.8	5.81941	ppb
|>	Ho	165	1227168.2		ppb
|-	Pb	208	1919476.4	41.7409	ppb
	Kr	83	-725.8		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: 20209-6
Sample Da Tuesday, April 02, 2013 14:59:28
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	96724.3		ppb
|-	Sc	45	305347.9		ppb
|>	Rh	103	505287.9		ppb
|	Cd	111	14151.3	5.81432	ppb
|-	Cd	114	30775.4	5.41491	ppb
|>	Ho	165	1154270.2		ppb
|-	Pb	208	2395386.7	55.40147	ppb
	Kr	83	-648.2		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: 20209-6
Sample Da Tuesday, April 02, 2013 15:00:57
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	103450.8		ppb
|-	Sc	45	324807.3		ppb
|>	Rh	103	546595.1		ppb
|	Cd	111	14112.9	5.3582	ppb
|-	Cd	114	31734.5	5.16088	ppb
|>	Ho	165	1224816		ppb
|-	Pb	208	2367223.7	51.59064	ppb
	Kr	83	-649.7		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: 20209-7
Sample Da Tuesday, April 02, 2013 15:02:26
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	113067.9		ppb
|-	Sc	45	305309.7		ppb
|>	Rh	103	615427.5		ppb
|	Cd	111	14091.7	4.74876	ppb
|-	Cd	114	31662.5	4.56991	ppb
|>	Ho	165	1361278.9		ppb
|-	Pb	208	1933121.8	37.88337	ppb
	Kr	83	-747		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: 20209-7
Sample Da Tuesday, April 02, 2013 15:03:55
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	111911.1		ppb
|-	Sc	45	306710.1		ppb
|>	Rh	103	607424.4		ppb
|	Cd	111	159873.3	54.85022	ppb
|-	Cd	114	373646.3	54.9528	ppb
|>	Ho	165	1352111.3		ppb
|-	Pb	208	4588806.9	90.66307	ppb
	Kr	83	-756.6		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: 20209-9
Sample Da Tuesday, April 02, 2013 15:05:24
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	119106.9		ppb
|-	Sc	45	352609.8		ppb
|>	Rh	103	617657.5		ppb
|	Cd	111	1021.7	0.32021	ppb
|-	Cd	114	485.4	0.04209	ppb
|>	Ho	165	1424665.1		ppb
|-	Pb	208	113199.4	2.03576	ppb
	Kr	83	-197.7		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 1
Sample Da Tuesday, April 02, 2013 15:09:53
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	106713.1		ppb
|-	Sc	45	278150.2		ppb
|>	Rh	103	573260.5		ppb
|	Cd	111	46.2	-0.00784	ppb
|-	Cd	114	90.5	-0.01399	ppb
|>	Ho	165	1185103.7		ppb
|-	Pb	208	1690.1	-0.05077	ppb
	Kr	83	45.8		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 4
Sample Da Tuesday, April 02, 2013 15:11:22
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	105870.4		ppb
|-	Sc	45	278618.9		ppb
|>	Rh	103	562582.4		ppb
|	Cd	111	270921	100.3721	ppb
|-	Cd	114	645447.8	102.5055	ppb
|>	Ho	165	1274985.8		ppb
|-	Pb	208	4871196.1	102.0718	ppb
	Kr	83	-17703		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: 20209-11
Sample Da Tuesday, April 02, 2013 15:12:54
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	100257.6		ppb
|-	Sc	45	266193.8		ppb
|>	Rh	103	531061.9		ppb
|	Cd	111	1419.2	0.53246	ppb
|-	Cd	114	1487.7	0.22231	ppb
|>	Ho	165	1206016.4		ppb
|-	Pb	208	117218	2.51002	ppb
	Kr	83	-163.1		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: 20209-11
Sample Da Tuesday, April 02, 2013 15:14:23
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	114540.5		ppb
|-	Sc	45	296335.3		ppb
|>	Rh	103	588570.1		ppb
|	Cd	111	132090.7	46.76247	ppb
|-	Cd	114	312098.6	47.36169	ppb
|>	Ho	165	1349216.9		ppb
|-	Pb	208	2710755.7	53.6346	ppb
	Kr	83	-207.9		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 1
Sample Da Tuesday, April 02, 2013 15:18:52
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	108752.1		ppb
|-	Sc	45	273656.9		ppb
|>	Rh	103	560938.7		ppb
|	Cd	111	26.2	-0.0149	ppb
|-	Cd	114	59.5	-0.0185	ppb
|>	Ho	165	1171082.2		ppb
|-	Pb	208	1244	-0.06047	ppb
	Kr	83	47.9		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 4
Sample Da Tuesday, April 02, 2013 15:20:21
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	110535.2		ppb
|-	Sc	45	281188		ppb
|>	Rh	103	572236.6		ppb
|	Cd	111	278248.2	101.3439	ppb
|-	Cd	114	653742.3	102.0711	ppb
|>	Ho	165	1278223.3		ppb
|-	Pb	208	4954373.8	103.5529	ppb
	Kr	83	-17953.2		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: 20209-10
Sample Da Wednesday, April 03, 2013 08:19:43
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	93479.5		ppb
|-	Sc	45	406452		ppb
|>	Rh	103	722036.7		ppb
|	Cd	111	1382.9	0.37464	ppb
|-	Cd	114	-14.3	-0.02989	ppb
|>	Ho	165	1389092.3		ppb
|-	Pb	208	122487.7	2.26891	ppb
	Kr	83	-285.5		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: 20209-10
Sample Da Wednesday, April 03, 2013 08:21:12
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	92140.6		ppb
|-	Sc	45	371617.3		ppb
|>	Rh	103	675578.4		ppb
|	Cd	111	1382.5	0.40188	ppb
|-	Cd	114	214.7	0.00033	ppb
|>	Ho	165	1325305.9		ppb
|-	Pb	208	127282	2.47931	ppb
	Kr	83	-271.5		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: 20209-13
Sample Da Wednesday, April 03, 2013 08:22:41
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	95881.7		ppb
|-	Sc	45	360177.9		ppb
|>	Rh	103	692035.1		ppb
|	Cd	111	729.3	0.19505	ppb
|-	Cd	114	649.1	0.05572	ppb
|>	Ho	165	1349544.1		ppb
|-	Pb	208	61142.4	1.12262	ppb
	Kr	83	-130.8		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: 20209-14
Sample Da Wednesday, April 03, 2013 08:24:09
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	89158.3		ppb
|-	Sc	45	343581.9		ppb
|>	Rh	103	645713.9		ppb
|	Cd	111	1483.8	0.45416	ppb
|-	Cd	114	274.4	0.00984	ppb
|>	Ho	165	1288856.7		ppb
|-	Pb	208	105982.2	2.11013	ppb
	Kr	83	-1123		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 1
Sample Da Wednesday, April 03, 2013 08:25:42
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	95552.7		ppb
|-	Sc	45	344830.8		ppb
|>	Rh	103	679521.8		ppb
|	Cd	111	26.2	-0.01668	ppb
|-	Cd	114	31.6	-0.02395	ppb
|>	Ho	165	1274798.6		ppb
|-	Pb	208	995.7	-0.068	ppb
	Kr	83	59.2		mg/L

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 4
Sample Da Wednesday, April 03, 2013 08:27:11
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	97687.5		ppb
|-	Sc	45	333359.1		ppb
|>	Rh	103	651151.5		ppb
|	Cd	111	301375	96.46468	ppb
|-	Cd	114	702357.6	96.37143	ppb
|>	Ho	165	1286111.3		ppb
|-	Pb	208	4855957.2	100.8713	ppb
	Kr	83	-19916.6		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	3/27/2013	9:16:12	8.599E-05			µg			8.599E-05					
STD1=.004ug	3/27/2013	9:17:26	0.0007093			µg			0.0007093					
STD2=.04ug	3/27/2013	9:18:42	0.0091019			µg			0.0091019					
STD3=.08ug	3/27/2013	9:19:58	0.0186354			µg			0.0186354					
STD4=.16ug	3/27/2013	9:21:14	0.0363272			µg			0.0363272					
STD5=.2ug	3/27/2013	9:22:32	0.0454894			µg			0.0454894					
Reagent Blank	3/27/2013	9:24:18	6.557E-05	0.0002879	0.0002879	µg			0.0000683	0.0002999	0.0002999	6.283E-05	0.0002759	0.0002759
0.004ug = DL	3/27/2013	9:25:31	0.0008813	0.0038689	0.0038689	µg			0.0008813	0.0038689	0.0038689			
0.080ug = STD.2	3/27/2013	9:26:47	0.0177195	0.0777886	0.0777886	µg			0.0177195	0.0777886	0.0777886			
0.080ug = QC STD 3	3/27/2013	9:28:06	0.0178756	0.0784739	0.0784739	µg			0.0178756	0.0784739	0.0784739			
REAGENT BLANK	3/27/2013	9:29:22	4.1E-07	1.83E-06	1.83E-06	µg			4.1E-07	1.83E-06	1.83E-06			
20209-1BH	3/27/2013	9:31:06	0.0037765	0.0165788	3.0256341	µg	4	730	0.0037707	0.0165536	3.0210346	0.0037822	0.016604	3.0302336
20209-2BH	3/27/2013	9:32:50	0.0032693	0.0143524	2.7628363	µg	4	770	0.0033796	0.0148366	2.8560383	0.003159	0.0138682	2.6696342
20209-2BH DUP	3/27/2013	9:34:35	0.0032721	0.0143645	2.7651632	µg	4	770	0.0032389	0.0142186	2.7370817	0.0033053	0.0145104	2.7932446
20209-3BH	3/27/2013	9:36:21	0.0031149	0.0136743	2.52974	µg	4	740	0.0031382	0.0137769	2.5487279	0.0030915	0.0135716	2.510752
20209-3BH SPK	3/27/2013	9:38:08	0.0209056	0.0917759	16.978542	µg	4	740	0.0211641	0.0929107	17.188479	0.0206471	0.0906411	16.768605
20209-4BH	3/27/2013	9:39:56	0.002787	0.0122349	2.2634602	µg	4	740	0.0028173	0.012368	2.2880784	0.0027567	0.0121018	2.238842
20209-5BH	3/27/2013	9:41:45	0.0095349	0.0418581	7.1158752	µg	4	680	0.0095846	0.0420764	7.1529806	0.0094851	0.0416398	7.0787697
20209-6BH	3/27/2013	9:43:34	0.0085918	0.0377182	6.2235095	µg	4	660	0.0086266	0.0378706	6.2486557	0.0085571	0.0375658	6.1983632
20209-6BH DUP	3/27/2013	9:45:20	0.0095925	0.0421109	6.9483056	µg	4	660	0.0096036	0.0421599	6.9563898	0.0095813	0.0420619	6.9402215
20209-7BH	3/27/2013	9:47:03	0.0097999	0.0430215	7.3136582	µg	4	680	0.0098155	0.0430901	7.3253121	0.0097843	0.042953	7.3020043
0.004ug = DL	3/27/2013	9:48:16	0.0008619	0.0037836	0.0037836	µg	4	680	0.0008619	0.0037836	0.0037836			
0.080ug = STD.2	3/27/2013	9:49:32	0.0177535	0.0779382	0.0779382	µg	4	680	0.0177535	0.0779382	0.0779382			
REAGENT BLANK	3/27/2013	9:50:48	3.498E-05	0.0001536	0.0001536	µg	4	680	3.498E-05	0.0001536	0.0001536			
20209-7BH SPK	3/27/2013	9:52:32	0.0272521	0.1196368	20.338259	µg	4	680	0.0271973	0.1193964	20.297388	0.0273068	0.1198772	20.379129
20209-8BH	3/27/2013	9:54:16	0.0059102	0.0259459	4.6648515	µg	4	750	0.0059775	0.0262411	4.920207	0.005843	0.0256506	4.8094959
20209-9BH	3/27/2013	9:56:00	0.0070195	0.0308156	5.5468006	µg	4	720	0.0070342	0.0308802	5.5584449	0.0070047	0.0307509	5.5351564
20209-10BH	3/27/2013	9:57:45	0.0087476	0.0384021	6.7203647	µg	4	700	0.0088341	0.0387818	6.7868227	0.0086611	0.0380223	6.6539068
20209-10BH DUP	3/27/2013	9:59:31	0.0087084	0.0382302	6.6902802	µg	4	700	0.0087432	0.0383829	6.7170152	0.0086736	0.0380774	6.6635452
20209-11BH	3/27/2013	10:01:17	0.0092533	0.0406221	7.007319	µg	4	690	0.0092173	0.0404639	6.9800142	0.0092894	0.0407804	7.0346239
20209-11BH SPK	3/27/2013	10:03:03	0.025844	0.1134553	19.571034	µg	4	690	0.0259311	0.1138376	19.63698	0.0257569	0.113073	19.505089
20209-12BH	3/27/2013	10:04:50	0.0088493	0.0388483	6.8955719	µg	4	710	0.0088951	0.0390496	6.931299	0.0088034	0.038647	6.8598448
20209-13BH	3/27/2013	10:06:38	-0.0000337	-0.000148	-0.0111002	µg	4	300	-0.0000425	-0.0001868	-0.0140142	-0.0000248	-0.0001091	-0.0081862
20209-14BH	3/27/2013	10:08:26	-0.0000063	-0.0000279	-0.0016046	µg	4	230	-0.0000301	-0.0001324	-0.0076163	1.745E-05	7.664E-05	0.0044072
0.004ug = DL	3/27/2013	10:09:41	0.0008681	0.003811	0.003811	µg	4	230	0.0008681	0.003811	0.003811			
0.080ug = STD.2	3/27/2013	10:10:57	0.017096	0.0750517	0.0750517	µg	4	230	0.017096	0.0750517	0.0750517			
REAGENT BLANK	3/27/2013	10:12:13	0.0001668	0.0007322	0.0007322	µg	4	230	0.0001668	0.0007322	0.0007322			
20209-1A	3/27/2013	10:13:59	1.68E-06	7.39E-06	0.0003696	µg	4	200	-0.000017	-0.0000749	-0.0037464	2.043E-05	8.971E-05	0.0044856
20209-2A	3/27/2013	10:15:48	1.832E-05	8.046E-05	0.0040234	µg	4	200	2.147E-05	9.426E-05	0.0047133	1.518E-05	6.667E-05	0.0033335
20209-2A DUP	3/27/2013	10:17:38	9.155E-05	0.0004019	0.0200961	µg	4	200	9.637E-05	0.0004231	0.0211538	8.673E-05	0.0003808	0.0190384
20209-3A	3/27/2013	10:19:24	5.646E-05	0.0002479	0.0123951	µg	4	200	0.0000522	0.0002292	0.0114586	6.073E-05	0.0002666	0.0133316
20209-3A SPK	3/27/2013	10:21:06	0.0168796	0.0741018	3.7050895	µg	4	200	0.0169549	0.0744322	3.7216099	0.0168044	0.0737714	3.688569
20209-4A	3/27/2013	10:22:49	2.753E-05	0.0001209	0.006044	µg	4	200	2.877E-05	0.0001263	0.0063167	2.629E-05	0.0001154	0.0057713
20209-5A	3/27/2013	10:24:33	3.965E-05	0.0001741	0.0087034	µg	4	200	6.313E-05	0.0002772	0.0138582	1.616E-05	7.097E-05	0.0035486
20209-7A	3/27/2013	10:31:30	0.0001008	0.0004427	0.022133	µg	4	200	0.0001036	0.000455	0.0227479	9.803E-05	0.0004304	0.0215181
0.004ug = DL	3/27/2013	10:32:44	0.0009147	0.0040154	0.0040154	µg	4	200	0.0009147	0.0040154	0.0040154			
0.080ug = STD.2	3/27/2013	10:34:00	0.0170193	0.0747151	0.0747151	µg	4	200	0.0170193	0.0747151	0.0747151			
REAGENT BLANK	3/27/2013	10:35:16	0.0001738	0.0007629	0.0007629	µg	4	200	0.0001738	0.0007629	0.0007629			
20209-7A SPK	3/27/2013	10:37:01	0.0167887	0.0737027	3.6851355	µg	4	200	0.0169078	0.0742253	3.7112631	0.0166697	0.0731802	3.6590078
20209-8A	3/27/2013	10:38:47	0.0001108	0.0004865	0.0243259	µg	4	200	0.0001283	0.0005632	0.0281603	9.335E-05	0.0004098	0.0204916
20209-9A	3/27/2013	10:40:33	7.277E-05	0.0003195	0.0159752	µg	4	200	6.449E-05	0.0002831	0.0141562	8.106E-05	0.0003559	0.0177942
20209-10A	3/27/2013	10:42:19	0.0001003	0.0004403	0.0220127	µg	4	200	8.977E-05	0.0003941	0.0197067	0.0001108	0.0004864	0.0243188
20209-10A DUP	3/27/2013	10:44:07	0.0001018	0.000447	0.0223502	µg	4	200	0.0001075	0.0004721	0.0236038	9.611E-05	0.0004219	0.0210966
20209-11A	3/27/2013	10:45:55	7.638E-05	0.0003353	0.0167656	µg	4	200	0.000126	0.0005532	0.02766	2.674E-05	0.0001174	0.0058713
20209-11A SPK	3/27/2013	10:47:43	0.0173265	0.0760633	3.8031637	µg	4	200	0.0174459	0.0765879	3.829393	0.017207	0.0755387	3.7769345
20209-12A	3/27/2013	10:49:31	6.469E-05	0.000284	0.0142006	µg	4	200	0.0001023	0.0004492	0.0224614	2.706E-05	0.0001188	0.0059399
20209-13A	3/27/2013	10:51:20	1.014E-05	4.452E-05	0.0022264	µg	4	200	1.8E-07	8.1E-07	4.094E-05	2.009E-05	8.823E-05	0.0044118
20209-14A	3/27/2013	10:53:06	6.901E-05	0.000303	0.0151495	µg	4	200	6.568E-05	0.0002884	0.014419	7.234E-05	0.0003176	0.0158801
0.004ug = DL	3/27/2013	10:54:18	0.0008716	0.0038263	0.0038263	µg	4	200	0.0008716	0.0038263	0.0038263			
0.080ug = STD.2	3/27/2013	10:55:34	0.0170445	0.0748254	0.0748254	µg	4	200	0.0170445	0.0748254	0.0748254			
REAGENT BLANK	3/27/2013	10:56:50	0.0001685	0.0007396	0.0007396	µg	4	200	0.0001685	0.0007396	0.0007396			
Calib Blank	3/27/2013	11:20:25	0.0001358			µg	4	500	0.0001358					
STD1=.004ug	3/27/2013	11:21:39	0.0008959			µg	4	500	0.0008959					
STD2=.04ug	3/27/2013	11:22:54	0.0086983			µg	4	500	0.0086983					
STD3=.08ug	3/27/2013	11:24:10	0.0170455			µg	4	500	0.0170455					
STD4=.16ug	3/27/2013	11:25:27	0.0335432			µg	4	500	0.0335432					
STD5=.2ug	3/27/2013	11:26:45	0.0425737			µg	4	500	0.0425737					
Reagent Blank	3/27/2013	11:28:31	7.853E-05	0.0003706	0.0003706	µg	4	500	0.0001096	0.0005171	0.0005171	4.748E-05	0.0002241	0.0002241
0.004ug = DL	3/27/2013	11:29:44	0.0009154	0.0043202	0.0043202	µg	4	500	0.0009154	0.0043202	0.0043202			
0.080ug = STD.2	3/27/2013	11:31:00	0.01664	0.0785345	0.0785345	µg	4	500	0.01664	0.0785345	0.0785345			
0.080ug = QC STD 3	3/27/2013	11:32:19	0.0170228	0.0803412	0.0803412	µg	4	500	0.0170228	0.0803412	0.0803412			
REAGENT BLANK	3/27/2013	11:33:35	0.0000175	0.0000826	0.0000826	µg	4	500	0.0000175	0.0000826	0.0000826			
20209-1B	3/27/2013	11:35:18	-0.0000139	-0.0000656	-0.0082028	µg	4	500	5.38E-06	2.541E-05	0.0031763	-0.0000331	-0.0001566	-0.019582
20209-2B	3/27/2013	11:37:01	0.0001233	0.0005818	0.0727239	µg	4	500	0.0001593	0.0007516	0.0939513	8.728E-05	0.000412	0.0514966
20209-2B DUP	3/27/2013	11:38:45	4.923E-05	0.0002324	0.0290448	µg	4	500	4.933E-05	0.0002328	0.0291062	4.912E-05	0.0002319	0.0289833
20209-3B	3/27/2013	11:40:29	-0.0000783	-0.0003698	-0.0554743	µg	4	600	-0.0001035	-0.0004886	-0.0732931	-0.0000531	-0.000251	-0.0376554

PerkinElmer FIMS-100 CVAA Mercury Analyzer

Sample_ID	Date	Time	Mean_Sig	Mean_Rd	Mean_Rt	Units	Aliq.	Vol.	Sig 1	Reading-1	Result-1	Sig 2	Reading-2	Result-2
20209-3B SPK	3/27/2013	11:42:13	0.0156264	0.0737506	11.062591	µg	4	600	0.0157383	0.0742785	11.141782	0.0155146	0.0732227	10.9834
20209-4B	3/27/2013	11:43:57	-0.000042	-0.0001986	-0.0248368	µg	4	500	6.31E-06	2.979E-05	0.0037248	-0.0000905	-0.0004271	-0.0533984
20209-5B	3/27/2013	11:45:43	0.000292	0.0013783	0.1722923	µg	4	500	0.0003117	0.0014711	0.1838836	0.0002724	0.0012856	0.160701
20209-6B	3/27/2013	11:47:29	-0.0000033	-0.0000156	-0.0019565	µg	4	500	-0.0000029	-0.0000139	-0.001746	-0.0000036	-0.0000173	-0.002167
20209-6B DUP	3/27/2013	11:49:15	9.934E-05	0.0004689	0.0586116	µg	4	500	9.527E-05	0.0004497	0.0562105	0.0001034	0.0004881	0.0610128
20209-7B	3/27/2013	11:51:02	-0.0000299	-0.0001413	-0.0176744	µg	4	500	-0.0000449	-0.0002122	-0.0265354	-0.0000149	-0.0000705	-0.0088135
0.004ug = DL	3/27/2013	11:52:17	0.0009004	0.0042494	0.0042494	µg	4	500	0.0009004	0.0042494	0.0042494			
0.080ug = STD.2	3/27/2013	11:53:33	0.0166023	0.0783563	0.0783563	µg	4	500	0.0166023	0.0783563	0.0783563			
REAGENT BLANK	3/27/2013	11:54:49	7.839E-05	0.00037	0.00037	µg	4	500	7.839E-05	0.00037	0.00037			
20209-7B SPK	3/27/2013	11:56:35	0.0160129	0.0755746	9.4468205	µg	4	500	0.0160749	0.0758675	9.4834414	0.0159508	0.0752816	9.4101995
20209-8B	3/27/2013	11:58:23	0.0006727	0.0031747	0.3968329	µg	4	500	0.0006645	0.0031363	0.3920367	0.0006808	0.003213	0.401629
20209-9B	3/27/2013	12:00:11	-0.0000397	-0.0001877	-0.0234664	µg	4	500	-0.0000227	-0.0001074	-0.013434	-0.0000567	-0.0002679	-0.0334988
20209-10B	3/27/2013	12:01:59	0.0005308	0.0025052	0.3131541	µg	4	500	0.0004941	0.002332	0.2915054	0.0005675	0.0026784	0.3348029
20209-10B DUP	3/27/2013	12:03:44	-0.0000335	-0.0001581	-0.0197633	µg	4	500	-0.0000017	-0.0000081	-0.001023	-0.0000652	-0.000308	-0.0385036
20209-11B	3/27/2013	12:05:26	0.0013211	0.0062353	0.779413	µg	4	500	0.0013439	0.0063428	0.7928447	0.0012984	0.0061279	0.7659813
20209-11B SPK	3/27/2013	12:07:08	0.0159203	0.0751379	9.3922352	µg	4	500	0.0160775	0.0758798	9.48497	0.0157632	0.074396	9.2995004
20209-12B	3/27/2013	12:08:52	-0.0000434	-0.0002052	-0.0256587	µg	4	500	-0.0000436	-0.0002058	-0.0257253	-0.0000433	-0.0002047	-0.025592
20209-13B	3/27/2013	12:10:35	-0.0000517	-0.0002442	-0.0305353	µg	4	500	-0.0000371	-0.0001755	-0.0219411	-0.0000663	-0.000313	-0.0391295
20209-14B	3/27/2013	12:12:19	3.896E-05	0.0001839	0.0229847	µg	4	500	-0.0000047	-0.0000225	-0.0028128	8.268E-05	0.0003903	0.0487822
0.004ug = DL	3/27/2013	12:13:33	0.0008925	0.0042123	0.0042123	µg	4	500	0.0008925	0.0042123	0.0042123			
0.080ug = STD.2	3/27/2013	12:14:50	0.01695	0.0799974	0.0799974	µg	4	500	0.01695	0.0799974	0.0799974			
REAGENT BLANK	3/27/2013	12:16:06	9.603E-05	0.0004532	0.0004532	µg	4	500	9.603E-05	0.0004532	0.0004532			
Calib Blank	3/28/2013	8:35:38	-0.0000128			µg			-0.0000128					
STD1=.004ug	3/28/2013	8:36:52	0.0007314			µg			0.0007314					
STD2=.04ug	3/28/2013	8:38:07	0.0095933			µg			0.0095933					
STD3=.08ug	3/28/2013	8:39:23	0.020454			µg			0.020454					
STD4=.16ug	3/28/2013	8:40:39	0.0406766			µg			0.0406766					
STD5=.2ug	3/28/2013	8:41:58	0.0496621			µg			0.0496621					
Reagent Blank	3/28/2013	8:43:43	0.0000939	0.0003743	0.0003743	µg			0.000174	0.0006936	0.0006936	1.381E-05	5.506E-05	5.506E-05
0.004ug = DL	3/28/2013	8:44:56	0.0009666	0.003853	0.003853	µg			0.0009666	0.003853	0.003853			
0.080ug = STD.2	3/28/2013	8:46:12	0.0187828	0.0748727	0.0748727	µg			0.0187828	0.0748727	0.0748727			
0.080ug = QC STD 3	3/28/2013	8:47:30	0.0203049	0.0809401	0.0809401	µg			0.0203049	0.0809401	0.0809401			
REAGENT BLANK	3/28/2013	8:48:46	8.336E-05	0.0003323	0.0003323	µg			8.336E-05	0.0003323	0.0003323			
20209-1C	3/28/2013	8:50:30	0.0003557	0.0014178	0.141781	µg	4	400	0.0003307	0.0013182	0.1318213	0.0003807	0.0015174	0.1517406
20209-2C	3/28/2013	8:52:14	0.0003209	0.0012793	0.1279316	µg	4	400	0.0003433	0.0013683	0.1368287	0.0002986	0.0011903	0.1190345
20209-2C DUP	3/28/2013	8:53:59	0.0002548	0.0010155	0.1015513	µg	4	400	0.0002814	0.0011218	0.1121808	0.0002281	0.0009092	0.0909218
20209-3C	3/28/2013	8:55:46	0.0001553	0.0006189	0.0618945	µg	4	400	0.0001876	0.000748	0.0747963	0.0001229	0.0004899	0.0489927
20209-3C SPK	3/28/2013	8:57:32	0.0185391	0.0739014	7.3901446	µg	4	400	0.0188102	0.0749821	7.4982144	0.018268	0.0728207	7.2820748
20209-4C	3/28/2013	8:59:21	0.0002765	0.0011023	0.1102276	µg	4	400	0.0003445	0.0013732	0.1373242	0.0002085	0.0008313	0.083131
20209-5C	3/28/2013	9:01:10	0.0005582	0.002225	0.2225011	µg	4	400	0.0006531	0.0026034	0.2603397	0.0004632	0.0018466	0.1846625
20209-6C	3/28/2013	9:02:59	0.0004826	0.0019236	0.1923596	µg	4	400	0.0005333	0.0021257	0.2125749	0.0004318	0.0017214	0.1721443
20209-6C DUP	3/28/2013	9:04:45	0.0005401	0.002153	0.2152979	µg	4	400	0.0005166	0.0020594	0.2059413	0.0005636	0.0022465	0.2246545
20209-7C	3/28/2013	9:06:28	0.0007595	0.0030275	0.3027547	µg	4	400	0.00081	0.0032287	0.3228666	0.000709	0.0028264	0.2826428
0.004ug = DL	3/28/2013	9:07:41	0.0009138	0.0036425	0.0036425	µg	4	400	0.0009138	0.0036425	0.0036425			
0.080ug = STD.2	3/28/2013	9:08:57	0.0182375	0.0726992	0.0726992	µg	4	400	0.0182375	0.0726992	0.0726992			
REAGENT BLANK	3/28/2013	9:10:13	0.0001882	0.0007503	0.0007503	µg	4	400	0.0001882	0.0007503	0.0007503			
20209-7C SPK	3/28/2013	9:11:57	0.0192277	0.0766462	7.6646214	µg	4	400	0.0194451	0.0775129	7.751294	0.0190103	0.0757795	7.5779488
20209-8C	3/28/2013	9:13:42	0.0005863	0.002337	0.2336972	µg	4	400	0.0006127	0.0024423	0.2442346	0.0005598	0.0022316	0.2231599
20209-9C	3/28/2013	9:15:26	0.0002818	0.0011232	0.1123167	µg	4	400	0.000268	0.0010685	0.1068461	0.0002955	0.0011779	0.1177873
20209-10C	3/28/2013	9:17:11	0.0003878	0.0015459	0.1545889	µg	4	400	0.000387	0.0015428	0.1542811	0.0003886	0.001549	0.1548968
20209-10C DUP	3/28/2013	9:18:57	0.0002733	0.0010893	0.1089287	µg	4	400	0.0002569	0.0010242	0.1024213	0.0002896	0.0011544	0.1154362
20209-11C	3/28/2013	9:20:44	0.0003418	0.0013623	0.1362311	µg	4	400	0.000328	0.0013075	0.1307495	0.0003555	0.0014171	0.1417126
20209-11C SPK	3/28/2013	9:22:29	0.0205055	0.08174	8.1739986	µg	4	400	0.0207712	0.082799	8.2798988	0.0202399	0.080681	8.0680983
20209-12C	3/28/2013	9:24:16	0.0003748	0.0014939	0.1493896	µg	4	400	0.0003921	0.0015629	0.1562943	0.0003574	0.0014248	0.142485
20209-13C	3/28/2013	9:26:04	-0.0000147	-0.0000585	-0.0058599	µg	4	400	-0.0000167	-0.0000666	-0.0066686	-0.0000126	-0.0000505	-0.0050512
20209-14C	3/28/2013	9:27:51	2.64E-06	1.054E-05	0.0010549	µg	4	400	0.0000032	1.279E-05	0.0012796	2.08E-06	0.0000083	0.0008301
0.004ug = DL	3/28/2013	9:29:06	0.0010381	0.0041382	0.0041382	µg	4	400	0.0010381	0.0041382	0.0041382			
0.080ug = STD.2	3/28/2013	9:30:22	0.0181031	0.0721632	0.0721632	µg	4	400	0.0181031	0.0721632	0.0721632			
REAGENT BLANK	3/28/2013	9:31:38	0.0001393	0.0005552	0.0005552	µg	4	400	0.0001393	0.0005552	0.0005552			
Calib Blank	3/28/2013	9:58:11	0.0003406			µg	20	1	0.0003406					
STD1=.004ug	3/28/2013	9:59:26	0.0008214			µg	20	1	0.0008214					
STD2=.04ug	3/28/2013	10:00:41	0.0105473			µg	20	1	0.0105473					
STD3=.08ug	3/28/2013	10:01:58	0.0213688			µg	20	1	0.0213688					
STD4=.16ug	3/28/2013	10:03:16	0.0428626			µg	20	1	0.0428626					
STD5=.2ug	3/28/2013	10:04:35	0.0527632			µg	20	1	0.0527632					
Reagent Blank	3/28/2013	10:06:23	-0.0002568	-0.0009672	-0.0009672	µg	20	1	-0.0002517	-0.0009481	-0.0009481	-0.0002618	-0.0009862	-0.0009862
0.004ug = DL	3/28/2013	10:08:51	0.0010323	0.0038877	0.0038877	µg	20	1	0.0010323	0.0038877	0.0038877			
0.080ug = STD.2	3/28/2013	10:10:08	0.0221891	0.083568	0.083568	µg	20	1	0.0221891	0.083568	0.083568			
REAGENT BLANK	3/28/2013	10:11:25	-0.0001867	-0.0007032	-0.0007032	µg	20	1	-0.0001867	-0.0007032	-0.0007032			
20209-6A	3/28/2013	10:15:44	0.0001009	0.0003799	0.0189965	µg	4	200	9.735E-05	0.0003667	0.0183337	0.0001044	0.0003932	0.0196593
20209-6A DUP	3/28/2013	10:17:30	0.0002287	0.0008613	0.0430627	µg	4	200	0.0002223	0.0008371	0.041856	0.0002351	0.0008854	0.0442694
0.004ug = DL	3/28/2013	10:35:43	0.0010315	0.0038849	0.0038849	µg	20	1	0.0010315	0.0038849	0.0038849			
0.080ug = STD.2	3/28/2013	10:37:00	0.0226337	0.0852426	0.0852426	µg	20	1	0.0226337	0.0852426	0.0852426			
REAGENT BLANK	3/28/2013	10:38:17	-0.0001282	-0.0004829	-0.0004829	µg	20	1	-0.0001282	-0.0004829	-0.0004829			
Calib Blank	4/2/2013	11:45:53	5.465E-05			µg			5.465E-05					
STD1=.004ug	4/2/2013	11:47:07	0.0009398			µg			0.0009398					

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
STD2=.04ug	4/2/2013	11:48:22	0.0110039			µg			0.0110039					
STD3=.08ug	4/2/2013	11:49:38	0.0219494			µg			0.0219494					
STD4=.16ug	4/2/2013	11:50:55	0.0431396			µg			0.0431396					
STD5=.2ug	4/2/2013	11:52:13	0.0529791			µg			0.0529791					
Reagent Blank	4/2/2013	11:53:59	3.743E-05	0.0001399	0.0001399	µg			1.656E-05	6.188E-05	6.188E-05	0.0000583	0.0002179	0.0002179
0.004ug = DL	4/2/2013	11:55:12	0.0010228	0.0038218	0.0038218	µg			0.0010228	0.0038218	0.0038218			
0.080ug = STD.2	4/2/2013	11:56:28	0.0212256	0.0793128	0.0793128	µg			0.0212256	0.0793128	0.0793128			
0.080ug = QC STD 3	4/2/2013	12:02:57	0.0213071	0.0796176	0.0796176	µg			0.0213071	0.0796176	0.0796176			
REAGENT BLANK	4/2/2013	12:04:13	0.0001639	0.0006124	0.0006124	µg			0.0001639	0.0006124	0.0006124			
0.004ug = DL	4/2/2013	14:20:40	0.0010549	0.0039416	0.0039416	µg	4	200	0.0010549	0.0039416	0.0039416			
0.080ug = STD.2	4/2/2013	14:21:55	0.0204795	0.0765251	0.0765251	µg	4	200	0.0204795	0.0765251	0.0765251			
REAGENT BLANK	4/2/2013	14:23:11	0.0001357	0.000507	0.000507	µg	4	200	0.0001357	0.000507	0.000507			
20209-LRB	4/2/2013	14:40:32	8.355E-05	0.0003122	0.0078056	µg	4	100	6.227E-05	0.0002327	0.0058174	0.0001048	0.0003918	0.0097939
0.004ug = DL	4/2/2013	14:41:46	0.0011302	0.0042231	0.0042231	µg	4	100	0.0011302	0.0042231	0.0042231			
0.080ug = STD.2	4/2/2013	14:43:01	0.0205026	0.0766111	0.0766111	µg	4	100	0.0205026	0.0766111	0.0766111			
REAGENT BLANK	4/2/2013	14:44:17	9.065E-05	0.0003388	0.0003388	µg	4	100	9.065E-05	0.0003388	0.0003388			
20209-LRB SPK	4/2/2013	14:46:02	0.0150378	0.056191	3.5119378	µg	1.6	100	0.0150316	0.0561681	3.5105059	0.0150439	0.0562139	3.5133696
20209-1 FH	4/2/2013	14:48:01	0.0001428	0.0005335	0.0133387	µg	4	100	0.000169	0.0006316	0.0157899	0.0001165	0.0004355	0.0108875
20209-2 FH	4/2/2013	14:49:47	5.628E-05	0.0002103	0.005258	µg	4	100	7.093E-05	0.000265	0.0066261	4.164E-05	0.0001556	0.0038899
20209-2 FH DUP	4/2/2013	14:51:35	7.443E-05	0.0002781	0.0069531	µg	4	100	8.329E-05	0.0003113	0.0077816	6.556E-05	0.000245	0.0061246
20209-3 FH	4/2/2013	14:53:23	6.766E-05	0.0002529	0.0063214	µg	4	100	5.584E-05	0.0002087	0.0052168	7.949E-05	0.000297	0.007426
20209-3 FH SPK	4/2/2013	14:55:11	0.0205866	0.0769251	1.9231282	µg	4	100	0.0206001	0.0769755	1.9243866	0.0205731	0.0768748	1.9218698
20209-4 FH	4/2/2013	14:56:56	4.555E-05	0.0001702	0.0042559	µg	4	100	3.426E-05	0.0001281	0.0032013	5.684E-05	0.0002124	0.0053105
20209-5 FH	4/2/2013	14:58:38	0.0001761	0.000658	0.01645	µg	4	100	0.0001698	0.0006344	0.0158611	0.0001824	0.0006816	0.0170389
20209-6 FH	4/2/2013	15:00:20	0.0001431	0.0005346	0.0133638	µg	4	100	0.0001226	0.0004579	0.0114487	0.0001636	0.0006112	0.0152788
20209-6 FH DUP	4/2/2013	15:02:03	2.803E-05	0.0001048	0.0026191	µg	4	100	0.0000598	0.0002235	0.0055869	-0.0000037	-0.0000139	-0.0003486
0.004ug = DL	4/2/2013	15:03:16	0.0010387	0.0038811	0.0038811	µg	4	100	0.0010387	0.0038811	0.0038811			
0.080ug = STD.2	4/2/2013	15:04:32	0.0204785	0.0765214	0.0765214	µg	4	100	0.0204785	0.0765214	0.0765214			
REAGENT BLANK	4/2/2013	15:05:48	7.077E-05	0.0002645	0.0002645	µg	4	100	7.077E-05	0.0002645	0.0002645			
20209-7 FH	4/2/2013	15:07:32	0.0001784	0.0006666	0.0166653	µg	4	100	0.0001769	0.0006609	0.0165237	0.0001799	0.0006723	0.0168068
20209-7 FH SPK	4/2/2013	15:09:16	0.0200658	0.0749792	1.8744802	µg	4	100	0.0199874	0.0746862	1.8671561	0.0201442	0.0752722	1.8818042
20209-8 FH	4/2/2013	15:11:00	0.0002155	0.0008053	0.0201332	µg	4	100	0.000233	0.0008705	0.021762	0.0001981	0.0007402	0.0185045
20209-9 FH	4/2/2013	15:12:44	7.828E-05	0.0002925	0.0073128	µg	4	100	7.648E-05	0.0002858	0.0071452	8.007E-05	0.0002992	0.0074804
20209-10 FH	4/2/2013	15:14:30	7.817E-05	0.0002921	0.0073033	µg	4	100	8.314E-05	0.0003107	0.0077668	7.321E-05	0.0002736	0.0068397
20209-10 FH DUP	4/2/2013	15:16:16	3.088E-05	0.0001154	0.0028854	µg	4	100	3.145E-05	0.0001175	0.0029384	3.031E-05	0.0001133	0.0028323
20209-11 FH	4/2/2013	15:18:02	5.341E-05	0.0001996	0.0049899	µg	4	100	0.0000717	0.0002679	0.0066984	3.512E-05	0.0001313	0.0032815
20209-11 FH SPK	4/2/2013	15:20:06	0.0189852	0.0709414	1.7735349	µg	4	100	0.0190511	0.0711875	1.7796882	0.0189194	0.0706953	1.7673816
20209-12 FH	4/2/2013	15:21:53	7.604E-05	0.0002842	0.0071038	µg	4	100	8.034E-05	0.0003002	0.0075057	7.174E-05	0.0002681	0.0067019
20209-13 FH	4/2/2013	15:23:41	0.0001264	0.0004725	0.0118119	µg	4	100	0.0001318	0.0004927	0.0123167	0.000121	0.0004523	0.0113071
0.004ug = DL	4/2/2013	15:24:57	0.0010712	0.0040026	0.0040026	µg	4	100	0.0010712	0.0040026	0.0040026			
0.080ug = STD.2	4/2/2013	15:26:14	0.0201351	0.075238	0.075238	µg	4	100	0.0201351	0.075238	0.075238			
REAGENT BLANK	4/2/2013	15:27:30	0.0001247	0.0004659	0.0004659	µg	4	100	0.0001247	0.0004659	0.0004659			
20209-14 FH	4/2/2013	15:29:13	3.109E-05	0.0001162	0.0029049	µg	4	100	4.401E-05	0.0001645	0.0041119	1.817E-05	6.791E-05	0.0016979
0.004ug = DL	4/2/2013	15:47:43	0.0010466	0.0039109	0.0039109	µg	0.2	1	0.0010466	0.0039109	0.0039109			
0.080ug = STD.2	4/2/2013	15:48:59	0.0201746	0.0753857	0.0753857	µg	0.2	1	0.0201746	0.0753857	0.0753857			
REAGENT BLANK	4/2/2013	15:50:15	8.586E-05	0.0003209	0.0003209	µg	0.2	1	8.586E-05	0.0003209	0.0003209			

Wheelabrator North 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 19	Mar 19	Mar 19
Start Time (approx.)		08:15	09:48	11:19
Stop Time (approx.)		09:15	10:48	12:19

☐ 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)	1197.0000	1107.0000	801.7000
S_{Cl-2}	Fraction 2 concentration (mg Cl^-/liter)			
v_1	Fraction 1 sample volume (ml)	689.0	675.0	714.0
v_2	Fraction 2 sample volume (ml)			
m_{HCl}	HCl collected before blank subtraction (mg)	847.8255	768.1473	588.4414
m_b	Allowable blank subtraction (mg)	0.0000	0.0000	0.0000
m_{nb}	HCl collected after blank subtraction (mg)	847.8255	768.1473	588.4414
m_{MDL}	Minimum detectable HCl (mg)	0.0064	0.0062	0.0066
m_n	*Total HCl used in emission calculations (mg)*	847.8255	768.1473	588.4414

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Prepared by Clean Air Engineering Proprietary Software
SS EPA26-1 Version 2006-10b (Cl)

Wheelabrator North 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 19	Mar 19	Mar 19
Start Time (approx.)		08:15	09:48	11:19
Stop Time (approx.)		09:15	10:48	12:19

☐ 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)	7.6600	7.1700	5.9000	
S_{Cl-2}	Fraction 2 concentration (mg Cl⁻/liter)				
v_1	Fraction 1 sample volume (ml)	653.0	659.0	660.0	
v_2	Fraction 2 sample volume (ml)				
m_{HCl}	HCl collected before blank subtraction (mg)	5.1420	4.8573	4.0030	
m_b	Allowable blank subtraction (mg)	0.0000	0.0000	0.0000	
m_{nb}	HCl collected after blank subtraction (mg)	5.1420	4.8573	4.0030	
m_{MDL}	Minimum detectable HCl (mg)	0.0060	0.0061	0.0061	
m_n	*Total HCl used in emission calculations (mg)*	5.1420	4.8573	4.0030	

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

USEPA Method 26A (HCl)
Chloride Laboratory Data Summary

Run No.	Blank	1	2	3
Date (2013)		Mar 21	Mar 21	Mar 21
Start Time (approx.)		07:54	09:15	10:35
Stop Time (approx.)		08:54	10:15	11:35

☐ 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)	1210.0000	1106.0000	1182.0000
S_{Cl-2}	Fraction 2 concentration (mg Cl^-/liter)			
v_1	Fraction 1 sample volume (ml)	613.0	631.0	668.0
v_2	Fraction 2 sample volume (ml)			
m_{HCl}	HCl collected before blank subtraction (mg)	762.4984	717.4268	811.6841
m_b	Allowable blank subtraction (mg)	0.0000	0.0000	0.0000
m_{nb}	HCl collected after blank subtraction (mg)	762.4984	717.4268	811.6841
m_{MDL}	Minimum detectable HCl (mg)	0.0057	0.0058	0.0062
m_n	*Total HCl used in emission calculations (mg)*	762.4984	717.4268	811.6841

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Prepared by Clean Air Engineering Proprietary Software
SS EPA26-1 Version 2006-10b (Cl)

Wheelabrator North 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 21	Mar 21	Mar 21
Start Time (approx.)		07:54	09:15	10:35
Stop Time (approx.)		08:54	10:15	11:35

☐ 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)	2.3700	2.2700	2.2600
S_{Cl-2}	Fraction 2 concentration (mg Cl⁻/liter)			
v_1	Fraction 1 sample volume (ml)	780.0	735.0	837.0
v_2	Fraction 2 sample volume (ml)			
m_{HCl}	HCl collected before blank subtraction (mg)	1.9004	1.7152	1.9446
m_b	Allowable blank subtraction (mg)	0.0000	0.0000	0.0000
m_{nb}	HCl collected after blank subtraction (mg)	1.9004	1.7152	1.9446
m_{MDL}	Minimum detectable HCl (mg)	0.0072	0.0068	0.0077
m_n	*Total HCl used in emission calculations (mg)*	1.9004	1.7152	1.9446

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Wheelabrator North 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 20	Mar 20	Mar 20
Start Time (approx.)			08:13	09:39	11:00
Stop Time (approx.)			09:13	10:39	12:00

☐ 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)		1258.0000	1152.0000	916.4000
S_{Cl-2}	Fraction 2 concentration (mg Cl⁻/liter)				
v_1	Fraction 1 sample volume (ml)		637.0	624.0	704.0
v_2	Fraction 2 sample volume (ml)				
m_{HCl}	HCl collected before blank subtraction (mg)		823.7837	738.9757	663.2097
m_b	Allowable blank subtraction (mg)		0.0000	0.0000	0.0000
m_{nb}	HCl collected after blank subtraction (mg)		823.7837	738.9757	663.2097
m_{MDL}	Minimum detectable HCl (mg)		0.0059	0.0058	0.0065
m_n	*Total HCl used in emission calculations (mg)*		823.7837	738.9757	663.2097

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Prepared by Clean Air Engineering Proprietary Software
SS EPA26-1 Version 2006-10b (Cl)

Wheelabrator North 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 20	Mar 20	Mar 20
Start Time (approx.)		08:13	09:39	11:00
Stop Time (approx.)		09:13	10:39	12:00

☐ 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)	12.5600	11.5300	11.9800
S_{Cl-2}	Fraction 2 concentration (mg Cl⁻/liter)			
v_1	Fraction 1 sample volume (ml)	750.0	690.0	726.0
v_2	Fraction 2 sample volume (ml)			
m_{HCl}	HCl collected before blank subtraction (mg)	9.6838	8.1785	8.9410
m_b	Allowable blank subtraction (mg)	0.0000	0.0000	0.0000
m_{nb}	HCl collected after blank subtraction (mg)	9.6838	8.1785	8.9410
m_{MDL}	Minimum detectable HCl (mg)	0.0069	0.0064	0.0067
m_n	*Total HCl used in emission calculations (mg)*	9.6838	8.1785	8.9410

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CleanAir Engineering
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LABORATORY ANALYSIS FOR ANIONS
Laboratory Services Report No: 64-28959_IC_CL_V0

Performed for:
PALATINE SOURCE TESTING
500 West Wood St
Palatine IL, 60067

Pertaining to a Field Sampling Project Performed for :
WHEELABRATOR NORTH BROWARD

Customer Reference No: 12218
Laboratory Services Project No: 28959
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 16:33:05 -05'00'

Eric Ewing
Title: Analyst – Laboratory Services
Ph: 847-654-4519
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Reviewed by,

Digitally signed by Michael Tuegel
Date: 2013.04.12 16:48:19 -05'00'

Michael Tuegel
Title: Quality Leader – Laboratory Services
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REVISION HISTORY

LABORATORY ANALYSIS FOR ANIONS
LABORATORY Services Report No: 64-28959_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	360	<
28959-002	0.1N H2SO4 RB	600	<
U1 SDA Inlet			
28959-003	Imp C&R R1	689	1,195
28959-004	Imp C&R R2	675	1,107
28959-005	Imp C&R R3	714	801.7
U1 FF Outlet			
28959-006	Imp C&R R1	653	7.66
28959-007	Imp C&R R2	659	7.17
28959-008	Imp C&R R3	660	5.90
U2 SDA Inlet			
28959-009	Imp C&R R1	613	1,210
28959-010	Imp C&R R2	631	1,106
28959-011	Imp C&R R3	668	1,182
U2 FF Outlet			
28959-012	Imp C&R R1	780	2.37
28959-013	Imp C&R R2	735	2.27
28959-014	Imp C&R R3	837	2.26
U3 SDA Inlet			
28959-015	Imp C&R R1	637	1,258
28959-016	Imp C&R R2	624	1,152
28959-017	Imp C&R R3	704	916.4
U3 FF Outlet			
28959-018	Imp C&R R1	750	12.56
28959-019	Imp C&R R2	690	11.53
28959-020	Imp C&R R3	726	11.98

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.

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	1034	206	19.95%
Imp C&R	U1 FF Outlet	6.91	0.91	13.12%
Imp C&R	U2 SDA Inlet	1166	54.1	4.64%
Imp C&R	U2 FF Outlet	2.30	0.06	2.74%
Imp C&R	U3 SDA Inlet	1109	175	15.76%
Imp C&R	U3 FF Outlet	12.02	0.52	4.31%

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 28959-001 and 28959-002 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

i

Sample Calculations
Ion Chromatography Analysis

Customer:	Palatine Source Testing	Lab Project No:	28959	Analyst:	Eric Ewing
Plant:	Wheelabrator North 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 North 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 North 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 North 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 North 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 North 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} = 0.2555
$Area_{Trial2}$ = 0.2533
$Area_{Trial1}$ = 0.2576

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

$\Delta_{Injection}$ = 0.0043
$Area_{Trial2}$ = 0.2533
$Area_{Trial1}$ = 0.2576

Sample Calculations
Ion Chromatography Analysis

Customer:	Palatine Source Testing	Lab Project No:	28959	Analyst:	Eric Ewing
Plant:	Wheelabrator North 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)

$\Delta_{Injection}$	=	0.8%
Avg_{Inj}	=	0.2555
$Area_{Trial2}$	=	0.2533

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}	=	1194.80
DF	=	1000
Avg_{Inj}	=	0.2555
m	=	4.6523
b	=	0.0064

Sample Calculations
Ion Chromatography Analysis

Customer:	Palatine Source Testing	Lab Project No:	28959	Analyst:	Eric Ewing
Plant:	Wheelabrator North 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)

$M_{Analyte}$ = 823.22
C_{Reg} = 1194.7981
V_{Soln} = 689.0

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 North 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.

$$V_{f\_i} = \left(\sigma_{f\_i}\right)^2$$

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 North 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 North 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

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CHROMATOGRAPHIC DATA REDUCTION
Ion Chromatography Analysis

Customer:	Palatine Source Testing	Lab Project No:	28959	Analyst:	Eric Ewing
Plant:	Wheelabrator North Broward	Customer Reference No:	12218	Received:	4/1/13
Applicable Analytical Method:			U.S. EPA Method 26A	Analyte:	Chloride

MDL=	0.009 mg/L	Average Flow Rate
LOQ=	0.041 mg/L	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	04/01/13	0.0000	0.0000	0.0000	1	360.0	<	<0.015
Reagent Blank	28959-002	0.1N H2SO4 RB	04/01/13	0.0000	0.0000	0.0000	1	600.0	<	<0.024
U1 SDA Inlet	28959-003	Imp C&R R1	04/01/13	0.2576	0.2533	0.2555	1000	689.0	1,194.80	823.22
U1 SDA Inlet	28959-004	Imp C&R R2	04/01/13	0.2357	0.2374	0.2366	1000	675.0	1,106.87	747.14
U1 SDA Inlet	28959-005	Imp C&R R3	04/01/13	0.1701	0.1718	0.1710	1000	714.0	801.68	572.40
U1 FF Outlet	28959-006	Imp C&R R1	04/04/13	0.1606	0.1659	0.1633	10	653.0	7.66	5.00
U1 FF Outlet	28959-007	Imp C&R R2	04/04/13	0.1536	0.1520	0.1528	10	659.0	7.17	4.73
U1 FF Outlet	28959-008	Imp C&R R3	04/04/13	0.1250	0.1260	0.1255	10	660.0	5.90	3.90
U2 SDA Inlet	28959-009	Imp C&R R1	04/01/13	0.2593	0.2583	0.2588	1000	613.0	1,210.38	741.96
U2 SDA Inlet	28959-010	Imp C&R R2	04/01/13	0.2382	0.2344	0.2363	1000	631.0	1,105.71	697.70
U2 SDA Inlet	28959-011	Imp C&R R3	04/01/13	0.2531	0.2522	0.2527	1000	668.0	1,181.77	789.42
U2 FF Outlet	28959-012	Imp C&R R1	04/05/13	0.0237	0.0246	0.0242	20	780.0	2.37	1.85
U2 FF Outlet	28959-013	Imp C&R R2	04/05/13	0.0226	0.0234	0.0230	20	735.0	2.27	1.67
U2 FF Outlet	28959-014	Imp C&R R3	04/05/13	0.0226	0.0233	0.0230	20	837.0	2.26	1.69
U3 SDA Inlet	28959-015	Imp C&R R1	04/02/13	0.2706	0.2674	0.2690	1000	637.0	1,257.84	801.24
U3 SDA Inlet	28959-016	Imp C&R R2	04/02/13	0.2453	0.2470	0.2462	1000	624.0	1,151.53	718.56
U3 SDA Inlet	28959-017	Imp C&R R3	04/02/13	0.1950	0.1962	0.1956	1000	704.0	916.36	645.12
U3 FF Outlet	28959-018	Imp C&R R1	04/04/13	0.1322	0.1351	0.1337	20	750.0	12.56	9.42
U3 FF Outlet	28959-019	Imp C&R R2	04/04/13	0.1216	0.1235	0.1226	20	690.0	11.53	7.96
U3 FF Outlet	28959-020	Imp C&R R3	04/04/13	0.1264	0.1284	0.1274	20	726.0	11.98	8.70

File: SPS-04-2R56_IC_Cl_V0
Date: 4/12/2013
Time: 4:30 PM

QUALITY ASSURANCE RECORDS

CHROMATOGRAPHIC DATA REDUCTION
Ion Chromatography Analysis

Customer:	Palatine Source Testing	Lab Project No:	28959	Analyst:	Eric Ewing
Plant:	Wheelabrator North 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	04/01/13	0.0000	0.0000	0.0000	na	na	Yes
Reagent Blank	28959-002	0.1N H2SO4 RB	04/01/13	0.0000	0.0000	0.0000	na	na	Yes
U1 SDA Inlet	28959-003	Imp C&R R1	04/01/13	0.2576	0.2533	0.2555	0.0043	1.7%	Yes
U1 SDA Inlet	28959-004	Imp C&R R2	04/01/13	0.2357	0.2374	0.2366	0.0017	0.7%	Yes
U1 SDA Inlet	28959-005	Imp C&R R3	04/01/13	0.1701	0.1718	0.1710	0.0017	1.0%	Yes
U1 FF Outlet	28959-006	Imp C&R R1	04/04/13	0.1606	0.1659	0.1633	0.0053	3.2%	Yes
U1 FF Outlet	28959-007	Imp C&R R2	04/04/13	0.1536	0.1520	0.1528	0.0016	1.0%	Yes
U1 FF Outlet	28959-008	Imp C&R R3	04/04/13	0.1250	0.1260	0.1255	0.0010	0.8%	Yes
U2 SDA Inlet	28959-009	Imp C&R R1	04/01/13	0.2593	0.2583	0.2588	0.0010	0.4%	Yes
U2 SDA Inlet	28959-010	Imp C&R R2	04/01/13	0.2382	0.2344	0.2363	0.0038	1.6%	Yes
U2 SDA Inlet	28959-011	Imp C&R R3	04/01/13	0.2531	0.2522	0.2527	0.0009	0.4%	Yes
U2 FF Outlet	28959-012	Imp C&R R1	04/05/13	0.0237	0.0246	0.0242	0.0009	3.7%	Yes
U2 FF Outlet	28959-013	Imp C&R R2	04/05/13	0.0226	0.0234	0.0230	0.0008	3.5%	Yes
U2 FF Outlet	28959-014	Imp C&R R3	04/05/13	0.0226	0.0233	0.0230	0.0007	3.1%	Yes
U3 SDA Inlet	28959-015	Imp C&R R1	04/02/13	0.2706	0.2674	0.2690	0.0032	1.2%	Yes
U3 SDA Inlet	28959-016	Imp C&R R2	04/02/13	0.2453	0.2470	0.2462	0.0017	0.7%	Yes
U3 SDA Inlet	28959-017	Imp C&R R3	04/02/13	0.1950	0.1962	0.1956	0.0012	0.6%	Yes
U3 FF Outlet	28959-018	Imp C&R R1	04/04/13	0.1322	0.1351	0.1337	0.0029	2.2%	Yes
U3 FF Outlet	28959-019	Imp C&R R2	04/04/13	0.1216	0.1235	0.1226	0.0019	1.6%	Yes
U3 FF Outlet	28959-020	Imp C&R R3	04/04/13	0.1264	0.1284	0.1274	0.0020	1.6%	Yes

CHROMATOGRAPHIC DATA REDUCTION

Customer:	Palatine Source Testing	Lab Project No:	28959	Analyst:	Eric Ewing
Plant:	Wheelabrator North 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	0.1669	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?
U1 FF Outlet	28959-006	Imp C&R R1	04/04/13	0.1606	0.1659	0.1633	0.0053	3.2%			
U1 FF Outlet	28959-006	Imp C&R R1	04/04/13	0.1681	0.1651	0.1666	0.0030	1.8%	2.0%		Yes
U3 FF Outlet	28959-018	Imp C&R R1	04/04/13	0.1322	0.1351	0.1337	0.0029	2.2%			
U3 FF Outlet	28959-018	Imp C&R R1	04/04/13	0.1357	0.1376	0.1367	0.0019	1.4%	2.2%		Yes

Matrix Spike Recoveries

									Precision	Spike Recovery	Is Spike Recovery Between 90-110%
Matrix Spike	28959-007	Imp C&R R2	04/04/13	0.3442	0.3446	0.3444	0.0004	0.1%		98.9%	Yes
Matrix Spike	28959-007	Imp C&R R2	04/04/13	0.3455	0.3412	0.3434	0.0043	1.3%	0.3%	98.6%	Yes
Matrix Spike	28959-020	Imp C&R R3	04/04/13	0.3314	0.3351	0.3333	0.0037	1.1%		99.3%	Yes

File: SPS-04-28959_IC_CI_V0
Date: 4/12/2013
Time: 4:30 PM

CHAIN-OF-CUSTODY DOCUMENTATION

Lab Project No.: 28959
CleanAir No.: 12218
66

Date Received: 4/1/2013

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	1-20	Impinger C&R	Nalgene	US EPA Method 26A Chloride

Printed 2013/04/01 11:16:42

CLIENT Wheelabrator
PLANT North Broward
PROJECT MANAGER S. Brown

PROJECT 12218NB
DEPT. 66

66-12218NB-8

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

28959

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
-001	3/19	Reagent Blank	All	DI Water (~200 mL), 250 mL HDPE	1		X				Please Report North
-002	3/19	Reagent Blank	All	0.1 N H_2SO_4 (~200 mL), 1000 mL HDPE	1		X				and South Broward Separately

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**
	4/1/13 1105					3/27/2013

CLIENT Wheelabrator | PROJECT 12218NB | 66-12218NB-7

PLANT North 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	2	ALKALINE IMPINGER CATCH AND RINSE 1000 mL HDPE

28959

LAB ID NUMBER	DATE (2013)	TEST LOCATION	RUN NUMBER	SAMPLE MATRIX	NUMBER OF CONTAINERS	CONTAINER SEALED? LIQUID LEVEL MARKED?	ANALYSIS REQUESTED: Chloride	Bromide	Archive	ADDITIONAL INFORMATION
-006	3/19	Unit 1 FF Outlet	1	Acidic Impinger Catch and Rinse, 1000 mL HDPE	1	653	X			Please Report North
-007	3/19	Unit 1 FF Outlet	2	Acidic Impinger Catch and Rinse, 1000 mL HDPE	1	659	X			and South Broward Separately
-008	3/19	Unit 1 FF Outlet	3	Acidic Impinger Catch and Rinse, 1000 mL HDPE	1	660	X			
-003	3/19	Unit 1 SDA Inlet	1	Acidic Impinger Catch and Rinse, 1000 mL HDPE	1	689	X			
-004	3/19	Unit 1 SDA Inlet	2	Acidic Impinger Catch and Rinse, 1000 mL HDPE	1	675	X			
-005	3/19	Unit 1 SDA Inlet	3	Acidic Impinger Catch and Rinse, 1000 mL HDPE	1	714	X			
						CAE				
-012	3/21	Unit 2 FF Outlet	1	Acidic Impinger Catch and Rinse, 1000 mL HDPE	1	678	X			
-013	3/21	Unit 2 FF Outlet	2	Acidic Impinger Catch and Rinse, 1000 mL HDPE	1	735	X			
-014	3/21	Unit 2 FF Outlet	3	Acidic Impinger Catch and Rinse, 1000 mL HDPE	1	837	X			
-009	3/21	Unit 2 SDA Inlet	1	Acidic Impinger Catch and Rinse, 1000 mL HDPE	1	613	X			
-010	3/21	Unit 2 SDA Inlet	2	Acidic Impinger Catch and Rinse, 1000 mL HDPE	1	631	X			
-011	3/21	Unit 2 SDA Inlet	3	Acidic Impinger Catch and Rinse, 1000 mL HDPE	1	668	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**
	3/27/13 1105					3/27/2013

CLIENT	Wheelabrator	PROJECT	12218NB
PLANT	North Broward	DEPT.	66
PROJECT MANAGER	S. Brown		66-12218NB-6

ANALYTICAL METHOD	CONTAINER NUMBER	SAMPLE FRACTION
USEPA M-26	1	ACIDIC IMPINGER CATCH AND RINSE 1000 mL HDPE

CleanAir ENGINEERING
500 West Wood Street
Palatine, IL 60067
800-627-0033 (phone)
847-991-3385 (fax)

FORWARDING LAB
CleanAir Analytical Services
500 West Wood Street
Palatine, IL 60067
800-627-0033 (phone)
847-991-3385 (fax)

28959

ANALYSIS REQUESTED

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
											Please Report North
											and South Broward Separately
-018	3/20 ✓	Unit 3 FF Outlet	1	Acidic Impinger Catch and Rinse, 1000 mL HDPE	1	750	X				
-019	3/20 ✓	Unit 3 FF Outlet	2	Acidic Impinger Catch and Rinse, 1000 mL HDPE	1	690	X				
-020	3/20 ✓	Unit 3 FF Outlet	3	Acidic Impinger Catch and Rinse, 1000 mL HDPE	1	726	X				
-015	3/20 ✓	Unit 3 SDA Inlet	1	Acidic Impinger Catch and Rinse, 1000 mL HDPE	1	637	X				
-016	3/20 ✓	Unit 3 SDA Inlet	2	Acidic Impinger Catch and Rinse, 1000 mL HDPE	1	624	X				
-017	3/20 ✓	Unit 3 SDA Inlet	3	Acidic Impinger Catch and Rinse, 1000 mL HDPE	1	704	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**
[signature]	4/1/13 1105					[signature] 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 North 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 (Peak 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 than ten times the MDL?	Yes
Is the Avg Recovery between 90% < R_a < 110% ?	Yes

File: SPS-04-28959_IC_Cl_V0
Date: 4/12/2013
Time: 4:30 PM

EQUIPMENT CALIBRATION RECORDS

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CHROMATOGRAPHIC DATA REDUCTION
Ion Chromatography Analysis

Customer:	Reliable Source Testing	Lab Project No:	28959	Analyst	Eric Ewing
Plant:	Wheelabrator North 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:	Cal 00	Cal 01	Cal 02	Cal 03	Cal 04	Cal 05	Cal 06
Conc. (mg/L)		0.0000	0.0406	0.2029	0.4059	1.2680	1.6231	2.5380
Cal 1 Trial 1	03/29/2013	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	0.2694	0.3433	0.5361
Cal 2 Trial 1	04/01/2013			0.0428				
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	6	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

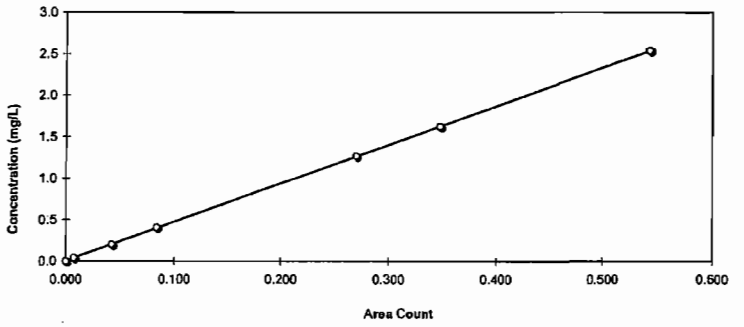
Average Minus Minimum Value (Rel. %)		3.90%	4.26%	3.22%	0.73%	1.44%	1.46%
Is Minimum Within 5% of Average Value?		Yes	Yes	Yes	Yes	Yes	Yes
Maximum Minus Average Value (Rel. %)		2.60%	3.97%	2.98%	1.09%	1.72%	1.56%
Is Maximum Within 5% of Average Value?		Yes	Yes	Yes	Yes	Yes	Yes

Quality Control Checks

Measured Area Counts (Counts)	Actual Concentration (mg/L)	Regression Concentration (mg/L)	Difference pt-Line (1% Scale)	Is Difference Less Than 2% of Scale?	Difference pt-Line (Relative %)	Is Relative Difference Less Than 10%?
0.0000	0.000	0.006	-0.25%	Yes	0.00%	Yes
0.0077	0.041	0.042	-0.05%	Yes	-3.88%	Yes
0.0425	0.203	0.204	-0.05%	Yes	-0.82%	Yes
0.0838	0.408	0.398	0.38%	Yes	2.35%	Yes
0.2702	1.266	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 > 0.9952
Slope	m =	4.6523	
Intercept	b =	0.0064	
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.

STANDARD PREPARATION RECORDS

Stock Solution Standard Mixing Recipe (Anions)

Ion Chromatography Analysis

Customer:	Palatine Source Testing	Lab Project No:	28959	Analyst:	Eric Ewing
Plant:	Wheelabrator North 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)	1000	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	1.1050	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

QC Standard Mixing Recipe (Anions)

Ion Chromatography Analysis

Customer:	Palatine Source Testing	Lab Project No:	28959	Analyst:	Eric Ewing
Plant:	Wheelabrator North 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

File: SPS-84-28959_IC_Cl_V0
Date: 4/12/2013
Time: 4:30 PM

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										

CHROMATOGRAMS

SGS ANALYTICAL PERSPECTIVES

4 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.	12218NB
AP Project #	**A5322**
Analytical Protocol	Method 23
No. Samples Submitted	5
No. Samples Analyzed	4 (Reagent Blank Archived)
No. Laboratory Method Blanks	1
No. OPRs / Batch CS3	1
No. Outstanding Samples	0
Date Received	22-Mar-2013
Condition Received	good
Temperature upon Receipt (C)	5 (traps and filters), 15, 17 (solvents)
Extraction within Holding Time	yes
Analysis within Holding Time	yes
Data meet QA/QC Requirements	yes
Exceptions	none
Analytical Difficulties	none

ANALYTICAL PERSPECTIVES IS NOW PART OF SGS, THE WORLD'S LEADING INSPECTION, VERIFICATION, TESTING AND CERTIFICATION COMPANY.

QC Annotations:

Please see Appendix A & B attached for data qualifier/attribute and lab identifier descriptions which may be contained in the project.

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.

The management and staff of SGS Analytical Perspectives welcomes customer feedback, both positive and negative, as we continually improve our services. Please visit our web site at www.ultratrace.com and click on the 'Leave Your Feedback Here!' link on the Home Page. Thank you for choosing SGS Analytical Perspectives.

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

A5322 - TEQ

Project ID: 12218NB

Sample Summary
Part 1

SGS ANALYTICAL PERSPECTIVES

Method 23

Analyte	Method Blank A5322	Unit 2 FF Outlet Field Blank	Unit 2 FF Outlet Run 1	Unit 2 FF Outlet Run 2	Unit 2 FF Outlet Run 3
	pg	pg	pg	pg	pg
2,3,7,8-TCDD	(2.3)	(2.05)	4.73	[6.43]	5.29
1,2,3,7,8-PeCDD	(2.17)	(1.73)	41.1	42.3	44.6
1,2,3,4,7,8-HxCDD	(2.4)	(1.74)	74.2	72.2	74.2
1,2,3,6,7,8-HxCDD	(2.35)	(1.87)	244	247	272
1,2,3,7,8,9-HxCDD	(2.67)	(1.84)	119	129	141
1,2,3,4,6,7,8-HpCDD	(2.91)	(2.1)	1710	1690	1870
OCDD	16.4	11.9	1640	1580	1820
2,3,7,8-TCDF	(1.65)	(1.25)	21.4	20	[19.7]
1,2,3,7,8-PeCDF	(1.5)	(1.1)	28	26.4	33.4
2,3,4,7,8-PeCDF	(1.42)	(1.01)	73	80	82.3
1,2,3,4,7,8-HxCDF	(1.27)	(1.63)	47.5	49.7	58.3
1,2,3,6,7,8-HxCDF	(1.2)	(1.49)	56.7	63.6	68.7
2,3,4,6,7,8-HxCDF	(1.33)	(1.61)	115	139	146
1,2,3,7,8,9-HxCDF	(1.42)	(1.74)	(3.22)	(3.92)	(4.49)
1,2,3,4,6,7,8-HpCDF	(1.47)	(1.5)	144	150	164
1,2,3,4,7,8,9-HpCDF	(1.88)	(1.88)	32.8	39.1	39.6
OCDF	(3.09)	(2.1)	50.9	56.9	60.4
ITEF TEQ (ND=0; EMPC=0)	**0.0164**	**0.0119**	**152**	**155**	**169**
ITEF TEQ (ND=0; EMPC=EMPC)	**0.0164**	**0.0119**	**152**	**161**	**171**
ITEF TEQ (ND=DL/2; EMPC=0)	**2.85**	**2.44**	**152**	**157**	**169**
ITEF TEQ (ND=DL/2; EMPC=EMPC)	**2.85**	**2.44**	**152**	**162**	**171**
ITEF TEQ (ND=DL; EMPC=EMPC)	**5.68**	**4.86**	**152**	**162**	**171**
Checkcode	246-133-VCY	815-468-JHZ	518-996-SHZ	858-864-NJF	552-183-NDY
Lab ID	MB1_10764_DF_SDS	A5322_10764_DF_001	A5322_10764_DF_002	A5322_10764_DF_003	A5322_10764_DF_004

( ) = DL
[ ] = EMPC

A5322 - WHO-2005-TEQ

Project ID: 12218NB

Sample Summary Part 1	SGS ANALYTICAL PERSPECTIVES				Method 23
Analyte	**Method Blank A5322**	**Unit 2 FF Outlet Field Blank**	**Unit 2 FF Outlet Run 1**	**Unit 2 FF Outlet Run 2**	**Unit 2 FF Outlet Run 3**
	pg	pg	pg	pg	pg
2,3,7,8-TCDD	(2.3)	(2.05)	4.73	[6.43]	5.29
1,2,3,7,8-PeCDD	(2.17)	(1.73)	41.1	42.3	44.6
1,2,3,4,7,8-HxCDD	(2.4)	(1.74)	74.2	72.2	74.2
1,2,3,6,7,8-HxCDD	(2.35)	(1.87)	244	247	272
1,2,3,7,8,9-HxCDD	(2.67)	(1.84)	119	129	141
1,2,3,4,6,7,8-HpCDD	(2.91)	(2.1)	1710	1690	1870
OCDD	16.4	11.9	1640	1580	1820
2,3,7,8-TCDF	(1.65)	(1.25)	21.4	20	[19.7]
1,2,3,7,8-PeCDF	(1.5)	(1.1)	28	26.4	33.4
2,3,4,7,8-PeCDF	(1.42)	(1.01)	73	80	82.3
1,2,3,4,7,8-HxCDF	(1.27)	(1.63)	47.5	49.7	58.3
1,2,3,6,7,8-HxCDF	(1.2)	(1.49)	56.7	63.6	68.7
2,3,4,6,7,8-HxCDF	(1.33)	(1.61)	115	139	146
1,2,3,7,8,9-HxCDF	(1.42)	(1.74)	(3.22)	(3.92)	(4.49)
1,2,3,4,6,7,8-HpCDF	(1.47)	(1.5)	144	150	164
1,2,3,4,7,8,9-HpCDF	(1.88)	(1.88)	32.8	39.1	39.6
OCDF	(3.09)	(2.1)	50.9	56.9	60.4
WHO-2005 TEQ (ND=0; EMPC=0)	**0.00492**	**0.00357**	**156**	**158**	**173**
WHO-2005 TEQ (ND=0; EMPC=EMPC)	**0.00492**	**0.00357**	**156**	**165**	**175**
WHO-2005 TEQ (ND=DL/2; EMPC=0)	**3.22**	**2.75**	**156**	**160**	**173**
WHO-2005 TEQ (ND=DL/2; EMPC=EMPC)	**3.22**	**2.75**	**156**	**165**	**175**
WHO-2005 TEQ (ND=DL; EMPC=EMPC)	**6.43**	**5.49**	**156**	**165**	**175**
Checkcode	246-133-VCY	815-468-JHZ	518-996-SHZ	858-864-NJF	552-183-NDY
Lab ID	MB1_10764_DF_SDS	A5322_10764_DF_001	A5322_10764_DF_002	A5322_10764_DF_003	A5322_10764_DF_004

( ) = DL
[ ] = EMPC

A5322 - Totals

Project ID: 12218NB

Sample Summary Part 2					Method 23
Analyte	**Method Blank A5322**	**Unit 2 FF Outlet Field Blank**	**Unit 2 FF Outlet Run 1**	**Unit 2 FF Outlet Run 2**	**Unit 2 FF Outlet Run 3**
	pg	pg	pg	pg	pg
Totals					
TCDDs	0	0	2250	2380	2400
PeCDDs	0	0	3110	3090	3330
HxCDDs	0	0	5950	6060	6540
HpCDDs	0	0	3380	3300	3710
OCDD	16.4	11.9	1640	1580	1820
TCDFs	0	0	1090	1080	1150
PeCDFs	0	0	1070	1030	1150
HxCDFs	0	0	825	951	1030
HpCDFs	0	0	340	387	419
OCDF	0	0	50.9	56.9	60.4
Total PCDD/Fs (ND=0; EMPC=0)	**16.4**	**11.9**	**19,700**	**19,900**	**21,600**
Total PCDD/Fs (ND=0; EMPC=EMPC)	**16.4**	**15.7**	**19,800**	**20,000**	**21,700**
Total PCDD/Fs (2378-X ND=DL; EMPC=EMPC)	**47.4**	**42.3**	**19,800**	**20,000**	**21,700**
Total 2378s (ND=0; EMPC=0)	**16.4**	**11.9**	**4,410**	**4,390**	**4,880**
Total 2378s (ND=0.5; EMPC=0)	**31.9**	**25.2**	**4,410**	**4,390**	**4,880**
Total 2378s (ND=1; EMPC=0)	**47.4**	**38.5**	**4,410**	**4,390**	**4,890**
Total 2378s (ND=0; EMPC=1)	**16.4**	**11.9**	**4,410**	**4,390**	**4,900**
Total 2378s (ND=0.5; EMPC=1)	**31.9**	**25.2**	**4,410**	**4,400**	**4,900**
Total 2378s (ND=1; EMPC=1)	**47.4**	**38.5**	**4,410**	**4,400**	**4,900**
Checkcode	246-133-VCY	815-468-JHZ	518-996-SHZ	858-864-NJF	552-183-NDY
Lab ID	MB1_10764_DF_SDS	A5322_10764_DF_001	A5322_10764_DF_002	A5322_10764_DF_003	A5322_10764_DF_004

( ) = DL
[ ] = EMPC

A5322 - Others
Project ID: 12218NB

Sample Summary Part 3					Method 23
Analyte	**Method Blank A5322**	**Unit 2 FF Outlet Field Blank**	**Unit 2 FF Outlet Run 1**	**Unit 2 FF Outlet Run 2**	**Unit 2 FF Outlet Run 3**
	pg	pg	pg	pg	pg
Other PCDD/Fs (ND=0, EMPC=0)					
Other TCDD	0	0	2240	2380	2400
Other PeCDD	0	0	3060	3040	3280
Other HxCDD	0	0	5510	5610	6060
Other HpCDD	0	0	1670	1610	1840
Other TCDF	0	0	1070	1060	1150
Other PeCDF	0	0	966	925	1030
Other HxCDF	0	0	606	698	755
Other HpCDF	0	0	163	198	215
Other PCDD/Fs (ND=0, EMPC=EMPC)					
Other TCDD	0	0	2240	2390	2410
Other PeCDD	0	0	3080	3110	3300
Other HxCDD	0	0	5510	5610	6060
Other HpCDD	0	3.76	1670	1610	1840
Other TCDF	0	0	1090	1070	1150
Other PeCDF	0	0	971	938	1060
Other HxCDF	0	0	626	698	755
Other HpCDF	0	0	163	198	215
Checkcode	246-133-VCY	815-468-JHZ	518-996-SHZ	858-864-NJF	552-183-NDY
Lab ID	MB1_10764_DF_SDS	A5322_10764_DF_001	A5322_10764_DF_002	A5322_10764_DF_003	A5322_10764_DF_004

( ) = DL
[ ] = EMPC

A5322 - DLs

Project ID: 12218NB

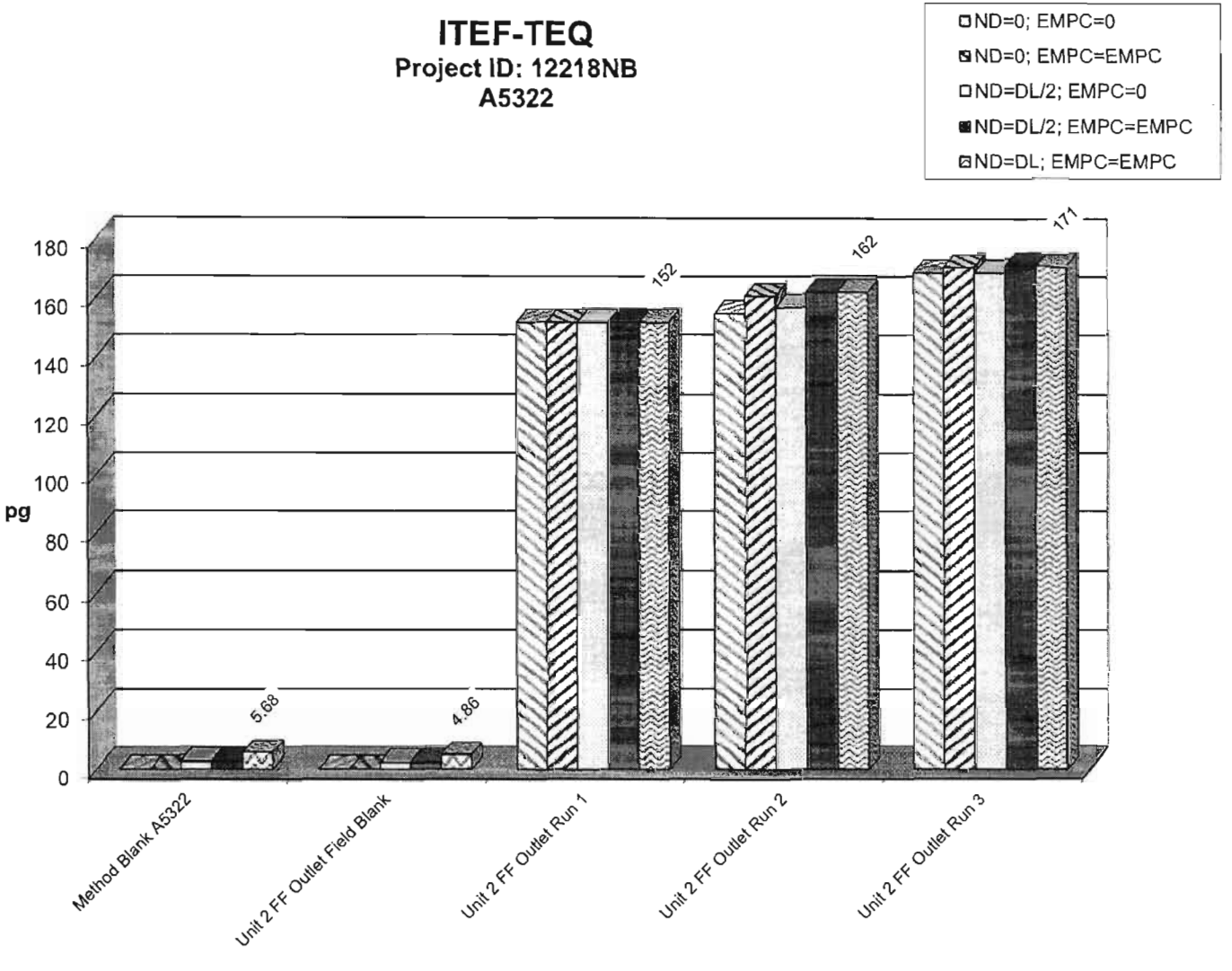
Sample Summary
Part 5 (DLs)

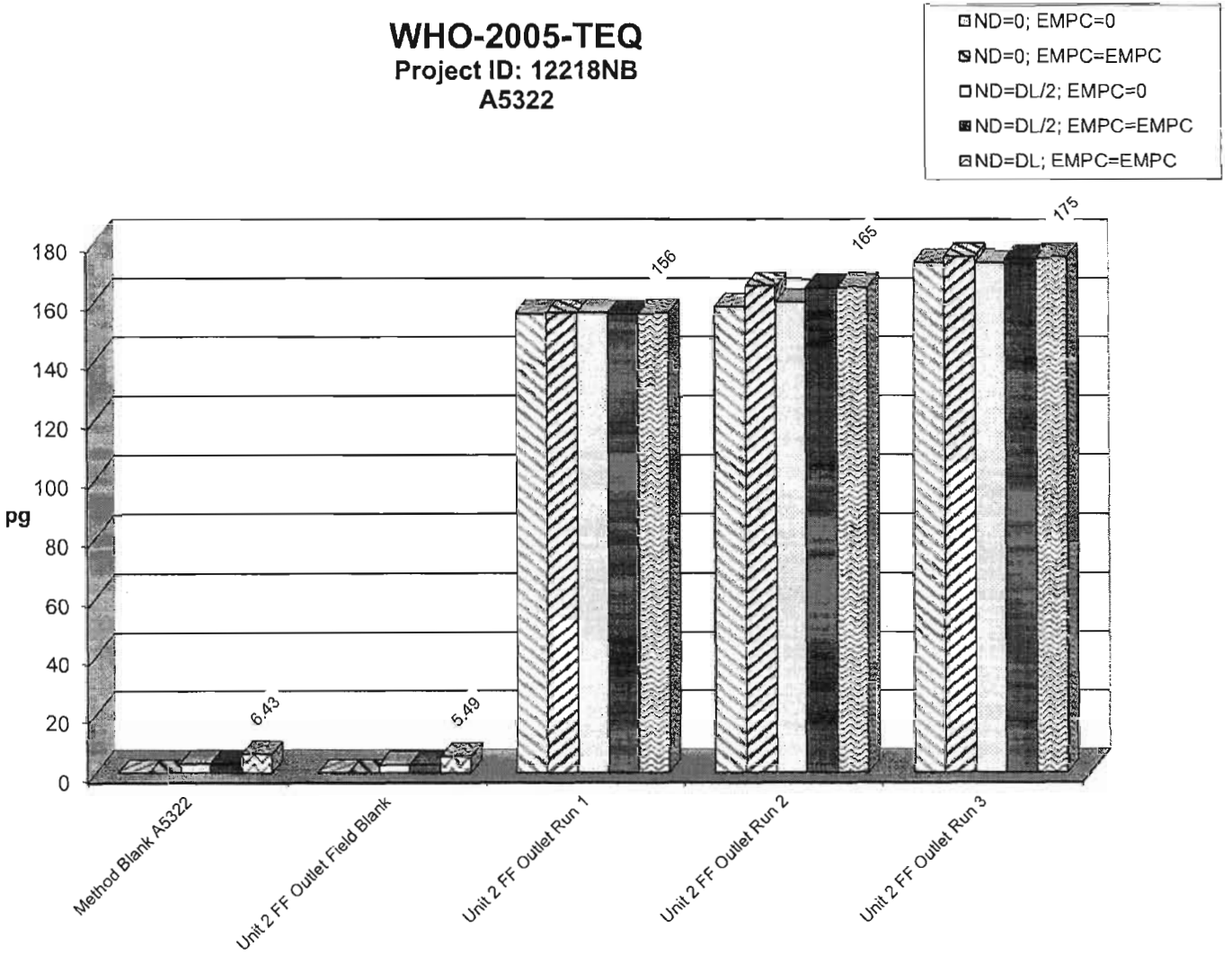
SGS ANALYTICAL PERSPECTIVES

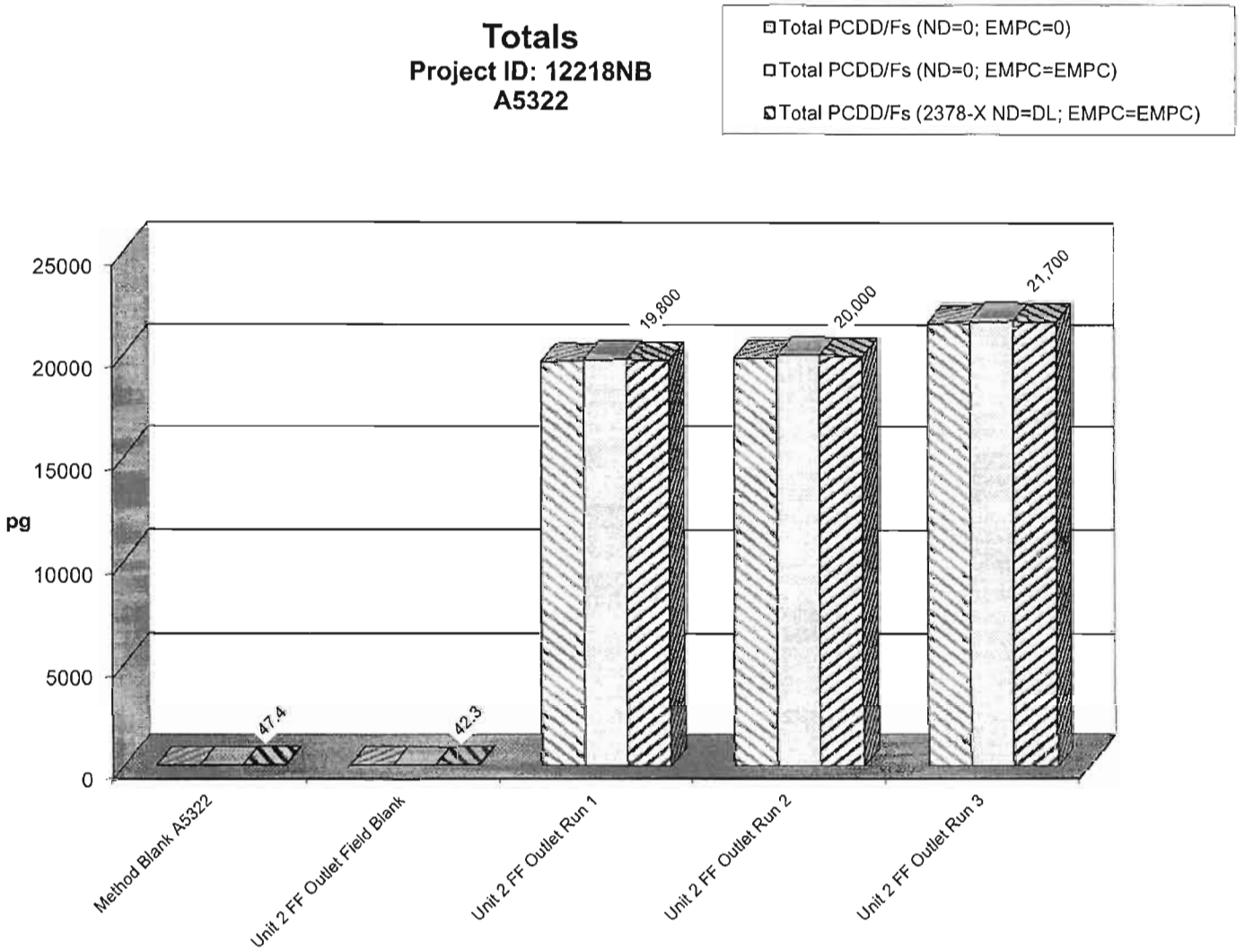
Method 23

Analyte	Method Blank A5322	Unit 2 FF Outlet Field Blank	Unit 2 FF Outlet Run 1	Unit 2 FF Outlet Run 2	Unit 2 FF Outlet Run 3
	pg	pg	pg	pg	pg
2,3,7,8-TCDD	2.3	2.05	1.64	2.86	2.04
1,2,3,7,8-PeCDD	2.17	1.73	2.37	2.71	2.81
1,2,3,4,7,8-HxCDD	2.4	1.74	1.91	3.39	2.68
1,2,3,6,7,8-HxCDD	2.35	1.87	2.01	3.31	2.71
1,2,3,7,8,9-HxCDD	2.67	1.84	1.97	3.35	2.89
1,2,3,4,6,7,8-HpCDD	2.91	2.1	1.88	2.78	3.07
OCDD	3.62	3.91	3.58	5.68	3.65
2,3,7,8-TCDF	1.65	1.25	1.39	2.43	2.17
1,2,3,7,8-PeCDF	1.5	1.1	2.65	2.88	3.22
2,3,4,7,8-PeCDF	1.42	1.01	2.58	2.52	3.18
1,2,3,4,7,8-HxCDF	1.27	1.63	2.81	3.32	3.73
1,2,3,6,7,8-HxCDF	1.2	1.49	2.63	3.39	3.79
2,3,4,6,7,8-HxCDF	1.33	1.61	2.82	3.63	3.76
1,2,3,7,8,9-HxCDF	1.42	1.74	3.22	3.92	4.49
1,2,3,4,6,7,8-HpCDF	1.47	1.5	1.5	2.17	1.67
1,2,3,4,7,8,9-HpCDF	1.88	1.88	1.97	2.4	2.01
OCDF	3.09	2.1	2.96	4.22	3.63
Total TCDD	2.3	2.05	1.64	2.86	2.04
Total PeCDD	2.17	1.73	2.37	2.71	2.81
Total HxCDD	2.47	1.81	1.95	3.34	2.75
Total HpCDD	2.91	2.1	1.88	2.78	3.07
Total TCDF	1.65	1.25	1.39	2.43	2.17
Total PeCDF	1.46	1.05	2.62	2.7	3.2
Total HxCDF	1.3	1.61	2.86	3.55	3.92
Total HpCDF	1.65	1.68	1.72	2.28	1.83
Checkcode	246-133-VCY	815-468-JHZ	518-996-SHZ	858-864-NJF	552-183-NDY
Lab ID	MB1_10764_DF_SDS	A5322_10764_DF_001	A5322_10764_DF_002	A5322_10764_DF_003	A5322_10764_DF_004

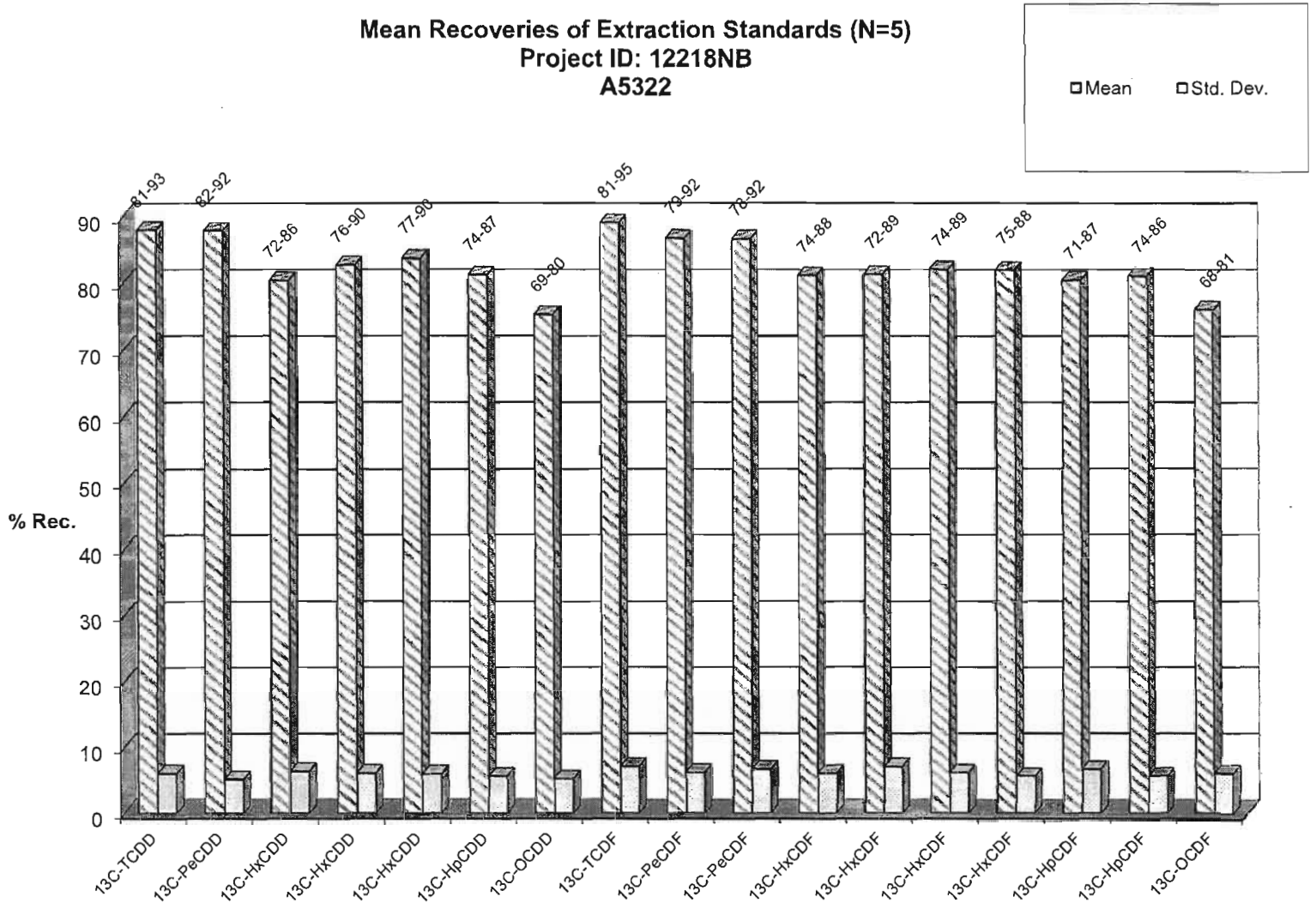
ITEF-TEQ
Project ID: 12218NB
A5322




WHO-2005-TEQ
Project ID: 12218NB
A5322
ND=0; EMPC=0
ND=0; EMPC=EMPC
ND=DL/2; EMPC=0
ND=DL/2; EMPC=EMPC
ND=DL; EMPC=EMPC
pg
180
160
140
120
100
80
60
40
20
0
6.43
5.49
156
165
175
Method Blank A5322
Unit 2 FF Outlet Field Blank
Unit 2 FF Outlet Run 1
Unit 2 FF Outlet Run 2
Unit 2 FF Outlet Run 3

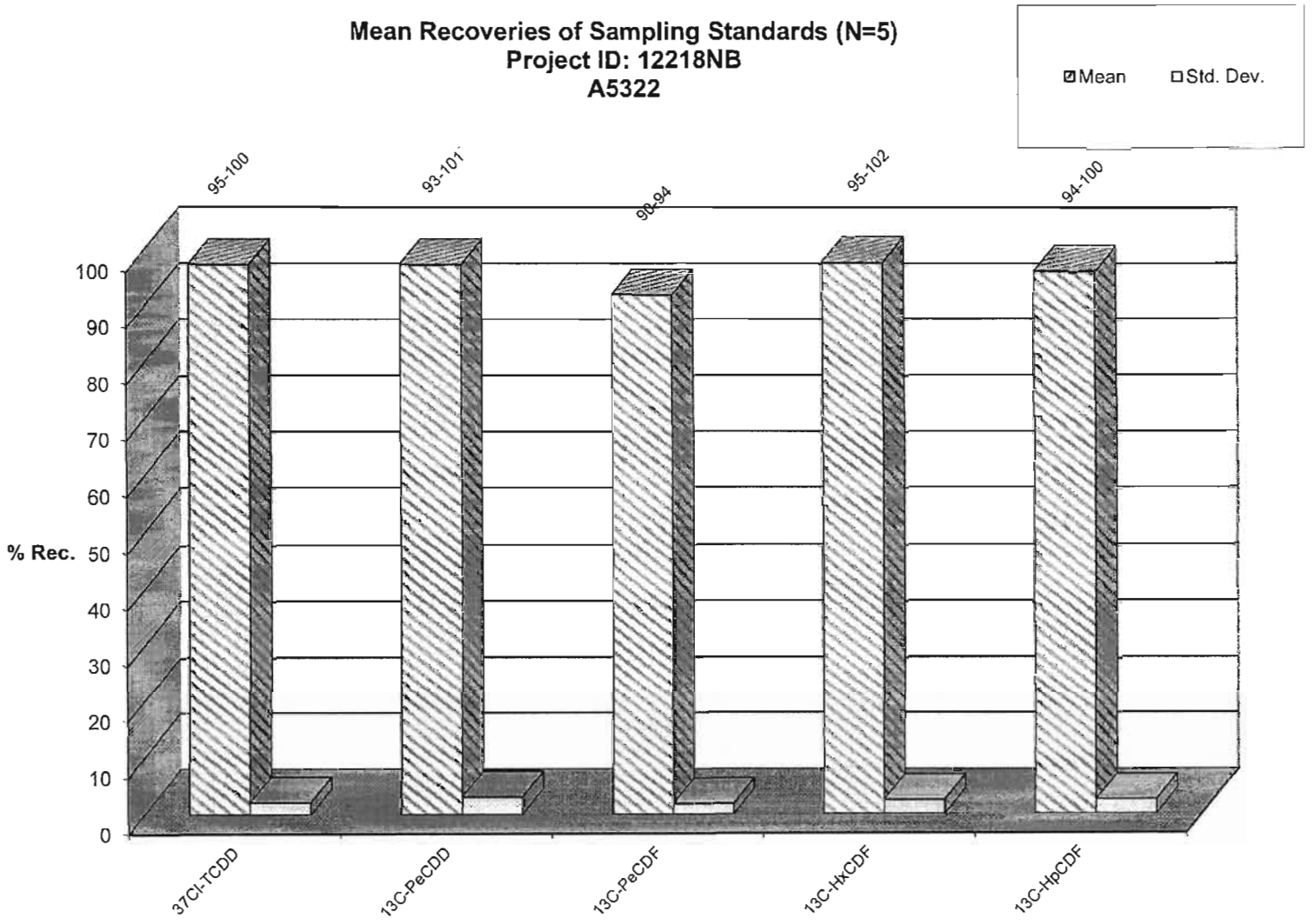

Totals
Project ID: 12218NB
A5322
Total PCDD/Fs (ND=0; EMPC=0)
Total PCDD/Fs (ND=0; EMPC=EMPC)
Total PCDD/Fs (2378-X ND=DL; EMPC=EMPC)
pg
25000
20000
15000
10000
5000
0
47.4
42.3
19,800
20,000
21,700
Method Blank A5322
Unit 2 FF Outlet Field Blank
Unit 2 FF Outlet Run 1
Unit 2 FF Outlet Run 2
Unit 2 FF Outlet Run 3

Mean Recoveries of Extraction Standards (N=5)
Project ID: 12218NB
A5322

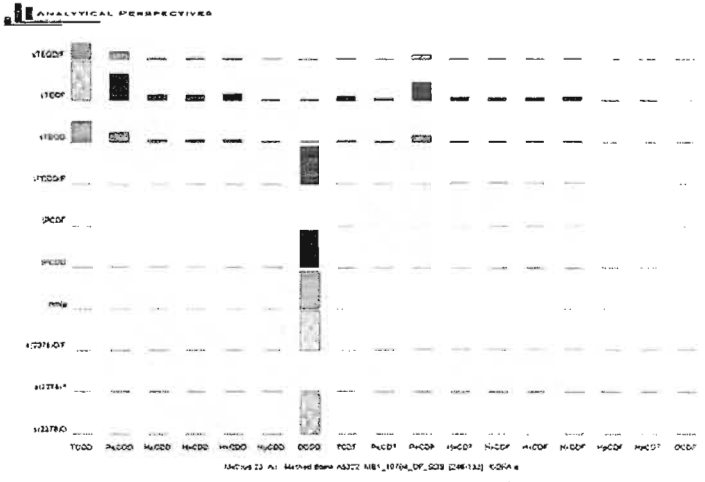


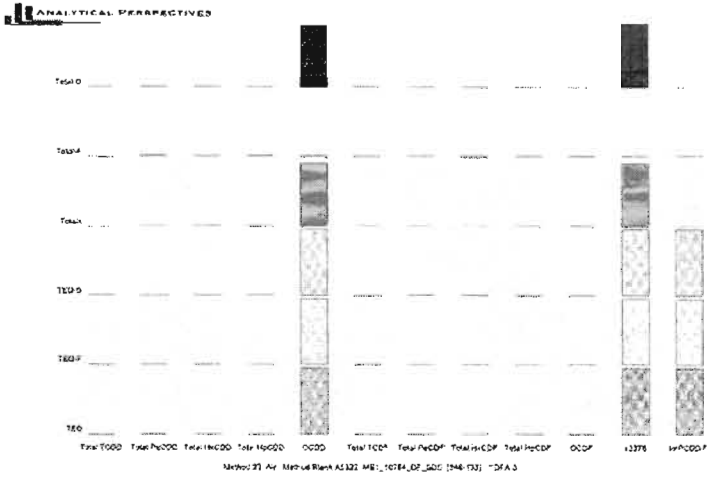
Method Specification Limits: Tetra-Hexa ES: 40-130%, Hepta-Octa ES: 25-130% (**F** = fail)

Mean Recoveries of Sampling Standards (N=5)
Project ID: 12218NB
A5322



Method Specification Limits: Tetra-Octa SS: 70-130% (**F** = fail)


ANALYTICAL PERSPECTIVES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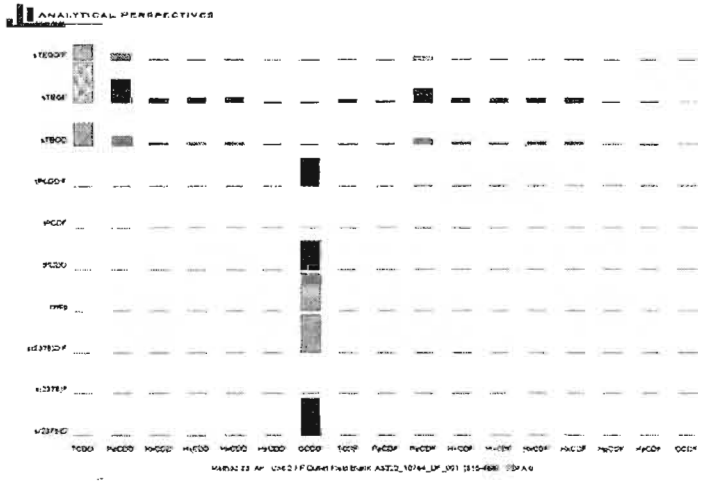
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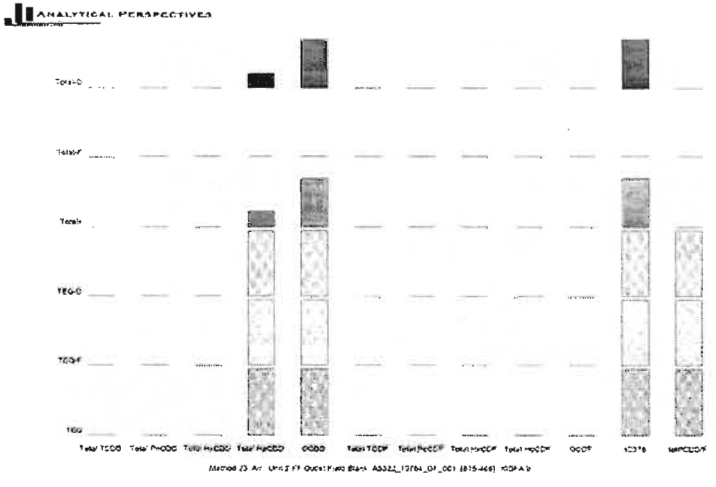
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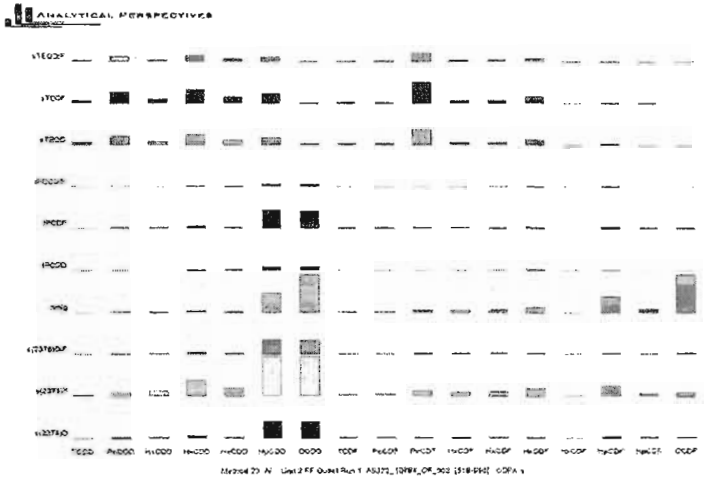
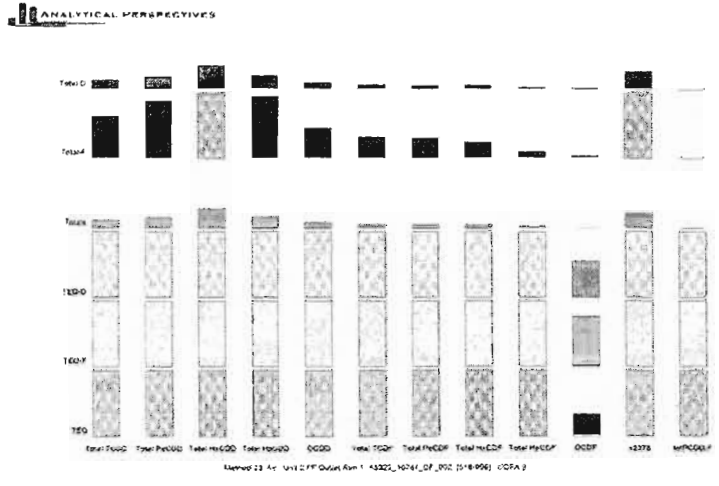

ANALYTICAL PERSPECTIVES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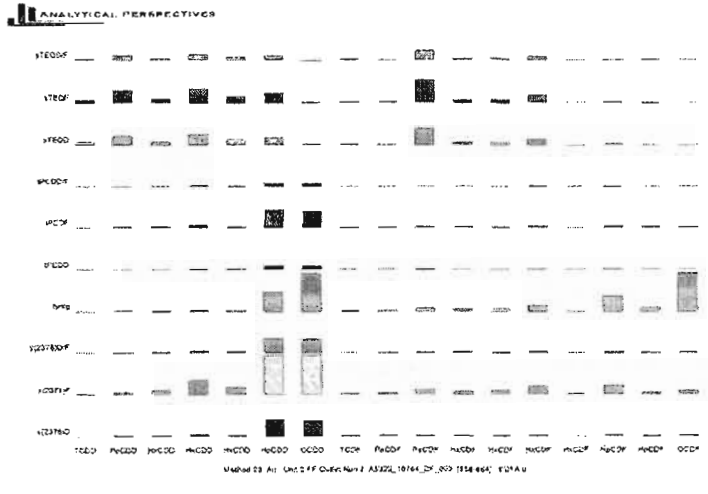
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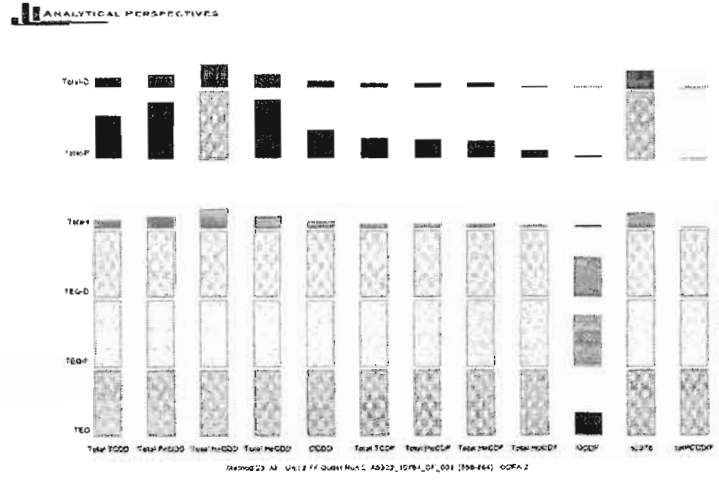
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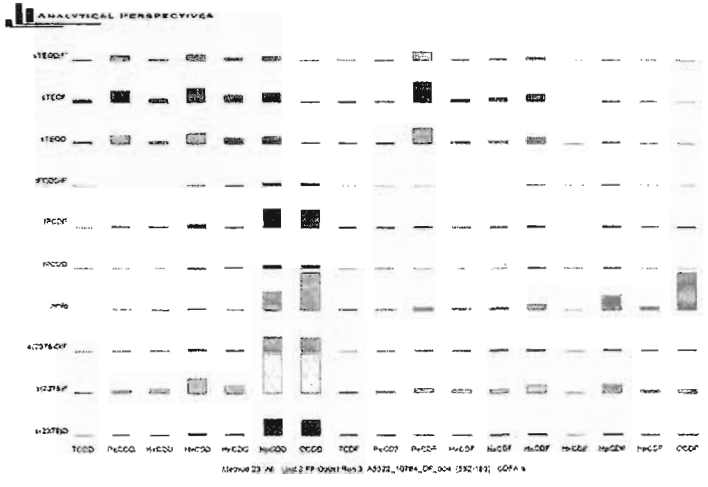
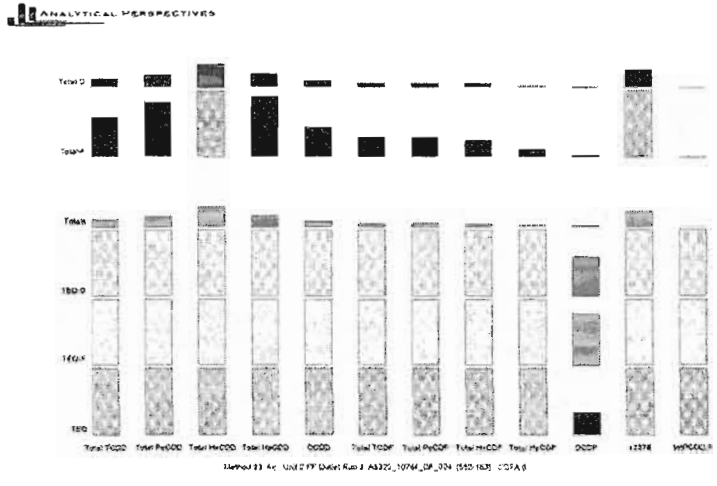

ANALYTICAL PERSPECTIVES


ANALYTICAL PERSPECTIVES

Sample ID: Method Blank A5322

Method 23

Client Data		Sample Data		Laboratory Data			
Name:	Clean Air Engineering	Matrix:	Air	Lab Project ID:	A5322	Date Received:	n/a
Project ID:	12218NB	Weight/Volume:	1	Lab Sample ID	MB1_10764_DF_SDS	Date Extracted:	26-Mar-2013
Date Collected:	n/a			QC Batch No:	10764	Date Analyzed:	01-Apr-2013
		Split:	2	Dilution:	-	Time Analyzed:	00:55:36

Analyte	Conc. (pg)	DL (pg)	EMPC (pg)	Qualifiers	Standard	ES Recoveries	Qualifiers
2378-TCDD	ND	2.3			ES 2378-TCDD	91.5	
12378-PeCDD	ND	2.17			ES 12378-PeCDD	89.9	
123478-HxCDD	ND	2.4			ES 123478-HxCDD	86.5	
123678-HxCDD	ND	2.35			ES 123678-HxCDD	89.8	
123789-HxCDD	ND	2.67			ES 123789-HxCDD	90.5	
1234678-HpCDD	ND	2.91			ES 1234678-HpCDD	87.1	
OCDD	16.4			J	ES OCDD	79.9	
2378-TCDF	ND	1.65			ES 2378-TCDF	95.3	
12378-PeCDF	ND	1.5			ES 12378-PeCDF	91.6	
23478-PeCDF	ND	1.42			ES 23478-PeCDF	91	
123478-HxCDF	ND	1.27			ES 123478-HxCDF	87.6	
123678-HxCDF	ND	1.2			ES 123678-HxCDF	89.4	
234678-HxCDF	ND	1.33			ES 234678-HxCDF	88.6	
123789-HxCDF	ND	1.42			ES 123789-HxCDF	87.8	
1234678-HpCDF	ND	1.47			ES 1234678-HpCDF	87.1	
1234789-HpCDF	ND	1.88			ES 1234789-HpCDF	85.8	
OCDF	ND	3.09			ES OCDF	80.6	
Totals					**Standard**	**SS/AS Recoveries**	
					SS 37Cl-2378-TCDD	99.7	
Total TCDD	ND	2.3	ND		SS 12347-PeCDD	99	
Total PeCDD	ND	2.17	ND		SS 12346-PeCDF	94.4	
Total HxCDD	ND	2.47	ND		SS 123469-HxCDF	97.4	
Total HpCDD	ND	2.91	ND		SS 1234689-HpCDF	97	
					AS 1368-TCDD	100	
Total TCDF	ND	1.65	ND		AS 1368-TCDF	97.4	
Total PeCDF	ND	1.46	ND				
Total HxCDF	ND	1.3	ND				
Total HpCDF	ND	1.65	ND				
Total PCDD/Fs	**16.4**		**16.4**				
ITEF TEQs							
TEQ: ND=0	0.0164		0.0164				
TEQ: ND=DL/2	2.85	2.83	2.85				
TEQ: ND=DL	5.68	5.66	5.68				

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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:	A5322	Date Received:	22-Mar-2013
Project ID:	12218NB	Weight/Volume:	1	Lab Sample ID	A5322_10764_DF_001	Date Extracted:	26-Mar-2013
Date Collected:	21-Mar-2013			QC Batch No:	10764	Date Analyzed:	01-Apr-2013
		Split:	2	Dilution:	-	Time Analyzed:	01:48:04

Analyte	Conc. (pg)	DL (pg)	EMPC (pg)	Qualifiers	Standard	ES Recoveries	Qualifiers
2378-TCDD	ND	2.05			ES 2378-TCDD	92.7	
12378-PeCDD	ND	1.73			ES 12378-PeCDD	92.2	
123478-HxCDD	ND	1.74			ES 123478-HxCDD	84.5	
123678-HxCDD	ND	1.87			ES 123678-HxCDD	84.6	
123789-HxCDD	ND	1.84			ES 123789-HxCDD	87.8	
1234678-HpCDD	ND	2.1			ES 1234678-HpCDD	84.9	
OCDD	11.9			J B	ES OCDD	80.1	
2378-TCDF	ND	1.25			ES 2378-TCDF	92.9	
12378-PeCDF	ND	1.1			ES 12378-PeCDF	92.4	
23478-PeCDF	ND	1.01			ES 23478-PeCDF	91.4	
123478-HxCDF	ND	1.63			ES 123478-HxCDF	83.9	
123678-HxCDF	ND	1.49			ES 123678-HxCDF	86	
234678-HxCDF	ND	1.61			ES 234678-HxCDF	85.4	
123789-HxCDF	ND	1.74			ES 123789-HxCDF	85.7	
1234678-HpCDF	ND	1.5			ES 1234678-HpCDF	83.5	
1234789-HpCDF	ND	1.88			ES 1234789-HpCDF	84.5	
OCDF	ND	2.1			ES OCDF	81.1	
Totals					**Standard**	**SS/AS Recoveries**	
					SS 37Cl-2378-TCDD	99.6	
Total TCDD	ND	2.05	ND		SS 12347-PeCDD	101	
Total PeCDD	ND	1.73	ND		SS 12346-PeCDF	91.1	
Total HxCDD	ND	1.81	ND		SS 123469-HxCDF	97.5	
Total HpCDD	ND		3.76		SS 1234689-HpCDF	98.2	
					AS 1368-TCDD	97	
Total TCDF	ND	1.25	ND		AS 1368-TCDF	92.1	
Total PeCDF	ND	1.05	ND				
Total HxCDF	ND	1.61	ND				
Total HpCDF	ND	1.68	ND				
Total PCDD/Fs	**11.9**		**15.7**				
ITEF TEQs							
TEQ: ND=0	0.0119		0.0119				
TEQ: ND=DL/2	2.44	2.43	2.44				
TEQ: ND=DL	4.86	4.85	4.86				

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Sample ID: Unit 2 FF Outlet Run 1

Method 23

Client Data		Sample Data		Laboratory Data			
Name:	Clean Air Engineering	Matrix:	Air	Lab Project ID:	A5322	Date Received:	22-Mar-2013
Project ID:	12218NB	Weight/Volume:	1	Lab Sample ID	A5322_10764_DF_002	Date Extracted:	26-Mar-2013
Date Collected:	19-Mar-2013			QC Batch No:	10764	Date Analyzed:	01-Apr-2013
		Split:	2	Dilution:	-	Time Analyzed:	02:40:43

Analyte	Conc. (pg)	DL (pg)	EMPC (pg)	Qualifiers	Standard	ES Recoveries	Qualifiers
2378-TCDD	4.73			J	ES 2378-TCDD	81.3	
12378-PeCDD	41.1			J	ES 12378-PeCDD	81.7	
123478-HxCDD	74.2				ES 123478-HxCDD	75.3	
123678-HxCDD	244				ES 123678-HxCDD	77	
123789-HxCDD	119				ES 123789-HxCDD	78.4	
1234678-HpCDD	1710				ES 1234678-HpCDD	76.6	
OCDD	1640				ES OCDD	71.3	
2378-TCDF	21.4				ES 2378-TCDF	82.2	
12378-PeCDF	28			J	ES 12378-PeCDF	81.1	
23478-PeCDF	73				ES 23478-PeCDF	81	
123478-HxCDF	47.5			J	ES 123478-HxCDF	75.8	
123678-HxCDF	56.7				ES 123678-HxCDF	76.2	
234678-HxCDF	115				ES 234678-HxCDF	77.7	
123789-HxCDF	ND	3.22			ES 123789-HxCDF	77.2	
1234678-HpCDF	144				ES 1234678-HpCDF	76.3	
1234789-HpCDF	32.8			J	ES 1234789-HpCDF	76.9	
OCDF	50.9			J	ES OCDF	71.7	
Totals					**Standard**	**SS/AS Recoveries**	
					SS 37Cl-2378-TCDD	94.8	
Total TCDD	2250		2250		SS 12347-PeCDD	92.9	
Total PeCDD	3110		3120		SS 12346-PeCDF	89.9	
Total HxCDD	5950		5950		SS 123469-HxCDF	95.3	
Total HpCDD	3380		3380		SS 1234689-HpCDF	94.2	
					AS 1368-TCDD	86.7	
Total TCDF	1090		1110		AS 1368-TCDF	82.1	
Total PeCDF	1070		1070				
Total HxCDF	825		845				
Total HpCDF	340		340				
Total PCDD/Fs	**19700**		**19800**				
ITEF TEQs							
TEQ: ND=0	152		152				
TEQ: ND=DL/2	152	3.09	152				
TEQ: ND=DL	152	6.18	152				

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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:	A5322	Date Received:	22-Mar-2013
Project ID:	12218NB	Weight/Volume:	1	Lab Sample ID	A5322_10764_DF_003	Date Extracted:	26-Mar-2013
Date Collected:	20-Mar-2013			QC Batch No:	10764	Date Analyzed:	01-Apr-2013
		Split:	2	Dilution:	-	Time Analyzed:	03:33:19

Analyte	Conc. (pg)	DL (pg)	EMPC (pg)	Qualifiers	Standard	ES Recoveries	Qualifiers
2378-TCDD	EMPC		6.43	J	ES 2378-TCDD	81.6	
12378-PeCDD	42.3			J	ES 12378-PeCDD	83.2	
123478-HxCDD	72.2				ES 123478-HxCDD	72.1	
123678-HxCDD	247				ES 123678-HxCDD	75.9	
123789-HxCDD	129				ES 123789-HxCDD	76.9	
1234678-HpCDD	1690				ES 1234678-HpCDD	74.1	
OCDD	1580				ES OCDD	68.6	
2378-TCDF	20				ES 2378-TCDF	80.8	
12378-PeCDF	26.4			J	ES 12378-PeCDF	79.3	
23478-PeCDF	80				ES 23478-PeCDF	78.1	
123478-HxCDF	49.7			J	ES 123478-HxCDF	73.8	
123678-HxCDF	63.6				ES 123678-HxCDF	72.2	
234678-HxCDF	139				ES 234678-HxCDF	73.9	
123789-HxCDF	ND	3.92			ES 123789-HxCDF	75	
1234678-HpCDF	150				ES 1234678-HpCDF	71.1	
1234789-HpCDF	39.1			J	ES 1234789-HpCDF	73.5	
OCDF	56.9			J	ES OCDF	67.7	
Totals					**Standard**	**SS/AS Recoveries**	
					SS 37Cl-2378-TCDD	98.5	
Total TCDD	2380		2390		SS 12347-PeCDD	99.2	
Total PeCDD	3090		3150		SS 12346-PeCDF	93.5	
Total HxCDD	6060		6060		SS 123469-HxCDF	102	
Total HpCDD	3300		3300		SS 1234689-HpCDF	99.7	
					AS 1368-TCDD	77.5	
Total TCDF	1080		1090		AS 1368-TCDF	69.5	
Total PeCDF	1030		1040				
Total HxCDF	951		951				
Total HpCDF	387		387				
Total PCDD/Fs	**19900**		**20000**				
ITEF TEQs							
TEQ: ND=0	155		161				
TEQ: ND=DL/2	157	4.19	162				
TEQ: ND=DL	158	8.38	162				

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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:	A5322	Date Received:	22-Mar-2013
Project ID:	12218NB	Weight/Volume:	1	Lab Sample ID	A5322_10764_DF_004	Date Extracted:	26-Mar-2013
Date Collected:	20-Mar-2013			QC Batch No:	10764	Date Analyzed:	01-Apr-2013
		Split:	2	Dilution:	-	Time Analyzed:	04:25:57

Analyte	Conc. (pg)	DL (pg)	EMPC (pg)	Qualifiers	Standard	ES Recoveries	Qualifiers
2378-TCDD	5.29			J	ES 2378-TCDD	93.1	
12378-PeCDD	44.6			J	ES 12378-PeCDD	92.5	
123478-HxCDD	74.2				ES 123478-HxCDD	84	
123678-HxCDD	272				ES 123678-HxCDD	86.5	
123789-HxCDD	141				ES 123789-HxCDD	85.4	
1234678-HpCDD	1870				ES 1234678-HpCDD	83.8	
OCDD	1820				ES OCDD	77.1	
2378-TCDF	EMPC		19.7		ES 2378-TCDF	94.7	
12378-PeCDF	33.4			J	ES 12378-PeCDF	89.5	
23478-PeCDF	82.3				ES 23478-PeCDF	92.1	
123478-HxCDF	58.3				ES 123478-HxCDF	84.9	
123678-HxCDF	68.7				ES 123678-HxCDF	83.2	
234678-HxCDF	146				ES 234678-HxCDF	85	
123789-HxCDF	ND	4.49			ES 123789-HxCDF	84.3	
1234678-HpCDF	164				ES 1234678-HpCDF	84.6	
1234789-HpCDF	39.6			J	ES 1234789-HpCDF	85.3	
OCDF	60.4			J	ES OCDF	79.2	
Totals					**Standard**	**SS/AS Recoveries**	
					SS 37Cl-2378-TCDD	96.4	
Total TCDD	2400		2410		SS 12347-PeCDD	97	
Total PeCDD	3330		3340		SS 12346-PeCDF	92.9	
Total HxCDD	6540		6540		SS 123469-HxCDF	98.9	
Total HpCDD	3710		3710		SS 1234689-HpCDF	93.9	
					AS 1368-TCDD	97.1	
Total TCDF	1150		1170		AS 1368-TCDF	93.2	
Total PeCDF	1150		1170				
Total HxCDF	1030		1030				
Total HpCDF	419		419				
Total PCDD/Fs	**21600**		**21700**				
ITEF TEQs							
TEQ: ND=0	169		171				
TEQ: ND=DL/2	169	3.95	171				
TEQ: ND=DL	170	7.89	171				

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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: SB

Date: 4/30

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

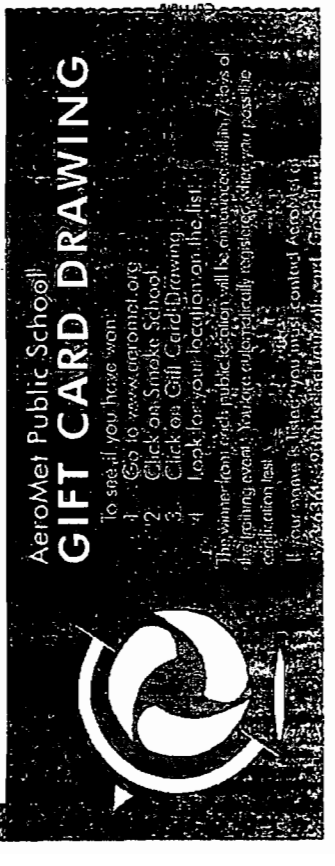
Daniel Luckhard

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



J - 3

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