



**Results of the  
EPA Information Collection Request (ICR)**

**Test Location**  
**Metropolitan Wastewater Treatment Plant**  
**Emission Unit 1 (EU001)**  
**Seneca Wastewater Treatment Plant**  
**3750 Plant Road**  
**Eagan, Minnesota 55122**  
**AQ Facility ID: 03700043-005**  
**AQ File Number: 879A**

**Prepared for:**

**Ms. Mary Gail Scott**  
**Environmental Compliance Manager**  
**Metropolitan Council Environmental Services**  
**390 Robert Street North**  
**St. Paul, Minnesota 55101-1805**  
**Phone: (651) 602-1073**  
**Fax: (651) 602-1130**  
**marygail.scott@metc.state.mn.us**

**Report # 902630 Seneca**  
**February 16-17, 2010**

**Prepared By:**

*Brian Durkop*

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**Brian Durkop**  
**Vice President**

**REPORT CERTIFICATIONS****1.) Certification of sampling procedures by the team leader of the personnel conducting the sampling procedures:**

"I certify under penalty of law that the sampling procedures were performed in accordance with the approved test plan and that the data presented in this test report are, to the best of my knowledge and belief, true, accurate, and complete. All exceptions are listed and explained in the test report."

Signature: Brian DarkopPrint Name: Brian DarkopTitle: Vice PresidentDate: 3-25-10**2.) Certification of analytical procedures by the person responsible for the laboratory analysis of field samples:**

"I certify under penalty of law that the analytical procedures were performed in accordance with the requirements of the test methods and that the data presented for use in this test report were, to the best of my knowledge and belief, true, accurate, and complete. All exceptions are listed and explained in the test report."

Signature: Mark CarlsonPrint Name: Mark CarlsonTitle: Project SupervisorDate: 3-25-10**3.) Certification of test report by senior staff person at the testing company who is responsible for compiling and checking the test report:**

"I certify under penalty of law that this test report and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the test information submitted. Based on my inquiry of the person or persons who performed the sampling and analysis related to the performance test, the information submitted in this test report is, to the best of my knowledge and belief, true, accurate, and complete. All exceptions are listed and explained in the test report."

Signature: Brian DarkopPrint Name: Brian DarkopTitle: Vice PresidentDate: 3-25-10**4.) Certification of test report by owner or operator of the emission facility:**

"I certify under penalty of law that the information submitted in this test report accurately reflects the operating conditions at the emission facility during this performance test and describes the date and nature of all operational and maintenance activities that were performed on the process and control equipment during the month prior to the performance test. Based on my inquiry of the person or persons who performed the operational and maintenance activities, the information submitted in this test report is, to the best of my knowledge and belief, true, accurate, and complete. All exceptions are listed and explained in the cover letter or attachments submitted with this report."

Signature: David QuastPrint Name: David QuastTitle: Principal EngineerDate: 3-23-10

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## SECTION 1.0

### EXECUTIVE SUMMARY

This report presents the results of a source test performed by Eagle Mountain Scientific, Inc. (EMSI) at the Metropolitan Council Environmental Services, Metropolitan Wastewater Treatment Plant (Seneca) on Unit 1 (EU001) located in Eagan, Minnesota. The testing was performed on February 16-17, 2010 to meet the requirements of the US EPA Section 114 Information Collection Request (ICR). EMSI conducted U. S. EPA (EPA) ICR approved testing methods. This report describes the procedures used to complete the testing and the results of these tests.

Mr. Adam Duske, Mr. Brian Durkop, Mr. Mark Carlson, Mr. Randy Resch, and Mr. Nathan Kizer performed the testing. There were no MPCA representatives present during this performance test. Met Council personnel recorded the process operating conditions and provided the final process data averages for inclusion in this report.

#### 1.1 Summary of Test Methods

**Table 1.1**  
**Metropolitan Council Environmental Services**  
**Seneca Wastewater Treatment Plant**  
**Unit 1 (EU001)**  
**Test Methods Per Unit**  
**February 16-17, 2010**

METHOD	PURPOSE	RUN TIME (Minutes)	# OF RUNS	TEST LOCATION
EPA 6C	Determination of Sulfur Dioxide	60	3	Stack
EPA 7E	Determination of Oxides of Nitrogen	60	3	Stack
EPA 10	Determination of Carbon Monoxide	60	3	Stack
EPA 23	Determination of Dioxin / Furans / PCBs / PAH	240	3	Stack
OTM27	Determination of Particulate Matter Less Than 2.5 microns	240	3	Stack
OTM28	Determination of Condensable Particulate Matter	240	3	Stack
EPA 26	Determination of Hydrogen Chloride	60	3	Stack

## 1.2 Summary of Test Results

**Table 1.2**  
**Metropolitan Council Environmental Services**  
**Seneca Wastewater Treatment Plant**  
**Unit 1 (EU001)**  
**February 16-17, 2010**

GROUP	PARAMETER	UNITS	TEST 1	TEST 2	TEST 3	AVERAGE
CEMS	Sulfur Dioxide Nitrogen Oxides Carbon Monoxide	ppmvd @ 7% O <sub>2</sub>	18.8 214.0 1,900.3	17.7 219.6 1,701.2	18.2 224.4 2,064.6	18.2 219.3 1,888.7
Dioxin/ Furans	2378-TCDD 12378-PeCDD 123478-HxCDD 123678-HxCDD 123789-HxCDD 1234678-HpCDD OCDD 2378-TCDF 12378-PeCDF 23478-PeCDF 123478-HxCDF 123678-HxCDF 234678-HxCDF 123789-HxCDF 1234678-HpCDF 1234789-HpCDF OCDF	ng/dscm @ 7% O <sub>2</sub>	<0.0195 <0.0195 <0.0195 <0.0195 <0.0195 <0.0195 <0.1949 0.0804 <0.0195 <0.0195 <0.0195 <0.0195 <0.0195 <0.0195 <0.0195 <0.0195 <0.0195 <0.1949	<0.0196 <0.0196 <0.0196 <0.0196 <0.0196 <0.0196 <0.1965 0.1012 <0.0196 <0.0196 <0.0196 <0.0196 <0.0196 <0.0196 <0.0196 <0.0196 <0.0196 <0.1965	<0.0203 <0.0203 <0.0203 <0.0203 <0.0203 <0.0203 <0.2030 0.0731 <0.0203 <0.0203 <0.0203 <0.0203 <0.0203 <0.0203 <0.0203 <0.0203 <0.0203 <0.2030	<0.0198 <0.0198 <0.0198 <0.0198 <0.0198 <0.0198 <0.1981 0.0849 <0.0198 <0.0198 <0.0198 <0.0198 <0.0198 <0.0198 <0.0198 <0.0198 <0.0198 <0.1981
PCB	3,4',4,5'-TetraCB (#81) 3,3',4,4'-TetraCB (#77) 2',3,4,4',5-PentaCB (#123) 2,3',4,4',5-PentaCB (#118) 2,3,4,4',5-PentaCB (#114) 2,3,3',4,4'-PentaCB (#105) 3,3',4,4',5-PentaCB (#126) 2,3',4,4',5,5'-HexaCB (#167) 2,3,3,4,4,5-HexaCB (#156/#157) 3,3',4,4',5,5'-HexaCB (#169) 2,3,3',4,4',5,5'-HeptaCB (#189)	ng/dscm @ 7% O <sub>2</sub>	<0.0974 <0.0974 <0.0974 3.0813 <0.0974 0.8616 <0.0974 <0.0974 <0.1947 <0.0974 <0.0974	<0.0982 <0.0982 <0.0982 2.8859 <0.0982 0.8000 <0.0982 <0.0982 <0.1963 <0.0982 <0.0982	<0.1014 <0.1014 <0.1014 3.3975 <0.1014 0.9178 <0.1014 <0.1014 <0.2028 <0.1014 <0.1014	<0.0990 <0.0990 <0.0990 3.1216 <0.0990 0.8598 <0.0990 <0.0990 <0.1980 <0.0990 <0.0990
PAH	Naphthalene 2-Methylnaphthalene 2-Chloronaphthalene Acenaphthylene Acenaphthene Fluorene Phenanthrene Anthracene Fluoranthene Pyrene Benzo(a)anthracene	ug/dscm @ 7% O <sub>2</sub>	2.7259 0.2064 0.0618 0.0083 0.0088 0.0136 0.0798 <0.0002 0.0259 0.0137 0.0011	2.5718 0.1080 0.0815 0.0014 0.0043 0.0068 0.0550 0.0038 0.0186 0.0118 0.0014	3.0223 0.1014 0.0781 0.0016 0.0069 0.0103 0.0629 0.0049 0.0363 0.0217 0.0051	2.7733 0.1386 0.0738 0.0038 0.0067 0.0103 0.0659 +0.0030 0.0269 0.0157 0.0025

	Chrysene		0.0066	0.0079	0.0139	0.0095
	Benzo(b)fluoranthene		0.0011	0.0020	0.0027	0.0019
	Benzo(k)fluoranthene		<0.0002	0.0009	0.0009	+0.0006
	Benzo(e)pyrene		0.0087	0.0020	0.0015	0.0041
	Benzo(a)pyrene		<0.0002	<0.0002	<0.0002	<0.0002
	Perylene		<0.0001	<0.0001	<0.0001	<0.0001
	Indeno (1,2,3 -cd) pyrene		<0.0001	<0.0001	<0.0002	<0.0001
	Dibenz(a,h)anthracene		<0.0002	<0.0002	<0.0002	<0.0002
	Benzo(g,h,i)perylene		0.0185	0.0060	0.0032	0.0093
PM2.5	Total PM2.5	lb/ton dry sludge	+0.0472	0.0430	0.0464	+0.0455
	Filterable PM2.5		+0.0435	0.0399	0.0433	+0.0422
	Organic		0.0020	0.0016	0.0017	0.0017
	Aqueous		0.0018	0.0016	0.0014	0.0016
	Total Particulate Matter		+0.0487	0.0457	0.0475	+0.0473
Acid Gas	HCl	lb/ton dry sludge	0.0115	0.0119	0.0131	0.0122

< Below Detection Limit (BDL)

+ Detection Limit Limited (DLL)

### 1.3 Summary of Production and Operating Parameters

The primary process parameters monitored during the test are reported in the following tables. A large number of parameters were monitored by the plant during the ICR test. The complete list and average values obtained during each run are provided in Section 2.0 of this report.

**Table 1.3**  
**Metropolitan Council Environmental Services**  
**Seneca Wastewater Treatment Plant**  
**Unit 1 (EU001)**  
**CEMS (SO<sub>2</sub>, NO<sub>x</sub>, CO)**  
**February 17, 2010**

PARAMETER	TEST 1	TEST 2	TEST 3	AVERAGE
Dry Sludge Feed Rate (tph)	1.26	1.22	1.16	1.21
Inc Nat Gas Usage (scfh)	2,017	440	311	923
AftBrn Nat Gas Usage (scfh)	691	387	300	459
Venturi Water Flow (gpm)	220	219	219	219
Venturi DP (inH <sub>2</sub> O)	16.9	16.6	16.9	16.8
Opacity (%)	5.4	5.5	5.3	5.4

**Table 1.4**  
**Metropolitan Council Environmental Services**  
**Seneca Wastewater Treatment Plant**  
**Unit 1 (EU001)**  
**Dioxin/Furans/PCB's/PAH**  
**February 16-17, 2010**

PARAMETER	TEST 1	TEST 2	TEST 3	AVERAGE
Dry Sludge Feed Rate (tph)	1.26	1.30	1.30	1.29
Inc Nat Gas Usage (scfh)	1,917	233	1,971	1,374
AftBrn Nat Gas Usage (scfh)	790	406	655	617
Venturi Water Flow (gpm)	222	218	223	221
Venturi DP (inH2O)	17.1	17.0	17.1	17.1
Opacity (%)	6.5	5.8	7.3	6.5

**Table 1.5**  
**Metropolitan Council Environmental Services**  
**Seneca Wastewater Treatment Plant**  
**Unit 1 (EU001)**  
**Particulate Matter Less Than 2.5 Microns**  
**February 16-17, 2010**

PARAMETER	TEST 1	TEST 2	TEST 3	AVERAGE
Dry Sludge Feed Rate (tph)	1.26	1.30	1.30	1.29
Inc Nat Gas Usage (scfh)	1,917	233	1,971	1,374
AftBrn Nat Gas Usage (scfh)	790	406	655	617
Venturi Water Flow (gpm)	222	218	223	221
Venturi DP (inH2O)	17.1	17.0	17.1	17.1
Opacity (%)	6.5	5.8	7.3	6.5

**Table 1.6**  
**Metropolitan Council Environmental Services**  
**Seneca Wastewater Treatment Plant**  
**Unit 1 (EU001)**  
**Hydrogen Chloride**  
**February 17, 2010**

PARAMETER	TEST 1	TEST 2	TEST 3	AVERAGE
Dry Sludge Feed Rate (tph)	1.26	1.22	1.16	1.21
Inc Nat Gas Usage (scfh)	2,017	440	311	923
AftBrn Nat Gas Usage (scfh)	691	387	300	459
Venturi Water Flow (gpm)	220	219	219	219
Venturi DP (inH2O)	16.9	16.6	16.9	16.8
Opacity (%)	5.4	5.5	5.3	5.4

#### 1.4 Errors and Omissions

Errors and omissions that occurred during this project and in this report are outlined in this subsection to correct mistakes, clarify data, and to discuss field changes to the proposed test protocol.

Nearly all PAH compounds were detected in the train blank. These detected values were due to the very low detection levels in the analytical procedures. The blank was reported in Appendix D of this report and for evaluation of the level of detection that can be attributed to the source. The reported values were not blank corrected but careful consideration must be made regarding the level of detection in the train blank when evaluating the results.

Sampling for scrubber solids was not conducted during the stack test due to an oversight during the testing. Met Council provided estimates of the scrubber solids based their experience and knowledge of the units. Met Council routinely conducts testing for the determination of solids and has a very good handle of the normal level of solids. Therefore, this estimate can be used with a high degree of certainty.

Except as noted, testing was conducted according to the approved test protocol and the procedures utilized to complete the project were conducted according to the protocol.

#### 1.5 Summary of Report Organization

This report is organized in the following manner. Section 2.0 provides detailed test results for the individual test runs. Section 3.0 provides a summary of the testing procedures.

The following information is located in appendices A through F, respectively: copies of the field data sheets, calculated field data results, process operations data, laboratory test analyses, equipment calibrations.



## SECTION 2.0

### TEST RESULTS

The testing was conducted in conformance to applicable US EPA and MPCA methodologies and rules. The testing project was conducted according to the approved test plan submitted to the MPCA.

#### 2.1 Continuous Emissions Monitoring (CEMS) Results

EPA Methods 6C, 7E and 10 were conducted for the determination of Sulfur Dioxide, Oxides of Nitrogen and Carbon Monoxide. Table 2.1 reports the results from Unit 1 (EU001).

**Table 2.1**  
**Metropolitan Council Environmental Services**  
**Seneca Wastewater Treatment Plant**  
**Unit 1 (EU001)**  
**February 17, 2010**  
**Determination of Sulfur Dioxide, Nitrogen Oxides and Carbon Monoxide (CEMS)**

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<b>Client:</b> Met Council	<b>Plant:</b> Seneca
<b>Date(s):</b> February 17, 2010	<b>EPA Method(s):</b> 6C, 7E, 10

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Run #: .....	Run 1	Run 2	Run 3	
Date:.....	2/17/2010	2/17/2010	2/17/2010	
Time:.....	13:50-14:50	15:12-16:12	16:28-17:28	Average

#### **Process Conditions**

Wet Sludge Feed (tons/hr) .....	4.89	4.74	4.57	4.73
Sludge Solids Content (%).....	25.70	25.80	25.43	25.64
Dry Sludge Feed (tons/hr) .....	1.26	1.22	1.16	1.21
AftBrn Nat Gas (cu ft/hr).....	691	387	300	459
Incin Natural Gas (cu ft/hr).....	2,017	440	311	923
Exhaust Oxygen (%).....	6.3	6.3	7.0	6.5
Opacity (%).....	5.4	5.5	5.3	5.4
ID Fan Power (amps).....	189	188	190	189
Hearth 1 Temp .....	1,149	1,157	1,188	1,165
Hearth 2 Temp .....	1,329	1,342	1,375	1,349
Hearth 3 Temp (F) .....	1,478	1,447	1,437	1,454
Hearth 4 Temp (F) .....	1,402	1,433	1,406	1,414
Hearth 5 Temp (F) .....	919	943	947	936
AftBrn Comb Zone (F) .....	1,067	1,069	1,075	1,070

#### **Control Equipment (Wet Scrubber)**

Venturi DP (inH2O) .....	16.9	16.6	16.9	16.8
Scrubber Draft DP (inH2O).....	-0.30	-0.30	-0.30	-0.30
Total Scrubber Water (gpm) ...	676	673	671	673
Venturi Water Flow (gpm) .....	220	219	219	219
Venturi Out Temp (F) .....	150	151	150	150
Sub-cooler Out Temp (F).....	69	69	69	69

**Test Results - Nitrogen Oxides**

NOx Raw (ppm) .....	84.4	79.7	83.6	82.6
NOx Drift Corr. (ppm).....	86.9	82.2	86.4	85.2
NOx (ppm@7%O2).....	214.0	219.6	224.4	219.3

**Calibration Gas Values - Nitrogen Oxides**

NOx Span (ppm).....	101.6	101.6	101.6	101.6
Zero Gas (ppm).....	0.0	0.0	0.0	0.0
Mid Gas (ppm).....	50.2	50.2	50.2	50.2
High Gas (ppm) .....	101.6	101.6	101.6	101.6

**Calibration Results - Nitrogen Oxides**

NOx CE Zero (%).....	0.9	0.9	0.9	0.9
NOx CE Mid (%).....	-0.1	-0.1	-0.1	-0.1
NOx CE High (%) .....	0.5	0.5	0.5	0.5
NOx SB Zero Pre (%).....	2.4	3.0	3.0	2.8
NOx SB Zero Post (%) .....	3.0	3.0	2.8	2.9
NOx SB Span Pre (%) .....	0.1	0.3	0.0	0.1
NOx SB Span Post (%).....	0.3	0.0	0.2	0.2
NOx Zero Drift (%) .....	0.6	0.0	-0.1	0.2
NOx Span Drift (%).....	0.2	-0.3	0.2	0.0

**Test Results - Carbon Monoxide**

CO Raw (ppm).....	770.1	635.6	791.8	732.5
CO Drift Corr. (ppm).....	771.9	636.6	795.2	734.6
CO (ppm@7% O2).....	1,900.3	1,701.2	2,064.6	1,888.7

**Calibration Gas Values - Carbon Monoxide**

CO Span (ppm) .....	1,600.0	1,600.0	1,600.0	1,600.0
Zero Gas (ppm).....	0.0	0.0	0.0	0.0
Mid Gas (ppm).....	792.3	792.3	792.3	792.3
High Gas (ppm) .....	1600.0	1600.0	1600.0	1600.0

**Calibration Results - Carbon Monoxide**

CO CE Zero (%) .....	0.0	0.0	0.0	0.0
CO CE Mid (%) .....	-0.1	-0.1	-0.1	-0.1
CO CE High (%).....	-0.1	-0.1	-0.1	-0.1
CO SB Zero Pre (%) .....	0.3	0.3	0.3	0.3
CO SB Zero Post (%) .....	0.3	0.3	0.3	0.3
CO SB Span Pre (%).....	0.0	0.0	-0.1	-0.1
CO SB Span Post (%) .....	0.0	-0.1	-0.2	-0.1
CO Zero Drift (%) .....	0.0	0.0	0.0	0.0
CO Span Drift (%) .....	0.0	-0.1	-0.1	0.0

**Test Results - Sulfur Dioxide**

SO2 Raw (ppm) .....	7.1	6.2	6.5	6.6
SO2 Drift Corr. (ppm) .....	7.6	6.6	7.0	7.1
SO2 (ppm@7%O2).....	18.8	17.7	18.2	18.2

**Calibration Gas Values - Sulfur Dioxide**

SO2 Span (ppm) .....	101.0	101.0	101.0	101.0
Zero Gas (ppm).....	0.0	0.0	0.0	0.0
Mid Gas (ppm).....	50.6	50.6	50.6	50.6
High Gas (ppm) .....	101.0	101.0	101.0	101.0

**Calibration Results - Sulfur Dioxide**

SO2 CE Zero (%).....	0.0	0.0	0.0
SO2 CE Mid (%) .....	-1.4	-1.4	-1.4
SO2 CE High (%).....	-1.5	-1.5	-1.5
SO2 SB Zero Pre (%) .....	0.1	0.0	0.2
SO2 SB Zero Post (%).....	0.4	0.0	0.1
SO2 SB Span Pre (%) .....	-4.0	-2.9	-3.4
SO2 SB Span Post (%) .....	-3.3	-1.6	-2.6
SO2 Zero Drift (%).....	0.3	0.0	0.0
SO2 Span Drift (%) .....	0.7	0.4	0.8

**Test Results – Oxygen**

O2 Raw (ppm) .....	15.4	15.6	15.6
O2 Drift Corr. (ppm).....	15.3	15.5	15.5

**Calibration Gas Values - Oxygen**

O2 Span (ppm).....	21.3	21.3	21.3
Zero Gas (ppm).....	0.0	0.0	0.0
Mid Gas (ppm).....	10.0	10.0	10.0
High Gas (ppm) .....	21.3	21.3	21.3

**Calibration Results – Oxygen**

O2 CE Zero (%).....	0.0	0.0	0.0
O2 CE Mid (%).....	0.3	0.3	0.3
O2 CE High (%) .....	1.7	1.7	1.7
O2 SB Zero Pre (%).....	0.5	0.1	0.2
O2 SB Zero Post (%) .....	0.0	0.0	0.0
O2 SB Span Pre (%) .....	0.3	-0.1	0.1
O2 SB Span Post (%).....	0.1	-0.1	0.0
O2 Zero Drift (%).....	-0.5	-0.1	-0.2
O2 Span Drift (%).....	-0.1	0.0	-0.1

**Test Results - Carbon Dioxide**

CO2 Raw (ppm).....	5.1	5.2	5.2
CO2 Drift Corr. (ppm).....	5.0	5.3	5.1

**Calibration Gas Values - Carbon Dioxide**

CO2 Span (ppm).....	19.2	19.2	19.2
Zero Gas (ppm).....	0.0	0.0	0.0
Mid Gas (ppm).....	10.0	10.0	10.0
High Gas (ppm) .....	19.2	19.2	19.2

**Calibration Results - Carbon Dioxide**

CO2 CE Zero (%) .....	1.2	1.2	1.2
CO2 CE Mid (%) .....	-1.2	-1.2	-1.2
CO2 CE High (%).....	-0.3	-0.3	-0.3
CO2 SB Zero Pre (%) .....	0.4	0.4	0.7
CO2 SB Zero Post (%) .....	1.4	-0.6	0.4
CO2 SB Span Pre (%).....	0.3	-0.8	0.1
CO2 SB Span Post (%).....	0.7	-0.8	-0.3
CO2 Zero Drift (%) .....	1.0	-1.0	-0.3
CO2 Span Drift (%).....	0.4	0.0	-0.3

## 2.2 Dioxin/Furan Results

The results of the tests performed for the determination of dioxin/furans are reported in Tables 2.2. Three test runs were performed on Unit 1 with each run at 240 minutes in length.

**Table 2.2**  
**Metropolitan Council Environmental Services**  
**Seneca Wastewater Treatment Plant**  
**Unit 1 (EU001)**  
**February 16-17, 2010**  
**Determination of Dioxin/Furan Emissions from Stationary Sources**

<b>Client:</b> Met Council		<b>Plant:</b> Seneca	
<b>Date(s):</b> February 16-17, 2010		<b>EPA Method(s):</b> 1-4, 23	
Run #: .....	Run 1	Run 2	Run 3
Date:.....	2-16-10	2-16-10	2-17-10
Time:.....	8:55-13:03	14:00-18:05	8:05-12:40
			Average
<b>Process Conditions</b>			
Wet Sludge Feed (tons/hr) .....	4.84	4.83	4.84
Sludge Solids Content (%).....	26.00	26.80	26.53
Dry Sludge Feed (tons/hr) .....	1.26	1.30	1.29
AftBrn Nat Gas (cu ft/hr).....	790	406	617
Incin Natural Gas (cu ft/hr).....	1,917	233	1,374
Exhaust Oxygen (%).....	6.8	6.6	6.7
Opacity (%).....	6.5	5.8	6.5
ID Fan Power (amps).....	190	188	189
Hearth 1 Temp .....	1,132	1,159	1,143
Hearth 2 Temp .....	1,326	1,343	1,333
Hearth 3 Temp (F) .....	1,429	1,399	1,431
Hearth 4 Temp (F) .....	1,307	1,349	1,341
Hearth 5 Temp (F) .....	646	857	758
AftBrn Comb Zone (F) .....	1,065	1,067	1,070
<b>Control Equipment (Wet Scrubber)</b>			
Venturi DP (inH2O) .....	17.1	17.0	17.1
Scrubber Draft DP (inH2O).....	-0.30	-0.30	-0.30
Total Scrubber Water (gpm)...	683	671	680
Venturi Water Flow (gpm) .....	222	218	221
Venturi Out Temp (F) .....	147	149	148
Sub-cooler Out Temp (F).....	67	68	67
<b>Stack Conditions</b>			
Doc. Version .....	ST604-04		
Nozzle (inches) .....	0.374	0.374	0.374
Delta P (inH2O).....	0.103	0.100	0.103
Delta H (inH2O) .....	2.06	2.04	2.09
Stack Temp (°F).....	109	111	110
Oxygen (%).....	15.3	15.3	15.4
Carbon Dioxide (%).....	4.8	4.5	4.7
Moisture (%).....	1.49	1.53	1.55
Mol Weight, Dry.....	29.4	29.3	29.4

Mol Weight, Wet .....	29.2	29.2	29.2	29.2
Stack Press (inH20) .....	-0.20	-0.20	-0.20	-0.20
Stack Area (ft2).....	15.90	15.90	15.90	15.90
Stack Vel (ft/sec) .....	18.8	18.5	19.2	18.8
Stack Flow (wacfm).....	17,927	17,673	18,320	17,973
Stack Flow (wscfm).....	16,290	16,014	16,597	16,300
Stack Flow (dscfm).....	16,046	15,768	16,329	16,048

#### **Test Results - Dioxin/Furans**

Sample Gas Vol (dscf).....	179.935	178.457	186.012	181.468
Isokinetics (%) .....	97.4	98.3	98.9	98.2

#### **Lab Results - ng/dscm**

2378-TCDD .....	0.0079	0.0079	0.0076	0.0078
12378-PeCDD.....	0.0079	0.0079	0.0076	0.0078
123478-HxCDD.....	0.0079	0.0079	0.0076	0.0078
123678-HxCDD.....	0.0079	0.0079	0.0076	0.0078
123789-HxCDD.....	0.0079	0.0079	0.0076	0.0078
1234678-HpCDD.....	0.0079	0.0079	0.0076	0.0078
OCDD .....	0.0785	0.0792	0.0759	0.0779
2378-TCDF.....	0.0324	0.0408	0.0273	0.0335
12378-PeCDF .....	0.0079	0.0079	0.0076	0.0078
23478-PeCDF .....	0.0079	0.0079	0.0076	0.0078
123478-HxCDF .....	0.0079	0.0079	0.0076	0.0078
123678-HxCDF .....	0.0079	0.0079	0.0076	0.0078
234678-HxCDF .....	0.0079	0.0079	0.0076	0.0078
123789-HxCDF .....	0.0079	0.0079	0.0076	0.0078
1234678-HpCDF .....	0.0079	0.0079	0.0076	0.0078
1234789-HpCDF .....	0.0079	0.0079	0.0076	0.0078
OCDF.....	0.0785	0.0792	0.0759	0.0779
Total TCDD .....	0.0359	0.0325	0.0446	0.0377
Total PeCDD .....	0.0079	0.0079	0.0076	0.0078
Total HxCDD.....	0.0079	0.0079	0.0076	0.0078
Total HpCDD.....	0.0084	0.0083	0.0076	0.0081
Total TCDF.....	0.3670	0.4789	0.3341	0.3933
Total PeCDF .....	0.0079	0.0079	0.0076	0.0078
Total HxCDF .....	0.0206	0.0194	0.0182	0.0194
Total HpCDF .....	0.0079	0.0079	0.0076	0.0078
Total PCDD/PCDF.....	0.6204	0.7290	0.5868	0.6454
Total TEQ .....	0.0252	0.0262	0.0240	0.0252

#### **Lab Results - lbs/hr**

2378-TCDD .....	4.72E-07	4.68E-07	4.64E-07	4.68E-07
12378-PeCDD.....	4.72E-07	4.68E-07	4.64E-07	4.68E-07
123478-HxCDD.....	4.72E-07	4.68E-07	4.64E-07	4.68E-07
123678-HxCDD.....	4.72E-07	4.68E-07	4.64E-07	4.68E-07
123789-HxCDD.....	4.72E-07	4.68E-07	4.64E-07	4.68E-07
1234678-HpCDD.....	4.72E-07	4.68E-07	4.64E-07	4.68E-07
OCDD .....	4.72E-06	4.68E-06	4.64E-06	4.68E-06
2378-TCDF.....	1.95E-06	2.41E-06	1.67E-06	2.01E-06
12378-PeCDF .....	4.72E-07	4.68E-07	4.64E-07	4.68E-07
23478-PeCDF .....	4.72E-07	4.68E-07	4.64E-07	4.68E-07
123478-HxCDF .....	4.72E-07	4.68E-07	4.64E-07	4.68E-07
123678-HxCDF .....	4.72E-07	4.68E-07	4.64E-07	4.68E-07
234678-HxCDF .....	4.72E-07	4.68E-07	4.64E-07	4.68E-07

123789-HxCDF .....	4.72E-07	4.68E-07	4.64E-07	4.68E-07
1234678-HpCDF .....	4.72E-07	4.68E-07	4.64E-07	4.68E-07
1234789-HpCDF .....	4.72E-07	4.68E-07	4.64E-07	4.68E-07
OCDF.....	4.72E-06	4.68E-06	4.64E-06	4.68E-06
Total TCDD .....	2.16E-06	1.92E-06	2.73E-06	2.27E-06
Total PeCDD .....	4.72E-07	4.68E-07	4.64E-07	4.68E-07
Total HxCDD.....	4.72E-07	4.68E-07	4.64E-07	4.68E-07
Total HpCDD.....	5.07E-07	4.91E-07	4.64E-07	4.88E-07
Total TCDF.....	2.21E-05	2.83E-05	2.04E-05	2.36E-05
Total PeCDF .....	4.72E-07	4.68E-07	4.64E-07	4.68E-07
Total HxCDF .....	1.24E-06	1.15E-06	1.11E-06	1.17E-06
Total HpCDF .....	4.72E-07	4.68E-07	4.64E-07	4.68E-07
Total PCDD/PCDF.....	3.73E-05	4.31E-05	3.59E-05	3.87E-05
Total TEQ .....	1.52E-06	1.55E-06	1.47E-06	1.51E-06

**Lab Results - ng/dscm @7% O2**

2378-TCDD .....	0.0195	0.0196	0.0203	0.0198
12378-PeCDD.....	0.0195	0.0196	0.0203	0.0198
123478-HxCDD.....	0.0195	0.0196	0.0203	0.0198
123678-HxCDD.....	0.0195	0.0196	0.0203	0.0198
123789-HxCDD.....	0.0195	0.0196	0.0203	0.0198
1234678-HpCDD.....	0.0195	0.0196	0.0203	0.0198
OCDD .....	0.1949	0.1965	0.2030	0.1981
2378-TCDF.....	0.0804	0.1012	0.0731	0.0849
12378-PeCDF .....	0.0195	0.0196	0.0203	0.0198
23478-PeCDF .....	0.0195	0.0196	0.0203	0.0198
123478-HxCDF .....	0.0195	0.0196	0.0203	0.0198
123678-HxCDF .....	0.0195	0.0196	0.0203	0.0198
234678-HxCDF .....	0.0195	0.0196	0.0203	0.0198
123789-HxCDF .....	0.0195	0.0196	0.0203	0.0198
1234678-HpCDF .....	0.0195	0.0196	0.0203	0.0198
1234789-HpCDF .....	0.0195	0.0196	0.0203	0.0198
OCDF.....	0.1949	0.1965	0.2030	0.1981
Total TCDD .....	0.0891	0.0806	0.1193	0.0963
Total PeCDD .....	0.0195	0.0196	0.0203	0.0198
Total HxCDD.....	0.0195	0.0196	0.0203	0.0198
Total HpCDD.....	0.0209	0.0206	0.0203	0.0206
Total TCDF.....	0.9110	1.1887	0.8932	0.9976
Total PeCDF .....	0.0195	0.0196	0.0203	0.0198
Total HxCDF .....	0.0512	0.0481	0.0487	0.0493
Total HpCDF .....	0.0195	0.0196	0.0203	0.0198
Total PCDD/PCDF.....	1.5399	1.8095	1.5686	1.6394
Total TEQ .....	0.0626	0.0651	0.0641	0.0640

## 2.3 Polychlorinated Biphenyls (PCBs) Results

The results of the tests performed for the determination of PCBs are reported in Table 2.3. Three test runs were performed on Unit 1 with each run at 240 minutes in length.

**Table 2.3**  
**Metropolitan Council Environmental Services**  
**Seneca Wastewater Treatment Plant**  
**Unit 1 (EU001)**  
**February 16-17, 2010**  
**Determination of PCB Emissions from Stationary Sources**

<b>Client:</b> Met Council		<b>Plant:</b> Seneca	
<b>Date(s):</b> February 16-17, 2010		<b>EPA Method(s):</b> 1-4, 23	
Run #: .....	Run 1	Run 2	Run 3
Date:.....	2-16-10	2-16-10	2-17-10
Time:.....	8:55-13:03	14:00-18:05	8:05-12:40
			Average
<b>Process Conditions</b>			
Wet Sludge Feed (tons/hr) .....	4.84	4.83	4.84
Sludge Solids Content (%).....	26.00	26.80	26.53
Dry Sludge Feed (tons/hr) .....	1.26	1.30	1.29
AftBrn Nat Gas (cu ft/hr).....	790	406	617
Incin Natural Gas (cu ft/hr).....	1,917	233	1,374
Exhaust Oxygen (%).....	6.8	6.6	6.7
Opacity (%).....	6.5	5.8	6.5
ID Fan Power (amps).....	190	188	189
Hearth 1 Temp .....	1,132	1,159	1,143
Hearth 2 Temp .....	1,326	1,343	1,333
Hearth 3 Temp (F) .....	1,429	1,399	1,431
Hearth 4 Temp (F) .....	1,307	1,349	1,341
Hearth 5 Temp (F) .....	646	857	758
AftBrn Comb Zone (F) .....	1,065	1,067	1,067
<b>Control Equipment (Wet Scrubber)</b>			
Venturi DP (inH2O) .....	17.1	17.0	17.1
Scrubber Draft DP (inH2O).....	-0.30	-0.30	-0.30
Total Scrubber Water (gpm)...	683	671	680
Venturi Water Flow (gpm) .....	222	218	221
Venturi Out Temp (F) .....	147	149	148
Sub-cooler Out Temp (F).....	67	68	67
<b>Stack Conditions</b>			
Nozzle (inches) .....	0.374	0.374	0.374
Delta P (inH2O).....	0.10	0.10	0.10
Delta H (inH2O) .....	2.06	2.04	2.09
Stack Temp (°F).....	109	111	110
Oxygen (%).....	15.3	15.3	15.4
Carbon Dioxide (%).....	4.8	4.5	4.7
Vol Liquid Col (ml) .....	57.9	59.0	60.5
Moisture (%).....	1.5	1.5	1.5
Mol Weight, Dry.....	29.4	29.3	29.4

Mol Weight, Wet .....	29.2	29.2	29.2	29.2
P. Barometric (inHg).....	29.32	29.32	29.29	29.31
Stack Press (inH20) .....	-0.20	-0.20	-0.20	-0.20
Stack Area (ft2).....	15.90	15.90	15.90	15.90
Stack Vel (ft/sec) .....	18.8	18.5	19.2	18.8
Stack Flow (wacfm).....	17,927	17,673	18,320	17,973
Stack Flow (wscfm) .....	16,290	16,014	16,597	16,300
Stack Flow (dscfm).....	16,046	15,768	16,329	16,048

#### **Test Results - Polychlorinated Biphenyls**

Sample Gas Vol (dscf) .....	179.935	178.457	186.012	181.468
Isokinetics (%) .....	97.4	98.3	98.9	98.2

#### **Lab Results - ng/dscm**

3,4',4,5'-TetraCB (#81) .....	0.0392	0.0395	0.0379	0.0389
3,3',4,4'-TetraCB (#77) .....	0.0392	0.0395	0.0379	0.0389
2',3,4,4',5-PentaCB (#123).....	0.0392	0.0395	0.0379	0.0389
2,3',4,4',5-PentaCB (#118).....	1.2414	1.1627	1.2710	1.2250
2,3,4,4',5-PentaCB (#114) .....	0.0392	0.0395	0.0379	0.0389
2,3,3',4,4'-PentaCB (#105).....	0.3471	0.3223	0.3434	0.3376
3,3',4,4',5-PentaCB (#126).....	0.0392	0.0395	0.0379	0.0389
2,3',4,4',5,5'-HexaCB (#167) ..	0.0392	0.0395	0.0379	0.0389
2,3,3,4,4',5-HexaCB (156/157)	0.0784	0.0791	0.0759	0.0778
3,3',4,4',5,5'-HexaCB (#169) ..	0.0392	0.0395	0.0379	0.0389
2,3,3',4,4',5,5'-HeptaCB (189)	0.0392	0.0395	0.0379	0.0389

#### **Lab Results - lbs/hr**

3,4',4,5'-TetraCB (#81) .....	2.3592E-09	2.3376E-09	2.3224E-09	2.3397E-09
3,3',4,4'-TetraCB (#77) .....	2.3592E-09	2.3376E-09	2.3224E-09	2.3397E-09
2',3,4,4',5-PentaCB (#123).....	2.3592E-09	2.3376E-09	2.3224E-09	2.3397E-09
2,3',4,4',5-PentaCB (#118).....	7.4670E-08	6.8725E-08	7.7799E-08	7.3731E-08
2,3,4,4',5-PentaCB (#114) .....	2.3592E-09	2.3376E-09	2.3224E-09	2.3397E-09
2,3,3',4,4'-PentaCB (#105).....	2.0879E-08	1.9051E-08	2.1017E-08	2.0316E-08
3,3',4,4',5-PentaCB (#126).....	2.3592E-09	2.3376E-09	2.3224E-09	2.3397E-09
2,3',4,4',5,5'-HexaCB (#167) ..	2.3592E-09	2.3376E-09	2.3224E-09	2.3397E-09
2,3,3,4,4',5-HexaCB (156/157)	4.7185E-09	4.6752E-09	4.6447E-09	4.6795E-09
3,3',4,4',5,5'-HexaCB (#169) ..	2.3592E-09	2.3376E-09	2.3224E-09	2.3397E-09
2,3,3',4,4',5,5'-HeptaCB (189)	2.3592E-09	2.3376E-09	2.3224E-09	2.3397E-09

#### **Lab Results - ng/dscm @7% O2**

3,4',4,5'-TetraCB (#81) .....	0.0974	0.0982	0.1014	0.0990
3,3',4,4'-TetraCB (#77) .....	0.0974	0.0982	0.1014	0.0990
2',3,4,4',5-PentaCB (#123).....	0.0974	0.0982	0.1014	0.0990
2,3',4,4',5-PentaCB (#118).....	3.0813	2.8859	3.3975	3.1216
2,3,4,4',5-PentaCB (#114) .....	0.0974	0.0982	0.1014	0.0990
2,3,3',4,4'-PentaCB (#105).....	0.8616	0.8000	0.9178	0.8598
3,3',4,4',5-PentaCB (#126).....	0.0974	0.0982	0.1014	0.0990
2,3',4,4',5,5'-HexaCB (#167) ..	0.0974	0.0982	0.1014	0.0990
2,3,3,4,4',5-HexaCB (156/157)	0.1947	0.1963	0.2028	0.1980
3,3',4,4',5,5'-HexaCB (#169) ..	0.0974	0.0982	0.1014	0.0990
2,3,3',4,4',5,5'-HeptaCB (189)	0.0974	0.0982	0.1014	0.0990



## 2.4 Polycyclic Aromatic Hydrocarbon (PAH) Results

The results of the tests performed for the determination of PAH are reported in Table 2.4. Three test runs were performed on Unit 1 with each run at 240 minutes in length.

**Table 2.4**  
**Metropolitan Council Environmental Services**  
**Seneca Wastewater Treatment Plant**  
**Unit 1 (EU001)**  
**February 16-17, 2010**  
**Determination of PAH Emissions from Stationary Sources**

<b>Client:</b> Met Council		<b>Plant:</b> Seneca	
<b>Date(s):</b> February 16-17, 2010		<b>EPA Method(s):</b> 1-4, 23	
Run #: .....	Run 1	Run 2	Run 3
Date:.....	2-16-10	2-16-10	2-17-10
Time:.....	8:55-13:03	14:00-18:05	8:05-12:40
			Average
<b>Process Conditions</b>			
Wet Sludge Feed (tons/hr) .....	4.84	4.83	4.84
Sludge Solids Content (%).....	26.00	26.80	26.53
Dry Sludge Feed (tons/hr) .....	1.26	1.30	1.29
AftBrn Nat Gas (cu ft/hr).....	790	406	617
Incin Natural Gas (cu ft/hr).....	1,917	233	1,374
Exhaust Oxygen (%).....	6.8	6.6	6.7
Opacity (%).....	6.5	5.8	6.5
ID Fan Power (amps).....	190	188	189
Hearth 1 Temp .....	1,132	1,159	1,143
Hearth 2 Temp .....	1,326	1,343	1,333
Hearth 3 Temp (F) .....	1,429	1,399	1,431
Hearth 4 Temp (F) .....	1,307	1,349	1,341
Hearth 5 Temp (F) .....	646	857	758
AftBrn Comb Zone (F) .....	1,065	1,067	1,067
<b>Control Equipment (Wet Scrubber)</b>			
Venturi DP (inH2O) .....	17.1	17.0	17.1
Scrubber Draft DP (inH2O).....	-0.30	-0.30	-0.30
Total Scrubber Water (gpm)...	683	671	680
Venturi Water Flow (gpm) .....	222	218	221
Venturi Out Temp (F) .....	147	149	148
Sub-cooler Out Temp (F).....	67	68	67
<b>Stack Conditions</b>			
Nozzle (inches) .....	0.374	0.374	0.374
Delta P (inH2O).....	0.10	0.10	0.10
Delta H (inH2O) .....	2.06	2.04	2.09
Stack Temp (°F).....	109	111	110
Oxygen (%).....	15.3	15.3	15.4
Carbon Dioxide (%).....	4.8	4.5	4.7
Vol Liquid Col (ml) .....	57.9	59.0	60.5
Moisture (%).....	1.5	1.5	1.5
Mol Weight, Dry.....	29.4	29.3	29.4

Mol Weight, Wet .....	29.2	29.2	29.2	29.2
P. Barometric (inHg).....	29.32	29.32	29.29	29.31
Stack Press (inH2O) .....	-0.20	-0.20	-0.20	-0.20
Stack Area (ft2).....	15.90	15.90	15.90	15.90
Stack Vel (ft/sec) .....	18.8	18.5	19.2	18.8
Stack Flow (wacfm).....	17,927	17,673	18,320	17,973
Stack Flow (wscfm) .....	16,290	16,014	16,597	16,300
Stack Flow (dscfm).....	16,046	15,768	16,329	16,048

#### **Test Results - Polyaromatic Hydrocarbons**

Sample Gas Vol (dscf) .....	179.935	178.457	186.012	181.468
Isokinetics (%) .....	97.4	98.3	98.9	98.2

#### **Lab Results - ug/dscm**

Naphthalene .....	1.0982	1.0361	1.1306	1.0883
2-Methylnaphthalene .....	0.0832	0.0435	0.0379	0.0549
2-Chloronaphthalene.....	0.0249	0.0328	0.0292	0.0290
Acenaphthylene .....	0.0033	0.0006	0.0006	0.0015
Acenaphthene .....	0.0035	0.0017	0.0026	0.0026
Fluorene .....	0.0055	0.0027	0.0039	0.0040
Phenanthrene.....	0.0322	0.0221	0.0235	0.0259
Anthracene .....	0.0001	0.0015	0.0018	0.0011
Fluoranthene .....	0.0104	0.0075	0.0136	0.0105
Pyrene .....	0.0055	0.0047	0.0081	0.0061
Benzo(a)anthracene .....	0.0004	0.0006	0.0019	0.0010
Chrysene .....	0.0026	0.0032	0.0052	0.0037
Benzo(b)fluoranthene .....	0.0004	0.0008	0.0010	0.0008
Benzo(k)fluoranthene .....	0.0001	0.0004	0.0003	0.0003
Benzo(e)pyrene.....	0.0035	0.0008	0.0006	0.0016
Benzo(a)pyrene.....	0.0001	0.0001	0.0001	0.0001
Perylene .....	0.0001	0.0001	0.0000	0.0001
Indeno (1,2,3 -cd) pyrene.....	0.0001	0.0001	0.0001	0.0001
Dibenz(a,h)anthracene .....	0.0001	0.0001	0.0001	0.0001
Benzo(g,h,i)perylene.....	0.0075	0.0024	0.0012	0.0037

#### **Lab Results - lbs/hr**

Naphthalene .....	6.606E-05	6.125E-05	6.921E-05	6.550E-05
2-Methylnaphthalene .....	5.002E-06	2.571E-06	2.322E-06	3.298E-06
2-Chloronaphthalene.....	1.498E-06	1.940E-06	1.788E-06	1.742E-06
Acenaphthylene .....	2.005E-07	3.448E-08	3.588E-08	9.030E-08
Acenaphthene .....	2.123E-07	1.029E-07	1.579E-07	1.577E-07
Fluorene .....	3.303E-07	1.625E-07	2.369E-07	2.432E-07
Phenanthrene.....	1.935E-06	1.309E-06	1.440E-06	1.561E-06
Anthracene .....	3.657E-09	9.117E-08	1.124E-07	6.908E-08
Fluoranthene .....	6.276E-07	4.418E-07	8.314E-07	6.336E-07
Pyrene .....	3.315E-07	2.805E-07	4.970E-07	3.697E-07
Benzo(a)anthracene .....	2.666E-08	3.413E-08	1.161E-07	5.897E-08
Chrysene .....	1.592E-07	1.882E-07	3.182E-07	2.219E-07
Benzo(b)fluoranthene .....	2.607E-08	4.815E-08	6.224E-08	4.549E-08
Benzo(k)fluoranthene .....	4.129E-09	2.151E-08	1.997E-08	1.520E-08
Benzo(e)pyrene.....	2.112E-07	4.815E-08	3.518E-08	9.816E-08
Benzo(a)pyrene.....	3.657E-09	3.623E-09	3.600E-09	3.627E-09
Perylene .....	3.067E-09	3.039E-09	3.019E-09	3.042E-09
Indeno (1,2,3 -cd) pyrene.....	3.539E-09	3.506E-09	3.484E-09	3.510E-09
Dibenz(a,h)anthracene .....	5.426E-09	5.376E-09	5.341E-09	5.381E-09

Benzo(g,h,i)perylene.....	4.494E-07	1.438E-07	7.432E-08	2.225E-07
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**Lab Results - ug/dscm @7% O2**

Naphthalene .....	2.7259	2.5718	3.0223	2.7733
2-Methylnaphthalene .....	0.2064	0.1080	0.1014	0.1386
2-Chloronaphthalene.....	0.0618	0.0815	0.0781	0.0738
Acenaphthylene .....	0.0083	0.0014	0.0016	0.0038
Acenaphthene .....	0.0088	0.0043	0.0069	0.0067
Fluorene .....	0.0136	0.0068	0.0103	0.0103
Phenanthrene.....	0.0798	0.0550	0.0629	0.0659
Anthracene .....	0.0002	0.0038	0.0049	0.0030
Fluoranthene .....	0.0259	0.0186	0.0363	0.0269
Pyrene .....	0.0137	0.0118	0.0217	0.0157
Benzo(a)anthracene .....	0.0011	0.0014	0.0051	0.0025
Chrysene .....	0.0066	0.0079	0.0139	0.0095
Benzo(b)fluoranthene .....	0.0011	0.0020	0.0027	0.0019
Benzo(k)fluoranthene .....	0.0002	0.0009	0.0009	0.0006
Benzo(e)pyrene.....	0.0087	0.0020	0.0015	0.0041
Benzo(a)pyrene.....	0.0002	0.0002	0.0002	0.0002
Perylene .....	0.0001	0.0001	0.0001	0.0001
Indeno (1,2,3 -cd) pyrene.....	0.0001	0.0001	0.0002	0.0001
Dibenz(a,h)anthracene .....	0.0002	0.0002	0.0002	0.0002
Benzo(g,h,i)perylene.....	0.0185	0.0060	0.0032	0.0093

## 2.5 Particulate Matter Results

Other Test Method (OTM-027) and Other Test Method 028 (OTM-028) were conducted for the determination of particulate matter less than 2.5 microns. The cyclone was recovered and added to the PM2.5 catch for the determination of total particulate matter. All front half and back half fractions were reported in this section. Table 2.5 reports the results from Unit 1 (EU001).

**Table 2.5**  
**Metropolitan Council Environmental Services**  
**Seneca Wastewater Treatment Plant**  
**Unit 1 (EU001)**  
**February 16-17, 2010**  
**Determination of Particulate Matter Less Than 2.5 Microns**

<b>Client:</b> Met Council		<b>Plant:</b> Seneca	
<b>Date(s):</b> February 16-17, 2010		<b>EPA Method(s):</b> 1-4, OTM-027/028	
Run #: .....	Run 1	Run 2	Run 3
Date:.....	2-16-10	2-16-10	2-17-10
Time:.....	8:55-13:03	14:00-18:06	8:04-12:45
			Average
<b>Process Conditions</b>			
Wet Sludge Feed (tons/hr) .....	4.84	4.83	4.84
Sludge Solids Content (%).....	26.00	26.80	26.53
Dry Sludge Feed (tons/hr) .....	1.26	1.30	1.29
AftBrn Nat Gas (cu ft/hr).....	790	406	617
Incin Natural Gas (cu ft/hr).....	1,917	233	1,374
Exhaust Oxygen (%).....	6.8	6.6	6.7

Opacity (%).....	6.5	5.8	7.3	6.5
ID Fan Power (amps).....	190	188	189	189
Hearth 1 Temp .....	1,132	1,159	1,138	1,143
Hearth 2 Temp .....	1,326	1,343	1,329	1,333
Hearth 3 Temp (F) .....	1,429	1,399	1,465	1,431
Hearth 4 Temp (F) .....	1,307	1,349	1,367	1,341
Hearth 5 Temp (F) .....	646	857	771	758
AftBrn Comb Zone (F) .....	1,065	1,067	1,070	1,067

***Control Equipment (Wet Scrubber)***

Venturi DP (inH2O) .....	17.1	17.0	17.1	17.1
Scrubber Draft DP (inH2O).....	-0.30	-0.30	-0.31	-0.30
Total Scrubber Water (gpm) ...	683	671	687	680
Venturi Water Flow (gpm) .....	222	218	223	221
Venturi Out Temp (F) .....	147	149	148	148
Sub-cooler Out Temp (F).....	67	68	67	67

***Stack Conditions***

Nozzle (inches) .....	0.274	0.275	0.274	0.274
Stack Temp (°F).....	109	111	110	110
Oxygen (%).....	15.3	15.3	15.7	15.4
Carbon Dioxide (%).....	4.8	4.5	4.9	4.7
Moisture (%).....	1.8	1.7	1.7	1.7
Mol Weight, Dry.....	29.4	29.3	29.4	29.4
Mol Weight, Wet .....	29.2	29.1	29.2	29.2
Viscosity of Gas.....	190.0	190.6	190.6	190.4
Stack Press (inH2O) .....	-0.20	-0.20	-0.20	-0.20
Stack Area (ft2).....	15.90	15.90	15.90	15.90
Stack Vel (ft/sec) .....	18.6	18.5	18.4	18.5
Stack Flow (wacfm).....	17,733	17,613	17,596	17,647
Stack Flow (wscfm).....	16,127	15,948	15,949	16,008
Stack Flow (dscfm).....	15,840	15,682	15,671	15,731

***Test Results - PM2.5***

Sample Gas Vol (dscf).....	90.862	92.184	93.427	92.158
Isokinetics (%).....	91.0	94.7	94.7	93.5
Point > Min/Max Delta P.....	0	0	0	0
D50 .....	2.44	2.35	2.36	2.38
Acceptable Test Run.....	Yes	Yes	Yes	-

PM 2.5 Filter (mg) .....	48.5	45.5	48.7	47.6
PM 2.5 Rinse (mg).....	0.5	0.6	2.0	1.0
>PM2.5 Rinse (mg) .....	1.7	3.1	1.3	2.0
Aqueous (mg) .....	2.0	1.8	1.6	1.8
Organic (mg).....	2.2	1.8	2.0	2.0
PM2.5 Total (mg) .....	53.2	49.7	54.3	52.4
Total (mg) .....	54.9	52.8	55.6	54.5

PM 2.5 Filterable (lbs/hr).....	1.130	1.037	1.125	1.097
> 2.5 Filterable (lbs/hr) .....	0.039	0.070	0.029	0.046
Aqueous (lbs/hr) .....	0.047	0.042	0.037	0.042
Organic (lbs/hr).....	0.051	0.040	0.044	0.045
PM2.5 Total (lbs/hr) .....	1.228	1.119	1.206	1.184
Total (lbs/hr) .....	1.267	1.189	1.234	1.230

PM 2.5 Filterable (gr/dscf).....	0.0083	0.0077	0.0084	0.0081
>2.5 Filterable (gr/dscf) .....	0.0003	0.0005	0.0002	0.0003
Aqueous (gr/dscf) .....	0.0003	0.0003	0.0003	0.0003
Organic (gr/dscf).....	0.0004	0.0003	0.0003	0.0003
PM2.5 Total (gr/dscf) .....	0.0090	0.0083	0.0090	0.0088
Total (gr/dscf) .....	0.0093	0.0088	0.0092	0.0091
PM 2.5 Filter (lb/ton dry fuel)	0.0435	0.0399	0.0433	0.0422
>2.5 Filter (lb/ton dry fuel).....	0.0015	0.0027	0.0011	0.0018
Aqueous (lb/ton dry fuel).....	0.0018	0.0016	0.0014	0.0016
Organic (lb/ton dry fuel).....	0.0020	0.0016	0.0017	0.0017
PM2.5 Total (lb/ton dry fuel).....	0.0472	0.0430	0.0464	0.0455
Total (lb/ton dry fuel) .....	0.0487	0.0457	0.0475	0.0473

## 2.6 Hydrogen Chloride Results

The results of the tests performed for the determination of Hydrogen Chloride are reported in Table 2.6. Three test runs were performed on Unit 1 with each run at 60 minutes in length.

**Table 2.6**  
**Metropolitan Council Environmental Services**  
**Seneca Wastewater Treatment Plant**  
**Unit 1 (EU001)**  
**February 17, 2010**  
**Determination of Hydrogen Chloride**

<b>Client:</b> Met Council		<b>Plant:</b> Seneca	
<b>Date(s):</b> February 16-17, 2010		<b>EPA Method(s):</b> 1-4, 26M	
Run #: .....	Run 1	Run 2	Run 3
Date:.....	2/17/2010	2/17/2010	2/17/2010
Time:.....	13:50-14:56	15:12-16:12	16:28-17:28
			Average
<b>Process Conditions</b>			
Wet Sludge Feed (tons/hr) .....	4.89	4.74	4.57
Sludge Solids Content (%).....	25.70	25.80	25.43
Dry Sludge Feed (tons/hr) .....	1.26	1.22	1.16
AftBrn Nat Gas (cu ft/hr).....	691	387	300
Incin Natural Gas (cu ft/hr).....	2,017	440	311
Exhaust Oxygen (%).....	6.3	6.3	7.0
Opacity (%).....	5.4	5.5	5.3
ID Fan Power (amps).....	189	188	190
Hearth 1 Temp .....	1,149	1,157	1,188
Hearth 2 Temp .....	1,329	1,342	1,375
Hearth 3 Temp (F) .....	1,478	1,447	1,437
Hearth 4 Temp (F) .....	1,402	1,433	1,406
Hearth 5 Temp (F) .....	919	943	947
AftBrn Comb Zone (F) .....	1,067	1,069	1,075
<b>Control Equipment (Wet Scrubber)</b>			
Venturi DP (inH20) .....	16.9	16.6	16.9
Scrubber Draft DP (inH20).....	-0.30	-0.30	-0.30
Total Scrubber Water (gpm) ...	676	673	671

Venturi Water Flow (gpm) .....	220	219	219	219
Venturi Out Temp (F) .....	150	151	150	150
Sub-cooler Out Temp (F).....	69	69	69	69

**Stack Conditions**

Doc. Version .....	ST619-01			
Delta H (inH2O) .....	1.89	1.93	1.87	1.90
Stack Temp (°F).....	113	114	114	114
Oxygen (%).....	15.3	15.7	15.5	15.5
Carbon Dioxide (%).....	5.0	5.1	5.3	5.1
Mol Weight, Dry.....	29.4	29.4	29.5	29.4
Mol Weight, Wet .....	29.2	29.2	29.2	29.2
Stack Press (inH2O) .....	-0.20	-0.20	-0.20	-0.20
Stack Area (ft2).....	15.90	15.90	15.90	15.90
Stack Vel (ft/sec) .....	18.63	18.80	18.62	18.68
Stack Flow (wacfm).....	17,782	17,941	17,767	17,830
Stack Flow (wscfm) .....	16,035	16,144	15,992	16,057
Stack Flow (dscfm).....	15,788	15,863	15,731	15,794

**Test Results - Hydrogen Chloride**

Sample Gas Vol (dscf).....	43.082	43.224	42.426	42.911
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**Lab Results - Hydrogen Chloride**

HCl Total (ug/sample) .....	300	300	310	303
HCl Conc (mg/dscm) .....	0.2459	0.2451	0.2580	0.2497
HCl Conc (ppm) .....	0.1619	0.1613	0.1699	0.1644
HCl Conc (ppm @ 7% O2).....	0.4018	0.4313	0.4372	0.4234
HCl Conc (lbs/hr) .....	0.0145	0.0145	0.0152	0.0147
HCl Conc (lb/ton dry Sludge).0.0115	0.0115	0.0119	0.0131	0.0122

## SECTION 3.0

### TEST PROCEDURES

#### 3.1 Determination of Sample Point Locations

REF: Code of Federal Regulations, Title 40, Part 60, Appendix A, Method 1

##### Stack Dimensions (Units 1)

Inside Diameter:	54	inches
Area:	15.9	ft <sup>2</sup>
Distance Upstream of Ports:	552	inches
Distance Downstream of Ports:	912	inches
Total Number of Points:	12	
Number of Points per Diameter:	6	

##### Sample Point Dimensions

Point 1	2.38	inches
Point 2	7.88	inches
Point 3	15.98	inches
Point 4	38.02	inches
Point 5	46.12	inches
Point 6	51.62	inches

##### Cyclonic Flow Test Results (Yaw Angles)

<i>FBR Unit</i>	<i>U1</i>
Point 1	0
Point 2	+1
Point 3	+3
Point 4	+6
Point 5	+1
Point 6	+5
Point 7	+4
Point 8	+4
Point 9	+3
Point 10	+2
Point 11	+2
Point 12	+4
<i>Absolute Avg</i>	2.9

### 3.2 Determination of Velocity and Volumetric Flow

REF: Code of Federal Regulations, Title 40, Part 60, Appendix A, Method 2

#### Measurement System

A combination Stausscheibe (Type S) pitot tube and type K thermocouple were used to measure duct velocity head and temperature. The pitot tube was connected via flexible tubing to an inclined manometer. The thermocouple was connected to a digital potentiometer.

#### Measurement Procedure

Subsequent to sampling, traverse points were selected based on Method 1 requirements. The locations of the traverse points are presented in Section 3.1 and the reduced field data sheets. A traverse of the stack was performed to determine stack velocity head, temperature distributions, cyclonic flow, and stack static pressure.

#### Calculations

##### Method 2 - Stack Absolute Pressure

$$P_s = P_{Barometric} + \left( \frac{P_{sg}}{13.6} \right)$$

$P_s$  = Stack absolute pressure, inHg  
 $P_{bar}$  = Barometric pressure, inHg  
 $P_{sg}$  = Stack static pressure, IWG

##### Method 2 - Stack Velocity

$$v_s = K_p C_p (\sqrt{\Delta P})_{avg} \sqrt{\frac{T_{s(avg)}}{P_s M_s}}$$

$v_s$  = Stack velocity, ft/sec  
 $\Delta P$  = Average velocity head, in  $H_2O$   
 $C_p$  = Pitot tube coefficient, dimensionless  
 $T_s$  = Stack absolute temperature, °R  
 $P_s$  = Stack absolute pressure, inHg  
 $M_s$  = Molecular weight of stack gas, wet basis, lb/lb-mole  
 $K_p$  = Pitot tube constant, 85.49

##### Method 2 - Stack Volumetric Flow Rate (actual)

$$Q = v_s * A_s * 60$$

$Q$  = Wet stack gas flow rate at actual conditions, WACFM  
 $v_s$  = Stack velocity, ft/sec  
 $A_s$  = Stack area,  $ft^2$



#### Method 2 - Stack Volumetric Flow Rate (wet - Std)

$$Q_{ws} = Q * \frac{T_{std}}{T_s} * \frac{P_s}{P_{std}}$$

$Q_{ws}$  = Wet stack gas flow rate at standard conditions, WSCFM  
 $T_{std}$  = Standard absolute temperature, 528 °R  
 $T_s$  = Stack absolute temperature, °R  
 $P_s$  = Stack absolute pressure, inHg  
 $P_{std}$  = Standard absolute pressure, 29.92 inHg

#### Method 2 - Stack Volumetric Flow Rate (dry - Std)

$$Q_{sd} = Q * (1 - B_{ws}) * \frac{T_{std}}{T_s} * \frac{P_s}{P_{std}}$$

$Q_{sd}$  = Dry stack gas flow rate at standard conditions, DSCFM  
 $Q$  = Wet stack gas flow rate at actual conditions, WACFM  
 $B_{ws}$  = Flue gas moisture content, proportion by volume, dimensionless  
 $T_{std}$  = Standard absolute temperature, 528 °R  
 $T_s$  = Stack absolute temperature, °R  
 $P_s$  = Stack absolute pressure, inHg  
 $P_{std}$  = Standard absolute pressure, 29.92 inHg

### **3.3 Determination of Molecular Weight and Moisture Content**

REF: Code of Federal Regulations, Title 40, Part 60, Appendix A, Methods 3 and 4

#### **Sampling System**

A stainless steel probe was connected to the impinger train, which consisted of a set of pre-weighed impingers connected in series and immersed in an ice bath. The impinger train was followed in series by a carbon vane pump, a dry test meter, and a calibrated orifice connected to an inclined manometer. A Tedlar bag was used to collect an integrated Method 3 sample.

#### **Measurement Procedure**

Prior to sampling, a leak check was performed and the leak rate, time, and vacuum was recorded on the stack test data sheet. Following the leak check, the sample probe was inserted into the stack and the pump turned on. The sample time was calculated based on a minimum sample volume of 21 cubic feet and a sample rate of 0.75 cubic feet per minute. At the conclusion of sampling, a final leak check was performed and recorded on the data sheet.

## Calculations

### Method 3 - Flue Gas Molecular Weight (dry)

$$M_d = (.44 \% CO_2 + .32 \% O_2 + .28 (\% N_2 + \% CO))$$

$M_d$  = Molecular weight of flue gas (dry), lb/lb-mole

### Method 3 - Flue Gas Molecular Weight (wet)

$$M_w = (.44 \% CO_2 + .32 \% O_2 + .28 (\% N_2 + \% CO)) \left( 1 - \frac{\% H_2O}{100} \right) + .18 \% H_2O$$

$M_w$  = Molecular weight of flue gas (wet), lb/lb-mole

### Method 3 - Flue Gas Molecular Weight (wet)

$$M_w = M_d (1 - B_{ws}) + 18.0 B_{ws}$$

$M_w$  = Molecular weight of flue gas (wet), lb/lb-mole

$M_d$  = Molecular weight of flue gas (dry), lb/lb-mole

$B_{ws}$  = Flue gas moisture content, proportion by volume, dimensionless

### Method 4 - Flue Gas Moisture Content

$$B_{ws} = \frac{V_{wc (std)}}{(V_{m (std)} + V_{wc (std)})}$$

$B_{ws}$  = Flue gas moisture content, proportion by volume, dimensionless

$V_{wc (std)}$  = Volume of water vapor at standard conditions, SCF

$V_{m (std)}$  = Dry meter volume at standard conditions, DSCF

### Method 4 - Volume of Water Vapor (Std)

$$V_{wc (std)} = 0.04715 V_{lc}$$

$V_{wc (std)}$  = Volume of water vapor at standard conditions, SCF

$V_{lc}$  = Volume of liquid collected in the impingers, mL

### 3.4 Determination of Gaseous Emissions

REF: Code of Federal Regulations, Title 40, Part 60, Appendix A, Methods 3A, 6C, 7E, 10

#### Sampling System

A sintered metal filter was connected via a "Swage-Lok" fitting to a heated stainless steel probe. The probe was attached to a heated Teflon sample line maintained at 250°F followed by a sample conditioning system to remove moisture. The dry conditioned sample was transported under pressure via a Teflon sample line to the sample manifold by a Teflon lined diaphragm pump. The sample manifold maintained the proper sample pressure to each analyzer.

#### Calibration Procedure

Once the analyzer had a sufficient warm up period and after all adjustments to the analyzer were complete, a local calibration error check was completed. The local calibration error check consisted of introducing calibration gas directly into the analyzer. These calibrations were performed using three calibration gases: a zero gas (nitrogen); a mid range gas (40% to 60% of the analyzer range); and a high range gas (100% of the analyzer range). All upscale calibration gases were NIST Traceable to 1% (Protocol 1). The analyzer response must be within 2% of the analyzer range or the calibration procedure was repeated. This procedure is completed at the beginning and at the end of the sampling day or when adjustments to the analyzers are necessary.

Following the local calibration error procedures, the system bias check was completed. The system bias consisted of introducing an upscale and zero gas into the sample probe tip allowing the entire system to be evaluated. The upscale gas was selected based on the value that was closest to the expected concentration. The system bias check must be within 5% of the analyzer range or the entire calibration procedure was repeated and the test run thrown out. The system calibration procedure was completed before and after each test period.

The pre and post system bias was used to calculate the analyzer drift over the test period. The calibration procedure was repeated if the difference was greater than 3% of the analyzer range.

#### Sampling Procedure

Prior to sampling, a leak check of the sample system was conducted by plugging the probe opening. An acceptable leak check was achieved when the sample flow reached zero. Sampling began by adjusting the system pressure to 5 psi and the individual analyzer flow rates to 2 SCFH. The test results were continuously recorded on a strip chart and an ASCII text file for data manipulation.

## Calculations

$$C_{gas} = (C - C_o) \frac{C_{ma}}{C_m - C_o}$$

- $C_{gas}$  = Effluent gas concentration, dry basis, ppm  
 $C$  = Average gas concentration indicated by gas analyzer, dry basis, ppm  
 $C_o$  = Average initial and final system cal. bias check response for the zero gas, ppm  
 $C_{ma}$  = Actual concentration of upscale calibration gas, ppm  
 $C_m$  = Average initial & final system cal bias check responses for upscale cal gas, ppm

$$C_b = \frac{(C_s - C_l)}{S} * 100$$

- $C_b$  = System calibration bias check, % of span  
 $C_s$  = System analyzer calibration response, ppm  
 $C_l$  = Local analyzer calibration response, ppm  
 $S$  = Analyzer span range

$$C_e = \frac{(C_l - C_a)}{S} * 100$$

- $C_e$  = Analyzer calibration error check, % of span  
 $C_l$  = Local analyzer calibration response, ppm  
 $C_a$  = Actual concentration of calibration gas cylinder, ppm

$$D = \frac{(C_{sf} - C_{si})}{S} * 100$$

- $D$  = Analyzer drift, % of span  
 $C_{sf}$  = Final system analyzer calibration response, ppm  
 $C_{si}$  = Initial system analyzer calibration response, ppm  
 $S$  = Analyzer span range

$$E = \frac{C_{gas} Q_{sd} 60 MW}{10^6 V_i}$$

- $E$  = Pounds per hour of gaseous pollutant, lb/hr  
 $C_{gas}$  = Effluent gas concentration, dry basis, ppm  
 $Q_{sd}$  = Dry stack gas flow rate at standard conditions, DSCFM  
 $MW$  = Molecular weight of pollutant, lb/lb-mole

### 3.5 Determination of Dioxin/Furans/PCBs/PAH

REF: Code of Federal Regulations, Title 40, Part 60, Appendix A, Methods 2-4, 23

#### Sampling System

A curved sample nozzle was connected via a "Swage-Lok" fitting to a heated probe liner. The probe liner was attached to a heated glass filter holder containing a pre-screened glass fiber filter. The exit to the filter holder was connected to the condenser followed by the XAD-2 resin trap. The XAD-2 resin trap was connect directly to the impinger train which consisted of a set of pre-weighed impingers connected in series and immersed in an ice bath. The impinger train was followed in series by a carbon vane pump, a dry test meter, and a calibrated orifice connected to an inclined manometer. The CEMS was used to measure the oxygen content for the 7% O<sub>2</sub> correction. Type K thermocouples were used to measure the following temperatures: probe heater, filter heater, impinger outlet, and dry test meter inlet and outlet.

A combination Stausscheibe (Type S) pitot tube and type K thermocouple were used to measure duct velocity head and temperature. The pitot tube was connected via flexible tubing to an inclined manometer. The thermocouple was connected to a digital potentiometer.

#### Sampling Procedure

Prior to sampling, traverse points were selected based on Method 1 requirements. The locations of the traverse points are presented in the reduced field data sheets. A preliminary traverse of the stack was performed to determine stack velocity head, temperature distributions, cyclonic flow, and stack static pressure. If necessary, preliminary runs by Methods 3 and 4 were performed to determine duct moisture and fixed gas content. Based on this information, a sample nozzle of appropriate inside diameter was selected, and the impinger train charged. Sample time per traverse point was estimated in order to collect the minimum dscf of sample.

The apparatus was assembled as completely as possible in the staging area and transported to the sample site. Potential contamination of the sample train was prevented by sealing all openings with hexane rinsed aluminum foil. Once in the sampling area, the probe and filter heaters were brought to temperatures of 250 ±25°F, and the apparatus was leak checked. Upon successful completion of the leak check, the initial dry test meter reading was recorded, and the probe inserted at the first traverse point.

The stack temperature, dry test meter temperature, and the velocity head across the pitot was measured and recorded on the data sheet. The isokinetic sampling rate in terms of pressure drop across the calibrated orifice was calculated and recorded on the data sheet. The pump and timer were turned on, and the sample rate adjusted to correspond to the calculated isokinetic rate. Once the sample rate was set, the following data was recorded:

- Dry Gas Meter Volume
- Dry test meter outlet temperature
- Sample vacuum

- Probe heater temperature
- Filter heater temperature
- Impinger outlet temperature

At the end of the sample time for the first point, the probe was moved to the next point, and the measurements, calculations and recording of data was repeated. Upon completion of sampling from a port, the pump was turned off and the dry test meter reading recorded. The probe was removed from the stack, and placed in the next sample port. The previously described procedure was repeated for each sample port.

When the sample run was completed, the final dry test meter reading was recorded and the probe removed from the port. A post-test leak check was performed at a vacuum higher than the highest sample vacuum measured during the sample run. The final leak rate was recorded on the data sheet. The sample train was sealed from contamination and transported to the staging area for recovery.

### **Sample Recovery**

Sample was recovered as follows:. The filter was recovered to a labeled petri dish made of glass and labeled container number 1. The nozzle, probe, front half and back half of the filter holder, and the condenser were rinsed 3 times with acetone and methylene chloride and added to container number 2. The same procedure for container number 2 was followed using toluene as the rinse solvent and added to container number 3. All samples were recovered to a labeled, clean amber glass bottle. The liquid level in the bottle was marked upon completion of recovery. The XAD-2 resin trap was sealed and labeled container number 4. All samples were shipped to the laboratory for analysis in a cooler containing ice.

Prior to recovery of the impinger fraction, the exterior of each impinger was cleaned and dried, and the net weight gain of each was determined to the nearest 0.1 gram. The impinger fraction consisted of the liquid impinger catch and rinses of the impingers. The impinger catch was recovered and stored for later analysis in the event that break-through was discovered from the trap. The liquid level of the bottle was marked upon completion of recovery.

A train blank was prepared using the same reagents and using the same recovery for the test samples. The blank containers were clearly labeled, and the liquid levels marked.

### **Analytical Procedure**

The Method 3 sample was analyzed in the field with a fyrite analyzer. The results of this analysis are presented both in the calculated field data and on the field data sheets.

Prior to analysis, the samples were checked for liquid loss. The laboratory analysis was performed by Maxxam Analytical. The procedures used to perform the analysis followed EPA Method 23 requirements. The laboratory results and Quality Control are provided in Appendix D.

### 3.6 Determination of Particulate Matter Less Than 2.5 Microns

REF: Other Test Method – 027 and 028

#### Sampling System

A PM-2.5 and 10 head was connected via a "Swage-Lok" fitting to a probe liner. The probe liner was connected to a teflon jumper, which was attached to the impinger train, which consisted of a set of pre-weighed impingers, connected in series and immersed in an ice bath. The impinger train was followed in series by a carbon vane pump, a dry test meter, and a calibrated orifice

connected to an inclined manometer. A Tedlar bag was used to collect an integrated Method 3 sample. Type K thermocouples were used to measure the following temperatures: stack, impinger outlet, and dry test meter inlet and outlet.

A combination Stausscheibe (Type S) pitot tube and type K thermocouple were used to measure duct velocity head and temperature. The pitot tube was connected via flexible tubing to an inclined manometer. The thermocouple was connected to a digital potentiometer.

#### Sampling Procedure

Prior to sampling, traverse points were selected based on Method 1 requirements. The locations of the traverse points are presented in section 3.1. A preliminary traverse of the stack was performed to determine stack velocity head, temperature distributions, cyclonic flow, and stack static pressure. If necessary, preliminary runs by Methods 3 and 4 were performed to determine duct moisture and fixed gas content. Based on this information, a sample nozzle of appropriate inside diameter was selected, and the impinger train charged. Sample time per traverse point was estimated in order that a minimum of 30 dscf of sample would be collected.

The apparatus was assembled as completely as possible in the staging area and transported to the sample site. Sealing all openings with aluminum foil prevented potential contamination of the sample train. Once in the sampling area the apparatus was leak checked. Upon successful completion of the leak check, the initial dry test meter reading was recorded, and the probe inserted at the first traverse point and the PM-2.5 head was allowed to reach the duct temperature.

The stack temperature, dry test meter temperature, and the velocity head across the pitot was measured and recorded on the data sheet. The anisokinetic sampling rate in terms of pressure drop across the calibrated orifice was calculated and recorded on the data sheet. The pump and timer were turned on, and the sample time was adjusted to correspond to the calculated anisokinetic rate. Once the sample rate was set, the following data was recorded:

- Dry Gas Meter Volume
- Dry test meter outlet temperature
- Sample vacuum
- Impinger outlet temperature

At the end of the sample time for the first point, the probe was moved to the next point, and the measurements, calculations and recording of data was repeated. Upon completion of sampling from a port, the pump was turned off and the dry test meter reading recorded. The probe was removed from the stack, and placed in the next sample port. The previously described procedure was repeated for each sample port.

When the sample run was completed, the final dry test meter reading was recorded and the probe removed from the port. A post-test leak check was performed at a vacuum higher than the highest sample vacuum measured during the sample run. The final leak rate was recorded on the data sheet. The sample train was sealed from contamination and transported to the staging area for recovery.

### **Sample Recovery**

Sample was recovered in two fractions: front half and back half. The front half fraction consisted of the filter itself, as well as, acetone rinses and brushings of the turn around cap, the stem, and the filter housing area before the filter. The filter was recovered to a labeled petri dish made of glass or plastic. Acetone rinses were recovered to a clean-labeled polyethylene bottle. The liquid level in the polyethylene bottle was marked upon completion of recovery.

Prior to recovery of the back half fraction, the exterior of each impinger were cleaned and dried, and the net weight gain of each was determined to the nearest 0.5 gram. The back half fraction consisted of the liquid impinger catch, rinses of the impingers, and all connecting glassware. Glassware rinses were recovered to a clean, labeled polyethylene or glass bottle. The liquid level of the bottle was marked upon completion of recovery.

At the conclusion of each day of sampling, reagent and recovery solvent blanks were collected into the same types of sample containers as were used for the sample recovery. The blank containers were clearly labeled, and the liquid levels marked.

### **Analytical Procedure**

The Method 3 sample was analyzed in the field with a fyrite analyzer. The results of this analysis are presented both in the calculated field data and on the field data sheets.

Prior to analysis, the samples were checked for liquid loss, and the liquid volume of each sample bottle determined. The liquid samples from each run and blanks were transferred to individual tarred beakers, and the liquid allowed to evaporate at ambient temperature and pressure. The front half fraction and solvent blanks were analyzed gravimetrically until two consecutive weightings agreed to within 0.5 mg.

Prior to analysis, back half fractions and blanks were checked for liquid loss, and the liquid volume of each sample bottle determined. The back half fraction was extracted with methylene chloride gravimetrically. Each sample was extracted three times with 125 ml of methylene chloride in a separatory funnel. After each extraction, the organic (solvent) fraction was decanted. The organic fraction was evaporated at ambient temperature and pressure, while the aqueous fraction was evaporated at just below the boiling point of water.



After evaporation, the beakers were desiccated for 24 hours, and weighed until consecutive weightings agreed to within 0.5 mg.

### Calculations

$$A_n = \pi r^2$$

$A_n$  = Area of the sample nozzle,  $ft^2$   
 $r$  = Radius of the nozzle,  $ft$

$$V_{m (std)} = 17.64 V_m Y \left( \frac{P_{barometric} + \frac{\Delta H}{13.6}}{T_m} \right)$$

$V_{m (std)}$  = Dry meter volume at standard conditions, DSCF  
 $V_m$  = Dry meter volume uncorrected, DCF  
 $Y$  = Meter calibration coefficient  
 $P_{bar}$  = Barometric pressure, inHg  
 $\Delta H$  = Orifice pressure differential, IWG  
 $T_m$  = Meter temperature,  $^{\circ}R$   
 $17.64$  =  $^{\circ}R/inHg$

$$I = \frac{100 T_s [K_3 V_{lc} + (V_m Y / T_m)(P_{barometric} + \Delta H / 13.6)]}{60 \theta v_s P_s A_n}$$

$I$  = % Anisokinetics  
 $T_s$  = Absolute average stack gas temperature,  $^{\circ}R$   
 $K_3$  = 0.002669 inHg-ft<sup>3</sup>/mL-  $^{\circ}R$   
 $V_m$  = Volume of gas sample as measured by the dry gas meter, DCF  
 $Y$  = Dry gas meter calibration factor  
 $V_{lc}$  = Volume of liquid collected in the impingers, mL  
 $\theta$  = Sample time, minutes  
 $P_{bar}$  = Barometric pressure at the sampling site, inHg  
 $\Delta H$  = Average pressure differential across the orifice meter, in  $H_2O$   
 $v_s$  = Stack velocity, ft/sec  
 $P_s$  = Stack absolute pressure, inHg  
 $A_n$  = Cross sectional area of nozzle,  $ft^2$   
 $T_m$  = Absolute average dry gas meter temperature,  $^{\circ}R$

$$C_s = 0.01543 \left( \frac{M_n}{V_{m (std)}} \right)$$

$C_s$  = Grains per dry standard cubic foot

$M_n$  = Mass of collected particulate, mg  
 $V_{m (std)}$  = Dry meter volume at standard conditions, DSCF

$$E = C_s * Q_{sd} * \frac{60 \text{ min/hr}}{7000 \text{ gr/lb}}$$

$E$  = Pounds per hour, particulates  
 $C_s$  = Particulate grain loading, gr/DSCF  
 $Q_{sd}$  = Dry stack gas flow rate at standard conditions, DSCFM

$$\mu_s = 51.05 + 0.207 T_s + 3.24 \times 10^{-5} T_s^2 + 53.147 f_{O_2} - 74.143 B_{ws}$$

$\mu_s$  = Velocity of stack gas, micropoise  
 $T_s$  = Average absolute stack gas temperature,  $\mathcal{R}$   
 $f_{O_2}$  = Stack gas fraction  $O_2$ , by volume, dry basis  
 $B_{ws}$  = Flue gas moisture content, proportion by volume, dimensionless

$$Q_s = 0.002837 \mu_s \left( \frac{T_s}{M_w P_s} \right)^{0.2949}$$

$Q_s$  = Total cyclone flow rate at wet cyclone conditions,  $\text{ft}^3/\text{min}$   
 $\mu_s$  = Velocity of stack gas, micropoise  
 $T_s$  = Average absolute stack gas temperature,  $\mathcal{R}$   
 $M_w$  = Molecular weight of flue gas (wet), lb/lb-mole  
 $P_s$  = Stack absolute pressure, inHg

$$\Delta H = \left( \frac{Q_s (1 - B_{ws}) P_s}{T_s} \right)^2 \left( \frac{T_m M_d (1.083) \Delta H_{@}}{P_{barometric}} \right)$$

$\Delta H$  = Orifice pressure head needed for cyclone flow rate, in  $H_2O$   
 $Q_s$  = Total cyclone flow rate at wet cyclone conditions,  $\text{ft}^3/\text{min}$   
 $B_{ws}$  = Flue gas moisture content, proportion by volume, dimensionless  
 $P_s$  = Stack absolute pressure, inHg  
 $T_s$  = Average absolute stack gas temperature,  $\mathcal{R}$   
 $T_m$  = Absolute average dry gas meter temperature,  $\mathcal{R}$   
 $M_d$  = Molecular weight of flue gas (dry), lb/lb-mole  
 $P_{bar}$  = Barometric pressure, inHg  
 $\Delta H_{@}$  = Orifice calibration coefficient, in  $H_2O$

$$V_n = \frac{3.056 Q_s}{D_n^2}$$

$V_n$  = Nozzle velocity, ft/sec  
 $Q_s$  = Total cyclone flow rate at wet cyclone conditions, ft<sup>3</sup>/min  
 $D_n$  = Inside diameter of the sample nozzle, inches

$$V_{\min} = V_n \left( 0.2457 + \sqrt{0.3072 - \frac{0.2603 \left( \sqrt{Q_s} \right) \mu_s}{V_n^{1.5}}} \right)$$

$V_{\min}$  = Minimum velocity, ft/sec  
 $V_n$  = Nozzle velocity, ft/sec  
 $Q_s$  = Total cyclone flow rate at wet cyclone conditions, ft<sup>3</sup>/min  
 $\mu_s$  = Velocity of stack gas, micropoise

$$V_{\max} = V_n \left( 0.4457 + \sqrt{0.5690 + \frac{0.2603 \left( \sqrt{Q_s} \right) \mu_s}{V_n^{1.5}}} \right)$$

$V_{\max}$  = Maximum velocity, ft/sec  
 $V_n$  = Nozzle velocity, ft/sec  
 $Q_s$  = Total cyclone flow rate at wet cyclone conditions, ft<sup>3</sup>/min  
 $\mu_s$  = Velocity of stack gas, micropoise

$$R_{\min} = 0.2457 + \sqrt{0.3072 - \frac{0.2603 \left( \sqrt{Q_s} \right) \mu_s}{V_n^{1.5}}}$$

If  $R_{\min}$  is less than 0.5, or if an imaginary number occurs when calculating  $R_{\min}$ , use Equation 1 to calculate  $V_{\min}$ . Otherwise, use Equation 2.

$$\text{Eq. 1} \quad V_{\min} = V_n (0.5)$$

$$\text{Eq. 2} \quad V_{\min} = V_n R_{\min}$$

$V_{\min}$  = Minimum velocity, ft/sec  
 $V_n$  = Nozzle velocity, ft/sec  
 $Q_s$  = Total cyclone flow rate at wet cyclone conditions, ft<sup>3</sup>/min  
 $\mu_s$  = Velocity of stack gas, micropoise

$$R_{\max} = 0.4457 + \sqrt{0.5690 + \frac{0.2603 \left( \sqrt{Q_s} \right) \mu_s}{V_n^{1.5}}}$$

If  $R_{\max}$  is greater than 1.5, use Equation 3 to calculate  $V_{\max}$ . Otherwise, use Equation 4.

$$\text{Eq. 3} \quad V_{\max} = V_n (1.5)$$

$$\text{Eq. 4} \quad V_{\max} = V_n R_{\max}$$

$V_{\max}$  = Maximum velocity, ft/sec

$V_n$  = Nozzle velocity, ft/sec

$Q_s$  = Total cyclone flow rate at wet cyclone conditions, ft<sup>3</sup>/min

$\mu_s$  = Velocity of stack gas, micropoise

$$\Delta p_{\min} = 1.3686 \times 10^{-4} \frac{P_s M_w (V_{\min})^2}{T_s C_p^2}$$

$\Delta p_{\min}$  = Minimum velocity head value during sampling for selected nozzle, in H<sub>2</sub>O

$P_s$  = Stack absolute pressure, inHg

$M_w$  = Molecular weight of flue gas (wet), lb/lb-mole

$V_{\min}$  = Minimum velocity, ft/sec

$T_s$  = Average absolute stack gas temperature, °R

$C_p$  = Pitot tube coefficient

$$\Delta p_{\max} = 1.3686 \times 10^{-4} \frac{P_s M_w (V_{\max})^2}{T_s C_p^2}$$

$\Delta p_{\max}$  = Maximum velocity head value during sampling for selected nozzle, in H<sub>2</sub>O

$P_s$  = Stack absolute pressure, inHg

$M_w$  = Molecular weight of flue gas (wet), lb/lb-mole

$V_{\max}$  = Maximum velocity, ft/sec

$T_s$  = Average absolute stack gas temperature, °R

$C_p$  = Pitot tube coefficient

$$t_1 = \sqrt{\frac{\Delta p_1}{\Delta p_{\text{avg}}}} \left( \frac{\text{Total run time}}{\text{Number of points}} \right)$$

$t_1$  = Dwell time at first traverse point, minutes

$\Delta p_1$  = The velocity head at the first traverse point (from a previous traverse), in H<sub>2</sub>O

$\Delta p_{\text{avg}}$  = Square of the average square root of the  $\Delta p$ 's (previous vel. traverse), in H<sub>2</sub>O

$$t_n = \frac{t_1}{\sqrt{\Delta p_1}} \sqrt{\Delta p_n}$$

$t_n$  = Dwell time at traverse point n, minutes

$\Delta p_n$  = Measured velocity head at point n, in  $H_2O$   
 $\Delta p_1$  = Measured velocity head at point 1, in  $H_2O$

$$Q_s = \frac{T_s}{17.64 P_s} \left( \frac{V_{m(std)} + V_{w(std)}}{\theta} \right)$$

$Q_s$  = Total cyclone flow rate at wet cyclone conditions,  $ft^3/min$   
 $T_s$  = Average absolute stack gas temperature,  $^{\circ}R$   
 $P_s$  = Stack absolute pressure, inHg  
 $V_{m(std)}$  = Dry meter volume at standard conditions, DSCF  
 $V_{wc(std)}$  = Volume of water vapor at standard conditions, SCF  
 $\theta$  = Sample time, minutes

$$D_{50} = \beta_1 \left( \frac{T_s}{M_w P_s} \right)^{0.2091} \left( \frac{\mu_s}{Q_s} \right)^{0.7091}$$

$D_{50}$  = Diameter of particles having a 50 percent probability of penetration,  $\mu m$   
 $\beta_1$  = 0.15625  
 $\mu_s$  = Velocity of stack gas, micropoise  
 $T_s$  = Average absolute stack gas temperature,  $^{\circ}R$   
 $P_s$  = Stack absolute pressure, inHg  
 $Q_s$  = Total cyclone flow rate at wet cyclone conditions,  $ft^3/min$   
 $M_w$  = Molecular weight of flue gas (wet), lb/lb-mole

### 3.7 Determination of Hydrogen Chloride

REF: Code of Federal Regulations, Title 40, Part 60, Appendix A, Methods 26

#### Sampling System

A heated glass probe liner was attached to a heated glass filter holder containing a teflon mat filter. The exit to the filter holder was connected to the impinger train which consisted of a set of impingers containing 0.1 N  $H_2SO_4$  connected in series and immersed in an ice bath. The impinger train was followed in series by a pump and dry test meter. A Tedlar bag was used to collect an integrated Method 3 and 3A sample. Type K thermocouples were used to measure the following temperatures: probe heater, filter heater, impinger outlet, and dry test meter inlet and outlet. The thermocouple was connected to a digital potentiometer.

#### Sampling Procedure

The sample time of 60 minutes at approximately 0.75 acf per minute was selected. The apparatus was assembled as completely as possible in the staging area and transported to the sample site. Potential contamination of the sample train was prevented by sealing all openings with aluminum foil. Once in the sampling area, the probe and filter heaters were brought to temperatures of  $250 \pm 25^{\circ}F$ , and the apparatus was leak checked. Upon successful completion of the leak check the probe inserted at the sample point. The sample probe and

filter were then conditioned for 5 minutes prior to sampling by drawing flue gas through the probe and filter bypassing the impingers. Upon completion of the purge, the initial dry test meter reading was recorded.

The pump and timer were turned on and the sample rate adjusted to 0.75 acf per minute. Once the sample rate was set, the following data was recorded:

- Dry Gas Meter Volume
- Dry Gas Meter inlet temperature
- Dry Gas Meter outlet temperature
- Probe heater temperature
- Filter heater temperature
- Impinger outlet temperature

When the sample run was completed, the final dry test meter reading was recorded and the probe removed from the port. A post-test leak check was performed at a vacuum higher than the highest sample vacuum measured during the sample run. The final leak rate was recorded on the data sheet. The sample train was then recovered.

#### **Sample Recovery**

Each impingers content and rinses were recovered into a clean sample bottle and clearly labeled and liquid levels marked. Reagents blanks were collected into the same types of sample containers as were used for the sample recovery. The blank containers were clearly labeled, and the liquid levels marked.

#### **Analytical Procedure**

The Method 3A sample was analyzed in the field with an O2 analyzer. The results of this analysis are presented in the calculated field data.

Prior to analysis, the samples were checked for liquid loss. The procedures used to perform the analysis followed EPA Method 26 requirements. The laboratory results and quality control are provided in Appendix D.

#### **Calculations**

##### **Methods 26 - Volume of Sample Collected (Std)**

$$V_{m (std)} = 17.64 V_m Y \left( \frac{P_{barometric} + \frac{\Delta H}{13.6}}{T_m} \right)$$

$V_{m (std)}$  = Dry meter volume at standard conditions, DSCF  
 $V_m$  = Dry meter volume uncorrected, DCF  
 $Y$  = Meter calibration coefficient

$P_{bar}$  = Barometric pressure, inHg  
 $\Delta H$  = Orifice pressure differential, IWG  
 $T_m$  = Meter temperature, °R  
17.64 = °R/inHg

#### Method 26 - Hydrogen Chloride Per Sample

$$C_{ug / sample} = V_s * (C_s - C_b)$$

$C_{ug/sample}$  = Concentration of Hydrogen Chloride, ug/sample  
 $V_s$  = Volume of sample, ml  
 $C_s$  = Concentration of sample, ug/ml  
 $C_b$  = Concentration of blank, ug/ml

#### Method 26 - Hydrogen Chloride Concentration

$$C_{ppm} = ((C_{ug / sample} * E10^{-6} * 0.0022 / 36.46 * 10.91048) / V_m) * E10_6$$

$C_{ppm}$  = Hydrogen Chloride Concentration, ppm  
 $C_{ug/sample}$  = Total Hydrogen Chloride per sample, ug/sample  
 $V_m$  = Dry meter volume, dscm

**Appendix A**  
**Field Data Sheets**



# AUTOMATED BOX STACK TEST DATA SHEET

Client	Met Council	Test Date	<del>855</del> <del>2-2</del> 2-16-10
Facility	Seneca	Start/Stop Time	855 - 1303
Unit	1	Test Method	EPA OTM 027/028
Location	Stack	Run Number	1
Project #	902630	Description	PM 2.5
Operator	BD	Carbon Trap ID	<del>1</del>

## RUN DATA

Tamb	°F	# Ports	2	Meter Box #	AB 1	ID#	232001
Pbar	29.32	In Hg	# Points	12	Nozzle Dia. (in)	0.274	ID# 225076
Filter #	m67	Time/Pt	120	Probe ID #		Pitot ID #	
MF #	29.32 0.98	Port Order	A>B	del H @	2.020		
Pstack	-0.20	In H2O	Pitot Coef	0.84	Meter Factor	1.000	
Sample Time	2	min	Test #	1	Data File Name	Unit 1 Run 1 OTM07	

Leak Chk	CFM	Vac	Init	Time	Pitot Leak Check	Run	1	2	3	Average	
Pre	0.010	10	BD	826	Pre	Post	O2			15.3	
Post	0.009	25	BD	1308	X	X	CO2			4.8	
≤ 0.02 cfm or 4 % of Sample Rate					Stable @ ≥ 3" 15 sec						

## DATA CORRECTIONS / RECORD

End Vol	Start Vol	Diff	Omit	Description	Impinger	End	Start	Diff	ID #
					#1	367.6	361.9		
					#2	624.8	621.4		
					#3	694.3	697.3		
					#4	855.6	826.8		
					#5				
					#6				
					#7				
					#8				
					Total				

	Sample Point		Time	Delta P	Delta H	Meter Reading	Vacuum	Temperatures (°F)				Meter	
	Port	Point	(min)	(in. H <sub>2</sub> O)	(in. H <sub>2</sub> O)	(acf)	(in. Hg)	Stack	Probe	Filter	Imp Out	In	Out
			0			0				ABX			
19.3	A	<del>19.9</del>	<del>20.2</del>	0.09	0.55	8.036	4	109.2	250	<del>32.6</del>	31.5	102	85
39.6	A	<del>19.9</del>	<del>21.3</del>	0.10	0.55	16.08	5	110.3	252	<del>34.1</del>	33.5	102.2	85.4
60.9	A	<del>19.9</del>	<del>22.9</del>	0.11	0.55	25.204	7	110.2	251	<del>44.9</del>	40.6	105.9	92.5
81.3	A	<del>19.9</del>	<del>24.3</del>	0.10	0.55	33.80	8	109.7	250	<del>47.3</del>	43.3	104.2	93.5
100.6	A	<del>19.9</del>	<del>27.1</del>	0.08	0.55	41.182	10	110.0	251	<del>51.1</del>	46.9	100.6	93.8
120.9	A	<del>19.9</del>	<del>27.8</del>	0.10	0.55	49.472	11	108.0	250	<del>50.8</del>	48.0	98.2	92.8
141.2	B	1	<del>28.1</del>	0.10	0.55	57.012	12	101.4	251	<del>52.5</del>	52.0	93.9	90.0
162.6	B	2	<del>28.1</del>	0.11	0.55	64.67	13	107.3	250	<del>54.7</del>	56.1	92.9	88.7
182.9	B	3	<del>28.1</del>	0.10	0.55	72.550	14	108.5	250	<del>56.2</del>	62.9	91.2	87.3
204.2	B	4	<del>28.1</del>	0.11	0.55	80.900	15	109.5	248	<del>45.3</del>	48.2	89.3	86.1
225.5	B	5	<del>28.1</del>	0.11	0.55	88.910	17	110.3	249	<del>46.0</del>	46.2	86.6	84.7
244.8	B	6	<del>28.1</del>	0.09	0.55	96.834	20	109.4	248	<del>53.4</del>	54.2	82.5	83.1

# AUTOMATED BOX STACK TEST DATA SHEET

Client	Met Council	Test Date	2-16-00
Facility	Seneca	Start/Stop Time	1400-1806
Unit	1	Test Method	EPA OTM 027/028
Location	Stack	Run Number	2
Project #	902630	Description	PM 2.5
Operator	BD	Carbon Trap ID	

## RUN DATA

Tamb	°F	# Ports	2	Meter Box #	AB 1	ID#	232001
Pbar	29.30	In Hg	# Points	12	Nozzle Dia. (in)	0.275	ID# 225088
Filter #	m68	Time/Pt	~20	Probe ID #		Pitot ID #	
MF #	0.98	Port Order	A→B	del H @	2.020		
Pstack	-0.20	In H2O	Pitot Coef	0.84	Meter Factor	1.000	
Sample Time	~240	min	Test #	1	Data File Name	Unit 1 Run 2 OTM 27	

Leak Chk	CFM	Vac	Init	Time	Pitot Leak Check	Run	1	2	3	Average
Pre	0.014	25	BD	1345	Pre	O2				15.3
Post	0.014	25	BD	1808	Post	CO2				4.5
≤ 0.02 cfm or 4 % of Sample Rate					Stable @ ≥ 3" 15 sec					

## DATA CORRECTIONS / RECORD

End Vol	Start Vol	Diff	Omit	Description	Impinger	MATERIAL WEIGHT (g)	50ml Rinse Y (N)		
						End	Start	Diff	ID #
					#1	364.8	358.8		263647
					#2	610.4	608.0		261024
					#3	698.5	699.1		261095
					#4	822.3	796.8		261118
					#5				
					#6				
					#7				
					#8				
					Total				

Sample Point		Time	Delta P	Delta H	Meter Reading	Vacuum	Temperatures (°F)				Meter	
Port	Point	(min)	(in. H <sub>2</sub> O)	(in. H <sub>2</sub> O)	(acf)	(in. Hg)	Stack	Probe	Filter	Imp Out	In	Out
		0			0				AUX			
A	1	20.1	0.10	0.58	8.429	5	106.1	248	43.2	38	97.3	85.2
A	2	46.1	0.11	0.58	17.65	6	111.3	249	44.6	38.6	98.2	86.4
A	3	62.2	0.11	0.58	25.31	7	111.8	249	45.9	39.2	99.0	87.6
A	4	82.3	0.10	0.58	33.81	7	112.7	248	46.7	39.8	99.7	89.1
A	5	101.3	0.09	0.58	41.379	9	112.3	249	45.8	40.2	100.1	90.3
A	6	118.1	0.07	0.58	48.451	11	111.8	248	45.4	41.1	99.7	91.3
B	1	138.2	0.00	0.58	56.723	12	103.3	249	43.6	41.8	97.1	90.9
B	2	159.3	0.11	0.58	65.48	14	110.9	249	44.1	40.9	96.0	90.8
B	3	180.4	0.11	0.58	74.000	15	112.2	250	43.6	40.5	95.5	90.7
B	4	201.4	0.11	0.58	82.76	16	112.6	249	43.9	40.5	92.9	90.0
B	5	220.5	0.09	0.58	90.612	18	112.2	250	44.4	42.0	87.5	88.9
B	6	239.5	0.08	0.58	98.354	20	111.7	250	44.0	44.8	85.7	87.3

# AUTOMATED BOX STACK TEST DATA SHEET

Client	Met Council	Test Date	2-18-10
Facility	Seneca	Start/Stop Time	804 - 1245
Unit	1	Test Method	EPA OTM 027/028
Location	Stack	Run Number	3
Project #	902630	Description	PM 2.5
Operator	BD	Carbon Trap ID	

## RUN DATA

Tamb	°F	# Ports	2	Meter Box #	AB 1	ID#	232001
Pbar	29.29	In Hg	# Points	12	Nozzle Dia. (in)	0.274	ID# 22
Filter #	m69	Time/Pt	20	Probe ID #		Pitot ID #	
MF #	0.98	Port Order	A → B	del H @	2.020		
Pstack	-0.2	In H2O	Pitot Coef	0.84	Meter Factor	1.000	
Sample Time	1240	min	Test #	1	Data File Name	Unit 1 Run 3 OTM27	

Leak Chk	CFM	Vac	Init	Time	Pitot Leak Check	Run	1	2	3	Average	
Pre	0.012	23	BD	757	Pre	Post	O2			15.7	
Post	0.012	26	BD	1249	OK	OK	CO2			4.9	
≤ 0.02 cfm or 4 % of Sample Rate					Stable @ ≥ 3" 15 sec						

## DATA CORRECTIONS / RECORD

End Vol	Start Vol	Diff	Omit	Description	Impinger	MATERIAL WEIGHT (g)	50ml Rinse	Y	
						End	Start	Diff	ID #
					#1	371.1	362.0		763046
					#2	626.0	621.6		261031
					#3	682.0	684.7		261026
					#4	868.3	843.8		261009
					#5				
					#6				
					#7				
					#8				
					Total				

Sample Point		Time	Delta P	Delta H	Meter Reading	Vacuum	Temperatures (°F)				Meter	
Port	Point	(min)	(in. H <sub>2</sub> O)	(in. H <sub>2</sub> O)	(acf)	(in. Hg)	Stack	Probe	<del>Filter</del>	Imp Out	In	Out
		0			0				AUX			
A	1	19.5	0.09	0.57	7.927	6	106	250	38.4	34.4	96	78
A	2	50.0	0.10	0.57	16.415	7	111	249	32.8	30.1	83.5	76.3
A	3	61.5	0.11	0.57	24.757	8	111	249	33.1	30.3	83.7	76.1
A	4	82.0	0.10	0.57	32.584	8	111	248	34.7	31.5	84.3	76.0
A	5	101.4	0.09	0.57	40.492	10	111.2	249	36.4	32.6	85.5	76.6
A	6	119.7	0.08	0.57	48.051	11	111.1	250	37.7	33.8	85.7	77.3
B	1	140.2	0.10	0.57	56.094	13	106.7	249	32.4	31.9	85.2	77.8
B	2	160.8	0.10	0.57	64.364	15	106.8	249	31.4	31.9	85.1	78.2
B	3	182.3	0.11	0.57	72.930	16	109.7	249	32.8	31.8	84.5	78.6
B	4	203.8	0.11	0.57	81.598	17	111	248	33	33.8	82.8	78.9
B	5	225.3	0.11	0.57	90.020	20	111.7	249	33.1	35.0	80.0	78.5
B	6	244.7	0.09	0.57	97.644	22	112.3	250	33.7	36.5	77.3	77.9

Power Loss 30 min 12.374 Volume

# AUTOMATED BOX STACK TEST DATA SHEET

Client	Met Council	Test Date	2-16-10
Facility	Seneca	Start/Stop Time	855 - 1303
Unit	Multiple Hearth 1 (EU001)	Test Method	EPA 23
Location	Stack	Run Number	1
Project #	902630	Description	Dioxin/Furans/PCB's/PAH's
Operator	BD	Carbon Trap ID	-

## RUN DATA

Tamb	°F	# Ports	2	Meter Box #	AB-3	ID#	
Pbar	29.32	In Hg	# Points	12	Nozzle Dia. (in)	0.3974	ID# 224012
Filter #	Trap #1	Time/Pt	20	Probe ID #		Pitot ID #	
MF #	1.39	Port Order	B→A	del H @		1.889	
Pstack	-0.20	In H2O	Pitot Coef	0.84	Meter Factor	1.011	
Sample Time	240	min	Test #	1	Data File Name	Unit 1 Run 1 m23	

Leak Chk	CFM	20	Vac	Init	Time	Pitot Leak Check	Run	1	2	3	Average
Pre	0.014	BD	BD	BD	847	Pre	O2				15.3
Post	0.018	20	BD	BD	1306	Post	CO2				4.8
≤ 0.02 cfm or 4 % of Sample Rate						Stable @ ≥ 3" 15 sec					

## DATA CORRECTIONS / RECORD

End Vol	Start Vol	Diff	Omit	Description	Impinger	MATERIAL WEIGHT (g)	50ml Rinse	Y	N
						End	Start	Diff	ID #
					#1	377.4	361.3		263051
					#2	694.4	692.2		261011
					#3	684.3	686.3		261096
					#4	612.6	2611.9		261030
					#5	907.2	866.3		261042
					#6				
					#7				
					#8				
					Total				

Post Field Meter Calibration		Set Vacuum = 17"		Collect 5 cf per run				
Delta H	Vm I	Vm F	Tm I	Tm F	ID	Amb	Vacuum	Time

TC Field Calibration	
Ref °F	Probe TC °F
≤ 1.5 % (Absolute Temp)	

## Comments


# AUTOMATED BOX STACK TEST DATA SHEET

Client	<u>Met Council</u>	Test Date	<u>2-16-10</u>
Facility	<u>Seneca</u>	Start/Stop Time	<u>1400-1805</u>
Unit	<u>Multiple Hearth 1 (Euool)</u>	Test Method	<u>EPA 23</u>
Location	<u>Stack</u>	Run Number	<u>2</u>
Project #	<u>902630</u>	Description	<u>Dioxin/Furans/PCB's/PAH's</u>
Operator	<u>BD</u>	Carbon Trap ID	<u>—</u>

## RUN DATA

Tamb	<u>29.32</u>	°F	# Ports	<u>2</u>	Meter Box #	<u>AB-3</u>	ID#	<u>224012</u>
Pbar	<u>29.32</u>	In Hg	# Points	<u>12</u>	Nozzle Dia. (in)	<u>0.374</u>	ID#	<u>224012</u>
Filter #	<u>Trap 2</u>		Time/Pt	<u>20</u>	Probe ID #		Pitot ID #	
MF #	<u>1.39</u>		Port Order	<u>B→A</u>	del H @	<u>1.889</u>		
Pstack	<u>-0.20</u>	In H2O	Pitot Coef	<u>0.84</u>	Meter Factor	<u>1.011</u>		
Sample Time	<u>240</u>	min	Test #	<u>1</u>	Data File Name	<u>Unit 1 Run 2 M23</u>		

Leak Chk	CFM	Vac	Init	Time	Pitot Leak Check	Run	1	2	3	Average
Pre	<u>0.018</u>	<u>20</u>	<u>BD</u>	<u>1345</u>	Pre	O2				<u>15.3</u>
Post	<u>0.014</u>	<u>20</u>	<u>BD</u>	<u>1806</u>	Post	CO2				<u>4.5</u>
≤ 0.02 cfm or 4 % of Sample Rate					Stable @ ≥ 3" 15 sec					

## DATA CORRECTIONS / RECORD

End Vol	Start Vol	Diff	Omit	Description	Impinger	End	Start	Diff	50ml Rinse Y (N)	ID #
					#1	<u>378.5</u>	<u>361.6</u>			
					#2	<u>698.1</u>	<u>697.5</u>			
					#3	<u>685.6</u>	<u>689.2</u>			
					#4	<u>615.9</u>	<u>615.7</u>			
					#5	<u>954.2</u>	<u>909.3</u>			
					#6					
					#7					
					#8					
					Total					

Post Field Meter Calibration Set Vacuum = 17" Collect 5 cf per run

Delta H	Vm I	Vm F	Tm I	Tm F	ID	Amb	Vacuum	Time

TC Field Calibration

Ref °F	Probe TC °F

≤ 1.5 % (Absolute Temp)

## Comments


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Client	Met Council	Test Date	2-10-10
Facility	Seneca	Start/Stop Time	805 - 1240
Unit	Multiple Hearth 1 (EU001)	Test Method	EPA 23
Location	Stack	Run Number	3
Project #	902630	Description	Dioxin/Furans/PCB's/PAH's
Operator	BD	Carbon Trap ID	-

Tamb	°F	# Ports	2	Meter Box #	AB-3	ID#
Pbar	In Hg	# Points	12	Nozzle Dia. (in)	0.374	ID# 224012
Filter #		Time/Pt	20	Probe ID #		Pitot ID #
MF #		Port Order	B→A	del H @	1.889	
Pstack	In H <sub>2</sub> O	Pitot Coef	0.84	Meter Factor	1.011	
Sample Time	240 min	Test #	1	Data File Name	Unit 1 Run 3 M23	

Leak Chk	CFM	Vac	Init	Time	Pitot Leak Check		Run	1	2	3	Average
Pre	0.017	20	BD	749	Pre	Post	O2				15.7
Post	0.013	18	BD	1245	OK	OK	CO2				4.9
< 0.02 cfm or 4 % of Sample Rate					Stable @ ≥ 3" 15 sec						

End Vol	Start Vol	Diff	Omit	Description	Impinger	End	Start	Diff	ID #
					#1	377.5	361.6		263051
					#2	695.2	694.3		261011
					#3	681.4	684.2		261096
					#4	614.9	612.5		261030
					#5	946.6	898.3		261042
					#6				
					#7				
					#8				
					Total				

Delta H	Vm I	Vm F	Tm I	Tm F	ID	Amb	Vacuum	Time
2.05	8	6.147	68.7	69.2	63	59.7	17	8
2.05	8	6.147	69.2	71.2	63	59.9	17	8
2.05	8	6.333	71.2	74.3	63	63.2	17	9

Ref °F	Probe TC °F

 $\leq 1.5\%$  (Absolute Temp)

Power Loss 28min 21.302 Volume

# AUTOMATED BOX STACK TEST DATA SHEET

Client	Met Council	Test Date	2-17-10
Facility	Seneca	Start/Stop Time	1350 - 1456
Unit	1	Test Method	EPA 26
Location	Stack	Run Number	1
Project #	902630	Description	HCl
Operator	BD	Carbon Trap ID	

## RUN DATA

Tamb	29.29	°F	# Ports	1	Meter Box #	AB-3	ID#
Pbar		In Hg	# Points	1	Nozzle Dia. (in)	WA	ID#
Filter #			Time/Pt	60	Probe ID #		Pitot ID #
MF #	1.39		Port Order		del H @	1.889	
Pstack	-0.20	In H2O	Pitot Coef		Meter Factor	1.011	
Sample Time	60	min	Test #	1	Data File Name	Unit 1 Run 1 HCl	

Leak Chk	CFM	Vac	Init	Time	Pitot Leak Check	Run	1	2	3	Average
Pre	0.009	15	BD	1342	Pre	O2				15.3
Post	0.002	10	BD	1457	Post	CO2				5.0

≤ 0.02 cfm or 4 % of Sample Rate      Stable @ ≥ 3" 15 sec

## DATA CORRECTIONS / RECORD

End Vol	Start Vol	Diff	Omit	Description	Impinger	MATERIAL WEIGHT (g)		50ml Rinse	Y	N
						End	Start	Diff	ID #	
					#1	110	100ml			
					#2	100	100ml			
					#3	0	0			
					#4	4.3	0			
					#5					
					#6					
					#7					
					#8					
					Total					

Post Field Meter Calibration      Set Vacuum = 17"      Collect 5 cf per run

Delta H	Vm I	Vm F	Tm I	Tm F	ID	Amb	Vacuum	Time

TC Field Calibration

Ref °F	Probe TC °F

≤ 1.5 % (Absolute Temp)

## Comments

		ΔP		E		ΔP		E	
Flow	A	1	0.09	108.1	B	1	0.10	110.3	
		2	0.10	111.1		2	0.10	110.4	
		3	0.11	111.3		3	0.11	111.5	
		4	0.11	111.4		4	0.11	111.3	
		5	0.09	111.3		5	0.11	111.3	
		6	0.08	111.1		6	0.10	110.1	

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# AUTOMATED BOX STACK TEST DATA SHEET

Client	Met Council	Test Date	2/17/10
Facility	Seneca	Start/Stop Time	1512 - 1612
Unit	1	Test Method	EPA 26
Location	Stack	Run Number	2
Project #	902630	Description	HCl
Operator	BD	Carbon Trap ID	

## RUN DATA

Tamb	°F	# Ports	1	Meter Box #	AB-3	ID#
Pbar	29.29	In Hg	1	Nozzle Dia. (in)	NA	ID#
Filter #		Time/Pt	60	Probe ID #		Pitot ID #
MF #		Port Order		del H @	1.889	
Pstack	-0.20	In H2O		Meter Factor	1.011	
Sample Time	60	min	Test #	1	Data File Name	

Leak Chk	CFM	Vac	Init	Time	Pitot Leak Check	Run	1	2	3	Average
Pre	0	10	BD	1507	Pre	Post	O2			15.7
Post	0.001	11	BD	1614			CO2			5.1

≤ 0.02 cfm or 4 % of Sample Rate      Stable @ ≥ 3" 15 sec

## DATA CORRECTIONS / RECORD

End Vol	Start Vol	Diff	Omit	Description	Impinger	End	Start	Diff	50ml Rinse	Y N
					#1	110	100			
					#2	100	100			
					#3	0	0			
					#4	5.2	0			
					#5					
					#6					
					#7					
					#8					
					Total					

Post Field Meter Calibration      Set Vacuum = 17"      Collect 5 cf per run

Delta H	Vm I	Vm F	Tm I	Tm F	ID	Amb	Vacuum	Time

TC Field Calibration

Ref °F	Probe TC °F

≤ 1.5 % (Absolute Temp)

## Comments

Comments	ΔP	F	ΔP	F
Flow A 1	0.09	111.5	BI	0.09
2	0.10	111.6	2	0.10
3	0.11	112.1	3	0.12
4	0.11	111.6	4	0.12
5	0.11	110.7	5	0.10
6	0.09	106.7	6	0.09



# AUTOMATED BOX STACK TEST DATA SHEET

Client	Met Council	Test Date	2-17-10
Facility	Seneca	Start/Stop Time	1628-1728
Unit	1	Test Method	EPA 26
Location	Stack	Run Number	3
Project #	902630	Description	HCl
Operator		Carbon Trap ID	

## RUN DATA

Tamb	29.29	°F	# Ports	1	Meter Box #	AB-3	ID#
Pbar		In Hg	# Points	1	Nozzle Dia. (in)	1/4	ID#
Filter #			Time/Pt	60	Probe ID #		Pitot ID #
MF #	1.39		Port Order		del H @		1.889
Pstack	-0.20	In H2O	Pitot Coef	-	Meter Factor		1.011
Sample Time	60	min	Test #	1	Data File Name	Unit 1 Run 3 M23	

Leak Chk	CFM	Vac	Init	Time	Pitot Leak Check	Run	1	2	3	Average
Pre	0	12	BD	1629	Pre	O2				15.5
Post	0	12	BD	1731	Post	CO2				5.3

≤ 0.02 cfm or 4 % of Sample Rate      Stable @ ≥ 3" 15 sec

## DATA CORRECTIONS / RECORD

End Vol	Start Vol	Diff	Omit	Description	Impinger	End	Start	Diff	50ml Rinse	Y N
					#1	110	100			
					#2	100	100			
					#3	0.0	0			
					#4	4.4	0			
					#5					
					#6					
					#7					
					#8					
					Total					

Post Field Meter Calibration      Set Vacuum = 17"      Collect 5 cf per run

Delta H	Vm I	Vm F	Tm I	Tm F	ID	Amb	Vacuum	Time
2.05	0	6.147	68.7	69.2	63	59.7	17	8
2.05	0	6.147	69.2	71.2	63	59.9	17	8
2.05	0	6.933	71.2	74.3	63	63.2	17	9

TC Field Calibration

Ref °F	Probe TC °F

≤ 1.5 % (Absolute Temp)

## Comments

Flow	AP	F	AP	F
1	0.09	112	0.09	111.6
2	0.10	112.2	0.11	109.6
3	0.11	113.2	0.12	111.1
4	0.11	113.6	0.12	110.1
5	0.10	112.8	0.10	110.4
6	0.08	108.5	0.08	109.1

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Met Council

Client:	<u>Seneca</u>	Date:	<u>2/15/10</u>	Facility:	<u>Seneca</u>
Job Number:		Unit:		Operator(s):	<u>BD</u>
Location:	<u>stack</u>	Fuel Type:			
Test Number:	<u>1</u>	Stack O <sub>2</sub> (%):			
Barometric Pressure: (in. Hg)		Stack CO <sub>2</sub> (%):			
Stack Pressure(Ps) (in. H <sub>2</sub> O):		Test Description:			
Pitot Tube Coefficient (Cp):	<u>0.84</u>				

[illegible]

$$V_S = 85.48 C_P \frac{1}{(T_S + 460) \Delta P} \frac{(P_S/13.6 + P_{BAR}) M_{fg}}{}$$

$$M_{fg} = 0.440 (\%CO_2) + 0.320 (\%O_2) + 0.280 (100 - \%O_2 - \%CO_2)$$

Stack Information (Metropolitan Council, Seneca, 1, Stack)

feet

inches

Stack Diameter

54

Area

15.9

ft2

Points per Diameter

Diameter

54

inches

Port Depth

inches

Eff Diameter

inches

☒ Circular Stack

☐ Square Stack

Applicable Regulation

☒ 40 CFR Part 75

☐ 40 CFR Part 60

☐ Both

Gas Points

☒ Stratification Failed or Not Conducted

☐ No Stratification

☐ Stratification Unknown

☐ 12 Pt Strat Test Passed <= 5%

☐ 12 Pt Strat Test Passed <= 10%

☐ 6 Pt Strat Test Passed <= 5%

☐ 3 Pt Strat Test Passed <= 5%

NOTE: Select a measurement line that passed through the center of the duct in a direction through the stratification.

Moisture Points

☐ Moisture RATA

☐ Convert Wet to Dry

☒ Flow Only

Particulate and Flow Points

Distance Upstream from Flow Disturbance (A)

912

Inches

Distance Downstream from Flow Disturbance (B)

552

Inches

# of Ports

2

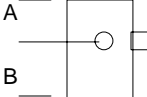
☒ Particulate

☐ PM-10

☐ Flow

A

B



Gas RATA Points

Long Measurement Line

Stratification Points

Point 1

9.02

Inches

Point 2

27

Inches

Point 3

44.98

Inches

Point 1

Inches

Point 2

Inches

Point 3

Inches

Point 4

Inches

Point 5

Inches

Point 6

Inches

Point 7

Inches

Point 8

Inches

Point 9

Inches

Point 10

Inches

Point 11

Inches

Point 12

Inches

Moisture Points

Single Point

Single point allowed for MW determination.

Point 1

40

Inches

Particulate and Flow Points

Number of Points

12

Duct Diameters A

16.8889

Duct Diameters B

10.2222

Point 1

2.38

Inches

Point 2

7.88

Inches

Point 3

15.98

Inches

Point 4

38.02

Inches

Point 5

46.12

Inches

Point 6

51.62

Inches

Point 7

Inches

Point 8

Inches

Point 9

Inches

Point 10

Inches

Point 11

Inches

Point 12

Inches

Clear

Print

Exit

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## **Appendix B**

### **Calculated Field Data Results**

**Met Council  
Seneca  
Unit 1**

Date	2/17/2010		2/17/2010		2/17/2010	
Time	13:50-14:50		15:12-16:12		16:28-17:28	
Analyzer Value	Run 1		Run 2		Run 3	
NOx	84.4		79.7		83.6	
CO	770.1		635.6		791.8	
SO2	7.1		6.2		6.5	
O2	15.4		15.8		15.6	
CO2	5.1		5.2		5.2	
Calibration Err	Pre		Pre		Pre	
NOx Zero	0.9		0.9		0.9	
NOx Mid	50.1		50.1		50.1	
NOx High	102.1		102.1		102.1	
CO Zero	0.0		0.0		0.0	
CO Mid	791.0		791.0		791.0	
CO High	1599.0		1599.0		1599.0	
SO2 Zero	0.0		0.0		0.0	
SO2 Mid	49.2		49.2		49.2	
SO2 High	99.5		99.5		99.5	
O2 Zero	0.0		0.0		0.0	
O2 Mid	10.1		10.1		10.1	
O2 High	21.6		21.6		21.6	
CO2 Zero	0.2		0.2		0.2	
CO2 Mid	9.8		9.8		9.8	
CO2 High	19.2		19.2		19.2	
System Bias	Pre	Post	Pre	Post	Pre	Post
NOx Zero	3.3	3.9	3.9	3.9	3.9	3.8
NOx Span	50.2	50.4	50.4	50.1	50.1	50.3
CO Zero	4.2	4.5	4.5	4.6	4.6	4.7
CO Span	790.2	790.4	790.4	789.5	789.5	788.3
SO2 Zero	0.1	0.4	0.4	0.0	0.0	0.0
SO2 Span	45.1	45.8	45.8	46.3	46.3	47.6
O2 Zero	0.1	0.0	0.0	0.0	0.0	0.0
O2 Span	10.1	10.1	10.1	10.0	10.0	10.0
CO2 Zero	0.3	0.5	0.5	0.3	0.3	0.1
CO2 Span	9.8	9.9	9.9	9.6	9.6	9.6
Run Results	Run 1		Run 2		Run 3	
NOx	86.9		82.2		86.4	
CO	771.9		636.6		795.2	
SO2	7.6		6.6		7.0	
O2	15.3		15.7		15.5	
CO2	5.0		5.1		5.3	
NOx @ 7% O2	214.0		219.6		224.4	
CO @ 7% O2	1900.3		1701.2		2064.6	
SO2 @ 7% O2	18.8		17.7		18.2	
F-Factor			0		0	
Cal Results	Run 1		Run 2		Run 3	
NOx CE Zero	0.9		0.9		0.9	
NOx CE Mid	-0.1		-0.1		-0.1	
NOx CE High	0.5		0.5		0.5	
NOx SB Zero	2.4	3.0	3.0	3.0	3.0	2.8
NOx SB Span	0.1	0.3	0.3	0.0	0.0	0.2
NOx Zero Drift	0.6		0.0		-0.1	
NOx Span Drift	0.2		-0.3		0.2	
CO CE Zero	0.0		0.0		0.0	
CO CE Mid	-0.1		-0.1		-0.1	
CO CE High	-0.1		-0.1		-0.1	
CO SB Zero	0.3	0.3	0.3	0.3	0.3	0.3
CO SB Span	0.0	0.0	0.0	-0.1	-0.1	-0.2
CO Zero Drift	0.0		0.0		0.0	
CO Span Drift	0.0		-0.1		-0.1	
SO2 CE Zero	0.0		0.0		0.0	
SO2 CE Mid	-1.4		-1.4		-1.4	
SO2 CE High	-1.5		-1.5		-1.5	
SO2 SB Zero	0.1	0.4	0.4	0.0	0.0	0.0
SO2 SB Span	-4.0	-3.3	-3.3	-2.9	-2.9	-1.6
SO2 Zero Drift	0.3		-0.4		0.0	
SO2 Span Drift	0.7		0.4		1.3	
O2 CE Zero	0.0		0.0		0.0	
O2 CE Mid	0.3		0.3		0.3	
O2 CE High	1.7		1.7		1.7	
O2 SB Zero	0.5	0.0	0.0	0.1	0.1	0.0
O2 SB Span	0.3	0.1	0.1	-0.1	-0.1	-0.1
O2 Zero Drift	-0.5		0.1		-0.1	
O2 Span Drift	-0.1		-0.3		0.0	
CO2 CE Zero	1.2		1.2		1.2	
CO2 CE Mid	-1.2		-1.2		-1.2	
CO2 CE High	-0.3		-0.3		-0.3	
CO2 SB Zero	0.4	1.4	1.4	0.4	0.4	-0.6
CO2 SB Span	0.3	0.7	0.7	-0.8	-0.8	-0.8
CO2 Zero Drift	1.0		-1.0		-1.0	
CO2 Span Drift	0.4		-1.5		0.0	
Analyzer	Zero	Span	Mid	High	Range	SB
NOx	0.0	50.24	50.24	101.60	101.60	Mid
CO	0.0	792.30	792.30	1600.00	1600.00	Mid
SO2	0.0	50.64	50.64	101.00	101.00	Mid
O2	0.0	10.00	10.00	21.26	21.26	Mid
CO2	0.0	9.98	9.98	19.23	19.23	Mid

# Emission Report

## Met Council

Seneca

Unit: 1

Start Date	End Date	Start	Stop	Test	CO2 %	SO2 ppm	O2 %	CO ppm	NOx ppm
02/17/10	02/17/10	13:50:00	13:50:59	1	5.0	5.4	16.0	525.5	81.4
02/17/10	02/17/10	13:51:01	13:51:59	1	4.8	5.3	16.0	578.5	81.1
02/17/10	02/17/10	13:52:00	13:52:59	1	5.0	5.3	15.7	798.9	79.7
02/17/10	02/17/10	13:53:00	13:53:58	1	5.0	5.8	15.7	827.1	82.6
02/17/10	02/17/10	13:54:00	13:54:59	1	5.1	5.9	15.5	816.7	81.5
02/17/10	02/17/10	13:55:00	13:55:59	1	5.0	5.8	15.7	682.9	84.8
02/17/10	02/17/10	13:56:00	13:56:59	1	5.0	5.8	15.6	737.8	82.5
02/17/10	02/17/10	13:57:00	13:57:59	1	5.0	5.9	15.7	646.9	84.5
02/17/10	02/17/10	13:58:00	13:58:59	1	5.0	5.4	15.7	736.0	81.0
02/17/10	02/17/10	13:59:00	13:59:58	1	5.0	5.6	15.7	660.2	83.7
02/17/10	02/17/10	14:00:00	14:00:59	1	4.9	5.2	15.9	708.2	80.2
02/17/10	02/17/10	14:01:00	14:01:59	1	4.8	4.9	15.8	589.3	82.3
02/17/10	02/17/10	14:02:00	14:02:59	1	4.9	4.9	15.8	719.1	79.3
02/17/10	02/17/10	14:03:00	14:03:58	1	4.9	5.0	15.7	623.1	82.8
02/17/10	02/17/10	14:04:00	14:04:59	1	4.9	4.7	15.8	697.9	80.5
02/17/10	02/17/10	14:05:00	14:05:59	1	4.9	4.8	15.7	639.2	84.0
02/17/10	02/17/10	14:06:00	14:06:59	1	4.8	4.7	15.9	719.5	81.7
02/17/10	02/17/10	14:07:00	14:07:58	1	4.9	4.9	15.7	671.7	83.5
02/17/10	02/17/10	14:08:00	14:08:59	1	4.8	4.9	15.8	754.2	83.2
02/17/10	02/17/10	14:09:00	14:09:59	1	5.1	5.1	15.5	639.7	84.6
02/17/10	02/17/10	14:10:00	14:10:59	1	5.3	6.8	15.1	860.5	83.0
02/17/10	02/17/10	14:11:00	14:11:58	1	5.4	8.5	15.0	933.6	85.8
02/17/10	02/17/10	14:12:00	14:12:59	1	5.6	10.6	14.7	887.5	86.2
02/17/10	02/17/10	14:13:00	14:13:59	1	5.7	11.3	14.7	933.0	88.8
02/17/10	02/17/10	14:14:00	14:14:59	1	5.7	11.8	14.6	809.1	89.4
02/17/10	02/17/10	14:15:00	14:15:59	1	5.6	11.1	14.8	824.8	89.3
02/17/10	02/17/10	14:16:00	14:16:59	1	5.6	10.8	14.7	709.3	88.1
02/17/10	02/17/10	14:17:00	14:17:59	1	5.4	9.7	15.1	713.6	86.1
02/17/10	02/17/10	14:18:00	14:18:59	1	5.2	7.9	15.4	601.8	84.2
02/17/10	02/17/10	14:19:00	14:19:59	1	5.1	7.2	15.5	669.3	80.0
02/17/10	02/17/10	14:20:00	14:20:59	1	5.0	6.5	15.6	624.6	80.5

Start Date	End Date	Start	Stop	Test	CO2 %	SO2 ppm	O2 %	CO ppm	NOx ppm
02/17/10	02/17/10	14:21:00	14:21:59	1	4.9	6.1	15.7	686.3	80.3
02/17/10	02/17/10	14:22:00	14:22:59	1	5.1	5.6	15.4	588.4	81.9
02/17/10	02/17/10	14:23:00	14:23:59	1	4.9	5.4	15.8	668.5	81.9
02/17/10	02/17/10	14:24:00	14:24:59	1	5.0	5.3	15.6	585.6	82.4
02/17/10	02/17/10	14:25:00	14:25:59	1	4.8	5.2	15.8	744.2	82.7
02/17/10	02/17/10	14:26:00	14:26:59	1	5.1	5.7	15.4	719.0	80.5
02/17/10	02/17/10	14:27:00	14:27:58	1	5.0	6.0	15.6	743.7	82.9
02/17/10	02/17/10	14:28:00	14:28:59	1	5.0	6.4	15.6	678.1	82.5
02/17/10	02/17/10	14:29:00	14:29:59	1	5.0	6.0	15.6	773.5	82.8
02/17/10	02/17/10	14:30:00	14:30:59	1	5.1	6.1	15.5	842.9	82.2
02/17/10	02/17/10	14:31:00	14:31:59	1	5.0	6.1	15.5	913.7	83.9
02/17/10	02/17/10	14:32:00	14:32:59	1	5.1	6.4	15.3	853.9	84.2
02/17/10	02/17/10	14:33:00	14:33:59	1	5.0	6.3	15.5	989.6	86.3
02/17/10	02/17/10	14:34:00	14:34:59	1	5.0	6.5	15.3	881.5	84.5
02/17/10	02/17/10	14:35:00	14:35:59	1	4.8	6.8	15.5	947.4	87.1
02/17/10	02/17/10	14:36:00	14:36:59	1	5.0	7.3	15.2	1,098.4	84.4
02/17/10	02/17/10	14:37:00	14:37:59	1	5.0	7.9	15.2	1,023.1	91.3
02/17/10	02/17/10	14:38:00	14:38:59	1	5.0	7.8	15.2	950.3	88.8
02/17/10	02/17/10	14:39:00	14:39:59	1	5.1	8.1	15.2	815.0	89.6
02/17/10	02/17/10	14:40:01	14:40:59	1	5.0	8.1	15.3	830.8	86.2
02/17/10	02/17/10	14:41:00	14:41:59	1	5.0	8.0	15.2	794.9	87.3
02/17/10	02/17/10	14:42:00	14:42:59	1	5.0	7.9	15.3	838.2	84.4
02/17/10	02/17/10	14:43:00	14:43:59	1	5.1	8.9	15.1	814.3	85.6
02/17/10	02/17/10	14:44:00	14:44:59	1	5.1	9.5	15.0	878.6	85.8
02/17/10	02/17/10	14:45:00	14:45:59	1	5.2	10.4	14.9	830.5	88.0
02/17/10	02/17/10	14:46:00	14:46:59	1	5.2	10.7	14.9	906.5	87.3
02/17/10	02/17/10	14:47:00	14:47:59	1	5.3	11.9	14.8	823.5	91.0
02/17/10	02/17/10	14:48:00	14:48:59	1	5.3	12.0	14.8	880.8	89.2
02/17/10	02/17/10	14:49:01	14:49:58	1	5.3	12.0	14.7	766.0	91.8
Average					5.1	7.1	15.4	770.1	84.4
Minimum Value					4.8	4.7	14.6	525.5	79.3
Maximum Value					5.7	12.0	16.0	1,098.4	91.8

# Emission Report

## Met Council

Seneca

Unit: 1

Start Date	End Date	Start	Stop	Test	CO2 %	SO2 ppm	O2 %	CO ppm	NOx ppm
02/17/10	02/17/10	15:12:01	15:12:59	2	5.8	8.2	15.1	783.3	79.3
02/17/10	02/17/10	15:13:00	15:13:59	2	5.8	8.9	15.2	797.6	83.3
02/17/10	02/17/10	15:14:00	15:14:59	2	5.4	8.0	15.8	613.1	83.7
02/17/10	02/17/10	15:15:00	15:15:59	2	5.4	6.1	16.0	520.9	79.5
02/17/10	02/17/10	15:16:00	15:16:59	2	5.2	5.2	16.2	533.3	79.5
02/17/10	02/17/10	15:17:00	15:17:59	2	5.2	4.8	16.1	505.2	78.0
02/17/10	02/17/10	15:18:00	15:18:59	2	5.2	4.7	16.1	637.4	75.8
02/17/10	02/17/10	15:19:00	15:19:58	2	5.4	5.5	15.8	742.9	75.7
02/17/10	02/17/10	15:20:00	15:20:59	2	5.4	5.8	15.8	604.3	78.3
02/17/10	02/17/10	15:21:00	15:21:59	2	5.5	6.8	15.8	662.7	78.1
02/17/10	02/17/10	15:22:00	15:22:59	2	5.5	6.8	15.8	707.7	77.9
02/17/10	02/17/10	15:23:00	15:23:58	2	5.5	7.2	15.7	636.3	80.5
02/17/10	02/17/10	15:24:00	15:24:59	2	5.5	7.2	15.8	698.3	78.5
02/17/10	02/17/10	15:25:00	15:25:59	2	5.6	7.3	15.7	601.4	79.8
02/17/10	02/17/10	15:26:01	15:26:59	2	5.5	6.8	15.9	668.8	78.4
02/17/10	02/17/10	15:27:00	15:27:59	2	5.5	6.4	15.9	579.9	79.9
02/17/10	02/17/10	15:28:00	15:28:58	2	5.4	5.6	15.9	546.9	78.1
02/17/10	02/17/10	15:29:00	15:29:59	2	5.4	5.4	16.0	557.5	78.5
02/17/10	02/17/10	15:30:00	15:30:59	2	5.5	5.9	15.8	560.7	77.3
02/17/10	02/17/10	15:31:00	15:31:59	2	5.4	5.7	16.0	584.9	78.9
02/17/10	02/17/10	15:32:00	15:32:59	2	5.5	5.8	15.8	526.4	78.0
02/17/10	02/17/10	15:33:00	15:33:59	2	5.5	6.3	15.9	647.2	78.0
02/17/10	02/17/10	15:34:00	15:34:59	2	5.3	6.5	15.8	563.2	77.9
02/17/10	02/17/10	15:35:00	15:35:59	2	5.0	6.2	16.0	606.3	78.3
02/17/10	02/17/10	15:36:00	15:36:59	2	5.1	6.3	15.9	586.9	77.6
02/17/10	02/17/10	15:37:00	15:37:59	2	5.0	5.8	16.0	565.6	78.8
02/17/10	02/17/10	15:38:00	15:38:59	2	5.0	5.4	16.1	576.8	77.3
02/17/10	02/17/10	15:39:00	15:39:59	2	5.0	5.2	16.0	507.7	78.6
02/17/10	02/17/10	15:40:00	15:40:59	2	4.9	5.2	16.1	600.5	77.9
02/17/10	02/17/10	15:41:00	15:41:59	2	5.0	5.2	16.0	552.3	78.3
02/17/10	02/17/10	15:42:00	15:42:59	2	5.0	5.6	15.9	587.3	78.8



Start Date	End Date	Start	Stop	Test	CO2 %	SO2 ppm	O2 %	CO ppm	NOx ppm
02/17/10	02/17/10	15:43:00	15:43:59	2	5.0	5.3	16.0	576.8	77.3
02/17/10	02/17/10	15:44:00	15:44:59	2	4.9	5.2	16.0	548.8	78.4
02/17/10	02/17/10	15:45:00	15:45:59	2	4.9	4.9	16.1	567.7	78.7
02/17/10	02/17/10	15:46:00	15:46:59	2	5.1	5.8	15.6	563.3	79.6
02/17/10	02/17/10	15:47:00	15:47:59	2	5.2	6.4	15.7	773.1	79.6
02/17/10	02/17/10	15:48:00	15:48:59	2	5.3	7.2	15.4	695.0	82.9
02/17/10	02/17/10	15:49:00	15:49:59	2	5.2	6.9	15.7	878.3	83.0
02/17/10	02/17/10	15:50:00	15:50:59	2	5.2	7.1	15.6	610.8	81.8
02/17/10	02/17/10	15:51:00	15:51:59	2	5.1	6.5	15.9	604.8	80.8
02/17/10	02/17/10	15:52:00	15:52:59	2	5.1	6.3	15.8	527.7	79.6
02/17/10	02/17/10	15:53:00	15:53:59	2	5.1	6.2	15.8	825.5	78.7
02/17/10	02/17/10	15:54:01	15:54:59	2	5.1	6.7	15.7	763.1	79.4
02/17/10	02/17/10	15:55:00	15:55:59	2	5.2	6.6	15.6	763.5	80.0
02/17/10	02/17/10	15:56:00	15:56:59	2	5.1	6.4	15.9	601.0	81.8
02/17/10	02/17/10	15:57:00	15:57:59	2	5.0	6.0	15.8	580.9	79.5
02/17/10	02/17/10	15:58:00	15:58:59	2	5.0	5.4	16.1	625.9	80.8
02/17/10	02/17/10	15:59:00	15:59:59	2	5.0	5.5	15.8	582.2	80.4
02/17/10	02/17/10	16:00:00	16:00:59	2	4.9	4.9	16.2	650.1	79.1
02/17/10	02/17/10	16:01:00	16:01:59	2	5.0	5.1	15.8	589.9	81.4
02/17/10	02/17/10	16:02:00	16:02:59	2	5.0	5.2	15.9	716.9	80.1
02/17/10	02/17/10	16:03:00	16:03:59	2	5.0	5.7	15.7	600.4	82.2
02/17/10	02/17/10	16:04:00	16:04:59	2	5.1	5.2	15.9	646.0	80.6
02/17/10	02/17/10	16:05:00	16:05:59	2	5.1	6.2	15.6	572.2	81.2
02/17/10	02/17/10	16:06:00	16:06:59	2	5.1	5.9	15.7	694.1	79.9
02/17/10	02/17/10	16:07:00	16:07:59	2	5.0	6.1	15.8	588.5	82.1
02/17/10	02/17/10	16:08:00	16:08:59	2	5.2	5.8	15.7	745.0	81.4
02/17/10	02/17/10	16:09:00	16:09:59	2	5.4	8.0	15.2	811.7	83.4
02/17/10	02/17/10	16:10:00	16:10:59	2	5.3	8.3	15.5	881.8	86.0
02/17/10	02/17/10	16:11:00	16:11:59	2	5.2	7.7	15.6	694.0	84.7
Average					5.2	6.2	15.8	635.7	79.7
Minimum Value					4.9	4.7	15.1	505.2	75.7
Maximum Value					5.8	8.9	16.2	881.8	86.0

# Emission Report

## Met Council

Seneca

Unit: 1

Start Date	End Date	Start	Stop	Test	CO2 %	SO2 ppm	O2 %	CO ppm	NOx ppm
02/17/10	02/17/10	16:28:00	16:28:59	3	4.7	5.6	16.1	537.1	76.9
02/17/10	02/17/10	16:29:00	16:29:59	3	4.8	5.0	16.2	538.3	75.4
02/17/10	02/17/10	16:30:00	16:30:59	3	4.8	5.0	16.1	554.8	77.6
02/17/10	02/17/10	16:31:00	16:31:59	3	4.8	4.7	16.1	617.8	77.6
02/17/10	02/17/10	16:32:00	16:32:59	3	5.1	5.0	15.7	659.6	78.4
02/17/10	02/17/10	16:33:00	16:33:59	3	5.3	6.0	15.5	785.6	80.2
02/17/10	02/17/10	16:34:00	16:34:59	3	5.4	7.6	15.2	661.1	83.3
02/17/10	02/17/10	16:35:01	16:35:59	3	5.4	8.1	15.3	949.3	84.1
02/17/10	02/17/10	16:36:00	16:36:59	3	5.4	8.7	15.1	1,008.9	86.8
02/17/10	02/17/10	16:37:00	16:37:59	3	5.0	6.9	15.9	988.6	87.8
02/17/10	02/17/10	16:38:00	16:38:59	3	5.0	5.9	15.8	624.7	84.1
02/17/10	02/17/10	16:39:00	16:39:59	3	5.2	5.4	15.9	848.3	78.9
02/17/10	02/17/10	16:40:00	16:40:59	3	5.3	7.1	15.4	771.2	82.0
02/17/10	02/17/10	16:41:00	16:41:59	3	5.3	7.5	15.5	767.7	85.1
02/17/10	02/17/10	16:42:00	16:42:59	3	5.1	6.8	15.9	678.8	83.0
02/17/10	02/17/10	16:43:00	16:43:59	3	5.0	5.7	15.9	582.4	81.4
02/17/10	02/17/10	16:44:00	16:44:59	3	4.8	4.9	16.3	653.0	80.0
02/17/10	02/17/10	16:45:00	16:45:59	3	4.9	4.6	16.0	541.2	79.9
02/17/10	02/17/10	16:46:00	16:46:59	3	4.9	4.2	16.2	631.3	79.5
02/17/10	02/17/10	16:47:00	16:47:59	3	5.3	5.1	15.5	641.8	81.8
02/17/10	02/17/10	16:48:00	16:48:59	3	5.5	6.8	15.3	916.8	83.1
02/17/10	02/17/10	16:49:00	16:49:59	3	5.7	9.1	14.9	889.4	88.5
02/17/10	02/17/10	16:50:00	16:50:59	3	5.4	9.2	15.3	923.9	88.7
02/17/10	02/17/10	16:51:00	16:51:59	3	5.1	7.1	16.0	712.1	86.6
02/17/10	02/17/10	16:52:00	16:52:59	3	5.0	5.1	16.0	529.1	82.6
02/17/10	02/17/10	16:53:00	16:53:58	3	4.8	4.3	16.3	615.5	80.9
02/17/10	02/17/10	16:54:00	16:54:59	3	5.2	4.8	15.7	659.5	81.8
02/17/10	02/17/10	16:55:00	16:55:59	3	5.4	6.8	15.3	852.8	84.5
02/17/10	02/17/10	16:56:00	16:56:59	3	5.6	8.4	15.2	1,000.2	86.3
02/17/10	02/17/10	16:57:00	16:57:59	3	5.7	9.8	14.9	917.4	89.7
02/17/10	02/17/10	16:58:00	16:58:58	3	5.3	8.7	15.4	838.1	89.9

Start Date	End Date	Start	Stop	Test	CO2 %	SO2 ppm	O2 %	CO ppm	NOx ppm
02/17/10	02/17/10	16:59:00	16:59:59	3	5.1	6.4	16.1	636.1	83.4
02/17/10	02/17/10	17:00:00	17:00:59	3	5.0	5.3	15.9	576.6	81.6
02/17/10	02/17/10	17:01:00	17:01:59	3	5.0	5.1	16.1	643.0	80.3
02/17/10	02/17/10	17:02:00	17:02:59	3	5.1	5.4	15.8	578.2	80.7
02/17/10	02/17/10	17:03:00	17:03:59	3	5.2	5.4	15.9	721.5	78.8
02/17/10	02/17/10	17:04:00	17:04:59	3	5.3	6.1	15.5	695.7	83.8
02/17/10	02/17/10	17:05:00	17:05:59	3	5.4	7.0	15.4	909.5	82.7
02/17/10	02/17/10	17:06:00	17:06:59	3	5.5	7.8	15.2	848.8	88.2
02/17/10	02/17/10	17:07:00	17:07:59	3	5.4	8.2	15.4	970.4	86.8
02/17/10	02/17/10	17:08:00	17:08:59	3	5.0	6.8	15.9	806.2	86.8
02/17/10	02/17/10	17:09:00	17:09:59	3	5.0	4.8	16.0	606.2	81.9
02/17/10	02/17/10	17:10:00	17:10:59	3	5.3	5.3	15.5	784.3	83.2
02/17/10	02/17/10	17:11:00	17:11:59	3	5.5	7.1	15.2	885.4	84.9
02/17/10	02/17/10	17:12:00	17:12:59	3	5.7	8.9	14.9	1,011.8	89.9
02/17/10	02/17/10	17:13:00	17:13:59	3	5.8	10.3	14.8	1,232.4	89.4
02/17/10	02/17/10	17:14:00	17:14:59	3	5.5	9.9	15.2	1,254.9	96.2
02/17/10	02/17/10	17:15:00	17:15:59	3	5.2	7.9	15.8	893.9	91.6
02/17/10	02/17/10	17:16:00	17:16:59	3	5.1	5.7	16.0	858.4	82.8
02/17/10	02/17/10	17:17:00	17:17:59	3	5.1	5.8	15.8	757.6	82.9
02/17/10	02/17/10	17:18:01	17:18:59	3	5.1	5.2	16.1	851.7	80.4
02/17/10	02/17/10	17:19:00	17:19:59	3	5.1	5.4	15.8	718.6	80.9
02/17/10	02/17/10	17:20:00	17:20:59	3	5.0	4.9	16.1	920.4	78.8
02/17/10	02/17/10	17:21:00	17:21:59	3	5.1	5.4	15.6	807.7	83.8
02/17/10	02/17/10	17:22:00	17:22:59	3	5.1	4.8	16.0	910.0	79.5
02/17/10	02/17/10	17:23:00	17:23:59	3	5.1	5.2	15.7	647.5	82.5
02/17/10	02/17/10	17:24:00	17:24:59	3	5.1	5.1	15.9	710.9	79.8
02/17/10	02/17/10	17:25:00	17:25:59	3	5.4	6.2	15.3	933.7	85.5
02/17/10	02/17/10	17:26:00	17:26:59	3	5.5	8.2	15.2	1,138.2	89.0
02/17/10	02/17/10	17:27:00	17:27:59	3	5.7	9.8	14.9	1,313.0	96.5
Average					5.2	6.5	15.6	792.0	83.7
Minimum Value					4.7	4.2	14.8	529.1	75.4
Maximum Value					5.8	10.3	16.3	1,313.0	96.5



## AUTOMATED BOX STACK TEST DATA SHEET

Client	Met Council	Test Date	2-16-10
Facility	Seneca	Start/Stop Time	8:55-13:03
Unit	Unit 1	Test Method	EPA 23
Location	Stack	Run Number	1
Project #	902630	Description	Dioxin/Furan
Operator	BD	Carbon Trap ID	

### RUN DATA

Tamb	28	°F	# Ports	2	Meter Box #	AB 3	ID#	2320003
Pbar	29.32	In Hg	# Points	12	Nozzle Dia. (in)	0.374	ID#	224012
Filter #	Trap #1		Time/Pt	20	Probe ID #	221018	Pitot ID #	222024
MF #	1.39		Port Order	B-A	del H @	1.889		
Pstack	-0.2	In H2O	Pitot Coef	0.84	Meter Factor	1.011		
Sample Time	240	min	Test #	1	Data File Name	Unit 1 Run 1 M23		

Leak Chk	CFM	Vac	Init	Time	Pitot Leak Check	Run	1	2	3	Average
Pre	0.014	20	BD	8:47	Pre	O2	15.30	15.30	15.30	15.30
Post	0.018	20	BD	13:06	ok	CO2	4.80	4.80	4.80	4.80

≤ 0.02 cfm or 4 % of Sample Rate      Stable @ ≥ 3" 15 sec

### DATA CORRECTIONS / RECORD

End Vol	Start Vol	Diff	Omit	Description	Impinger	MATERIAL WEIGHT (g)	50ml Rinse	Y	N
						End	Start	Diff	ID #
					#1	377.4	361.3		263051
					#2	694.4	692.2		261011
					#3	684.3	686.3		261096
					#4	612.6	611.9		261030
					#5	907.2	866.3		261042
					#6				
					#7				
					#8	0.0	0.0		
					Total	3275.9	3218.0	57.9	

Post Field Meter Calibration			Set Vacuum = 17"			Collect 5 cf per run		
Delta H	Vm I	Vm F	Tm I	Tm F	ID	Amb	Vacuum	Time
Enter on Run 3 Sheet								

TC Field Calibration	
Ref °F	Probe TC °F

≤ 1.5 % (Absolute Temp)

### Comments


Point	Time	Delta P	Delta H	Meter Vol	Vac	Stack	Probe	Filter	Dryer	Meter In	Meter Out	
	240	0.10	2.06	185.252		11.6	109.1	247.8	250.9	51.2	86.5	76.2
1	1	0.1	2.67	0.909		9.8	109.7	248.3	254.3	40.6	84.4	82.1
1	2	0.09	1.97	1.663		7.8	108.7	248.4	247.9	40.8	88.5	83
1	3	0.1	1.87	2.397		7.4	108.4	248.1	254.3	40.3	91.3	83.2
1	4	0.09	1.88	3.137		7.4	109	248.2	249.7	39.4	93.8	83.5
1	5	0.1	1.88	3.878		7.4	109.4	248.4	252.4	40	95.7	83.8
1	6	0.09	1.92	4.626		7.5	108.6	248.2	248.9	41	97.2	84
1	7	0.1	2.07	5.429		8	108.4	248.4	250.5	41.9	98.6	84.2
1	8	0.09	2.01	6.166		7.8	108.7	247.8	251.4	42.7	99.6	84.5
1	9	0.09	1.93	6.917		7.6	109.3	248.1	249.7	43.1	100.2	84.7
1	10	0.09	1.92	7.664		7.5	109.4	248.1	252.7	43.4	100.8	85
1	11	0.1	1.95	8.419		7.7	108.9	247.6	248.8	43.6	101.4	85.3
1	12	0.09	1.93	9.168		7.5	108.5	248.6	253	43.7	101.8	85.5
1	13	0.09	1.9	9.912		7.5	108.2	248.1	249.8	43.7	102.1	85.8
1	14	0.1	1.97	10.671		7.7	109	248.4	249.6	43.8	102.5	86.1
1	15	0.1	1.93	11.423		7.6	108.8	247.6	251.9	43.2	102.4	85.9
1	16	0.1	1.99	12.189		7.9	109.4	247.3	249.8	43.5	102.7	86.5
1	17	0.1	2.02	12.959		7.9	108.6	247.8	251.4	43.7	102.7	86.7
1	18	0.09	1.99	13.72		7.9	108.4	248.6	251.1	43.9	102.8	86.8
1	19	0.09	1.98	14.483		7.8	109	248.9	249.7	44	102.9	87
2	20	0.1	1.96	15.242		7.8	109.6	248.2	252	44.1	102.9	87.1
2	21	0.11	2.19	16.047		8.4	110.4	246	249.7	44.2	103.2	87.3
2	22	0.11	2.32	16.904		9	110.1	248.2	250.3	44.6	103.4	87.5
2	23	0.11	2.32	17.705		9	109.9	249.1	251.6	44.8	103.5	87.7
2	24	0.11	2.21	18.516		8.8	110.2	246.9	249.3	44.8	103.6	87.9
2	25	0.11	2.25	19.332		8.8	110.6	248.4	254.1	44.7	103.6	88
2	26	0.11	2.24	20.149		8.8	110.8	248.6	249.3	44.8	103.6	88.2
2	27	0.11	2.23	20.959		8.9	110.2	247.9	252.2	45	103.7	88.3
2	28	0.12	2.22	21.794		8.7	110.5	246.4	251.1	45.2	103.8	88.5
2	29	0.11	2.34	22.603		9.3	111.1	248	251.8	45.4	104	88.7
2	30	0.11	2.3	23.429		9.2	111	249.7	250.6	45.5	104	88.8
2	31	0.11	2.28	24.261		9.2	111.1	247.3	251.3	45.7	104.1	89
2	32	0.11	2.21	25.065		8.9	110.5	246.6	251.9	45.7	104.2	89.1
2	33	0.11	2.32	25.896		9.3	111.3	248.1	249.5	45.9	104.2	89.2
2	34	0.11	2.21	26.709		9	110.6	248.8	253.1	46.1	104.2	89.4
2	35	0.11	2.13	27.505		9.1	110.7	246.9	249.2	46	104.1	89.4
2	36	0.11	2.12	28.3		9.7	111.2	248.1	253.3	46.1	104.1	89.5
2	37	0.11	2.23	29.121		10.3	110.9	248.3	249.7	46.4	104.1	89.6
2	38	0.11	2.18	29.92		10.1	110.8	248.6	251.5	46.6	104	89.7
2	39	0.11	2.16	30.721		10	110.9	245.8	250.5	46.7	104	89.8
3	40	0.11	2.15	31.521		10	111	247.8	251	46.9	104	89.9
3	41	0.11	2.2	32.331		10.2	111	249.6	251.6	47.1	104	90
3	42	0.11	2.22	33.144		10.4	110.9	247.4	249.3	47.3	104.1	90.1
3	43	0.11	2.23	33.962		10.4	110.9	248.2	252.6	47.4	104.2	90.2
3	44	0.11	2.2	34.771		10.3	110.9	247.8	248.7	47.7	104.2	90.3
3	45	0.11	2.23	35.589		10.4	111.6	248.8	253.5	48	104.2	90.3
3	46	0.1	2.12	36.383		10.2	112	247.1	249.2	48.3	104.2	90.4
3	47	0.1	2.1	37.174		10	111.3	247.7	253	48.6	104.1	90.5
3	48	0.11	2.11	37.966		10	111.1	248.4	249.8	48.8	104.1	90.6
3	49	0.11	2.14	38.764		10.2	111.1	248.6	252.2	49.1	104.1	90.5
3	50	0.1	2.16	39.566		10.3	111	247.2	250.3	49.4	104.2	90.7
3	51	0.11	2.17	40.371		10.4	111.1	247.4	250.1	49.5	104.3	90.8
3	52	0.11	2.19	41.18		10.5	111.2	249.3	251.8	49.8	104.3	90.8
3	53	0.11	2.21	42.02		10.6	110.7	247.4	249.2	49.4	103.8	90.4
3	54	0.11	2.18	42.803		10.6	110.9	248.1	252.6	49.8	102.9	90.1
3	55	0.11	2.24	43.676		10.9	110.2	248	248.6	50.1	101.9	89.9
3	56	0.11	2.3	44.451		11	110.2	248.8	252.5	50.5	101.3	89.7
3	57	0.11	2.3	45.281		11.2	110.5	245.9	249.1	50.8	100.5	89.4
3	58	0.11	2.25	46.101		11	110.3	248.9	252.8	51	99.8	89
3	59	0.11	2.29	46.928		11.1	109.9	248	249.8	51.2	99.1	88.7
4	60	0.12	2.33	47.762		11.3	110.1	247.7	250.5	51.5	98.3	88.1
4	61	0.11	2.3	48.59		11.3	110.2	249.6	251.8	52	97.7	87.8

4	62	0.1	2.07	49.372	10.3	110.1	247.6	249.7	52.2	96.9	87.3
4	63	0.1	2.12	50.162	10.5	110.2	248.1	253.6	52.7	96.3	86.9
4	64	0.1	2.12	50.955	10.5	110.3	248.6	248.6	53	95.7	86.5
4	65	0.1	2.1	51.745	10.5	110	247.3	252.7	53.3	95.2	86.1
4	66	0.1	2.13	52.539	10.6	110	247.1	249.3	53.5	94.8	85.6
4	67	0.1	2.11	53.328	10.6	109.5	249	252.9	53.7	94.4	85.2
4	68	0.11	2.16	54.128	10.8	110.3	248.6	248.7	53.9	93.9	84.8
4	69	0.1	2.12	54.918	10.6	110.1	247.3	254.1	54.3	93.4	84.4
4	70	0.1	2.07	55.702	10.5	110.2	247.1	249.4	54.4	92.8	83.9
4	71	0.1	2.08	56.484	10.5	109.6	249.2	252.9	54.6	92.4	83.4
4	72	0.1	2.07	57.264	10.5	110	247.6	248.6	55	92	83.1
4	73	0.1	2.09	58.048	10.6	110.2	247.8	253.2	55.1	91.6	82.6
4	74	0.1	2.09	58.83	10.6	110.3	248.1	249.3	55.2	91.3	82.3
4	75	0.11	2.12	59.62	10.8	110.4	248.9	252.5	55.5	90.8	81.9
4	76	0.1	2.1	60.407	10.8	110.1	247.5	250	55.8	90.4	81.5
4	77	0.1	2.08	61.185	10.6	109.4	247.8	250.8	55.9	90.1	81.2
4	78	0.11	2.11	61.972	10.9	109.7	248.4	251.3	56.1	89.8	80.7
4	79	0.1	2.08	62.751	10.7	109.9	248.7	249.5	56.4	89.3	80.2
5	80	0.11	2.1	63.537	10.8	110.4	248.7	250.9	56.8	88.8	79.9
5	81	0.11	2.13	64.325	11	109.9	246.2	250.9	57	88.5	79.6
5	82	0.11	2.13	65.115	11	109.8	247.9	251	57.2	88.1	79.2
5	83	0.13	2.32	65.938	11.8	109	249.1	250.6	57.4	87.7	78.8
5	84	0.11	2.29	66.759	11.9	109.1	248.3	250.4	57.7	87.4	78.5
5	85	0.11	2.25	67.567	11.6	109.7	246.4	253.5	57.5	86.9	78.1
5	86	0.11	2.3	68.388	11.8	110.2	247.7	249.5	57.3	86.6	77.8
5	87	0.12	2.3	69.209	11.9	109.5	248.8	252.4	57.4	86.3	77.6
5	88	0.11	2.33	70.031	12.1	109.7	247.4	249.1	57.5	86	77.3
5	89	0.11	2.21	70.832	11.5	109.4	248	253	57.4	85.5	77
5	90	0.11	2.24	71.641	11.7	109.7	249.5	250.5	57.4	85.3	76.7
5	91	0.11	2.23	72.448	11.7	109.7	248.6	251.1	57.2	85	76.4
5	92	0.12	2.31	73.266	12	109.6	246.6	250.9	57.1	84.7	76.1
5	93	0.11	2.28	74.08	12	109.5	247.8	250.3	56.9	84.4	75.8
5	94	0.11	2.31	74.901	12.1	109.5	249.6	251.9	56.6	84.1	75.5
5	95	0.11	2.27	75.712	12.1	109.4	248.5	249.7	56.4	83.9	75.3
5	96	0.12	2.3	76.532	12.1	109.4	247.7	252.6	56.2	83.7	75.1
5	97	0.12	2.44	77.374	12.9	109.5	246.8	249	56.1	83.6	74.9
5	98	0.11	2.31	78.191	12.4	109.4	248.2	253	56	83.1	74.6
5	99	0.12	2.3	79.008	12.3	109.3	248.4	249.1	55.9	82.9	74.4
6	100	0.12	2.3	79.825	12.3	109.5	248.9	254.6	55.9	82.7	74.2
6	101	0.11	2.36	80.652	12.7	109.3	248.1	248.8	55.9	82.6	74
6	102	0.09	2.01	81.412	11.2	108.3	248	253.3	55.9	82.2	73.8
6	103	0.1	1.91	82.15	10.5	108.1	246.9	248.8	55.9	82.2	73.6
6	104	0.1	1.9	82.889	10.5	108.2	248.7	253.1	55.7	82.3	73.4
6	105	0.1	1.91	83.628	10.6	108.3	248.9	248.9	55.7	82.5	73.2
6	106	0.1	1.95	84.376	10.8	108.3	248.6	252.7	55.7	82.7	73
6	107	0.09	1.94	85.123	10.9	108.2	247.2	249.4	55.7	82.7	72.9
6	108	0.1	1.91	85.862	10.7	108.3	248.3	252.7	55.5	82.7	72.7
6	109	0.1	1.96	86.613	10.9	108.3	247.1	249.3	55.4	82.7	72.6
6	110	0.1	1.93	87.358	10.9	108.5	248.7	251.5	55.6	82.8	72.5
6	111	0.1	1.94	88.105	10.9	108.2	249	250.6	55.6	82.7	72.3
6	112	0.1	1.93	88.847	10.9	108.3	248	250.8	55.7	82.7	72.3
6	113	0.1	1.91	89.589	10.8	108.4	246.8	250.8	55.7	82.7	72.2
6	114	0.1	1.89	90.327	10.8	108.5	247.4	248.6	55.7	82.6	72.1
6	115	0.1	1.96	91.076	11	108.3	248.9	252.5	55.8	82.6	71.9
6	116	0.1	1.95	91.821	11.1	108.2	248.6	249.1	56	82.6	71.8
6	117	0.1	1.96	92.572	11.1	108.3	247.6	252.2	56.1	82.6	71.8
6	118	0.1	1.94	93.318	11.1	108.1	247	250.7	56.2	82.5	71.6
6	119	0.1	1.91	94.058	10.9	108.3	248.1	250.5	56.4	82.4	71.6
1	120	0.1	1.9	94.787	11	108.4	249.4	252.2	56.5	82.4	71.5
1	121	0.07	1.96	95.535	9.7	96.3	246.2	248.7	53.8	72.9	70
1	122	0.08	1.54	96.192	9.3	99.4	249.4	252.2	54.5	75.3	69.7
1	123	0.08	1.54	96.847	9.4	100.7	247.5	249.4	54.7	77	69.6
1	124	0.07	1.5	97.495	9.1	101.5	247.6	252.3	54.7	78.1	69.6

1	125	0.08	1.53	98.148	9.3	101.7	247.6	249	54.8	79.1	69.5
1	126	0.07	1.47	98.792	9.1	102.1	249.1	252.7	54.9	79.8	69.5
1	127	0.07	1.47	99.434	9.1	102.1	247.2	249.2	55.1	80.2	69.5
1	128	0.07	1.5	100.085	9.2	102.5	246.8	253.2	55.5	80.7	69.5
1	129	0.08	1.52	100.741	9.3	102	248.4	248.8	55.9	81.1	69.5
1	130	0.08	1.52	101.374	9.4	101.8	248.4	251.8	56.3	81.3	69.5
1	131	0.08	1.51	102.028	9.4	101.9	246	250.3	56.8	81.5	69.5
1	132	0.08	1.53	102.685	9.5	102.4	248	250.5	57.2	81.7	69.6
1	133	0.07	1.48	103.331	9.2	102.6	249	251.7	57.6	81.8	69.6
1	134	0.08	1.5	103.98	9.3	102.4	245.9	249	58	81.8	69.6
1	135	0.08	1.51	104.634	9.4	101.9	248.8	254.1	58.4	81.9	69.6
1	136	0.08	1.54	105.293	9.5	101.9	248.6	248.3	58.7	82	69.7
1	137	0.08	1.51	105.944	9.5	101.6	246.5	253.2	59	82.1	69.7
1	138	0.08	1.52	106.599	9.5	101.8	247.6	249.3	59.5	82.2	69.7
1	139	0.07	1.48	107.241	9.3	101.8	248.2	252.9	59.7	82.1	69.7
2	140	0.09	1.69	107.932	10.2	105.7	246.3	248.9	59.9	82.2	69.8
2	141	0.09	1.85	108.658	11.2	107.5	249.4	253	60.2	82.5	69.9
2	142	0.09	1.77	109.369	10.8	107.7	245.7	249.1	60.8	82.4	69.9
2	143	0.09	1.86	110.096	11.2	107.7	248.9	251.2	61	82.3	69.9
2	144	0.1	1.88	110.831	11.4	107.8	245.1	251.1	61.4	82.1	69.9
2	145	0.09	1.87	111.563	11.4	107.3	248	250.1	61.8	82.1	70
2	146	0.09	1.84	112.286	11.2	107.6	246.8	251.9	62.2	81.9	70
2	147	0.09	1.83	113.01	11.2	108.1	246.3	248.7	62.5	81.8	70
2	148	0.09	1.73	113.712	10.7	108.3	248	253.1	63.1	81.7	70
2	149	0.1	1.84	114.436	10.9	108.4	245.8	248.5	63.3	81.7	70
2	150	0.09	1.88	115.169	11.3	107.9	248.8	252.4	63.6	81.8	70
2	151	0.09	1.86	115.898	11.2	107.9	245	248.7	63.8	81.8	70.1
2	152	0.09	1.81	116.614	11	108.1	249	254.6	64.1	81.8	70.1
2	153	0.09	1.8	117.33	10.9	108.8	246.3	248.9	64.5	81.8	70.1
2	154	0.09	1.71	118.029	10.4	108.5	248.5	252	64.6	81.7	70.1
2	155	0.09	1.83	118.75	10.9	108.4	247	249.9	64.9	81.6	70
2	156	0.1	1.89	119.486	11.3	107.8	247.7	251.8	65	81.7	70
2	157	0.1	1.9	120.224	11.3	107.5	248.5	250.6	65.3	81.6	70
2	158	0.09	1.87	120.952	11.2	107.7	246.3	249	65.7	81.5	70
2	159	0.1	1.97	121.703	11.6	109.2	248.7	253	65.9	81.5	70
3	160	0.1	1.96	122.452	11.7	110.1	248.1	249.6	65.9	81.4	70
3	161	0.1	2.02	123.217	11.9	110.2	247.2	251.1	64.8	81.4	70.1
3	162	0.1	2	123.975	11.8	110.1	249.5	250.1	63.7	81.3	70.1
3	163	0.1	2.04	124.741	11.9	109.9	246.5	251.5	62.2	81.2	70.1
3	164	0.1	1.99	125.493	11.5	110.2	248.3	250.5	60.9	81.1	70.1
3	165	0.1	2.01	126.25	11.7	109.8	248.5	250.2	59.4	81.1	70.1
3	166	0.1	1.94	126.991	11.2	110.4	245.7	251.9	58.2	81.1	70.1
3	167	0.1	1.96	127.74	11.3	110.5	248.2	248.6	56.8	81.1	70
3	168	0.1	2	128.496	11.5	110.4	247.1	252.5	55.3	81.2	70
3	169	0.1	2.02	129.255	11.7	110.3	246.7	249	54.1	81.1	70
3	170	0.11	2.08	130.03	12.1	110.2	249.1	253.4	53.1	81.1	70
3	171	0.11	2.09	130.805	12.3	109.9	245.5	248.8	52	81	69.9
3	172	0.11	2.02	131.565	12.5	109.8	249	250.3	51.4	80.7	70
3	173	0.1	2.07	132.335	13	109.8	246.4	251.9	50.6	80.5	69.9
3	174	0.1	2.04	133.097	12.9	110	246.7	248.9	49.8	80.2	69.9
3	175	0.1	1.99	133.852	12.7	110.6	248.8	252	49.2	80	69.9
3	176	0.1	2.05	134.619	13	110.6	245	250	48.5	79.9	69.9
3	177	0.11	2.09	135.392	13.2	109.8	248	249.9	47.9	79.7	69.9
3	178	0.11	2.15	136.177	13.6	109.4	246.8	251.7	47.5	79.5	69.8
3	179	0.12	2.24	136.976	14	109.8	246.7	249.5	47.1	79.3	69.8
4	180	0.12	2.37	137.802	14.9	110.5	248.9	252.4	46.8	79.1	69.8
4	181	0.12	2.42	138.637	15.3	111	245.1	249.2	46.6	78.7	69.8
4	182	0.11	2.27	139.443	14.6	112	249	252.4	46.3	78.2	69.8
4	183	0.12	2.27	140.251	14.4	112.2	245.9	249.7	45.9	78	69.7
4	184	0.13	2.41	141.086	15.2	111.2	248.1	251.6	45.8	77.8	69.8
4	185	0.12	2.45	141.928	15.7	110.5	248.2	250	45.7	77.5	69.7
4	186	0.12	2.38	142.757	15.3	110.3	247.2	250.8	45.6	77.2	69.7
4	187	0.12	2.36	143.58	15.2	110.5	249.3	251.8	45.3	77	69.7

4	188	0.12	2.36	144.403	15.1	110.8	246.5	249.5	45.3	76.8	69.6
4	189	0.12	2.37	145.23	15.3	110.8	249.8	251.8	45.1	76.6	69.6
4	190	0.12	2.34	146.049	15.2	110.8	247.3	249	45	76.5	69.6
4	191	0.12	2.33	146.869	15.2	110.9	248.5	252.5	44.9	76.4	69.6
4	192	0.12	2.36	147.692	15.3	111	248.8	248.9	44.8	76.3	69.5
4	193	0.12	2.34	148.515	15.4	111.3	247.4	252.5	44.8	76.3	69.5
4	194	0.12	2.37	149.341	15.5	111.3	245.4	249.3	44.6	76.2	69.5
4	195	0.12	2.36	150.167	15.6	111.1	249.1	252.9	44.6	76.1	69.4
4	196	0.12	2.34	150.987	15.4	111	245.4	249.3	44.5	75.9	69.3
4	197	0.12	2.32	151.806	15.4	111	248.3	251.9	44.5	75.8	69.2
4	198	0.12	2.37	152.632	15.7	111	246.2	249.1	44.5	75.7	69.2
4	199	0.12	2.32	153.451	15.4	111.1	248	252.2	44.5	75.5	69.1
5	200	0.12	2.32	154.27	15.6	110.5	247.5	250.3	44.4	75.4	69.1
5	201	0.11	2.22	155.065	14.9	110.2	247.3	250.1	44.4	75.4	69
5	202	0.11	2.17	155.856	14.6	110.3	249.1	251.7	44.4	75.6	69
5	203	0.11	2.2	156.649	14.7	110.2	244.9	250.1	44.4	75.6	69
5	204	0.12	2.28	157.46	15.3	110.6	248.5	249.2	44.4	75.8	69
5	205	0.11	2.23	158.26	15.1	110.5	247.1	251.9	44.4	75.7	68.9
5	206	0.11	2.21	159.056	15	110.5	246	250.9	44.4	75.7	68.9
5	207	0.11	2.24	159.857	15.2	110.4	249.1	249.5	44.2	75.6	68.8
5	208	0.11	2.22	160.654	15.1	110.8	245.6	251.6	44.3	75.5	68.7
5	209	0.11	2.18	161.445	14.9	111.4	247.7	249.2	44.3	75.5	68.8
5	210	0.11	2.19	162.236	14.9	110.9	248.6	251.8	44.4	75.6	68.8
5	211	0.11	2.22	163.035	15.2	110.5	245.5	249.8	44.5	75.7	68.7
5	212	0.12	2.24	163.835	15.4	110.6	249	251.7	44.5	75.6	68.7
5	213	0.11	2.22	164.632	15.3	110.5	245.4	250.3	44.6	75.6	68.7
5	214	0.11	2.2	165.425	15.2	110.6	248.5	250.4	44.6	75.6	68.7
5	215	0.11	2.22	166.223	15.4	110.6	246.9	252.4	44.6	75.4	68.6
5	216	0.11	2.16	167.009	15.1	110.6	246.8	249.3	44.7	75.4	68.6
5	217	0.11	2.09	167.782	14.7	110.6	248.9	251.5	44.7	75.4	68.6
5	218	0.12	2.15	168.565	14.9	110.6	246.1	250.8	44.8	75.6	68.6
5	219	0.11	2.2	169.36	15.4	110.5	247.2	249.3	44.8	75.6	68.6
6	220	0.11	2.16	170.146	15.2	110.5	247.7	252	44.9	75.6	68.6
6	221	0.11	2.19	170.941	15.4	110.3	246.3	248.9	44.9	75.6	68.6
6	222	0.11	2.18	171.731	15.4	110.6	249	251.4	45.1	75.6	68.7
6	223	0.11	2.21	172.528	15.6	110.6	246.3	250.4	45.2	75.6	68.8
6	224	0.11	2.22	173.325	15.7	110.5	247.3	251.6	45.3	75.6	68.8
6	225	0.11	2.23	174.126	15.8	110.7	249.8	249.7	45.3	75.7	68.9
6	226	0.11	2.21	174.92	15.9	110.5	247	251.2	45.5	75.7	68.9
6	227	0.1	2.02	175.68	14.7	109.5	247	250.9	45.5	75.7	68.9
6	228	0.1	1.93	176.419	14	109.5	248.2	249.8	45.6	76	69
6	229	0.1	1.88	177.15	13.7	109.6	247.3	252	45.7	76.4	69
6	230	0.1	1.87	177.879	13.6	109.4	246.5	249.2	45.8	76.9	69.2
6	231	0.1	1.86	178.608	13.7	109.4	249.2	252.6	45.7	77.3	69.2
6	232	0.1	1.89	179.34	13.8	109.6	246.7	249.3	45.7	77.5	69.2
6	233	0.1	1.89	180.074	13.9	109.7	247.6	252.1	45.8	77.8	69.4
6	234	0.1	1.96	180.82	14.3	109.7	249	249.6	45.9	78	69.6
6	235	0.1	1.93	181.563	14.3	109.5	247.2	251.8	46	78.3	69.7
6	236	0.1	1.89	182.294	13.9	109.4	247.8	249.8	46.2	78.6	69.8
6	237	0.1	1.91	183.032	14.1	109.5	248.2	252.3	46.2	78.9	70
6	238	0.1	1.94	183.778	14.3	109.6	248.4	250.8	46.4	79.2	70.2
6	239	0.1	1.95	184.524	14.5	109.4	247	250	46.4	79.5	70.4
1	240	0.1	1.94	185.252	14.5	109.4	249	252.3	46.6	79.7	70.7



### Determination of Dioxin/Furan Emissions From Stationary Sources

Determination of Dioxin/Furan Emissions From Stationary Sources			
Client	Met Council	Date	2-16-10
Facility	Seneca	Job Number	902630
Unit	Unit 1	Description	Dioxin/Furan
Location	Stack	Run No.	1
Pbar (inHg)	29.32	Ref Temp°F	68
Ref Pres (in.Hg)	29.92	H2O Cond. (mL)	57.9
Meter Factor (Y)	1.011	Delta H@	1.889
Pitot Coeff. (Cp)	0.84	Stack Area (ft2)	15.90
Dry MW	29.4	Wet MW	29.2
Nozzle Diameter (in)	0.374	Press Stack (Ps)	-0.20
Avg O2 (%)	15.30	Avg CO2 (%)	4.80

Traverse Point		Time (min)	Delta P (in.H2O)	Delta H (inH2O)	Meter Reading (acf)	Vacuum (in. Hg)	Stack Temp (°F)	Probe Temp. (°F)	Filter Temp. (°F)	Impinger Temp (°F)	Meter In Temp (°F)	Meter Out Temp (°F)
Port	Point											
		See Automated Box 1-Minute Data Sheet										
Averages		240	0.10	2.06	185.252	11.6	109	248	251	51	87	76

Sample Gas Volume	179.935 dscf
Water Vapor	2.730 scf
Moisure Content	1.49 %
Avg. Stack Velocity	18.79 ft/sec
	1127.19 ft/min
Stack Flow	17927 wacfm
	16290 wscfm
	16046 dscfm

**% Isokinetic** **97.4 %**

# EMSI



## AUTOMATED BOX STACK TEST DATA SHEET

Client	Met Council	Test Date	2-16-10
Facility	Seneca	Start/Stop Time	14:00-18:05
Unit	Unit 1	Test Method	EPA 23
Location	Stack	Run Number	2
Project #	902630	Description	Dioxin/Furan
Operator	BD	Carbon Trap ID	

### RUN DATA

Tamb		°F	# Ports	2	Meter Box #	AB 3	ID#	2320003
Pbar	29.32	In Hg	# Points	12	Nozzle Dia. (in)	0.374	ID#	224012
Filter #	Trap #1		Time/Pt	20	Probe ID #	221018	Pitot ID #	222024
MF #	1.39		Port Order	B-A	del H @	1.889		
Pstack	-0.2	In H2O	Pitot Coef	0.84	Meter Factor	1.011		
Sample Time	240	min	Test #	1	Data File Name	Unit 1 Run 2 M23		

Leak Chk	CFM	Vac	Init	Time	Pitot Leak Check	Run	1	2	3	Average
Pre	0.018	20	BD	13:45	Pre	O2	15.30	15.30	15.30	15.30
Post	0.014	20	BD	18:06	ok	CO2	4.50	4.50	4.50	4.50
≤ 0.02 cfm or 4 % of Sample Rate					Stable @ ≥ 3" 15 sec					

### DATA CORRECTIONS / RECORD

End Vol	Start Vol	Diff	Omit	Description	Impinger	MATERIAL WEIGHT (g)			50ml Rinse	Y	N
						End	Start	Diff	ID #		
					#1	378.5	361.6				
					#2	698.1	697.5				
					#3	685.6	689.2				
					#4	615.9	615.7				
					#5	954.2	909.3				
					#6						
					#7						
					#8	0.0	0.0				
					Total	3332.3	3273.3	59.0			

Post Field Meter Calibration Set Vacuum = 17" Collect 5 cf per run

Delta H	Vm I	Vm F	Tm I	Tm F	ID	Amb	Vacuum	Time
Enter on Run 3 Sheet								

TC Field Calibration

Ref °F	Probe TC °F

≤ 1.5 % (Absolute Temp)

### Comments


Date	Time	Port	Point	Time	Delta P	Delta H	Meter Vol	Vac	Stack	Probe	Filter	Dryer	Meter In	Meter Out
Average					240	0.10	2.04	183.472	13.7	110.7	247.9	251.1	50.4	84.4
2/16/2010	2:01:01 PM		1	1	1	0.08	2.41	0.82	10.3	104	248.4	249.6	40.7	77.3
2/16/2010	2:02:01 PM		1	1	2	0.08	1.47	1.463	7.6	105.1	247.9	251.8	42.4	79.2
2/16/2010	2:03:01 PM		1	1	3	0.08	1.43	2.098	7.4	105.6	246.7	250.7	42.5	81.2
2/16/2010	2:04:01 PM		1	1	4	0.08	1.59	2.768	8	105.9	248.4	249.2	42.6	83.2
2/16/2010	2:05:01 PM		1	1	5	0.08	1.53	3.425	7.9	106.1	249.1	251.3	42.5	84.9
2/16/2010	2:06:01 PM		1	1	6	0.08	1.53	4.082	7.9	106.7	247.9	251	42.3	86.1
2/16/2010	2:07:01 PM		1	1	7	0.08	1.53	4.742	7.9	106.4	247.7	249	42	87.1
2/16/2010	2:08:01 PM		1	1	8	0.08	1.55	5.404	8	106.4	248.1	252.2	41.7	87.9
2/16/2010	2:09:01 PM		1	1	9	0.08	1.6	6.079	8.3	106.2	248.2	249.2	41.2	88.6
2/16/2010	2:10:01 PM		1	1	10	0.08	1.56	6.744	8	106.1	248.8	252.1	41	89.1
2/16/2010	2:11:01 PM		1	1	11	0.08	1.59	7.414	8.1	106.1	249	250.2	40.8	89.5
2/16/2010	2:12:01 PM		1	1	12	0.08	1.58	8.085	8.1	106.2	247.6	249.8	40.6	89.9
2/16/2010	2:13:01 PM		1	1	13	0.08	1.52	8.744	7.9	105.8	247.8	252.6	40.7	90.1
2/16/2010	2:14:01 PM		1	1	14	0.08	1.56	9.409	8	105.8	247.8	249.5	40.7	90.4
2/16/2010	2:15:01 PM		1	1	15	0.08	1.57	10.078	8.1	105.8	248.7	251.7	40.6	90.6
2/16/2010	2:16:01 PM		1	1	16	0.08	1.6	10.754	8.3	105.5	249.1	251.8	40.6	90.7
2/16/2010	2:17:01 PM		1	1	17	0.08	1.58	11.422	8.2	105.7	247.5	248.8	40.8	90.8
2/16/2010	2:18:01 PM		1	1	18	0.08	1.6	12.096	8.3	106	247.6	253.4	40.8	91
2/16/2010	2:19:01 PM		1	1	19	0.08	1.6	12.77	8.3	105.9	247.6	249.5	40.9	91.1
2/16/2010	2:20:01 PM		1	2	20	0.08	1.53	13.431	8.1	105.6	249	251.4	41	91.2
2/16/2010	2:21:01 PM		1	2	21	0.08	1.58	14.104	8.3	105.8	247.3	251.2	40.9	91.3
2/16/2010	2:22:01 PM		1	2	22	0.09	1.63	14.786	8.4	106.6	246.6	249.5	40.9	91.3
2/16/2010	2:23:02 PM		1	2	23	0.09	1.84	15.513	9.3	109.2	248.7	252.6	40.9	91.5
2/16/2010	2:24:02 PM		1	2	24	0.1	1.93	16.26	9.8	110	249.2	250.9	40.9	91.6
2/16/2010	2:25:02 PM		1	2	25	0.1	1.93	17.004	10.3	110.4	247.6	250.6	41	91.6
2/16/2010	2:26:02 PM		1	2	26	0.09	1.89	17.743	10.8	110.7	247.3	252.1	41.1	91.5
2/16/2010	2:27:02 PM		1	2	27	0.09	1.88	18.479	10.7	110.8	247.5	249.8	41	91.3
2/16/2010	2:28:02 PM		1	2	28	0.09	1.87	19.208	10.6	111	248.8	251.3	41.1	90.9
2/16/2010	2:29:02 PM		1	2	29	0.09	1.77	19.923	10.3	111.3	247.6	252.6	41.2	90.8
2/16/2010	2:30:02 PM		1	2	30	0.1	1.93	20.67	10.9	110.9	246.9	249.1	41.2	90.7
2/16/2010	2:31:02 PM		1	2	31	0.1	1.92	21.412	10.9	110.9	248.8	253.6	41.4	90.7
2/16/2010	2:32:02 PM		1	2	32	0.1	1.92	22.154	11	111	249.6	250	41.4	90.5
2/16/2010	2:33:02 PM		1	2	33	0.09	1.87	22.887	10.7	111.1	247.2	251.8	41.6	90.5
2/16/2010	2:34:02 PM		1	2	34	0.1	1.93	23.633	11	111.2	247.2	251.5	41.6	90.5
2/16/2010	2:35:02 PM		1	2	35	0.1	1.96	24.383	11.2	111.2	248.2	249.8	41.7	90.5
2/16/2010	2:36:02 PM		1	2	36	0.1	1.93	25.128	11.1	111.2	248.8	252.7	41.8	90.3
2/16/2010	2:37:02 PM		1	2	37	0.1	1.9	25.869	11	111.4	247.1	249	41.9	90.2
2/16/2010	2:38:02 PM		1	2	38	0.1	1.93	26.612	11.1	111.4	248.1	252.4	42	90.1
2/16/2010	2:39:02 PM		1	2	39	0.09	1.9	27.354	11.1	111.1	248.8	250.1	42.1	90.1
2/16/2010	2:40:02 PM		1	3	40	0.1	1.92	28.098	11.1	111.2	248.8	250.3	42.1	90.1
2/16/2010	2:41:02 PM		1	3	41	0.1	1.92	28.845	11.2	111.3	247.4	251.4	42.3	90.1
2/16/2010	2:42:02 PM		1	3	42	0.09	1.9	29.585	11.1	111.1	246.9	251.3	42.3	90
2/16/2010	2:43:02 PM		1	3	43	0.1	1.96	30.338	11.3	111.4	248	251.2	42.3	90
2/16/2010	2:44:02 PM		1	3	44	0.1	1.99	31.098	11.6	111.5	249.5	252.4	42.4	90.1
2/16/2010	2:45:02 PM		1	3	45	0.11	2.14	31.886	12.1	112	247.9	249.7	42.5	90
2/16/2010	2:46:02 PM		1	3	46	0.12	2.33	32.711	13.3	112.6	247.3	253.8	42.6	89.9
2/16/2010	2:47:02 PM		1	3	47	0.11	2.3	33.528	13.2	112.5	246.9	248.8	42.9	89.6
2/16/2010	2:48:02 PM		1	3	48	0.12	2.31	34.348	13.2	112.5	249.2	251.3	42.8	89.3
2/16/2010	2:49:02 PM		1	3	49	0.11	2.21	35.149	12.8	112.3	246.2	249.5	43	89
2/16/2010	2:50:02 PM		1	3	50	0.11	2.25	35.956	12.9	112.3	248.3	252.3	43.1	88.8
2/16/2010	2:51:02 PM		1	3	51	0.11	2.25	36.767	13	112.5	249.2	250.5	43.2	88.6
2/16/2010	2:52:02 PM		1	3	52	0.11	2.27	37.577	13.1	112.5	247.5	251	43.3	88.3
2/16/2010	2:53:02 PM		1	3	53	0.11	2.26	38.391	13.2	112.5	247.6	252.3	43.4	88.2
2/16/2010	2:54:02 PM		1	3	54	0.11	2.27	39.205	13.1	112.6	247.9	249.7	43.6	88.1
2/16/2010	2:55:02 PM		1	3	55	0.11	2.34	40.028	13.6	112.8	248.5	252	43.7	88.1
2/16/2010	2:56:02 PM		1	3	56	0.11	2.32	40.848	13.5	112.9	246	251.3	43.9	87.9
2/16/2010	2:57:02 PM		1	3	57	0.11	2.26	41.659	13.1	112.7	248.1	250.6	44	87.8
2/16/2010	2:58:02 PM		1	3	58	0.11	2.43	42.499	13.8	112.9	248.4	249.8	44.1	87.7
2/16/2010	2:59:02 PM		1	3	59	0.11	2.56	43.365	15	112.9	247.5	253.2	44.2	87.5
2/16/2010	3:00:02 PM		1	4	60	0.11	2.57	44.232	15	112.7	246.5	249	44.4	87.2
2/16/2010	3:01:02 PM		1	4	61	0.11	2.56	45.097	15	112.9	248.8	252.1	44.4	86.9
2/16/2010	3:02:02 PM		1	4	62	0.1	2.55	45.968	15	113.1	247.3	251.4	44.5	86.5
2/16/2010	3:03:02 PM		1	4	63	0.11	2.55	46.826	15	112.9	247.1	249.7	44.7	86.1
2/16/2010	3:04:02 PM		1	4	64	0.11	2.55	47.69	15	112.7	249.8	252.9	44.9	85.8
2/16/2010	3:05:02 PM		1	4	65	0.11	2.55	48.552	15.1	112.9	247.8	250.1	45.2	85.6
2/16/2010	3:06:02 PM		1	4	66	0.12	2.55	49.415	15.1	112.9	247.4	253.1	45.4	85.6
2/16/2010	3:07:02 PM		1	4	67	0.12	2.53	50.275	15.1	113	247.1	249.4	45.6	85.5
2/16/2010	3:08:02 PM		1	4	68	0.12	2.53	51.135	15.1	113	248.9	251.6	45.7	85.5
2/16/2010	3:09:02 PM		1	4	69	0.12	2.52	51.993	15.1	113.1	246.5	250.7	45.9	85.5
2/16/2010	3:10:02 PM		1	4	70	0.12	2.52	52.851	15.1	113.1	247.4	249.8	46	85.3
2/16/2010	3:11:02 PM		1	4	71	0.12	2.45	53.693	14.8	113.2	249.2	252	46.2	85.3
2/16/2010	3:12:02 PM		1	4	72	0.12	2.45	54.537	14.7	113.2	246.5	249.1	46.2	85.3
2/16/2010	3:13:02 PM		1	4	73	0.12	2.44	55.381	14.7	113.2	248.9	252.8	46.4	85.4
2/16/2010	3:14:00 PM		1	4	74	0.12	2.42	56.191	14.7	113	248	249.9	46.6	85.4
2/16/2010	3:15:00 PM		1	4	75	0.12	2.36	57.021	14.4	113	247.8	251.6	46.7	85.4
2/16/2010	3:16:02 PM		1	4	76	0.12	2.37	57.884	14.4	113.2	248.6	250.3	46.8	85.5
2/16/2010	3:17:00 PM		1	4	77	0.12	2.4	58.693	14.6	113.4	248.7	251.8	46.9	85.6
2/16/2010	3:18:00 PM		1	4	78	0.12	2.41	59.536	14.7	113.2	246	249.6	47	85.6
2/16/2010	3:19:00 PM		1	4	79	0.12	2.42	60.377	14.8	113	248.6	252.7	47.2	85.6
2/16/2010	3:20:00 PM		1	5	80	0.12	2.42	61.218	14.8	113.1	249.7	250.3	47.3	85.7
2/16/2010	3:21:00 PM		1	5	81	0.12	2.42	62.056	14.8	112.9	247.8	251.6	47.4	85.6
2/16/2010	3:22:00 PM		1	5	82	0.12	2.41	62.896	14.8	113	246.3	251.4	47.5	85.6
2/16/2010	3:23:00 PM		1	5	83	0.12	2.39	63.729	14.8	112.7	248.3	250.7	47.6	85.5
2/16/2010	3:24:00 PM		1	5	84	0.11	2.3	64.547	14.3	112.5	248.4	252.8	47.7	85.5

2/16/2010	3:25:00 PM	1	5	85	0.11	2.28	65.359	14.1	112.4	247	248.8	47.9	85.5	78.5
2/16/2010	3:26:00 PM	1	5	86	0.11	2.29	66.176	14.2	112.5	248.8	252.2	48.1	85.7	78.6
2/16/2010	3:27:00 PM	1	5	87	0.11	2.33	67	14.5	112.5	248.7	249.4	48.2	85.7	78.5
2/16/2010	3:28:00 PM	1	5	88	0.12	2.33	67.823	14.5	112.5	248.4	252.4	48.4	85.7	78.5
2/16/2010	3:29:00 PM	1	5	89	0.11	2.3	68.641	14.4	112.6	246.4	251.6	48.6	85.6	78.5
2/16/2010	3:30:00 PM	1	5	90	0.11	2.2	69.441	13.9	112.5	248.1	249.7	48.9	85.7	78.4
2/16/2010	3:31:01 PM	1	5	91	0.11	2.25	70.251	14.1	112.8	249.1	252.3	49.2	85.9	78.5
2/16/2010	3:32:00 PM	1	5	92	0.11	2.32	71.071	14.6	112.7	247.7	249.1	49.3	86	78.5
2/16/2010	3:33:00 PM	1	5	93	0.11	2.28	71.885	14.5	112.5	247.3	251.4	49.4	86.1	78.5
2/16/2010	3:34:00 PM	1	5	94	0.11	2.26	72.697	14.2	112.1	249.1	252.9	49.6	86	78.5
2/16/2010	3:35:01 PM	1	5	95	0.11	2.31	73.515	14.6	112	248.8	249.5	49.8	86	78.5
2/16/2010	3:36:01 PM	1	5	96	0.11	2.3	74.332	14.6	112.6	247.5	252.7	49.9	85.9	78.5
2/16/2010	3:37:00 PM	1	5	97	0.11	2.31	75.15	14.7	112.4	246	249.5	50.1	85.8	78.5
2/16/2010	3:38:00 PM	1	5	98	0.11	2.28	75.964	14.6	112.3	248.5	252	50.4	85.7	78.4
2/16/2010	3:39:00 PM	1	5	99	0.12	2.34	76.789	14.9	112.3	247.8	251.3	50.6	85.6	78.5
2/16/2010	3:40:00 PM	1	6	100	0.11	2.31	77.61	14.9	113.1	247.1	250.1	51	85.5	78.5
2/16/2010	3:41:00 PM	1	6	101	0.11	2.25	78.419	14.6	112.6	249	252.2	51.2	85.4	78.4
2/16/2010	3:42:01 PM	1	6	102	0.1	2.11	79.204	13.8	112	249.1	249.9	51.4	85.5	78.4
2/16/2010	3:43:01 PM	1	6	103	0.1	2.12	79.988	13.7	111.7	248.5	251.8	51.7	85.6	78.4
2/16/2010	3:44:01 PM	1	6	104	0.1	2.09	80.765	13.5	111.7	246.7	251.9	51.9	85.8	78.4
2/16/2010	3:45:01 PM	1	6	105	0.1	2.08	81.543	13.5	111.4	248.1	250.6	52.1	86.1	78.4
2/16/2010	3:46:01 PM	1	6	106	0.1	2.11	82.323	13.6	111.8	248.9	252.5	52.3	86.3	78.5
2/16/2010	3:47:01 PM	1	6	107	0.11	2.15	83.113	14	111.5	248.6	249.3	52.6	86.4	78.5
2/16/2010	3:48:01 PM	1	6	108	0.1	2.11	83.896	13.8	111.4	247	250.9	52.6	86.4	78.4
2/16/2010	3:49:01 PM	1	6	109	0.1	2.08	84.672	13.6	111.2	248	252.3	52.9	86.3	78.4
2/16/2010	3:50:01 PM	1	6	110	0.1	2.11	85.456	13.8	111.7	247.9	249.6	53.2	86.4	78.4
2/16/2010	3:51:01 PM	1	6	111	0.1	2.12	86.239	13.9	111.4	248.9	251.3	53.3	86.3	78.3
2/16/2010	3:52:01 PM	1	6	112	0.1	2.11	87.023	13.9	111.7	246.9	251.4	53.5	86.3	78.3
2/16/2010	3:53:01 PM	1	6	113	0.1	2.1	87.803	13.8	111.2	247.3	248.1	53.7	86.2	78.2
2/16/2010	3:54:01 PM	1	6	114	0.1	2.09	88.584	13.9	111.1	249.3	253.8	53.9	86.2	78.2
2/16/2010	3:55:01 PM	1	6	115	0.1	2.12	89.367	14	111.5	248.7	249.7	54.3	86.2	78.2
2/16/2010	3:56:01 PM	1	6	116	0.1	2.1	90.147	14	111.3	246.7	252.6	54.4	86.1	78.1
2/16/2010	3:57:01 PM	1	6	117	0.1	2.07	90.923	13.8	111.7	246.8	250	54.7	86	78.1
2/16/2010	3:58:01 PM	1	6	118	0.1	2.06	91.698	13.8	111.5	248.8	251.4	54.9	85.9	78
2/16/2010	3:59:01 PM	1	6	119	0.1	2.06	92.471	13.8	111.7	248.7	252.6	55.1	85.9	78
2/16/2010	4:00:01 PM	2	1	120	0.1	2.08	93.238	13.9	111.8	246.6	249.3	55.4	86	78
2/16/2010	4:06:01 PM	2	1	121	0.07	2.53	94.072	12.9	102.2	248.1	250.8	53.5	79.9	77.4
2/16/2010	4:07:01 PM	2	1	122	0.07	1.81	94.792	12.1	103	247.5	252.3	54.7	81.1	77.2
2/16/2010	4:08:01 PM	2	1	123	0.07	1.62	95.469	10.9	103.1	247.5	250.2	55.1	82.1	77.1
2/16/2010	4:09:01 PM	2	1	124	0.07	1.52	96.124	10.3	103.5	248.2	251.2	55.2	83.2	77.1
2/16/2010	4:10:01 PM	2	1	125	0.07	1.51	96.776	10.2	103.2	249	251.9	55.1	84.2	77
2/16/2010	4:11:01 PM	2	1	126	0.07	1.5	97.428	10.2	103.6	248.9	248.2	55.1	85.1	77
2/16/2010	4:12:01 PM	2	1	127	0.07	1.48	98.076	10.1	103.9	248.9	253.5	55	85.8	77
2/16/2010	4:13:01 PM	2	1	128	0.07	1.44	98.714	9.9	104.2	248	250.2	55.1	86.3	76.9
2/16/2010	4:14:01 PM	2	1	129	0.07	1.35	99.33	9.4	104.1	247.9	249.9	55.1	86.8	77
2/16/2010	4:15:01 PM	2	1	130	0.06	1.35	99.947	9.4	104.1	248.3	253	55.2	87.1	77
2/16/2010	4:16:01 PM	2	1	131	0.07	1.35	100.563	9.4	103.8	247.9	250.2	55.3	87.5	77
2/16/2010	4:17:01 PM	2	1	132	0.06	1.34	101.177	9.4	103.4	248.8	252.5	55.6	87.9	77.1
2/16/2010	4:18:01 PM	2	1	133	0.07	1.34	101.792	9.4	103.5	249.2	250.6	55.9	88.1	77.1
2/16/2010	4:19:01 PM	2	1	134	0.07	1.38	102.414	9.7	103.4	248.1	249.8	56.1	88.5	77.2
2/16/2010	4:20:01 PM	2	1	135	0.07	1.34	103.029	9.9	103.7	247.6	254.1	56.1	88.7	77.2
2/16/2010	4:21:01 PM	2	1	136	0.06	1.35	103.645	10.2	103.1	247.6	249.7	56.3	88.8	77.3
2/16/2010	4:22:01 PM	2	1	137	0.07	1.36	104.264	10.2	103.3	248.4	252.7	56.6	88.7	77.3
2/16/2010	4:23:01 PM	2	1	138	0.06	1.34	104.877	10.1	103.4	248.4	249.7	56.9	88.8	77.3
2/16/2010	4:24:01 PM	2	1	139	0.07	1.36	105.496	10.2	103.5	249	251.9	57	88.7	77.3
2/16/2010	4:25:01 PM	2	2	140	0.08	1.38	106.12	10.3	105.3	246.9	251.7	57.3	88.8	77.3
2/16/2010	4:26:01 PM	2	2	141	0.1	1.55	106.782	11.1	108.5	247.3	250	57.7	88.8	77.4
2/16/2010	4:27:01 PM	2	2	142	0.1	1.74	107.489	12.3	109.7	248.6	251.6	58	89	77.4
2/16/2010	4:28:01 PM	2	2	143	0.09	1.83	108.215	12.9	110.7	248.2	249.6	57.2	89	77.4
2/16/2010	4:29:01 PM	2	2	144	0.09	1.93	108.96	13.6	111.1	247	249.6	56.6	88.6	77.5
2/16/2010	4:30:01 PM	2	2	145	0.09	1.93	109.706	13.5	111.3	249	252	56.8	88.1	77.4
2/16/2010	4:31:01 PM	2	2	146	0.09	1.92	110.453	13.5	111.2	248.9	250.6	56.9	87.7	77.5
2/16/2010	4:32:01 PM	2	2	147	0.09	1.92	111.198	13.5	111	247.5	249.6	57	87.4	77.5
2/16/2010	4:33:01 PM	2	2	148	0.09	1.92	111.94	13.4	111.1	247.8	252.6	56.8	87.2	77.5
2/16/2010	4:34:01 PM	2	2	149	0.09	1.93	112.685	13.5	111.4	248.7	249.4	56.7	86.9	77.5
2/16/2010	4:35:01 PM	2	2	150	0.1	1.92	113.428	13.5	111.2	247.5	253.3	56.4	86.7	77.5
2/16/2010	4:36:01 PM	2	2	151	0.09	1.91	114.171	13.5	110.9	246.8	251.1	55.9	86.5	77.4
2/16/2010	4:37:01 PM	2	2	152	0.09	1.9	114.907	13.4	110.9	247.8	250.7	55.6	86.3	77.4
2/16/2010	4:38:01 PM	2	2	153	0.09	1.88	115.644	13.4	111	249.2	252.1	55.1	86.3	77.5
2/16/2010	4:39:01 PM	2	2	154	0.09	1.9	116.385	13.5	111	246.7	249.3	54.5	86.1	77.4
2/16/2010	4:40:01 PM	2	2	155	0.09	1.91	117.125	13.5	111	248.3	253	54	86.1	77.4
2/16/2010	4:41:01 PM	2	2	156	0.09	1.9	117.866	13.6	111	249.4	250.4	53.5	86	77.4
2/16/2010	4:42:01 PM	2	2	157	0.09	1.9	118.604	13.6	111	248.2	249.8	53.1	85.9	77.3
2/16/2010	4:43:01 PM	2	2	158	0.09	1.88	119.341	13.5	111.2	246.9	252.7	52.7	85.8	77.3
2/16/2010	4:44:01 PM	2	2	159	0.09	1.87	120.075	13.4	111.1	247.1	249.2	52.3	85.7	77.3
2/16/2010	4:45:01 PM	2	3	160	0.09	1.88	120.81	13.5	111.5	249	253.1	52	85.6	77.2
2/16/2010	4:46:01 PM	2	3	161	0.08	1.81	121.534	13.3	111.8	247.1	250	51.7	85.6	77.2
2/16/2010	4:47:01 PM	2	3	162	0.1	1.83	122.258	13	112.4	247.9	250.5	51.3	85.5	77.2
2/16/2010	4:48:01 PM	2	3	163	0.1	1.95	123.007	14	112.9	249.4	252.4	51.1	85.5	77.1
2/16/2010	4:49:01 PM	2	3	164	0.11	2.06	123.781	14.7	112.8	247.2	249	50.7	85.3	77.1
2/16/2010	4:50:01 PM	2	3	165	0.11	2.15	124.566	15.3	112.4	247.3	253.6	50.1	84.9	77
2/16/2010	4:51:01 PM	2	3	166	0.11	2.16	125.353	15.5	111.9	248.1	249.5	49.9	84.5	76.9
2/16/2010	4:52:01 PM	2	3	167	0.1	2.1	126.131	15.2	112.5	248.7	252.4	49.7	84.1	76.8
2/16/2010	4:53:01 PM	2	3	168	0.1	2.08	126.904	15.1	112.6	246.2	251.4	49.6	83.9	76.8
2/16/2010	4:54:01 PM	2	3	169	0.1	2.09	127.679	15.1	112.3	247.4	249.8	49.4	83.6	76.7
2/16/														

2/16/2010	4:56:01 PM	2	3	171	0.1	2.08	129.231	15.2	112.6	246.3	251.5	49.4	83.1	76.5
2/16/2010	4:57:01 PM	2	3	172	0.1	2.08	130.002	15.2	112.7	247.8	249.9	49.4	82.8	76.4
2/16/2010	4:58:01 PM	2	3	173	0.1	2.1	130.779	15.2	112.5	249.2	252.4	49.4	82.7	76.4
2/16/2010	4:59:01 PM	2	3	174	0.1	2.09	131.556	15.3	112.3	246.5	249.8	49.3	82.5	76.3
2/16/2010	5:00:01 PM	2	3	175	0.1	2.06	132.325	15.1	112.6	248.3	252.9	49.5	82.3	76.2
2/16/2010	5:01:01 PM	2	3	176	0.1	2.02	133.088	14.9	112.4	248.9	250.2	49.7	82.3	76.1
2/16/2010	5:02:01 PM	2	3	177	0.11	2.1	133.865	15.3	112.4	247.2	250.4	49.7	82.2	76.1
2/16/2010	5:03:01 PM	2	3	178	0.11	2.15	134.653	15.8	112.1	248.3	251.6	49.6	82	75.9
2/16/2010	5:04:01 PM	2	3	179	0.1	2.09	135.428	15.5	112.4	248.7	249.2	49.7	81.9	75.9
2/16/2010	5:05:01 PM	2	4	180	0.1	2.06	136.199	15.3	112.3	247.9	253.6	49.8	81.7	75.7
2/16/2010	5:06:01 PM	2	4	181	0.11	2.12	136.981	15.6	112.1	246.4	250.7	49.9	81.7	75.7
2/16/2010	5:07:01 PM	2	4	182	0.12	2.28	137.793	16.6	113.2	248.2	250.1	50.2	81.5	75.6
2/16/2010	5:08:01 PM	2	4	183	0.11	2.29	138.606	17.2	112.7	248	252.2	50.5	81.2	75.5
2/16/2010	5:09:01 PM	2	4	184	0.11	2.14	139.394	16.1	113.2	246.2	250.2	50.7	80.6	75.4
2/16/2010	5:10:01 PM	2	4	185	0.11	2.15	140.18	16	113.2	248.3	252	50.8	80.5	75.3
2/16/2010	5:11:01 PM	2	4	186	0.11	2.15	140.967	16	113.2	248.3	251.2	50.9	80.4	75.2
2/16/2010	5:12:01 PM	2	4	187	0.11	2.15	141.757	16.1	113.3	246.6	249.8	51.2	80.3	75.2
2/16/2010	5:13:01 PM	2	4	188	0.11	2.22	142.556	16.4	113.1	249.4	252.4	51.4	80.2	75.1
2/16/2010	5:14:01 PM	2	4	189	0.12	2.29	143.367	17.1	113.3	247.9	249.1	51.7	80	75
2/16/2010	5:15:01 PM	2	4	190	0.12	2.31	144.184	17.4	113.3	247.7	253.8	51.8	79.6	74.9
2/16/2010	5:16:01 PM	2	4	191	0.12	2.32	145.002	17.6	112.8	247.4	250.3	52.1	79.3	74.9
2/16/2010	5:17:01 PM	2	4	192	0.12	2.35	145.828	17.8	112.6	248.7	252.3	52.3	78.9	74.8
2/16/2010	5:18:01 PM	2	4	193	0.12	2.37	146.654	18	112.4	245.7	251.5	52.5	78.6	74.7
2/16/2010	5:19:01 PM	2	4	194	0.12	2.36	147.48	18	112.5	247.6	250.9	52.7	78.1	74.6
2/16/2010	5:20:01 PM	2	4	195	0.12	2.39	148.312	18.3	112.4	249.3	251.9	53	77.8	74.5
2/16/2010	5:21:01 PM	2	4	196	0.12	2.36	149.138	18.3	112.5	246	249.4	53.5	77.4	74.4
2/16/2010	5:22:01 PM	2	4	197	0.12	2.38	149.967	18.2	112.4	249.2	252.4	53.7	77	74.3
2/16/2010	5:23:01 PM	2	4	198	0.11	2.32	150.786	17.9	112.4	246.4	250	53.9	76.9	74.2
2/16/2010	5:24:01 PM	2	4	199	0.12	2.35	151.612	18.1	112.4	248	250.4	54.2	76.7	74.1
2/16/2010	5:25:01 PM	2	5	200	0.11	2.31	152.43	17.9	112.5	249.3	252.3	54.5	76.5	74
2/16/2010	5:26:01 PM	2	5	201	0.12	2.34	153.253	18.1	112.5	246.1	249.5	54.8	76.4	73.9
2/16/2010	5:27:01 PM	2	5	202	0.12	2.36	154.079	18.3	112.4	248.1	252.1	54.9	76.2	73.8
2/16/2010	5:28:01 PM	2	5	203	0.11	2.27	154.891	17.8	112.1	248.6	250.1	55.2	76	73.7
2/16/2010	5:29:01 PM	2	5	204	0.11	2.24	155.695	17.5	112.1	247.9	253.2	55.4	76.1	73.7
2/16/2010	5:30:01 PM	2	5	205	0.11	2.26	156.501	17.5	112	246.2	250.7	55.7	76.1	73.5
2/16/2010	5:31:01 PM	2	5	206	0.11	2.23	157.303	17.5	111.9	248.6	251.6	55.9	76.1	73.5
2/16/2010	5:32:01 PM	2	5	207	0.11	2.19	158.097	17.1	111.8	245.2	251.3	56.1	76.1	73.3
2/16/2010	5:33:01 PM	2	5	208	0.11	2.24	158.9	17.5	111.9	249.4	249.8	56.3	76.1	73.2
2/16/2010	5:34:01 PM	2	5	209	0.11	2.29	159.711	17.9	111.9	245.4	252.8	56.5	76.1	73.1
2/16/2010	5:35:01 PM	2	5	210	0.11	2.27	160.518	18	112	248.8	249.2	56.7	76	73
2/16/2010	5:36:01 PM	2	5	211	0.11	2.28	161.327	18	112	246.6	253.2	57	75.9	73
2/16/2010	5:37:01 PM	2	5	212	0.11	2.24	162.13	17.8	111.8	247	249.8	57.3	75.6	72.9
2/16/2010	5:38:01 PM	2	5	213	0.11	2.24	162.932	17.6	111.8	247.2	252.1	57.4	75.6	72.8
2/16/2010	5:39:01 PM	2	5	214	0.11	2.27	163.741	17.9	111.8	246.8	251.5	57.6	75.5	72.7
2/16/2010	5:40:01 PM	2	5	215	0.11	2.28	164.552	18	111.8	249.5	250.5	57.9	75.4	72.6
2/16/2010	5:41:01 PM	2	5	216	0.11	2.25	165.355	17.9	111.8	245	253.6	58.2	75.2	72.5
2/16/2010	5:42:01 PM	2	5	217	0.11	2.27	166.165	18	112.1	249.6	249.1	58.4	75.1	72.4
2/16/2010	5:43:01 PM	2	5	218	0.11	2.27	166.972	18	111.8	245.9	252.3	58.6	74.9	72.3
2/16/2010	5:44:01 PM	2	5	219	0.11	2.24	167.776	17.9	112	248	251.1	58.8	74.8	72.2
2/16/2010	5:45:01 PM	2	6	220	0.11	2.22	168.573	17.7	111.9	248.5	251.5	59	74.7	72
2/16/2010	5:46:01 PM	2	6	221	0.1	2.15	169.357	17.3	111.9	245.4	251.4	59.2	74.6	71.9
2/16/2010	5:47:01 PM	2	6	222	0.1	2.03	170.12	16.2	111.5	249.2	249.6	59.4	74.8	71.8
2/16/2010	5:48:01 PM	2	6	223	0.1	1.98	170.873	15.8	111.3	245.8	253.5	59.4	75.1	71.7
2/16/2010	5:49:01 PM	2	6	224	0.1	1.93	171.612	15.4	111.7	248.8	249.7	59.5	75.4	71.7
2/16/2010	5:50:01 PM	2	6	225	0.09	1.9	172.346	15.2	111.8	246.5	253.8	59.6	75.8	71.6
2/16/2010	5:51:01 PM	2	6	226	0.1	1.9	173.083	15.2	111.5	247.4	249.3	59.7	76.2	71.5
2/16/2010	5:52:01 PM	2	6	227	0.1	1.92	173.82	15.3	111.1	247.4	252.9	59.7	76.4	71.4
2/16/2010	5:53:01 PM	2	6	228	0.1	1.93	174.562	15.5	111.2	246.2	251.1	59.8	76.7	71.4
2/16/2010	5:54:01 PM	2	6	229	0.1	1.94	175.306	15.7	111.1	249.5	251.9	59.9	76.8	71.4
2/16/2010	5:55:01 PM	2	6	230	0.1	1.93	176.049	15.6	111.1	245.3	251.9	60	76.9	71.3
2/16/2010	5:56:01 PM	2	6	231	0.1	1.95	176.794	15.8	111.1	249	250.6	60.2	76.9	71.3
2/16/2010	5:57:01 PM	2	6	232	0.1	1.92	177.535	15.6	110.8	245.3	252.2	60.2	77	71.3
2/16/2010	5:58:01 PM	2	6	233	0.1	1.92	178.273	15.6	110.7	248.8	249.5	60.4	77	71.3
2/16/2010	5:59:01 PM	2	6	234	0.1	1.92	179.014	15.6	110.9	247	252.8	60.7	77	71.2
2/16/2010	6:00:01 PM	2	6	235	0.1	1.93	179.755	15.7	110.7	246.9	250.6	60.8	77	71.2
2/16/2010	6:01:01 PM	2	6	236	0.1	1.93	180.497	15.8	110.8	248.8	250.8	60.9	77	71.1
2/16/2010	6:02:01 PM	2	6	237	0.1	1.92	181.238	15.7	110.7	245.7	252.1	61.1	77	71.1
2/16/2010	6:03:01 PM	2	6	238	0.1	1.94	181.982	15.8	111	249.6	249.2	61.3	76.9	71.1
2/16/2010	6:04:01 PM	2	6	239	0.1	1.97	182.731	16.1	110.7	246	252.5	61.4	76.9	71.1
2/16/2010	6:05:01 PM	3	1	240	0.1	1.97	183.472	16.1	110.7	247.7	250.2	61.5	76.8	71

### Determination of Dioxin/Furan Emissions From Stationary Sources

Client	Met Council	Date	2-17-10
Facility	Seneca	Job Number	902630
Unit	Unit 1	Description	Dioxin/Furan
Location	Stack	Run No.	2
Pbar (inHg)	29.32	Ref Temp°F	68
Ref Pres (in.Hg)	29.92	H2O Cond. (mL)	59.0
Meter Factor (Y)	1.011	Delta H@	1.889
Pitot Coeff. (Cp)	0.84	Stack Area (ft2)	15.90
Dry MW	29.3	Wet MW	29.2
Nozzle Diameter (in)	0.374	Press Stack (Ps)	-0.20
Avg O2 (%)	15.30	Avg CO2 (%)	4.50

Traverse Point		Time (min)	Delta P (in.H <sub>2</sub> O)	Delta H (inH <sub>2</sub> O)	Meter Reading (acf)	Vacuum (in. Hg)	Stack Temp (°F)	Probe Temp. (°F)	Filter Temp. (°F)	Impinger Temp (°F)	Meter In Temp (°F)	Meter Out Temp (°F)
Port	Point											
			See Automated Box 1-Minute Data Sheet									
Averages		0	0.10	2.04	183.472	13.7	111	248	251	50	84	77

Sample Gas Volume	178.457 dscf
Water Vapor	2.782 scf
Moisure Content	1.53 %
Avg. Stack Velocity	18.52 ft/sec
	1111.18 ft/min
Stack Flow	17673 wacfm
	16014 wscfm
	15768 dscfm

**% Isokinetic** **98.3 %**

# EMSI



## AUTOMATED BOX STACK TEST DATA SHEET

Client	Met Council	Test Date	2-17-10
Facility	Seneca	Start/Stop Time	8:05-12:40
Unit	Unit 1	Test Method	EPA 23
Location	Stack	Run Number	3
Project #	902630	Description	Dioxin/Furan
Operator	BD	Carbon Trap ID	

### RUN DATA

Tamb		°F	# Ports	2	Meter Box #	AB 3	ID#	232003
Pbar	29.29	In Hg	# Points	12	Nozzle Dia. (in)	0.374	ID#	224012
Filter #			Time/Pt	20	Probe ID #	221018	Pitot ID #	222024
MF #	1.39		Port Order	B-A	del H @	1.889		
Pstack	-0.2	In H2O	Pitot Coef	0.84	Meter Factor	1.011		
Sample Time	240	min	Test #	1	Data File Name	Unit 1 Run 3 M23		

Leak Chk	CFM	Vac	Init	Time	Pitot Leak Check	Run	1	2	3	Average
Pre	0.017	20	BD	7:49	Pre	O2	15.70	15.70	15.70	15.70
Post	0.013	18	BD	12:45	ok	CO2	4.90	4.90	4.90	4.90
≤ 0.02 cfm or 4 % of Sample Rate					Stable @ ≥ 3" 15 sec					

### DATA CORRECTIONS / RECORD

End Vol	Start Vol	Diff	Omit	Description	Impinger	MATERIAL WEIGHT (g)			50ml Rinse	Y	N
						End	Start	Diff	ID #		
					#1	377.5	361.6			263051	
					#2	695.2	694.3			261011	
					#3	681.4	684.2			261096	
					#4	614.9	612.5			261030	
					#5	946.6	898.3			261042	
					#6						
					#7						
					#8	0.0	0.0				
					Total	3315.6	3250.9	64.7			

Post Field Meter Calibration Set Vacuum = 17" Collect 5 cf per run

Delta H	Vm I	Vm F	Tm I	Tm F	ID	Amb	Vacuum	Time
2.05	0.000	6.147	69	69.2	63	60	17	8.0
2.05	0.000	6.147	69	71.2	63	60	17	8.0
2.05	0.000	6.933	71	74.3	63	63	17	9.0

TC Field Calibration

Ref °F	Probe TC °F

≤ 1.5 % (Absolute Temp)

### Comments

Power Loss 28 min 21.302 Volume

Date	Time	Port	Point	Time	Delta P	Delta H	Meter Vol	Vac	Stack	Probe	Filter	Dryer	Meter In	Meter Out	
Average					240	0.11	2.18	188.439	12.7	110.3	247.7	251.1	47.2	77.2	67.4
2/17/2010	8:06:36 AM		1	1	1	0.09	2.35	0.822	10.3	110.2	248.8	250.6	34	96.2	89.2
2/17/2010	8:07:36 AM		1	1	2	0.09	1.96	1.581	9.9	110.3	248.2	251.2	34.9	98.9	89.6
2/17/2010	8:08:36 AM		1	1	3	0.09	1.94	2.336	9.7	110.6	247.7	253.2	35.6	101	90
2/17/2010	8:09:36 AM		1	1	4	0.09	1.96	3.094	9.8	110.6	247.3	249.2	36.1	102.7	90.4
2/17/2010	8:10:36 AM		1	1	5	0.09	1.92	3.847	9.7	110.9	248.3	252.1	36.6	104.2	90.9
2/17/2010	8:11:36 AM		1	1	6	0.09	1.95	4.604	9.7	110.8	249.3	252.2	36.8	105.3	91.4
2/17/2010	8:12:36 AM		1	1	7	0.09	1.93	5.358	9.8	110.9	247.5	250.3	37.2	106.3	91.8
2/17/2010	8:13:36 AM		1	1	8	0.09	1.92	6.11	9.8	110.8	247.5	250	37.4	107.1	92.3
2/17/2010	8:14:36 AM		1	1	9	0.09	1.9	6.857	9.9	110.9	248.8	253.9	37.7	107.6	92.6
2/17/2010	8:15:36 AM		1	1	10	0.09	1.87	7.6	10	111	249	249.9	37.9	108.1	93
2/17/2010	8:16:36 AM		1	1	11	0.09	1.97	8.362	10.5	111.2	248.9	252.3	38	108.6	93.5
2/17/2010	8:17:36 AM		1	1	12	0.09	1.95	9.121	10.5	111.1	246.9	252.4	38.1	109.1	94
2/17/2010	8:18:36 AM		1	1	13	0.1	1.99	9.89	10.7	111.2	246.8	250.1	38.1	109.3	94.2
2/17/2010	8:19:36 AM		1	1	14	0.09	1.94	10.647	10.7	110.5	248.9	252.3	37.3	108.5	93.6
2/17/2010	8:20:36 AM		1	1	15	0.08	1.81	11.377	10.3	110.9	247.7	251.2	38.5	106.7	93.5
2/17/2010	8:21:36 AM		1	1	16	0.08	1.89	12.125	10.9	110.4	247.7	249.3	38.5	104.4	92.9
2/17/2010	8:22:36 AM		1	1	17	0.08	1.94	12.883	11.3	110	249.2	254.9	38.5	102.1	92.1
2/17/2010	8:23:36 AM		1	1	18	0.08	1.94	13.639	11.4	110.6	248	249.3	39.5	100.2	91.8
2/17/2010	8:24:36 AM		1	1	19	0.08	1.93	14.394	11.3	111.2	247.3	250.6	39.6	98	90.8
2/17/2010	8:25:36 AM		1	2	20	0.09	1.93	15.147	11.3	111.7	247.6	254.2	39.5	96	90
2/17/2010	8:26:36 AM		1	2	21	0.09	1.92	15.899	11.3	111	248.6	250.7	39.6	94.3	89.2
2/17/2010	8:27:36 AM		1	2	22	0.09	2.06	16.678	11.9	110.1	248.7	249.8	40.1	92.5	88.3
2/17/2010	8:28:36 AM		1	2	23	0.09	2.06	17.454	12	109.9	247.5	252.7	40.4	90.9	87.4
2/17/2010	8:29:36 AM		1	2	24	0.09	2.05	18.23	12	109.9	246.5	251.7	40.2	89.4	86.3
2/17/2010	8:30:36 AM		1	2	25	0.09	2.05	19.003	12	109.7	248.6	249.8	40.2	87.8	85.2
2/17/2010	8:31:36 AM		1	2	26	0.09	2.03	19.774	12.1	109.5	246.8	253.2	40	86.3	84.1
2/17/2010	8:32:36 AM		1	2	27	0.09	2.03	20.543	12	109.4	247.1	252	40.5	85.2	83.3
2/17/2010	8:33:36 AM		1	2	28	0.09	1.98	21.302	11.9	109.6	248.6	250.3	40.5	84.1	82.4
2/17/2010	9:05:01 AM		1	2	29	0.1	1.94	22.081	12.5	108.7	248.1	254.6	36.5	56.6	55.1
2/17/2010	9:06:01 AM		1	2	30	0.1	2	22.826	12.5	109.4	248.6	250.4	36.4	57.6	54.8
2/17/2010	9:07:01 AM		1	2	31	0.1	1.99	23.57	12.4	109.8	246.8	252.6	36.2	59.2	54.5
2/17/2010	9:08:01 AM		1	2	32	0.1	1.99	24.317	12.3	110	246.7	250.4	36	60.5	54.5
2/17/2010	9:09:01 AM		1	2	33	0.11	2.07	25.076	12.9	110	248.9	250.3	35.9	61.6	54.4
2/17/2010	9:10:01 AM		1	2	34	0.1	2.04	25.831	13.1	109.6	248.1	251.7	35.9	62.4	54.5
2/17/2010	9:11:01 AM		1	2	35	0.1	1.97	26.574	12.7	110.6	246.5	251.3	36	62.9	54.5
2/17/2010	9:12:01 AM		1	2	36	0.1	1.99	27.318	12.7	110.1	248.1	250	36.1	63.6	54.6
2/17/2010	9:13:01 AM		1	2	37	0.1	2.01	28.067	12.9	110.4	248.7	251.3	36.6	64.2	54.7
2/17/2010	9:14:01 AM		1	2	38	0.1	2.03	28.821	13	109.7	246	251.8	37	64.6	54.8
2/17/2010	9:15:01 AM		1	2	39	0.1	2.03	29.575	12.9	109.9	248.2	249.7	37.7	65	54.9
2/17/2010	9:16:01 AM		1	3	40	0.11	2.04	30.331	13	109.5	248.9	252.1	38.2	65.3	55
2/17/2010	9:17:01 AM		1	3	41	0.12	2.26	31.128	14.3	110.9	246	251.6	38.8	65.5	55.1
2/17/2010	9:18:01 AM		1	3	42	0.12	2.27	31.926	14.5	110.7	247.9	250.1	39.3	65.6	55.2
2/17/2010	9:19:01 AM		1	3	43	0.12	2.31	32.731	14.7	111.3	248.9	250.1	39.9	65.6	55.5
2/17/2010	9:20:01 AM		1	3	44	0.12	2.32	33.539	14.9	111.1	246	252.3	40.4	65.5	55.6
2/17/2010	9:21:01 AM		1	3	45	0.12	2.31	34.345	14.9	111.2	247.8	250.8	40.7	65.4	55.8
2/17/2010	9:22:01 AM		1	3	46	0.12	2.3	35.148	14.8	111.1	249.2	250.5	41.1	65.4	55.9
2/17/2010	9:23:01 AM		1	3	47	0.12	2.31	35.955	14.9	111.4	246.5	252.9	41.5	65.4	56.1
2/17/2010	9:24:01 AM		1	3	48	0.12	2.33	36.763	15.1	111	247.3	250.6	41.9	65.4	56.1
2/17/2010	9:25:01 AM		1	3	49	0.11	2.27	37.56	14.6	111	248.5	248.7	42.4	65.2	56.2
2/17/2010	9:26:01 AM		1	3	50	0.12	2.29	38.362	14.9	110.7	247.3	252.7	42.8	65.2	56.3
2/17/2010	9:27:01 AM		1	3	51	0.12	2.3	39.164	14.9	111.1	246.4	250.3	43.1	65.3	56.5
2/17/2010	9:28:01 AM		1	3	52	0.12	2.31	39.971	15	110.8	249	250.3	43.3	65.4	56.7
2/17/2010	9:29:01 AM		1	3	53	0.12	2.37	40.787	15.4	110.8	246.4	252.5	43.7	65.4	56.9
2/17/2010	9:30:01 AM		1	3	54	0.12	2.39	41.606	15.6	111.1	247.1	251.2	44.1	65.5	57
2/17/2010	9:31:02 AM		1	3	55	0.12	2.42	42.435	15.8	111.2	249.1	249.8	44.4	65.4	57.1
2/17/2010	9:32:02 AM		1	3	56	0.12	2.28	43.239	15.1	111.3	247.2	252.2	44.6	65.4	57.3
2/17/2010	9:33:02 AM		1	3	57	0.12	2.3	44.043	15.1	111.1	246.6	251.2	44.6	65.7	57.4
2/17/2010	9:34:02 AM		1	3	58	0.12	2.32	44.851	15.2	111.3	248.5	249.8	44.9	65.9	57.6
2/17/2010	9:35:02 AM		1	3	59	0.12	2.35	45.665	15.4	111.2	247.6	250.9	45.3	65.9	57.7
2/17/2010	9:36:02 AM		1	4	60	0.12	2.36	46.481	15.6	111.3	246.3	252.4	45.6	66	57.8
2/17/2010	9:37:02 AM		1	4	61	0.13	2.45	47.311	16.1	111.9	248.6	249.6	46.1	66	58
2/17/2010	9:38:02 AM		1	4	62	0.13	2.48	48.148	16.4	112	248.1	252.5	46.6	65.9	58.2
2/17/2010	9:39:02 AM		1	4	63	0.13	2.69	49.021	16.3	111.9	246.7	252.5	46.9	65.9	58.3
2/17/2010	9:40:02 AM		1	4	64	0.13	2.7	49.901	12.6	112.1	248.3	249.4	47.4	66.2	58.5
2/17/2010	9:41:02 AM		1	4	65	0.13	2.61	50.757	11.9	111.9	248	252.6	47.6	67.3	58.6
2/17/2010	9:42:02 AM		1	4	66	0.13	2.57	51.609	11.7	111.9	246.3	251.8	47.9	68.3	58.8
2/17/2010	9:43:02 AM		1	4	67	0.13	2.56	52.462	11.7	111.8	248.4	250.3	48.3	69.2	58.9
2/17/2010	9:44:02 AM		1	4	68	0.13	2.57	53.317	11.7	111.8	247.6	250.7	48.5	70	59.1
2/17/2010	9:45:02 AM		1	4	69	0.13	2.63	54.18	12.1	111.8	246.4	252.4	48.7	70.8	59.3
2/17/2010	9:46:02 AM		1	4	70	0.13	2.59	55.038	11.9	112	248.2	249.9	48.8	71.3	59.5
2/17/2010	9:47:02 AM		1	4	71	0.13	2.61	55.897	12.1	111.6	247.9	251.4	49	71.7	59.7
2/17/2010	9:48:02 AM		1	4	72	0.13	2.49	56.739	11.6	111.9	245.8	252	49.1	72.1	60
2/17/2010	9:49:02 AM		1	4	73	0.13	2.53	57.585	11.8	111.7	248.7	250.2	49.2	72.5	60.1
2/17/2010	9:50:02 AM		1	4	74	0.13	2.6	58.447	12.2	112	248.1	251.2	49.4	72.8	60.3
2/17/2010	9:51:02 AM		1	4	75	0.13	2.57	59.301	12.3	111.9	246.9	253.3	49.5	73	60.6
2/17/2010	9:52:02 AM		1	4	76	0.13	2.56	60.154	12.8	112.1	248.5	249.3	49.7	73.1	60.8
2/17/2010	9:53:02 AM		1	4	77	0.13	2.56	61.005	12.9	111.9	247.4	254	49.9	73	61
2/17/2010	9:54:02 AM		1	4	78	0.12	2.31	61.814	11.8	111.5	246.5	250.1	50.3	73.1	61.2
2/17/2010	9:55:02 AM		1	4	79	0.12	2.32	62.626	11.8	111.3	249.1	251.1	50.5	73.3	61.3
2/17/2010	9:56:02 AM		1	5	80	0.12	2.35	63.441	12	111.4	245.7	251.9	50.6	73.6	61.5
2/17/2010	9:57:02 AM		1	5	81	0.12	2.33	64.256	11.9	113.2	248.1	249.6	50.5	73.7	61.6
2/17/2010	9:58:00 AM		1	5	82	0.12	2.36	65.046	12.2	110.5	248.3	250.1	51		



2/17/2010	10:01:00 AM	1	5	85	0.12	2.37	67.49	12.2	111.2	248.7	251.3	52	74.3	62.2
2/17/2010	10:02:00 AM	1	5	86	0.12	2.35	68.305	12.1	111.8	246.9	253.1	52.2	74.4	62.3
2/17/2010	10:03:00 AM	1	5	87	0.11	2.27	69.105	11.7	111.8	247.5	250.2	52.5	74.4	62.3
2/17/2010	10:04:00 AM	1	5	88	0.11	2.28	69.907	11.8	111.3	249.1	250.6	52.7	74.4	62.5
2/17/2010	10:05:00 AM	1	5	89	0.12	2.29	70.712	11.9	111.4	246.4	252.7	53	74.5	62.5
2/17/2010	10:06:00 AM	1	5	90	0.12	2.3	71.517	12	111.3	247.4	250.5	53.3	74.6	62.7
2/17/2010	10:07:00 AM	1	5	91	0.11	2.23	72.311	11.7	111.7	249	250.3	53.5	74.7	62.8
2/17/2010	10:08:02 AM	1	5	92	0.11	2.22	73.129	11.7	111.4	248.1	251.1	53.6	74.8	62.8
2/17/2010	10:09:02 AM	1	5	93	0.12	2.31	73.935	12.1	111.7	246.7	252.2	54	74.9	63
2/17/2010	10:10:00 AM	1	5	94	0.12	2.28	74.712	12	111.5	247.6	249.5	54.4	74.9	63.1
2/17/2010	10:11:02 AM	1	5	95	0.12	2.36	75.558	12.4	112	248.7	251.1	54.6	74.9	63.2
2/17/2010	10:12:02 AM	1	5	96	0.12	2.32	76.37	12.3	111.7	246.1	252.5	54.9	74.9	63.3
2/17/2010	10:13:02 AM	1	5	97	0.12	2.46	77.207	13	112.3	248.3	250.7	55.1	74.9	63.3
2/17/2010	10:14:02 AM	1	5	98	0.12	2.41	78.033	12.8	111.4	248.6	250.2	55.4	74.8	63.4
2/17/2010	10:15:02 AM	1	5	99	0.12	2.3	78.839	12.3	111.5	248.7	252.6	55.9	74.7	63.5
2/17/2010	10:16:02 AM	1	6	100	0.12	2.34	79.654	12.5	111.3	245.7	250.9	56.3	74.8	63.6
2/17/2010	10:17:02 AM	1	6	101	0.12	2.35	80.47	12.6	111.6	248	249.7	56.8	74.8	63.7
2/17/2010	10:18:02 AM	1	6	102	0.12	2.29	81.277	12.4	111	248.8	254.1	57.2	74.8	63.7
2/17/2010	10:19:00 AM	1	6	103	0.12	2.33	82.064	12.6	111.6	246.3	249.6	57.6	74.9	63.8
2/17/2010	10:20:02 AM	1	6	104	0.12	2.31	82.899	12.5	110.9	248.4	250.2	58.2	74.9	63.9
2/17/2010	10:21:02 AM	1	6	105	0.12	2.29	83.704	12.4	110.9	248.2	252.5	58.4	75	64
2/17/2010	10:22:00 AM	1	6	106	0.12	2.4	84.502	12.9	110.9	246.5	249.6	58.8	75.2	64.1
2/17/2010	10:23:02 AM	1	6	107	0.12	2.4	85.354	13.1	110.8	248.8	251.7	59.2	75.2	64.3
2/17/2010	10:24:02 AM	1	6	108	0.12	2.35	86.173	12.8	111.1	247.8	252.7	59.8	75.2	64.4
2/17/2010	10:25:02 AM	1	6	109	0.12	2.34	86.988	12.8	111.4	246.5	249.7	60.1	75.3	64.6
2/17/2010	10:26:02 AM	1	6	110	0.12	2.36	87.807	12.8	111.5	248.7	254.2	60.7	75.4	64.6
2/17/2010	10:27:02 AM	1	6	111	0.12	2.34	88.62	12.8	111.4	248.3	250.3	61	75.5	64.7
2/17/2010	10:28:02 AM	1	6	112	0.12	2.35	89.439	12.9	110.9	247.3	250.3	61.4	75.5	64.8
2/17/2010	10:29:02 AM	1	6	113	0.12	2.34	90.257	13	110.9	249.1	252.6	62	75.6	64.9
2/17/2010	10:30:02 AM	1	6	114	0.12	2.32	91.067	12.6	111.2	248	250.6	62	75.6	65
2/17/2010	10:31:02 AM	1	6	115	0.12	2.34	91.88	12.8	111.5	247.6	251.4	62.5	75.6	65
2/17/2010	10:32:02 AM	1	6	116	0.12	2.36	92.7	13	111.6	249.4	253.2	63.2	75.7	65.2
2/17/2010	10:33:02 AM	1	6	117	0.13	2.51	93.545	13.7	111.4	247.9	249.9	63.5	75.8	65.3
2/17/2010	10:34:02 AM	1	6	118	0.12	2.4	94.372	13.3	110.6	247.6	251.7	64	75.6	65.3
2/17/2010	10:35:02 AM	1	6	119	0.12	2.44	95.204	13.4	110.5	249.2	252.1	64.7	75.6	65.4
2/17/2010	10:36:02 AM	2	1	120	0.12	2.46	96.016	13.4	110.9	248	250.3	65.2	75.7	65.6
2/17/2010	10:41:00 AM	2	1	121	0.09	2.45	96.837	11.4	101.2	247.4	252	61.6	69.1	65.1
2/17/2010	10:42:00 AM	2	1	122	0.09	1.9	97.565	10.5	103	247.7	243.5	62.1	71	65.2
2/17/2010	10:43:00 AM	2	1	123	0.08	1.76	98.265	10	103.8	249.2	255.9	59.6	72.5	65.2
2/17/2010	10:44:00 AM	2	1	124	0.08	1.67	98.949	9.5	104.7	248.3	248.7	57.3	73.7	65.2
2/17/2010	10:45:00 AM	2	1	125	0.09	1.72	99.643	9.6	104.8	247.5	252.6	55	74.7	65.2
2/17/2010	10:46:00 AM	2	1	126	0.09	1.76	100.343	9.8	104.9	246.8	250.5	53.2	75.6	65.2
2/17/2010	10:47:00 AM	2	1	127	0.09	1.78	101.049	9.9	105	247.9	250.1	51.6	76.4	65.2
2/17/2010	10:48:00 AM	2	1	128	0.09	1.88	101.773	10.3	104	249.2	253.7	50.7	77.1	65.4
2/17/2010	10:49:00 AM	2	1	129	0.09	1.88	102.498	10.4	104.1	247	248.6	50.3	77.6	65.5
2/17/2010	10:50:00 AM	2	1	130	0.09	1.79	103.207	10.1	104.3	248.2	253.3	49.5	78	65.7
2/17/2010	10:51:00 AM	2	1	131	0.08	1.73	103.903	9.7	104.1	249.2	246.8	48.2	78.3	65.8
2/17/2010	10:52:00 AM	2	1	132	0.08	1.71	104.597	9.4	104.2	248.3	253.7	47.5	78.6	65.9
2/17/2010	10:53:00 AM	2	1	133	0.09	1.77	105.301	9.6	103.8	245.8	250.6	47.1	78.9	66
2/17/2010	10:54:00 AM	2	1	134	0.09	1.8	106.013	9.7	104.6	247.3	249.9	46.4	79.2	66.1
2/17/2010	10:55:00 AM	2	1	135	0.09	1.79	106.721	9.7	105.1	249.1	248.9	45.5	79.4	66.2
2/17/2010	10:56:00 AM	2	1	136	0.08	1.7	107.412	9.4	105.4	247.2	251.4	44.8	79.5	66.3
2/17/2010	10:57:00 AM	2	1	137	0.08	1.7	108.101	9.4	104.7	246.7	253.2	44.1	79.6	66.4
2/17/2010	10:58:00 AM	2	1	138	0.09	1.73	108.8	10.2	104.6	247.6	248.3	44.1	79.8	66.5
2/17/2010	10:59:00 AM	2	1	139	0.09	1.77	109.507	10.5	105	248.3	251	44	79.9	66.6
2/17/2010	11:00:00 AM	2	2	140	0.09	1.78	110.214	10.5	105.1	244.8	251	43.6	79.9	66.7
2/17/2010	11:01:00 AM	2	2	141	0.09	1.82	110.928	10.7	105.2	248.8	248.7	43.2	79.9	66.8
2/17/2010	11:02:00 AM	2	2	142	0.09	1.82	111.642	10.7	104.4	248.1	251.3	43	79.9	67
2/17/2010	11:03:00 AM	2	2	143	0.09	1.8	112.352	10.7	104.7	246.3	249.1	42.9	80	67.1
2/17/2010	11:04:00 AM	2	2	144	0.08	1.69	113.04	10.2	105.4	248.7	250.8	42.9	79.9	67.2
2/17/2010	11:05:01 AM	2	2	145	0.09	1.72	113.74	10.3	105.7	248.7	250.2	42.7	79.9	67.3
2/17/2010	11:06:01 AM	2	2	146	0.09	1.81	114.458	10.8	104.9	246.9	250.8	42.4	80	67.3
2/17/2010	11:07:01 AM	2	2	147	0.09	1.86	115.189	11.2	105.2	247.4	251.5	42.1	80.1	67.4
2/17/2010	11:08:01 AM	2	2	148	0.09	1.88	115.921	11.2	106	249.7	248.2	42	80	67.4
2/17/2010	11:09:01 AM	2	2	149	0.09	1.88	116.647	11.2	105.9	247.6	253.9	42	79.9	67.5
2/17/2010	11:10:01 AM	2	2	150	0.08	1.74	117.348	10.6	105.9	246.1	250.8	42	79.8	67.5
2/17/2010	11:11:01 AM	2	2	151	0.08	1.71	118.041	10.4	106.6	248.3	248.7	41.9	79.7	67.5
2/17/2010	11:12:01 AM	2	2	152	0.08	1.69	118.729	10.3	106.8	246.6	251.2	41.7	79.7	67.5
2/17/2010	11:13:01 AM	2	2	153	0.09	1.83	119.448	10.9	106.2	246.4	249.6	41.8	79.7	67.6
2/17/2010	11:14:01 AM	2	2	154	0.09	1.88	120.175	11.2	105.5	248.8	249.4	41.9	79.8	67.6
2/17/2010	11:15:01 AM	2	2	155	0.09	1.85	120.899	11.2	105.2	246.6	250.4	42	79.8	67.7
2/17/2010	11:16:01 AM	2	2	156	0.09	1.87	121.63	11.3	106.6	247.1	252.4	42	79.7	67.6
2/17/2010	11:17:01 AM	2	2	157	0.09	1.86	122.353	11.2	106.2	248.4	248.9	42	79.7	67.7
2/17/2010	11:18:01 AM	2	2	158	0.09	1.76	123.057	10.8	106.8	247.3	253.5	42.1	79.6	67.7
2/17/2010	11:19:01 AM	2	2	159	0.09	1.71	123.753	10.5	106.3	246.8	250.5	42.1	79.6	67.8
2/17/2010	11:20:01 AM	2	3	160	0.09	1.73	124.454	10.6	105.2	247.8	248.8	42.3	79.6	67.8
2/17/2010	11:21:01 AM	2	3	161	0.09	1.8	125.168	11	104.3	247.7	258.7	42.5	79.7	67.8
2/17/2010	11:22:01 AM	2	3	162	0.11	2.1	125.939	12.3	108.2	245.2	249.3	42.6	79.8	67.8
2/17/2010	11:23:01 AM	2	3	163	0.11	2.18	126.727	12.9	109.6	248.8	249.4	43	79.8	67.9
2/17/2010	11:24:01 AM	2	3	164	0.11	2.28	127.532	13.5	110.4	246.9	251.3	43	79.5	67.9
2/17/2010	11:25:01 AM	2	3	165	0.11	2.21	128.325	13.3	111.2	249.5	252.6	43.2	79.3	68
2/17/2010	11:26:01 AM	2	3	166	0.1	2.1	129.097	12.5	112.1	245	249.4	43	79	68
2/17/2010	11:27:01 AM	2	3	167	0.11	2.2	129.892	13.1	111.5	248.8	248.8	43.1	78.8	68
2/17/2010	11:28:01 AM	2	3	168	0.11	2.26	130.694	13.5	110.7	245.7	254.2	43.7	78.5	68
2/17/2010	11:29:01 AM	2	3	169										

2/17/2010	11:31:01 AM	2	3	171	0.11	2.16	133.081	13	111.5	246.1	251.1	44.2	78	68.2
2/17/2010	11:32:01 AM	2	3	172	0.11	2.17	133.867	13.1	111.3	249.8	249.4	44.2	77.9	68.2
2/17/2010	11:33:01 AM	2	3	173	0.11	2.14	134.644	13	111.6	246.1	250.8	44.4	78	68.3
2/17/2010	11:34:01 AM	2	3	174	0.1	2.03	135.402	12.4	112.5	249.9	251.4	44.6	78	68.4
2/17/2010	11:35:01 AM	2	3	175	0.1	2.05	136.166	12.5	112.9	246.1	250.7	44.8	78.2	68.4
2/17/2010	11:36:01 AM	2	3	176	0.11	2.17	136.948	13.1	111.8	247.8	248.6	45	78.2	68.4
2/17/2010	11:37:01 AM	2	3	177	0.11	2.15	137.73	13.1	111.5	247.9	253	44.9	78.2	68.4
2/17/2010	11:38:01 AM	2	3	178	0.11	2.15	138.512	13.2	111	245.9	251.9	44.9	78.1	68.4
2/17/2010	11:39:01 AM	2	3	179	0.11	2.21	139.304	13.5	110.7	249.7	249.7	44.9	78	68.3
2/17/2010	11:40:01 AM	2	4	180	0.11	2.18	140.089	13.5	111.3	246.4	252.1	45.2	77.8	68.3
2/17/2010	11:41:01 AM	2	4	181	0.1	2.03	140.848	12.7	112.3	250.3	250.7	45	77.8	68.4
2/17/2010	11:42:01 AM	2	4	182	0.1	2.03	141.609	12.7	112.7	246.2	248.9	45.4	77.7	68.3
2/17/2010	11:43:01 AM	2	4	183	0.11	2.15	142.39	13.3	111.5	249.5	253	45.6	77.8	68.4
2/17/2010	11:44:01 AM	2	4	184	0.11	2.22	143.184	13.7	111.3	244.3	249	45.9	77.8	68.4
2/17/2010	11:45:01 AM	2	4	185	0.11	2.16	143.968	13.5	111.2	249	250.3	46	77.7	68.4
2/17/2010	11:46:01 AM	2	4	186	0.11	2.09	144.738	13	111.3	244.7	251.6	45.7	77.7	68.4
2/17/2010	11:47:01 AM	2	4	187	0.12	2.41	145.567	14.7	112.3	248.3	254.1	46.2	77.6	68.3
2/17/2010	11:48:01 AM	2	4	188	0.12	2.45	146.406	15.2	113.2	246.6	250.3	46.7	77.2	68.3
2/17/2010	11:49:01 AM	2	4	189	0.13	2.49	147.253	15.5	113	247.8	251.2	47	76.9	68.3
2/17/2010	11:50:01 AM	2	4	190	0.13	2.59	148.115	16.1	112.1	246.8	252.5	47.6	76.4	68.3
2/17/2010	11:51:01 AM	2	4	191	0.13	2.66	148.99	16.5	111.6	246.8	250.6	48	75.8	68.2
2/17/2010	11:52:01 AM	2	4	192	0.13	2.62	149.857	15.9	111.8	249.3	250.8	48.5	75.3	68.2
2/17/2010	11:53:01 AM	2	4	193	0.13	2.65	150.729	15.9	112.1	245.2	250.2	48.9	75.1	68.3
2/17/2010	11:54:01 AM	2	4	194	0.12	2.48	151.57	15	112.8	247.8	249.5	49.2	74.9	68.3
2/17/2010	11:55:01 AM	2	4	195	0.12	2.42	152.402	14.4	113.3	248.5	250.7	49.3	75	68.2
2/17/2010	11:56:01 AM	2	4	196	0.12	2.49	153.247	14.8	113.1	245.9	252	49.3	75.1	68.1
2/17/2010	11:57:01 AM	2	4	197	0.12	2.46	154.088	14.6	112.9	247.3	251.3	49.4	75.2	68.1
2/17/2010	11:58:01 AM	2	4	198	0.13	2.51	154.936	14.8	112.3	249.1	250.4	49.5	75.2	68.1
2/17/2010	11:59:01 AM	2	4	199	0.13	2.5	155.779	14.7	112.4	246.4	253.6	49.7	75.2	68
2/17/2010	12:00:01 PM	2	5	200	0.13	2.5	156.625	15.1	112.5	246.9	249.9	49.8	75.3	68
2/17/2010	12:01:01 PM	2	5	201	0.12	2.48	157.466	15.4	112.4	249.8	249.4	49.8	75.1	68
2/17/2010	12:02:01 PM	2	5	202	0.12	2.44	158.301	14.9	112.7	246.9	249.6	49.8	75.1	68
2/17/2010	12:03:02 PM	2	5	203	0.12	2.41	159.131	14.8	112.6	249.1	252.2	49.8	75.2	68
2/17/2010	12:04:01 PM	2	5	204	0.12	2.46	159.97	15	112.3	245.9	250.2	49.7	75.2	68.1
2/17/2010	12:05:01 PM	2	5	205	0.12	2.43	160.804	15	111.7	249.7	250.4	49.9	75.2	68
2/17/2010	12:06:01 PM	2	5	206	0.12	2.44	161.64	15	111.6	245.3	253.2	50	75.2	68.1
2/17/2010	12:07:01 PM	2	5	207	0.12	2.46	162.479	15.1	111.7	247.8	250.9	50.4	75.3	68.1
2/17/2010	12:08:01 PM	2	5	208	0.12	2.45	163.315	15.2	112.3	248.6	248.7	50.6	75.3	68.1
2/17/2010	12:09:01 PM	2	5	209	0.11	2.34	164.131	14.6	113.2	246.3	254.3	50.4	75.3	68.2
2/17/2010	12:10:02 PM	2	5	210	0.11	2.26	164.938	14.2	113.7	246.8	249.9	50	75.4	68.1
2/17/2010	12:11:02 PM	2	5	211	0.12	2.32	165.752	14.6	113.2	249.1	250	50	75.4	68
2/17/2010	12:12:02 PM	2	5	212	0.12	2.35	166.571	14.6	112.9	245.8	252.4	50	75.5	68
2/17/2010	12:13:02 PM	2	5	213	0.12	2.37	167.392	14.8	113	248.6	251	50.3	75.5	68
2/17/2010	12:14:02 PM	2	5	214	0.12	2.37	168.213	14.8	112.5	248.3	250.9	50.2	75.4	68
2/17/2010	12:15:00 PM	2	5	215	0.12	2.36	169.008	14.8	112.6	245.2	250.5	50	75.4	68
2/17/2010	12:16:00 PM	2	5	216	0.12	2.35	169.832	14.8	112.2	248.4	248.8	50.1	75.3	67.9
2/17/2010	12:17:00 PM	2	5	217	0.12	2.43	170.666	15.3	112.3	247.7	250.8	50.5	75.4	68
2/17/2010	12:18:02 PM	2	5	218	0.12	2.41	171.524	15.2	111.9	246.2	252.3	50.5	75.3	68
2/17/2010	12:19:00 PM	2	5	219	0.12	2.47	172.34	15.5	112	248.8	248.8	50.5	75.1	67.9
2/17/2010	12:20:00 PM	2	6	220	0.11	2.27	173.142	14.7	111.6	248.9	249.7	50.8	75	68
2/17/2010	12:21:00 PM	2	6	221	0.1	2.11	173.918	13.5	111.2	247.2	251	50.9	75.2	68
2/17/2010	12:22:00 PM	2	6	222	0.1	2.08	174.685	13.4	111.9	246.8	252.8	50.5	75.5	68
2/17/2010	12:23:00 PM	2	6	223	0.1	2.05	175.447	13.4	112	248.3	249.1	50.4	75.8	67.9
2/17/2010	12:24:00 PM	2	6	224	0.1	2.05	176.209	13.4	111.9	247.8	251	50.4	76	67.9
2/17/2010	12:25:00 PM	2	6	225	0.1	2.05	176.97	13.4	111.8	246.1	248.6	50.5	76.4	68
2/17/2010	12:26:00 PM	2	6	226	0.1	2.08	177.739	13.6	111.4	248.6	255.8	50.1	76.6	68
2/17/2010	12:27:00 PM	2	6	227	0.1	2.05	178.5	13.4	111.5	247.8	251	50.2	76.7	68
2/17/2010	12:28:00 PM	2	6	228	0.1	2.08	179.269	13.6	111.8	247.7	252.1	50.1	76.8	68
2/17/2010	12:29:01 PM	2	6	229	0.1	2.06	180.036	13.5	112	249.8	250.6	50.1	76.9	68
2/17/2010	12:30:01 PM	2	6	230	0.1	2.08	180.803	13.6	111.7	246.5	250.6	50.1	76.9	68
2/17/2010	12:31:01 PM	2	6	231	0.1	2.07	181.569	13.5	111.8	246.9	249.2	50.5	77	68.1
2/17/2010	12:32:01 PM	2	6	232	0.1	2.08	182.337	13.7	111.5	248.6	250.6	50.5	77.2	68.3
2/17/2010	12:33:01 PM	2	6	233	0.1	2.06	183.102	13.5	111.6	248.1	251.2	50.6	77.3	68.4
2/17/2010	12:34:01 PM	2	6	234	0.1	2.08	183.872	13.7	111.6	246.9	257.5	50.4	77.3	68.4
2/17/2010	12:35:01 PM	2	6	235	0.1	2.07	184.639	13.5	111.8	247.1	250.9	50.7	77.4	68.4
2/17/2010	12:36:01 PM	2	6	236	0.1	2.07	185.406	13.6	111.3	248.9	252.7	50.6	77.5	68.5
2/17/2010	12:37:01 PM	2	6	237	0.1	2.01	186.16	13.3	111.5	248.3	252.3	50.7	77.5	68.5
2/17/2010	12:38:01 PM	2	6	238	0.1	1.99	186.913	13	111.5	246	249.7	50.7	77.6	68.5
2/17/2010	12:39:01 PM	2	6	239	0.1	2.04	187.674	13.4	111.5	248.2	250.3	50.9	77.7	68.5
2/17/2010	12:40:01 PM	3	1	240	0.11	2.11	188.439	13.7	111.8	248.9	252.2	50.9	77.8	68.6

### Determination of Dioxin/Furan Emissions From Stationary Sources

Determination of Dioxin/Furan Emissions From Stationary Sources			
Client	Met Council	Date	2-17-10
Facility	Seneca	Job Number	902630
Unit	Unit 1	Description	Dioxin/Furan
Location	Stack	Run No.	3
Pbar (inHg)	29.29	Ref Temp°F	68
Ref Pres (in.Hg)	29.92	H2O Cond. (mL)	64.7
Meter Factor (Y)	1.011	Delta H@	1.889
Pitot Coeff. (Cp)	0.84	Stack Area (ft2)	15.90
Dry MW	29.4	Wet MW	29.2
Nozzle Diameter (in)	0.374	Press Stack (Ps)	-0.20
Avg O2 (%)	15.70	Avg CO2 (%)	4.90

Traverse Point		Time (min)	Delta P (in.H <sub>2</sub> O)	Delta H (inH <sub>2</sub> O)	Meter Reading (acf)	Vacuum (in. Hg)	Stack Temp (°F)	Probe Temp. (°F)	Filter Temp. (°F)	Impinger Temp (°F)	Meter In Temp (°F)	Meter Out Temp (°F)
Port	Point											
		<b>See Automated Box 1-Minute Data Sheet</b>										
Averages		0	0.11	2.18	188.439	12.7	110	248	251	47	77	67

Sample Gas Volume	186.012 dscf
Water Vapor	3.051 scf
Moisure Content	1.61 %
Avg. Stack Velocity	19.20 ft/sec
	1151.92 ft/min
Stack Flow	18320 wacfm
	16597 wscfm
	16329 dscfm

**% Isokinetic** **98.9 %**

# EMSI

# EPA Method 23 Example Calculation

## Run 1 Unit 1 Test Method

### Sample Volume (dscf)

179.935

<b>A</b>	Convert F to R	460
<b>B</b>	Reference Temperature (F)	68
<b>C</b>	Reference Pressure (inHg)	29.92
<b>D</b>	Meter Volume (ft3)	185.252
<b>E</b>	Meter Factor (Yd)	1.011
<b>F</b>	Barometric Pressure (inHg)	29.32
<b>G</b>	Avg Delta H (inH2O)	2.06
<b>H</b>	Convert inH2O to inHg	13.6
<b>I</b>	Avg Meter In Temp (F)	87
<b>J</b>	Avg Meter Out Temp (F)	76
<b>Formula</b>	$((A + B) / C) * D * E * ((F + G / H) / ((I + J) / 2) + A)$	

### Water Vapor (scf)

2.730

<b>A</b>	Water Condensed (ml)	57.9
<b>B</b>	Constant	0.04715
<b>Formula</b>	$A * B$	

### Moisture Content (%)

1.49

<b>A</b>	Water Vapor (scf)	2.730
<b>B</b>	Sample Volume (dscm)	179.935
<b>Formula</b>	$(A / (A + B)) * 100$	

### Absolute Stack Pressure (in. Hg)

29.31

<b>A</b>	Barometric Pressure (in. Hg)	29.3
<b>B</b>	Stack Pressure (in. H2O)	-0.20
<b>C</b>	Conversion inH2O to inHg	13.6
<b>Formula</b>	$A + (B / C)$	

### Stack MW Dry (lbs/lb\*mole)

29.38

<b>A</b>	MW Fraction CO2	0.44
<b>B</b>	Average CO2 (%)	4.8
<b>C</b>	MW O2	0.32
<b>D</b>	Average O2 (%)	15.3
<b>E</b>	MW Fraction N2 / CO	0.28
<b>F</b>	Average N2 (%)	79.9
<b>G</b>	Average CO (ppm)	0.0
<b>H</b>	Conversion (ppm to %)	10000
<b>Formula</b>	$(A * B) + (C * D) + (E * F) + ((E * (G / H))$	

### Stack MW Wet (lb/lb mole)

29.21

<b>A</b>	Stack MW dry (lb/lb mole)	29.38
<b>B</b>	Constant A	1
<b>C</b>	Moisture Content (%)	1.49
<b>D</b>	Percent Conversion	100
<b>E</b>	MW H2O (lb/lb mole)	18
<b>Formula</b>	$A * (B - (C / D) + (E * (C / D)))$	

### Avg. Stack Velocity (ft/sec)

18.79

<b>A</b>	EPA Constant	85.49
<b>B</b>	Pitot Coef.	0.84
<b>C</b>	Avg. SQRT Delta P	0.32
<b>D</b>	Avg. Temp (R)	569
<b>E</b>	Abs. Stack Pres. (in Hg)	29.305
<b>F</b>	Stack MW Wet (lb/lb mole)	29.21
<b>Formula</b>	$A * B * C * \text{SQRT}(D / (E * F))$	

### Nozzle Area (ft2)

0.000762905

<b>A</b>	Nozzle Size	0.374
<b>B</b>	Constant A	12
<b>C</b>	Constant B	2
<b>D</b>	Pi (Microsoft Function @Pi)	3.141592654
<b>Formula</b>	$((A / 12) / 2) ^ 2 * D$	

### % Isokinetic

97.4

<b>A</b>	Percent Conversion	100.00
<b>B</b>	Avg. Stack Temp. (F)	109
<b>C</b>	Temp Conv to Rankin	460
<b>D</b>	Constant C	0.002669
<b>E</b>	H2O Cond (ml)	57.90

<b>F</b>	Meter Volume (acf)	185.252
<b>G</b>	Meter Factor	1.011
<b>H</b>	Meter Inlet Temp (F)	87
<b>I</b>	Meter Outlet Temp (F)	76
<b>J</b>	Divide by 2	2
<b>K</b>	Barometric Press. (in. Hg)	29.32
<b>L</b>	Avg. Delta H (inH2O)	2.06
<b>M</b>	Conv inHg to inH2O	13.6
<b>N</b>	60 minutes per hour conv	60
<b>O</b>	Test Length (min)	240
<b>P</b>	Avg. Stack Vel. (ft/sec)	18.79
<b>Q</b>	Abs. Stack Press. (in. Hg)	29.305
<b>R</b>	Nozzle Area (ft2)	0.000762905
<b>Formula</b>	$A * (B + C) * (D * E + F * G / (((H + I) / J) + C) * (K + L / M)) / (N * O * P * Q * R)$	

#### Stack Area (ft2)

15.90

<b>A</b>	Stack Diameter (inches)	54.0
<b>B</b>	Constant A	12
<b>C</b>	Constant B	2
<b>D</b>	Pi (Microsoft Function @Pi)	3.141592654
<b>Formula</b>	$((A / 12) / 2)^2 * D$	

#### Stack Volumetric Flow (wacfm)

17,927

<b>A</b>	Stack Area (ft2)	15.90
<b>B</b>	Stack Flow Velocity (ft/sec)	18.79
<b>C</b>	Conversion sec to min	60
<b>Formula</b>	$((A / 12) / 2)^2 * D$	

#### Stack Volumetric Flow (wscfm)

16,290

<b>A</b>	Stack Flow (wacfm)	17927
<b>B</b>	Convert F to R	460
<b>C</b>	Reference Temp (F)	68
<b>D</b>	Avg. Temp (R)	569
<b>E</b>	Abs. Stack Press. (in. Hg)	29.305
<b>F</b>	Reference Pres (inHg)	29.92
<b>Formula</b>	$A * ((B + C) / D) * (E / F)$	

#### Stack Volumetric Flow (dscfm)

16,046

<b>A</b>	Stack Flow (wscfm)	16290
<b>B</b>	Moisture Content (%)	1.49
<b>C</b>	Percent Conversion	100
<b>Formula</b>	$A * (1 - (B / C))$	

#### Total PCDD/PCDF (ng)

3.16

<b>A</b>	OCDD (ng)	0.40
<b>B</b>	OCDF (ng)	0.40
<b>C</b>	Total TCDD (ng)	0.18
<b>D</b>	Total PeCDD (ng)	0.04
<b>E</b>	Total HxCDD (ng)	0.04
<b>F</b>	Total HpCDD (ng)	0.04
<b>G</b>	Total TCDF (ng)	1.87
<b>H</b>	Total PeCDF (ng)	0.04
<b>I</b>	Total HxCDF (ng)	0.11
<b>J</b>	Total HpCDF (ng)	0.04
<b>Formula</b>	$A + B + C + D + E + F + G + H + I + J$	

#### Total PCDD/PCDF (ng/dscf)

0.018

<b>A</b>	Total PCDD/PCDF (ng)	3.16
<b>B</b>	Sample Gas Volume (dscf)	179.935
<b>Formula</b>	$A / B$	

#### Total PCDD/PCDF (ng/dscm)

0.620

<b>A</b>	Total PCDD/PCDF (ng/dscf)	0.018
<b>B</b>	Conversion ft3 to m3	35.31467
<b>Formula</b>	$A * B$	

#### Total PCDD/PCDF (ng/dscm @ 7% O2)

1.540

<b>A</b>	Total PCDD/PCDF (ng/dscm)	0.620
<b>B</b>	Oxygen Correction Value (%)	7.0
<b>C</b>	Ambient Oxygen Conc (%)	20.9
<b>D</b>	Stack Oxygen (%)	15.3
<b>Formula</b>	$A * ((C - B) / (C - D))$	

# **EPA Method OTM 027**

## **Determination of Particulate Matter Less Than 2.5 Microns**

<b>Test Information</b>					
Client:	Met Council	Date:	2-16-10	Time:	8:55-13:03
Facility:	Seneca	Location:	Stack	Job #:	902630
Unit:	Unit 1	Test #:	1		13:03

<b>Preliminary Measurements</b>			
Barometric Press. =	29.32	% CO2 =	4.3
Stack Pressure, Pg =	-0.2	% O2 =	15.5
Ave. Stack Temp., Ts =	108	M2 Pitot Correction, Cp =	0.84
Inlet Meter Temp. =	100	M201A Pitot Correction =	0.84
Outlet Meter Temp. =	80	Delta H@ =	2.020
Moisture Content, % =	3.10	Total Run Time =	245
Average Delta P =	0.10	Number Of Sample Points =	12
Point #1 Delta P =	0.09	Nozzle Number:	225076
		Nozzle Diameter:	0.274
Cyclone Flow Rate, Qs = 0.42892 CFM			
Minimum Delta P, ^Pmin, = 0.022080 "H2O			
Maximum Delta P, ^Pmax, = 0.185863 "H2O			
PM 2.5 Delta H Setpoint = 0.54298 "H2O			

<b>Test Data</b>					
Barometric Press. =	29.32	inHg	Water Condensate		
Stack Pressure, Pg =	-0.2	inH2O	Start	End	Total
% CO2 =	4.8	%	1	361.9	367.6
% O2 =	15.3	%	2	621.4	624.8
Meter Factor (Y)	1.000	dimensionless	3	697.3	694.3
Stack Diameter	54.00	inches	4	826.8	855.6
			Total	2507.4	2542.3
					34.9

Port/Point	Time	Delta P	ER	Stack Temp.	Dwell Time	Delta H	Meter ACF	Vacuum	Imp Temp	Meter Inlet	Meter Outlet	Cond Filter
							0.000					
A-1	0.0	0.09		109.2	19.3	0.55	8.036	4.0	32	102	85	32.6
A-2	19.3	0.10		110.3	20.3	0.55	16.080	5.0	34	102	85	34.1
A-3	39.6	0.11		110.2	21.3	0.55	25.204	7.0	41	106	93	44.9
A-4	60.9	0.10		109.7	20.3	0.55	33.400	8.0	43	104	94	47.3
A-5	81.3	0.09		110	19.3	0.55	41.132	10.0	47	101	94	51.1
A-6	100.6	0.10		108	20.3	0.55	49.472	11.0	48	98	93	50.8
B-1	120.9	0.10		101.4	20.3	0.55	57.012	12.0	52	94	90	52.5
B-2	141.2	0.11		107.3	21.3	0.55	64.670	13.0	56	93	89	54.7
B-3	162.6	0.10		108.5	20.3	0.55	72.550	14.0	63	91	87	56.2
B-4	182.9	0.11		109.5	21.3	0.55	80.900	15.0	48	89	86	45.3
B-5	204.2	0.11		110.3	21.3	0.55	88.910	17.0	46	87	85	46
B-6	225.5	0.09		109.4	19.3	0.55	96.834	20.0	54	83	83	53.4
Final	244.8	--	--	--	--	--	--	--	--	--	--	--
<b>Avg/Total</b>	<b>244.8</b>	<b>0.10</b>		<b>109</b>	<b>20</b>	<b>0.55</b>	<b>96.834</b>	<b>11.3</b>	<b>47</b>	<b>96</b>	<b>89</b>	<b>47</b>

<b>Test Results</b>			
Absolute Pressure Stack (Ps)	29.31 inHg	Stack Flow	17,733 wacfm
Vol Meter (Vm(std))	90.862 dscf	Stack Flow	16,127 wscfm
Sample Rate (Qs)	0.415 acfm	Stack Flow	15,840 dscfm
Volume Water Vapor (Vw(std))	1.643 scf	Moisture Gain	34.9 mg
Molecular Weight Dry (Md)	29.38 lb/lb-mole		
Molecular Weight Wet (Mw)	29.18 lb/lb-mole		
Viscosity of Gas	189.99 micropoise		
Moisture Content Gas	1.78 %		
Stack Velocity	18.58 ft/sec		
Area Nozzle	0.000409 ft2		
Stack Area	15.90 ft2		

<b>Acceptability Criteria</b>	
# Points outside delta P min/max ranges	n

## EPA Method QTM 027

#### Determination of Particulate Matter Less Than 2.5 Microns

## Test Information

Client:	Met Council	Date:	2-16-10	Time:	14:00-18:06	14:00
Facility:	Seneca	Location:	Stack	Job #:	902630	18:06
Unit:	Unit 1	Test #:	2			

## Preliminary Measurements

Barometric Press. =	29.32	% CO2 =	4.5
Stack Pressure, Pg =	-0.2	% O2 =	15.5
Ave. Stack Temp., Ts =	109	M2 Pitot Correction, Cp =	0.84
Inlet Meter Temp. =	96	M201A Pitot Correction =	0.84
Outlet Meter Temp. =	89	Delta H@ =	2.020
Moisture Content, % =	1.70	Total Run Time =	242
Average Delta P =	0.10	Number Of Sample Points =	12
Point #1 Delta P =	0.1	Nozzle Number:	225088
		Nozzle Diameter:	0.275

Cyclone Flow Rate, Qs =	0.43130 CFM
Minimum Delta P, $\Delta P_{min}$ , =	0.022122 "H <sub>2</sub> O
Maximum Delta P, $\Delta P_{max}$ , =	0.186970 "H <sub>2</sub> O
PM 2.5 Delta H Setpoint =	0.57329 "H <sub>2</sub> O

## Test Data

Barometric Press. =	29.3	inHg	Water Condensate			
Stack Pressure, Pg =	-0.2	inH2O	Start	End	Total	
% CO2 =	4.5	%	1	358.8	364.8	6
% O2 =	15.3	%	2	608	610.4	2.4
Meter Factor (Y)	1.000	dimensionless	3	699.1	698.5	-0.6
Stack Diameter	54.00	inches	4	796.8	822.3	25.5
			Total	2462.7	2496	33.3

Port/Point	Time	Delta P	ER Stack Temp.	Dwell Time	Delta H	Meter ACF	Vacuum	Imp Temp	Meter Inlet	Meter Outlet	Cond Filter
						0.000					
A-1	0.0	0.10	106.1	20.1	0.58	8.429	5.0	38	97	85	43.2
A-2	20.1	0.11	111.3	21.1	0.58	17.650	6.0	39	98	86	44.6
A-3	41.1	0.11	111.8	21.1	0.58	25.310	7.0	39	99	88	45.9
A-4	62.2	0.10	112.7	20.1	0.58	33.581	7.0	40	100	89	46.7
A-5	82.3	0.09	112.3	19.1	0.58	41.379	9.0	40	100	90	45.8
A-6	101.3	0.07	111.8	16.8	0.58	48.451	11.0	41	100	91	45.4
B-1	118.1	0.10	103.3	20.1	0.58	56.723	12.0	42	97	91	43.6
B-2	138.2	0.11	110.9	21.1	0.58	65.480	14.0	41	96	91	44.1
B-3	159.3	0.11	112.2	21.1	0.58	74.000	15.0	41	96	91	43.6
B-4	180.4	0.11	112.6	21.1	0.58	82.760	16.0	41	93	90	43.9
B-5	201.4	0.09	112.2	19.1	0.58	90.612	18.0	42	90	89	44.4
B-6	220.5	0.09	111.7	19.1	0.58	98.354	20.0	45	86	87	44.4
Final	239.5	--	--	--	--	--	--	--	--	--	--
Avg/Total	239.5	0.10	111	20	0.58	98.354	11.7	41	96	89	45

## Test Results

Absolute Pressure Stack (Ps)	29.29 inHg	Stack Flow	17,613 wacfm
Vol Meter (Vm(std))	92.184 dscf	Stack Flow	15,948 wscfm
Sample Rate (Qs)	0.432 acfm	Stack Flow	15,682 dscfm
Volume Water Vapor (Vw(std))	1.567 scf	Moisture Gain	33.3 mg
Molecular Weight Dry (Md)	29.33 lb/lb-mole		
Molecular Weight Wet (Mw)	29.14 lb/lb-mole		
Viscosity of Gas	190.59 micropoise		
Moisture Content Gas	1.67 %		
Stack Velocity	18.46 ft/sec		
Area Nozzle	0.000412 ft2		
Stack Area	15.90 ft2		

### Acceptability Criteria

# Points outside delta P min/max ranges	<b>0</b>
% Isokinetic (I)	<b>94.68</b> 80<= I <=120
Z Value Acceptance Criteria	<b>1.0320</b> 0.99 <= Z <= 1.01
Z Value Acceptance Criteria 2nd Iteration	<b>1.0000</b> 0.99 <= Z <= 1.01
Acceptable Test Run	<b>Yes</b> Yes/No



## EPA Method QTM 027

### Determination of Particulate Matter Less Than 2.5 Microns

## Test Information

Client:	Met Council	Date:	2-17-10	Time:	8:04-12:45	8:04
Facility:	Seneca	Location:	Stack	Job #:	902630	12:45
Unit:	Unit 1	Test #:	3			

## Preliminary Measurements

Barometric Press. =	29.29	% CO2 =	4.5
Stack Pressure, Pg =	-0.2	% O2 =	15.0
Ave. Stack Temp., Ts =	111	M2 Pitot Correction, Cp =	0.84
Inlet Meter Temp. =	96	M201A Pitot Correction =	0.84
Outlet Meter Temp. =	89	Delta H@ =	2.020
Moisture Content, % =	1.80	Total Run Time =	245
Average Delta P =	0.10	Number Of Sample Points =	12
Point #1 Delta P =	0.09	Nozzle Number:	225076
		Nozzle Diameter:	0.274

Cyclone Flow Rate, Qs =	0.43261 CFM
Minimum Delta P, $\Delta P_{min}$ , =	0.022454 "H <sub>2</sub> O
Maximum Delta P, $\Delta P_{max}$ , =	0.189009 "H <sub>2</sub> O
PM 2.5 Delta H Setpoint =	0.57092 "H <sub>2</sub> O

## Test Data

Barometric Press. =	29.29	inHg	Water Condensate			
Stack Pressure, Pg =	-0.2	inH2O	Start	End	Total	
% CO2 =	4.9	%	1	362	371.1	9.1
% O2 =	15.7	%	2	621.6	626	4.4
Meter Factor (Y)	1.000	dimensionless	3	684.7	682	-2.7
Stack Diameter	54.00	inches	4	843.8	868.3	24.5
			Total	2512.1	2547.4	35.3

Port/Point	Time	Delta P	ER Stack Temp.	Dwell Time	Delta H	Meter ACF	Vacuum	Imp Temp	Meter Inlet	Meter Outlet	Cond Filter
						0.000					
A-1	0.0	0.09	106	19.5	0.57	7.927	6.0	34	96	78	38.4
A-2	19.5	0.10	111	20.5	0.57	16.415	7.0	30	84	76	32.8
A-3	40.0	0.11	111	21.5	0.57	24.757	8.0	30	84	76	33.1
A-4	61.5	0.10	111	20.5	0.57	32.584	8.0	32	84	76	34.7
A-5	82.0	0.09	111.3	19.5	0.57	40.492	10.0	33	86	77	36.4
A-6	101.4	0.08	111.1	18.3	0.57	48.051	11.0	34	86	77	37.7
B-1	119.7	0.10	106.7	20.5	0.57	56.096	13.0	32	85	78	32.4
B-2	140.2	0.10	106.8	20.5	0.57	64.364	15.0	32	85	78	31.4
B-3	160.8	0.11	109.7	21.5	0.57	72.930	16.0	32	85	79	32.8
B-4	182.3	0.11	111	21.5	0.57	81.598	17.0	34	83	79	33.3
B-5	203.8	0.11	111.7	21.5	0.57	90.020	20.0	35	80	79	33.1
B-6	225.3	0.09	112.3	19.5	0.57	97.644	22.0	37	77	78	33.7
Final	244.7	--	--	--	--	--	--	--	--	--	--
Avg/Total	244.7	0.099	110	20	0.57	97.644	12.8	33	84	78	34

## Test Results

Absolute Pressure Stack (Ps)	29.28 inHg	Stack Flow	17,596 wacfm
Vol Meter (Vm(std))	93.427 dscf	Stack Flow	15,949 wscfm
Sample Rate (Qs)	0.429 acfm	Stack Flow	15,671 dscfm
Volume Water Vapor (Vw(std))	1.662 scf	Moisture Gain	35.3 mg
Molecular Weight Dry (Md)	29.41 lb/lb-mole		
Molecular Weight Wet (Mw)	29.21 lb/lb-mole		
Viscosity of Gas	190.56 micropoise		
Moisture Content Gas	1.75 %		
Stack Velocity	18.44 ft/sec		
Area Nozzle	0.000409 ft2		
Stack Area	15.90 ft2		

### Acceptability Criteria

# Points outside delta P min/max ranges	0
% Isokinetic (I)	94.68 80<= I <=120
Z Value Acceptance Criteria	1.0320 0.99 <= Z <= 1.01
Z Value Acceptance Criteria 2nd Iteration	1.0000 0.99 <= Z <= 1.01
Acceptable Test Run	Yes Yes/No





## AUTOMATED BOX STACK TEST DATA SHEET

Client	Met Council	Test Date	2/17/2010
Facility	Seneca	Start/Stop Time	13:50-14:56
Unit	1	Test Method	EPA 26
Location	Stack	Run Number	1
Project #	902630	Description	HCl
Operator	BD	Carbon Trap ID	

### RUN DATA

Tamb	°F	# Ports	1	Meter Box #	AB-3	ID#
Pbar	29.29	In Hg		Nozzle Dia. (in)	NA	ID#
Filter #		# Points	1	Probe ID #		Pitot ID #
MF #	1.39	Time/Pt	60	del H @	1.889	
Pstack	-0.2	Port Order		Meter Factor	1.011	
Sample Time	60	In H2O		Data File Name	Unit 1 Run 3 M23	
		Pitot Coef	0.84			
		Test #	1			

Leak Chk	CFM	Vac	Init	Time	Pitot Leak Check	Run	1	2	3	Average
Pre	0.009	15	BD	13:42	Pre	O2	15.30	15.30	15.30	15.30
Post	0.002	10	BD	14:57	ok	CO2	5.00	5.00	5.00	5.00

$\leq 0.02$  cfm or 4 % of Sample Rate      Stable @  $\geq 3"$  15 sec

### DATA CORRECTIONS / RECORD

End Vol	Start Vol	Diff	Omit	Description	Impinger	MATERIAL WEIGHT (g)	50ml Rinse	Y	N
						End	Start	Diff	ID #
					#1	110.0	100.0		
					#2	100.0	100.0		
					#3	0.0	0.0		
					#4	4.3	0.0		
					#5				
					#6				
					#7				
					#8				
					Total	214.3	200.0	14.3	

Post Field Meter Calibration    Set Vacuum = 17"    Collect 5 cf per run

Delta H	Vm I	Vm F	Tm I	Tm F	ID	Amb	Vacuum	Time

TC Field Calibration

Ref °F	Probe TC °F

$\leq 1.5$  % (Absolute Temp)

Comments


	Time	Port	Point	Time	Delta P	Delta H	Meter Vol	Vac	Stack	Probe	Filter	Dryer	Meter In	Meter Out	
Average					60	0.10	1.89	43.813	6.6	112.9	248.3	250.8	46.4	79.6	68.3
2/17/2010	1:51:02 PM	1	1	1	0.09	2.45	0.849		7.5	113.1	248.8	251.9	41.9	84.1	80.9
2/17/2010	1:52:02 PM	1	1	2	0.09	1.96	1.601		6.3	113.3	248	249.3	42.5	88.2	81.3
2/17/2010	1:53:02 PM	1	1	3	0.09	1.97	2.354		6.4	113.4	248.7	252.6	42.4	90	80.8
2/17/2010	1:54:02 PM	1	1	4	0.09	1.96	3.106		6.4	113.2	248.5	249.1	42.7	90.6	80.6
2/17/2010	1:55:02 PM	1	2	5	0.09	1.96	3.857		6.4	112.6	248.6	250.9	42.3	90.6	80.2
2/17/2010	1:56:02 PM	1	2	6	0.1	1.96	4.609		6.4	112.4	248.6	251.8	42.1	90.5	79.8
2/17/2010	1:57:02 PM	1	2	7	0.1	1.96	5.358		6.4	112.4	248.3	249.6	41.7	89.9	79.2
2/17/2010	1:58:02 PM	1	2	8	0.1	1.95	6.105		6.4	112.6	248.8	250.7	41.9	89.6	78.9
2/17/2010	1:59:02 PM	1	2	9	0.1	1.94	6.852		6.4	112.5	248.6	250.6	42.2	89.2	78.4
2/17/2010	2:00:02 PM	1	3	10	0.1	1.94	7.597		6.4	112.3	248.5	249.4	42.3	88.3	77.6
2/17/2010	2:01:02 PM	1	3	11	0.11	1.93	8.34		6.4	112.5	248.6	251.3	43	87.8	77.3
2/17/2010	2:02:02 PM	1	3	12	0.11	1.91	9.08		6.4	111.9	248.8	251.1	42.9	86.7	76.4
2/17/2010	2:03:02 PM	1	3	13	0.11	1.91	9.819		6.4	111.7	248.5	251.2	43.3	86	75.8
2/17/2010	2:04:02 PM	1	3	14	0.11	1.91	10.555		6.4	111.8	248.6	251.5	43.9	85.2	75.2
2/17/2010	2:05:02 PM	1	4	15	0.11	1.9	11.29		6.4	111.8	248.7	249.6	44.5	84.6	74.9
2/17/2010	2:06:02 PM	1	4	16	0.11	1.88	12.023		6.3	112.1	248.7	252.5	44.9	84	74.4
2/17/2010	2:07:02 PM	1	4	17	0.11	1.86	12.754		6.3	111.9	248.4	249.3	45.2	83.5	73.9
2/17/2010	2:08:02 PM	1	4	18	0.11	1.85	13.484		6.3	112.1	248.5	253	45.4	82.8	73.2
2/17/2010	2:09:02 PM	1	4	19	0.11	1.85	14.211		6.3	111.8	248.7	249.1	45.9	82.3	72.7
2/17/2010	2:10:02 PM	1	5	20	0.11	1.86	14.936		6.3	111.4	248.6	252.3	46.1	81.7	72
2/17/2010	2:11:02 PM	1	5	21	0.09	1.87	15.66		6.4	111.7	249	249.6	46.4	81.3	71.5
2/17/2010	2:12:02 PM	1	5	22	0.09	1.85	16.384		6.3	112	248.7	253.4	46.8	81.1	71.2
2/17/2010	2:13:02 PM	1	5	23	0.09	1.84	17.105		6.3	112	247.7	248.9	46.8	80.7	70.5
2/17/2010	2:14:02 PM	1	5	24	0.09	1.84	17.824		6.4	112	248.8	252	46.8	80.3	70
2/17/2010	2:15:02 PM	1	6	25	0.09	1.83	18.542		6.4	112.3	247.5	250.4	47.1	80	69.8
2/17/2010	2:16:02 PM	1	6	26	0.08	1.83	19.26		6.3	112	247.6	249.7	46.9	79.3	69
2/17/2010	2:17:00 PM	1	6	27	0.08	1.83	19.952		6.3	112.3	248	251.5	47	78.9	68.6
2/17/2010	2:18:00 PM	1	6	28	0.08	1.82	20.669		6.3	112.5	248.2	249	47.3	78.6	68.3
2/17/2010	2:19:00 PM	1	6	29	0.08	1.8	21.385		6.3	112.8	248.6	253.1	47.4	78.4	68
2/17/2010	2:20:00 PM	2	1	30	0.08	1.81	22.099		6.3	112.8	248.3	249.2	47.7	78.3	67.8
2/17/2010	2:26:19 PM	1	7	31	0.1	1.85	22.829		6.1	113	248.2	251.8	46	69.5	65.8
2/17/2010	2:27:21 PM	1	7	32	0.1	1.87	23.577		6.5	112.5	246.6	248.6	46.6	72.2	64.4
2/17/2010	2:28:21 PM	1	7	33	0.1	1.86	24.299		6.5	112.4	248.3	251.8	46.7	73.6	64
2/17/2010	2:29:21 PM	1	7	34	0.1	1.86	25.021		6.5	113	247.4	249.7	46.7	74.4	63.7
2/17/2010	2:30:21 PM	1	8	35	0.1	1.85	25.739		6.5	113.4	248.7	251	46.5	74.7	63.5
2/17/2010	2:31:21 PM	1	8	36	0.1	1.91	26.47		6.7	113.6	248.5	251.7	46.2	74.9	63.3
2/17/2010	2:32:21 PM	1	8	37	0.1	1.91	27.201		6.8	113.6	248.1	250.1	46.4	75.2	63.3
2/17/2010	2:33:21 PM	1	8	38	0.1	1.89	27.932		6.8	113.7	248.9	251.9	46.3	75.1	62.9
2/17/2010	2:34:21 PM	1	8	39	0.1	1.89	28.663		6.8	113.3	248.4	249.5	46.4	75.2	62.6
2/17/2010	2:35:21 PM	1	9	40	0.1	1.89	29.393		6.8	113.9	248.7	251.8	46.7	75.3	62.5
2/17/2010	2:36:21 PM	1	9	41	0.11	1.87	30.12		6.8	113.8	248.5	249.9	47.1	75.3	62.4
2/17/2010	2:37:21 PM	1	9	42	0.11	1.9	30.847		6.8	113.9	248.6	250.3	47.4	75.2	62.3
2/17/2010	2:38:21 PM	1	9	43	0.11	1.88	31.574		6.8	113.4	248.2	252.1	47.6	75.1	62
2/17/2010	2:39:21 PM	1	9	44	0.11	1.91	32.301		6.8	113.2	247.3	248.8	48	75.1	61.8
2/17/2010	2:40:21 PM	1	10	45	0.11	1.89	33.027		6.8	113.3	248.2	251.2	48.3	75	61.8
2/17/2010	2:41:21 PM	1	10	46	0.11	1.88	33.752		6.8	113.3	247.3	250.9	48.5	74.9	61.6
2/17/2010	2:42:21 PM	1	10	47	0.11	1.88	34.476		6.8	113.2	247.8	249.5	48.5	74.9	61.4
2/17/2010	2:43:21 PM	1	10	48	0.11	1.87	35.199		6.8	113.2	248.9	252.2	48.5	75	61.2
2/17/2010	2:44:21 PM	1	10	49	0.11	1.88	35.922		6.8	113.6	248.6	250.1	49	74.9	61.1
2/17/2010	2:45:21 PM	1	11	50	0.11	1.88	36.645		6.8	113.4	247.9	251.9	49.1	74.6	60.8
2/17/2010	2:46:21 PM	1	11	51	0.11	1.87	37.366		6.8	113.4	248.2	248.7	49.1	74.4	60.6
2/17/2010	2:47:21 PM	1	11	52	0.11	1.87	38.088		6.8	113.9	248.3	252.8	49.6	74.7	60.9
2/17/2010	2:48:21 PM	1	11	53	0.11	1.86	38.809		6.8	114.1	246.8	249.3	49.8	74.7	60.9
2/17/2010	2:49:21 PM	1	11	54	0.11	1.85	39.529		6.8	113.9	248.1	252.9	49.8	74.5	60.5
2/17/2010	2:50:21 PM	1	12	55	0.11	1.87	40.249		6.8	113.9	247.6	249.8	49.9	74.6	60.4
2/17/2010	2:51:19 PM	1	12	56	0.1	1.85	40.942		6.8	113.9	248.5	251.1	50.3	74.8	60.5
2/17/2010	2:52:19 PM	1	12	57	0.1	1.86	41.661		6.8	114.4	249	251.6	50.4	75.4	60.9
2/17/2010	2:53:19 PM	1	12	58	0.1	1.85	42.38		6.8	114	248.5	249.1	50.3	76.2	61.2
2/17/2010	2:54:19 PM	1	12	59	0.1	1.85	43.098		6.8	113.5	248.4	252.8	50.3	76.7	61.4
2/17/2010	2:55:19 PM	2	1	60	0.1	1.86	43.813		6.8	112.7	248.3	249.3	50.2	77.3	61.7

# EPA REFERENCE METHOD 26A

## Determination of Hydrogen Halides and Halogens From Stationary Sources

Client	Met Council	Date	2/17/2010
Facility	Seneca	Job Number	902630
Unit	1	Description	HCl
Location	Stack	Run No.	1
Pbar (inHg)	29.29	Ref Temp°F	68
Ref Pres (in.Hg)	29.92	H2O Cond. (mL)	14.3
Meter Factor (Y)	1.011	Delta H@	1.889
Pitot Coeff. (Cp)	0.84	Stack Area (ft2)	15.90
Dry MW	29.4	Wet MW	29.2
Nozzle Diameter (in)	NA	Press Stack (Ps)	-0.20
Avg O2 (%)	15.30	Avg CO2 (%)	5.00

Traverse Point		Time (min)	Delta P (in.H2O)	Delta H (inH2O)	Meter Reading (acf)	Vacuum (in. Hg)	Stack Temp (°F)	Probe Temp. (°F)	Filter Temp. (°F)	Impinger Temp (°F)	Meter In Temp (°F)	Meter Out Temp (°F)
Port	Point											
			See Automated Box 1-Minute Data Sheet									
Averages		60	0.10	1.89	43.813	6.6	113	248	251	46	80	68

Sample Gas Volume 43.082 dscf  
 Water Vapor 0.674 scf  
 Moisture Content 1.54 %  
 Avg. Stack Velocity 18.63 ft/sec  
 1118.07 ft/min  
 Stack Flow 17782 wacfm  
 16035 wscfm  
 15788 dscfm

EMSI



## AUTOMATED BOX STACK TEST DATA SHEET

Client	Met Council	Test Date	2/17/2010
Facility	Seneca	Start/Stop Time	15:12-16:12
Unit	1	Test Method	EPA 26
Location	Stack	Run Number	2
Project #	902630	Description	HCl
Operator	BD	Carbon Trap ID	

### RUN DATA

Tamb	°F	# Ports	1	Meter Box #	AB-3	ID#
Pbar	29.29	In Hg	# Points	1	Nozzle Dia. (in)	NA
Filter #		Time/Pt	60	Probe ID #		Pitot ID #
MF #	1.39	Port Order		del H @		1.889
Pstack	-0.2	In H2O	Pitot Coef	0.84	Meter Factor	1.011
Sample Time	60	min	Test #	1	Data File Name	Unit 1 Run 3 M23

Leak Chk	CFM	Vac	Init	Time	Pitot Leak Check	Run	1	2	3	Average
Pre	0	10	BD	15:07	Pre	O2	15.70	15.70	15.70	15.70
Post	0.001	11	BD	16:14	Post	CO2	5.10	5.10	5.10	5.10
≤ 0.02 cfm or 4 % of Sample Rate					Stable @ ≥ 3" 15 sec					

### DATA CORRECTIONS / RECORD

End Vol	Start Vol	Diff	Omit	Description	Impinger	MATERIAL WEIGHT (g)			50ml Rinse	Y	N
						End	Start	Diff	ID #		
					#1	111.0	100.0				
					#2	100.0	100.0				
					#3	0.0	0.0				
					#4	5.2	0.0				
					#5						
					#6						
					#7						
					#8						
					Total	216.2	200.0	16.2			

Post Field Meter Calibration    Set Vacuum = 17"    Collect 5 cf per run

Delta H	Vm I	Vm F	Tm I	Tm F	ID	Amb	Vacuum	Time

TC Field Calibration

Ref °F	Probe TC °F

≤ 1.5 % (Absolute Temp)

### Comments


Date	Time	Port	Point	Time	Delta P	Delta H	Meter Vol	Vac	Stack	Probe	Filter	Dryer	Meter In	Meter Out
Average					60	0.10	1.93	44.476	7.4	114.1	248.2	250.9	48.8	87.6
2/17/2010	3:13:02 PM	1	1	1	0.09	2.06	0.763		7	113.5	248	249.6	47.3	70.7
2/17/2010	3:14:02 PM	1	1	2	0.09	1.97	1.508		7.2	114.1	248.3	252.3	49.8	77.3
2/17/2010	3:15:02 PM	1	1	3	0.09	1.98	2.25		7.2	114.3	247.4	249.3	49.9	79.9
2/17/2010	3:16:02 PM	1	1	4	0.09	1.96	2.994		7.3	114.1	248.7	252.5	49.2	81.1
2/17/2010	3:17:02 PM	1	2	5	0.09	1.96	3.736		7.3	114	248.4	249.8	48.3	82.1
2/17/2010	3:18:02 PM	1	2	6	0.1	1.95	4.48		7.3	114.6	248.7	250.9	47.3	83
2/17/2010	3:19:02 PM	1	2	7	0.1	1.95	5.221		7.3	114.7	248.9	251.8	46.4	83.7
2/17/2010	3:20:02 PM	1	2	8	0.1	1.95	5.963		7.3	114.1	248.8	249.6	45.8	84.2
2/17/2010	3:21:02 PM	1	2	9	0.1	1.95	6.704		7.3	114.2	248.8	252.3	45.5	84.7
2/17/2010	3:22:02 PM	1	3	10	0.1	1.95	7.447		7.3	114.2	248.3	248.6	45.3	85.1
2/17/2010	3:23:02 PM	1	3	11	0.11	1.95	8.186		7.3	114.2	248.5	252.8	45.4	85.5
2/17/2010	3:24:02 PM	1	3	12	0.11	1.94	8.93		7.3	114.2	247.9	249.6	45.6	85.9
2/17/2010	3:25:02 PM	1	3	13	0.11	1.95	9.669		7.3	114.1	248.3	251	45.9	86.2
2/17/2010	3:26:02 PM	1	3	14	0.11	1.94	10.414		7.4	114.2	247.3	251.7	46.1	86.4
2/17/2010	3:27:02 PM	1	4	15	0.11	1.95	11.156		7.3	114.1	247.7	249.3	46.4	86.7
2/17/2010	3:28:02 PM	1	4	16	0.11	1.95	11.899		7.4	113.9	248.4	252.2	46.7	86.8
2/17/2010	3:29:02 PM	1	4	17	0.11	1.94	12.642		7.4	114.1	248.1	249	47	87
2/17/2010	3:30:00 PM	1	4	18	0.11	1.94	13.362		7.4	113.7	248.6	251.9	47	87.2
2/17/2010	3:31:00 PM	1	4	19	0.11	1.94	14.109		7.3	114.2	248.7	249.6	47.1	87.3
2/17/2010	3:32:01 PM	1	5	20	0.11	1.94	14.851		7.4	114	248	252.9	47.3	87.3
2/17/2010	3:33:00 PM	1	5	21	0.11	1.93	15.592		7.4	114.3	246.9	249.7	47.5	87.4
2/17/2010	3:34:01 PM	1	5	22	0.11	1.93	16.336		7.4	114.2	247.7	251.9	47.7	87.7
2/17/2010	3:35:01 PM	1	5	23	0.11	1.94	17.081		7.4	114.4	247.8	249.3	47.9	87.9
2/17/2010	3:36:01 PM	1	5	24	0.11	1.93	17.823		7.4	114.2	248.2	251.2	48	88.1
2/17/2010	3:37:01 PM	1	6	25	0.11	1.93	18.567		7.4	114.3	248.5	251.8	48.3	88.3
2/17/2010	3:38:01 PM	1	6	26	0.09	1.93	19.309		7.4	114.2	248.7	251.3	48.5	88.4
2/17/2010	3:39:01 PM	1	6	27	0.09	1.93	20.051		7.4	114.1	248.4	251.5	48.7	88.6
2/17/2010	3:40:01 PM	1	6	28	0.09	1.93	20.793		7.4	114.1	248.1	249.6	48.7	88.7
2/17/2010	3:41:01 PM	1	6	29	0.09	1.93	21.535		7.4	114	248.2	250.9	48.8	88.9
2/17/2010	3:42:01 PM	1	7	30	0.09	1.92	22.278		7.4	114	247.2	252.2	48.9	88.9
2/17/2010	3:43:01 PM	1	7	31	0.09	1.94	23.023		7.4	114.2	248.1	250.5	49.1	88.9
2/17/2010	3:44:01 PM	1	7	32	0.09	1.92	23.765		7.4	114	247.9	251.4	49.1	89.1
2/17/2010	3:45:01 PM	1	7	33	0.09	1.92	24.505		7.4	114.3	248.3	250.6	49.2	89.2
2/17/2010	3:46:01 PM	1	7	34	0.09	1.91	25.248		7.4	113.5	248.4	251.4	49.2	89.4
2/17/2010	3:47:01 PM	1	8	35	0.09	1.93	25.99		7.4	113.8	248.5	250.5	49.3	89.6
2/17/2010	3:48:00 PM	1	8	36	0.1	1.92	26.709		7.4	113.6	248.5	251.2	49.3	89.6
2/17/2010	3:49:00 PM	1	8	37	0.1	1.93	27.449		7.4	114.5	248.5	252.1	49.5	89.8
2/17/2010	3:50:00 PM	1	8	38	0.1	1.91	28.19		7.4	114.5	248.5	251.4	49.6	89.9
2/17/2010	3:51:02 PM	1	8	39	0.1	1.92	28.956		7.4	114.1	248.4	250.3	49.6	89.9
2/17/2010	3:52:00 PM	1	9	40	0.1	1.91	29.673		7.4	113.7	248.6	252.2	49.7	90
2/17/2010	3:53:02 PM	1	9	41	0.12	1.92	30.438		7.4	114.9	248.3	249.6	49.8	90
2/17/2010	3:54:02 PM	1	9	42	0.12	1.91	31.181		7.4	114.9	248.7	252	49.9	90
2/17/2010	3:55:02 PM	1	9	43	0.12	1.91	31.921		7.4	114.9	248.2	249	50	90.1
2/17/2010	3:56:02 PM	1	9	44	0.12	1.91	32.663		7.4	114.3	248.5	251.7	50	90
2/17/2010	3:57:00 PM	1	10	45	0.12	1.92	33.383		7.4	114	246.5	250.2	50.3	90
2/17/2010	3:58:00 PM	1	10	46	0.12	1.91	34.126		7.4	114.1	248.2	251.2	50.3	90
2/17/2010	3:59:00 PM	1	10	47	0.12	1.91	34.871		7.4	113.9	247.7	251.2	50.4	90.1
2/17/2010	4:00:00 PM	1	10	48	0.12	1.91	35.613		7.4	114.3	248	250.6	50.5	90.1
2/17/2010	4:01:01 PM	1	10	49	0.12	1.92	36.354		7.4	113.7	248.7	252.3	50.6	90.1
2/17/2010	4:02:01 PM	1	11	50	0.12	1.9	37.097		7.4	114.1	248.4	250	50.7	90.1
2/17/2010	4:03:01 PM	1	11	51	0.1	1.91	37.836		7.5	113.8	248.7	251.9	50.7	90.2
2/17/2010	4:04:01 PM	1	11	52	0.1	1.9	38.577		7.4	113.9	248.2	250.9	50.7	90.2
2/17/2010	4:05:01 PM	1	11	53	0.1	1.91	39.316		7.4	113.6	247.8	252.1	50.8	90.2
2/17/2010	4:06:01 PM	1	11	54	0.1	1.9	40.055		7.5	113.8	247.3	249.2	50.9	90.1
2/17/2010	4:07:01 PM	1	12	55	0.1	1.9	40.795		7.4	114.1	248.2	252.7	51.1	90.1
2/17/2010	4:08:01 PM	1	12	56	0.09	1.92	41.532		7.4	114	247.4	250	51	90.2
2/17/2010	4:09:01 PM	1	12	57	0.09	1.89	42.27		7.4	114.1	248.3	250.7	51.2	90.2
2/17/2010	4:10:01 PM	1	12	58	0.09	1.89	43.008		7.4	114.4	248.6	250.6	51.3	90.3
2/17/2010	4:11:01 PM	1	12	59	0.09	1.9	43.746		7.5	114.5	248.4	250.4	51.2	90.2
2/17/2010	4:12:01 PM	2	1	60	0.09	1.89	44.476		7.4	114.4	248.1	250.9	51.4	90.3

# EPA REFERENCE METHOD 26A

## Determination of Hydrogen Halides and Halogens From Stationary Sources

Client	Met Council	Date	2/17/2010
Facility	Seneca	Job Number	902630
Unit	1	Description	HCl
Location	Stack	Run No.	2
Pbar (inHg)	29.29	Ref Temp°F	68
Ref Pres (in.Hg)	29.92	H2O Cond. (mL)	16.2
Meter Factor (Y)	1.011	Delta H@	1.889
Pitot Coeff. (Cp)	0.84	Stack Area (ft2)	15.90
Dry MW	29.4	Wet MW	29.2
Nozzle Diameter (in)	NA	Press Stack (Ps)	-0.20
Avg O2 (%)	15.70	Avg CO2 (%)	5.10

Traverse Point		Time (min)	Delta P (in.H2O)	Delta H (inH2O)	Meter Reading (acf)	Vacuum (in. Hg)	Stack Temp (°F)	Probe Temp. (°F)	Filter Temp. (°F)	Impinger Temp (°F)	Meter In Temp (°F)	Meter Out Temp (°F)
Port	Point											
			See Automated Box 1-Minute Data Sheet									
Averages		0	0.10	1.93	44.476	7.4	114	248	251	49	88	73

Sample Gas Volume 43.224 dscf  
 Water Vapor 0.764 scf  
 Moisture Content 1.74 %  
 Avg. Stack Velocity 18.80 ft/sec  
 1128.05 ft/min  
 Stack Flow 17941 wacfm  
 16144 wscfm  
 15863 dscfm

EMSI



## AUTOMATED BOX STACK TEST DATA SHEET

Client	Met Council	Test Date	2/17/2010
Facility	Seneca	Start/Stop Time	16:28-17:28
Unit	1	Test Method	EPA 26
Location	Stack	Run Number	3
Project #	902630	Description	HCl
Operator	BD	Carbon Trap ID	

### RUN DATA

Tamb		°F	# Ports	1	Meter Box #	AB-3	ID#
Pbar	29.29	In Hg	# Points	1	Nozzle Dia. (in)	NA	ID#
Filter #			Time/Pt	60	Probe ID #		Pitot ID #
MF #	1.39		Port Order		del H @		1.889
Pstack	-0.2	In H2O	Pitot Coef	0.84	Meter Factor		1.011
Sample Time	60	min	Test #	1	Data File Name		Unit 1 Run 3 M23

Leak Chk	CFM	Vac	Init	Time	Pitot Leak Check	Run	1	2	3	Average
Pre	0	12	BD	16:24	Pre	O2	15.50	15.50	15.50	15.50
Post	0	12	BD	17:31	Post	CO2	5.30	5.30	5.30	5.30
≤ 0.02 cfm or 4 % of Sample Rate					Stable @ ≥ 3" 15 sec					

### DATA CORRECTIONS / RECORD

End Vol	Start Vol	Diff	Omit	Description	Impinger	MATERIAL WEIGHT (g)			50ml Rinse	Y	N
						End	Start	Diff	ID #		
					#1	110.0	100.0				
					#2	100.0	100.0				
					#3	0.0	0.0				
					#4	4.9	0.0				
					#5						
					#6						
					#7						
					#8						
					Total	214.9	200.0	14.9			

### Post Field Meter Calibration Set Vacuum = 17" Collect 5 cf per run

Delta H	Vm I	Vm F	Tm I	Tm F	ID	Amb	Vacuum	Time
2.05	0	6.147	68.70	69.2	63	59.70	17.000	8.000
2.05	0	6.147	69.20	71.2	63	59.90	17.000	8.000
2.05	0	6.933	71.20	74.3	63	63.20	17.000	9.000

### TC Field Calibration

Ref °F	Probe TC °F

≤ 1.5 % (Absolute Temp)

### Comments


Date	Time	Port	Point	Time	Delta P	Delta H	Meter Vol	Vac	Stack	Probe	Filter	Dryer	Meter In	Meter Out	
Average					60	0.10	1.87	43.813	7.5	114.0	248.2	250.8	47.3	88.8	75.6
2/17/2010	4:29:00 PM	1	1	1	0.09	2	0.747		7.3	114.1	248	249.1	45.6	78	74.4
2/17/2010	4:30:00 PM	1	1	2	0.09	1.92	1.484		7.4	113.7	248.9	251.9	46.1	82.8	74.4
2/17/2010	4:31:00 PM	1	1	3	0.09	1.9	2.222		7.4	113.8	248.9	249	45.5	85.1	74.4
2/17/2010	4:32:02 PM	1	1	4	0.09	1.91	2.985		7.4	113.7	248.7	250.6	44.8	86.6	74.5
2/17/2010	4:33:02 PM	1	2	5	0.09	1.92	3.721		7.4	113.4	247.5	250	44.1	87.6	74.6
2/17/2010	4:34:00 PM	1	2	6	0.1	1.9	4.432		7.4	112.9	248.4	251.7	43.6	88.1	74.7
2/17/2010	4:35:00 PM	1	2	7	0.1	1.9	5.17		7.4	113.6	247.9	252.5	43.5	88.5	74.7
2/17/2010	4:36:00 PM	1	2	8	0.1	1.9	5.905		7.4	114.2	247.8	249.6	43.4	88.8	74.8
2/17/2010	4:37:00 PM	1	2	9	0.1	1.91	6.641		7.4	115.6	248.5	252.4	43.5	89	74.9
2/17/2010	4:38:00 PM	1	3	10	0.1	1.89	7.377		7.4	115.2	248.3	248.1	43.7	89.1	75
2/17/2010	4:39:00 PM	1	3	11	0.11	1.89	8.113		7.4	115.3	248.7	253.3	43.9	89.3	75.2
2/17/2010	4:40:02 PM	1	3	12	0.11	1.89	8.874		7.5	114.2	248.5	249.6	44.1	89.3	75.2
2/17/2010	4:41:00 PM	1	3	13	0.11	1.9	9.584		7.5	114	248.8	251.5	44.4	89.4	75.3
2/17/2010	4:42:01 PM	1	3	14	0.11	1.88	10.321		7.5	114.4	248.7	249	44.6	89.4	75.3
2/17/2010	4:43:01 PM	1	4	15	0.11	1.88	11.057		7.4	114.1	248.6	250.3	44.8	89.4	75.3
2/17/2010	4:44:01 PM	1	4	16	0.11	1.89	11.791		7.4	114.5	247.6	253.2	45.1	89.3	75.4
2/17/2010	4:45:01 PM	1	4	17	0.11	1.88	12.525		7.4	113.7	247.3	250	45.4	89.3	75.5
2/17/2010	4:46:01 PM	1	4	18	0.11	1.88	13.259		7.5	113.9	248	249.6	45.6	89.4	75.5
2/17/2010	4:47:01 PM	1	4	19	0.11	1.87	13.994		7.4	113.1	248.9	253	45.8	89.4	75.6
2/17/2010	4:48:01 PM	1	5	20	0.11	1.87	14.726		7.5	113	248.5	249.5	46	89.5	75.7
2/17/2010	4:49:01 PM	1	5	21	0.1	1.88	15.458		7.5	113.3	248.4	252.7	46.1	89.5	75.7
2/17/2010	4:50:01 PM	1	5	22	0.1	1.88	16.193		7.5	113.9	248.5	251.3	46.3	89.4	75.7
2/17/2010	4:51:01 PM	1	5	23	0.1	1.89	16.927		7.5	114.4	248.1	249.5	46.5	89.4	75.7
2/17/2010	4:52:01 PM	1	5	24	0.1	1.89	17.659		7.5	114.2	248.2	254.1	46.5	89.4	75.8
2/17/2010	4:53:01 PM	1	6	25	0.1	1.86	18.394		7.5	114.1	246.8	248.5	46.7	89.4	75.9
2/17/2010	4:54:01 PM	1	6	26	0.08	1.87	19.126		7.5	113.2	248.3	252.9	46.7	89.4	75.9
2/17/2010	4:55:01 PM	1	6	27	0.08	1.87	19.859		7.5	113.1	248	249.2	46.8	89.3	75.8
2/17/2010	4:56:02 PM	1	6	28	0.08	1.87	20.592		7.5	113.3	248.6	253.3	47	89.2	75.8
2/17/2010	4:57:02 PM	1	6	29	0.08	1.85	21.324		7.5	113.6	248.1	249.3	47.2	89.1	75.7
2/17/2010	4:58:02 PM	1	7	30	0.08	1.84	22.054		7.5	114	248	251.2	47.3	89.1	75.7
2/17/2010	4:59:02 PM	1	7	31	0.09	1.89	22.785		7.5	114.6	246.4	250.1	47.4	89.1	75.7
2/17/2010	5:00:02 PM	1	7	32	0.09	1.88	23.515		7.5	114.1	247.9	249.7	47.5	89.1	75.8
2/17/2010	5:01:02 PM	1	7	33	0.09	1.88	24.245		7.5	114.1	248.8	251.8	47.6	89.1	75.8
2/17/2010	5:02:02 PM	1	7	34	0.09	1.88	24.975		7.5	113.7	248.9	249.8	47.7	89.1	75.8
2/17/2010	5:03:02 PM	1	8	35	0.09	1.88	25.704		7.5	114	248.4	251.8	47.8	89.1	75.7
2/17/2010	5:04:02 PM	1	8	36	0.11	1.87	26.432		7.5	113.5	247	252	48	89.1	75.7
2/17/2010	5:05:02 PM	1	8	37	0.11	1.82	27.16		7.5	113.7	247.3	249.1	48.1	89.1	75.8
2/17/2010	5:06:02 PM	1	8	38	0.11	1.86	27.887		7.5	113.6	248.8	252.9	48.3	89.1	75.8
2/17/2010	5:07:02 PM	1	8	39	0.11	1.86	28.615		7.5	114	248.6	248.9	48.5	89.1	75.8
2/17/2010	5:08:02 PM	1	9	40	0.11	1.84	29.343		7.5	114.8	248.7	251.7	48.7	89.1	75.8
2/17/2010	5:09:02 PM	1	9	41	0.12	1.84	30.071		7.5	114.5	247.5	251.5	48.7	89.1	75.8
2/17/2010	5:10:02 PM	1	9	42	0.12	1.83	30.797		7.5	113.5	247.3	250	48.8	89.1	75.8
2/17/2010	5:11:02 PM	1	9	43	0.12	1.85	31.522		7.5	113.1	248.1	252.4	49	89.1	75.8
2/17/2010	5:12:02 PM	1	9	44	0.12	1.85	32.249		7.5	113.5	247.9	250.5	49.3	89.1	75.9
2/17/2010	5:13:02 PM	1	10	45	0.12	1.85	32.975		7.5	114	248.3	249.7	49.3	89.2	75.9
2/17/2010	5:14:02 PM	1	10	46	0.12	1.85	33.7		7.5	115	249	250.5	49.5	89.2	75.9
2/17/2010	5:15:02 PM	1	10	47	0.12	1.84	34.426		7.5	115.4	247.3	250.5	49.5	89.3	76
2/17/2010	5:16:02 PM	1	10	48	0.12	1.83	35.15		7.5	115.4	247.3	249.3	49.6	89.3	76
2/17/2010	5:17:02 PM	1	10	49	0.12	1.85	35.876		7.5	114.9	248.4	252.6	49.7	89.2	76
2/17/2010	5:18:02 PM	1	11	50	0.12	1.85	36.602		7.5	115.1	248.8	250.4	49.9	89.3	76
2/17/2010	5:19:02 PM	1	11	51	0.1	1.83	37.325		7.5	114.8	248.7	249.8	50	89.3	76
2/17/2010	5:20:02 PM	1	11	52	0.1	1.83	38.048		7.5	115	248.1	252.8	50.1	89.4	76
2/17/2010	5:21:02 PM	1	11	53	0.1	1.83	38.772		7.5	114.7	246.5	248.7	50.3	89.4	76.1
2/17/2010	5:22:02 PM	1	11	54	0.1	1.84	39.496		7.5	114.9	248.2	253.1	50.5	89.3	76
2/17/2010	5:23:02 PM	1	12	55	0.1	1.83	40.219		7.5	114.2	248.3	249.4	50.6	89.3	76
2/17/2010	5:24:02 PM	1	12	56	0.08	1.82	40.939		7.5	114	248.7	251.1	50.6	89.3	76
2/17/2010	5:25:02 PM	1	12	57	0.08	1.83	41.662		7.5	112.3	248.3	250.6	50.8	89.2	76
2/17/2010	5:26:02 PM	1	12	58	0.08	1.83	42.384		7.5	112.5	246.7	249.7	51	89.2	76
2/17/2010	5:27:02 PM	1	12	59	0.08	1.82	43.107		7.5	109.5	248	251.6	51	89.3	76.1
2/17/2010	5:28:02 PM	2	1	60	0.08	1.82	43.813		7.5	113.9	249.5	250.5	51.2	89.2	76



# EPA REFERENCE METHOD 26A

## Determination of Hydrogen Halides and Halogens From Stationary Sources

Client	Met Council	Date	2/17/2010
Facility	Seneca	Job Number	902630
Unit	1	Description	HCl
Location	Stack	Run No.	3
Pbar (inHg)	29.29	Ref Temp°F	68
Ref Pres (in.Hg)	29.92	H2O Cond. (mL)	14.9
Meter Factor (Y)	1.011	Delta H@	1.889
Pitot Coeff. (Cp)	0.84	Stack Area (ft2)	15.90
Dry MW	29.5	Wet MW	29.2
Nozzle Diameter (in)	NA	Press Stack (Ps)	-0.20
Avg O2 (%)	15.50	Avg CO2 (%)	5.30

Traverse Point		Time (min)	Delta P (in.H2O)	Delta H (inH2O)	Meter Reading (acf)	Vacuum (in. Hg)	Stack Temp (°F)	Probe Temp. (°F)	Filter Temp. (°F)	Impinger Temp (°F)	Meter In Temp (°F)	Meter Out Temp (°F)
Port	Point											
			See Automated Box 1-Minute Data Sheet									
Averages		0	0.10	1.87	43.813	7.5	114	248	251	47	89	76

Sample Gas Volume 42.426 dscf  
 Water Vapor 0.703 scf  
 Moisture Content 1.63 %  
 Avg. Stack Velocity 18.62 ft/sec  
 1117.10 ft/min  
 Stack Flow 17767 wacfm  
 15992 wscfm  
 15731 dscfm

EMSI

**Appendix C**

**Process Operations Data**

**Multiple Hearth Incinerator : INC#1 Seneca**

RUN #1 Time segment start time	Wet Sludge feed	Sludge Solids content	Dry Sludge feed	Incinerator	Aftbrnrer	Hearth 1	Hearth 2	Hearth 3	Hearth 4	Hearth 5	Aftbrnrer	Venturi	Subcool	Water flows		ID fan				
	Gas	Gas	temp	temp	temp	temp	temp	temp	temp	temp	temp	out	temp	Venturi	Total	power	draft	venturi dp	Opacity	Oxygen
(hr:min)	WTPH	%TS	Calculated	(SCFH)	(SCFH)	(°F)	(°F)	(°F)	(°F)	(°F)	(°F)	(°F)	(°F)	(gpm)	(gpm)	(amps)	(INWC)	(INWC)	(%)	(%)
	SENSE035FTCV			SENsdb001FT	SENsdb002FT	SENsdbH1CTTMP	SENsdbH2CTTMP	SENsdbH3CTTMP	SENsdbH4CTTMP	SENsdbH5CTTMP	SENsdb066TT	SENsdb095TT	SENsdb145TT	SENsdb091FT	SENsdbSCRBLQ	SENsdb148amp	SENsdb044PT	SENsdb094pt	SENsdb154at	SENsdb050at
2/16/10 8:55	4.5	26.00	1.17	1700	650	1110	1324	1418	1,271	497	1,065	143.0	65	223	686	189	-0.30	17.1	5.7	7.7
2/16/10 9:25	4.4	26.00	1.14	160	390	1141	1340	1360	1,267	516	1,066	145.4	66	223	687	187	-0.31	16.9	9.4	7.0
2/16/10 9:55	4.6	26.00	1.19	990	1100	1106	1326	1372	1,268	591	1,064	143.9	66	223	685	188	-0.30	17.0	6.6	7.7
2/16/10 10:25	4.7	26.00	1.23	1200	1200	1099	1308	1397	1,282	622	1,065	145.7	66	222	684	191	-0.29	17.4	5.4	7.5
2/16/10 10:55	5.0	26.00	1.31	2100	840	1128	1321	1402	1,291	648	1,065	148.1	67	222	682	192	-0.29	17.5	6.1	6.8
2/16/10 11:25	5.0	26.00	1.30	2100	830	1140	1327	1448	1,317	698	1,065	149.2	68	222	681	188	-0.31	17.1	5.1	6.5
2/16/10 11:55	5.1	26.00	1.34	2000	1000	1129	1313	1440	1,330	729	1,064	148.3	67	221	681	194	-0.29	17.4	9.3	6.3
2/16/10 12:25	5.1	26.00	1.33	3500	540	1166	1338	1511	1,368	754	1,067	151.1	69	221	680	192	-0.30	17.0	5.3	6.0
2/16/10 12:55	5.1	26.00	1.32	3500	560	1167	1339	1515	1,370	755	1,067	151.1	69	221	680	191	-0.30	17.0	5.4	6.0
Run Average =	4.84	26.00	1.26	1917	790	1132	1326	1429	1307	646	1065	147	67	222	683	190	-0.30	17.1	6.5	6.8

Values reported are 30 minute average values.

**Multiple Hearth Incinerator : INC#1 Seneca**

<b>RUN #2</b>																			
Time segment	Wet Sludge feed	Sludge Solids content	Dry Sludge feed	Incinerator	Aftbrnr	Hearth 1	Hearth 2	Hearth 3	Hearth 4	Hearth 5	Aftbrnr	Venturi	Subcool	Water flows		ID fan			
start time				Gas	Gas	temp	temp	temp	temp	temp	temp	out	temp	Venturi	Total	power	draft	venturi dp	Opacity
(hr:min)	WTPH	%TS	Calculated	(SCFH)	(SCFH)	(°F)	(°F)	(°F)	(°F)	(°F)	(°F)	(°F)	(°F)	(gpm)	(gpm)	(amps)	(INWC)	(INWC)	(%)
	SENSE035FTCV			SENSdb001FT	SENSdb002FT	SENSdbH1CTTMP	SENSdbH2CTTMP	SENSdbH3CTTMP	SENSdbH4CTTMP	SENSdbH5CTTMP	SENSdb066TT	SENSdb095TT	SENSdb145TT	SENSdb091FT	SENSdbSCRFLC	SENSdb148amp	SENSdb044PT	SENSdb094pt	SENSdb154at
2/16/10 14:00	4.8	26.80	1.28	410	390	1175	1364	1442	1,354	801	1,066	149.8	68	220	676	187	-0.30	16.2	5.3
2/16/10 14:30	5.0	26.80	1.33	320	110	1192	1384	1418	1,349	818	1,076	150.8	68	220	675	190	-0.29	17.5	5.8
2/16/10 15:00	4.8	26.80	1.27	110	320	1169	1348	1395	1,338	845	1,065	147.6	67	219	672	189	-0.29	17.8	5.3
2/16/10 15:30	4.7	26.80	1.27	170	620	1141	1327	1381	1,327	855	1,064	147.2	67	219	672	188	-0.30	17.4	5.3
2/16/10 16:00	4.8	26.80	1.29	530	770	1134	1322	1388	1,332	858	1,064	148.4	68	218	672	189	-0.30	17.3	5.6
2/16/10 16:30	4.9	26.80	1.32	180	580	1137	1324	1390	1,355	872	1,065	149.9	68	218	669	188	-0.30	16.6	5.6
2/16/10 17:00	5.0	26.80	1.34	120	58	1167	1343	1401	1,376	882	1,069	150.7	68	218	668	187	-0.31	16.7	7.1
2/16/10 17:30	4.8	26.80	1.28	130	400	1159	1339	1388	1,357	891	1,065	148.8	68	217	669	186	-0.30	16.6	5.9
2/16/10 18:00	4.8	26.80	1.28	130	410	1159	1339	1388	1,356	892	1,065	148.8	68	217	670	186	-0.30	16.6	5.9
Run Average =	4.84	26.80	1.30	233	406	1159	1343	1399	1349	857	1067	149	68	218	671	188	-0.30	17.0	5.8

Values reported are 30 minute average values.

**Multiple Hearth Incinerator : INC#1 Seneca**

<b>RUN #3</b>																			
Time segment	Wet Sludge feed	Sludge Solids content	Dry Sludge feed	Incinerator	Aftbrnr	Hearth 1	Hearth 2	Hearth 3	Hearth 4	Hearth 5	Aftbrnr	Venturi	Subcool	Water flows		ID fan			
start time				Gas	Gas	temp	temp	temp	temp	temp	temp	out	temp	Venturi	Total	power	draft	venturi dp	Opacity
(hr:min)	WTPH	%TS	Calculated	(SCFH)	(SCFH)	(°F)	(°F)	(°F)	(°F)	(°F)	(°F)	(°F)	(°F)	(gpm)	(gpm)	(amps)	(INWC)	(INWC)	(%)
	SENSE035FTCV			SENSdb001FT	SENSdb002FT	SENSdbH1CTTMP	SENSdbH2CTTMP	SENSdbH3CTTMP	SENSdbH4CTTMP	SENSdbH5CTTMP	SENSdb066TT	SENSdb095TT	SENSdb145TT	SENSdb091FT	SENSdbSCRBFLC	SENSdb148amp	SENSdb044PT	SENSdb094pt	SENSdb154at
2/17/10 8:04	4.2	26.80	1.14	140	66	1173	1376	1405	1,314	681	1,104	146.1	66	224	690	186	-0.31	17.5	6.0
2/17/10 8:34	4.6	26.80	1.22	190	770	1121	1339	1404	1,314	674	1,067	141.2	65	224	688	188	-0.29	17.3	5.8
2/17/10 9:04	4.6	26.80	1.24	360	770	1095	1322	1395	1,315	676	1,065	145.0	66	224	687	188	-0.30	17.0	5.6
2/17/10 9:34	4.9	26.80	1.30	140	790	1117	1325	1368	1,309	707	1,064	146.7	67	224	688	188	-0.30	16.5	5.7
2/17/10 10:04	5.2	26.80	1.39	380	790	1115	1324	1379	1,314	772	1,065	147.0	67	224	686	189	-0.30	17.5	6.1
2/17/10 10:34	5.2	26.80	1.38	3000	860	1133	1319	1468	1,351	817	1,065	149.3	68	223	686	190	-0.31	17.3	5.7
2/17/10 11:04	5.0	26.80	1.34	3600	190	1159	1332	1540	1,401	835	1,070	152.1	69	223	687	188	-0.36	17.0	5.5
2/17/10 11:34	4.9	26.80	1.31	4000	810	1155	1319	1560	1,446	850	1,067	150.2	69	223	686	190	-0.32	16.9	10.8
2/17/10 12:04	4.9	26.80	1.31	4000	740	1156	1319	1562	1,449	851	1,068	150.3	69	223	686	190	-0.32	16.9	10.8
2/17/10 12:34	4.9	26.80	1.32	3900	760	1156	1319	1564	1453	852	1068	150	69	223	685	191	-0.31	16.9	10.8
Run Average =	4.83	26.80	1.30	1971	655	1138	1329	1465	1367	771	1070	148	67	223	687	189	-0.31	17.1	7.3

Values reported are 30 minute average values.

**Multiple Hearth Incinerator : INC#1 Seneca**

RUN #1 Time segment start time	Wet Sludge feed	Sludge Solids content	Dry Sludge feed	Incinerator	Aftbrnrer	Hearth 1	Hearth 2	Hearth 3	Hearth 4	Hearth 5	Aftbrnrer	Venturi	Subcool	Water flows		ID fan				
				Gas	Gas	temp	temp	temp	temp	temp	temp	out	temp	Venturi	Total	power	draft	venturi dp	Opacity	Oxygen
(hr:min)	WTPH	%TS	Calculated	(SCFH)	(SCFH)	(°F)	(°F)	(°F)	(°F)	(°F)	(°F)	(°F)	(°F)	(gpm)	(gpm)	(amps)	(INWC)	(INWC)	(%)	(%)
	SENSE035FTCV			SENSdb001FT	SENSdb002FT	SENSdbH1CTTMP	SENSdbH2CTTMP	SENSdbH3CTTMP	SENSdbH4CTTMP	SENSdbH5CTTMP	SENSdb066TT	SENSdb095TT	SENSdb145TT	SENSdb091FT	SENSdbSCRBFLO	SENSdb148amp	SENSdb044PT	SENSdb094pt	SENSdb154at	SENSdb050at
2/17/10 13:50	4.9	25.70	1.26	3042	853	1139	1321	1469	1,384	898	1,069	150.1	69	221	681	191	-0.30	17.5	5.3	6.5
2/17/10 13:55	4.9	25.70	1.25	3846	331	1193	1362	1592	1,436	886	1,069	151.9	70	221	680	190	-0.31	17.1	5.4	6.0
2/17/10 14:00	4.8	25.70	1.23	2560	426	1214	1379	1578	1,434	912	1,085	151.0	70	221	677	192	-0.31	17.2	5.5	6.4
2/17/10 14:05	4.7	25.70	1.20	154	849	1130	1328	1441	1,390	906	1,064	148.5	68	220	677	187	-0.30	16.5	5.2	6.9
2/17/10 14:10	4.8	25.70	1.23	291	789	1131	1325	1419	1,385	919	1,065	149.5	68	220	677	189	-0.30	16.8	5.1	6.5
2/17/10 14:15	5.0	25.70	1.28	1488	841	1134	1322	1458	1,392	930	1,065	149.1	68	220	674	190	-0.29	17.0	5.4	6.6
2/17/10 14:20	4.8	25.70	1.23	4460	348	1131	1320	1456	1,388	930	1,068	150.4	68	220	673	190	-0.31	17.2	5.1	6.3
2/17/10 14:25	4.9	25.70	1.26	1794	721	1145	1323	1470	1,401	926	1,065	150.5	69	220	675	189	-0.31	16.8	5.4	6.2
2/17/10 14:30	4.9	25.70	1.27	1790	785	1144	1322	1469	1,402	926	1,065	150.4	69	219	674	189	-0.31	16.8	5.4	6.2
2/17/10 14:35	4.9	25.70	1.27	1794	742	1144	1321	1468	1403	926	1065	150	69	219	674	188	-0.31	16.8	5.5	6.2
2/17/10 14:40	5.0	25.70	1.28	1799	768	1143	1321	1468	1403	926	1065	150	69	219	674	189	-0.31	16.9	5.5	6.2
2/17/10 14:45	5.0	25.70	1.28	1791	721	1143	1322	1467	1404	927	1065	150	69	219	674	188	-0.31	16.9	5.5	6.2
2/17/10 14:50	5.0	25.70	1.28	1708	749	1143	1322	1466	1405	927	1065	150	69	219	674	188	-0.31	16.9	5.5	6.2
2/17/10 14:55	5.0	25.70	1.28	1727	747	1143	1322	1466	1406	927	1065	150	69	219	674	188	-0.31	16.9	5.5	6.2
Run Average =	4.89	25.70	1.26	2017	691	1149	1329	1478	1402	919	1067	150	69	220	676	189	-0.30	16.9	5.4	6.3

Values reported are 30 minute average values.

**Multiple Hearth Incinerator : INC#1 Seneca**

<b>RUN #2</b>																			
Time segment	Wet Sludge feed	Sludge Solids content	Dry Sludge feed	Incinerator	Aftbrnr	Hearth 1	Hearth 2	Hearth 3	Hearth 4	Hearth 5	Aftbrnr	Venturi	Subcool	Water flows		ID fan			
start time				Gas	Gas	temp	temp	temp	temp	temp	temp	out	temp	Venturi	Total	power	draft	venturi dp	Opacity
(hr:min)	WTPH	%TS	Calculated	(SCFH)	(SCFH)	(°F)	(°F)	(°F)	(°F)	(°F)	(°F)	(°F)	(°F)	(gpm)	(gpm)	(amps)	(INWC)	(INWC)	(%)
	SENSE035FTCV			SENsdb001FT	SENsdb002FT	SENsdbH1CTTMP	SENsdbH2CTTMP	SENsdbH3CTTMP	SENsdbH4CTTMP	SENsdbH5CTTMP	SENsdb066TT	SENsdb095TT	SENsdb145TT	SENsdb091FT	SENsdbSCRBFLC	SENsdb148amp	SENsdb044PT	SENsdb094pt	SENsdb154at
2/17/10 15:12	4.6	25.80	1.19	332	700	1137	1332	1461	1,396	908	1,065	148.7	68	220	677	188	-0.30	16.5	5.6
2/17/10 15:17	4.8	25.80	1.24	303	970	1125	1321	1420	1,385	914	1,064	149.1	68	220	676	189	-0.30	16.7	5.0
2/17/10 15:22	5.0	25.80	1.28	1349	709	1137	1325	1446	1,390	928	1,065	149.5	69	220	675	189	-0.29	16.8	5.2
2/17/10 15:27	4.9	25.80	1.26	1747	775	1138	1321	1465	1,393	928	1,065	149.8	69	220	675	190	-0.31	17.1	5.3
2/17/10 15:32	5.0	25.80	1.29	1195	626	1146	1325	1460	1,421	932	1,066	150.8	69	220	674	187	-0.31	16.8	5.3
2/17/10 15:37	5.0	25.80	1.29	120	457	1143	1330	1441	1,458	947	1,065	151.3	69	219	673	187	-0.29	16.4	5.6
2/17/10 15:42	4.9	25.80	1.26	107	61	1174	1356	1457	1,485	956	1,076	152.6	69	219	671	190	-0.30	16.6	5.8
2/17/10 15:47	4.6	25.80	1.18	95	119	1174	1354	1444	1,454	958	1,073	151.8	69	218	672	187	-0.30	16.5	5.7
2/17/10 15:52	4.6	25.80	1.18	96	119	1174	1354	1444	1,453	959	1,073	151.8	69	218	672	187	-0.30	16.5	5.7
2/17/10 15:57	4.6	25.80	1.18	96	128	1174	1355	1443	1451	959	1072	152	69	218	672	187	-0.30	16.5	5.7
2/17/10 16:02	4.6	25.80	1.18	95	130	1174	1355	1442	1450	959	1073	152	69	218	672	187	-0.30	16.5	5.6
2/17/10 16:07	4.6	25.80	1.18	95	114	1175	1356	1442	1448	959	1073	152	69	218	672	187	-0.30	16.5	5.6
2/17/10 16:12	4.6	25.80	1.19	95	118	1175	1356	1441	1447	959	1073	152	69	218	672	187	-0.30	16.5	5.6
Run Average =	4.74	25.80	1.22	440	387	1157	1342	1447	1433	943	1069	151	69	219	673	188	-0.30	16.6	5.5

Values reported are 30 minute average values.

**Multiple Hearth Incinerator : INC#1 Seneca**

<b>RUN #3</b>																			
Time segment	Wet Sludge feed	Sludge Solids content	Dry Sludge feed	Incinerator	Aftbrnr	Hearth 1	Hearth 2	Hearth 3	Hearth 4	Hearth 5	Aftbrnr	Venturi	Subcool	Water flows		ID fan			
start time				Gas	Gas	temp	temp	temp	temp	temp	temp	out	temp	Venturi	Total	power	draft	venturi dp	Opacity
(hr:min)	WTPH	%TS	Calculated	(SCFH)	(SCFH)	(°F)	(°F)	(°F)	(°F)	(°F)	(°F)	(°F)	(°F)	(gpm)	(gpm)	(amps)	(INWC)	(INWC)	(%)
	SENSE035FTCV			SENsdb001FT	SENsdb002FT	SENsdbH1CTTMP	SENsdbH2CTTMP	SENsdbH3CTTMP	SENsdbH4CTTMP	SENsdbH5CTTMP	SENsdb066TT	SENsdb095TT	SENsdb145TT	SENsdb091FT	SENsdbSCRBFLC	SENsdb148amp	SENsdb044PT	SENsdb094pt	SENsdb154at
2/17/10 16:28	4.8	25.43	1.23	1601	863	1133	1320	1465	1,392	930	1,064	149.1	68	220	674	190	-0.29	17.0	5.5
2/17/10 16:33	5.0	25.43	1.27	1708	749	1143	1322	1466	1,405	927	1,065	150.4	69	220	674	188	-0.31	16.9	5.1
2/17/10 16:38	5.0	25.43	1.28	510	503	1142	1328	1444	1,438	939	1,065	151.1	69	219	673	188	-0.31	16.6	5.5
2/17/10 16:43	4.8	25.43	1.22	108	247	1158	1340	1447	1,470	955	1,068	152.0	69	219	672	186	-0.30	16.4	5.6
2/17/10 16:48	4.6	25.43	1.18	95	111	1177	1361	1437	1,439	958	1,073	151.4	69	219	672	187	-0.29	16.5	6.1
2/17/10 16:53	4.4	25.43	1.13	11	62	1189	1378	1428	1,410	958	1,073	150.0	68	218	671	187	-0.30	16.6	5.2
2/17/10 16:58	4.4	25.43	1.11	(4)	140	1178	1374	1418	1,394	954	1,067	148.9	68	218	670	188	-0.29	17.2	5.2
2/17/10 17:03	4.4	25.43	1.11	1	189	1219	1408	1428	1,390	948	1,084	149.3	69	218	671	191	-0.31	17.2	5.2
2/17/10 17:08	4.4	25.43	1.11	2	202	1220	1408	1428	1,389	948	1,084	149.2	69	218	671	191	-0.30	17.2	5.2
2/17/10 17:13	4.4	25.43	1.12	2	206	1221	1409	1428	1389	948	1083	149	69	218	670	191	-0.31	17.2	5.1
2/17/10 17:18	4.4	25.43	1.12	2	206	1221	1409	1429	1389	948	1083	149	69	218	670	192	-0.30	17.2	5.1
2/17/10 17:23	4.4	25.43	1.13	2	207	1221	1409	1429	1388	947	1082	149	69	218	670	192	-0.30	17.1	5.1
2/17/10 17:28	4.4	25.43	1.12	1	214	1222	1410	1429	1388	947	1081	149	69	218	670	192	-0.30	17.1	5.0
Run Average =	4.57	25.43	1.16	311	300	1188	1375	1437	1406	947	1075	150	69	219	671	190	-0.30	16.9	5.3

Values reported are 30 minute average values.





Republic Environmental  
Systems (Pennsylvania), LLC

2869 Sandstone Dr. Hatfield Pa. 19440

(tel)215-822-8995 (fax)215-822-1293

## Certificate of Analytical Results

Date: 16-Mar-10

**CLIENT:** Maxxam Analytical Services  
6740 Campobello Road  
Mississauga, Ontario L5N 2L8  
**Lab Order:** R10030003  
**Project:** B022956

Analyses	As Received Basis	Dry Basis	Units	Method	Date	Analyst
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### FE4552-01R \ 1-DIOXIN/ PM2.

**Lab ID:** R10030003-01A

**Date Sampled:** 02/17/2010

**Date Received:** 03/01/2010

**Matrix:** SOLID

#### PERCENT MOISTURE

Moisture, Total	73.9	%	D 2216	01-Mar-10	VJO
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#### ASH, COAL

Ash	4.23	16.2	%	D3174	03-Mar-10	VJO
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#### CARBON, HYDROGEN, NITROGEN, OXYGEN (COAL)

Carbon	11.4	43.7	%	D5291/537	05-Mar-10	VJO
Hydrogen (Excl. H in Moisture)	1.78	6.82	%			
Hydrogen (Incl. H in Moisture)	10.0		%			
Nitrogen	1.51	5.79	%			
Oxygen (Excl. O in Moisture)	6.92	26.5	%			
Oxygen (Incl. O in Moisture)	72.6		%			

#### FIXED CARBON, COAL

Fixed Carbon	2.82	10.8	%	D3172	03-Mar-10	VJO
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#### HEATING VALUE, COAL

Heating Value	2140	8,200	Btu/lb	D5865	05-Mar-10	VJO
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#### SULFUR

Sulfur	0.230	0.88	%	D4239	02-Mar-10	VJO
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#### VOLATILE MATTER, COAL

Volatile Matter	19.0	72.8	%	D3175	03-Mar-10	VJO
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< Indicates less than the limit of quantitation

H - Hold Time exceedance



2869 Sandstone Dr. Hatfield Pa. 19440

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## Certificate of Analytical Results

Date: 16-Mar-10

**CLIENT:** Maxxam Analytical Services  
6740 Campobello Road  
Mississauga, Ontario L5N 2L8  
**Lab Order:** R10030003  
**Project:** B022956

Analyses	As Received Basis	Dry Basis	Units	Method	Date	Analyst
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### FE4553-01R \ 2-DIOXIN/ PM2.

**Lab ID:** R10030003-02A

**Date Sampled:** 02/17/2010

**Date Received:** 03/01/2010

**Matrix:** SOLID

#### PERCENT MOISTURE

Moisture, Total	72.9	%	D 2216	01-Mar-10	VJO
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#### ASH, COAL

Ash	4.05	14.9	%	D3174	03-Mar-10	VJO
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#### CARBON, HYDROGEN, NITROGEN, OXYGEN (COAL)

Carbon	11.4	42.1	%	D5291/537	05-Mar-10	VJO
Hydrogen (Excl. H in Moisture)	1.80	6.64	%			
Hydrogen (Incl. H in Moisture)	10.1		%			
Nitrogen	1.48	5.46	%			
Oxygen (Excl. O in Moisture)	7.17	26.5	%			
Oxygen (Incl. O in Moisture)	72.8		%			

#### FIXED CARBON, COAL

Fixed Carbon	2.09	7.71	%	D3172	03-Mar-10	VJO
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#### HEATING VALUE, COAL

Heating Value	2140	7,900	Btu/lb	D5865	05-Mar-10	VJO
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#### SULFUR

Sulfur	0.210	0.77	%	D4239	02-Mar-10	VJO
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#### VOLATILE MATTER, COAL

Volatile Matter	20.0	73.8	%	D3175	03-Mar-10	VJO
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< Indicates less than the limit of quantitation

H - Hold Time exceedance



2869 Sandstone Dr. Hatfield Pa. 19440

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## Certificate of Analytical Results

Date: 16-Mar-10

**CLIENT:** Maxxam Analytical Services  
6740 Campobello Road  
Mississauga, Ontario L5N 2L8  
**Lab Order:** R10030003  
**Project:** B022956

Analyses	As Received Basis	Dry Basis	Units	Method	Date	Analyst
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### FE4554-01R \ 3-DIOXIN/ PM2.

**Lab ID:** R10030003-03A

**Date Sampled:** 02/17/2010

**Date Received:** 03/01/2010

**Matrix:** SOLID

#### PERCENT MOISTURE

Moisture, Total	73.3	%	D 2216	01-Mar-10	VJO
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#### ASH, COAL

Ash	4.22	15.8	%	D3174	03-Mar-10	VJO
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#### CARBON, HYDROGEN, NITROGEN, OXYGEN (COAL)

Carbon	11.9	44.6	%	D5291/537	05-Mar-10	VJO
Hydrogen (Excl. H in Moisture)	1.88	7.04	%			
Hydrogen (Incl. H in Moisture)	10.1		%			
Nitrogen	1.49	5.58	%			
Oxygen (Excl. O in Moisture)	6.95	26.0	%			
Oxygen (Incl. O in Moisture)	72.0		%			

#### FIXED CARBON, COAL

Fixed Carbon	3.20	12.0	%	D3172	03-Mar-10	VJO
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#### HEATING VALUE, COAL

Heating Value	2240	8,390	Btu/lb	D5865	05-Mar-10	VJO
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#### SULFUR

Sulfur	0.230	0.86	%	D4239	02-Mar-10	VJO
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#### VOLATILE MATTER, COAL

Volatile Matter	19.3	72.3	%	D3175	03-Mar-10	VJO
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< Indicates less than the limit of quantitation

H - Hold Time exceedance



2869 Sandstone Dr. Hatfield Pa. 19440

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## Certificate of Analytical Results

Date: 16-Mar-10

**CLIENT:** Maxxam Analytical Services  
6740 Campobello Road  
Mississauga, Ontario L5N 2L8  
**Lab Order:** R10030003  
**Project:** B022956

Analyses	As Received Basis	Dry Basis	Units	Method	Date	Analyst
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### FE4555-01R \ 4-HCL

**Lab ID:** R10030003-04A

**Date Sampled:** 02/17/2010

**Date Received:** 03/01/2010

**Matrix:** SOLID

#### PERCENT MOISTURE

Moisture, Total	75.5	%	D 2216	01-Mar-10	VJO
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#### ASH, COAL

Ash	3.94	16.1	%	D3174	03-Mar-10	VJO
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#### CARBON, HYDROGEN, NITROGEN, OXYGEN (COAL)

Carbon	10.7	43.7	%	D5291/537	05-Mar-10	VJO
Hydrogen (Excl. H in Moisture)	1.55	6.33	%			
Hydrogen (Incl. H in Moisture)	10.0		%			
Nitrogen	1.31	5.35	%			
Oxygen (Excl. O in Moisture)	6.74	27.5	%			
Oxygen (Incl. O in Moisture)	73.8		%			

#### FIXED CARBON, COAL

Fixed Carbon	2.30	9.39	%	D3172	03-Mar-10	VJO
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#### HEATING VALUE, COAL

Heating Value	2030	8,290	Btu/lb	D5865	05-Mar-10	VJO
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#### SULFUR

Sulfur	0.220	0.90	%	D4239	02-Mar-10	VJO
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#### VOLATILE MATTER, COAL

Volatile Matter	18.2	74.3	%	D3175	03-Mar-10	VJO
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< Indicates less than the limit of quantitation

H - Hold Time exceedance



2869 Sandstone Dr. Hatfield Pa. 19440

(tel)215-822-8995 (fax)215-822-1293

## Certificate of Analytical Results

Date: 16-Mar-10

**CLIENT:** Maxxam Analytical Services  
6740 Campobello Road  
Mississauga, Ontario L5N 2L8  
**Lab Order:** R10030003  
**Project:** B022956

Analyses	As Received Basis	Dry Basis	Units	Method	Date	Analyst
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### FE4556-01R \ 5-HCL

**Lab ID:** R10030003-05A

**Date Sampled:** 02/17/2010

**Date Received:** 03/01/2010

**Matrix:** SOLID

#### PERCENT MOISTURE

Moisture, Total	74.8	%	D 2216	01-Mar-10	VJO
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#### ASH, COAL

Ash	4.08	16.2	%	D3174	03-Mar-10	VJO
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#### CARBON, HYDROGEN, NITROGEN, OXYGEN (COAL)

Carbon	11.2	44.4	%	D5291/537	05-Mar-10	VJO
Hydrogen (Excl. H in Moisture)	1.75	6.94	%			
Hydrogen (Incl. H in Moisture)	10.1		%			
Nitrogen	1.41	5.60	%			
Oxygen (Excl. O in Moisture)	6.56	26.0	%			
Oxygen (Incl. O in Moisture)	73.0		%			

#### FIXED CARBON, COAL

Fixed Carbon	2.82	11.2	%	D3172	03-Mar-10	VJO
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#### HEATING VALUE, COAL

Heating Value	2100	8,330	Btu/lb	D5865	05-Mar-10	VJO
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#### SULFUR

Sulfur	0.220	0.87	%	D4239	02-Mar-10	VJO
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#### VOLATILE MATTER, COAL

Volatile Matter	18.3	72.6	%	D3175	03-Mar-10	VJO
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< Indicates less than the limit of quantitation

H - Hold Time exceedance



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## Certificate of Analytical Results

Date: 16-Mar-10

**CLIENT:** Maxxam Analytical Services  
6740 Campobello Road  
Mississauga, Ontario L5N 2L8  
**Lab Order:** R10030003  
**Project:** B022956

Analyses	As Received Basis	Dry Basis	Units	Method	Date	Analyst
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### FE4557-01R \ 6-HCL

**Lab ID:** R10030003-06A

**Date Sampled:** 02/17/2010

**Date Received:** 03/01/2010

**Matrix:** SOLID

#### PERCENT MOISTURE

Moisture, Total	73.3	%	D 2216	01-Mar-10	VJO
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#### ASH, COAL

Ash	4.19	15.7	%	D3174	03-Mar-10	VJO
-----	------	------	---	-------	-----------	-----

#### CARBON, HYDROGEN, NITROGEN, OXYGEN (COAL)

Carbon	12.0	44.9	%	D5291/537	05-Mar-10	VJO
Hydrogen (Excl. H in Moisture)	1.85	6.93	%			
Hydrogen (Incl. H in Moisture)	10.0		%			
Nitrogen	1.45	5.43	%			
Oxygen (Excl. O in Moisture)	7.01	26.3	%			
Oxygen (Incl. O in Moisture)	72.1		%			

#### FIXED CARBON, COAL

Fixed Carbon	2.56	9.59	%	D3172	03-Mar-10	VJO
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#### HEATING VALUE, COAL

Heating Value	2270	8,500	Btu/lb	D5865	05-Mar-10	VJO
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#### SULFUR

Sulfur	0.220	0.82	%	D4239	02-Mar-10	VJO
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#### VOLATILE MATTER, COAL

Volatile Matter	19.9	74.5	%	D3175	03-Mar-10	VJO
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< Indicates less than the limit of quantitation

H - Hold Time exceedance

**Appendix D**  
**Laboratory Results**

**EPA Reference Method 23**  
**Determination of Dioxins/Furan Emissions From Stationary Sources**

<b>Client</b>	<b>Met Council</b>	<b>Date</b>	<b>2-16-10</b>
<b>Facility</b>	<b>Seneca</b>	<b>Job Number</b>	<b>902630</b>
<b>Unit</b>	<b>Unit 1</b>	<b>Operator</b>	<b>BD</b>
<b>Location</b>	<b>Stack</b>	<b>Version</b>	<b>ST604-04</b>

**AVERAGE TEST 1-3**

Element	Detection		ng/dscm				
	Status	ng	ng/dscf	ng/dscm	lbs/hr	@7% O2	TEF
2378-TCDD	BDL	0.04	0.000	0.008	4.68E-07	0.020	1
12378-PeCDD	BDL	0.04	0.000	0.008	4.68E-07	0.020	0.5
123478-HxCDD	BDL	0.04	0.000	0.008	4.68E-07	0.020	0.1
123678-HxCDD	BDL	0.04	0.000	0.008	4.68E-07	0.020	0.1
123789-HxCDD	BDL	0.04	0.000	0.008	4.68E-07	0.020	0.1
1234678-HpCDD	BDL	0.04	0.000	0.008	4.68E-07	0.020	0.01
OCDD	BDL	0.40	0.002	0.078	4.68E-06	0.198	0.001
2378-TCDF	ADL	0.17	0.001	0.033	2.01E-06	0.085	0.1
12378-PeCDF	BDL	0.04	0.000	0.008	4.68E-07	0.020	0.05
23478-PeCDF	BDL	0.04	0.000	0.008	4.68E-07	0.020	0.5
123478-HxCDF	BDL	0.04	0.000	0.008	4.68E-07	0.020	0.1
123678-HxCDF	BDL	0.04	0.000	0.008	4.68E-07	0.020	0.1
234678-HxCDF	BDL	0.04	0.000	0.008	4.68E-07	0.020	0.1
123789-HxCDF	BDL	0.04	0.000	0.008	4.68E-07	0.020	0.1
1234678-HpCDF	BDL	0.04	0.000	0.008	4.68E-07	0.020	0.01
1234789-HpCDF	BDL	0.04	0.000	0.008	4.68E-07	0.020	0.01
OCDF	BDL	0.40	0.002	0.078	4.68E-06	0.198	0.001
Total TCDD	ADL	0.19	0.001	0.038	2.27E-06	0.096	
Total PeCDD	BDL	0.04	0.000	0.008	4.68E-07	0.020	
Total HxCDD	BDL	0.04	0.000	0.008	4.68E-07	0.020	
Total HpCDD	DLL	0.04	0.000	0.008	4.88E-07	0.021	
Total TCDF	ADL	2.02	0.008	0.393	2.36E-05	0.998	
Total PeCDF	BDL	0.04	0.000	0.008	4.68E-07	0.020	
Total HxCDF	ADL	0.10	0.000	0.019	1.17E-06	0.049	
Total HpCDF	BDL	0.04	0.000	0.008	4.68E-07	0.020	
Total PCDD/PCDF	DLL	1.08	0.000	0.212	1.27E-05	0.527	
Total TEQ	DLL	0.13	0.001	0.03	1.51E-06	0.06	

**BDL = Below Detection Limit - All fractions below detection limit**

**DLL = Detection Limit Limited - Some fractions below detection limit**

**ADL = Above Detection Limit - All fractions above detection limit**



**EPA Reference Method 23**  
**Determination of Dioxins/Furan Emissions From Stationary Sources**

<b>Client</b>	<b>Met Council</b>	<b>Date</b>	<b>2-16-10</b>
<b>Facility</b>	<b>Seneca</b>	<b>Job Number</b>	<b>902630</b>
<b>Unit</b>	<b>Unit 1</b>	<b>Operator</b>	<b>BD</b>
<b>Location</b>	<b>Stack</b>	<b>Version</b>	<b>ST604-04</b>

<b>TEST 1</b>	<b>Time</b>	<b>8:55-13:03</b>	<b>Date</b>	<b>2-16-10</b>
Stack Volumetric Flow	16046	DSCFM	F-Factor	NA
Sample Gas Volume	179.935	DSCF	Heat Input	NA mmBtu/hr
Oxygen	15.3	%		

Element	Status	Detection		ng/dscm			
		ng	ng/dscf	ng/dscm	lbs/hr	@7% O2	TEF
2378-TCDD	BDL	0.040	0.000	0.008	4.72E-07	0.0195	1
12378-PeCDD	BDL	0.040	0.000	0.008	4.72E-07	0.0195	0.5
123478-HxCDD	BDL	0.040	0.000	0.008	4.72E-07	0.0195	0.1
123678-HxCDD	BDL	0.040	0.000	0.008	4.72E-07	0.0195	0.1
123789-HxCDD	BDL	0.040	0.000	0.008	4.72E-07	0.0195	0.1
1234678-HpCDD	BDL	0.040	0.000	0.008	4.72E-07	0.0195	0.01
OCDD	BDL	0.400	0.002	0.079	4.72E-06	0.1949	0.001
2378-TCDF	ADL	0.165	0.001	0.032	1.95E-06	0.0804	0.1
12378-PeCDF	BDL	0.040	0.000	0.008	4.72E-07	0.0195	0.05
23478-PeCDF	BDL	0.040	0.000	0.008	4.72E-07	0.0195	0.5
123478-HxCDF	BDL	0.040	0.000	0.008	4.72E-07	0.0195	0.1
123678-HxCDF	BDL	0.040	0.000	0.008	4.72E-07	0.0195	0.1
234678-HxCDF	BDL	0.040	0.000	0.008	4.72E-07	0.0195	0.1
123789-HxCDF	BDL	0.040	0.000	0.008	4.72E-07	0.0195	0.1
1234678-HpCDF	BDL	0.040	0.000	0.008	4.72E-07	0.0195	0.01
1234789-HpCDF	BDL	0.040	0.000	0.008	4.72E-07	0.0195	0.01
OCDF	BDL	0.400	0.002	0.079	4.72E-06	0.1949	0.001
Total TCDD	ADL	0.183	0.001	0.036	2.16E-06	0.0891	
Total PeCDD	BDL	0.040	0.000	0.008	4.72E-07	0.0195	
Total HxCDD	BDL	0.040	0.000	0.008	4.72E-07	0.0195	
Total HpCDD	ADL	0.043	0.000	0.008	5.07E-07	0.0209	
Total TCDF	ADL	1.870	0.010	0.367	2.21E-05	0.9110	
Total PeCDF	BDL	0.040	0.000	0.008	4.72E-07	0.0195	
Total HxCDF	ADL	0.105	0.001	0.021	1.24E-06	0.0512	
Total HpCDF	BDL	0.040	0.000	0.008	4.72E-07	0.0195	
Total PCDD/PCDF	DLL	3.161	0.018	0.620	3.73E-05	1.5399	
Total TEQ	DLL	0.129	0.001	0.03	1.52E-06	0.0626	

**BDL = Below Detection Limit - All fractions below detection limit**

**DLL = Detection Limit Limited - Some fractions below detection limit**

**ADL = Above Detection Limit - All fractions above detection limit**

**EPA Reference Method 23**  
**Determination of Dioxins/Furan Emissions From Stationary Sources**

<b>Client</b>	<b>Met Council</b>	<b>Date</b>	<b>2-16-10</b>
<b>Facility</b>	<b>Seneca</b>	<b>Job Number</b>	<b>902630</b>
<b>Unit</b>	<b>Unit 1</b>	<b>Operator</b>	<b>BD</b>
<b>Location</b>	<b>Stack</b>	<b>Version</b>	<b>ST604-04</b>

<b>TEST 2</b>	<b>Time</b>	<b>14:00-18:05</b>	<b>Date</b>	<b>2-16-10</b>
Stack Volumetric Flow	15768	DSCFM	F-Factor	NA
Sample Gas Volume	178.457	DSCF	Heat Input	NA mmBtu/hr
Oxygen	15.3	%		

Element	Detection		ng/dscm				
	Status	ng	ng/dscf	ng/dscm	lbs/hr	@7% O2	TEF
2378-TCDD	BDL	0.040	0.000	0.008	4.68E-07	0.0196	1
12378-PeCDD	BDL	0.040	0.000	0.008	4.68E-07	0.0196	0.5
123478-HxCDD	BDL	0.040	0.000	0.008	4.68E-07	0.0196	0.1
123678-HxCDD	BDL	0.040	0.000	0.008	4.68E-07	0.0196	0.1
123789-HxCDD	BDL	0.040	0.000	0.008	4.68E-07	0.0196	0.1
1234678-HpCDD	BDL	0.040	0.000	0.008	4.68E-07	0.0196	0.01
OCDD	BDL	0.400	0.002	0.079	4.68E-06	0.1965	0.001
2378-TCDF	ADL	0.206	0.001	0.041	2.41E-06	0.1012	0.1
12378-PeCDF	BDL	0.040	0.000	0.008	4.68E-07	0.0196	0.05
23478-PeCDF	BDL	0.040	0.000	0.008	4.68E-07	0.0196	0.5
123478-HxCDF	BDL	0.040	0.000	0.008	4.68E-07	0.0196	0.1
123678-HxCDF	BDL	0.040	0.000	0.008	4.68E-07	0.0196	0.1
234678-HxCDF	BDL	0.040	0.000	0.008	4.68E-07	0.0196	0.1
123789-HxCDF	BDL	0.040	0.000	0.008	4.68E-07	0.0196	0.1
1234678-HpCDF	BDL	0.040	0.000	0.008	4.68E-07	0.0196	0.01
1234789-HpCDF	BDL	0.040	0.000	0.008	4.68E-07	0.0196	0.01
OCDF	BDL	0.400	0.002	0.079	4.68E-06	0.1965	0.001
Total TCDD	ADL	0.164	0.001	0.032	1.92E-06	0.0806	
Total PeCDD	BDL	0.040	0.000	0.008	4.68E-07	0.0196	
Total HxCDD	BDL	0.040	0.000	0.008	4.68E-07	0.0196	
Total HpCDD	ADL	0.042	0.000	0.008	4.91E-07	0.0206	
Total TCDF	ADL	2.420	0.014	0.479	2.83E-05	1.1887	
Total PeCDF	BDL	0.040	0.000	0.008	4.68E-07	0.0196	
Total HxCDF	ADL	0.098	0.001	0.019	1.15E-06	0.0481	
Total HpCDF	BDL	0.040	0.000	0.008	4.68E-07	0.0196	
Total PCDD/PCDF	DLL	3.684	0.021	0.729	4.31E-05	1.8095	
Total TEQ	DLL	0.133	0.001	0.03	1.55E-06	0.0651	

**BDL = Below Detection Limit - All fractions below detection limit**

**DLL = Detection Limit Limited - Some fractions below detection limit**

**ADL = Above Detection Limit - All fractions above detection limit**

**EPA Reference Method 23**  
**Determination of Dioxins/Furan Emissions From Stationary Sources**

<b>Client</b>	<b>Met Council</b>	<b>Date</b>	<b>2-17-10</b>
<b>Facility</b>	<b>Seneca</b>	<b>Job Number</b>	<b>902630</b>
<b>Unit</b>	<b>Unit 1</b>	<b>Operator</b>	<b>BD</b>
<b>Location</b>	<b>Stack</b>	<b>Version</b>	<b>ST604-04</b>

<b>TEST 3</b>	<b>Time</b>	<b>8:05-12:40</b>	<b>Date</b>	<b>2-17-10</b>
Stack Volumetric Flow	16329	DSCFM	F-Factor	NA
Sample Gas Volume	186.012	DSCF	Heat Input	NA mmBtu/hr
Oxygen	15.7	%		

Element	Status	Detection		ng/dscm			
		ng	ng/dscf	ng/dscm	lbs/hr	@7% O2	TEF
2378-TCDD	BDL	0.040	0.000	0.008	4.64E-07	0.0203	1
12378-PeCDD	BDL	0.040	0.000	0.008	4.64E-07	0.0203	0.5
123478-HxCDD	BDL	0.040	0.000	0.008	4.64E-07	0.0203	0.1
123678-HxCDD	BDL	0.040	0.000	0.008	4.64E-07	0.0203	0.1
123789-HxCDD	BDL	0.040	0.000	0.008	4.64E-07	0.0203	0.1
1234678-HpCDD	BDL	0.040	0.000	0.008	4.64E-07	0.0203	0.01
OCDD	BDL	0.400	0.002	0.076	4.64E-06	0.2030	0.001
2378-TCDF	ADL	0.144	0.001	0.027	1.67E-06	0.0731	0.1
12378-PeCDF	BDL	0.040	0.000	0.008	4.64E-07	0.0203	0.05
23478-PeCDF	BDL	0.040	0.000	0.008	4.64E-07	0.0203	0.5
123478-HxCDF	BDL	0.040	0.000	0.008	4.64E-07	0.0203	0.1
123678-HxCDF	BDL	0.040	0.000	0.008	4.64E-07	0.0203	0.1
234678-HxCDF	BDL	0.040	0.000	0.008	4.64E-07	0.0203	0.1
123789-HxCDF	BDL	0.040	0.000	0.008	4.64E-07	0.0203	0.1
1234678-HpCDF	BDL	0.040	0.000	0.008	4.64E-07	0.0203	0.01
1234789-HpCDF	BDL	0.040	0.000	0.008	4.64E-07	0.0203	0.01
OCDF	BDL	0.400	0.002	0.076	4.64E-06	0.2030	0.001
Total TCDD	ADL	0.235	0.001	0.045	2.73E-06	0.1193	
Total PeCDD	BDL	0.040	0.000	0.008	4.64E-07	0.0203	
Total HxCDD	BDL	0.040	0.000	0.008	4.64E-07	0.0203	
Total HpCDD	BDL	0.040	0.000	0.008	4.64E-07	0.0203	
Total TCDF	ADL	1.760	0.009	0.334	2.04E-05	0.8932	
Total PeCDF	BDL	0.040	0.000	0.008	4.64E-07	0.0203	
Total HxCDF	ADL	0.096	0.001	0.018	1.11E-06	0.0487	
Total HpCDF	BDL	0.040	0.000	0.008	4.64E-07	0.0203	
Total PCDD/PCDF	DLL	3.091	0.017	0.587	3.59E-05	1.5686	
Total TEQ	DLL	0.126	0.001	0.02	1.47E-06	0.0641	

**BDL = Below Detection Limit - All fractions below detection limit**

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**ADL = Above Detection Limit - All fractions above detection limit**

**EPA Reference Method 23**  
**Determination of Dioxins/Furan Emissions From Stationary Sources**

<b>Client</b>	<b>Met Council</b>	<b>Date</b>	<b>2-16-10</b>
<b>Facility</b>	<b>Seneca</b>	<b>Job Number</b>	<b>902630</b>
<b>Unit</b>	<b>Unit 1</b>	<b>Operator</b>	<b>BD</b>
<b>Location</b>	<b>Stack</b>	<b>Version</b>	<b>ST604-04</b>

*Reagent Blank*

<b>Element</b>	<b>Detection</b>		<b>TEF</b>
	<b>Status</b>	<b>ng</b>	
2378-TCDD	BDL	0.040	1
12378-PeCDD	BDL	0.040	0.5
123478-HxCDD	BDL	0.040	0.1
123678-HxCDD	BDL	0.040	0.1
123789-HxCDD	BDL	0.040	0.1
1234678-HpCDD	BDL	0.040	0.01
OCDD	BDL	0.400	0.001
2378-TCDF	BDL	0.040	0.1
12378-PeCDF	BDL	0.040	0.05
23478-PeCDF	BDL	0.040	0.5
123478-HxCDF	BDL	0.040	0.1
123678-HxCDF	BDL	0.040	0.1
234678-HxCDF	BDL	0.040	0.1
123789-HxCDF	BDL	0.040	0.1
1234678-HpCDF	BDL	0.040	0.01
1234789-HpCDF	BDL	0.040	0.01
OCDF	BDL	0.040	0.001
Total TCDD	BDL	0.040	
Total PeCDD	BDL	0.040	
Total HxCDD	BDL	0.040	
Total HpCDD	BDL	0.400	
Total TCDF	BDL	0.040	
Total PeCDF	BDL	0.040	
Total HxCDF	BDL	0.040	
Total HpCDF	BDL	0.040	

**BDL = Below Detection Limit - All fractions below detection limit**

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**EMSI**

**EPA Reference Method 23**  
**Determination of Dioxins/Furan Emissions From Stationary Sources**

<b>Client</b>	<b>Met Council</b>	<b>Date</b>	<b>2/8/2010</b>
<b>Facility</b>	<b>Metro</b>	<b>Job Number</b>	<b>902630</b>
<b>Unit</b>	<b>FBR 1</b>	<b>Operator</b>	<b>NT NK</b>
<b>Location</b>	<b>Stack</b>	<b>Version</b>	<b>ST604-04</b>

*Train Blank*

Element	Detection		TEF
	Status	ng	
2378-TCDD	BDL	0.040	1
12378-PeCDD	BDL	0.040	0.5
123478-HxCDD	BDL	0.040	0.1
123678-HxCDD	BDL	0.040	0.1
123789-HxCDD	BDL	0.040	0.1
1234678-HpCDD	BDL	0.040	0.01
OCDD	BDL	0.400	0.001
2378-TCDF	BDL	0.040	0.1
12378-PeCDF	BDL	0.040	0.05
23478-PeCDF	BDL	0.040	0.5
123478-HxCDF	BDL	0.040	0.1
123678-HxCDF	BDL	0.040	0.1
234678-HxCDF	BDL	0.040	0.1
123789-HxCDF	BDL	0.040	0.1
1234678-HpCDF	BDL	0.040	0.01
1234789-HpCDF	BDL	0.040	0.01
OCDF	BDL	0.400	0.001
Total TCDD	BDL	0.040	
Total PeCDD	BDL	0.040	
Total HxCDD	BDL	0.040	
Total HpCDD	BDL	0.040	
Total TCDF	BDL	0.040	
Total PeCDF	BDL	0.040	
Total HxCDF	BDL	0.040	
Total HpCDF	BDL	0.040	

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**DLL = Detection Limit Limited - Some fractions below detection limit**

**ADL = Above Detection Limit - All fractions above detection limit**

**EMSI**

**EPA REFERENCE METHOD 23**  
**Determination of Polychlorinated Biphenyl Emissions From Stationary Sources**

<b>Client</b>	<b>Met Council</b>	<b>Date</b>	<b>2-16-10</b>
<b>Facility</b>	<b>Seneca</b>	<b>Job Number</b>	<b>902630</b>
<b>Unit</b>	<b>Unit 1</b>	<b>Operator</b>	<b>BD</b>
<b>Location</b>	<b>Stack</b>		

**AVERAGE TEST 1-3**

<b>Element</b>	<b>Detection Status</b>						<b>ng/dscm</b>
		<b>ng</b>	<b>ng/dscf</b>	<b>ng/dscm</b>	<b>lbs/hr</b>		<b>@7%O2</b>
3,4',4,5'-TetraCB (#81)	BDL	0.20	0.0011	0.0389	2.340E-09		0.0990
3,3',4,4'-TetraCB (#77)	BDL	0.20	0.0011	0.0389	2.340E-09		0.0990
2',3,4,4',5-PentaCB (#123)	BDL	0.20	0.0011	0.0389	2.340E-09		0.0990
2,3',4,4',5-PentaCB (#118)	ADL	6.30	0.0347	1.2250	7.373E-08		3.1216
2,3,4,4',5-PentaCB (#114)	BDL	0.20	0.0011	0.0389	2.340E-09		0.0990
2,3,3',4,4'-PentaCB (#105)	ADL	1.74	0.0096	0.3376	2.032E-08		0.8598
3,3',4,4',5-PentaCB (#126)	BDL	0.20	0.0011	0.0389	2.340E-09		0.0990
2,3',4,4',5,5'-HexaCB (#167)	BDL	0.20	0.0011	0.0389	2.340E-09		0.0990
2,3,3,4,4,5-HexaCB (#156/#157)	BDL	0.40	0.0022	0.0778	4.679E-09		0.1980
3,3',4,4',5,5'-HexaCB (#169)	BDL	0.20	0.0011	0.0389	2.340E-09		0.0990
2,3,3',4,4',5,5'-HeptaCB (#189)	BDL	0.20	0.0011	0.0389	2.340E-09		0.0990

**BDL = Below Detection Limit - All fractions below detection limit**

**DLL = Detection Limit Limited - Some fractions below detection limit**

**ADL = Above Detection Limit - All fractions above detection limit**

**EMSI**

**EPA REFERENCE METHOD 23**  
**Determination of Polychlorinated Biphenyl Emissions From Stationary Sources**

<b>Client</b>	<b>Met Council</b>	<b>Date</b>	<b>2-16-10</b>
<b>Facility</b>	<b>Seneca</b>	<b>Job Number</b>	<b>902630</b>
<b>Unit</b>	<b>Unit 1</b>	<b>Operator</b>	<b>BD</b>
<b>Location</b>	<b>Stack</b>	<b>Version</b>	<b>ST604-04</b>

<b>TEST 1</b>	<b>Time</b>	<b>8:55-13:03</b>	<b>Date</b>	<b>2-16-10</b>
Stack Volumetric Flow	16,046	dscfm	Oxygen	15.30 %
Sample Gas Volume	179.935	dscf	F-Factor	NA
			Heat Input	NA mmBtu/hr

Element	Detection		ng/dscm			
	Status	ng	ng/dscf	ng/dscm	lbs/hr	@7%O <sub>2</sub>
3,4',4,5'-TetraCB (#81)	BDL	0.20	0.0011	0.0392	2.359E-09	0.0974
3,3',4,4'-TetraCB (#77)	BDL	0.20	0.0011	0.0392	2.359E-09	0.0974
2',3,4,4',5-PentaCB (#123)	BDL	0.20	0.0011	0.0392	2.359E-09	0.0974
2,3',4,4',5-PentaCB (#118)	ADL	6.33	0.0352	1.2414	7.467E-08	3.0813
2,3,4,4',5-PentaCB (#114)	BDL	0.20	0.0011	0.0392	2.359E-09	0.0974
2,3,3',4,4'-PentaCB (#105)	ADL	1.77	0.0098	0.3471	2.088E-08	0.8616
3,3',4,4',5-PentaCB (#126)	BDL	0.20	0.0011	0.0392	2.359E-09	0.0974
2,3',4,4',5,5'-HexaCB (#167)	BDL	0.20	0.0011	0.0392	2.359E-09	0.0974
2,3,3,4,4,5-HexaCB (#156/#157)	BDL	0.40	0.0022	0.0784	4.718E-09	0.1947
3,3',4,4',5,5'-HexaCB (#169)	BDL	0.20	0.0011	0.0392	2.359E-09	0.0974
2,3,3',4,4',5,5'-HeptaCB (#189)	BDL	0.20	0.0011	0.0392	2.359E-09	0.0974

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**ADL = Above Detection Limit - All fractions above detection limit**

**EMSI**

**EPA REFERENCE METHOD 23**  
**Determination of Polychlorinated Biphenyl Emissions From Stationary Sources**

<b>Client</b>	<b>Met Council</b>	<b>Date</b>	<b>2-16-10</b>
<b>Facility</b>	<b>Seneca</b>	<b>Job Number</b>	<b>902630</b>
<b>Unit</b>	<b>Unit 1</b>	<b>Operator</b>	<b>BD</b>
<b>Location</b>	<b>Stack</b>		

<b>TEST 2</b>	<b>Time</b>	<b>14:00-18:05</b>	<b>Date</b>	<b>2-16-10</b>
Stack Volumetric Flow	15,768	dscfm	Oxygen	15.30 %
Sample Gas Volume	178.457	dscf	F-Factor	NA
			Heat Input	NA mmBtu/hr

<b>Element</b>	<b>Detection Status</b>	<b>ng</b>	<b>ng/dscf</b>	<b>ng/dscm</b>	<b>lbs/hr</b>	<b>ng/dscm @7%O2</b>
3,4',4,5'-TetraCB (#81)	BDL	0.20	0.0011	0.0395	2.338E-09	0.0982
3,3',4,4'-TetraCB (#77)	BDL	0.20	0.0011	0.0395	2.338E-09	0.0982
2',3,4,4',5-PentaCB (#123)	BDL	0.20	0.0011	0.0395	2.338E-09	0.0982
2,3',4,4',5-PentaCB (#118)	ADL	5.88	0.0329	1.1627	6.873E-08	2.8859
2,3,4,4',5-PentaCB (#114)	BDL	0.20	0.0011	0.0395	2.338E-09	0.0982
2,3,3',4,4'-PentaCB (#105)	ADL	1.63	0.0091	0.3223	1.905E-08	0.8000
3,3',4,4',5-PentaCB (#126)	BDL	0.20	0.0011	0.0395	2.338E-09	0.0982
2,3',4,4',5,5'-HexaCB (#167)	BDL	0.20	0.0011	0.0395	2.338E-09	0.0982
2,3,3,4,4,5-HexaCB (#156/#157)	BDL	0.40	0.0022	0.0791	4.675E-09	0.1963
3,3',4,4',5,5'-HexaCB (#169)	BDL	0.20	0.0011	0.0395	2.338E-09	0.0982
2,3,3',4,4',5,5'-HeptaCB (#189)	BDL	0.20	0.0011	0.0395	2.338E-09	0.0982

**BDL = Below Detection Limit - All fractions below detection limit**  
**DLL = Detection Limit Limited - Some fractions below detection limit**  
**ADL = Above Detection Limit - All fractions above detection limit**

**EMSI**



## EPA REFERENCE METHOD 23

### Determination of Polychlorinated Biphenyl Emissions From Stationary Sources

<b>Client</b>	<b>Met Council</b>	<b>Date</b>	<b>2-17-10</b>
<b>Facility</b>	<b>Seneca</b>	<b>Job Number</b>	<b>902630</b>
<b>Unit</b>	<b>Unit 1</b>	<b>Operator</b>	<b>BD</b>
<b>Location</b>	<b>Stack</b>		

<b>TEST 3</b>	<b>Time</b>	<b>8:05-12:40</b>	<b>Date</b>	<b>2-17-10</b>
Stack Volumetric Flow	16,329	dscfm	Oxygen	15.70 %
Sample Gas Volume	186.012	dscf	F-Factor	NA
			Heat Input	NA mmBtu/hr

<b>Element</b>	<b>Detection Status</b>	<b>ng</b>	<b>ng/dscf</b>	<b>ng/dscm</b>	<b>lbs/hr</b>	<b>ng/dscm @7%O2</b>
3,4',4,5'-TetraCB (#81)	BDL	0.20	0.0011	0.0379	2.322E-09	0.1014
3,3',4,4'-TetraCB (#77)	BDL	0.20	0.0011	0.0379	2.322E-09	0.1014
2',3,4,4',5-PentaCB (#123)	BDL	0.20	0.0011	0.0379	2.322E-09	0.1014
2,3',4,4',5-PentaCB (#118)	ADL	6.70	0.0360	1.2710	7.780E-08	3.3975
2,3,4,4',5-PentaCB (#114)	BDL	0.20	0.0011	0.0379	2.322E-09	0.1014
2,3,3',4,4'-PentaCB (#105)	ADL	1.81	0.0097	0.3434	2.102E-08	0.9178
3,3',4,4',5-PentaCB (#126)	BDL	0.20	0.0011	0.0379	2.322E-09	0.1014
2,3',4,4',5,5'-HexaCB (#167)	BDL	0.20	0.0011	0.0379	2.322E-09	0.1014
2,3,3,4,4,5-HexaCB (#156/#157)	BDL	0.40	0.0022	0.0759	4.645E-09	0.2028
3,3',4,4',5,5'-HexaCB (#169)	BDL	0.20	0.0011	0.0379	2.322E-09	0.1014
2,3,3',4,4',5,5'-HeptaCB (#189)	BDL	0.20	0.0011	0.0379	2.322E-09	0.1014

**BDL = Below Detection Limit - All fractions below detection limit**

**DLL = Detection Limit Limited - Some fractions below detection limit**

**ADL = Above Detection Limit - All fractions above detection limit**

**EMSI**

**EPA REFERENCE METHOD 23**  
**Determination of Polychlorinated Biphenyl Emissions From Stationary Sources**

<b>Client</b>	<b>Met Council</b>	<b>Date</b>	<b>2-16-10</b>
<b>Facility</b>	<b>Seneca</b>	<b>Job Number</b>	<b>902630</b>
<b>Unit</b>	<b>Unit 1</b>	<b>Operator</b>	<b>BD</b>
<b>Location</b>	<b>Stack</b>		

**Reagent Blank**

<b>Element</b>	<b>Detection</b>	
	<b>Status</b>	<b>ng</b>
3,4',4,5'-TetraCB (#81)	BDL	0.20
3,3',4,4'-TetraCB (#77)	BDL	0.20
2',3,4,4',5-PentaCB (#123)	BDL	0.20
2,3',4,4',5-PentaCB (#118)	BDL	0.20
2,3,4,4',5-PentaCB (#114)	BDL	0.20
2,3,3',4,4'-PentaCB (#105)	BDL	0.20
3,3',4,4',5-PentaCB (#126)	BDL	0.20
2,3',4,4',5,5'-HexaCB (#167)	BDL	0.20
2,3,3,4,4,5-HexaCB (#156/#157)	BDL	0.40
3,3',4,4',5,5'-HexaCB (#169)	BDL	0.20
2,3,3',4,4',5,5'-HeptaCB (#189)	BDL	0.20

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**ADL = Above Detection Limit - All fractions above detection limit**

**EMSI**

**EPA REFERENCE METHOD 23**  
**Determination of Polychlorinated Biphenyl Emissions From Stationary Sources**

<b>Client</b>	<b>Met Council</b>	<b>Date</b>	<b>2/8/2010</b>
<b>Facility</b>	<b>Metro</b>	<b>Job Number</b>	<b>902630</b>
<b>Unit</b>	<b>FBR 1</b>	<b>Operator</b>	<b>NT NK</b>
<b>Location</b>	<b>Stack</b>		

***Train Blank***

<b>Element</b>	<b>Detection</b>	
	<b>Status</b>	<b>ng</b>
3,4',4,5'-TetraCB (#81)	BDL	0.20
3,3',4,4'-TetraCB (#77)	BDL	0.20
2',3,4,4',5-PentaCB (#123)	BDL	0.20
2,3',4,4',5-PentaCB (#118)	BDL	0.20
2,3,4,4',5-PentaCB (#114)	BDL	0.20
2,3,3',4,4'-PentaCB (#105)	BDL	0.20
3,3',4,4',5-PentaCB (#126)	BDL	0.20
2,3',4,4',5,5'-HexaCB (#167)	BDL	0.20
2,3,3,4,4,5-HexaCB (#156/#157)	BDL	0.40
3,3',4,4',5,5'-HexaCB (#169)	BDL	0.20
2,3,3',4,4',5,5'-HeptaCB (#189)	BDL	0.20

**BDL = Below Detection Limit - All fractions below detection limit**

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**EMSI**

# EPA REFERENCE METHOD 23

## Determination of Polyaromatic Hydrocarbon Emissions From Stationary Sources

<b>Client</b>	<b>Met Council</b>	<b>Date</b>	<b>2-16-10</b>
<b>Facility</b>	<b>Seneca</b>	<b>Job Number</b>	<b>902630</b>
<b>Unit</b>	<b>Unit 1</b>	<b>Operator</b>	<b>BD</b>
<b>Location</b>	<b>Stack</b>		

### AVERAGE TEST 1-3

Element	Detection						ug/dscm
	Status	ug	ug/dscf	ug/dscm	lbs/hr	@ 7%O2	
Naphthalene	ADL	5.60000	0.0308	1.0883	6.550E-05	2.7733	
2-Methylnaphthalene	ADL	0.28133	0.0016	0.0549	3.298E-06	0.1386	
2-Chloronaphthalene	ADL	0.14900	0.0008	0.0290	1.742E-06	0.0738	
Acenaphthylene	ADL	0.00768	0.0000	0.0015	9.030E-08	0.0038	
Acenaphthene	ADL	0.01347	0.0001	0.0026	1.577E-07	0.0067	
Fluorene	ADL	0.02077	0.0001	0.0040	2.432E-07	0.0103	
Phenanthrene	ADL	0.13333	0.0007	0.0259	1.561E-06	0.0659	
Anthracene	DLL	0.00593	0.0000	0.0011	6.908E-08	0.0030	
Fluoranthene	ADL	0.05420	0.0003	0.0105	6.336E-07	0.0269	
Pyrene	ADL	0.03163	0.0002	0.0061	3.697E-07	0.0157	
Benzo(a)anthracene	ADL	0.00506	0.0000	0.0010	5.897E-08	0.0025	
Chrysene	ADL	0.01900	0.0001	0.0037	2.219E-07	0.0095	
Benzo(b)fluoranthene	ADL	0.00390	0.0000	0.0008	4.549E-08	0.0019	
Benzo(k)fluoranthene	DLL	0.00130	0.0000	0.0003	1.520E-08	0.0006	
Benzo(e)pyrene	ADL	0.00835	0.0000	0.0016	9.816E-08	0.0041	
Benzo(a)pyrene	BDL	0.00031	0.0000	0.0001	3.627E-09	0.0002	
Perylene	BDL	0.00026	0.0000	0.0001	3.042E-09	0.0001	
Indeno (1,2,3 -cd) pyrene	BDL	0.00030	0.0000	0.0001	3.510E-09	0.0001	
Dibenz(a,h)anthracene	BDL	0.00046	0.0000	0.0001	5.381E-09	0.0002	
Benzo(g,h,i)perylene	ADL	0.01893	0.0001	0.0037	2.225E-07	0.0093	

**BDL = Below Detection Limit - All fractions below detection limit**

**DLL = Detection Limit Limited - Some fractions below detection limit**

**ADL = Above Detection Limit - All fractions above detection limit**

**NOTE: Multiple Compounds Detected in the Blank**

**EMSI**

# EPA REFERENCE METHOD 23

## Determination of Polyaromatic Hydrocarbon Emissions From Stationary Sources

<b>Client</b>	<b>Met Council</b>	<b>Date</b>	<b>2-16-10</b>
<b>Facility</b>	<b>Seneca</b>	<b>Job Number</b>	<b>902630</b>
<b>Unit</b>	<b>Unit 1</b>	<b>Operator</b>	<b>BD</b>
<b>Location</b>	<b>Stack</b>	<b>Version</b>	<b>ST604-04</b>

<b>TEST 1</b>	<b>Time</b>	<b>8:55-13:03</b>	<b>Date</b>	<b>2-16-10</b>
Stack Volumetric Flow	16,046	dscfm	Oxygen	15.30 %
Sample Gas Volume	179.935	dscf	F-Factor	NA
			Heat Input	NA mmBtu/hr

<b>Element</b>	<b>Detection Status</b>	<b>ug</b>	<b>ug/dscf</b>	<b>ug/dscm</b>	<b>lbs/hr</b>	<b>ug/dscm @7%O2</b>	<b>ng</b>
Naphthalene	ADL	5.60000	0.0311	1.0982	6.606E-05	2.7259	5600.00
2-Methylnaphthalene	ADL	0.42400	0.0024	0.0832	5.002E-06	0.2064	424.00
2-Chloronaphthalene	ADL	0.12700	0.0007	0.0249	1.498E-06	0.0618	127.00
Acenaphthylene	ADL	0.01700	0.0001	0.0033	2.005E-07	0.0083	17.00
Acenaphthene	ADL	0.01800	0.0001	0.0035	2.123E-07	0.0088	18.00
Fluorene	ADL	0.02800	0.0002	0.0055	3.303E-07	0.0136	28.00
Phenanthrene	ADL	0.16400	0.0009	0.0322	1.935E-06	0.0798	164.00
Anthracene	BDL	0.00031	0.0000	0.0001	3.657E-09	0.0002	0.31
Fluoranthene	ADL	0.05320	0.0003	0.0104	6.276E-07	0.0259	53.20
Pyrene	ADL	0.02810	0.0002	0.0055	3.315E-07	0.0137	28.10
Benzo(a)anthracene	ADL	0.00226	0.0000	0.0004	2.666E-08	0.0011	2.26
Chrysene	ADL	0.01350	0.0001	0.0026	1.592E-07	0.0066	13.50
Benzo(b)fluoranthene	ADL	0.00221	0.0000	0.0004	2.607E-08	0.0011	2.21
Benzo(k)fluoranthene	BDL	0.00035	0.0000	0.0001	4.129E-09	0.0002	0.35
Benzo(e)pyrene	ADL	0.01790	0.0001	0.0035	2.112E-07	0.0087	17.90
Benzo(a)pyrene	BDL	0.00031	0.0000	0.0001	3.657E-09	0.0002	0.31
Perylene	BDL	0.00026	0.0000	0.0001	3.067E-09	0.0001	0.26
Indeno (1,2,3 -cd) pyrene	BDL	0.00030	0.0000	0.0001	3.539E-09	0.0001	0.30
Dibenz(a,h)anthracene	BDL	0.00046	0.0000	0.0001	5.426E-09	0.0002	0.46
Benzo(g,h,i)perylene	ADL	0.03810	0.0002	0.0075	4.494E-07	0.0185	38.10

**BDL = Below Detection Limit - All fractions below detection limit**

**DLL = Detection Limit Limited - Some fractions below detection limit**

**ADL = Above Detection Limit - All fractions above detection limit**

**NOTE: Multiple Compounds Detected in the Blank**

**EMSI**

## EPA REFERENCE METHOD 23

### Determination of Polyaromatic Hydrocarbon Emissions From Stationary Sources

<b>Client</b>	<b>Met Council</b>	<b>Date</b>	<b>2-16-10</b>
<b>Facility</b>	<b>Seneca</b>	<b>Job Number</b>	<b>902630</b>
<b>Unit</b>	<b>Unit 1</b>	<b>Operator</b>	<b>BD</b>
<b>Location</b>	<b>Stack</b>		

<b>TEST 2</b>	<b>Time</b>	<b>14:00-18:05</b>	<b>Date</b>	<b>2-16-10</b>
Stack Volumetric Flow	15,768	dscfm	Oxygen	15.30 %
Sample Gas Volume	178.457	dscf	F-Factor	NA
			Heat Input	NA mmBtu/hr

Element	Detection Status	ug/dscm					
		ug	ug/dscf	ug/dscm	lbs/hr	@7%O2	ng
Naphthalene	ADL	5.24000	0.0294	1.0361	6.125E-05	2.5718	5240.00
2-Methylnaphthalene	ADL	0.22000	0.0012	0.0435	2.571E-06	0.1080	220.00
2-Chloronaphthalene	ADL	0.16600	0.0009	0.0328	1.940E-06	0.0815	166.00
Acenaphthylene	ADL	0.00295	0.0000	0.0006	3.448E-08	0.0014	2.95
Acenaphthene	ADL	0.00880	0.0000	0.0017	1.029E-07	0.0043	8.80
Fluorene	ADL	0.01390	0.0001	0.0027	1.625E-07	0.0068	13.90
Phenanthrene	ADL	0.11200	0.0006	0.0221	1.309E-06	0.0550	112.00
Anthracene	ADL	0.00780	0.0000	0.0015	9.117E-08	0.0038	7.80
Fluoranthene	ADL	0.03780	0.0002	0.0075	4.418E-07	0.0186	37.80
Pyrene	ADL	0.02400	0.0001	0.0047	2.805E-07	0.0118	24.00
Benzo(a)anthracene	ADL	0.00292	0.0000	0.0006	3.413E-08	0.0014	2.92
Chrysene	ADL	0.01610	0.0001	0.0032	1.882E-07	0.0079	16.10
Benzo(b)fluoranthene	ADL	0.00412	0.0000	0.0008	4.815E-08	0.0020	4.12
Benzo(k)fluoranthene	ADL	0.00184	0.0000	0.0004	2.151E-08	0.0009	1.84
Benzo(e)pyrene	ADL	0.00412	0.0000	0.0008	4.815E-08	0.0020	4.12
Benzo(a)pyrene	BDL	0.00031	0.0000	0.0001	3.623E-09	0.0002	0.31
Perylene	BDL	0.00026	0.0000	0.0001	3.039E-09	0.0001	0.26
Indeno (1,2,3 -cd) pyrene	BDL	0.00030	0.0000	0.0001	3.506E-09	0.0001	0.30
Dibenz(a,h)anthracene	BDL	0.00046	0.0000	0.0001	5.376E-09	0.0002	0.46
Benzo(g,h,i)perylene	ADL	0.01230	0.0001	0.0024	1.438E-07	0.0060	12.30

**BDL = Below Detection Limit - All fractions below detection limit**

**DLL = Detection Limit Limited - Some fractions below detection limit**

**ADL = Above Detection Limit - All fractions above detection limit**

**NOTE: Multiple Compounds Detected in the Blank**

**EMSI**

# EPA REFERENCE METHOD 23

## Determination of Polyaromatic Hydrocarbon Emissions From Stationary Sources

<b>Client</b>	<b>Met Council</b>	<b>Date</b>	<b>2-17-10</b>
<b>Facility</b>	<b>Seneca</b>	<b>Job Number</b>	<b>902630</b>
<b>Unit</b>	<b>Unit 1</b>	<b>Operator</b>	<b>BD</b>
<b>Location</b>	<b>Stack</b>		

<b>TEST 3</b>	<b>Time</b>	<b>8:05-12:40</b>	<b>Date</b>	<b>2-17-10</b>
Stack Volumetric Flow	16,329	dscfm	Oxygen	15.70 %
Sample Gas Volume	186.012	dscf	F-Factor	NA
			Heat Input	NA mmBtu/hr

Element	Detection		ug/dscm				
	Status	ug	ug/dscf	ug/dscm	lbs/hr	@7%O2	ng
Naphthalene	ADL	5.96000	0.0320	1.1306	6.921E-05	3.0223	5960.00
2-Methylnaphthalene	ADL	0.20000	0.0011	0.0379	2.322E-06	0.1014	200.00
2-Chloronaphthalene	ADL	0.15400	0.0008	0.0292	1.788E-06	0.07809	154.00
Acenaphthylene	ADL	0.00309	0.0000	0.0006	3.588E-08	0.0016	3.09
Acenaphthene	ADL	0.01360	0.0001	0.0026	1.579E-07	0.0069	13.60
Fluorene	ADL	0.02040	0.0001	0.0039	2.369E-07	0.0103	20.40
Phenanthrene	ADL	0.12400	0.0007	0.0235	1.440E-06	0.0629	124.00
Anthracene	ADL	0.00968	0.0001	0.0018	1.124E-07	0.0049	9.68
Fluoranthene	ADL	0.07160	0.0004	0.0136	8.314E-07	0.0363	71.60
Pyrene	ADL	0.04280	0.0002	0.0081	4.970E-07	0.0217	42.80
Benzo(a)anthracene	ADL	0.01000	0.0001	0.0019	1.161E-07	0.0051	10.00
Chrysene	ADL	0.02740	0.0001	0.0052	3.182E-07	0.0139	27.40
Benzo(b)fluoranthene	ADL	0.00536	0.0000	0.0010	6.224E-08	0.0027	5.36
Benzo(k)fluoranthene	ADL	0.00172	0.0000	0.0003	1.997E-08	0.0009	1.72
Benzo(e)pyrene	ADL	0.00303	0.0000	0.0006	3.518E-08	0.0015	3.03
Benzo(a)pyrene	BDL	0.00031	0.0000	0.0001	3.600E-09	0.0002	0.31
Perylene	BDL	0.00026	0.0000	0.0000	3.019E-09	0.0001	0.26
Indeno (1,2,3 -cd) pyrene	BDL	0.00030	0.0000	0.0001	3.484E-09	0.0002	0.30
Dibenz(a,h)anthracene	BDL	0.00046	0.0000	0.0001	5.341E-09	0.0002	0.46
Benzo(g,h,i)perylene	ADL	0.00640	0.0000	0.0012	7.432E-08	0.0032	6.40

**BDL = Below Detection Limit - All fractions below detection limit**

**DDL = Detection Limit Limited - Some fractions below detection limit**

**ADL = Above Detection Limit - All fractions above detection limit**

**NOTE: Multiple Compounds Detected in the Blank**

**EMSI**

**EPA REFERENCE METHOD 23**  
**Determination of Polyaromatic Hydrocarbon Emissions From Stationary Sources**

<b>Client</b>	<u>Met Council</u>	<b>Date</b>	<u>2-16-10</u>
<b>Facility</b>	<u></u>	<b>Job Number</b>	<u>902630</u>
<b>Unit</b>	<u>1</u>	<b>Operator</b>	<u></u>
<b>Location</b>	<u>Stack</u>		

**Reagent Blank**

Element	Detection		
	Status	ug	ng
Naphthalene	ADL	0.28200	282.00
2-Methylnaphthalene	ADL	0.01310	13.10
2-Chloronaphthalene	BDL	0.00015	0.15
Acenaphthylene	ADL	0.00286	2.86
Acenaphthene	ADL	0.00069	0.69
Fluorene	ADL	0.00119	1.19
Phenanthrene	ADL	0.01050	10.50
Anthracene	ADL	0.00106	1.06
Fluoranthene	ADL	0.00680	6.80
Pyrene	ADL	0.00076	0.76
Benzo(a)anthracene	BDL	0.00017	0.17
Chrysene	ADL	0.00131	1.31
Benzo(b)fluoranthene	ADL	0.00082	0.82
Benzo(k)fluoranthene	ADL	0.00056	0.56
Benzo(e)pyrene	ADL	0.00228	2.28
Benzo(a)pyrene	ADL	0.00130	1.30
Perylene	BDL	0.00026	0.26
Indeno (1,2,3 -cd) pyrene	ADL	0.00180	1.80
Dibenz(a,h)anthracene	BDL	0.00046	0.46
Benzo(g,h,i)perylene	ADL	0.00512	5.12

**BDL = Below Detection Limit - All fractions below detection limit**

**DLL = Detection Limit Limited - Some fractions below detection limit**

**ADL = Above Detection Limit - All fractions above detection limit**

**NOTE: Multiple Compounds Detected in the Blank**

**EMSI**



**EPA REFERENCE METHOD 23**  
**Determination of Polyaromatic Hydrocarbon Emissions From Stationary Sources**

<b>Client</b>	<b>Met Council</b>	<b>Date</b>	<b>2/8/2010</b>
<b>Facility</b>	<b>Metro</b>	<b>Job Number</b>	<b>902630</b>
<b>Unit</b>	<b>1</b>	<b>Operator</b>	
<b>Location</b>	<b>Stack</b>		

***Train Blank***

<b>Element</b>	<b>Detection</b>		
	<b>Status</b>	<b>ug</b>	<b>ng</b>
Naphthalene	ADL	0.42800	428.00
2-Methylnaphthalene	ADL	0.02850	28.50
2-Chloronaphthalene	ADL	0.00017	0.17
Acenaphthylene	ADL	0.00225	2.25
Acenaphthene	ADL	0.00146	1.46
Fluorene	ADL	0.00306	3.06
Phenanthrene	ADL	0.02050	20.50
Anthracene	ADL	0.00224	2.24
Fluoranthene	ADL	0.01350	13.50
Pyrene	ADL	0.01130	11.30
Benzo(a)anthracene	ADL	0.00142	1.42
Chrysene	ADL	0.00428	4.28
Benzo(b)fluoranthene	ADL	0.00310	3.10
Benzo(k)fluoranthene	ADL	0.00064	0.64
Benzo(e)pyrene	ADL	0.00584	5.84
Benzo(a)pyrene	ADL	0.00156	1.56
Perylene	BDL	0.00026	0.26
Indeno (1,2,3 -cd) pyrene	ADL	0.00276	2.76
Dibenz(a,h)anthracene	BDL	0.00046	0.46
Benzo(g,h,i)perylene	ADL	0.01200	12.00

**BDL = Below Detection Limit - All fractions below detection limit**

**DLL = Detection Limit Limited - Some fractions below detection limit**

**ADL = Above Detection Limit - All fractions above detection limit**

**NOTE: Multiple Compounds Detected in the Blank**

**EMSI**

**EPA Method OTM 027**  
**Determination of Particulate Matter Less Than 2.5 Microns**  
**Total Emissions**

Client	Met Council	Analyst	MC
Facility	Seneca	Job Number	902630
Unit	Unit 1	Description	Compliance
Location	Stack		

<i>TEST 1</i>	<i>Time</i>	<i>8:55-13:03</i>	<i>Date</i>	<i>2-16-10</i>
Filterable Net Gain	DLL	49.0 mg	15.30	% Oxygen
Condensable Net Gain	ADL	4.2 mg	NA	F-factor
Sample Gas Volume		90.862 dscf		
Stack Volumetric Flow		15840 dscfm		
Particulate Concentration			NA	lbs/mmBtu
Particulate Concentration			0.586	mg/dscf
Particulate Emission Rate			1.228	lbs/hr
Particulate Concentration			0.009	gr/dscf
Particulate Concentration			0.022	gr/dscf @7% Oxygen
Total Particulate Gain (mg)			53.25	mg

<i>Test 2</i>	<i>Time</i>	<i>14:00-18:06</i>	<i>Date</i>	<i>2-16-10</i>
Filterable Net Gain	ADL	46.1 mg	15.30	% Oxygen
Condensable Net Gain	ADL	3.6 mg	NA	F-factor
Sample Gas Volume		92.184 dscf		
Stack Volumetric Flow		15682 dscfm		
Particulate Concentration			NA	lbs/mmBtu
Particulate Concentration			0.540	mg/dscf
Particulate Emission Rate			1.119	lbs/hr
Particulate Concentration			0.008	gr/dscf
Particulate Concentration			0.021	gr/dscf @7% Oxygen
Total Particulate Gain (mg)			49.75	mg

<i>Test 3</i>	<i>Time</i>	<i>8:04-12:45</i>	<i>Date</i>	<i>2-17-10</i>
Filterable Net Gain	ADL	50.7 mg	15.70	% Oxygen
Condensable Net Gain	ADL	3.6 mg	NA	F-factor
Sample Gas Volume		93.427 dscf		
Stack Volumetric Flow		15671 dscfm		
Particulate Concentration			NA	lbs/mmBtu
Particulate Concentration			0.582	mg/dscf
Particulate Emission Rate			1.206	lbs/hr
Particulate Concentration			0.009	gr/dscf
Particulate Concentration			0.024	gr/dscf @7% Oxygen
Total Particulate Gain (mg)			54.35	mg

<b>Results Average Test 1-3</b>				
Particulate Concentration			NA	lbs/mmBtu
Particulate Concentration			0.569	mg/dscf
Particulate Emission Rate			1.184	lbs/hr
Particulate Concentration			0.009	gr/dscf
Particulate Concentration			0.022	gr/dscf @7% Oxygen

**EPA Method OTM 027**  
**Determination of Particulate Matter Less Than 2.5 Microns**  
**Filterable Emissions**

Client	<u>Met Council</u>	Analyst	<u>MC</u>
Facility	<u>Seneca</u>	Job Number	<u>902630</u>
Unit	<u>Unit 1</u>	Description	<u>Compliance</u>
Location	<u>Stack</u>		

<i>TEST 1</i>	<i>Time</i>	<i>8:55-13:03</i>	<i>Date</i>	<i>2-16-10</i>
Filter Net Gain	ADL	<u>48.5</u> mg	<u>15.30</u>	% Oxygen
Probe Rinse Net Gain	BDL	<u>0.5</u> mg	NA	F-factor
Sample Gas Volume		<u>90.862</u> dscf		
Stack Volumetric Flow		<u>15840</u> dscfm		
Particulate Concentration			NA	lbs/mmBtu
Particulate Concentration			<u>0.539</u>	mg/dscf
Particulate Emission Rate			<u>1.130</u>	lbs/hr
Particulate Concentration			<u>0.008</u>	gr/dscf
Particulate Concentration			<u>0.021</u>	gr/dscf @7% Oxygen

<i>TEST 2</i>	<i>Time</i>	<i>14:00-18:06</i>	<i>Date</i>	<i>2-16-10</i>
Filter Net Gain	ADL	<u>45.5</u> mg	<u>15.30</u>	% Oxygen
Probe Rinse Net Gain	ADL	<u>0.6</u> mg	NA	F-factor
Sample Gas Volume		<u>92.184</u> dscf		
Stack Volumetric Flow		<u>15682</u> dscfm		
Particulate Concentration			NA	lbs/mmBtu
Particulate Concentration			<u>0.500</u>	mg/dscf
Particulate Emission Rate			<u>1.037</u>	lbs/hr
Particulate Concentration			<u>0.008</u>	gr/dscf
Particulate Concentration			<u>0.019</u>	gr/dscf @7% Oxygen

<i>TEST 3</i>	<i>Time</i>	<i>8:04-12:45</i>	<i>Date</i>	<i>2-17-10</i>
Filter Net Gain	ADL	<u>48.7</u> mg	<u>15.70</u>	% Oxygen
Probe Rinse Net Gain	ADL	<u>2.0</u> mg	NA	F-factor
Sample Gas Volume		<u>93.427</u> dscf		
Stack Volumetric Flow		<u>15671</u> dscfm		
Particulate Concentration			NA	lbs/mmBtu
Particulate Concentration			<u>0.543</u>	mg/dscf
Particulate Emission Rate			<u>1.125</u>	lbs/hr
Particulate Concentration			<u>0.008</u>	gr/dscf
Particulate Concentration			<u>0.022</u>	gr/dscf @7% Oxygen

**RESULTS AVERAGE TESTS 1-3**

Particulate Concentration	NA	lbs/mmBtu
Particulate Concentration	<u>0.527</u>	mg/dscf
Particulate Emission Rate	<u>1.097</u>	lbs/hr
Particulate Concentration	<u>0.008</u>	gr/dscf
Particulate Concentration	<u>0.021</u>	gr/dscf @7% Oxygen

**EPA Method OTM 027**  
**Determination of Particulate Matter Less Than 2.5 Microns**  
**Organic Condensable Emissions**

Client	<u>Met Council</u>	Analyst	<u>MC</u>
Facility	<u>Seneca</u>	Job Number	<u>902630</u>
Unit	<u>Unit 1</u>	Description	<u>Compliance</u>
Location	<u>Stack</u>		

<b>TEST 1</b>	<b>Time</b>	<b>8:55-13:03</b>	<b>Date</b>	<b>2-16-10</b>
Organic Net Gain (Solvent)	ADL	<u>2.2</u> mg	<u>15.30</u>	% Oxygen
Sample Gas Volume		<u>90.862</u> dscf	<u>NA</u>	F-factor
Stack Volumetric Flow		<u>15840</u> dscfm		
Particulate Concentration			<u>NA</u>	lbs/mmBtu
Particulate Concentration			<u>0.0242</u>	mg/dscf
Particulate Emission Rate			<u>0.0507</u>	lbs/hr
Particulate Concentration			<u>0.00037</u>	gr/dscf
Particulate Concentration			<u>0.00093</u>	gr/dscf @7% Oxygen

<b>TEST 2</b>	<b>Time</b>	<b>14:00-18:06</b>	<b>Date</b>	<b>2-16-10</b>
Organic Net Gain (Solvent)	ADL	<u>1.8</u> mg	<u>15.30</u>	% Oxygen
Sample Gas Volume		<u>92.184</u> dscf	<u>NA</u>	F-factor
Stack Volumetric Flow		<u>15682</u> dscfm		
Particulate Concentration			<u>NA</u>	lbs/mmBtu
Particulate Concentration			<u>0.0195</u>	mg/dscf
Particulate Emission Rate			<u>0.0405</u>	lbs/hr
Particulate Concentration			<u>0.00030</u>	gr/dscf
Particulate Concentration			<u>0.00075</u>	gr/dscf @7% Oxygen

<b>TEST 3</b>	<b>Time</b>	<b>8:04-12:45</b>	<b>Date</b>	<b>2-17-10</b>
Organic Net Gain (Solvent)	ADL	<u>2.0</u> mg	<u>15.70</u>	% Oxygen
Sample Gas Volume		<u>93.427</u> dscf	<u>NA</u>	F-factor
Stack Volumetric Flow		<u>15671</u> dscfm		
Particulate Concentration			<u>NA</u>	lbs/mmBtu
Particulate Concentration			<u>0.0214</u>	mg/dscf
Particulate Emission Rate			<u>0.0444</u>	lbs/hr
Particulate Concentration			<u>0.00033</u>	gr/dscf
Particulate Concentration			<u>0.00088</u>	gr/dscf @7% Oxygen

<b>Results Average Test 1-3</b>				
Particulate Concentration			<u>NA</u>	lbs/mmBtu
Particulate Concentration			<u>0.0217</u>	mg/dscf
Particulate Emission Rate			<u>0.0452</u>	lbs/hr
Particulate Concentration			<u>0.00034</u>	gr/dscf
Particulate Concentration			<u>0.00085</u>	gr/dscf @7% Oxygen

**Determination of Particulate Matter Less Than 2.5 Microns  
Aqueous Condensable Emissions**

Client	Met Council	Analyst	MC
Facility	Seneca	Job Number	902,630
Unit	Unit 1	Description	Compliance
Location	Stack		

<i>Test 1</i>	<i>Time</i>	<i>8:55-13:03</i>	<i>Date</i>	<i>2-16-10</i>
Dried Sample Net Gain		2.1 mg	15.30	% Oxygen
Aqueous Net Gain (H2O)	ADL	2.0 mg	0.100	Normality of NH <sub>4</sub> OH
Sample Gas Volume		90.862 dscf	0.03	Volume of Titrant (ml)
Stack Volumetric Flow		15840 dscfm	0.05	Mass of NH <sub>4</sub> Added (mg)
			NA	F-factor
Particulate Concentration			NA	lbs/mmBtu
Particulate Concentration			0.023	mg/dscf
Particulate Emission Rate			0.047	lbs/hr
Particulate Concentration			0.000	gr/dscf
Particulate Concentration			0.001	gr/dscf @7% Oxygen

<i>Test 2</i>	<i>Time</i>	<i>14:00-18:06</i>	<i>Date</i>	<i>2-16-10</i>
Dried Sample Net Gain		1.9 mg	15.30	% Oxygen
Aqueous Net Gain (H2O)	ADL	1.8 mg	0.100	Normality of NH <sub>4</sub> OH
Sample Gas Volume		92.184 dscf	0.03	Volume of Titrant (ml)
Stack Volumetric Flow		15682 dscfm	0.05	Mass of NH <sub>4</sub> Added (mg)
			NA	F-factor
Particulate Concentration			NA	lbs/mmBtu
Particulate Concentration			0.020	mg/dscf
Particulate Emission Rate			0.042	lbs/hr
Particulate Concentration			0.000	gr/dscf
Particulate Concentration			0.001	gr/dscf @7% Oxygen

<i>Test 3</i>	<i>Time</i>	<i>8:04-12:45</i>	<i>Date</i>	<i>2-17-10</i>
Dried Sample Net Gain		1.7 mg	15.70	% Oxygen
Aqueous Net Gain (H2O)	ADL	1.6 mg	0.100	Normality of NH <sub>4</sub> OH
Sample Gas Volume		93.427 dscf	0.03	Volume of Titrant (ml)
Stack Volumetric Flow		15671 dscfm	0.05	Mass of NH <sub>4</sub> Added (mg)
			NA	F-factor
Particulate Concentration			NA	lbs/mmBtu
Particulate Concentration			0.018	mg/dscf
Particulate Emission Rate			0.037	lbs/hr
Particulate Concentration			0.000	gr/dscf
Particulate Concentration			0.001	gr/dscf @7% Oxygen

Results Average Test 1-3				
Particulate Concentration		NA		lbs/mmBtu
Particulate Concentration			0.020	mg/dscf
Particulate Emission Rate			0.042	lbs/hr
Particulate Concentration			0.000	gr/dscf
Particulate Concentration			0.001	gr/dscf @7% Oxygen

**EPA Method OTM 027**  
**Determination of Particulate Matter Greater Than 2.5 Microns**  
**Filterable Emissions**

Client	<u>Met Council</u>	Analyst	<u>MC</u>
Facility	<u>Seneca</u>	Job Number	<u>902630</u>
Unit	<u>Unit 1</u>	Description	<u>Compliance</u>
Location	<u>Stack</u>		

<i>TEST 1</i>	<i>Time</i>	<i>8:55-13:03</i>	<i>Date</i>	<i>2-16-10</i>
Filter Net Gain		<u>          </u> mg	<u>15.30</u>	% Oxygen
Probe Rinse Net Gain	ADL	<u>1.7</u> mg	NA	F-factor
Sample Gas Volume		<u>90.862</u> dscf		
Stack Volumetric Flow		<u>15840</u> dscfm		
Particulate Concentration			NA	lbs/mmBtu
Particulate Concentration			<u>0.019</u>	mg/dscf
Particulate Emission Rate			<u>0.039</u>	lbs/hr
Particulate Concentration			<u>0.000</u>	gr/dscf
Particulate Concentration			<u>0.001</u>	gr/dscf @7% Oxygen

<i>TEST 2</i>	<i>Time</i>	<i>14:00-18:06</i>	<i>Date</i>	<i>2-16-10</i>
Filter Net Gain		<u>          </u> mg	<u>15.30</u>	% Oxygen
Probe Rinse Net Gain	ADL	<u>3.1</u> mg	NA	F-factor
Sample Gas Volume		<u>92.184</u> dscf		
Stack Volumetric Flow		<u>15682</u> dscfm		
Particulate Concentration			NA	lbs/mmBtu
Particulate Concentration			<u>0.034</u>	mg/dscf
Particulate Emission Rate			<u>0.070</u>	lbs/hr
Particulate Concentration			<u>0.001</u>	gr/dscf
Particulate Concentration			<u>0.001</u>	gr/dscf @7% Oxygen

<i>TEST 3</i>	<i>Time</i>	<i>8:04-12:45</i>	<i>Date</i>	<i>2-17-10</i>
Filter Net Gain		<u>          </u> mg	<u>15.70</u>	% Oxygen
Probe Rinse Net Gain	ADL	<u>1.3</u> mg	NA	F-factor
Sample Gas Volume		<u>93.427</u> dscf		
Stack Volumetric Flow		<u>15671</u> dscfm		
Particulate Concentration			NA	lbs/mmBtu
Particulate Concentration			<u>0.014</u>	mg/dscf
Particulate Emission Rate			<u>0.029</u>	lbs/hr
Particulate Concentration			<u>0.000</u>	gr/dscf
Particulate Concentration			<u>0.001</u>	gr/dscf @7% Oxygen

**RESULTS AVERAGE TESTS 1-3**

Particulate Concentration			NA	lbs/mmBtu
Particulate Concentration			<u>0.022</u>	mg/dscf
Particulate Emission Rate			<u>0.046</u>	lbs/hr
Particulate Concentration			<u>0.000</u>	gr/dscf
Particulate Concentration			<u>0.001</u>	gr/dscf @7% Oxygen

## EPA REFERENCE METHOD 26A

### Determination of Hydrogen Chloride Emissions From Stationary Sources

#### Hydrogen Halide Emission Results

Client	Met Council	Date	2/17/2010
Facility	Seneca	Job Number	902630
Unit	1	Operator	BD
Location	Stack	Version	ST619-01

<b>TEST 1</b>	<b>Time</b>	<b>13:50-14:56</b>	<b>Date</b>	<b>2/17/2010</b>
Concentration of Blank		0.0 ug/ml Cl- as HCl		
Concentration of Sample		300.0 ug/sample		
Choose Constant		1.000 HCl = 1.000		
Sample Gas Volume		1.220 dscm		
Percent O2		15.3 %		
Hydrogen Halide Total			300.00 ug/sample	
Hydrogen Halide Concentration			0.25 mg/dscm	
Hydrogen Halide Concentration			0.16 ppm	
Hydrogen Halide Concentration			0.40 ppm@ 7% O2	

<b>TEST 2</b>	<b>Time</b>	<b>15:12-16:12</b>	<b>Date</b>	<b>2/17/2010</b>
Concentration of Blank		0.0 ug/ml Cl- as HCl		
Concentration of Sample		300 ug/sample		
Choose Constant		1.000 HCl = 1.000		
Sample Gas Volume		1.224 dscm		
Percent O2		15.7 %		
Hydrogen Halide Total			300.00 ug/sample	
Hydrogen Halide Concentration			0.25 mg/dscm	
Hydrogen Halide Concentration			0.16 ppm	
Hydrogen Halide Concentration			0.43 ppm@ 7% O2	

<b>TEST 3</b>	<b>Time</b>	<b>16:28-17:28</b>	<b>Date</b>	<b>2/17/2010</b>
Concentration of Blank		0.0 ug/ml Cl- as HCl		
Concentration of Sample		310.0 ug/sample		
Choose Constant		1.000 HCl = 1.000		
Sample Gas Volume		1.202 dscm		
Percent O2		15.5 %		
Hydrogen Halide Total			310.00 ug/sample	
Hydrogen Halide Concentration			0.26 mg/dscm	
Hydrogen Halide Concentration			0.17 ppm	
Hydrogen Halide Concentration			0.44 ppm@ 7% O2	

#### RESULT AVERAGE TEST 1-3

Hydrogen Halide Total	303.33 ug/sample
Hydrogen Halide Concentration	0.25 mg/dscm
Hydrogen Halide Concentration	0.16 ppm
Hydrogen Halide Concentration	0.42 ppm@ 7% O2

Your Project #: 902630  
Site: MET COUNCIL- SENECA

**Attention: Mark Carlson**

Eagle Mountain  
8905 Autumn Oaks Dr.  
Rockford, MN  
USA 55373

**Report Date: 2010/03/10**

**CERTIFICATE OF ANALYSIS**

**MAXXAM JOB #: B023014**

**Received: 2010/02/25, 12:10**

Sample Matrix: Impinger Solution

# Samples Received: 4

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
2,3,7,8-TCDF Confirmation (M23) ¶	3	N/A	2010/03/04	BRL SOP-00404	EPA1613Bmod(M23/23A)
Dioxins/Furans in Air (Method 23) ¶	4	2010/02/26	2010/03/03	BRL SOP-00404	EPA1613Bmod(M23/23A)
PAHs in Air (CARB429)	4	2010/02/26	2010/03/04	BRL SOP-00201	CARB429mod(CARB429)
PCBs by HRMS (1668A)	2	2010/02/26	2010/03/02	BRL SOP-00408	EPA 1668Amod(M0010)
PCBs by HRMS (1668A)	2	2010/02/26	2010/03/03	BRL SOP-00408	EPA 1668Amod(M0010)

(1) This test was performed in Maxxam Mississauga under Maxxam Burlington SCC Accreditation

**Encryption Key**

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

CLAYTON JOHNSON, Project Manager  
Email: Clayton.Johnson@maxxamanalytics.com  
Phone# (905) 817-5769

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Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. SCC and CALA have approved this reporting process and electronic report format.

Total cover pages: 1



Maxxam Job #: B023014  
Report Date: 2010/03/10

Eagle Mountain  
Client Project #: 902630  
Project name: MET COUNCIL- SENECA

## RESULTS OF ANALYSES OF IMPINGER SOLUTION

Maxxam ID		FE4801						
Sampling Date		2010/02/17				TOXIC EQUIVALENCY	# of	
	Units	REAGENT BLANK-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

<b>Polyaromatic Hydrocarbons</b>								
Naphthalene	ng	282	1.2	22				2087844
2-Methylnaphthalene	ng	13.1	0.44	3.1				2087844
2-Chloronaphthalene	ng	<0.15	0.048	0.15				2087844
Acenaphthylene	ng	2.86	0.21	0.32				2087844
Acenaphthene	ng	0.69	0.24	0.40				2087844
Fluorene	ng	1.19	0.43	0.49				2087844
Phenanthrene	ng	10.5	0.32	0.67				2087844
Anthracene	ng	1.06	0.37	0.31				2087844
Fluoranthene	ng	6.80	0.16	0.65				2087844
Pyrene	ng	0.76	0.14	0.52				2087844
Benzo(a)anthracene	ng	<0.17	1.3	0.17				2087844
Chrysene	ng	1.31	0.14	0.33				2087844
Benzo(b)fluoranthene	ng	0.82	0.20	0.59				2087844
Benzo(k)fluoranthene	ng	0.56	0.27	0.35				2087844
Benzo(e)pyrene	ng	2.28	0.38	0.43				2087844
Benzo(a)pyrene	ng	1.30	0.49	0.31				2087844
Perylene	ng	<0.26	0.38	0.26				2087844
Indeno(1,2,3-cd)pyrene	ng	1.80	1.2	0.30				2087844
Dibenz(a,h)anthracene	ng	<0.46	0.90	0.46				2087844
Benzo(g,h,i)perylene	ng	5.12	1.1	0.23				2087844
<b>PCBs</b>								
2-MonoCB-(1)	ng	<0.20	0.0072	0.20				2087846
3-MonoCB-(2)	ng	<0.20	0.0080	0.20				2087846
4-MonoCB-(3)	ng	<0.20	0.0073	0.20				2087846
2,2'-DiCB-(4)	ng	<0.20	0.045	0.20				2087846
2,3-DiCB-(5)	ng	<0.20	0.092	0.20				2087846
2,3'-DiCB-(6)	ng	<0.20	0.085	0.20				2087846
2,4-DiCB-(7)	ng	<0.20	0.085	0.20				2087846

RDL = Reportable Detection Limit

EDL = Estimated Detection Limit

QC Batch = Quality Control Batch

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

Maxxam Job #: B023014  
Report Date: 2010/03/10

Eagle Mountain  
Client Project #: 902630  
Project name: MET COUNCIL- SENECA

# RESULTS OF ANALYSES OF IMPINGER SOLUTION

Maxxam ID		FE4801						
Sampling Date		2010/02/17				TOXIC EQUIVALENCY	# of	
	Units	REAGENT BLANK-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

2,4'-DiCB-(8)	ng	<0.20	0.080	0.20				2087846
2,5-DiCB-(9)	ng	<0.20	0.084	0.20				2087846
2,6-DiCB-(10)	ng	<0.20	0.037	0.20				2087846
3,3'-DiCB-(11)	ng	<0.20	0.087	0.20				2087846
DiCB-(12)+(13)	ng	<0.40	0.088	0.40				2087846
3,5-DiCB-(14)	ng	<0.20	0.084	0.20				2087846
4,4'-DiCB-(15)	ng	<0.20	0.095	0.20				2087846
22'3-TriCB-(16)	ng	<0.20	0.023	0.20				2087846
22'4-TriCB-(17)	ng	<0.20	0.019	0.20				2087846
TriCB-(18)+(30)	ng	<0.40 (1)	0.022	0.40				2087846
22'6-TriCB-(19)	ng	<0.20	0.019	0.20				2087846
TriCB-(20) + (28)	ng	<0.40	0.014	0.40				2087846
TriCB-(21)+(33)	ng	<0.40 (1)	0.015	0.40				2087846
234'-TriCB-(22)	ng	<0.20	0.015	0.20				2087846
235-TriCB-(23)	ng	<0.20	0.016	0.20				2087846
236-TriCB-(24)	ng	<0.20	0.015	0.20				2087846
23'4-TriCB-(25)	ng	<0.20	0.013	0.20				2087846
TriCB-(26)+(29)	ng	<0.40	0.014	0.40				2087846
23'6-TriCB-(27)	ng	<0.20	0.014	0.20				2087846
24'5-TriCB-(31)	ng	<0.20	0.013	0.20				2087846
24'6-TriCB-(32)	ng	<0.20	0.013	0.20				2087846
23'5'-TriCB-(34)	ng	<0.20	0.014	0.20				2087846
33'4-TriCB-(35)	ng	<0.20	0.014	0.20				2087846
33'5-TriCB-(36)	ng	<0.20	0.012	0.20				2087846
344'-TriCB-(37)	ng	<0.20	0.015	0.20				2087846
345-TriCB-(38)	ng	<0.20	0.014	0.20				2087846
34'5-TriCB-(39)	ng	<0.20	0.014	0.20				2087846
TetraCB-(40)+(41)+(71)	ng	<0.60	0.036	0.60				2087846
22'34'-TetraCB-(42)	ng	<0.20	0.040	0.20				2087846

EDL = Estimated Detection Limit

QC Batch = Quality Control Batch

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

( 1 ) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.

Maxxam Job #: B023014  
Report Date: 2010/03/10

Eagle Mountain  
Client Project #: 902630  
Project name: MET COUNCIL- SENECA

### RESULTS OF ANALYSES OF IMPINGER SOLUTION

Maxxam ID		FE4801						
Sampling Date		2010/02/17			TOXIC EQUIVALENCY		# of	
	Units	REAGENT BLANK-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
22'35'-TetraCB-(43)	ng	<0.20	0.048	0.20				2087846
TetraCB-(44)+(47)+(65)	ng	<0.60 (1)	0.080	0.60				2087846
TetraCB-(45)+(51)	ng	<0.40	0.036	0.40				2087846
22'36'-TetraCB-(46)	ng	<0.20	0.042	0.20				2087846
22'45'-TetraCB-(48)	ng	<0.20	0.036	0.20				2087846
TetraCB-(49)+TetraCB-(69)	ng	<0.40 (1)	0.054	0.40				2087846
TetraCB-(50)+(53)	ng	<0.40	0.035	0.40				2087846
22'55'-TetraCB-(52)	ng	<0.20	0.036	0.20				2087846
22'66'-TetraCB-(54)	ng	<0.20	0.014	0.20				2087846
233'4'-TetraCB-(55)	ng	<0.20	0.022	0.20				2087846
233'4'-Tetra CB-(56)	ng	<0.20	0.022	0.20				2087846
233'5'-TetraCB-(57)	ng	<0.20	0.021	0.20				2087846
233'5'-TetraCB-(58)	ng	<0.20	0.022	0.20				2087846
TetraCB-(59)+(62)+(75)	ng	<0.60	0.028	0.60				2087846
2344'-TetraCB -(60)	ng	<0.20	0.022	0.20				2087846
TetraCB-(61)+(70)+(74)+(76)	ng	<0.80	0.021	0.80				2087846
234'5'-TetraCB-(63)	ng	<0.20	0.020	0.20				2087846
234'6'-TetraCB-(64)	ng	<0.20	0.027	0.20				2087846
23'44'-TetraCB-(66)	ng	<0.20	0.021	0.20				2087846
23'45'-TetraCB-(67)	ng	<0.20	0.019	0.20				2087846
23'45'-TetraCB-(68)	ng	<0.20	0.019	0.20				2087846
23'55'-TetraCB-(72)	ng	<0.20	0.020	0.20				2087846
23'5'6'-TetraCB-(73)	ng	<0.20	0.025	0.20				2087846
33'44'-TetraCB-(77)	ng	<0.20	0.020	0.20	0.000100	0.00000200		2087846
33'45'-TetraCB-(78)	ng	<0.20	0.022	0.20				2087846
33'45'-TetraCB(79)	ng	<0.20	0.019	0.20				2087846
33'55'-TetraCB-(80)	ng	<0.20	0.019	0.20				2087846
344'5'-TetraCB-(81)	ng	<0.20	0.020	0.20	0.000300	0.00000600		2087846
22'33'4'-PentaCB-(82)	ng	<0.20	0.020	0.20				2087846
EDL = Estimated Detection Limit QC Batch = Quality Control Batch TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient, The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested. WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds ( 1 ) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.								

Maxxam Job #: B023014  
Report Date: 2010/03/10

Eagle Mountain  
Client Project #: 902630  
Project name: MET COUNCIL- SENECA

## RESULTS OF ANALYSES OF IMPINGER SOLUTION

Maxxam ID		FE4801						
Sampling Date		2010/02/17			TOXIC EQUIVALENCY		# of	
	Units	REAGENT BLANK-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

PentaCB-(83)+(99)	ng	<0.40	0.018	0.40				2087846
22'33'6-PentaCB-(84)	ng	<0.20	0.021	0.20				2087846
PentaCB-(85)+(116)+(117)	ng	<0.60	0.015	0.60				2087846
PentaCB-(86)(87)(97)(109)(119)(125)	ng	<1.2	0.016	1.2				2087846
PentaCB-(88)+(91)	ng	<0.40	0.018	0.40				2087846
22'346'-PentaCB-(89)	ng	<0.20	0.019	0.20				2087846
PentaCB-(90)+(101)+(113)	ng	<0.60	0.016	0.60				2087846
22'355'-PentaCB-(92)	ng	<0.20	0.018	0.20				2087846
PentaCB-(93)+(98)+(100)+(102)	ng	<0.80	0.018	0.80				2087846
22'356'-PentaCB-(94)	ng	<0.20	0.019	0.20				2087846
22'35'6-PentaCB-(95)	ng	<0.20	0.017	0.20				2087846
22'366'-PentaCB-(96)	ng	<0.20	0.0083	0.20				2087846
22'45'6-PentaCB-(103)	ng	<0.20	0.016	0.20				2087846
22'466'-PentaCB-(104)	ng	<0.20	0.010	0.20				2087846
233'44'-PentaCB-(105)	ng	<0.20	0.021	0.20	0.0000300	0.000000630		2087846
233'45-PentaCB-(106)	ng	<0.20	0.021	0.20				2087846
233'4'5-PentaCB-(107)	ng	<0.20	0.021	0.20				2087846
PentaCB-(108)+(124)	ng	<0.40	0.022	0.40				2087846
PentaCB-(110)+(115)	ng	<0.40 (1)	0.093	0.40				2087846
233'55'-PentaCB-(111)	ng	<0.20	0.014	0.20				2087846
233'56-PentaCB-(112)	ng	<0.20	0.014	0.20				2087846
2344'5-PentaCB-(114)	ng	<0.20	0.020	0.20	0.0000300	0.000000600		2087846
23'44'5-PentaCB-(118)	ng	<0.20	0.020	0.20	0.0000300	0.000000600		2087846
23'455'-PentaCB-(120)	ng	<0.20	0.013	0.20				2087846
23'45'6-PentaCB-(121)	ng	<0.20	0.014	0.20				2087846
233'4'5'-PentaCB-(122)	ng	<0.20	0.023	0.20				2087846
23'44'5'-PentaCB-(123)	ng	<0.20	0.021	0.20	0.0000300	0.000000630		2087846
33'44'5-PentaCB-(126)	ng	<0.20	0.020	0.20	0.100	0.00200		2087846
33'455'-PentaCB-(127)	ng	<0.20	0.021	0.20				2087846

EDL = Estimated Detection Limit

QC Batch = Quality Control Batch

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

( 1 ) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.

Maxxam Job #: B023014  
Report Date: 2010/03/10

Eagle Mountain  
Client Project #: 902630  
Project name: MET COUNCIL- SENECA

# RESULTS OF ANALYSES OF IMPINGER SOLUTION

Maxxam ID		FE4801						
Sampling Date		2010/02/17			TOXIC EQUIVALENCY		# of	
	Units	REAGENT BLANK-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
HexaCB-(128)+(166)	ng	<0.40	0.028	0.40				2087846
HexaCB-(129)+(138)+(163)	ng	<0.60	0.029	0.60				2087846
22'33'45'-HexaCB-(130)	ng	<0.20	0.034	0.20				2087846
22'33'46'-HexaCB-(131)	ng	<0.20	0.034	0.20				2087846
22'33'46'-HexaCB-(132)	ng	<0.20	0.034	0.20				2087846
22'33'55'-HexaCB-(133)	ng	<0.20	0.031	0.20				2087846
HexaCB-(134)+(143)	ng	<0.40	0.037	0.40				2087846
HexaCB-(135)+(151)	ng	<0.40	0.012	0.40				2087846
22'33'66'-HexaCB-(136)	ng	<0.20 (1)	0.014	0.20				2087846
22'344'5'-HexaCB-(137)	ng	<0.20	0.034	0.20				2087846
HexaCB-(139)+(140)	ng	<0.40	0.030	0.40				2087846
22'3455'-HexaCB-(141)	ng	<0.20	0.031	0.20				2087846
22'3456'-HexaCB-(142)	ng	<0.20	0.033	0.20				2087846
22'345'6'-HexaCB-(144)	ng	<0.20	0.012	0.20				2087846
22'3466'-HexaCB-(145)	ng	<0.20	0.0098	0.20				2087846
22'34'55'-HexaCB-(146)	ng	<0.20	0.028	0.20				2087846
HexaCB-(147)+(149)	ng	<0.40 (1)	0.11	0.40				2087846
22'34'56'-HexaCB-(148)	ng	<0.20	0.012	0.20				2087846
22'34'66'-HexaCB-(150)	ng	<0.20	0.0096	0.20				2087846
22'3566'-HexaCB-(152)	ng	<0.20	0.0091	0.20				2087846
HexaCB-(153)+(168)	ng	<0.40	0.025	0.40				2087846
22'44'56'-HexaCB-(154)	ng	<0.20	0.011	0.20				2087846
22'44'66'-HexaCB-(155)	ng	<0.20	0.012	0.20				2087846
HexaCB-(156)+(157)	ng	<0.40	0.022	0.40	0.0000300	0.000000660		2087846
233'44'6'-HexaCB-(158)	ng	<0.20	0.022	0.20				2087846
233'455'-HexaCB-(159)	ng	<0.20	0.025	0.20				2087846
233'456'-HexaCB-(160)	ng	<0.20	0.026	0.20				2087846
233'45'6'-HexaCB-(161)	ng	<0.20	0.023	0.20				2087846
233'4'55'-HexaCB-(162)	ng	<0.20	0.025	0.20				2087846
EDL = Estimated Detection Limit QC Batch = Quality Control Batch TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient, The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested. WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds ( 1 ) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.								

Maxxam Job #: B023014  
Report Date: 2010/03/10

Eagle Mountain  
Client Project #: 902630  
Project name: MET COUNCIL- SENECA

# RESULTS OF ANALYSES OF IMPINGER SOLUTION

Maxxam ID		FE4801						
Sampling Date		2010/02/17				TOXIC EQUIVALENCY	# of	
	Units	REAGENT BLANK-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

233'4'5'6'-HexaCB-(164)	ng	<0.20	0.023	0.20				2087846
233'5'5'6'-HexaCB-(165)	ng	<0.20	0.026	0.20				2087846
23'44'55'-HexaCB-(167)	ng	<0.20	0.022	0.20	0.0000300	0.000000660		2087846
33'44'55'-HexaCB-(169)	ng	<0.20	0.023	0.20	0.0300	0.000690		2087846
22'33'44'5'-HeptaCB-(170)	ng	<0.20	0.034	0.20				2087846
HeptaCB-(171)+(173)	ng	<0.40	0.042	0.40				2087846
22'33'455'-HeptaCB-(172)	ng	<0.20	0.042	0.20				2087846
22'33'456'-HeptaCB-(174)	ng	<0.20	0.041	0.20				2087846
22'33'45'6'-HeptaCB-(175)	ng	<0.20	0.012	0.20				2087846
22'33'466'-HeptaCB-(176)	ng	<0.20	0.0093	0.20				2087846
22'33'45'6'-HeptaCB-(177)	ng	<0.20	0.042	0.20				2087846
22'33'55'6'-HeptaCB-(178)	ng	<0.20	0.012	0.20				2087846
22'33'566'-HeptaCB-(179)	ng	<0.20	0.0091	0.20				2087846
HeptaCB-(180)+(193)	ng	<0.40	0.031	0.40				2087846
22'344'56'-HeptaCB-(181)	ng	<0.20	0.041	0.20				2087846
22'344'56'-HeptaCB-(182)	ng	<0.20	0.012	0.20				2087846
22'344'5'6'-HeptaCB-(183)	ng	<0.20	0.036	0.20				2087846
22'344'66'-HeptaCB-(184)	ng	<0.20	0.0090	0.20				2087846
22'3455'6'-HeptaCB-(185)	ng	<0.20	0.044	0.20				2087846
22'34566'-HeptaCB-(186)	ng	<0.20	0.0097	0.20				2087846
22'34'55'6'-HeptaCB-(187)	ng	<0.20 (1)	0.023	0.20				2087846
22'34'566'-HeptaCB-(188)	ng	<0.20	0.013	0.20				2087846
233'44'55'-HeptaCB-(189)	ng	<0.20	0.036	0.20	0.0000300	0.00000108		2087846
233'44'56'-HeptaCB-(190)	ng	<0.20	0.033	0.20				2087846
233'44'5'6'-HeptaCB-(191)	ng	<0.20	0.033	0.20				2087846
233'455'6'-HeptaCB-(192)	ng	<0.20	0.035	0.20				2087846
22'33'44'55'-OctaCB-(194)	ng	<0.20	0.036	0.20				2087846
22'33'44'56'-OctaCB-(195)	ng	<0.20	0.039	0.20				2087846
22'33'44'56'-OctaCB-(196)	ng	<0.20	0.021	0.20				2087846

EDL = Estimated Detection Limit  
QC Batch = Quality Control Batch  
TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,  
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.  
WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds  
( 1 ) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.

Maxxam Job #: B023014  
Report Date: 2010/03/10

Eagle Mountain  
Client Project #: 902630  
Project name: MET COUNCIL- SENECA

### RESULTS OF ANALYSES OF IMPINGER SOLUTION

Maxxam ID		FE4801						
Sampling Date		2010/02/17			TOXIC EQUIVALENCY		# of	
	Units	REAGENT BLANK-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
22'33'44'66'-OctaCB-(197)	ng	<0.20	0.016	0.20				2087846
OctaCB-(198)+(199)	ng	<0.40	0.021	0.40				2087846
22'33'4566'-OctaCB-(200)	ng	<0.20	0.015	0.20				2087846
22'33'45'66'-OctaCB-(201)	ng	<0.20	0.015	0.20				2087846
22'33'55'66'-OctaCB-(202)	ng	<0.20	0.019	0.20				2087846
22'344'55'6'-OctaCB-(203)	ng	<0.20	0.019	0.20				2087846
22'344'566'-OctaCB-(204)	ng	<0.20	0.015	0.20				2087846
233'44'55'6'-OctaCB-(205)	ng	<0.20	0.025	0.20				2087846
22'33'44'55'6'-NonaCB-(206)	ng	<0.20	0.030	0.20				2087846
22'33'44'566'-NonaCB-(207)	ng	<0.20	0.028	0.20				2087846
22'33'455'66'-NonaCB-(208)	ng	<0.20	0.031	0.20				2087846
DecaCB-(209)	ng	<0.20	0.012	0.20				2087846
Monochlorobiphenyl	ng	<N/A	0.0080	N/A				2087846
Dichlorobiphenyl	ng	0.101	0.095	N/A				2087846
Trichlorobiphenyl	ng	0.097	0.023	N/A				2087846
Tetrachlorobiphenyl	ng	0.294	0.048	N/A				2087846
Pentachlorobiphenyl	ng	0.402	0.023	N/A				2087846
Hexachlorobiphenyl	ng	0.232	0.038	N/A				2087846
Heptachlorobiphenyl	ng	0.053	0.044	N/A				2087846
Octachlorobiphenyl	ng	<N/A	0.039	N/A				2087846
Nonachlorobiphenyl	ng	<N/A	0.031	N/A				2087846
Decachlorobiphenyl	ng	<N/A	0.012	N/A				2087846
TOTAL TOXIC EQUIVALENCY	ng					0.00270		
<b>Surrogate Recovery (%)</b>								
2-Methylnaphthalene-2H10	%	72						2087844
Acenaphthylene-2H8	%	69						2087844
Benz(a)anthracene-2H12	%	87						2087844
Benzo(a)pyrene-2H12	%	80						2087844
Benzo(b)fluoranthene-2H12	%	104						2087844
Benzo(g,h,i)perylene-2H12	%	51						2087844
EDL = Estimated Detection Limit QC Batch = Quality Control Batch TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient, The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested. WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds								



Maxxam Job #: B023014  
Report Date: 2010/03/10

Eagle Mountain  
Client Project #: 902630  
Project name: MET COUNCIL- SENECA

# RESULTS OF ANALYSES OF IMPINGER SOLUTION

Maxxam ID		FE4801						
Sampling Date		2010/02/17				TOXIC EQUIVALENCY	# of	
	Units	REAGENT BLANK-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

Benzo(k)fluoranthene-2H12	%	88						2087844
Chrysene-2H12	%	88						2087844
Dibenzo(a,h)anthracene-2H14	%	55						2087844
Fluoranthene-2H10	%	96						2087844
Fluorene-2H10	%	79						2087844
Indeno(1,2,3-c,d)pyrene-2H12	%	60						2087844
Naphthalene-2H8	%	73						2087844
Perylene-2H12	%	94						2087844
Phenanthrene-2H10	%	96						2087844
Terphenyl-2H14	%	103						2087844
C13-2,2',3,5',6-PentaCB(95) (FS)	%	86						2087846
C13-2,44'-TriCB-(28)	%	71						2087846
C13-2,4'5'-TriCB-(31) (FS)	%	60						2087846
C13-22'33'44'55'6-NonaCB-(206)	%	120						2087846
C13-22'33'44'5'-HeptaCB-(170)	%	101						2087846
C13-22'33'455'66'-NonaCB-(208)	%	117						2087846
C13-22'33'55'66'-OctaCB-(202)	%	122						2087846
C13-22'33'55'6'-HeptaCB-(178)	%	146 (1)						2087846
C13-22'344'55'-HeptaCB-(180)	%	103						2087846
C13-22'34'566'-HeptaCB-(188)	%	118						2087846
C13-22'44'55'HexaCB-(153) (FS)	%	90						2087846
C13-22'44'66'-HexaCB-(155)	%	125						2087846
C13-22'466'-PentaCB-(104)	%	103						2087846
C13-22'66'-TetraCB-(54)	%	108						2087846
C13-22'6'-TriCB-(19)	%	96						2087846
C13-22'-DiCB-(4)	%	106						2087846
C13-233'44'55'6-OctaCB-(205)	%	101						2087846
C13-233'44'55'-HeptaCB-(189)	%	92						2087846
C13-233'44'-PentaCB-(105)	%	72						2087846

EDL = Estimated Detection Limit  
QC Batch = Quality Control Batch  
TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,  
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.  
WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds  
( 1 ) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.



Maxxam Job #: B023014  
Report Date: 2010/03/10

Eagle Mountain  
Client Project #: 902630  
Project name: MET COUNCIL- SENECA

# RESULTS OF ANALYSES OF IMPINGER SOLUTION

Maxxam ID		FE4801						
Sampling Date		2010/02/17				TOXIC EQUIVALENCY	# of	
	Units	REAGENT BLANK-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

C13-233'55'-PentaCB-(111)	%	106						2087846
C13-23'44'55'-HexaCB-(167)	%	86						2087846
C13-2344'5'-PentaCB-(114)	%	69						2087846
C13-23'44'5'-PentaCB-(118)	%	69						2087846
C13-2'344'5'-PentaCB-(123)	%	71						2087846
C13-2-MonoCB-(1)	%	77						2087846
C13-33'44'55'-HexaCB-(169)	%	82						2087846
C13-33'44'5'-PentaCB-(126)	%	72						2087846
C13-33'44'-TetraCB-(77)	%	81						2087846
C13-344'5'-TetraCB-(81)	%	79						2087846
C13-344'-TriCB-(37)	%	68						2087846
C13-44'-DiCB-(15)	%	73						2087846
C13-4-MonoCB-(3)	%	81						2087846
C13-DecaCB-(209)	%	143 (1)						2087846
C13-HexaCB-(156)+(157)	%	85						2087846

EDL = Estimated Detection Limit  
QC Batch = Quality Control Batch  
TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,  
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.  
WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds  
( 1 ) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

Maxxam Job #: B023014  
Report Date: 2010/03/10

Eagle Mountain  
Client Project #: 902630  
Project name: MET COUNCIL- SENECA

# RESULTS OF ANALYSES OF IMPINGER SOLUTION

Maxxam ID		FE4802						
Sampling Date		2010/02/16			TOXIC EQUIVALENCY		# of	
	Units	TEST 1-SENECA 1-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

<b>Polyaromatic Hydrocarbons</b>								
Naphthalene	ng	5600 (1)	20	22				2087844
2-Methylnaphthalene	ng	424	0.90	3.1				2087844
2-Chloronaphthalene	ng	127	0.076	0.15				2087844
Acenaphthylene	ng	17.0	0.59	0.32				2087844
Acenaphthene	ng	18.0	1.4	0.40				2087844
Fluorene	ng	28.0	3.1	0.49				2087844
Phenanthrene	ng	164	3.7	0.67				2087844
Anthracene	ng	<0.31	4.3	0.31				2087844
Fluoranthene	ng	53.2	0.70	0.65				2087844
Pyrene	ng	28.1	0.59	0.52				2087844
Benzo(a)anthracene	ng	2.26	0.51	0.17				2087844
Chrysene	ng	13.5	0.58	0.33				2087844
Benzo(b)fluoranthene	ng	2.21	1.3	0.59				2087844
Benzo(k)fluoranthene	ng	<0.35	1.9	0.35				2087844
Benzo(e)pyrene	ng	17.9	4.9	0.43				2087844
Benzo(a)pyrene	ng	<0.31	6.3	0.31				2087844
Perylene	ng	<0.26	6.3	0.26				2087844
Indeno(1,2,3-cd)pyrene	ng	<0.30	8.8	0.30				2087844
Dibenz(a,h)anthracene	ng	<0.46	8.4	0.46				2087844
Benzo(g,h,i)perylene	ng	38.1	9.4	0.23				2087844
<b>PCBs</b>								
2-MonoCB-(1)	ng	4.25	0.081	0.20				2087846
3-MonoCB-(2)	ng	6.10	0.090	0.20				2087846
4-MonoCB-(3)	ng	4.79	0.081	0.20				2087846
22'-DiCB-(4)	ng	0.46	0.049	0.20				2087846
2,3-DiCB-(5)	ng	<0.20 (2)	0.15	0.20				2087846

RDL = Reportable Detection Limit

EDL = Estimated Detection Limit

QC Batch = Quality Control Batch

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

( 1 ) PAH analysis - Exceeds Maximum Calibration Limit

( 2 ) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.

Maxxam Job #: B023014  
Report Date: 2010/03/10

Eagle Mountain  
Client Project #: 902630  
Project name: MET COUNCIL- SENECA

# RESULTS OF ANALYSES OF IMPINGER SOLUTION

Maxxam ID		FE4802						
Sampling Date		2010/02/16				TOXIC EQUIVALENCY	# of	
	Units	TEST 1-SENECA 1-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

2,3'-DiCB-(6)	ng	0.38	0.035	0.20				2087846
2,4'-DiCB-(7)	ng	0.38	0.035	0.20				2087846
2,4'-DiCB-(8)	ng	0.70	0.033	0.20				2087846
2,5'-DiCB-(9)	ng	0.25	0.035	0.20				2087846
2,6'-DiCB-(10)	ng	<0.20	0.040	0.20				2087846
3,3'-DiCB-(11)	ng	1.49	0.036	0.20				2087846
DiCB-(12)+(13)	ng	1.01	0.036	0.40				2087846
3,5'-DiCB-(14)	ng	0.21	0.034	0.20				2087846
4,4'-DiCB-(15)	ng	0.28	0.039	0.20				2087846
22'3'-TriCB-(16)	ng	0.61	0.029	0.20				2087846
22'4'-TriCB-(17)	ng	0.63	0.024	0.20				2087846
TriCB-(18)+(30)	ng	1.25	0.021	0.40				2087846
22'6'-TriCB-(19)	ng	<0.20	0.024	0.20				2087846
TriCB-(20) + (28)	ng	1.25	0.019	0.40				2087846
TriCB-(21)+(33)	ng	0.76	0.019	0.40				2087846
234'-TriCB-(22)	ng	0.49	0.020	0.20				2087846
235'-TriCB-(23)	ng	<0.20	0.021	0.20				2087846
236'-TriCB-(24)	ng	<0.20	0.019	0.20				2087846
23'4'-TriCB-(25)	ng	<0.20	0.017	0.20				2087846
TriCB-(26)+(29)	ng	<0.40	0.019	0.40				2087846
23'6'-TriCB-(27)	ng	<0.20	0.017	0.20				2087846
24'5'-TriCB-(31)	ng	1.35	0.018	0.20				2087846
24'6'-TriCB-(32)	ng	0.36	0.017	0.20				2087846
23'5'-TriCB-(34)	ng	<0.20	0.018	0.20				2087846
33'4'-TriCB-(35)	ng	<0.20	0.019	0.20				2087846
33'5'-TriCB-(36)	ng	<0.20	0.016	0.20				2087846
344'-TriCB-(37)	ng	0.23	0.020	0.20				2087846
345'-TriCB-(38)	ng	<0.20	0.019	0.20				2087846
34'5'-TriCB-(39)	ng	<0.20	0.019	0.20				2087846

EDL = Estimated Detection Limit

QC Batch = Quality Control Batch

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

Maxxam Job #: B023014  
Report Date: 2010/03/10

Eagle Mountain  
Client Project #: 902630  
Project name: MET COUNCIL- SENECA

# RESULTS OF ANALYSES OF IMPINGER SOLUTION

Maxxam ID		FE4802						
Sampling Date		2010/02/16			TOXIC EQUIVALENCY		# of	
	Units	TEST 1-SENECA 1-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

TetraCB-(40)+(41)+(71)	ng	0.92	0.036	0.60				2087846
22'34'-TetraCB-(42)	ng	0.49	0.040	0.20				2087846
22'35'-TetraCB-(43)	ng	<0.20	0.048	0.20				2087846
TetraCB-(44)+(47)+(65)	ng	5.04	0.033	0.60				2087846
TetraCB-(45)+(51)	ng	<0.40	0.036	0.40				2087846
22'36'-TetraCB-(46)	ng	<0.20	0.042	0.20				2087846
22'45'-TetraCB-(48)	ng	0.38	0.037	0.20				2087846
TetraCB-(49)+TetraCB-(69)	ng	2.96	0.032	0.40				2087846
TetraCB-(50)+(53)	ng	0.44	0.035	0.40				2087846
22'55'-TetraCB-(52)	ng	15.9	0.036	0.20				2087846
22'66'-TetraCB-(54)	ng	<0.20	0.024	0.20				2087846
233'4'-TetraCB-(55)	ng	<0.20	0.021	0.20				2087846
233'4'-Tetra CB(56)	ng	0.56	0.021	0.20				2087846
233'5'-TetraCB-(57)	ng	<0.20	0.020	0.20				2087846
233'5'-TetraCB-(58)	ng	<0.20	0.021	0.20				2087846
TetraCB-(59)+(62)+(75)	ng	<0.60	0.028	0.60				2087846
2344'-TetraCB -(60)	ng	0.27	0.021	0.20				2087846
TetraCB-(61)+(70)+(74)+(76)	ng	7.66	0.020	0.80				2087846
234'5'-TetraCB-(63)	ng	<0.20 (1)	0.055	0.20				2087846
234'6'-TetraCB-(64)	ng	1.42	0.027	0.20				2087846
23'44'-TetraCB-(66)	ng	1.62	0.019	0.20				2087846
23'45'-TetraCB-(67)	ng	<0.20 (1)	0.026	0.20				2087846
23'45'-TetraCB-(68)	ng	<0.20	0.018	0.20				2087846
23'55'-TetraCB-(72)	ng	<0.20	0.019	0.20				2087846
23'5'6'-TetraCB-(73)	ng	<0.20	0.025	0.20				2087846
33'44'-TetraCB-(77)	ng	<0.20	0.019	0.20	0.000100	0.00000190		2087846
33'45'-TetraCB-(78)	ng	<0.20	0.020	0.20				2087846
33'45'-TetraCB(79)	ng	<0.20	0.017	0.20				2087846
33'55'-TetraCB-(80)	ng	<0.20	0.018	0.20				2087846

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QC Batch = Quality Control Batch  
TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,  
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.  
WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds  
( 1 ) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.

Maxxam Job #: B023014  
Report Date: 2010/03/10

Eagle Mountain  
Client Project #: 902630  
Project name: MET COUNCIL- SENECA

# RESULTS OF ANALYSES OF IMPINGER SOLUTION

Maxxam ID		FE4802						
Sampling Date		2010/02/16			TOXIC EQUIVALENCY		# of	
	Units	TEST 1-SENECA 1-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

344'5-TetraCB-(81)	ng	<0.20	0.019	0.20	0.000300	0.00000570		2087846
22'33'4-PentaCB-(82)	ng	1.05	0.033	0.20				2087846
PentaCB-(83)+(99)	ng	7.05	0.030	0.40				2087846
22'33'6-PentaCB-(84)	ng	4.95	0.034	0.20				2087846
PentaCB-(85)+(116)+(117)	ng	1.44	0.024	0.60				2087846
PentaCB-(86)(87)(97)(109)(119)(125)	ng	9.6	0.026	1.2				2087846
PentaCB-(88)+(91)	ng	2.22	0.030	0.40				2087846
22'346'-PentaCB-(89)	ng	<0.20	0.031	0.20				2087846
PentaCB-(90)+(101)+(113)	ng	16.9	0.026	0.60				2087846
22'355'-PentaCB-(92)	ng	3.14	0.030	0.20				2087846
PentaCB-(93)+(98)+(100)+(102)	ng	<0.80	0.030	0.80				2087846
22'356'-PentaCB-(94)	ng	<0.20	0.032	0.20				2087846
22'35'6-PentaCB-(95)	ng	16.6	0.028	0.20				2087846
22'366'-PentaCB-(96)	ng	<0.20 (1)	0.091	0.20				2087846
22'45'6-PentaCB-(103)	ng	<0.20	0.027	0.20				2087846
22'466'-PentaCB-(104)	ng	<0.20	0.011	0.20				2087846
233'44'-PentaCB-(105)	ng	1.77	0.031	0.20	0.0000300	0.0000531		2087846
233'45-PentaCB-(106)	ng	<0.20	0.032	0.20				2087846
233'4'5-PentaCB-(107)	ng	0.41	0.032	0.20				2087846
PentaCB-(108)+(124)	ng	<0.40	0.033	0.40				2087846
PentaCB-(110)+(115)	ng	14.4	0.025	0.40				2087846
233'55'-PentaCB-(111)	ng	<0.20	0.023	0.20				2087846
233'56-PentaCB-(112)	ng	<0.20	0.023	0.20				2087846
2344'5-PentaCB-(114)	ng	<0.20	0.031	0.20	0.0000300	0.000000930		2087846
23'44'5-PentaCB-(118)	ng	6.33	0.030	0.20	0.0000300	0.000190		2087846
23'455'-PentaCB-(120)	ng	<0.20	0.022	0.20				2087846
23'45'6-PentaCB-(121)	ng	<0.20	0.023	0.20				2087846
233'4'5'-PentaCB-(122)	ng	<0.20	0.035	0.20				2087846
23'44'5'-PentaCB-(123)	ng	<0.20	0.031	0.20	0.0000300	0.000000930		2087846

EDL = Estimated Detection Limit

QC Batch = Quality Control Batch

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

( 1 ) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.

Maxxam Job #: B023014  
Report Date: 2010/03/10

Eagle Mountain  
Client Project #: 902630  
Project name: MET COUNCIL- SENECA

### RESULTS OF ANALYSES OF IMPINGER SOLUTION

Maxxam ID		FE4802						
Sampling Date		2010/02/16			TOXIC EQUIVALENCY		# of	
	Units	TEST 1-SENECA 1-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
33'44'5-PentaCB-(126)	ng	<0.20	0.030	0.20	0.100	0.00300		2087846
33'455'-PentaCB-(127)	ng	<0.20	0.032	0.20				2087846
HexaCB-(128)+(166)	ng	0.71	0.034	0.40				2087846
HexaCB-(129)+(138)+(163)	ng	5.61	0.035	0.60				2087846
22'33'45'-HexaCB-(130)	ng	0.37	0.041	0.20				2087846
22'33'46'-HexaCB-(131)	ng	0.22	0.042	0.20				2087846
22'33'46'-HexaCB-(132)	ng	3.16	0.042	0.20				2087846
22'33'55'-HexaCB-(133)	ng	<0.20 (1)	0.082	0.20				2087846
HexaCB-(134)+(143)	ng	0.51	0.045	0.40				2087846
HexaCB-(135)+(151)	ng	2.82	0.011	0.40				2087846
22'33'66'-HexaCB-(136)	ng	1.85	0.0085	0.20				2087846
22'344'5-HexaCB-(137)	ng	0.36	0.041	0.20				2087846
HexaCB-(139)+(140)	ng	<0.40	0.037	0.40				2087846
22'3455'-HexaCB-(141)	ng	1.17	0.038	0.20				2087846
22'3456-HexaCB-(142)	ng	<0.20	0.040	0.20				2087846
22'345'6-HexaCB-(144)	ng	0.52	0.011	0.20				2087846
22'3466'-HexaCB-(145)	ng	<0.20	0.0089	0.20				2087846
22'34'55'-HexaCB-(146)	ng	0.89	0.034	0.20				2087846
HexaCB-(147)+(149)	ng	8.34	0.046	0.40				2087846
22'34'56'-HexaCB-(148)	ng	<0.20	0.011	0.20				2087846
22'34'66'-HexaCB-(150)	ng	<0.20 (1)	0.018	0.20				2087846
22'3566'-HexaCB-(152)	ng	<0.20	0.0083	0.20				2087846
HexaCB-(153)+(168)	ng	4.58	0.031	0.40				2087846
22'44'56'-HexaCB-(154)	ng	<0.20	0.010	0.20				2087846
22'44'66'-HexaCB-(155)	ng	<0.20	0.011	0.20				2087846
HexaCB-(156)+(157)	ng	<0.40	0.043	0.40	0.0000300	0.00000129		2087846
233'44'6-HexaCB-(158)	ng	0.67	0.027	0.20				2087846
233'455'-HexaCB-(159)	ng	<0.20	0.049	0.20				2087846
233'456-HexaCB-(160)	ng	<0.20	0.032	0.20				2087846
EDL = Estimated Detection Limit QC Batch = Quality Control Batch TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient, The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested. WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds ( 1 ) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.								

Maxxam Job #: B023014  
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Eagle Mountain  
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# RESULTS OF ANALYSES OF IMPINGER SOLUTION

Maxxam ID		FE4802						
Sampling Date		2010/02/16			TOXIC EQUIVALENCY		# of	
	Units	TEST 1-SENECA 1-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

233'45'6-HexaCB-(161)	ng	<0.20	0.029	0.20				2087846
233'4'55'-HexaCB-(162)	ng	<0.20	0.050	0.20				2087846
233'4'5'6-HexaCB-(164)	ng	0.37	0.028	0.20				2087846
233'55'6-HexaCB-(165)	ng	<0.20	0.032	0.20				2087846
23'44'55'-HexaCB-(167)	ng	<0.20	0.042	0.20	0.0000300	0.00000126		2087846
33'44'55'-HexaCB-(169)	ng	<0.20	0.044	0.20	0.0300	0.00132		2087846
22'33'44'5-HeptaCB-(170)	ng	0.26	0.037	0.20				2087846
HeptaCB-(171)+(173)	ng	<0.40	0.045	0.40				2087846
22'33'455'-HeptaCB-(172)	ng	<0.20	0.046	0.20				2087846
22'33'456'-HeptaCB-(174)	ng	0.39	0.044	0.20				2087846
22'33'45'6-HeptaCB-(175)	ng	<0.20	0.019	0.20				2087846
22'33'466'-HeptaCB-(176)	ng	<0.20	0.015	0.20				2087846
22'33'45'6'-HeptaCB-(177)	ng	0.20	0.045	0.20				2087846
22'33'55'6-HeptaCB-(178)	ng	<0.20 (1)	0.079	0.20				2087846
22'33'566'-HeptaCB-(179)	ng	0.26	0.014	0.20				2087846
HeptaCB-(180)+(193)	ng	0.51	0.034	0.40				2087846
22'344'56-HeptaCB-(181)	ng	<0.20	0.044	0.20				2087846
22'344'56'-HeptaCB-(182)	ng	<0.20	0.019	0.20				2087846
22'344'5'6-HeptaCB-(183)	ng	0.28	0.039	0.20				2087846
22'344'66'-HeptaCB-(184)	ng	<0.20 (1)	0.070	0.20				2087846
22'3455'6-HeptaCB-(185)	ng	<0.20	0.047	0.20				2087846
22'34566'-HeptaCB-(186)	ng	<0.20	0.015	0.20				2087846
22'34'55'6-HeptaCB-(187)	ng	0.43	0.018	0.20				2087846
22'34'566'-HeptaCB-(188)	ng	<0.20	0.020	0.20				2087846
233'44'55'-HeptaCB-(189)	ng	<0.20	0.071	0.20	0.0000300	0.00000213		2087846
233'44'56-HeptaCB-(190)	ng	<0.20	0.036	0.20				2087846
233'44'5'6-HeptaCB-(191)	ng	<0.20	0.035	0.20				2087846
233'455'6-HeptaCB-(192)	ng	<0.20	0.038	0.20				2087846
22'33'44'55'-OctaCB-(194)	ng	<0.20 (1)	0.039	0.20				2087846

EDL = Estimated Detection Limit  
QC Batch = Quality Control Batch  
TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,  
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.  
WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds  
( 1 ) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.



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Eagle Mountain  
Client Project #: 902630  
Project name: MET COUNCIL- SENECA

### RESULTS OF ANALYSES OF IMPINGER SOLUTION

Maxxam ID		FE4802						
Sampling Date		2010/02/16			TOXIC EQUIVALENCY		# of	
	Units	TEST 1-SENECA 1-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
22'33'44'56-OctaCB-(195)	ng	<0.20	0.037	0.20				2087846
22'33'44'56'-OctaCB-(196)	ng	<0.20	0.044	0.20				2087846
22'33'44'66-OctaCB-(197)	ng	<0.20	0.034	0.20				2087846
OctaCB-(198)+(199)	ng	<0.40 (1)	0.054	0.40				2087846
22'33'4566'-OctaCB-(200)	ng	<0.20	0.031	0.20				2087846
22'33'45'66'-OctaCB-(201)	ng	<0.20	0.032	0.20				2087846
22'33'55'66'-OctaCB-(202)	ng	<0.20	0.040	0.20				2087846
22'344'55'6-OctaCB-(203)	ng	<0.20	0.041	0.20				2087846
22'344'566'-OctaCB-(204)	ng	<0.20	0.033	0.20				2087846
233'44'55'6-OctaCB-(205)	ng	<0.20	0.024	0.20				2087846
22'33'44'55'6-NonaCB-(206)	ng	<0.20	0.039	0.20				2087846
22'33'44'566'-NonaCB-(207)	ng	<0.20	0.036	0.20				2087846
22'33'455'66'-NonaCB-(208)	ng	<0.20	0.041	0.20				2087846
DecaCB-(209)	ng	<0.20	0.022	0.20				2087846
Monochlorobiphenyl	ng	15.1	0.090	N/A				2087846
Dichlorobiphenyl	ng	5.16	0.049	N/A				2087846
Trichlorobiphenyl	ng	7.49	0.029	N/A				2087846
Tetrachlorobiphenyl	ng	38.4	0.048	N/A				2087846
Pentachlorobiphenyl	ng	87.3	0.035	N/A				2087846
Hexachlorobiphenyl	ng	33.1	0.050	N/A				2087846
Heptachlorobiphenyl	ng	2.74	0.071	N/A				2087846
Octachlorobiphenyl	ng	<N/A	0.044	N/A				2087846
Nonachlorobiphenyl	ng	<N/A	0.041	N/A				2087846
Decachlorobiphenyl	ng	<N/A	0.022	N/A				2087846
TOTAL TOXIC EQUIVALENCY	ng					0.00458		
<b>Surrogate Recovery (%)</b>								
2-Methylnaphthalene-2H10	%	82						2087844
Acenaphthylene-2H8	%	66						2087844
Benz(a)anthracene-2H12	%	35						2087844
EDL = Estimated Detection Limit QC Batch = Quality Control Batch TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient, The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested. WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds ( 1 ) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.								



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Eagle Mountain  
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# RESULTS OF ANALYSES OF IMPINGER SOLUTION

Maxxam ID		FE4802						
Sampling Date		2010/02/16				TOXIC EQUIVALENCY	# of	
	Units	TEST 1-SENECA 1-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

Benzo(a)pyrene-2H12	%	51						2087844
Benzo(b)fluoranthene-2H12	%	134						2087844
Benzo(g,h,i)perylene-2H12	%	51						2087844
Benzo(k)fluoranthene-2H12	%	94						2087844
Chrysene-2H12	%	34						2087844
Dibenzo(a,h)anthracene-2H14	%	56						2087844
Fluoranthene-2H10	%	106						2087844
Fluorene-2H10	%	62						2087844
Indeno(1,2,3-c,d)pyrene-2H12	%	66						2087844
Naphthalene-2H8	%	88						2087844
Perylene-2H12	%	46						2087844
Phenanthrene-2H10	%	124						2087844
Terphenyl-2H14	%	69						2087844
C13-2,2',3,5',6-PentaCB(95) (FS)	%	105						2087846
C13-2,44'-TriCB-(28)	%	80						2087846
C13-2,4'5'-TriCB-(31) (FS)	%	73						2087846
C13-22'33'44'55'6-NonaCB-(206)	%	137						2087846
C13-22'33'44'5-HeptaCB-(170)	%	119						2087846
C13-22'33'455'66'-NonaCB-(208)	%	129						2087846
C13-22'33'55'66'-OctaCB-(202)	%	140						2087846
C13-22'33'55'6-HeptaCB-(178)	%	158						2087846
C13-22'344'55'-HeptaCB-(180)	%	120						2087846
C13-22'34'566'-HeptaCB-(188)	%	134						2087846
C13-22'44'55'HexaCB-(153) (FS)	%	106						2087846
C13-22'44'66'-HexaCB-(155)	%	142 (1)						2087846
C13-22'466'-PentaCB-(104)	%	122						2087846
C13-22'66'-TetraCB-(54)	%	127						2087846
C13-22'6-TriCB-(19)	%	114						2087846

EDL = Estimated Detection Limit

QC Batch = Quality Control Batch

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

( 1 ) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

Maxxam Job #: B023014  
Report Date: 2010/03/10

Eagle Mountain  
Client Project #: 902630  
Project name: MET COUNCIL- SENECA

### RESULTS OF ANALYSES OF IMPINGER SOLUTION

Maxxam ID		FE4802						
Sampling Date		2010/02/16				TOXIC EQUIVALENCY	# of	
	Units	TEST 1-SENECA 1-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

C13-22'-DiCB-(4)	%	103						2087846
C13-233'44'55'6-OctaCB-(205)	%	112						2087846
C13-233'44'55'-HeptaCB-(189)	%	102						2087846
C13-233'44'-PentaCB-(105)	%	87						2087846
C13-233'55'-PentaCB-(111)	%	119						2087846
C13-23'44'55'-HexaCB-(167)	%	97						2087846
C13-2344'5'-PentaCB-(114)	%	83						2087846
C13-23'44'5'-PentaCB-(118)	%	83						2087846
C13-2'344'5'-PentaCB-(123)	%	85						2087846
C13-2-MonoCB-(1)	%	56						2087846
C13-33'44'55'-HexaCB-(169)	%	85						2087846
C13-33'44'5'-PentaCB-(126)	%	89						2087846
C13-33'44'-TetraCB-(77)	%	94						2087846
C13-344'5'-TetraCB-(81)	%	97						2087846
C13-344'-TriCB-(37)	%	84						2087846
C13-44'-DiCB-(15)	%	93						2087846
C13-4-MonoCB-(3)	%	77						2087846
C13-DecaCB-(209)	%	154 (1)						2087846
C13-HexaCB-(156)+(157)	%	95						2087846

EDL = Estimated Detection Limit

QC Batch = Quality Control Batch

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

( 1 ) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

Maxxam Job #: B023014  
Report Date: 2010/03/10

Eagle Mountain  
Client Project #: 902630  
Project name: MET COUNCIL- SENECA

# RESULTS OF ANALYSES OF IMPINGER SOLUTION

Maxxam ID		FE4803						
Sampling Date		2010/02/16				TOXIC EQUIVALENCY	# of	
	Units	TEST 2-SENECA 1-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

<b>Polyaromatic Hydrocarbons</b>								
Naphthalene	ng	5240 (1)	15	22				2087844
2-Methylnaphthalene	ng	220	2.2	3.1				2087844
2-Chloronaphthalene	ng	166	0.056	0.15				2087844
Acenaphthylene	ng	2.95	1.3	0.32				2087844
Acenaphthene	ng	8.80	0.73	0.40				2087844
Fluorene	ng	13.9	1.7	0.49				2087844
Phenanthrene	ng	112	1.4	0.67				2087844
Anthracene	ng	7.80	1.7	0.31				2087844
Fluoranthene	ng	37.8	3.4	0.65				2087844
Pyrene	ng	24.0	2.9	0.52				2087844
Benzo(a)anthracene	ng	2.92	0.26	0.17				2087844
Chrysene	ng	16.1	0.26	0.33				2087844
Benzo(b)fluoranthene	ng	4.12	0.35	0.59				2087844
Benzo(k)fluoranthene	ng	1.84	0.48	0.35				2087844
Benzo(e)pyrene	ng	4.12	0.40	0.43				2087844
Benzo(a)pyrene	ng	<0.31	0.52	0.31				2087844
Perylene	ng	<0.26	0.45	0.26				2087844
Indeno(1,2,3-cd)pyrene	ng	<0.30	2.2	0.30				2087844
Dibenz(a,h)anthracene	ng	<0.46	1.7	0.46				2087844
Benzo(g,h,i)perylene	ng	12.3	2.8	0.23				2087844
<b>PCBs</b>								
2-MonoCB-(1)	ng	3.72	0.035	0.20				2087846
3-MonoCB-(2)	ng	5.82	0.039	0.20				2087846
4-MonoCB-(3)	ng	4.81	0.035	0.20				2087846
22'-DiCB-(4)	ng	0.39	0.020	0.20				2087846
2,3-DiCB-(5)	ng	<0.20 (2)	0.14	0.20				2087846

RDL = Reportable Detection Limit

EDL = Estimated Detection Limit

QC Batch = Quality Control Batch

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

( 1 ) PAH analysis - Exceeds Maximum Calibration Limit

( 2 ) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.

Maxxam Job #: B023014  
Report Date: 2010/03/10

Eagle Mountain  
Client Project #: 902630  
Project name: MET COUNCIL- SENECA

# RESULTS OF ANALYSES OF IMPINGER SOLUTION

Maxxam ID		FE4803						
Sampling Date		2010/02/16			TOXIC EQUIVALENCY		# of	
	Units	TEST 2-SENECA 1-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

2,3'-DiCB-(6)	ng	0.29	0.038	0.20				2087846
2,4'-DiCB-(7)	ng	0.29	0.038	0.20				2087846
2,4'-DiCB-(8)	ng	0.58	0.035	0.20				2087846
2,5'-DiCB-(9)	ng	<0.20 (1)	0.21	0.20				2087846
2,6'-DiCB-(10)	ng	<0.20	0.016	0.20				2087846
3,3'-DiCB-(11)	ng	1.84	0.038	0.20				2087846
DiCB-(12)+(13)	ng	1.10	0.039	0.40				2087846
3,5'-DiCB-(14)	ng	0.23	0.037	0.20				2087846
4,4'-DiCB-(15)	ng	<0.20 (1)	0.21	0.20				2087846
22'3'-TriCB-(16)	ng	0.42	0.019	0.20				2087846
22'4'-TriCB-(17)	ng	0.50	0.016	0.20				2087846
TriCB-(18)+(30)	ng	1.02	0.014	0.40				2087846
22'6'-TriCB-(19)	ng	<0.20	0.016	0.20				2087846
TriCB-(20) + (28)	ng	1.14	0.013	0.40				2087846
TriCB-(21)+(33)	ng	0.66	0.013	0.40				2087846
234'-TriCB-(22)	ng	0.38	0.014	0.20				2087846
235'-TriCB-(23)	ng	<0.20	0.014	0.20				2087846
236'-TriCB-(24)	ng	<0.20	0.013	0.20				2087846
23'4'-TriCB-(25)	ng	<0.20	0.012	0.20				2087846
TriCB-(26)+(29)	ng	<0.40	0.013	0.40				2087846
23'6'-TriCB-(27)	ng	<0.20	0.012	0.20				2087846
24'5'-TriCB-(31)	ng	1.13	0.012	0.20				2087846
24'6'-TriCB-(32)	ng	0.30	0.011	0.20				2087846
23'5'-TriCB-(34)	ng	<0.20	0.013	0.20				2087846
33'4'-TriCB-(35)	ng	<0.20 (1)	0.058	0.20				2087846
33'5'-TriCB-(36)	ng	<0.20	0.011	0.20				2087846
344'-TriCB-(37)	ng	<0.20	0.014	0.20				2087846
345'-TriCB-(38)	ng	<0.20	0.013	0.20				2087846
34'5'-TriCB-(39)	ng	<0.20	0.013	0.20				2087846

EDL = Estimated Detection Limit

QC Batch = Quality Control Batch

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

( 1 ) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.

Maxxam Job #: B023014  
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Eagle Mountain  
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Project name: MET COUNCIL- SENECA

# RESULTS OF ANALYSES OF IMPINGER SOLUTION

Maxxam ID		FE4803						
Sampling Date		2010/02/16			TOXIC EQUIVALENCY		# of	
	Units	TEST 2-SENECA 1-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

TetraCB-(40)+(41)+(71)	ng	0.84	0.011	0.60				2087846
22'34'-TetraCB-(42)	ng	0.43	0.012	0.20				2087846
22'35'-TetraCB-(43)	ng	<0.20 (1)	0.067	0.20				2087846
TetraCB-(44)+(47)+(65)	ng	4.52	0.0099	0.60				2087846
TetraCB-(45)+(51)	ng	<0.40	0.011	0.40				2087846
22'36'-TetraCB-(46)	ng	<0.20 (1)	0.079	0.20				2087846
22'45'-TetraCB-(48)	ng	0.34	0.011	0.20				2087846
TetraCB-(49)+TetraCB-(69)	ng	2.47	0.0095	0.40				2087846
TetraCB-(50)+(53)	ng	<0.40	0.011	0.40				2087846
22'55'-TetraCB-(52)	ng	13.5	0.011	0.20				2087846
22'66'-TetraCB-(54)	ng	<0.20	0.014	0.20				2087846
233'4'-TetraCB-(55)	ng	<0.20	0.021	0.20				2087846
233'4'-Tetra CB(56)	ng	0.55	0.021	0.20				2087846
233'5'-TetraCB-(57)	ng	<0.20	0.020	0.20				2087846
233'5'-TetraCB-(58)	ng	<0.20	0.021	0.20				2087846
TetraCB-(59)+(62)+(75)	ng	<0.60	0.0084	0.60				2087846
2344'-TetraCB -(60)	ng	0.28	0.021	0.20				2087846
TetraCB-(61)+(70)+(74)+(76)	ng	6.82	0.020	0.80				2087846
234'5'-TetraCB-(63)	ng	<0.20	0.019	0.20				2087846
234'6'-TetraCB-(64)	ng	1.20	0.0081	0.20				2087846
23'44'-TetraCB-(66)	ng	1.46	0.020	0.20				2087846
23'45'-TetraCB-(67)	ng	<0.20 (1)	0.019	0.20				2087846
23'45'-TetraCB-(68)	ng	<0.20	0.019	0.20				2087846
23'55'-TetraCB-(72)	ng	<0.20	0.019	0.20				2087846
23'5'6'-TetraCB-(73)	ng	<0.20	0.0075	0.20				2087846
33'44'-TetraCB-(77)	ng	<0.20	0.019	0.20	0.000100	0.00000190		2087846
33'45'-TetraCB-(78)	ng	<0.20	0.021	0.20				2087846
33'45'-TetraCB(79)	ng	<0.20	0.018	0.20				2087846
33'55'-TetraCB-(80)	ng	<0.20	0.019	0.20				2087846

EDL = Estimated Detection Limit  
QC Batch = Quality Control Batch  
TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,  
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.  
WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds  
( 1 ) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.

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Eagle Mountain  
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Project name: MET COUNCIL- SENECA

# RESULTS OF ANALYSES OF IMPINGER SOLUTION

Maxxam ID		FE4803						
Sampling Date		2010/02/16			TOXIC EQUIVALENCY		# of	
	Units	TEST 2-SENECA 1-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

344'5-TetraCB-(81)	ng	<0.20	0.019	0.20	0.000300	0.00000570		2087846
22'33'4-PentaCB-(82)	ng	1.00	0.032	0.20				2087846
PentaCB-(83)+(99)	ng	6.28	0.030	0.40				2087846
22'33'6-PentaCB-(84)	ng	4.50	0.033	0.20				2087846
PentaCB-(85)+(116)+(117)	ng	1.31	0.024	0.60				2087846
PentaCB-(86)(87)(97)(109)(119)(125)	ng	8.8	0.025	1.2				2087846
PentaCB-(88)+(91)	ng	1.97	0.029	0.40				2087846
22'346'-PentaCB-(89)	ng	<0.20	0.030	0.20				2087846
PentaCB-(90)+(101)+(113)	ng	15.5	0.026	0.60				2087846
22'355'-PentaCB-(92)	ng	2.85	0.029	0.20				2087846
PentaCB-(93)+(98)+(100)+(102)	ng	<0.80	0.029	0.80				2087846
22'356'-PentaCB-(94)	ng	<0.20	0.031	0.20				2087846
22'35'6-PentaCB-(95)	ng	15.1	0.027	0.20				2087846
22'366'-PentaCB-(96)	ng	<0.20	0.0061	0.20				2087846
22'45'6-PentaCB-(103)	ng	<0.20	0.026	0.20				2087846
22'466'-PentaCB-(104)	ng	<0.20	0.0075	0.20				2087846
233'44'-PentaCB-(105)	ng	1.63	0.014	0.20	0.0000300	0.0000489		2087846
233'45-PentaCB-(106)	ng	<0.20	0.014	0.20				2087846
233'4'5-PentaCB-(107)	ng	0.40	0.014	0.20				2087846
PentaCB-(108)+(124)	ng	<0.40 (1)	0.26	0.40				2087846
PentaCB-(110)+(115)	ng	13.4	0.024	0.40				2087846
233'55'-PentaCB-(111)	ng	<0.20	0.022	0.20				2087846
233'56-PentaCB-(112)	ng	<0.20	0.022	0.20				2087846
2344'5-PentaCB-(114)	ng	<0.20	0.014	0.20	0.0000300	0.000000420		2087846
23'44'5-PentaCB-(118)	ng	5.88	0.013	0.20	0.0000300	0.000176		2087846
23'455'-PentaCB-(120)	ng	<0.20	0.021	0.20				2087846
23'45'6-PentaCB-(121)	ng	<0.20	0.022	0.20				2087846
233'4'5'-PentaCB-(122)	ng	<0.20 (1)	0.051	0.20				2087846
23'44'5'-PentaCB-(123)	ng	<0.20	0.014	0.20	0.0000300	0.000000420		2087846

EDL = Estimated Detection Limit

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( 1 ) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.

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Eagle Mountain  
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# RESULTS OF ANALYSES OF IMPINGER SOLUTION

Maxxam ID		FE4803						
Sampling Date		2010/02/16			TOXIC EQUIVALENCY		# of	
	Units	TEST 2-SENECA 1-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

33'44'5-PentaCB-(126)	ng	<0.20	0.013	0.20	0.100	0.00130		2087846
33'455'-PentaCB-(127)	ng	<0.20	0.014	0.20				2087846
HexaCB-(128)+(166)	ng	<0.40 (1)	0.62	0.40				2087846
HexaCB-(129)+(138)+(163)	ng	5.16	0.031	0.60				2087846
22'33'45'-HexaCB-(130)	ng	0.41	0.037	0.20				2087846
22'33'46'-HexaCB-(131)	ng	<0.20	0.037	0.20				2087846
22'33'46'-HexaCB-(132)	ng	2.87	0.037	0.20				2087846
22'33'55'-HexaCB-(133)	ng	<0.20	0.034	0.20				2087846
HexaCB-(134)+(143)	ng	0.48	0.040	0.40				2087846
HexaCB-(135)+(151)	ng	2.61	0.0080	0.40				2087846
22'33'66'-HexaCB-(136)	ng	1.59	0.0061	0.20				2087846
22'344'5'-HexaCB-(137)	ng	<0.20 (1)	0.45	0.20				2087846
HexaCB-(139)+(140)	ng	<0.40	0.033	0.40				2087846
22'3455'-HexaCB-(141)	ng	1.13	0.033	0.20				2087846
22'3456-HexaCB-(142)	ng	<0.20	0.035	0.20				2087846
22'345'6'-HexaCB-(144)	ng	0.49	0.0079	0.20				2087846
22'3466'-HexaCB-(145)	ng	<0.20	0.0064	0.20				2087846
22'34'55'-HexaCB-(146)	ng	0.80	0.030	0.20				2087846
HexaCB-(147)+(149)	ng	7.41	0.041	0.40				2087846
22'34'56'-HexaCB-(148)	ng	<0.20	0.0079	0.20				2087846
22'34'66'-HexaCB-(150)	ng	<0.20	0.0062	0.20				2087846
22'3566'-HexaCB-(152)	ng	<0.20	0.0059	0.20				2087846
HexaCB-(153)+(168)	ng	4.26	0.027	0.40				2087846
22'44'56'-HexaCB-(154)	ng	<0.20	0.0071	0.20				2087846
22'44'66'-HexaCB-(155)	ng	<0.20 (1)	0.096	0.20				2087846
HexaCB-(156)+(157)	ng	<0.40	0.021	0.40	0.0000300	0.000000630		2087846
233'44'6-HexaCB-(158)	ng	0.61	0.024	0.20				2087846
233'455'-HexaCB-(159)	ng	<0.20	0.024	0.20				2087846
233'456-HexaCB-(160)	ng	<0.20	0.028	0.20				2087846

EDL = Estimated Detection Limit  
QC Batch = Quality Control Batch  
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WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds  
( 1 ) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.



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Eagle Mountain  
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### RESULTS OF ANALYSES OF IMPINGER SOLUTION

Maxxam ID		FE4803						
Sampling Date		2010/02/16			TOXIC EQUIVALENCY		# of	
	Units	TEST 2-SENECA 1-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
233'45'6-HexaCB-(161)	ng	<0.20	0.025	0.20				2087846
233'4'55'-HexaCB-(162)	ng	<0.20	0.024	0.20				2087846
233'4'5'6-HexaCB-(164)	ng	0.32	0.025	0.20				2087846
233'55'6-HexaCB-(165)	ng	<0.20	0.028	0.20				2087846
23'44'55'-HexaCB-(167)	ng	<0.20	0.020	0.20	0.0000300	0.000000600		2087846
33'44'55'-HexaCB-(169)	ng	<0.20	0.021	0.20	0.0300	0.000630		2087846
22'33'44'5-HeptaCB-(170)	ng	0.26	0.021	0.20				2087846
HeptaCB-(171)+(173)	ng	<0.40	0.026	0.40				2087846
22'33'455'-HeptaCB-(172)	ng	<0.20	0.026	0.20				2087846
22'33'456'-HeptaCB-(174)	ng	0.37	0.025	0.20				2087846
22'33'45'6-HeptaCB-(175)	ng	<0.20	0.014	0.20				2087846
22'33'466'-HeptaCB-(176)	ng	<0.20	0.011	0.20				2087846
22'33'45'6'-HeptaCB-(177)	ng	0.20	0.026	0.20				2087846
22'33'55'6-HeptaCB-(178)	ng	<0.20	0.014	0.20				2087846
22'33'566'-HeptaCB-(179)	ng	0.27	0.011	0.20				2087846
HeptaCB-(180)+(193)	ng	0.52	0.019	0.40				2087846
22'344'56-HeptaCB-(181)	ng	<0.20	0.025	0.20				2087846
22'344'56'-HeptaCB-(182)	ng	<0.20	0.014	0.20				2087846
22'344'5'6-HeptaCB-(183)	ng	0.24	0.022	0.20				2087846
22'344'66'-HeptaCB-(184)	ng	<0.20	0.010	0.20				2087846
22'3455'6-HeptaCB-(185)	ng	<0.20	0.027	0.20				2087846
22'34566'-HeptaCB-(186)	ng	<0.20	0.011	0.20				2087846
22'34'55'6-HeptaCB-(187)	ng	0.43	0.013	0.20				2087846
22'34'566'-HeptaCB-(188)	ng	<0.20	0.015	0.20				2087846
233'44'55'-HeptaCB-(189)	ng	<0.20	0.032	0.20	0.0000300	0.000000960		2087846
233'44'56-HeptaCB-(190)	ng	<0.20	0.020	0.20				2087846
233'44'5'6-HeptaCB-(191)	ng	<0.20	0.020	0.20				2087846
233'455'6-HeptaCB-(192)	ng	<0.20	0.022	0.20				2087846
22'33'44'55'-OctaCB-(194)	ng	<0.20	0.025	0.20				2087846
EDL = Estimated Detection Limit QC Batch = Quality Control Batch TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient, The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested. WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds								



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Eagle Mountain  
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# RESULTS OF ANALYSES OF IMPINGER SOLUTION

Maxxam ID		FE4803						
Sampling Date		2010/02/16				TOXIC EQUIVALENCY	# of	
	Units	TEST 2-SENECA 1-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

22'33'44'56-OctaCB-(195)	ng	<0.20	0.027	0.20				2087846
22'33'44'56'-OctaCB-(196)	ng	<0.20	0.037	0.20				2087846
22'33'44'66-OctaCB-(197)	ng	<0.20	0.028	0.20				2087846
OctaCB-(198)+(199)	ng	<0.40	0.037	0.40				2087846
22'33'4566'-OctaCB-(200)	ng	<0.20	0.026	0.20				2087846
22'33'45'66'-OctaCB-(201)	ng	<0.20	0.027	0.20				2087846
22'33'55'66'-OctaCB-(202)	ng	<0.20	0.034	0.20				2087846
22'344'55'6-OctaCB-(203)	ng	<0.20	0.035	0.20				2087846
22'344'566'-OctaCB-(204)	ng	<0.20	0.027	0.20				2087846
233'44'55'6-OctaCB-(205)	ng	<0.20	0.017	0.20				2087846
22'33'44'55'6-NonaCB-(206)	ng	<0.20	0.033	0.20				2087846
22'33'44'566'-NonaCB-(207)	ng	<0.20	0.031	0.20				2087846
22'33'455'66'-NonaCB-(208)	ng	<0.20	0.034	0.20				2087846
DecaCB-(209)	ng	<0.20 (1)	0.025	0.20				2087846
Monochlorobiphenyl	ng	14.3	0.039	N/A				2087846
Dichlorobiphenyl	ng	4.75	0.042	N/A				2087846
Trichlorobiphenyl	ng	6.28	0.019	N/A				2087846
Tetrachlorobiphenyl	ng	33.3	0.021	N/A				2087846
Pentachlorobiphenyl	ng	79.5	0.033	N/A				2087846
Hexachlorobiphenyl	ng	29.2	0.041	N/A				2087846
Heptachlorobiphenyl	ng	2.82	0.032	N/A				2087846
Octachlorobiphenyl	ng	0.190	0.037	N/A				2087846
Nonachlorobiphenyl	ng	<N/A	0.034	N/A				2087846
Decachlorobiphenyl	ng	<N/A	0.016	N/A				2087846
TOTAL TOXIC EQUIVALENCY	ng					0.00217		
Surrogate Recovery (%)								
2-Methylnaphthalene-2H10	%	74						2087844
Benz(a)anthracene-2H12	%	63						2087844
Benzo(b)fluoranthene-2H12	%	125						2087844

EDL = Estimated Detection Limit

QC Batch = Quality Control Batch

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

( 1 ) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.

Maxxam Job #: B023014  
Report Date: 2010/03/10

Eagle Mountain  
Client Project #: 902630  
Project name: MET COUNCIL- SENECA

# RESULTS OF ANALYSES OF IMPINGER SOLUTION

Maxxam ID		FE4803						
Sampling Date		2010/02/16				TOXIC EQUIVALENCY	# of	
	Units	TEST 2-SENECA 1-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

Benzo(g,h,i)perylene-2H12	%	60						2087844
Benzo(k)fluoranthene-2H12	%	101						2087844
Chrysene-2H12	%	70						2087844
Dibenzo(a,h)anthracene-2H14	%	66						2087844
Fluoranthene-2H10	%	87						2087844
Fluorene-2H10	%	83						2087844
Indeno(1,2,3-c,d)pyrene-2H12	%	78						2087844
Naphthalene-2H8	%	75						2087844
Phenanthrene-2H10	%	89						2087844
Terphenyl-2H14	%	104						2087844
C13-2,2',3,5',6-PentaCB(95) (FS)	%	95						2087846
C13-2,44'-TriCB-(28)	%	75						2087846
C13-2,4'5'-TriCB-(31) (FS)	%	64						2087846
C13-22'33'44'55'6-NonaCB-(206)	%	123						2087846
C13-22'33'44'5-HeptaCB-(170)	%	109						2087846
C13-22'33'455'66'-NonaCB-(208)	%	118						2087846
C13-22'33'55'66'-OctaCB-(202)	%	128						2087846
C13-22'33'55'6-HeptaCB-(178)	%	148 (1)						2087846
C13-22'344'55'-HeptaCB-(180)	%	110						2087846
C13-22'34'566'-HeptaCB-(188)	%	127						2087846
C13-22'44'55'HexaCB-(153) (FS)	%	99						2087846
C13-22'44'66'-HexaCB-(155)	%	135						2087846
C13-22'466'-PentaCB-(104)	%	109						2087846
C13-22'66'-TetraCB-(54)	%	109						2087846
C13-22'6-TriCB-(19)	%	91						2087846
C13-22'-DiCB-(4)	%	82						2087846
C13-233'44'55'6-OctaCB-(205)	%	102						2087846
C13-233'44'55'-HeptaCB-(189)	%	95						2087846

EDL = Estimated Detection Limit  
QC Batch = Quality Control Batch  
TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,  
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.  
WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds  
( 1 ) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

Maxxam Job #: B023014  
Report Date: 2010/03/10

Eagle Mountain  
Client Project #: 902630  
Project name: MET COUNCIL- SENECA

### RESULTS OF ANALYSES OF IMPINGER SOLUTION

Maxxam ID		FE4803						
Sampling Date		2010/02/16				TOXIC EQUIVALENCY	# of	
	Units	TEST 2-SENECA 1-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

C13-233'44'-PentaCB-(105)	%	74						2087846
C13-233'55'-PentaCB-(111)	%	111						2087846
C13-23'44'55'-HexaCB-(167)	%	88						2087846
C13-2344'5'-PentaCB-(114)	%	73						2087846
C13-23'44'5'-PentaCB-(118)	%	73						2087846
C13-2'344'5'-PentaCB-(123)	%	73						2087846
C13-2-MonoCB-(1)	%	50						2087846
C13-33'44'55'-HexaCB-(169)	%	80						2087846
C13-33'44'5'-PentaCB-(126)	%	77						2087846
C13-33'44'-TetraCB-(77)	%	85						2087846
C13-344'5'-TetraCB-(81)	%	84						2087846
C13-344'-TriCB-(37)	%	74						2087846
C13-44'-DiCB-(15)	%	76						2087846
C13-4-MonoCB-(3)	%	61						2087846
C13-DecaCB-(209)	%	147 (1)						2087846
C13-HexaCB-(156)+(157)	%	88						2087846

EDL = Estimated Detection Limit  
QC Batch = Quality Control Batch  
TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,  
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.  
WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds  
( 1 ) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

Maxxam Job #: B023014  
Report Date: 2010/03/10

Eagle Mountain  
Client Project #: 902630  
Project name: MET COUNCIL- SENECA

## RESULTS OF ANALYSES OF IMPINGER SOLUTION

Maxxam ID		FE4804						
Sampling Date		2010/02/17			TOXIC EQUIVALENCY		# of	
	Units	TEST 3-SENECA 1-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

<b>Polyaromatic Hydrocarbons</b>								
Naphthalene	ng	5960 (1)	15	22				2087844
2-Methylnaphthalene	ng	200	1.2	3.1				2087844
2-Chloronaphthalene	ng	154	0.072	0.15				2087844
Acenaphthylene	ng	3.09	0.85	0.32				2087844
Acenaphthene	ng	13.6	2.1	0.40				2087844
Fluorene	ng	20.4	3.9	0.49				2087844
Phenanthrene	ng	124	4.0	0.67				2087844
Anthracene	ng	9.68	0.77	0.31				2087844
Fluoranthene	ng	71.6	0.69	0.65				2087844
Pyrene	ng	42.8	0.58	0.52				2087844
Benzo(a)anthracene	ng	10.0	0.25	0.17				2087844
Chrysene	ng	27.4	0.25	0.33				2087844
Benzo(b)fluoranthene	ng	5.36	0.29	0.59				2087844
Benzo(k)fluoranthene	ng	1.72	0.42	0.35				2087844
Benzo(e)pyrene	ng	3.03	0.35	0.43				2087844
Benzo(a)pyrene	ng	<0.31	0.45	0.31				2087844
Perylene	ng	<0.26	0.39	0.26				2087844
Indeno(1,2,3-cd)pyrene	ng	<0.30	1.3	0.30				2087844
Dibenz(a,h)anthracene	ng	<0.46	1.0	0.46				2087844
Benzo(g,h,i)perylene	ng	6.40	1.5	0.23				2087844
<b>PCBs</b>								
2-MonoCB-(1)	ng	5.12	0.15	0.20				2087846
3-MonoCB-(2)	ng	9.70	0.16	0.20				2087846
4-MonoCB-(3)	ng	6.55	0.15	0.20				2087846
22'-DiCB-(4)	ng	0.45	0.063	0.20				2087846
2,3-DiCB-(5)	ng	<0.20 (2)	0.11	0.20				2087846

RDL = Reportable Detection Limit

EDL = Estimated Detection Limit

QC Batch = Quality Control Batch

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

( 1 ) PAH analysis - Exceeds Maximum Calibration Limit

( 2 ) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.

Maxxam Job #: B023014  
Report Date: 2010/03/10

Eagle Mountain  
Client Project #: 902630  
Project name: MET COUNCIL- SENECA

### RESULTS OF ANALYSES OF IMPINGER SOLUTION

Maxxam ID		FE4804						
Sampling Date		2010/02/17			TOXIC EQUIVALENCY		# of	
	Units	TEST 3-SENECA 1-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
2,3'-DiCB-(6)	ng	0.38	0.053	0.20				2087846
2,4'-DiCB-(7)	ng	<0.20 (1)	0.34	0.20				2087846
2,4'-DiCB-(8)	ng	0.63	0.050	0.20				2087846
2,5'-DiCB-(9)	ng	0.26	0.053	0.20				2087846
2,6'-DiCB-(10)	ng	<0.20	0.052	0.20				2087846
3,3'-DiCB-(11)	ng	1.65	0.054	0.20				2087846
DiCB-(12)+(13)	ng	1.43	0.055	0.40				2087846
3,5'-DiCB-(14)	ng	0.30	0.052	0.20				2087846
4,4'-DiCB-(15)	ng	0.28	0.060	0.20				2087846
22'3'-TriCB-(16)	ng	0.59	0.031	0.20				2087846
22'4'-TriCB-(17)	ng	0.59	0.026	0.20				2087846
TriCB-(18)+(30)	ng	1.17	0.022	0.40				2087846
22'6'-TriCB-(19)	ng	<0.20	0.025	0.20				2087846
TriCB-(20) + (28)	ng	1.36	0.015	0.40				2087846
TriCB-(21)+(33)	ng	0.79	0.015	0.40				2087846
234'-TriCB-(22)	ng	0.49	0.016	0.20				2087846
235'-TriCB-(23)	ng	<0.20	0.016	0.20				2087846
236'-TriCB-(24)	ng	<0.20	0.020	0.20				2087846
23'4'-TriCB-(25)	ng	<0.20	0.013	0.20				2087846
TriCB-(26)+(29)	ng	<0.40	0.015	0.40				2087846
23'6'-TriCB-(27)	ng	<0.20	0.018	0.20				2087846
24'5'-TriCB-(31)	ng	1.42	0.014	0.20				2087846
24'6'-TriCB-(32)	ng	0.37	0.018	0.20				2087846
23'5'-TriCB-(34)	ng	<0.20	0.014	0.20				2087846
33'4'-TriCB-(35)	ng	<0.20	0.015	0.20				2087846
33'5'-TriCB-(36)	ng	<0.20	0.013	0.20				2087846
344'-TriCB-(37)	ng	0.22	0.016	0.20				2087846
345'-TriCB-(38)	ng	<0.20	0.015	0.20				2087846
34'5'-TriCB-(39)	ng	<0.20	0.015	0.20				2087846
EDL = Estimated Detection Limit QC Batch = Quality Control Batch TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient, The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested. WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds ( 1 ) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.								

Maxxam Job #: B023014  
Report Date: 2010/03/10

Eagle Mountain  
Client Project #: 902630  
Project name: MET COUNCIL- SENECA

# RESULTS OF ANALYSES OF IMPINGER SOLUTION

Maxxam ID		FE4804						
Sampling Date		2010/02/17			TOXIC EQUIVALENCY		# of	
	Units	TEST 3-SENECA 1-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

TetraCB-(40)+(41)+(71)	ng	0.89	0.017	0.60				2087846
22'34'-TetraCB-(42)	ng	0.45	0.019	0.20				2087846
22'35'-TetraCB-(43)	ng	<0.20	0.023	0.20				2087846
TetraCB-(44)+(47)+(65)	ng	5.23	0.016	0.60				2087846
TetraCB-(45)+(51)	ng	<0.40 (1)	0.31	0.40				2087846
22'36'-TetraCB-(46)	ng	<0.20 (1)	0.091	0.20				2087846
22'45'-TetraCB-(48)	ng	0.39	0.017	0.20				2087846
TetraCB-(49)+TetraCB-(69)	ng	2.91	0.015	0.40				2087846
TetraCB-(50)+(53)	ng	0.42	0.017	0.40				2087846
22'55'-TetraCB-(52)	ng	16.2	0.017	0.20				2087846
22'66'-TetraCB-(54)	ng	<0.20	0.015	0.20				2087846
233'4'-TetraCB-(55)	ng	<0.20	0.020	0.20				2087846
233'4'-Tetra CB(56)	ng	0.59	0.020	0.20				2087846
233'5'-TetraCB-(57)	ng	<0.20	0.019	0.20				2087846
233'5'-TetraCB-(58)	ng	<0.20	0.019	0.20				2087846
TetraCB-(59)+(62)+(75)	ng	<0.60	0.013	0.60				2087846
2344'-TetraCB -(60)	ng	0.29	0.019	0.20				2087846
TetraCB-(61)+(70)+(74)+(76)	ng	7.94	0.018	0.80				2087846
234'5'-TetraCB-(63)	ng	<0.20	0.017	0.20				2087846
234'6'-TetraCB-(64)	ng	1.40	0.013	0.20				2087846
23'44'-TetraCB-(66)	ng	1.73	0.018	0.20				2087846
23'45'-TetraCB-(67)	ng	<0.20	0.017	0.20				2087846
23'45'-TetraCB-(68)	ng	<0.20	0.017	0.20				2087846
23'55'-TetraCB-(72)	ng	<0.20	0.018	0.20				2087846
23'5'6'-TetraCB-(73)	ng	<0.20	0.012	0.20				2087846
33'44'-TetraCB-(77)	ng	<0.20	0.017	0.20	0.000100	0.00000170		2087846
33'45'-TetraCB-(78)	ng	<0.20	0.019	0.20				2087846
33'45'-TetraCB(79)	ng	<0.20	0.016	0.20				2087846
33'55'-TetraCB-(80)	ng	<0.20	0.017	0.20				2087846

EDL = Estimated Detection Limit  
QC Batch = Quality Control Batch  
TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,  
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.  
WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds  
( 1 ) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.

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Eagle Mountain  
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### RESULTS OF ANALYSES OF IMPINGER SOLUTION

Maxxam ID		FE4804						
Sampling Date		2010/02/17			TOXIC EQUIVALENCY		# of	
	Units	TEST 3-SENECA 1-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

344'5-TetraCB-(81)	ng	<0.20	0.017	0.20	0.000300	0.00000510		2087846
22'33'4-PentaCB-(82)	ng	1.07	0.033	0.20				2087846
PentaCB-(83)+(99)	ng	7.09	0.030	0.40				2087846
22'33'6-PentaCB-(84)	ng	5.28	0.034	0.20				2087846
PentaCB-(85)+(116)+(117)	ng	1.43	0.024	0.60				2087846
PentaCB-(86)(87)(97)(109)(119)(125)	ng	10.0	0.026	1.2				2087846
PentaCB-(88)+(91)	ng	2.26	0.029	0.40				2087846
22'346'-PentaCB-(89)	ng	<0.20	0.031	0.20				2087846
PentaCB-(90)+(101)+(113)	ng	17.6	0.026	0.60				2087846
22'355'-PentaCB-(92)	ng	3.22	0.030	0.20				2087846
PentaCB-(93)+(98)+(100)+(102)	ng	<0.80	0.030	0.80				2087846
22'356'-PentaCB-(94)	ng	<0.20	0.032	0.20				2087846
22'35'6-PentaCB-(95)	ng	17.1	0.028	0.20				2087846
22'366'-PentaCB-(96)	ng	<0.20 (1)	0.092	0.20				2087846
22'45'6-PentaCB-(103)	ng	<0.20	0.027	0.20				2087846
22'466'-PentaCB-(104)	ng	<0.20	0.010	0.20				2087846
233'44'-PentaCB-(105)	ng	1.81	0.014	0.20	0.0000300	0.0000543		2087846
233'45-PentaCB-(106)	ng	<0.20	0.014	0.20				2087846
233'4'5-PentaCB-(107)	ng	0.45	0.014	0.20				2087846
PentaCB-(108)+(124)	ng	<0.40	0.014	0.40				2087846
PentaCB-(110)+(115)	ng	15.2	0.024	0.40				2087846
233'55'-PentaCB-(111)	ng	<0.20	0.023	0.20				2087846
233'56-PentaCB-(112)	ng	<0.20	0.023	0.20				2087846
2344'5-PentaCB-(114)	ng	<0.20	0.013	0.20	0.0000300	0.000000390		2087846
23'44'5-PentaCB-(118)	ng	6.70	0.013	0.20	0.0000300	0.000201		2087846
23'455'-PentaCB-(120)	ng	<0.20	0.021	0.20				2087846
23'45'6-PentaCB-(121)	ng	<0.20	0.022	0.20				2087846
233'4'5'-PentaCB-(122)	ng	<0.20	0.015	0.20				2087846
23'44'5'-PentaCB-(123)	ng	<0.20	0.013	0.20	0.0000300	0.000000390		2087846

EDL = Estimated Detection Limit

QC Batch = Quality Control Batch

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

( 1 ) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.



Maxxam Job #: B023014  
Report Date: 2010/03/10

Eagle Mountain  
Client Project #: 902630  
Project name: MET COUNCIL- SENECA

# RESULTS OF ANALYSES OF IMPINGER SOLUTION

Maxxam ID		FE4804						
Sampling Date		2010/02/17			TOXIC EQUIVALENCY		# of	
	Units	TEST 3-SENECA 1-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

33'44'5-PentaCB-(126)	ng	<0.20	0.013	0.20	0.100	0.00130		2087846
33'455'-PentaCB-(127)	ng	<0.20	0.014	0.20				2087846
HexaCB-(128)+(166)	ng	0.76	0.023	0.40				2087846
HexaCB-(129)+(138)+(163)	ng	5.75	0.024	0.60				2087846
22'33'45'-HexaCB-(130)	ng	0.44	0.028	0.20				2087846
22'33'46'-HexaCB-(131)	ng	<0.20	0.029	0.20				2087846
22'33'46'-HexaCB-(132)	ng	3.18	0.029	0.20				2087846
22'33'55'-HexaCB-(133)	ng	<0.20	0.026	0.20				2087846
HexaCB-(134)+(143)	ng	0.58	0.031	0.40				2087846
HexaCB-(135)+(151)	ng	2.93	0.012	0.40				2087846
22'33'66'-HexaCB-(136)	ng	1.83	0.0092	0.20				2087846
22'344'5-HexaCB-(137)	ng	<0.20 (1)	0.36	0.20				2087846
HexaCB-(139)+(140)	ng	<0.40	0.025	0.40				2087846
22'3455'-HexaCB-(141)	ng	1.18	0.026	0.20				2087846
22'3456-HexaCB-(142)	ng	<0.20	0.027	0.20				2087846
22'345'6-HexaCB-(144)	ng	0.54	0.012	0.20				2087846
22'3466'-HexaCB-(145)	ng	<0.20	0.0096	0.20				2087846
22'34'55'-HexaCB-(146)	ng	0.86	0.023	0.20				2087846
HexaCB-(147)+(149)	ng	8.25	0.032	0.40				2087846
22'34'56'-HexaCB-(148)	ng	<0.20	0.012	0.20				2087846
22'34'66'-HexaCB-(150)	ng	<0.20	0.0094	0.20				2087846
22'3566'-HexaCB-(152)	ng	<0.20	0.0089	0.20				2087846
HexaCB-(153)+(168)	ng	4.66	0.021	0.40				2087846
22'44'56'-HexaCB-(154)	ng	<0.20	0.011	0.20				2087846
22'44'66'-HexaCB-(155)	ng	<0.20	0.012	0.20				2087846
HexaCB-(156)+(157)	ng	<0.40	0.032	0.40	0.0000300	0.000000960		2087846
233'44'6-HexaCB-(158)	ng	0.66	0.019	0.20				2087846
233'455'-HexaCB-(159)	ng	<0.20	0.036	0.20				2087846
233'456-HexaCB-(160)	ng	<0.20	0.022	0.20				2087846

EDL = Estimated Detection Limit  
QC Batch = Quality Control Batch  
TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,  
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.  
WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds  
( 1 ) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.



Maxxam Job #: B023014  
Report Date: 2010/03/10

Eagle Mountain  
Client Project #: 902630  
Project name: MET COUNCIL- SENECA

# RESULTS OF ANALYSES OF IMPINGER SOLUTION

Maxxam ID		FE4804						
Sampling Date		2010/02/17			TOXIC EQUIVALENCY		# of	
	Units	TEST 3-SENECA 1-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

233'45'6-HexaCB-(161)	ng	<0.20	0.020	0.20				2087846
233'4'55'-HexaCB-(162)	ng	<0.20	0.037	0.20				2087846
233'4'5'6-HexaCB-(164)	ng	0.41	0.019	0.20				2087846
233'55'6-HexaCB-(165)	ng	<0.20	0.022	0.20				2087846
23'44'55'-HexaCB-(167)	ng	<0.20 (1)	0.13	0.20	0.0000300	0.00000390		2087846
33'44'55'-HexaCB-(169)	ng	<0.20	0.033	0.20	0.0300	0.000990		2087846
22'33'44'5-HeptaCB-(170)	ng	0.27	0.026	0.20				2087846
HeptaCB-(171)+(173)	ng	<0.40	0.032	0.40				2087846
22'33'455'-HeptaCB-(172)	ng	<0.20	0.032	0.20				2087846
22'33'456'-HeptaCB-(174)	ng	0.38	0.031	0.20				2087846
22'33'45'6-HeptaCB-(175)	ng	<0.20	0.012	0.20				2087846
22'33'466'-HeptaCB-(176)	ng	<0.20	0.0097	0.20				2087846
22'33'45'6'-HeptaCB-(177)	ng	<0.20 (1)	0.20	0.20				2087846
22'33'55'6-HeptaCB-(178)	ng	<0.20	0.013	0.20				2087846
22'33'566'-HeptaCB-(179)	ng	0.28	0.0094	0.20				2087846
HeptaCB-(180)+(193)	ng	0.54	0.024	0.40				2087846
22'344'56-HeptaCB-(181)	ng	<0.20	0.031	0.20				2087846
22'344'56'-HeptaCB-(182)	ng	<0.20	0.012	0.20				2087846
22'344'5'6-HeptaCB-(183)	ng	0.28	0.028	0.20				2087846
22'344'66'-HeptaCB-(184)	ng	<0.20	0.0093	0.20				2087846
22'3455'6-HeptaCB-(185)	ng	<0.20	0.033	0.20				2087846
22'34566'-HeptaCB-(186)	ng	<0.20	0.010	0.20				2087846
22'34'55'6-HeptaCB-(187)	ng	0.45	0.012	0.20				2087846
22'34'566'-HeptaCB-(188)	ng	<0.20	0.013	0.20				2087846
233'44'55'-HeptaCB-(189)	ng	<0.20	0.038	0.20	0.0000300	0.00000114		2087846
233'44'56-HeptaCB-(190)	ng	<0.20	0.025	0.20				2087846
233'44'5'6-HeptaCB-(191)	ng	<0.20	0.025	0.20				2087846
233'455'6-HeptaCB-(192)	ng	<0.20	0.027	0.20				2087846
22'33'44'55'-OctaCB-(194)	ng	<0.20	0.035	0.20				2087846

EDL = Estimated Detection Limit  
QC Batch = Quality Control Batch  
TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,  
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.  
WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds  
( 1 ) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.

Maxxam Job #: B023014  
Report Date: 2010/03/10

Eagle Mountain  
Client Project #: 902630  
Project name: MET COUNCIL- SENECA

# RESULTS OF ANALYSES OF IMPINGER SOLUTION

Maxxam ID		FE4804						
Sampling Date		2010/02/17			TOXIC EQUIVALENCY		# of	
	Units	TEST 3-SENECA 1-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

22'33'44'56-OctaCB-(195)	ng	<0.20	0.038	0.20				2087846
22'33'44'56'-OctaCB-(196)	ng	<0.20	0.036	0.20				2087846
22'33'44'66'-OctaCB-(197)	ng	<0.20	0.028	0.20				2087846
OctaCB-(198)+(199)	ng	<0.40	0.036	0.40				2087846
22'33'4566'-OctaCB-(200)	ng	<0.20	0.026	0.20				2087846
22'33'45'66'-OctaCB-(201)	ng	<0.20	0.027	0.20				2087846
22'33'55'66'-OctaCB-(202)	ng	<0.20 (1)	0.033	0.20				2087846
22'344'55'6-OctaCB-(203)	ng	<0.20	0.034	0.20				2087846
22'344'566'-OctaCB-(204)	ng	<0.20	0.027	0.20				2087846
233'44'55'6-OctaCB-(205)	ng	<0.20	0.024	0.20				2087846
22'33'44'55'6-NonaCB-(206)	ng	<0.20	0.031	0.20				2087846
22'33'44'566'-NonaCB-(207)	ng	<0.20	0.029	0.20				2087846
22'33'455'66'-NonaCB-(208)	ng	<0.20	0.033	0.20				2087846
DecaCB-(209)	ng	<0.20	0.018	0.20				2087846
Monochlorobiphenyl	ng	21.4	0.16	N/A				2087846
Dichlorobiphenyl	ng	5.39	0.063	N/A				2087846
Trichlorobiphenyl	ng	7.73	0.031	N/A				2087846
Tetrachlorobiphenyl	ng	39.0	0.023	N/A				2087846
Pentachlorobiphenyl	ng	90.7	0.034	N/A				2087846
Hexachlorobiphenyl	ng	33.1	0.037	N/A				2087846
Heptachlorobiphenyl	ng	2.79	0.038	N/A				2087846
Octachlorobiphenyl	ng	0.158	0.038	N/A				2087846
Nonachlorobiphenyl	ng	<N/A	0.033	N/A				2087846
Decachlorobiphenyl	ng	0.021	0.018	N/A				2087846
TOTAL TOXIC EQUIVALENCY	ng					0.00256		
Surrogate Recovery (%)								
2-Methylnaphthalene-2H10	%	70						2087844
Benz(a)anthracene-2H12	%	70						2087844
Benzo(b)fluoranthene-2H12	%	106						2087844

EDL = Estimated Detection Limit  
QC Batch = Quality Control Batch  
TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,  
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.  
WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds  
( 1 ) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.

Maxxam Job #: B023014  
Report Date: 2010/03/10

Eagle Mountain  
Client Project #: 902630  
Project name: MET COUNCIL- SENECA

# RESULTS OF ANALYSES OF IMPINGER SOLUTION

Maxxam ID		FE4804						
Sampling Date		2010/02/17				TOXIC EQUIVALENCY	# of	
	Units	TEST 3-SENECA 1-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

Benzo(g,h,i)perylene-2H12	%	69						2087844
Benzo(k)fluoranthene-2H12	%	83						2087844
Chrysene-2H12	%	75						2087844
Dibenzo(a,h)anthracene-2H14	%	99						2087844
Fluoranthene-2H10	%	81						2087844
Fluorene-2H10	%	77						2087844
Indeno(1,2,3-c,d)pyrene-2H12	%	103						2087844
Naphthalene-2H8	%	70						2087844
Phenanthrene-2H10	%	83						2087844
Terphenyl-2H14	%	99						2087844
C13-2,2',3,5',6-PentaCB(95) (FS)	%	89						2087846
C13-2,44'-TriCB-(28)	%	63						2087846
C13-2,4'5-TriCB-(31) (FS)	%	57						2087846
C13-22'33'44'55'6-NonaCB-(206)	%	126						2087846
C13-22'33'44'5-HeptaCB-(170)	%	108						2087846
C13-22'33'455'66'-NonaCB-(208)	%	118						2087846
C13-22'33'55'66'-OctaCB-(202)	%	128						2087846
C13-22'33'55'6-HeptaCB-(178)	%	143 (1)						2087846
C13-22'344'55'-HeptaCB-(180)	%	108						2087846
C13-22'34'566'-HeptaCB-(188)	%	119						2087846
C13-22'44'55'HexaCB-(153) (FS)	%	99						2087846
C13-22'44'66'-HexaCB-(155)	%	127						2087846
C13-22'466'-PentaCB-(104)	%	103						2087846
C13-22'66'-TetraCB-(54)	%	96						2087846
C13-22'6-TriCB-(19)	%	75						2087846
C13-22'-DiCB-(4)	%	48						2087846
C13-233'44'55'6-OctaCB-(205)	%	104						2087846
C13-233'44'55'-HeptaCB-(189)	%	95						2087846

EDL = Estimated Detection Limit  
QC Batch = Quality Control Batch  
TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,  
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.  
WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds  
( 1 ) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

Maxxam Job #: B023014  
Report Date: 2010/03/10

Eagle Mountain  
Client Project #: 902630  
Project name: MET COUNCIL- SENECA

## RESULTS OF ANALYSES OF IMPINGER SOLUTION

Maxxam ID		FE4804						
Sampling Date		2010/02/17				TOXIC EQUIVALENCY	# of	
	Units	TEST 3-SENECA 1-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

C13-233'44'-PentaCB-(105)	%	74						2087846
C13-233'55'-PentaCB-(111)	%	107						2087846
C13-23'44'55'-HexaCB-(167)	%	86						2087846
C13-2344'5'-PentaCB-(114)	%	71						2087846
C13-23'44'5'-PentaCB-(118)	%	73						2087846
C13-2'344'5'-PentaCB-(123)	%	74						2087846
C13-2-MonoCB-(1)	%	9.0 (1)						2087846
C13-33'44'55'-HexaCB-(169)	%	79						2087846
C13-33'44'5'-PentaCB-(126)	%	74						2087846
C13-33'44'-TetraCB-(77)	%	82						2087846
C13-344'5'-TetraCB-(81)	%	83						2087846
C13-344'-TriCB-(37)	%	70						2087846
C13-44'-DiCB-(15)	%	68						2087846
C13-4-MonoCB-(3)	%	28						2087846
C13-DecaCB-(209)	%	149 (1)						2087846
C13-HexaCB-(156)+(157)	%	88						2087846

EDL = Estimated Detection Limit  
QC Batch = Quality Control Batch  
TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,  
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.  
WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds  
( 1 ) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

Maxxam Job #: B023014  
Report Date: 2010/03/10

Eagle Mountain  
Client Project #: 902630  
Project name: MET COUNCIL- SENECA

### DIOXINS AND FURANS BY HRMS (IMPINGER SOLUTION)

Maxxam ID		FE4801						
Sampling Date		2010/02/17			TOXIC EQUIVALENCY		# of	
	Units	REAGENT BLANK-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

<b>Dioxins &amp; Furans</b>								
2,3,7,8-Tetra CDD *	pg	<40 (1)	2.5	40	1.00	2.50		2089890
1,2,3,7,8-Penta CDD	pg	<40	2.2	40	1.00	2.20		2089890
1,2,3,4,7,8-Hexa CDD	pg	<40	2.2	40	0.100	0.220		2089890
1,2,3,6,7,8-Hexa CDD	pg	<40	2.1	40	0.100	0.210		2089890
1,2,3,7,8,9-Hexa CDD	pg	<40 (1)	3.2	40	0.100	0.320		2089890
1,2,3,4,6,7,8-Hepta CDD	pg	<40	2.3	40	0.0100	0.0230		2089890
1,2,3,4,6,7,8,9-Octa CDD	pg	<400	4.1	400	0.000300	0.00123		2089890
Total Tetra CDD	pg	<40 (1)	2.5	40				2089890
Total Penta CDD	pg	<40	2.2	40				2089890
Total Hexa CDD	pg	<40	2.1	40				2089890
Total Hepta CDD	pg	<40 (1)	4.6	40				2089890
2,3,7,8-Tetra CDF **	pg	<40 (1)	4.7	40	0.100	0.470		2089890
1,2,3,7,8-Penta CDF	pg	<40	2.3	40	0.0300	0.0690		2089890
2,3,4,7,8-Penta CDF	pg	<40	2.1	40	0.300	0.630		2089890
1,2,3,4,7,8-Hexa CDF	pg	<40	2.3	40	0.100	0.230		2089890
1,2,3,6,7,8-Hexa CDF	pg	<40	2.0	40	0.100	0.200		2089890
2,3,4,6,7,8-Hexa CDF	pg	<40	2.6	40	0.100	0.260		2089890
1,2,3,7,8,9-Hexa CDF	pg	<40	2.5	40	0.100	0.250		2089890
1,2,3,4,6,7,8-Hepta CDF	pg	<40 (1)	4.6	40	0.0100	0.0460		2089890
1,2,3,4,7,8,9-Hepta CDF	pg	<40 (1)	5.2	40	0.0100	0.0520		2089890
1,2,3,4,6,7,8,9-Octa CDF	pg	<400	4.4	400	0.000300	0.00132		2089890
Total Tetra CDF	pg	<40 (1)	4.7	40				2089890
Total Penta CDF	pg	<40	2.2	40				2089890
Total Hexa CDF	pg	<40	2.3	40				2089890
Total Hepta CDF	pg	<40 (1)	4.6	40				2089890
Toxic Equivalency	pg	<N/A	4.7	N/A				2089890
<b>TCDF Confirmation</b>								
TOTAL TOXIC EQUIVALENCY	pg					7.21		

RDL = Reportable Detection Limit  
EDL = Estimated Detection Limit  
QC Batch = Quality Control Batch  
\* CDD = Chloro Dibenzo-p-Dioxin, \*\* CDF = Chloro Dibenzo-p-Furan  
TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,  
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.  
WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds  
(1) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.

Maxxam Job #: B023014  
Report Date: 2010/03/10

Eagle Mountain  
Client Project #: 902630  
Project name: MET COUNCIL- SENECA

### DIOXINS AND FURANS BY HRMS (IMPINGER SOLUTION)

Maxxam ID		FE4801						
Sampling Date		2010/02/17			TOXIC EQUIVALENCY		# of	
	Units	REAGENT BLANK-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

<b>Surrogate Recovery (%)</b>								
C13-1234678 HeptaCDD *	%	98						2089890
C13-1234678 HeptaCDF **	%	103						2089890
C13-123478 HexaCDD	%	99						2089890
C13-123478 HexaCDF	%	100						2089890
C13-1234789 HeptaCDF	%	103						2089890
C13-123678 HexaCDD	%	104						2089890
C13-123678 HexaCDF	%	97						2089890
C13-12378 PentaCDD	%	83						2089890
C13-12378 PentaCDF	%	83						2089890
C13-123789 HexaCDF	%	102						2089890
C13-23478 PentaCDF	%	115						2089890
C13-2378 TetraCDD	%	59						2089890
C13-2378 TetraCDF	%	58						2089890
C13-Octachlorodibenzo-p-Dioxin	%	107						2089890
Cl37-2378 TetraCDD	%	111						2089890

EDL = Estimated Detection Limit

QC Batch = Quality Control Batch

\* CDD = Chloro Dibenzo-p-Dioxin, \*\* CDF = Chloro Dibenzo-p-Furan

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

Maxxam Job #: B023014  
Report Date: 2010/03/10

Eagle Mountain  
Client Project #: 902630  
Project name: MET COUNCIL- SENECA

### DIOXINS AND FURANS BY HRMS (IMPINGER SOLUTION)

Maxxam ID		FE4802						
Sampling Date		2010/02/16			TOXIC EQUIVALENCY		# of	
	Units	TEST 1-SENECA 1-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

<b>Dioxins &amp; Furans</b>								
2,3,7,8-Tetra CDD *	pg	<40 (1)	26	40	1.00	26.0		2089890
1,2,3,7,8-Penta CDD	pg	<40 (1)	3.2	40	1.00	3.20		2089890
1,2,3,4,7,8-Hexa CDD	pg	<40	2.2	40	0.100	0.220		2089890
1,2,3,6,7,8-Hexa CDD	pg	<40	2.1	40	0.100	0.210		2089890
1,2,3,7,8,9-Hexa CDD	pg	<40	2.0	40	0.100	0.200		2089890
1,2,3,4,6,7,8-Hepta CDD	pg	<40	2.1	40	0.0100	0.0210		2089890
1,2,3,4,6,7,8,9-Octa CDD	pg	<400	4.2	400	0.000300	0.00126		2089890
Total Tetra CDD	pg	183	2.5	40				2089890
Total Penta CDD	pg	<40 (1)	3.2	40				2089890
Total Hexa CDD	pg	<40	2.1	40				2089890
Total Hepta CDD	pg	43	2.1	40				2089890
2,3,7,8-Tetra CDF **	pg	165	2.7	40	0.100	16.5		2089890
1,2,3,7,8-Penta CDF	pg	<40	2.5	40	0.0300	0.0750		2089890
2,3,4,7,8-Penta CDF	pg	<40	2.3	40	0.300	0.690		2089890
1,2,3,4,7,8-Hexa CDF	pg	<40	2.1	40	0.100	0.210		2089890
1,2,3,6,7,8-Hexa CDF	pg	<40	1.8	40	0.100	0.180		2089890
2,3,4,6,7,8-Hexa CDF	pg	<40	2.4	40	0.100	0.240		2089890
1,2,3,7,8,9-Hexa CDF	pg	<40	2.3	40	0.100	0.230		2089890
1,2,3,4,6,7,8-Hepta CDF	pg	<40 (1)	25	40	0.0100	0.250		2089890
1,2,3,4,7,8,9-Hepta CDF	pg	<40 (1)	5.4	40	0.0100	0.0540		2089890
1,2,3,4,6,7,8,9-Octa CDF	pg	<400	4.0	400	0.000300	0.00120		2089890
Total Tetra CDF	pg	1870	2.7	40				2089890
Total Penta CDF	pg	<40	2.4	40				2089890
Total Hexa CDF	pg	105	2.1	40				2089890
Total Hepta CDF	pg	<40	2.1	40				2089890
Toxic Equivalency	pg	22.6	2.7	N/A				2089890

RDL = Reportable Detection Limit

EDL = Estimated Detection Limit

QC Batch = Quality Control Batch

\* CDD = Chloro Dibenzo-p-Dioxin, \*\* CDF = Chloro Dibenzo-p-Furan

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

( 1 ) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.



Maxxam Job #: B023014  
Report Date: 2010/03/10

Eagle Mountain  
Client Project #: 902630  
Project name: MET COUNCIL- SENECA

### DIOXINS AND FURANS BY HRMS (IMPINGER SOLUTION)

Maxxam ID		FE4802						
Sampling Date		2010/02/16			TOXIC EQUIVALENCY		# of	
	Units	TEST 1-SENECA 1-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

<b>TCDF Confirmation</b>								
Confirmation 2,3,7,8-Tetra CDF **	pg	81.1	6.5	N/A	0.100	8.11		2093514
TOTAL TOXIC EQUIVALENCY	pg					39.9		
<b>Surrogate Recovery (%)</b>								
Confirmation C13-2378 TetraCDF	%	78						2093514
C13-1234678 HeptaCDD *	%	100						2089890
C13-1234678 HeptaCDF	%	102						2089890
C13-123478 HexaCDD	%	91						2089890
C13-123478 HexaCDF	%	106						2089890
C13-1234789 HeptaCDF	%	105						2089890
C13-123678 HexaCDD	%	109						2089890
C13-123678 HexaCDF	%	91						2089890
C13-12378 PentaCDD	%	118						2089890
C13-12378 PentaCDF	%	98						2089890
C13-123789 HexaCDF	%	99						2089890
C13-23478 PentaCDF	%	129						2089890
C13-2378 TetraCDD	%	67						2089890
C13-2378 TetraCDF	%	72						2089890
C13-Octachlorodibenzo-p-Dioxin	%	107						2089890
Cl37-2378 TetraCDD	%	104						2089890

EDL = Estimated Detection Limit  
QC Batch = Quality Control Batch  
\* CDD = Chloro Dibenzo-p-Dioxin, \*\* CDF = Chloro Dibenzo-p-Furan  
TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,  
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.  
WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds



Maxxam Job #: B023014  
Report Date: 2010/03/10

Eagle Mountain  
Client Project #: 902630  
Project name: MET COUNCIL- SENECA

### DIOXINS AND FURANS BY HRMS (IMPINGER SOLUTION)

Maxxam ID		FE4803						
Sampling Date		2010/02/16			TOXIC EQUIVALENCY		# of	
	Units	TEST 2-SENECA 1-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

<b>Dioxins &amp; Furans</b>								
2,3,7,8-Tetra CDD *	pg	<40 (1)	29	40	1.00	29.0		2089890
1,2,3,7,8-Penta CDD	pg	<40 (1)	2.5	40	1.00	2.50		2089890
1,2,3,4,7,8-Hexa CDD	pg	<40	2.5	40	0.100	0.250		2089890
1,2,3,6,7,8-Hexa CDD	pg	<40	2.4	40	0.100	0.240		2089890
1,2,3,7,8,9-Hexa CDD	pg	<40	2.3	40	0.100	0.230		2089890
1,2,3,4,6,7,8-Hepta CDD	pg	<40	2.6	40	0.0100	0.0260		2089890
1,2,3,4,6,7,8,9-Octa CDD	pg	<400	4.1	400	0.000300	0.00123		2089890
Total Tetra CDD	pg	164	2.9	40				2089890
Total Penta CDD	pg	<40 (1)	7.7	40				2089890
Total Hexa CDD	pg	<40	2.4	40				2089890
Total Hepta CDD	pg	42	2.6	40				2089890
2,3,7,8-Tetra CDF **	pg	206	2.7	40	0.100	20.6		2089890
1,2,3,7,8-Penta CDF	pg	<40	3.2	40	0.0300	0.0960		2089890
2,3,4,7,8-Penta CDF	pg	<40	2.9	40	0.300	0.870		2089890
1,2,3,4,7,8-Hexa CDF	pg	<40	2.4	40	0.100	0.240		2089890
1,2,3,6,7,8-Hexa CDF	pg	<40	2.1	40	0.100	0.210		2089890
2,3,4,6,7,8-Hexa CDF	pg	<40	2.7	40	0.100	0.270		2089890
1,2,3,7,8,9-Hexa CDF	pg	<40	2.7	40	0.100	0.270		2089890
1,2,3,4,6,7,8-Hepta CDF	pg	<40 (1)	30	40	0.0100	0.300		2089890
1,2,3,4,7,8,9-Hepta CDF	pg	<40 (1)	6.0	40	0.0100	0.0600		2089890
1,2,3,4,6,7,8,9-Octa CDF	pg	<400	4.3	400	0.000300	0.00129		2089890
Total Tetra CDF	pg	2420	2.7	40				2089890
Total Penta CDF	pg	<40	3.0	40				2089890
Total Hexa CDF	pg	98	2.5	40				2089890
Total Hepta CDF	pg	<40 (1)	34	40				2089890
Toxic Equivalency	pg	26.2	2.7	N/A				2089890

RDL = Reportable Detection Limit

EDL = Estimated Detection Limit

QC Batch = Quality Control Batch

\* CDD = Chloro Dibenzo-p-Dioxin, \*\* CDF = Chloro Dibenzo-p-Furan

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

( 1 ) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.

Maxxam Job #: B023014  
Report Date: 2010/03/10

Eagle Mountain  
Client Project #: 902630  
Project name: MET COUNCIL- SENECA

### DIOXINS AND FURANS BY HRMS (IMPINGER SOLUTION)

Maxxam ID		FE4803						
Sampling Date		2010/02/16			TOXIC EQUIVALENCY		# of	
	Units	TEST	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
		2-SENECA 1-M23						

<b>TCDF Confirmation</b>								
Confirmation 2,3,7,8-Tetra CDF **	pg	99.0	3.8	N/A	0.100	9.90		2093514
TOTAL TOXIC EQUIVALENCY	pg					44.5		
<b>Surrogate Recovery (%)</b>								
Confirmation C13-2378 TetraCDF	%	73						2093514
C13-1234678 HeptaCDD *	%	88						2089890
C13-1234678 HeptaCDF	%	96						2089890
C13-123478 HexaCDD	%	97						2089890
C13-123478 HexaCDF	%	101						2089890
C13-1234789 HeptaCDF	%	103						2089890
C13-123678 HexaCDD	%	110						2089890
C13-123678 HexaCDF	%	101						2089890
C13-12378 PentaCDD	%	103						2089890
C13-12378 PentaCDF	%	92						2089890
C13-123789 HexaCDF	%	100						2089890
C13-23478 PentaCDF	%	127						2089890
C13-2378 TetraCDD	%	60						2089890
C13-2378 TetraCDF	%	72						2089890
C13-Octachlorodibenzo-p-Dioxin	%	84						2089890
Cl37-2378 TetraCDD	%	108						2089890

EDL = Estimated Detection Limit

QC Batch = Quality Control Batch

\* CDD = Chloro Dibenzo-p-Dioxin, \*\* CDF = Chloro Dibenzo-p-Furan

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

Maxxam Job #: B023014  
Report Date: 2010/03/10

Eagle Mountain  
Client Project #: 902630  
Project name: MET COUNCIL- SENECA

### DIOXINS AND FURANS BY HRMS (IMPINGER SOLUTION)

Maxxam ID		FE4804						
Sampling Date		2010/02/17			TOXIC EQUIVALENCY		# of	
	Units	TEST 3-SENECA 1-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

<b>Dioxins &amp; Furans</b>								
2,3,7,8-Tetra CDD *	pg	<40	2.3	40	1.00	2.30		2089890
1,2,3,7,8-Penta CDD	pg	<40	2.2	40	1.00	2.20		2089890
1,2,3,4,7,8-Hexa CDD	pg	<40	2.8	40	0.100	0.280		2089890
1,2,3,6,7,8-Hexa CDD	pg	<40 (1)	3.2	40	0.100	0.320		2089890
1,2,3,7,8,9-Hexa CDD	pg	<40	2.5	40	0.100	0.250		2089890
1,2,3,4,6,7,8-Hepta CDD	pg	<40	2.0	40	0.0100	0.0200		2089890
1,2,3,4,6,7,8,9-Octa CDD	pg	<400	4.3	400	0.000300	0.00129		2089890
Total Tetra CDD	pg	235	2.3	40				2089890
Total Penta CDD	pg	<40	2.2	40				2089890
Total Hexa CDD	pg	<40	2.7	40				2089890
Total Hepta CDD	pg	<40	2.0	40				2089890
2,3,7,8-Tetra CDF **	pg	144	2.5	40	0.100	14.4		2089890
1,2,3,7,8-Penta CDF	pg	<40	2.8	40	0.0300	0.0840		2089890
2,3,4,7,8-Penta CDF	pg	<40	2.7	40	0.300	0.810		2089890
1,2,3,4,7,8-Hexa CDF	pg	<40	2.0	40	0.100	0.200		2089890
1,2,3,6,7,8-Hexa CDF	pg	<40	1.8	40	0.100	0.180		2089890
2,3,4,6,7,8-Hexa CDF	pg	<40	2.3	40	0.100	0.230		2089890
1,2,3,7,8,9-Hexa CDF	pg	<40	2.2	40	0.100	0.220		2089890
1,2,3,4,6,7,8-Hepta CDF	pg	<40 (1)	18	40	0.0100	0.180		2089890
1,2,3,4,7,8,9-Hepta CDF	pg	<40 (1)	4.2	40	0.0100	0.0420		2089890
1,2,3,4,6,7,8,9-Octa CDF	pg	<400	4.5	400	0.000300	0.00135		2089890
Total Tetra CDF	pg	1760	2.5	40				2089890
Total Penta CDF	pg	<40 (1)	3.9	40				2089890
Total Hexa CDF	pg	96	2.1	40				2089890
Total Hepta CDF	pg	<40 (1)	21	40				2089890
Toxic Equivalency	pg	51.8	2.5	N/A				2089890

RDL = Reportable Detection Limit

EDL = Estimated Detection Limit

QC Batch = Quality Control Batch

\* CDD = Chloro Dibenzo-p-Dioxin, \*\* CDF = Chloro Dibenzo-p-Furan

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

( 1 ) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.

Maxxam Job #: B023014  
Report Date: 2010/03/10

Eagle Mountain  
Client Project #: 902630  
Project name: MET COUNCIL- SENECA

### DIOXINS AND FURANS BY HRMS (IMPINGER SOLUTION)

Maxxam ID		FE4804						
Sampling Date		2010/02/17			TOXIC EQUIVALENCY		# of	
	Units	TEST	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
		3-SENECA						
		1-M23						

<b>TCDF Confirmation</b>								
Confirmation 2,3,7,8-Tetra CDF **	pg	<N/A (1)	71	N/A	0.100	7.10		2093514
TOTAL TOXIC EQUIVALENCY	pg					14.4		
<b>Surrogate Recovery (%)</b>								
Confirmation C13-2378 TetraCDF	%	68						2093514
C13-1234678 HeptaCDD *	%	101						2089890
C13-1234678 HeptaCDF	%	107						2089890
C13-123678 HexaCDD	%	103						2089890
C13-123678 HexaCDF	%	90						2089890
C13-12378 PentaCDD	%	80						2089890
C13-12378 PentaCDF	%	80						2089890
C13-123789 HexaCDF	%	107						2089890
C13-2378 TetraCDD	%	55						2089890
C13-2378 TetraCDF	%	63						2089890
C13-Octachlorodibenzo-p-Dioxin	%	98						2089890

EDL = Estimated Detection Limit  
QC Batch = Quality Control Batch  
\* CDD = Chloro Dibenzo-p-Dioxin, \*\* CDF = Chloro Dibenzo-p-Furan  
TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,  
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.  
WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds  
( 1 ) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.

Maxxam Job #: B023014  
Report Date: 2010/03/10

Eagle Mountain  
Client Project #: 902630  
Project name: MET COUNCIL- SENECA

### Test Summary

Maxxam ID FE4801  
Sample ID REAGENT BLANK-M23  
Matrix Impinger Solution  
Collected 2010/02/17  
Shipped  
Received 2010/02/25

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Dioxins/Furans in Air (Method 23)	HRMS/MS	2089890	2010/02/26	2010/03/03	OBC
PAHs in Air (CARB429)	HRMS/MS	2087844	2010/02/26	2010/03/04	EM
PCBs by HRMS (1668A)	HRMS/MS	2087846	2010/02/26	2010/03/02	BY

Maxxam ID FE4802  
Sample ID TEST 1-SENECA 1-M23  
Matrix Impinger Solution  
Collected 2010/02/16  
Shipped  
Received 2010/02/25

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
2,3,7,8-TCDF Confirmation (M23)	HRMS/MS	2093514	N/A	2010/03/04	AGU
Dioxins/Furans in Air (Method 23)	HRMS/MS	2089890	2010/02/26	2010/03/03	OBC
PAHs in Air (CARB429)	HRMS/MS	2087844	2010/02/26	2010/03/04	EM
PCBs by HRMS (1668A)	HRMS/MS	2087846	2010/02/26	2010/03/02	BY

Maxxam ID FE4803  
Sample ID TEST 2-SENECA 1-M23  
Matrix Impinger Solution  
Collected 2010/02/16  
Shipped  
Received 2010/02/25

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
2,3,7,8-TCDF Confirmation (M23)	HRMS/MS	2093514	N/A	2010/03/04	AGU
Dioxins/Furans in Air (Method 23)	HRMS/MS	2089890	2010/02/26	2010/03/03	OBC
PAHs in Air (CARB429)	HRMS/MS	2087844	2010/02/26	2010/03/04	EM
PCBs by HRMS (1668A)	HRMS/MS	2087846	2010/02/26	2010/03/03	BY

Maxxam ID FE4804  
Sample ID TEST 3-SENECA 1-M23  
Matrix Impinger Solution  
Collected 2010/02/17  
Shipped  
Received 2010/02/25

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
2,3,7,8-TCDF Confirmation (M23)	HRMS/MS	2093514	N/A	2010/03/04	AGU
Dioxins/Furans in Air (Method 23)	HRMS/MS	2089890	2010/02/26	2010/03/03	OBC
PAHs in Air (CARB429)	HRMS/MS	2087844	2010/02/26	2010/03/04	EM
PCBs by HRMS (1668A)	HRMS/MS	2087846	2010/02/26	2010/03/03	BY

Maxxam Job #: B023014  
Report Date: 2010/03/10

Eagle Mountain  
Client Project #: 902630  
Project name: MET COUNCIL- SENECA

#### GENERAL COMMENTS

Alternate laboratory surrogate spiking solution used for Test 2 and Test 3 Seneca due to availability.

Some of the surrogate recoveries are outside of standard recovery ranges due to interferences from the matrix.

**Results relate only to the items tested.**

Eagle Mountain  
Attention: Mark Carlson  
Client Project #: 902630  
P.O. #:  
Project name: MET COUNCIL- SENECA

### Quality Assurance Report

Maxxam Job Number: GB023014

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	%Recovery	Units	QC Limits
2087844 EM	Spiked Blank	2-Methylnaphthalene-2H10	2010/03/04		70	%	50 - 150
		Acenaphthylene-2H8	2010/03/04		72	%	50 - 150
		Benz(a)anthracene-2H12	2010/03/04		91	%	50 - 150
		Benzo(a)pyrene-2H12	2010/03/04		92	%	50 - 150
		Benzo(b)fluoranthene-2H12	2010/03/04		105	%	50 - 150
		Benzo(g,h,i)perylene-2H12	2010/03/04		84	%	50 - 150
		Benzo(k)fluoranthene-2H12	2010/03/04		89	%	50 - 150
		Chrysene-2H12	2010/03/04		88	%	50 - 150
		Dibenzo(a,h)anthracene-2H14	2010/03/04		93	%	50 - 150
		Fluoranthene-2H10	2010/03/04		93	%	50 - 150
		Indeno(1,2,3-c,d)pyrene-2H12	2010/03/04		94	%	50 - 150
		Naphthalene-2H8	2010/03/04		67	%	50 - 150
		Perylene-2H12	2010/03/04		101	%	50 - 150
		Phenanthrene-2H10	2010/03/04		95	%	50 - 150
		Naphthalene	2010/03/04		148 (1)	%	60 - 140
	RPD	Naphthalene	2010/03/04	4.0		%	50
	Spiked Blank	2-Methylnaphthalene	2010/03/04		101	%	60 - 140
	RPD	2-Methylnaphthalene	2010/03/04	6.7		%	50
	Spiked Blank	2-Chloronaphthalene	2010/03/04		111	%	N/A
	RPD	2-Chloronaphthalene	2010/03/04	4.6		%	50
	Spiked Blank	Acenaphthylene	2010/03/04		99	%	60 - 140
	RPD	Acenaphthylene	2010/03/04	2.0		%	50
	Spiked Blank	Acenaphthene	2010/03/04		101	%	60 - 140
	RPD	Acenaphthene	2010/03/04	2.0		%	50
	Spiked Blank	Fluorene	2010/03/04		78	%	60 - 140
	RPD	Fluorene	2010/03/04	5.0		%	50
	Spiked Blank	Phenanthrene	2010/03/04		84	%	60 - 140
	RPD	Phenanthrene	2010/03/04	2.4		%	50
	Spiked Blank	Anthracene	2010/03/04		82	%	60 - 140
	RPD	Anthracene	2010/03/04	3.6		%	50
	Spiked Blank	Fluoranthene	2010/03/04		91	%	60 - 140
	RPD	Fluoranthene	2010/03/04	1.1		%	50
	Spiked Blank	Pyrene	2010/03/04		82	%	60 - 140
	RPD	Pyrene	2010/03/04	1.2		%	50
	Spiked Blank	Benzo(a)anthracene	2010/03/04		79	%	60 - 140
	RPD	Benzo(a)anthracene	2010/03/04	11.9		%	50
	Spiked Blank	Chrysene	2010/03/04		91	%	60 - 140
	RPD	Chrysene	2010/03/04	0		%	50
	Spiked Blank	Benzo(b)fluoranthene	2010/03/04		84	%	60 - 140
	RPD	Benzo(b)fluoranthene	2010/03/04	3.5		%	50
	Spiked Blank	Benzo(k)fluoranthene	2010/03/04		90	%	60 - 140
	RPD	Benzo(k)fluoranthene	2010/03/04	4.5		%	50
	Spiked Blank	Benzo(e)pyrene	2010/03/04		100	%	60 - 140
	RPD	Benzo(e)pyrene	2010/03/04	7.7		%	50
	Spiked Blank	Benzo(a)pyrene	2010/03/04		108	%	60 - 140
	RPD	Benzo(a)pyrene	2010/03/04	4.7		%	50
	Spiked Blank	Perylene	2010/03/04		87	%	60 - 140
	RPD	Perylene	2010/03/04	1.1		%	50
	Spiked Blank	Indeno(1,2,3-cd)pyrene	2010/03/04		90	%	60 - 140
	RPD	Indeno(1,2,3-cd)pyrene	2010/03/04	11.8		%	50
	Spiked Blank	Dibenz(a,h)anthracene	2010/03/04		80	%	60 - 140
	RPD	Dibenz(a,h)anthracene	2010/03/04	16.1		%	50
	Spiked Blank	Benzo(g,h,i)perylene	2010/03/04		91	%	60 - 140
	RPD	Benzo(g,h,i)perylene	2010/03/04	2.2		%	50
	Method Blank	2-Methylnaphthalene-2H10	2010/03/04		92	%	50 - 150



Eagle Mountain  
Attention: Mark Carlson  
Client Project #: 902630  
P.O. #:  
Project name: MET COUNCIL- SENECA

## Quality Assurance Report (Continued)

Maxxam Job Number: GB023014

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	%Recovery	Units	QC Limits
2087844 EM	Method Blank	Acenaphthylene-2H8	2010/03/04		87	%	50 - 150
		Benz(a)anthracene-2H12	2010/03/04		97	%	50 - 150
		Benzo(a)pyrene-2H12	2010/03/04		88	%	50 - 150
		Benzo(b)fluoranthene-2H12	2010/03/04		112	%	50 - 150
		Benzo(g,h,i)perylene-2H12	2010/03/04		51	%	50 - 150
		Benzo(k)fluoranthene-2H12	2010/03/04		95	%	50 - 150
		Chrysene-2H12	2010/03/04		92	%	50 - 150
		Dibenzo(a,h)anthracene-2H14	2010/03/04		51	%	50 - 150
		Fluoranthene-2H10	2010/03/04		101	%	50 - 150
		Indeno(1,2,3-c,d)pyrene-2H12	2010/03/04		64	%	50 - 150
		Naphthalene-2H8	2010/03/04		92	%	50 - 150
		Perylene-2H12	2010/03/04		90	%	50 - 150
		Phenanthrene-2H10	2010/03/04		115	%	50 - 150
		Naphthalene	2010/03/04	92, EDL=0.38		ng	
		2-Methylnaphthalene	2010/03/04	5.0, EDL=0.24		ng	
		2-Chloronaphthalene	2010/03/04	ND, EDL=0.064		ng	
		Acenaphthylene	2010/03/04	0.46, EDL=0.12		ng	
		Acenaphthene	2010/03/04	ND, EDL=0.16		ng	
		Fluorene	2010/03/04	ND, EDL=0.25		ng	
		Phenanthrene	2010/03/04	1.85, EDL=0.20		ng	
		Anthracene	2010/03/04	0.63, EDL=0.24		ng	
		Fluoranthene	2010/03/04	2.14, EDL=0.12		ng	
		Pyrene	2010/03/04	3.30, EDL=0.10		ng	
		Benzo(a)anthracene	2010/03/04	0.31, EDL=0.10		ng	
		Chrysene	2010/03/04	0.61, EDL=0.12		ng	
		Benzo(b)fluoranthene	2010/03/04	1.00, EDL=0.18		ng	
		Benzo(k)fluoranthene	2010/03/04	0.63, EDL=0.24		ng	
		Benzo(e)pyrene	2010/03/04	3.30, EDL=0.34		ng	
		Benzo(a)pyrene	2010/03/04	ND, EDL=1.4		ng	
		Perylene	2010/03/04	ND, EDL=0.86		ng	
		Indeno(1,2,3-cd)pyrene	2010/03/04	2.66, EDL=1.7		ng	
		Dibenz(a,h)anthracene	2010/03/04	1.77, EDL=1.2		ng	
		Benzo(g,h,i)perylene	2010/03/04	8.20, EDL=1.6		ng	
2087846 BY	Spiked Blank	C13-2,44'-TriCB-(28)	2010/03/02		62	%	40 - 125
		C13-22'33'44'55'6'-NonaCB-(206)	2010/03/02		118	%	30 - 140
		C13-22'33'44'5'-HeptaCB-(170)	2010/03/02		103	%	30 - 140
		C13-22'33'455'66'-NonaCB-(208)	2010/03/02		113	%	30 - 140
		C13-22'33'55'66'-OctaCB-(202)	2010/03/02		117	%	30 - 140
		C13-22'33'55'6'-HeptaCB-(178)	2010/03/02		143 (1)	%	40 - 125
		C13-22'344'55'-HeptaCB-(180)	2010/03/02		106	%	30 - 140
		C13-22'34'566'-HeptaCB-(188)	2010/03/02		113	%	30 - 140
		C13-22'44'66'-HexaCB-(155)	2010/03/02		114	%	30 - 140
		C13-22'466'-PentaCB-(104)	2010/03/02		92	%	30 - 140
		C13-22'66'-TetraCB-(54)	2010/03/02		81	%	30 - 140
		C13-22'6'-TriCB-(19)	2010/03/02		73	%	30 - 140
		C13-22'-DiCB-(4)	2010/03/02		72	%	30 - 140
		C13-233'44'55'6'-OctaCB-(205)	2010/03/02		102	%	30 - 140
		C13-233'44'55'-HeptaCB-(189)	2010/03/02		96	%	30 - 140
		C13-233'44'-PentaCB-(105)	2010/03/02		83	%	30 - 140
		C13-233'55'-PentaCB-(111)	2010/03/02		108	%	40 - 125
		C13-23'44'55'-HexaCB-(167)	2010/03/02		92	%	30 - 140
		C13-2344'5'-PentaCB-(114)	2010/03/02		79	%	30 - 140
		C13-23'44'5'-PentaCB-(118)	2010/03/02		80	%	30 - 140
		C13-2'344'5'-PentaCB-(123)	2010/03/02		79	%	30 - 140
		C13-2-MonoCB-(1)	2010/03/02		54	%	15 - 140



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QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	%Recovery	Units	QC Limits
2087846 BY	Spiked Blank	C13-33'44'55'-HexaCB-(169)	2010/03/02		92	%	30 - 140
		C13-33'44'5'-PentaCB-(126)	2010/03/02		86	%	30 - 140
		C13-33'44'-TetraCB-(77)	2010/03/02		78	%	30 - 140
		C13-344'5'-TetraCB-(81)	2010/03/02		77	%	30 - 140
		C13-344'-TriCB-(37)	2010/03/02		63	%	30 - 140
		C13-44'-DiCB-(15)	2010/03/02		59	%	30 - 140
		C13-4-MonoCB-(3)	2010/03/02		56	%	15 - 140
		C13-DecaCB-(209)	2010/03/02		136	%	30 - 140
		C13-HexaCB-(156)+(157)	2010/03/02		91	%	30 - 140
	RPD	2-MonoCB-(1)	2010/03/02		99	%	50 - 150
		2-MonoCB-(1)	2010/03/02	0		%	30
	Spiked Blank	4-MonoCB-(3)	2010/03/02		97	%	50 - 150
	RPD	4-MonoCB-(3)	2010/03/02	0		%	30
	Spiked Blank	22'-DiCB-(4)	2010/03/02		102	%	50 - 150
	RPD	22'-DiCB-(4)	2010/03/02	1.9		%	30
	Spiked Blank	4,4'-DiCB-(15)	2010/03/02		109	%	50 - 150
	RPD	4,4'-DiCB-(15)	2010/03/02	1.9		%	30
	Spiked Blank	22'6'-TriCB-(19)	2010/03/02		98	%	50 - 150
	RPD	22'6'-TriCB-(19)	2010/03/02	3.0		%	30
	Spiked Blank	235-TriCB-(23)	2010/03/02		104	%	50 - 150
	RPD	235-TriCB-(23)	2010/03/02	1		%	30
	Spiked Blank	23'5'-TriCB-(34)	2010/03/02		98	%	50 - 150
	RPD	23'5'-TriCB-(34)	2010/03/02	4.0		%	30
	Spiked Blank	344'-TriCB-(37)	2010/03/02		108	%	50 - 150
	RPD	344'-TriCB-(37)	2010/03/02	0.9		%	30
	Spiked Blank	22'66'-TetraCB-(54)	2010/03/02		103	%	50 - 150
	RPD	22'66'-TetraCB-(54)	2010/03/02	3.8		%	30
	Spiked Blank	33'44'-TetraCB-(77)	2010/03/02		110	%	50 - 150
	RPD	33'44'-TetraCB-(77)	2010/03/02	1.8		%	30
	Spiked Blank	344'5'-TetraCB-(81)	2010/03/02		109	%	50 - 150
	RPD	344'5'-TetraCB-(81)	2010/03/02	0.9		%	30
	Spiked Blank	22'466'-PentaCB-(104)	2010/03/02		101	%	50 - 150
	RPD	22'466'-PentaCB-(104)	2010/03/02	0		%	30
	Spiked Blank	233'44'-PentaCB-(105)	2010/03/02		107	%	50 - 150
	RPD	233'44'-PentaCB-(105)	2010/03/02	0.9		%	30
	Spiked Blank	2344'5'-PentaCB-(114)	2010/03/02		106	%	50 - 150
	RPD	2344'5'-PentaCB-(114)	2010/03/02	2.8		%	30
	Spiked Blank	23'44'5'-PentaCB-(118)	2010/03/02		104	%	50 - 150
	RPD	23'44'5'-PentaCB-(118)	2010/03/02	4.7		%	30
	Spiked Blank	23'44'5'-PentaCB-(123)	2010/03/02		108	%	50 - 150
	RPD	23'44'5'-PentaCB-(123)	2010/03/02	1.9		%	30
	Spiked Blank	33'44'5'-PentaCB-(126)	2010/03/02		107	%	50 - 150
	RPD	33'44'5'-PentaCB-(126)	2010/03/02	1.9		%	30
	Spiked Blank	22'44'66'-HexaCB-(155)	2010/03/02		103	%	50 - 150
	RPD	22'44'66'-HexaCB-(155)	2010/03/02	1		%	30
	Spiked Blank	HexaCB-(156)+(157)	2010/03/02		107	%	50 - 150
	RPD	HexaCB-(156)+(157)	2010/03/02	0		%	30
	Spiked Blank	23'44'55'-HexaCB-(167)	2010/03/02		107	%	50 - 150
	RPD	23'44'55'-HexaCB-(167)	2010/03/02	2.8		%	30
	Spiked Blank	33'44'55'-HexaCB-(169)	2010/03/02		105	%	50 - 150
	RPD	33'44'55'-HexaCB-(169)	2010/03/02	1.9		%	30
	Spiked Blank	22'33'44'5'-HeptaCB-(170)	2010/03/02		103	%	50 - 150
	RPD	22'33'44'5'-HeptaCB-(170)	2010/03/02	1		%	30
	Spiked Blank	HeptaCB-(180)+(193)	2010/03/02		94	%	50 - 150
	RPD	HeptaCB-(180)+(193)	2010/03/02	3.1		%	30

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QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	%Recovery	Units	QC Limits
2087846 BY	Spiked Blank	22'344'56'-HeptaCB-(182)	2010/03/02		108	%	50 - 150
	RPD	22'344'56'-HeptaCB-(182)	2010/03/02	0.9		%	30
	Spiked Blank	22'34'55'6'-HeptaCB-(187)	2010/03/02		110	%	50 - 150
	RPD	22'34'55'6'-HeptaCB-(187)	2010/03/02	1.8		%	30
	Spiked Blank	22'34'566'-HeptaCB-(188)	2010/03/02		104	%	50 - 150
	RPD	22'34'566'-HeptaCB-(188)	2010/03/02	1		%	30
	Spiked Blank	233'44'55'-HeptaCB-(189)	2010/03/02		107	%	50 - 150
	RPD	233'44'55'-HeptaCB-(189)	2010/03/02	1.9		%	30
	Spiked Blank	22'33'55'66'-OctaCB-(202)	2010/03/02		102	%	50 - 150
	RPD	22'33'55'66'-OctaCB-(202)	2010/03/02	2.9		%	30
	Spiked Blank	233'44'55'6'-OctaCB-(205)	2010/03/02		107	%	50 - 150
	RPD	233'44'55'6'-OctaCB-(205)	2010/03/02	1.9		%	30
	Spiked Blank	22'33'44'55'6'-NonaCB-(206)	2010/03/02		101	%	50 - 150
	RPD	22'33'44'55'6'-NonaCB-(206)	2010/03/02	1		%	30
	Spiked Blank	22'33'455'66'-NonaCB-(208)	2010/03/02		104	%	50 - 150
	RPD	22'33'455'66'-NonaCB-(208)	2010/03/02	1		%	30
	Spiked Blank	DecaCB-(209)	2010/03/02		104	%	50 - 150
	RPD	DecaCB-(209)	2010/03/02	1		%	30
	Method Blank	C13-2,44'-TriCB-(28)	2010/03/02		68	%	40 - 125
		C13-22'33'44'55'6'-NonaCB-(206)	2010/03/02		122	%	30 - 140
		C13-22'33'44'5'-HeptaCB-(170)	2010/03/02		107	%	30 - 140
		C13-22'33'455'66'-NonaCB-(208)	2010/03/02		121	%	30 - 140
		C13-22'33'55'66'-OctaCB-(202)	2010/03/02		128	%	30 - 140
		C13-22'33'55'6'-HeptaCB-(178)	2010/03/02		133 (1)	%	40 - 125
		C13-22'344'55'-HeptaCB-(180)	2010/03/02		108	%	30 - 140
		C13-22'34'566'-HeptaCB-(188)	2010/03/02		120	%	30 - 140
		C13-22'44'66'-HexaCB-(155)	2010/03/02		128	%	30 - 140
		C13-22'466'-PentaCB-(104)	2010/03/02		105	%	30 - 140
		C13-22'66'-TetraCB-(54)	2010/03/02		92	%	30 - 140
		C13-22'6'-TriCB-(19)	2010/03/02		90	%	30 - 140
		C13-22'-DiCB-(4)	2010/03/02		93	%	30 - 140
		C13-233'44'55'6'-OctaCB-(205)	2010/03/02		101	%	30 - 140
		C13-233'44'55'-HeptaCB-(189)	2010/03/02		98	%	30 - 140
		C13-233'44'-PentaCB-(105)	2010/03/02		84	%	30 - 140
		C13-233'55'-PentaCB-(111)	2010/03/02		107	%	40 - 125
		C13-23'44'55'-HexaCB-(167)	2010/03/02		89	%	30 - 140
		C13-2344'5'-PentaCB-(114)	2010/03/02		80	%	30 - 140
		C13-23'44'5'-PentaCB-(118)	2010/03/02		82	%	30 - 140
		C13-2'344'5'-PentaCB-(123)	2010/03/02		82	%	30 - 140
		C13-2-MonoCB-(1)	2010/03/02		74	%	15 - 140
		C13-33'44'55'-HexaCB-(169)	2010/03/02		86	%	30 - 140
		C13-33'44'5'-PentaCB-(126)	2010/03/02		82	%	30 - 140
		C13-33'44'-TetraCB-(77)	2010/03/02		77	%	30 - 140
		C13-344'5'-TetraCB-(81)	2010/03/02		76	%	30 - 140
		C13-344'-TriCB-(37)	2010/03/02		68	%	30 - 140
		C13-44'-DiCB-(15)	2010/03/02		74	%	30 - 140
		C13-4-MonoCB-(3)	2010/03/02		73	%	15 - 140
		C13-DecaCB-(209)	2010/03/02		143 (1)	%	30 - 140
		C13-HexaCB-(156)+(157)	2010/03/02		89	%	30 - 140
		2-MonoCB-(1)	2010/03/02	ND, EDL=0.0062		ng	
		3-MonoCB-(2)	2010/03/02	ND, EDL=0.0069		ng	
		4-MonoCB-(3)	2010/03/02	ND, EDL=0.0062		ng	
		22'-DiCB-(4)	2010/03/02	ND, EDL=0.036		ng	
		2,3-DiCB-(5)	2010/03/02	ND, EDL=0.078		ng	
		2,3'-DiCB-(6)	2010/03/02	ND, EDL=0.073		ng	

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2087846 BY	Method Blank	2,4-DiCB-(7)	2010/03/02	ND, EDL=0.073		ng	
		2,4'-DiCB-(8)	2010/03/02	ND, EDL=0.070		ng	
		2,5-DiCB-(9)	2010/03/02	ND, EDL=0.073		ng	
		2,6-DiCB-(10)	2010/03/02	ND, EDL=0.029		ng	
		3,3'-DiCB-(11)	2010/03/02	ND, EDL=0.074		ng	
		DiCB-(12)+(13)	2010/03/02	ND, EDL=0.076		ng	
		3,5-DiCB-(14)	2010/03/02	ND, EDL=0.073		ng	
		4,4'-DiCB-(15)	2010/03/02	ND, EDL=0.085		ng	
		22'3-TriCB-(16)	2010/03/02	ND, EDL=0.024		ng	
		22'4-TriCB-(17)	2010/03/02	ND, EDL=0.019		ng	
		TriCB-(18)+(30)	2010/03/02	ND, EDL=0.016		ng	
		22'6-TriCB-(19)	2010/03/02	ND, EDL=0.019		ng	
		TriCB-(20) + (28)	2010/03/02	ND, EDL=0.0085		ng	
		TriCB-(21)+(33)	2010/03/02	ND, EDL=0.0082		ng	
		234'-TriCB-(22)	2010/03/02	ND, EDL=0.0089		ng	
		235-TriCB-(23)	2010/03/02	ND, EDL=0.0089		ng	
		236-TriCB-(24)	2010/03/02	ND, EDL=0.015		ng	
		23'4-TriCB-(25)	2010/03/02	ND, EDL=0.0077		ng	
		TriCB-(26)+(29)	2010/03/02	ND, EDL=0.0082		ng	
		23'6-TriCB-(27)	2010/03/02	ND, EDL=0.014		ng	
		24'5-TriCB-(31)	2010/03/02	ND, EDL=0.0080		ng	
		24'6-TriCB-(32)	2010/03/02	ND, EDL=0.013		ng	
		23'5'-TriCB-(34)	2010/03/02	ND, EDL=0.0084		ng	
		33'4-TriCB-(35)	2010/03/02	ND, EDL=0.0085		ng	
		33'5-TriCB-(36)	2010/03/02	ND, EDL=0.0073		ng	
		344'-TriCB-(37)	2010/03/02	ND, EDL=0.0091		ng	
		345-TriCB-(38)	2010/03/02	ND, EDL=0.0085		ng	
		34'5-TriCB-(39)	2010/03/02	ND, EDL=0.0083		ng	
		TetraCB-(40)+(41)+(71)	2010/03/02	ND, EDL=0.018		ng	
		22'34'-TetraCB-(42)	2010/03/02	ND, EDL=0.019		ng	
		22'35-TetraCB-(43)	2010/03/02	ND, EDL=0.022		ng	
		TetraCB-(44)+(47)+(65)	2010/03/02	ND, EDL=0.016		ng	
		TetraCB-(45)+(51)	2010/03/02	ND, EDL=0.018		ng	
		22'36'-TetraCB-(46)	2010/03/02	ND, EDL=0.020		ng	
		22'45-TetraCB-(48)	2010/03/02	ND, EDL=0.017		ng	
		TetraCB-(49)+TetraCB-(69)	2010/03/02	ND, EDL=0.015		ng	
		TetraCB-(50)+(53)	2010/03/02	ND, EDL=0.017		ng	
		22'55'-TetraCB-(52)	2010/03/02	ND, EDL=0.022		ng	
		22'66'-TetraCB-(54)	2010/03/02	ND, EDL=0.0086		ng	
		233'4-TetraCB-(55)	2010/03/02	ND, EDL=0.0058		ng	
		233'4'-Tetra CB(56)	2010/03/02	ND, EDL=0.0058		ng	
		233'5-TetraCB-(57)	2010/03/02	ND, EDL=0.0056		ng	
		233'5'-TetraCB-(58)	2010/03/02	ND, EDL=0.0055		ng	
		TetraCB-(59)+(62)+(75)	2010/03/02	ND, EDL=0.014		ng	
		2344'-TetraCB -(60)	2010/03/02	ND, EDL=0.0059		ng	
		TetraCB-(61)+(70)+(74)+(76)	2010/03/02	ND, EDL=0.0056		ng	
		234'5-TetraCB-(63)	2010/03/02	ND, EDL=0.0053		ng	
		234'6-TetraCB-(64)	2010/03/02	ND, EDL=0.013		ng	
		23'44'-TetraCB-(66)	2010/03/02	ND, EDL=0.0054		ng	
		23'45-TetraCB-(67)	2010/03/02	ND, EDL=0.0052		ng	
		23'45'-TetraCB-(68)	2010/03/02	ND, EDL=0.0051		ng	
		23'55'-TetraCB-(72)	2010/03/02	ND, EDL=0.0052		ng	
		23'5'6-TetraCB-(73)	2010/03/02	ND, EDL=0.014		ng	
		33'44'-TetraCB-(77)	2010/03/02	ND, EDL=0.0055		ng	
		33'45-TetraCB-(78)	2010/03/02	ND, EDL=0.0057		ng	

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2087846 BY	Method Blank	33'45'-TetraCB-(79)	2010/03/02	ND, EDL=0.0049		ng	
		33'55'-TetraCB-(80)	2010/03/02	ND, EDL=0.0050		ng	
		344'5'-TetraCB-(81)	2010/03/02	ND, EDL=0.0055		ng	
		22'33'4'-PentaCB-(82)	2010/03/02	ND, EDL=0.0099		ng	
		PentaCB-(83)+(99)	2010/03/02	ND, EDL=0.0092		ng	
		22'33'6'-PentaCB-(84)	2010/03/02	ND, EDL=0.010		ng	
		PentaCB-(85)+(116)+(117)	2010/03/02	ND, EDL=0.0074		ng	
		PentaCB-(86)(87)(97)(109)(119)(125)	2010/03/02	ND, EDL=0.0079		ng	
		PentaCB-(88)+(91)	2010/03/02	ND, EDL=0.0090		ng	
		22'346'-PentaCB-(89)	2010/03/02	ND, EDL=0.0093		ng	
		PentaCB-(90)+(101)+(113)	2010/03/02	ND, EDL=0.0079		ng	
		22'355'-PentaCB-(92)	2010/03/02	ND, EDL=0.0088		ng	
		PentaCB-(93)+(98)+(100)+(102)	2010/03/02	ND, EDL=0.0089		ng	
		22'356'-PentaCB-(94)	2010/03/02	ND, EDL=0.0097		ng	
		22'35'6'-PentaCB-(95)	2010/03/02	ND, EDL=0.0084		ng	
		22'366'-PentaCB-(96)	2010/03/02	ND, EDL=0.0038		ng	
		22'45'6'-PentaCB-(103)	2010/03/02	ND, EDL=0.0079		ng	
		22'466'-PentaCB-(104)	2010/03/02	ND, EDL=0.0045		ng	
		233'44'-PentaCB-(105)	2010/03/02	ND, EDL=0.0089		ng	
		233'45'-PentaCB-(106)	2010/03/02	ND, EDL=0.0091		ng	
		233'4'5'-PentaCB-(107)	2010/03/02	ND, EDL=0.0092		ng	
		PentaCB-(108)+(124)	2010/03/02	ND, EDL=0.0095		ng	
		PentaCB-(110)+(115)	2010/03/02	ND, EDL=0.021		ng	
		233'55'-PentaCB-(111)	2010/03/02	ND, EDL=0.0068		ng	
		233'56'-PentaCB-(112)	2010/03/02	ND, EDL=0.0067		ng	
		2344'5'-PentaCB-(114)	2010/03/02	ND, EDL=0.0087		ng	
		23'44'5'-PentaCB-(118)	2010/03/02	ND, EDL=0.0086		ng	
		23'455'-PentaCB-(120)	2010/03/02	ND, EDL=0.0065		ng	
		23'45'6'-PentaCB-(121)	2010/03/02	ND, EDL=0.0068		ng	
		233'4'5'-PentaCB-(122)	2010/03/02	ND, EDL=0.010		ng	
		23'44'5'-PentaCB-(123)	2010/03/02	ND, EDL=0.0089		ng	
		33'44'5'-PentaCB-(126)	2010/03/02	ND, EDL=0.0086		ng	
		33'455'-PentaCB-(127)	2010/03/02	ND, EDL=0.0093		ng	
		HexaCB-(128)+(166)	2010/03/02	ND, EDL=0.013		ng	
		HexaCB-(129)+(138)+(163)	2010/03/02	ND, EDL=0.065		ng	
		22'33'45'-HexaCB-(130)	2010/03/02	ND, EDL=0.016		ng	
		22'33'46'-HexaCB-(131)	2010/03/02	ND, EDL=0.015		ng	
		22'33'46'-HexaCB-(132)	2010/03/02	ND, EDL=0.012		ng	
		22'33'55'-HexaCB-(133)	2010/03/02	ND, EDL=0.014		ng	
		HexaCB-(134)+(143)	2010/03/02	ND, EDL=0.016		ng	
		HexaCB-(135)+(151)	2010/03/02	ND, EDL=0.018		ng	
		22'33'66'-HexaCB-(136)	2010/03/02	ND, EDL=0.0069		ng	
		22'344'5'-HexaCB-(137)	2010/03/02	ND, EDL=0.016		ng	
		HexaCB-(139)+(140)	2010/03/02	ND, EDL=0.014		ng	
		22'3455'-HexaCB-(141)	2010/03/02	ND, EDL=0.014		ng	
		22'3456'-HexaCB-(142)	2010/03/02	ND, EDL=0.015		ng	
		22'345'6'-HexaCB-(144)	2010/03/02	ND, EDL=0.0064		ng	
		22'3466'-HexaCB-(145)	2010/03/02	ND, EDL=0.0052		ng	
		22'34'55'-HexaCB-(146)	2010/03/02	ND, EDL=0.013		ng	
		HexaCB-(147)+(149)	2010/03/02	ND, EDL=0.015		ng	
		22'34'56'-HexaCB-(148)	2010/03/02	ND, EDL=0.0064		ng	
		22'34'66'-HexaCB-(150)	2010/03/02	ND, EDL=0.0049		ng	
		22'3566'-HexaCB-(152)	2010/03/02	ND, EDL=0.0047		ng	
		HexaCB-(153)+(168)	2010/03/02	ND, EDL=0.048		ng	
		22'44'56'-HexaCB-(154)	2010/03/02	ND, EDL=0.0057		ng	

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2087846 BY	Method Blank	22'44'66'-HexaCB-(155)	2010/03/02	ND, EDL=0.0063		ng	
		HexaCB-(156)+(157)	2010/03/02	ND, EDL=0.0089		ng	
		233'44'6'-HexaCB-(158)	2010/03/02	ND, EDL=0.010		ng	
		233'455'-HexaCB-(159)	2010/03/02	ND, EDL=0.0054		ng	
		233'456'-HexaCB-(160)	2010/03/02	ND, EDL=0.012		ng	
		233'45'6'-HexaCB-(161)	2010/03/02	ND, EDL=0.011		ng	
		233'4'55'-HexaCB-(162)	2010/03/02	ND, EDL=0.0055		ng	
		233'4'5'6'-HexaCB-(164)	2010/03/02	ND, EDL=0.010		ng	
		233'55'6'-HexaCB-(165)	2010/03/02	ND, EDL=0.012		ng	
		23'44'55'-HexaCB-(167)	2010/03/02	ND, EDL=0.0048		ng	
		33'44'55'-HexaCB-(169)	2010/03/02	ND, EDL=0.0049		ng	
		22'33'44'5'-HeptaCB-(170)	2010/03/02	ND, EDL=0.017		ng	
		HeptaCB-(171)+(173)	2010/03/02	ND, EDL=0.021		ng	
		22'33'455'-HeptaCB-(172)	2010/03/02	ND, EDL=0.022		ng	
		22'33'456'-HeptaCB-(174)	2010/03/02	ND, EDL=0.020		ng	
		22'33'45'6'-HeptaCB-(175)	2010/03/02	ND, EDL=0.0041		ng	
		22'33'466'-HeptaCB-(176)	2010/03/02	ND, EDL=0.0032		ng	
		22'33'45'6'-HeptaCB-(177)	2010/03/02	ND, EDL=0.021		ng	
		22'33'55'6'-HeptaCB-(178)	2010/03/02	ND, EDL=0.0043		ng	
		22'33'566'-HeptaCB-(179)	2010/03/02	ND, EDL=0.0067		ng	
		HeptaCB-(180)+(193)	2010/03/02	ND, EDL=0.023		ng	
		22'344'56'-HeptaCB-(181)	2010/03/02	ND, EDL=0.020		ng	
		22'344'56'-HeptaCB-(182)	2010/03/02	ND, EDL=0.0042		ng	
		22'344'5'6'-HeptaCB-(183)	2010/03/02	ND, EDL=0.018		ng	
		22'344'66'-HeptaCB-(184)	2010/03/02	ND, EDL=0.0031		ng	
		22'3455'6'-HeptaCB-(185)	2010/03/02	ND, EDL=0.021		ng	
		22'34566'-HeptaCB-(186)	2010/03/02	ND, EDL=0.0033		ng	
		22'34'55'6'-HeptaCB-(187)	2010/03/02	ND, EDL=0.012		ng	
		22'34'566'-HeptaCB-(188)	2010/03/02	ND, EDL=0.0043		ng	
		233'44'55'-HeptaCB-(189)	2010/03/02	ND, EDL=0.0073		ng	
		233'44'56'-HeptaCB-(190)	2010/03/02	ND, EDL=0.017		ng	
		233'44'5'6'-HeptaCB-(191)	2010/03/02	ND, EDL=0.016		ng	
		233'455'6'-HeptaCB-(192)	2010/03/02	ND, EDL=0.018		ng	
		22'33'44'55'-OctaCB-(194)	2010/03/02	ND, EDL=0.0067		ng	
		22'33'44'56'-OctaCB-(195)	2010/03/02	ND, EDL=0.0070		ng	
		22'33'44'56'-OctaCB-(196)	2010/03/02	ND, EDL=0.0069		ng	
		22'33'44'66'-OctaCB-(197)	2010/03/02	ND, EDL=0.0054		ng	
		OctaCB-(198)+(199)	2010/03/02	ND, EDL=0.0070		ng	
		22'33'4566'-OctaCB-(200)	2010/03/02	ND, EDL=0.0048		ng	
		22'33'45'66'-OctaCB-(201)	2010/03/02	ND, EDL=0.0051		ng	
		22'33'55'66'-OctaCB-(202)	2010/03/02	ND, EDL=0.0063		ng	
		22'344'55'6'-OctaCB-(203)	2010/03/02	ND, EDL=0.0066		ng	
		22'344'566'-OctaCB-(204)	2010/03/02	ND, EDL=0.0051		ng	
		233'44'55'6'-OctaCB-(205)	2010/03/02	ND, EDL=0.0046		ng	
		22'33'44'55'6'-NonaCB-(206)	2010/03/02	ND, EDL=0.0083		ng	
		22'33'44'566'-NonaCB-(207)	2010/03/02	ND, EDL=0.0078		ng	
		22'33'455'66'-NonaCB-(208)	2010/03/02	ND, EDL=0.0087		ng	
		DecaCB-(209)	2010/03/02	ND, EDL=0.0045		ng	
		Monochlorobiphenyl	2010/03/02	ND, EDL=0.0069		ng	
		Dichlorobiphenyl	2010/03/02	ND, EDL=0.085		ng	
		Trichlorobiphenyl	2010/03/02	ND, EDL=0.024		ng	
		Tetrachlorobiphenyl	2010/03/02	0.026, EDL=0.022		ng	
		Pentachlorobiphenyl	2010/03/02	0.120, EDL=0.010		ng	
		Hexachlorobiphenyl	2010/03/02	0.040, EDL=0.016		ng	
		Heptachlorobiphenyl	2010/03/02	ND, EDL=0.022		ng	



Eagle Mountain  
Attention: Mark Carlson  
Client Project #: 902630  
P.O. #:  
Project name: MET COUNCIL- SENECA

## Quality Assurance Report (Continued)

Maxxam Job Number: GB023014

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	%Recovery	Units	QC Limits
2087846 BY	Method Blank	Octachlorobiphenyl	2010/03/02	ND, EDL=0.0070		ng	
		Nonachlorobiphenyl	2010/03/02	ND, EDL=0.0087		ng	
		Decachlorobiphenyl	2010/03/02	ND, EDL=0.0045		ng	
2089890 OBC	Spiked Blank	C13-1234678 HeptaCDD	2010/03/02		105	%	25 - 130
		C13-1234678 HeptaCDF	2010/03/02		106	%	25 - 130
		C13-123678 HexaCDD	2010/03/02		97	%	40 - 130
		C13-123678 HexaCDF	2010/03/02		84	%	40 - 130
		C13-12378 PentaCDD	2010/03/02		85	%	40 - 130
		C13-12378 PentaCDF	2010/03/02		92	%	40 - 130
		C13-123789 HexaCDF	2010/03/02		95	%	40 - 130
		C13-2378 TetraCDD	2010/03/02		49	%	40 - 130
		C13-2378 TetraCDF	2010/03/02		54	%	40 - 130
		C13-Octachlorodibenzo-p-Dioxin	2010/03/02		116	%	25 - 130
		2,3,7,8-Tetra CDD	2010/03/02		106	%	80 - 140
		RPD	2010/03/02	NC		%	20
		Spiked Blank	2010/03/02		114	%	80 - 140
		RPD	2010/03/02	NC		%	20
		Spiked Blank	2010/03/02		94	%	80 - 140
		RPD	2010/03/02	NC		%	20
		Spiked Blank	2010/03/02		97	%	80 - 140
		RPD	2010/03/02	NC		%	20
		Spiked Blank	2010/03/02		99	%	80 - 140
		RPD	2010/03/02	NC		%	20
		Spiked Blank	2010/03/02		89	%	80 - 140
		RPD	2010/03/02	NC		%	20
		Spiked Blank	2010/03/02		100	%	80 - 140
		RPD	2010/03/02	NC		%	20
		Spiked Blank	2010/03/02		117	%	80 - 140
		RPD	2010/03/02	NC		%	20
		Spiked Blank	2010/03/02		114	%	80 - 140
		RPD	2010/03/02	NC		%	20
		Spiked Blank	2010/03/02		112	%	80 - 140
		RPD	2010/03/02	NC		%	20
		Spiked Blank	2010/03/02		106	%	80 - 140
		RPD	2010/03/02	NC		%	20
		Spiked Blank	2010/03/02		110	%	80 - 140
		RPD	2010/03/02	NC		%	20
		Spiked Blank	2010/03/02		125	%	80 - 140
		RPD	2010/03/02	NC		%	20
		Spiked Blank	2010/03/02		121	%	80 - 140
		RPD	2010/03/02	NC		%	20
		Spiked Blank	2010/03/02		95	%	80 - 140
		RPD	2010/03/02	NC		%	20
		Spiked Blank	2010/03/02		99	%	80 - 140
		RPD	2010/03/02	NC		%	20
		Spiked Blank	2010/03/02		110	%	80 - 140
		RPD	2010/03/02	NC		%	20
		Method Blank	2010/03/02		116	%	25 - 130
		C13-1234678 HeptaCDF	2010/03/02		110	%	25 - 130
		C13-123678 HexaCDD	2010/03/02		101	%	40 - 130
		C13-123678 HexaCDF	2010/03/02		92	%	40 - 130
		C13-12378 PentaCDD	2010/03/02		92	%	40 - 130
		C13-12378 PentaCDF	2010/03/02		97	%	40 - 130
		C13-123789 HexaCDF	2010/03/02		98	%	40 - 130
		C13-2378 TetraCDD	2010/03/02		68	%	40 - 130

Eagle Mountain  
Attention: Mark Carlson  
Client Project #: 902630  
P.O. #:  
Project name: MET COUNCIL- SENECA

## Quality Assurance Report (Continued)

Maxxam Job Number: GB023014

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	%Recovery	Units	QC Limits
2089890 OBC	Method Blank	C13-2378 TetraCDF	2010/03/02		79	%	40 - 130
		C13-Octachlorodibenzo-p-Dioxin	2010/03/02		111	%	25 - 130
		2,3,7,8-Tetra CDD	2010/03/02	ND, EDL=2.3		pg	
		1,2,3,7,8-Penta CDD	2010/03/02	ND, EDL=2.4		pg	
		1,2,3,4,7,8-Hexa CDD	2010/03/02	ND, EDL=2.2		pg	
		1,2,3,6,7,8-Hexa CDD	2010/03/02	ND, EDL=2.0		pg	
		1,2,3,7,8,9-Hexa CDD	2010/03/02	ND, EDL=1.9		pg	
		1,2,3,4,6,7,8-Hepta CDD	2010/03/02	ND, EDL=2.2		pg	
		1,2,3,4,6,7,8,9-Octa CDD	2010/03/02	ND, EDL=4.2		pg	
		Total Tetra CDD	2010/03/02	ND, EDL=2.3		pg	
		Total Penta CDD	2010/03/02	ND, EDL=2.4		pg	
		Total Hexa CDD	2010/03/02	ND, EDL=2.0		pg	
		Total Hepta CDD	2010/03/02	ND, EDL=2.2		pg	
		2,3,7,8-Tetra CDF	2010/03/02	ND, EDL=2.2		pg	
		1,2,3,7,8-Penta CDF	2010/03/02	ND, EDL=5.6 (2)		pg	
		2,3,4,7,8-Penta CDF	2010/03/02	ND, EDL=2.1		pg	
		1,2,3,4,7,8-Hexa CDF	2010/03/02	ND, EDL=2.3		pg	
		1,2,3,6,7,8-Hexa CDF	2010/03/02	ND, EDL=2.0		pg	
		2,3,4,6,7,8-Hexa CDF	2010/03/02	ND, EDL=2.6		pg	
		1,2,3,7,8,9-Hexa CDF	2010/03/02	ND, EDL=2.5		pg	
		1,2,3,4,6,7,8-Hepta CDF	2010/03/02	ND, EDL=10 (2)		pg	
		1,2,3,4,7,8,9-Hepta CDF	2010/03/02	ND, EDL=2.3		pg	
		1,2,3,4,6,7,8,9-Octa CDF	2010/03/02	ND, EDL=4.1		pg	
		Total Tetra CDF	2010/03/02	ND, EDL=2.2		pg	
		Total Penta CDF	2010/03/02	ND, EDL=2.1		pg	
		Total Hexa CDF	2010/03/02	53, EDL=2.3		pg	
		Total Hepta CDF	2010/03/02	ND, EDL=2.1		pg	
		Toxic Equivalency	2010/03/02	22.8, EDL=2.2		pg	
2093514 AGU	Method Blank	Confirmation C13-2378 TetraCDF	2010/03/04		81	%	40 - 135
		Confirmation 2,3,7,8-Tetra CDF	2010/03/04	4.7, EDL=3.4		pg	

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Spiked Blank: A blank matrix to which a known amount of the analyte has been added. Used to evaluate analyte recovery.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (RPD): The RPD was not calculated. The level of analyte detected in the parent sample and its duplicate was not sufficiently significant to permit a reliable calculation.

( 1 ) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

( 2 ) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.

# CHAIN OF CUSTODY DOCUMENT

Page: 1 of 1

Client: Met Council

Test Date: February 16-17, 2010

Project #: 902630

Location: Seneca Plant

SAMPLED BY:	RECOVERED BY:		DATE	TIME
Brian Durkop	Mark Carlson		2-16-10	17-16
RELINQUISHED BY:	RECEIVED BY:	FOR	DATE	TIME
Mark Carlson				
RELINQUISHED BY:	RECEIVED BY:	FOR	DATE	TIME
	M. J. Smith	Maxxam	10/2/25	12:10

## ANALYSIS REQUESTED

SAMPLE ID	SAMPLE DESCRIPTION	TEST NO.	DATE/TIME SAMPLED	PCDD/PCDF	PCB's	PAH's							SAMPLE COND.
1	Filter	1	2-16-10	X	X	X							Seneca 1
2	Trap	1	2-16-10	X	X	X							Seneca 1
3	Acetone, Meth Chloride	1	2-16-10	X	X	X							Seneca 1
4	Toluene	1	2-16-10	X	X	X							Seneca 1
5	Filter	2	2-16-10	X	X	X							Seneca 1
6	Trap	2	2-16-10	X	X	X							Seneca 1
7	Acetone, Meth Chloride	2	2-16-10	X	X	X							Seneca 1
8	Toluene	2	2-16-10	X	X	X							Seneca 1
9	Filter	3	2-17-10	X	X	X							Seneca 1
10	Trap	3	2-17-10	X	X	X							Seneca 1
11	Acetone, Meth Chloride	3	2-17-10	X	X	X							Seneca 1
12	Toluene	3	2-17-10	X	X	X							Seneca 1
13	Filter	Reagent	2-17-10	X	X	X							Reagent
14	Trap	Reagent	2-17-10	X	X	X							Reagent
15	Acetone, Meth Chloride	Reagent	2-17-10	X	X	X							Reagent
16	Toluene	Reagent	2-17-10	X	X	X							Reagent

COMMENTS:



## SAMPLE RECEIPT LOG

Lab Name: <u>Maxxam Analytics Inc., Mississauga Laboratory</u>	
Received by (Name): <u>M. Ficht</u>	
Received by (Signature): <u>[Signature]</u> Date: <u>10/02/25</u> Time: <u>12:10</u>	
Client Name: <u>Eagle Mountain</u>	
Number of Package: <u>Number of Boxes: 11 or Coolers: 3</u>	
Waybill #: <u>Driver pickup</u>	
<b>REMARKS:</b>	
<b>Sample Reception Documentation</b>	<b>Condition of Sample(s) Shipment - Comments</b>
Samples Packed in Coolers? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	
Cooler Contains ice? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	
Custody seal(s) on cooler? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A <input type="checkbox"/>	
Chain of Custody (CoC) present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	
Cooler Temperature measured? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	
Containers intact? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	
Correct containers used? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	
CoC agrees with samples? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	
Samples rec'd after hold time? Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	
Project Mgr contacted via SIF? Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	
<b>Project Manager Documentation</b>	
Client contacted if discrepancies in shipment are observed Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	
Client acceptance of deficiencies (if observed at sample receipt) Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	
<b>Cooler temperatures upon receipt</b>	
Cooler ID: <u>C1</u> Temp <u>15°C 15°C 15°C</u>	
Cooler ID: <u>C2</u> Temp <u>4°C 4°C 4°C</u>	
Cooler ID: <u>C3</u> Temp <u>15°C 15°C 15°C</u>	

Unpacked & package checked By: [Signature]Package checked By: [Signature]Relinquished by: [Signature]Date: 10/02/25Date: [Signature]Date: [Signature]

Your Project #: 902630  
 Site: MET COUNCIL-SENECA  
 Your C.O.C. #: n/a

**Attention: Mark Carlson**

Eagle Mountain  
 8905 Autumn Oaks Dr.  
 Rockford, MN  
 USA 55373

**Report Date: 2010/03/04**

**CERTIFICATE OF ANALYSIS**

**MAXXAM JOB #: B022930**

**Received: 2010/02/25, 12:10**

Sample Matrix: SAMPLING TRAIN

# Samples Received: 4

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
Hydrogen Halides in H <sub>2</sub> SO <sub>4</sub> Imp. @	4	2010/03/01	2010/03/01	BRL SOP-00108	EPA Method 26A
Volume of Sulfuric Acid Impinger	4	N/A	2010/03/01		

(1) This test was performed in Maxxam Mississauga under Maxxam Burlington SCC Accreditation

**Encryption Key**

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

CLAYTON JOHNSON, Project Manager  
 Email: Clayton.Johnson@maxxamanalytics.com  
 Phone# (905) 817-5769

=====

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. SCC and CALA have approved this reporting process and electronic report format.

Total cover pages: 1

Maxxam Job #: B022930  
Report Date: 2010/03/04

Eagle Mountain  
Client Project #: 902630  
Project name: MET COUNCIL-SENECA

### RESULTS OF ANALYSES OF SAMPLING TRAIN

Maxxam ID		FE4447	FE4448	FE4450	FE4454		
Sampling Date		2010/02/17	2010/02/17	2010/02/17	2010/02/17		
COC Number			n/a	n/a	n/a		
	<b>Units</b>	<b>4-BLANK</b>	<b>1-HCL-TEST 1</b>	<b>2-HCL-TEST 2</b>	<b>3-HCL-TEST 3</b>	<b>RDL</b>	<b>QC Batch</b>

Volume	ml	280	340	330	320	1	2089930
<b>Miscellaneous Parameters</b>							
Hydrochloric Acid	ug	<200	300	300	310	200	2089938
Hydrofluoric Acid	ug	<200	<200	<200	<200	200	2089938

N/A = Not Applicable  
RDL = Reportable Detection Limit  
QC Batch = Quality Control Batch

Maxxam Job #: B022930  
Report Date: 2010/03/04

Eagle Mountain  
Client Project #: 902630  
Project name: MET COUNCIL-SENECA

### Test Summary

Maxxam ID FE4447  
Sample ID 4-BLANK  
Matrix SAMPLING TRAIN  
Collected 2010/02/17  
Shipped  
Received 2010/02/25

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Hydrogen Halides in H2SO4 Imp.	IC/SPEC	2089938	2010/03/01	2010/03/01	A_S
Volume of Sulfuric Acid Impinger		2089930	N/A	2010/03/01	FMO

Maxxam ID FE4448  
Sample ID 1-HCL-TEST 1  
Matrix SAMPLING TRAIN  
Collected 2010/02/17  
Shipped  
Received 2010/02/25

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Hydrogen Halides in H2SO4 Imp.	IC/SPEC	2089938	2010/03/01	2010/03/01	A_S
Volume of Sulfuric Acid Impinger		2089930	N/A	2010/03/01	FMO

Maxxam ID FE4448 Dup  
Sample ID 1-HCL-TEST 1  
Matrix SAMPLING TRAIN  
Collected 2010/02/17  
Shipped  
Received 2010/02/25

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Hydrogen Halides in H2SO4 Imp.	IC/SPEC	2089938	2010/03/01	2010/03/01	A_S

Maxxam ID FE4450  
Sample ID 2-HCL-TEST 2  
Matrix SAMPLING TRAIN  
Collected 2010/02/17  
Shipped  
Received 2010/02/25

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Hydrogen Halides in H2SO4 Imp.	IC/SPEC	2089938	2010/03/01	2010/03/01	A_S
Volume of Sulfuric Acid Impinger		2089930	N/A	2010/03/01	FMO

Maxxam ID FE4454  
Sample ID 3-HCL-TEST 3  
Matrix SAMPLING TRAIN  
Collected 2010/02/17  
Shipped  
Received 2010/02/25

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Hydrogen Halides in H2SO4 Imp.	IC/SPEC	2089938	2010/03/01	2010/03/01	A_S
Volume of Sulfuric Acid Impinger		2089930	N/A	2010/03/01	FMO

Maxxam Job #: B022930  
Report Date: 2010/03/04

Eagle Mountain  
Client Project #: 902630  
Project name: MET COUNCIL-SENECA

**GENERAL COMMENTS**

**Results relate only to the items tested.**

Eagle Mountain  
Attention: Mark Carlson  
Client Project #: 902630  
P.O. #:  
Project name: MET COUNCIL-SENECA

Quality Assurance Report  
Maxxam Job Number: GB022930

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	%Recovery	Units	QC Limits
2089938 A_S	Matrix Spike (FE4448)	Hydrochloric Acid	2010/03/01		89	%	80 - 120
		Hydrofluoric Acid	2010/03/01		94	%	80 - 120
	Spiked Blank	Hydrochloric Acid	2010/03/01		92	%	90 - 110
		Hydrofluoric Acid	2010/03/01		96	%	90 - 110
	Method Blank	Hydrochloric Acid	2010/03/01	ND, RDL=200		ug	
		Hydrofluoric Acid	2010/03/01	ND, RDL=200		ug	
	RPD - Sample/Sample Dup	Hydrochloric Acid	2010/03/01	NC		%	20
		Hydrofluoric Acid	2010/03/01	NC		%	20
	<p>Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.</p> <p>Spiked Blank: A blank matrix to which a known amount of the analyte has been added. Used to evaluate analyte recovery.</p> <p>Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.</p> <p>NC (RPD): The RPD was not calculated. The level of analyte detected in the parent sample and its duplicate was not sufficiently significant to permit a reliable calculation.</p>						



# SAMPLE RECEIPT LOG

Lab Name: Maxxam Analytics Inc., Mississauga Laboratory

Received by (Name): M. Ficht

Received by (Signature): [Signature] Date: 10/02/25 Time: 12:10

Client Name: Eagle Mountain

Number of Package: Number of Boxes: 11 or Coolers: 3

Waybill #: Driver pickup

REMARKS:		Condition of Sample(s) Shipment - Comments
<b>Sample Reception Documentation</b>		
Samples Packed in Coolers?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	
Cooler Contains ice?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	
Custody seal(s) on cooler?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A <input type="checkbox"/>	
<b>Chain of Custody (CoC) present?</b>		
Chain of Custody (CoC) present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	
Cooler Temperature measured?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	
Containers intact?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	
Correct containers used?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	
CoC agrees with samples?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	
Samples rec'd after hold time?	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	
Project Mgr contacted via SIF?	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	
<b>Project Manager Documentation</b>		
Client contacted if discrepancies in shipment are observed	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	
Client acceptance of deficiencies (if observed at sample receipt)	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	
<b>Cooler temperatures upon receipt</b>		
Cooler ID <u>C1</u>	Temp <u>15°C 19°C 15°C</u>	
Cooler ID <u>C2</u>	Temp <u>4°C 4°C 4°C</u>	
Cooler ID <u>C7</u>	Temp <u>15°C 15°C 17°C</u>	

Unpacked & package checked By: [Signature] Date: 10/02/25

Package checked By: [Signature] Date: [Signature]

Relinquished by: [Signature] Date: [Signature]

902630 Seneca  
192 of 234



**Appendix E**  
**Equipment Calibrations**

**APEX INSTRUMENTS METHOD 5 PRE-TEST CONSOLE CALIBRATION**  
**USING CALIBRATED CRITICAL ORIFICES**  
**5-POINT ENGLISH UNITS**

Meter Console Information	
Console Model Number	AB 3
Console Serial Number	2320003
DGM Model Number	
DGM Serial Number	

Calibration Conditions			
Date	Time	1-25-10	11:00
Barometric Pressure		29.3	in Hg
Theoretical Critical Vacuum <sup>1</sup>		13.8	in Hg
Calibration Technician		NT	

Factors/Conversions		
Std Temp	528	°R
Std Press	29.92	in Hg
K <sub>1</sub>	17.647	oR/in Hg

<sup>1</sup>For valid test results, the Actual Vacuum should be 1 to 2 in. Hg greater than the Theoretical Critical Vacuum shown above.

<sup>2</sup>The Critical Orifice Coefficient, K', must be entered in English units, (ft<sup>3</sup>•oR<sup>1/2</sup>)/(in.Hg•min).

Calibration Data										
Run Time	Metering Console					Critical Orifice				
Elapsed	DGM Orifice ΔH	Volume Initial	Volume Final	Outlet Temp Initial	Outlet Temp Final	Serial Number	Coefficient	Amb Temp Initial	Amb Temp Final	Actual Vacuum
(θ)	(P <sub>m</sub> )	(V <sub>mi</sub> )	(V <sub>mf</sub> )	(t <sub>mi</sub> )	(t <sub>mf</sub> )		K'	(t <sub>amb</sub> )	(t <sub>amb</sub> )	
min	in H <sub>2</sub> O	cubic feet	cubic feet	°F	°F		see above <sup>2</sup>	°F	°F	in Hg
19.5	0.3	0.000	5.821	68	69	UN40	0.2318	65	65	17
12.5	0.6	0.000	5.441	69	70	UN48	0.3365	65	65	17
12.5	1.0	0.000	6.973	70	71	UN55	0.4319	65	65	17
7.5	2.0	0.000	5.741	71	71	UN63	0.5939	65	66	17
5.5	3.3	0.000	5.598	71	71	UN73	0.7868	66	66	17

Results								
Standardized Data				Dry Gas Meter				
Dry Gas Meter		Critical Orifice		Calibration Factor		Flowrate	ΔH @	
				Value	Variation	Std & Corr	0.75 SCFM	Variation
(V <sub>m(std)</sub> )	(Q <sub>m(std)</sub> )	(V <sub>cr(std)</sub> )	(Q <sub>cr(std)</sub> )	(Y)	(ΔY)	(Q <sub>m(std)(corr)</sub> )	(ΔH@)	(ΔΔH@)
cubic feet	cfm	cubic feet	cfm			cfm	in H <sub>2</sub> O	
5.692	0.292	5.772	0.296	1.014	0.003	0.296	1.949	0.060
5.314	0.425	5.371	0.430	1.011	-0.001	0.430	1.909	0.020
6.805	0.544	6.894	0.552	1.013	0.002	0.552	1.865	-0.024
5.610	0.748	5.685	0.758	1.013	0.002	0.758	1.895	0.006
5.489	0.998	5.521	1.004	1.006	-0.006	1.004	1.828	-0.061
				1.011	Y Average		1.889	ΔH@ Average

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

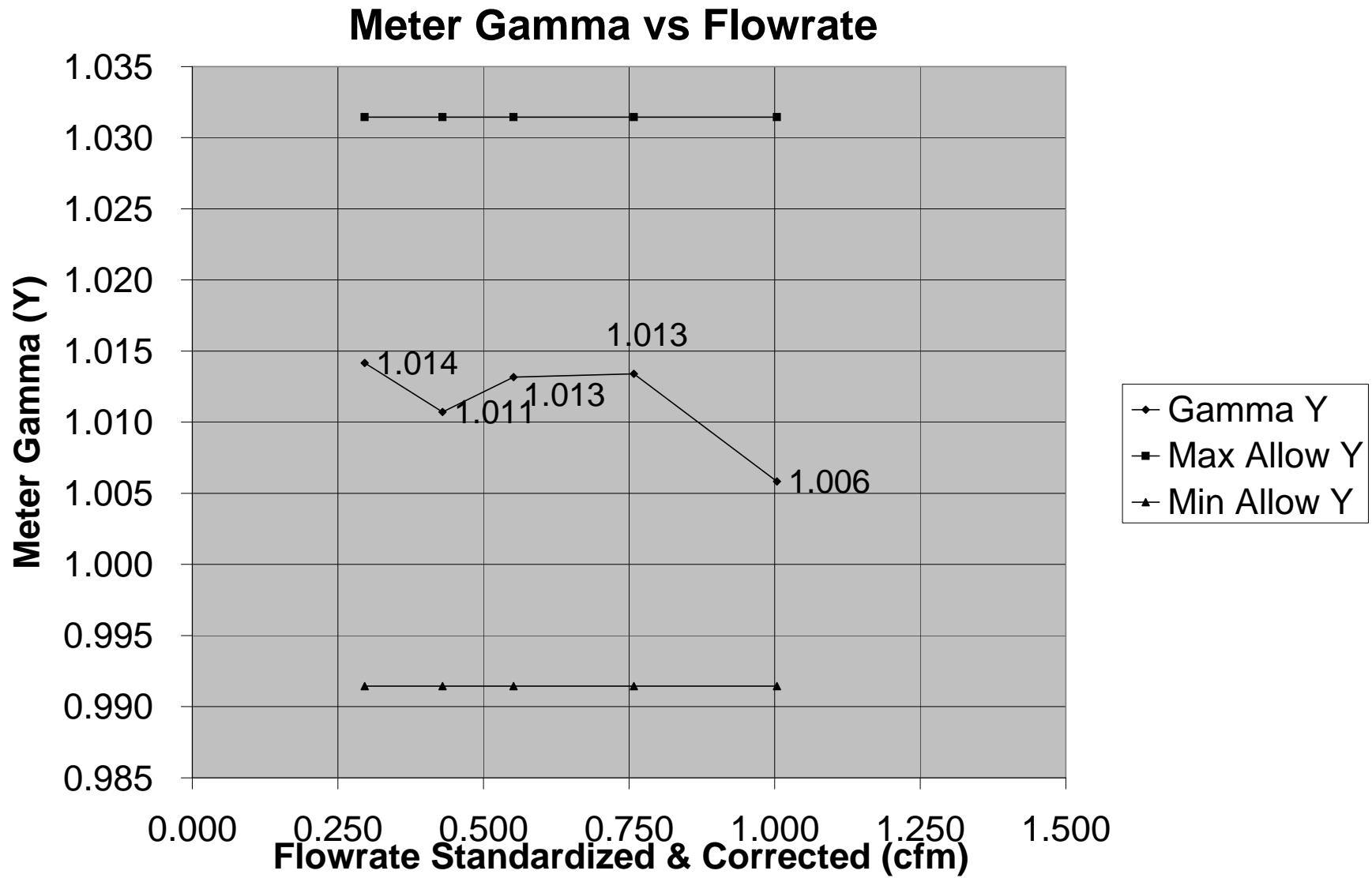
I certify that the above Dry Gas Meter was calibrated in accordance with USEPA Methods, CFR Title 40, Part 60, Appendix A-3, Method 5, 16.2.3

Signature \_\_\_\_\_

Date \_\_\_\_\_

#VALUE!

Calibration Technician: NT

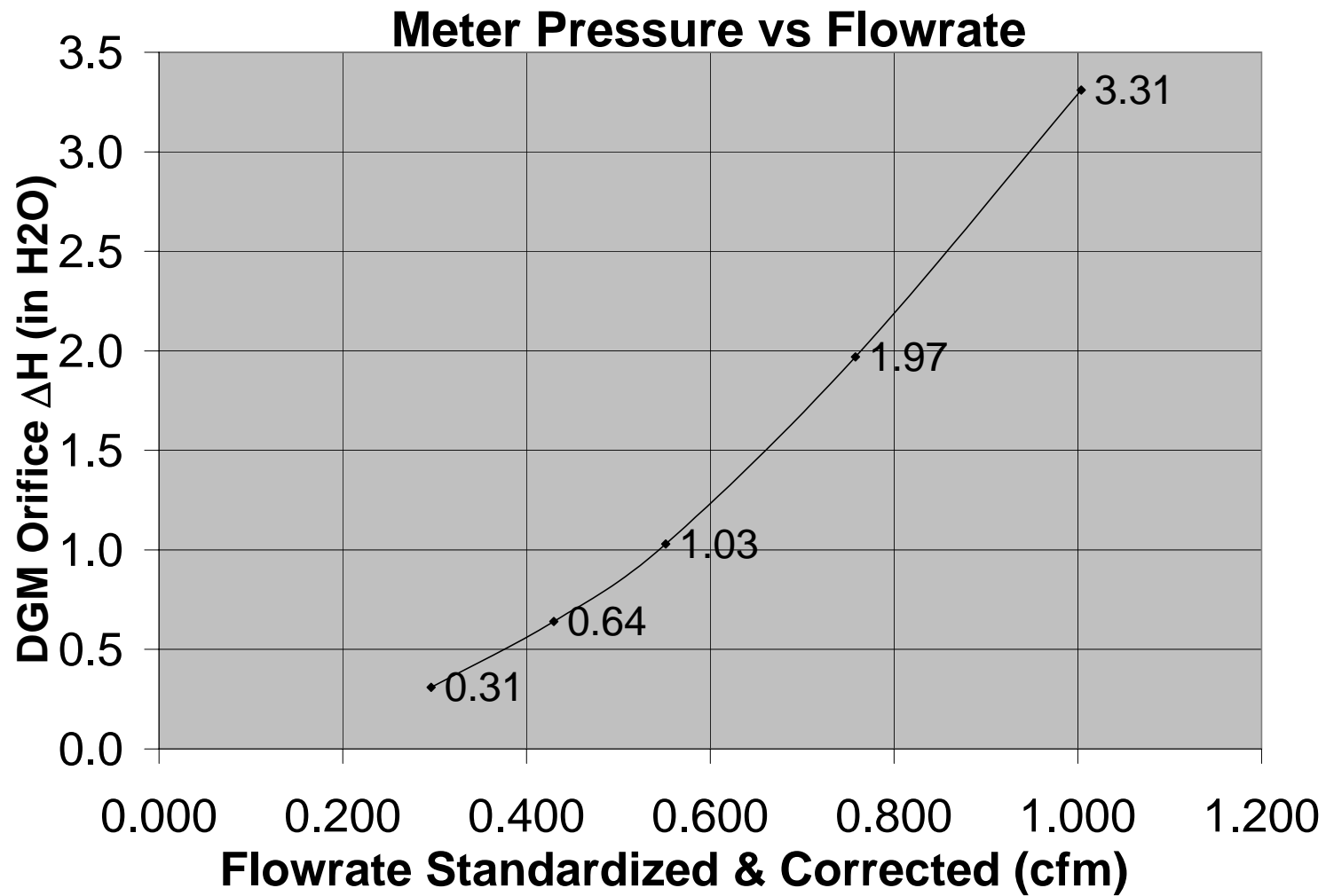


Console Serial: 2320003

Console Model: AB 3

#VALUE!

Calibration Technician:



Console Serial: 2320003

Console Model: A

**APEX INSTRUMENTS METHOD 5 POST-TEST CONSOLE CALIBRATION**  
**USING CALIBRATED CRITICAL ORIFICES**  
**3-POINT ENGLISH UNITS**

Meter Console Information	
Console Model Number	AB 3
Console Serial Number	
DGM Model Number	
DGM Serial Number	

Calibration Conditions			
Date	Time	2-17-10	0:00
Barometric Pressure		29.3	in Hg
Theoretical Critical Vacuum <sup>1</sup>		13.8	in Hg
Calibration Technician		BD	

Factors/Conversions		
Std Temp	528	°R
Std Press	29.92	in Hg
K <sub>1</sub>	17.647	oR/in Hg

<sup>1</sup>For valid test results, the Actual Vacuum should be 1 to 2 in. Hg greater than the Theoretical Critical Vacuum shown above.

<sup>2</sup>The Critical Orifice Coefficient, K', must be entered in English units, (ft<sup>3</sup>\*°R<sup>1/2</sup>)/(in.Hg\*min).

Calibration Data										
Run Time		Metering Console				Critical Orifice				
Elapsed	DGM Orifice ΔH	Volume Initial	Volume Final	Outlet Temp Initial	Outlet Temp Final	Serial Number	Coefficient see list on right	Amb Temp Initial	Amb Temp Final	Actual Vacuum
(θ)	(P <sub>m</sub> )	(V <sub>mi</sub> )	(V <sub>mf</sub> )	(t <sub>mi</sub> )	(t <sub>mf</sub> )		K'	(t <sub>amb</sub> )	(t <sub>amb</sub> )	
min	in H <sub>2</sub> O	cubic feet	cubic feet	°F	°F		see above <sup>2</sup>	°F	°F	in Hg
8.0	2.1	0.000	6.147	69	69	63	0.6072	60	60	17
8.0	2.1	0.000	6.147	69	71	63	0.6072	60	63	17
9.0	2.1	0.000	6.933	71	74	63	0.6072	63	63	17

Results								
Standardized Data				Dry Gas Meter				
Dry Gas Meter		Critical Orifice		Calibration Factor		Flowrate	ΔH @	
				Value	Variation	Std & Corr	0.75 SCFM	Variation
(V <sub>m(std)</sub> )	(Q <sub>m(std)</sub> )	(V <sub>cr(std)</sub> )	(Q <sub>cr(std)</sub> )	(Y)	(ΔY)	(Q <sub>m(std)(corr)</sub> )	(ΔH@)	(ΔΔH@)
cubic feet	cfm	cubic feet	cfm			cfm	in H <sub>2</sub> O	
6.038	0.755	6.241	0.780	1.034	-0.001	0.780	1.872	0.000
6.023	0.753	6.230	0.779	1.034	0.000	0.779	1.874	0.002
6.761	0.751	6.998	0.778	1.035	0.001	0.778	1.871	-0.001
Pretest Gamma	1.011	% Deviation	2.3	1.034	Y Average		1.873	ΔH@ Average

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

I certify that the above Dry Gas Meter was calibrated in accordance with USEPA Methods, CFR Title 40, Part 60, Appendix A-3, Method 5, 16.2.3

Signature \_\_\_\_\_

Date \_\_\_\_\_

**APEX INSTRUMENTS METHOD 5 PRE-TEST CONSOLE CALIBRATION**  
**USING CALIBRATED CRITICAL ORIFICES**  
**5-POINT ENGLISH UNITS**

Meter Console Information	
Console Model Number	EMSI-AB 1
Console Serial Number	2320001
DGM Master Factor	
DGM Serial Number	

Calibration Conditions			
Date	Time	08-Jan-10	12:10
Barometric Pressure		29.1	in Hg
Theoretical Critical Vacuum <sup>1</sup>		13.7	in Hg
Calibration Technician		NT	

Factors/Conversions		
Std Temp	528	°R
Std Press	29.92	in Hg
K <sub>1</sub>	17.647	oR/in Hg

<sup>1</sup>For valid test results, the Actual Vacuum should be 1 to 2 in. Hg greater than the Theoretical Critical Vacuum shown above.

<sup>2</sup>The Critical Orifice Coefficient, K', must be entered in English units, (ft<sup>3</sup>•oR<sup>1/2</sup>)/(in.Hg•min).

Calibration Data										
Run Time	Metering Console					Critical Orifice				
Elapsed	DGM Orifice ΔH	Volume Initial	Volume Final	Outlet Temp Initial	Outlet Temp Final	Serial Number	Coefficient	Amb Temp Initial	Amb Temp Final	Actual Vacuum
(θ)	(P <sub>m</sub> )	(V <sub>mi</sub> )	(V <sub>mf</sub> )	(t <sub>mi</sub> )	(t <sub>mf</sub> )		K'	(t <sub>amb</sub> )	(t <sub>amb</sub> )	
min	in H <sub>2</sub> O	cubic feet	cubic feet	°F	°F		see above <sup>2</sup>	°F	°F	in Hg
25.0	0.4	0.000	7.564	66	67	UN-40	0.2318	65	65	17
14.0	0.7	0.000	6.141	67	68	UN-48	0.3365	65	65	17
11.0	1.1	0.000	6.170	68	69	UN-55	0.4319	65	69	17
8.5	2.0	0.000	6.548	69	71	UN-63	0.5939	69	69	17
6.0	3.4	0.000	6.128	71	72	UN-73	0.7868	69	70	17

Results								
Standardized Data				Dry Gas Meter				
Dry Gas Meter		Critical Orifice		Calibration Factor		Flowrate	ΔH @	
				Value	Variation	Std & Corr	0.75 SCFM	Variation
(V <sub>m(std)</sub> )	(Q <sub>m(std)</sub> )	(V <sub>cr(std)</sub> )	(Q <sub>cr(std)</sub> )	(Y)	(ΔY)	(Q <sub>m(std)(corr)</sub> )	(ΔH@)	(ΔΔH@)
cubic feet	cfm	cubic feet	cfm			cfm	in H <sub>2</sub> O	
7.384	0.295	7.360	0.294	0.997	-0.003	0.294	2.221	0.201
5.989	0.428	5.983	0.427	0.999	-0.001	0.427	2.047	0.028
6.012	0.547	6.022	0.547	1.002	0.002	0.547	1.982	-0.038
6.377	0.750	6.387	0.751	1.002	0.002	0.751	1.971	-0.048
5.971	0.995	5.970	0.995	1.000	0.000	0.995	1.877	-0.142
				1.000	Y Average		2.020	ΔH@ Average

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

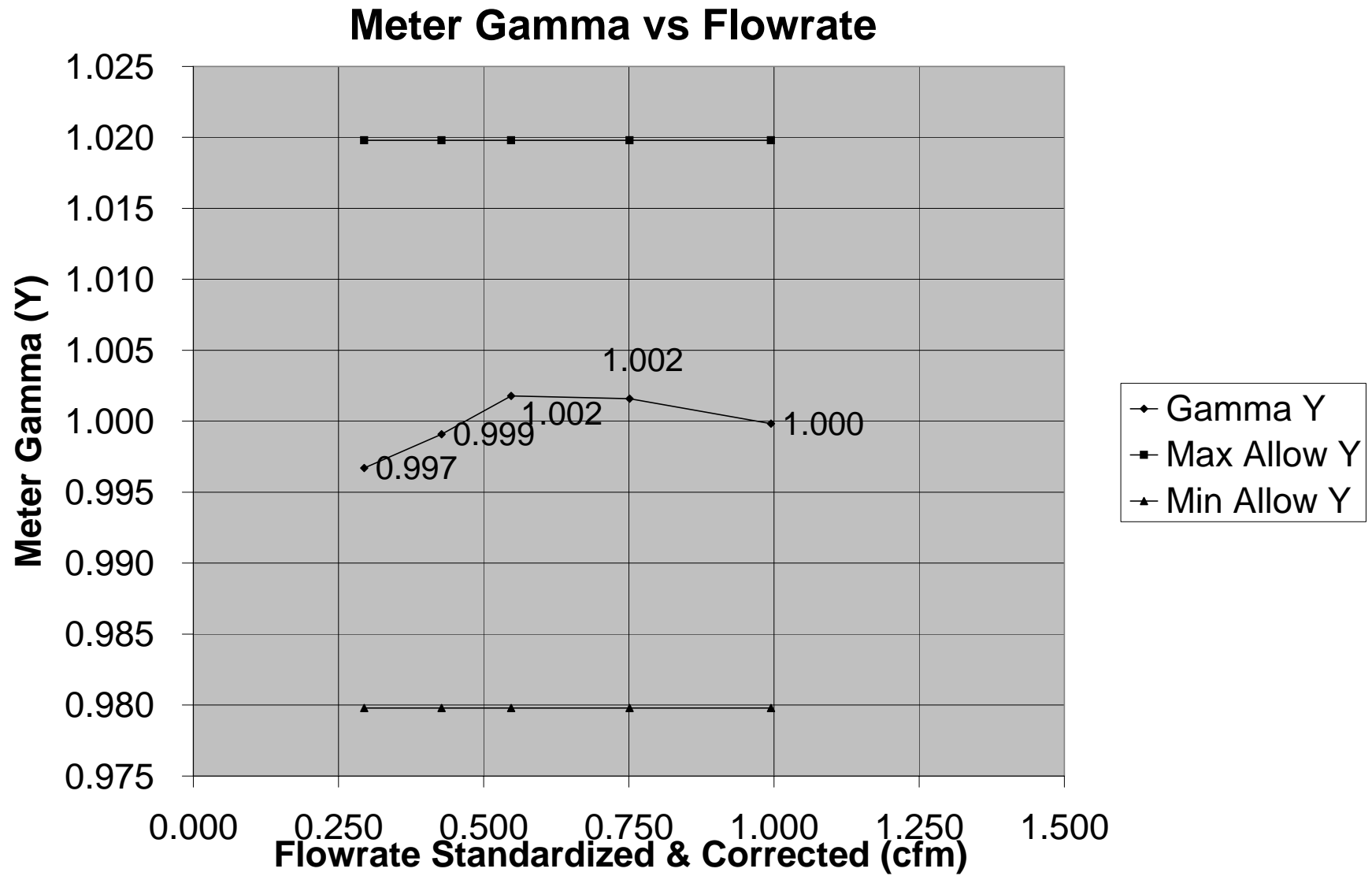
I certify that the above Dry Gas Meter was calibrated in accordance with USEPA Methods, CFR Title 40, Part 60, Appendix A-3, Method 5, 16.2.3

Signature \_\_\_\_\_

Date \_\_\_\_\_

Calibration Date: 1-8-2010

Calibration Technician: NT

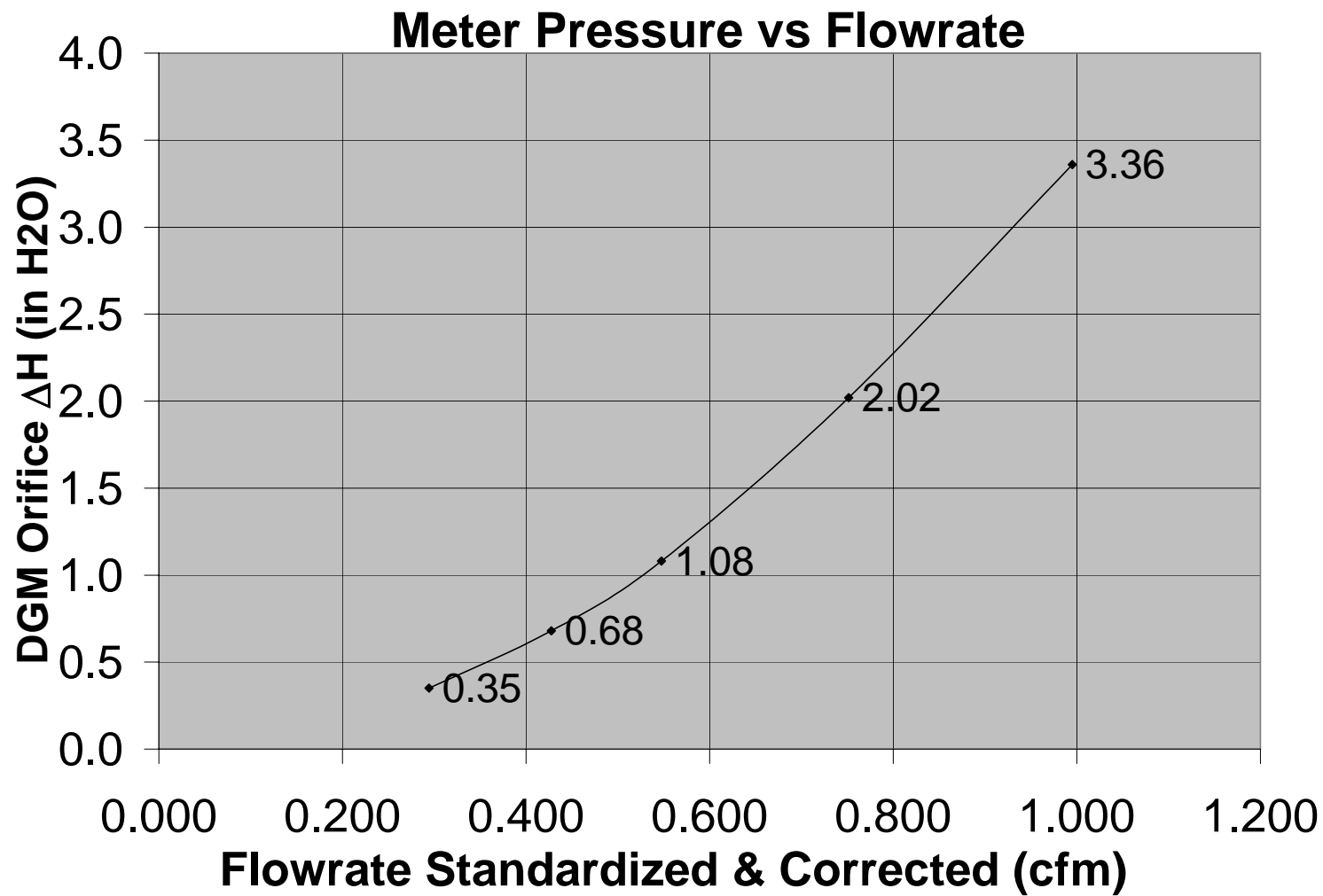


Console Serial: 2320001

Console Model: EMSI-AB

Calibration Date: 1-8-2010

Calibration Technician: NT



Console Serial: 2320001

Console Model: EMSI-AB 1



**APEX INSTRUMENTS METHOD 5 POST-TEST CONSOLE CALIBRATION**  
**USING CALIBRATED CRITICAL ORIFICES**  
**3-POINT ENGLISH UNITS**

Meter Console Information	
Console Model Number	
Console Serial Number	
DGM Model Number	
DGM Serial Number	

Calibration Conditions			
Date	Time	2-17-10	0:00
Barometric Pressure		29.3	in Hg
Theoretical Critical Vacuum <sup>1</sup>		13.8	in Hg
Calibration Technician		BD	

Factors/Conversions		
Std Temp	528	°R
Std Press	29.92	in Hg
K <sub>1</sub>	17.647	oR/in Hg

<sup>1</sup>For valid test results, the Actual Vacuum should be 1 to 2 in. Hg greater than the Theoretical Critical Vacuum shown above.

<sup>2</sup>The Critical Orifice Coefficient, K', must be entered in English units, (ft<sup>3</sup>\*°R<sup>1/2</sup>)/(in.Hg\*min).

Calibration Data										
Run Time		Metering Console				Critical Orifice				
Elapsed	DGM Orifice ΔH	Volume Initial	Volume Final	Outlet Temp Initial	Outlet Temp Final	Serial Number	Coefficient see list on right	Amb Temp Initial	Amb Temp Final	Actual Vacuum
(θ)	(P <sub>m</sub> )	(V <sub>mi</sub> )	(V <sub>mf</sub> )	(t <sub>mi</sub> )	(t <sub>mf</sub> )		K'	(t <sub>amb</sub> )	(t <sub>amb</sub> )	
min	in H <sub>2</sub> O	cubic feet	cubic feet	°F	°F		see above <sup>2</sup>	°F	°F	in Hg
14.0	0.7	0.000	6.400	84	85	48	0.3449	56	53	17
17.0	0.7	0.000	7.783	85	83	48	0.3449	53	52	17
14.0	0.7	0.000	6.383	83	82	48	0.3449	52	50	17

Results								
Standardized Data				Dry Gas Meter				
Dry Gas Meter		Critical Orifice		Calibration Factor		Flowrate	ΔH @	
(V <sub>m(std)</sub> )	(Q <sub>m(std)</sub> )	(V <sub>cr(std)</sub> )	(Q <sub>cr(std)</sub> )	Value	Variation	Std & Corr	0.75 SCFM	Variation
(V <sub>m(std)</sub> )	(Q <sub>m(std)</sub> )	(V <sub>cr(std)</sub> )	(Q <sub>cr(std)</sub> )	(Y)	(ΔY)	(Q <sub>m(std)(corr)</sub> )	(ΔH@)	(ΔΔH@)
cubic feet	cfm	cubic feet	cfm			cfm	in H <sub>2</sub> O	
6.088	0.435	6.235	0.445	1.024	-0.001	0.445	1.866	0.004
7.412	0.436	7.589	0.446	1.024	-0.001	0.446	1.860	-0.002
6.095	0.435	6.257	0.447	1.027	0.002	0.447	1.860	-0.002
Pretest Gamma	1.000	% Deviation	2.5	1.025	Y Average		1.862	ΔH@ Average

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

I certify that the above Dry Gas Meter was calibrated in accordance with USEPA Methods, CFR Title 40, Part 60, Appendix A-3, Method 5, 16.2.3

Signature \_\_\_\_\_

Date \_\_\_\_\_

### Temperature Sensor Calibration

Equipment ID #	Reference point Temp.*F	Reference TC Temp. *F	TC Temp. *F	Acceptable if $\leq 1.5\%$	
				% Difference	
235004 Hot Box	Ice Bath	NA		#VALUE!	Date
	Ambient	NA		#VALUE!	1-11-10
	Oven Temp. 1	244	250	0.85	Tech.
	Oven Temp. 2	292	300	1.05	NT

### Temperature Sensor Calibration

Equipment ID #	Reference point Temp.*F	Reference TC Temp. *F	TC Temp. *F	Acceptable if $\leq 1.5\%$	
				% Difference	
221015 M5 Probe	Ice Bath	33	35	0.40	Date
	Ambient	59	58	0.19	1-11-10
	Oven Temp. 1	247	250	0.42	Tech.
	Oven Temp. 2	393	400	0.81	NT

### Temperature Sensor Calibration

Equipment ID #	Reference point Temp.*F	Reference TC Temp. *F	TC Temp. *F	Acceptable if $\leq 1.5\%$	
				% Difference	
221018 M5 Probe	Ice Bath	35	36	0.20	Date
	Ambient	66	67	0.19	1-11-10
	Oven Temp. 1	250	251	0.14	Tech.
	Oven Temp. 2	400	408	0.92	NT

Each nozzle must be calibrated prior to field use. Each nozzle shall be given a permanent unique ID number at the time of first service. The following ID naming conventions shall be used:

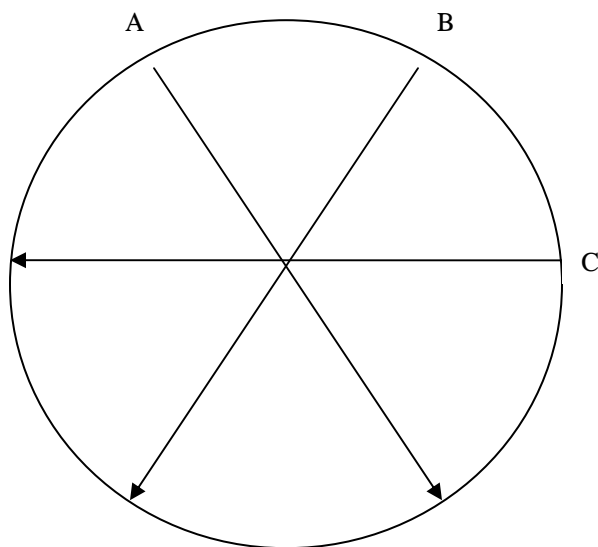
Nozzle Naming Convention

Glass Nozzles	224001 to 224999
Metal Nozzles	225001 to 225999

Note: Use first number available in sequential order from records

The nozzles shall be inspected for chips, cracks, corrosion and dents prior to service and prior to each field use. Any nozzle with notable damage shall be taken out of service and repaired and recalibrated before returning to service.

Conduct the nozzle calibration by using a micrometer to take three separate inside diameter measurements as outlined in the following diagram. Maintain a calibration log in a three ring binder and by electronically scanning each calibration page and adding it to the calibration folder. Copies of the folder should be made available in a file box located in each trailer.



Calibration Example

Readings		Acceptance Criteria:	
Measurement A	0.125	Highest Measurement	0.125
Measurement B	0.123	Lowest Measurement	0.123
Measurement C	0.125	Difference	0.002
Average	0.124	Acceptable $\leq 0.004$	Yes

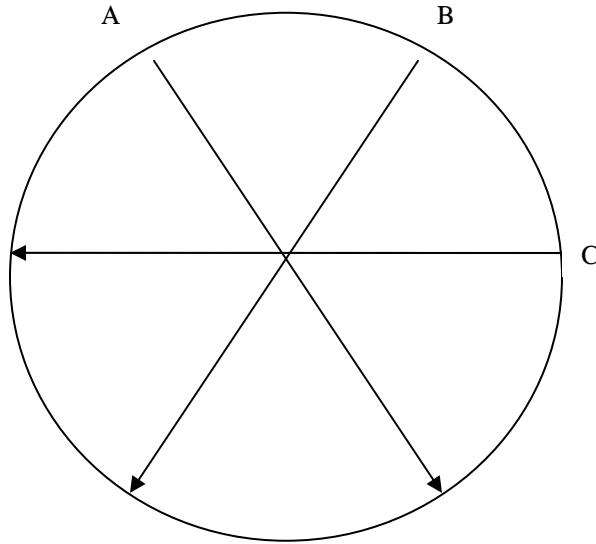
# EMSI Source Testing Department

o Isokinetic Nozzle Calibration Form

Form  
ST300-02

## Instructions:

Make three inside diameter measurements with a NIST traceable micrometer at dimensions A, B, and C. Record the results and click the calculate button. Record the Nozzle ID number, mark free of damage, record name and date of calibration.



Nozzle ID Number

225076

☒ Glass ☒ Metal

☐ Out of Service

☒ Nozzle Edge Free of Damage

NIST Master: 421002

Dimension A: .274 inches

Dimension B: .274 inches

Dimension C: .274 inches

Location: MN Metal Nozzle Box

Find

Save

Next #

Calculate

Clear

Historical Data Path

F:\EEQP\Historical Data\Nozzle.ini

## Acceptance Criteria:

Average 0.274 inches

Maximum Diameter 0.274 inches

Minimum Diameter 0.274 inches

Difference 0 inches

Acceptable  $\leq 0.004$  Passed

Date:

2010-01-28

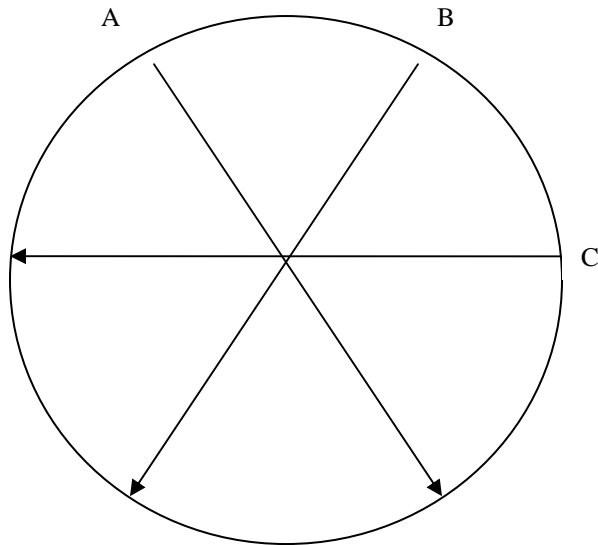
Technician:

Randy Resch

Comment:

Instructions:

Make three inside diameter measurements with a NIST traceable micrometer at dimensions A, B, and C. Record the results and click the calculate button. Record the Nozzle ID number, mark free of damage, record name and date of calibration.



Nozzle ID Number

224012

Dimension A 0.374 inches

Save

Next #

Find

Dimension B 0.375 inches

☒ Glass ☒ Metal

Dimension C 0.374 inches

☐ Out of Service

☒ Nozzle Edge Free of Damage

Calculate

Clear

Acceptance Criteria:

Average 0.374 inches

Maximum Diameter 0.375 inches

Minimum Diameter 0.374 inches

Difference 0.001 inches

Acceptable  $\leq 0.004$  Passed

Technician

Nathan Traut

Date

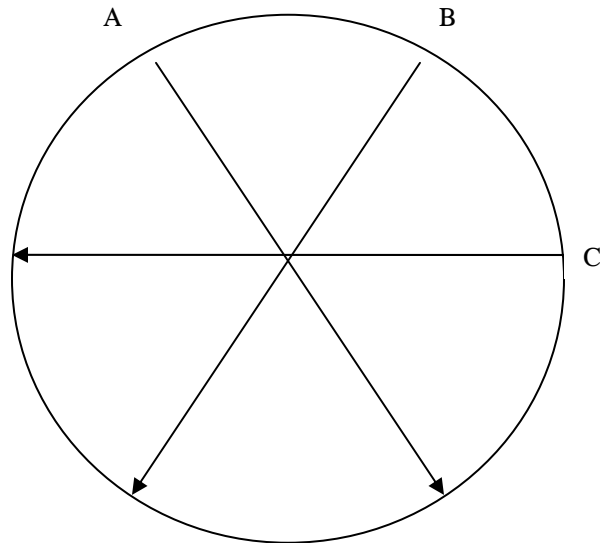
1/21/2008

Historical Data Path

F:\ASTM Compliance\Historical Data\Nozzle.ini

Instructions:

Make three inside diameter measurements with a NIST traceable micrometer at dimensions A, B, and C. Record the results and click the calculate button. Record the Nozzle ID number, mark free of damage, record name and date of calibration.



Nozzle ID Number

225088

☒ Glass ☒ Metal

☐ Out of Service

☒ Nozzle Edge Free of Damage

NIST Master: 421002

Dimension A: 0.274 inches

Dimension B: 0.275 inches

Dimension C: 0.275 inches

Location: MN Metal Nozzle Box

Find

Save

Next #

Calculate

Clear

Historical Data Path

F:\EEQP\Historical Data\Nozzle.ini

Acceptance Criteria:

Average 0.275 inches

Maximum Diameter 0.275 inches

Minimum Diameter 0.274 inches

Difference 0.001 inches

Acceptable  $\leq 0.004$  Passed

Date:

2010-02-02

Technician:

Nate Traut

Comment:

# EMSI Source Testing Department

o Probe Calibration Procedure (Caliper)

Form  
ST305-01

Probe ID Number	<input type="text" value="221015"/>	Pitot ID Number	<input type="text" value="222013"/>
NIST Master	<input type="text" value="421002"/>	Technician	<input type="text" value="Nathan Traut"/>
<input checked="" type="checkbox"/> MN	<input checked="" type="checkbox"/> PA	<input type="checkbox"/> Out of Service	Date
			<input type="text" value="2009-09-08"/>
<input type="button" value="Calculate"/>	<input type="button" value="Save"/>	<input type="button" value="Clear"/>	<input type="button" value="Next"/>
<input type="button" value="Find"/>			

	<input type="text" value="0.375"/> $D_t$ <input type="text" value="0.50"/> $D_n$ <input type="text" value="0.874"/> $a$
	<input type="text" value="0.480"/> $P_a$ <input type="text" value="0.480"/> $P_b$ <input type="text" value="0.840"/> $b$
	<input type="text"/> $c$ <input type="text"/> $d$ <input type="text"/> $e$
<b>OR</b>	
	<input type="text" value="7.832"/> $c$ <input type="text" value="2.790"/> $f$

## EPA Method 2 Specifications

$c \geq 3"$	Pass	$D_t = \frac{3}{16}" \text{ to } \frac{3}{8}"$	Pass
$a \geq \frac{3}{4}"$	Pass	$D_n = \frac{1}{2}"$	Pass
$d \geq 3"$	NA	$1.05 D_t < P < 1.50 D_t$	Pass
$e \geq \frac{3}{4}"$	NA	$b \geq 0"$	Pass
$f \geq 2"$	Pass	$P_a = P_b$	Pass

Note: All measurements are in inches.

Historical Data

# EMSI Source Testing Department

o Probe Calibration Procedure (Caliper)

Form  
ST305-01

Probe ID Number	<input type="text" value="221018"/>	Pitot ID Number	<input type="text" value="222024"/>
NIST Master	<input type="text" value="421002"/>	Technician	<input type="text" value="Nathan Traut"/>
<input checked="" type="checkbox"/> MN	<input checked="" type="checkbox"/> PA	<input type="checkbox"/> Out of Service	Date
			<input type="text" value="2009-09-08"/>
<input type="button" value="Calculate"/>		<input type="button" value="Save"/>	<input type="button" value="Clear"/>
		<input type="button" value="Next"/>	<input type="button" value="Find"/>

	<input type="text" value="0.375"/> $D_t$ <input type="text" value="0.508"/> $D_n$ <input type="text" value="0.825"/> $a$
	<input type="text" value="0.483"/> $P_a$ <input type="text" value="0.483"/> $P_b$ <input type="text" value="0.830"/> $b$
	<input type="text"/> $c$ <input type="text"/> $d$ <input type="text"/> $e$
<b>OR</b>	<b>OR</b>
	<input type="text" value="7.788"/> $c$ <input type="text" value="2.797"/> $f$

**EPA Method 2 Specifications**

$c \geq 3"$	<b>Pass</b>	$D_t = \frac{3}{16}" \text{ to } \frac{3}{8}"$	<b>Pass</b>
$a \geq \frac{3}{4}"$	<b>Pass</b>	$D_n = \frac{1}{2}"$	<b>Pass</b>
$d \geq 3"$	<b>NA</b>	$1.05 D_t < P < 1.50 D_t$	<b>Pass</b>
$e \geq \frac{3}{4}"$	<b>NA</b>	$b \geq 0"$	<b>Pass</b>
$f \geq 2"$	<b>Pass</b>	$P_a = P_b$	<b>Pass</b>

Note: All measurements are in inches.

Historical Data



# EMSI Source Testing Department

o Pitot Calibration Procedure (Caliper)

Form  
ST304-01

Probe ID Number:	221015	Pitot ID Number:	222013
NIST Master:	421002	Technician:	Nathan Traut
Location:	Minnesota	Date:	9-8-09
		Status:	Pass
Calculate	Save	Clear	Next
			Find

Historical Data: F:\ASTM Compliance\ Historical Data\ Pitot\ini

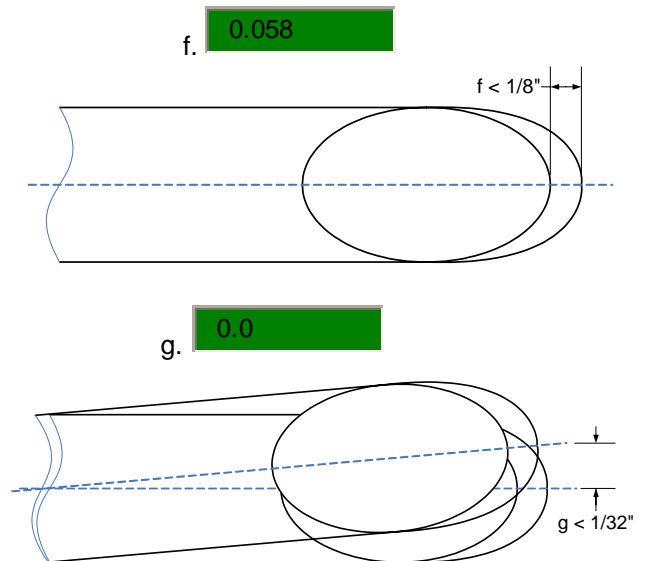
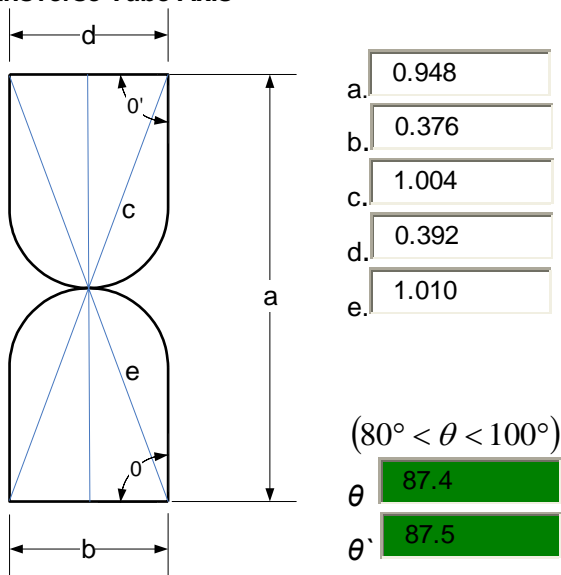
Note: All measurements are in inches.

Equation 1\*:  $\frac{a^2 + b^2 - c^2}{2ab} = \cos \theta$

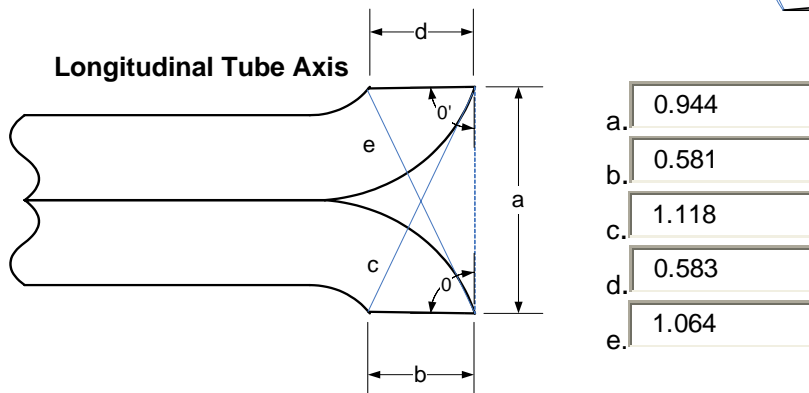
Equation 2\*:  $\frac{a^2 + d^2 - e^2}{2ad} = \cos \theta'$

\*Equations 1 & 2 are used for both the Transverse and Longitudinal calculations.

## Transverse Tube Axis



## Longitudinal Tube Axis



theta 91.1 (85° < theta < 95°)

theta' 84.8 (85° < theta < 95°)

Comments:

# EMSI Source Testing Department

o Pitot Calibration Procedure (Caliper)

Form  
ST304-01

Probe ID Number:	<input type="text"/>	Pitot ID Number:	<input type="text" value="222024"/>
NIST Master:	<input type="text" value="421002"/>	Technician:	<input type="text" value="Nate Traut"/>
Location:	<input type="text" value="Minnesota"/>	Date:	<input type="text" value="8-20-2009"/>
		Status:	<input type="text" value="Pass"/>

<input type="button" value="Calculate"/>	<input type="button" value="Save"/>	<input type="button" value="Clear"/>	<input type="button" value="Next"/>	<input type="button" value="Find"/>
--	-------------------------------------	--------------------------------------	-------------------------------------	-------------------------------------

Historical Data:

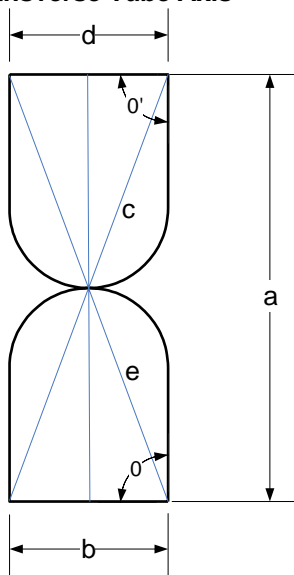
Note: All measurements are in inches.

Equation 1\*:  $\frac{a^2 + b^2 - c^2}{2ab} = \cos \theta$

Equation 2\*:  $\frac{a^2 + d^2 - e^2}{2ad} = \cos \theta'$

\*Equations 1 & 2 are used for both the Transverse and Longitudinal calculations.

## Transverse Tube Axis



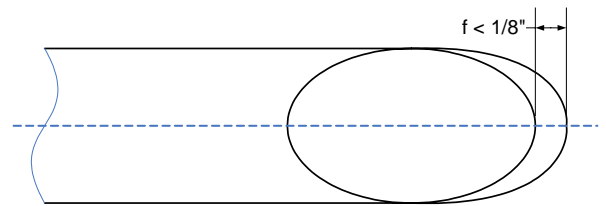
- a.
- b.
- c.
- d.
- e.

(80° < θ < 100°)

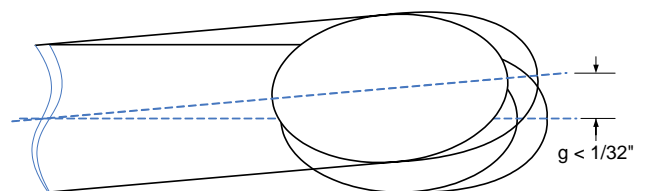
θ

θ'

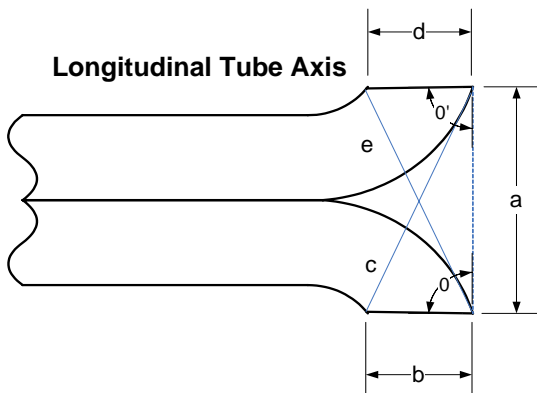
f.



g.



## Longitudinal Tube Axis



- a.
- b.
- c.
- d.
- e.

θ  (85° < θ < 95°)

θ'  (85° < θ < 95°)

Comments:

# Calibration Report

## Met Council

Seneca

Unit: 1

Channel	Test #	Start Time	Stop Time	Z/M/H	Local/Sys Bias	Actual Value	Cylinder Value	Span
CO2	1	13:08:25	13:08:38	Zero	Local	0.23	0.00	19.23
CO2	1	13:10:23	13:10:38	Mid	Local	9.75	9.98	19.23
CO2	1	13:16:50	13:16:55	High	Local	19.17	19.23	19.23
CO2	1	13:31:52	13:32:06	Zero	Pre SB	0.30	0.00	19.23
CO2	1	13:23:47	13:24:01	Mid	Pre SB	9.80	9.98	19.23
CO2	1	15:08:56	15:09:06	Zero	Post SB	0.50	0.00	19.23
CO2	1	14:52:57	14:53:10	Mid	Post SB	9.88	9.98	19.23
CO2	2	16:24:09	16:24:23	Zero	Post SB	0.30	0.00	19.23
CO2	2	16:16:41	16:16:55	Mid	Post SB	9.60	9.98	19.23
CO2	3	17:36:57	17:37:11	Zero	Post SB	0.11	0.00	19.23
CO2	3	17:33:46	17:34:00	Mid	Post SB	9.60	9.98	19.23
SO2	1	13:16:56	13:17:11	Zero	Local	0.00	0.00	101
SO2	1	13:12:02	13:12:15	Mid	Local	49.18	50.64	101
SO2	1	13:08:32	13:08:45	High	Local	99.46	101.00	101
SO2	1	13:22:17	13:24:02	Zero	Pre SB	0.13	0.00	101
SO2	1	13:32:36	13:32:49	Mid	Pre SB	45.11	50.64	101
SO2	1	14:53:44	14:53:58	Zero	Post SB	0.43	0.00	101
SO2	1	15:08:46	15:08:52	Mid	Post SB	45.81	50.64	101
SO2	2	16:16:42	16:16:56	Zero	Post SB	0.00	0.00	101
SO2	2	16:23:54	16:23:55	Mid	Post SB	46.25	50.64	101
SO2	3	17:33:46	17:34:01	Zero	Post SB	0.00	0.00	101
SO2	3	17:36:56	17:36:59	Mid	Post SB	47.60	50.64	101
O2	1	13:08:13	13:08:28	Zero	Local	0.00	0.00	21.26
O2	1	13:10:24	13:10:38	Mid	Local	10.07	10.00	21.26
O2	1	13:16:13	13:16:28	High	Local	21.63	21.26	21.26
O2	1	13:30:49	13:31:03	Zero	Pre SB	0.11	0.00	21.26
O2	1	13:23:46	13:24:00	Mid	Pre SB	10.13	10.00	21.26
O2	1	15:08:16	15:08:30	Zero	Post SB	0.00	0.00	21.26
O2	1	14:52:59	14:53:12	Mid	Post SB	10.10	10.00	21.26
O2	2	16:24:05	16:24:18	Zero	Post SB	0.03	0.00	21.26
O2	2	16:16:44	16:16:57	Mid	Post SB	10.04	10.00	21.26
O2	3	17:36:42	17:36:56	Zero	Post SB	0.00	0.00	21.26
O2	3	17:33:47	17:34:01	Mid	Post SB	10.04	10.00	21.26
CO	1	13:26:04	13:26:18	Zero	Local	0.00	0.00	1600
CO	1	13:26:34	13:26:38	Mid	Local	791.00	800.00	1600
CO	1	13:36:29	13:36:33	High	Local	1,599.00	1,600.00	1600
CO	1	13:46:08	13:46:14	Zero	Pre SB	4.20	0.00	1600
CO	1	13:46:00	13:46:04	Mid	Pre SB	790.20	800.00	1600
CO	1	14:53:26	14:53:39	Zero	Post SB	4.46	0.00	1600
CO	1	15:08:39	15:08:43	Mid	Post SB	790.40	800.00	1600
CO	2	16:16:46	16:16:59	Zero	Post SB	4.57	0.00	1600
CO	2	16:24:19	16:24:23	Mid	Post SB	789.50	800.00	1600
CO	3	17:33:48	17:34:03	Zero	Post SB	4.70	0.00	1600
CO	3	17:36:57	17:37:00	Mid	Post SB	788.30	800.00	1600
NOx	1	13:17:01	13:17:16	Zero	Local	0.90	0.00	101.6
NOx	1	13:13:26	13:13:40	Mid	Local	50.10	50.24	101.6
NOx	1	13:08:07	13:08:21	High	Local	102.12	101.60	101.6
NOx	1	13:26:32	13:28:27	Zero	Pre SB	3.33	0.00	101.6
NOx	1	13:30:37	13:30:50	Mid	Pre SB	50.19	50.24	101.6
NOx	1	14:56:59	14:57:13	Zero	Post SB	3.90	0.00	101.6
NOx	1	15:08:43	15:08:47	Mid	Post SB	50.40	50.24	101.6
NOx	2	16:16:49	16:17:02	Zero	Post SB	3.90	0.00	101.6
NOx	2	16:24:09	16:24:13	Mid	Post SB	50.10	50.24	101.6

Channel	Test #	Start Time	Stop Time	Z/M/H	Local/Sys Bias	Actual Value	Cylinder Value	Span
NOx	3	17:34:03	17:34:17	Zero	Post SB	3.79	0.00	101.6
NOx	3	17:36:57	17:37:00	Mid	Post SB	50.30	50.24	101.6



# CERTIFICATE OF ANALYSIS

## Grade of Product: EPA Protocol

Airgas Specialty Gases  
12722 S. Wentworth Avenue  
Chicago, IL 60628  
1-773-785-3000  
FAX: 1-773-785-1928  
www.airgas.com

Part Number: E03NI80E15A0138  
Cylinder Number: CC157271  
Laboratory: ASG - Chicago - IL  
Analysis Date: Oct 27, 2009

Reference Number: 54-124195104-7A  
Cylinder Volume: 151 Cu.Ft.  
Cylinder Pressure: 2015 PSIG  
Valve Outlet: 590

Expiration Date: Oct 27, 2012

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

### ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty
CARBON DIOXIDE	10.00 %	10.08 %	G1	+/- 1% NIST Traceable
OXYGEN	10.00 %	10.10 %	G1	+/- 1% NIST Traceable
NITROGEN	Balance			

### CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM/CO2	1	CC59142	13.78% CARBON DIOXIDE/	Oct 02, 2012
NTRM/O2	82658	SG9168259BAL	16.04% OXYGEN/	Jan 01, 2010

### ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
HORIBA 510	NDIR	Oct 21, 2009
HORIBA MPA-510	Paramagnetic	Oct 21, 2009

Triad Data Available Upon Request

Notes:

QA Approval

## CERTIFICATE OF ANALYSIS

### Grade of Product: EPA Protocol

Part Number: E03NI60E15A0286      Reference Number: 54-124192363-4  
Cylinder Number: CC141864      Cylinder Volume: 160 Cu.Ft.  
Laboratory: ASG - Chicago - IL      Cylinder Pressure: 2015 PSIG  
Analysis Date: Sep 30, 2009      Valve Outlet: 590

Expiration Date: Sep 30, 2012

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

ANALYTICAL RESULTS				
Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty
CARBON DIOXIDE	20.00 %	19.71 %	G1	+/- 1% NIST Traceable
OXYGEN	20.00 %	19.92 %	G1	+/- 1% NIST Traceable
NITROGEN	Balance			

CALIBRATION STANDARDS				
Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM/O2	60608	CC206109	22.51% OXYGEN/NITROGEN	May 01, 2010
NTRM/CO2	40604	XC034327B	19.84% CARBON DIOXIDE/	May 15, 2012

ANALYTICAL EQUIPMENT		
Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
HORIBA 510	NDIR	Sep 21, 2009
HORIBA MPA-510	Paramagnetic	Sep 21, 2009

Triad Data Available Upon Request

Notes:



QA Approval

## CERTIFICATE OF ANALYSIS

### Grade of Product: EPA Protocol

Part Number: E04NI99E15A0078      Reference Number: 54-124173526-7  
Cylinder Number: SG9152840      Cylinder Volume: 144 Cu.Ft.  
Laboratory: ASG - Chicago - IL      Cylinder Pressure: 2015 PSIG  
Analysis Date: Apr 14, 2009      Valve Outlet: 660

Expiration Date: Apr 14, 2011

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

ANALYTICAL RESULTS				
Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty
CARBON MONOXIDE	50.00 PPM	49.87 PPM	G1	+/- 1% NIST Traceable
NITRIC OXIDE	50.00 PPM	50.24 PPM	G1	+/- 1% NIST Traceable
SULFUR DIOXIDE	50.00 PPM	50.64 PPM	G1	+/- 1% NIST Traceable
NITROGEN	Balance			

Total oxides of nitrogen

50.27 PPM

For Reference Only

CALIBRATION STANDARDS				
Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM/CO	5120307	CC180376	49.33PPM CARBON MONOXIDE/NITROGEN	Feb 02, 2013
NTRM/SO2	052405	CC207614	45.91PPM SULFUR DIOXIDE/	Sep 12, 2010
NTRM/NO	2786	CC220043	95.96PPM NITRIC OXIDE/NITROGEN	Sep 01, 2010

ANALYTICAL EQUIPMENT		
Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet Nexus	FTIR	Apr 06, 2009
Nicolet Nexus	FTIR	Apr 06, 2009
Thermo 6700	FTIR	Apr 06, 2009

Triad Data Available Upon Request

Notes:

*Ant Stewart*

QA Approval

## CERTIFICATE OF ANALYSIS

### Grade of Product: EPA Protocol

Part Number: E04NI99E15A0568      Reference Number: 54-124173526-8  
Cylinder Number: CC175979      Cylinder Volume: 144 Cu.Ft.  
Laboratory: ASG - Chicago - IL      Cylinder Pressure: 2015 PSIG  
Analysis Date: Apr 14, 2009      Valve Outlet: 660

Expiration Date: Apr 14, 2011

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

#### ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty
CARBON MONOXIDE	100.0 PPM	101.0 PPM	G1	+/- 1% NIST Traceable
NITRIC OXIDE	100.0 PPM	101.6 PPM	G1	+/- 1% NIST Traceable
SULFUR DIOXIDE	100.0 PPM	101.0 PPM	G1	+/- 1% NIST Traceable
NITROGEN	Balance			

Total oxides of nitrogen

101.9 PPM

For Reference Only

#### CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM/NO	2786	CC220043	95.96PPM NITRIC OXIDE/NITROGEN	Sep 01, 2010
NTRM/CO	09060521	CC280705	98.88PPM CARBON MONOXIDE/	Feb 11, 2013
NTRM/SO2	10509	SG9196968BAL	173.0PPM SULFUR DIOXIDE/	May 01, 2011

#### ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet Nexus	FTIR	Apr 06, 2009
Nicolet Nexus	FTIR	Apr 06, 2009
Thermo 6700	FTIR	Apr 06, 2009

Triad Data Available Upon Request

Notes:

*Ant Heint*

QA Approval



**AIR LIQUIDE**Scott Specialty Gases  
Air Liquide America Specialty Gases LLC**RATA CLASS***Dual-Analyzed Calibration Standard*

1290 COMBERMERE STREET, TROY, MI 48083

Phone: 248-589-2950

Fax: 248-589-2134

**CERTIFICATE OF ACCURACY: Interference Free™ Multi-Component EPA Protocol Gas****Assay Laboratory**AIR LIQUIDE AMERICA SPECIALTY GASES LLC  
1290 COMBERMERE STREET  
TROY, MI 48083

P.O. No.: 2024

Project No.: 05-67700-005

**Customer**

EAGLE MOUNTAIN SCIENTIFIC, INC.

BRIAN DURKOP/PO#2024  
8905 AUTUMN OAKS DRIVE  
SUITE 2  
ROCKFORD MN 55373**ANALYTICAL INFORMATION**

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

**Cylinder Number:** ALM018587**Certification Date:** 13Aug2008**Exp. Date:** 13Aug2010**Cylinder Pressure\*\*\*:** 1908 PSIG

COMPONENT	CERTIFIED CONCENTRATION (Moles)		ACCURACY**	TRACEABILITY
CARBON MONOXIDE	792.3	PPM	+/- 1%	Direct NIST and NMI
NITRIC OXIDE	805.3	PPM	+/- 1%	Direct NIST and NMI
SULFUR DIOXIDE *	802.6	PPM	+/- 1%	Direct NIST and NMI
NITROGEN - OXYGEN FREE		BALANCE		
TOTAL OXIDES OF NITROGEN	805.3	PPM		Reference Value Only

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

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

\* This Protocol has been certified using corrected NIST SO2 standard values, per EPA guidance dated 7/24/96 and will not correlate with uncorrected Prot

**REFERENCE STANDARD**

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM 1681	02Oct2010	KAL003086	970.1 PPM	CARBON MONOXIDE
NTRM 1687	01May2011	AAL069441	976.5 PPM	NITRIC OXIDE
NTRM 1662	15May2010	KAL003112	975.0 PPM	SULFUR DIOXIDE

**INSTRUMENTATION**

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
FTIR//0928621	17Jul2008	FTIR
FTIR//0928621	31Jul2008	FTIR
FTIR//0928621	24Jul2008	FTIR

**ANALYZER READINGS**

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

**First Triad Analysis****CARBON MONOXIDE**

Date: 05Aug2008 Response Unit: PPM

Z1 = -0.02058 R1 = 977.2510 T1 = 798.3232  
R2 = 978.6576 Z2 = 0.04281 T2 = 798.6131  
Z3 = 0.10202 T3 = 798.8743 R3 = 979.4651  
Avg. Concentration: 791.8 PPM**Second Triad Analysis**

Date: 13Aug2008 Response Unit: PPM

Z1 = 0.04564 R1 = 975.0421 T1 = 796.7558  
R2 = 975.1014 Z2 = 0.13491 T2 = 796.8061  
Z3 = 0.13831 T3 = 797.6488 R3 = 975.8562  
Avg. Concentration: 792.8 PPM**Calibration Curve**Concentration = A + Bx + Cx<sup>2</sup> + Dx<sup>3</sup> + Ex<sup>4</sup>

r = 9.99965E-1

Constants: A = 0.00000E+0  
B = 8.14010E-1 C = 4.25000E-4  
D = 0.00000E+0 E = 0.00000E+0**NITRIC OXIDE**

Date: 05Aug2008 Response Unit: PPM

Z1 = -0.41669 R1 = 972.1114 T1 = 802.2248  
R2 = 973.6078 Z2 = -0.25583 T2 = 802.4943  
Z3 = -0.20831 T3 = 802.9935 R3 = 974.2383  
Avg. Concentration: 805.2 PPM

Date: 13Aug2008 Response Unit: PPM

Z1 = -0.17952 R1 = 970.3264 T1 = 801.6028  
R2 = 971.9733 Z2 = 0.01377 T2 = 801.6397  
Z3 = 0.10410 T3 = 801.8339 R3 = 973.7586  
Avg. Concentration: 805.4 PPMConcentration = A + Bx + Cx<sup>2</sup> + Dx<sup>3</sup> + Ex<sup>4</sup>

r = 9.99993E-1

Constants: A = 0.00000E+0  
B = 9.60382E-1 C = 1.34000E-4  
D = 0.00000E+0 E = 0.00000E+0**SULFUR DIOXIDE \***

Date: 05Aug2008 Response Unit: PPM

Z1 = -0.11769 R1 = 508.7850 T1 = 807.8456  
R2 = 509.3493 Z2 = -0.05980 T2 = 808.2460  
Z3 = 0.38021 T3 = 810.2842 R3 = 510.6563  
Avg. Concentration: 803.7 PPM

Date: 13Aug2008 Response Unit: PPM

Z1 = -1.10644 R1 = 980.7738 T1 = 806.0565  
R2 = 980.9421 Z2 = -0.00007 T2 = 806.4725  
Z3 = 0.10465 T3 = 806.5946 R3 = 981.4465  
Avg. Concentration: 801.5 PPMConcentration = A + Bx + Cx<sup>2</sup> + Dx<sup>3</sup> + Ex<sup>4</sup>

r = 9.99994E-1

Constants: A = 0.00000E+0  
B = 1.00604E+0 C = 4.00000E-6  
D = 0.00000E+0 E = 0.00000E+0

APPROVED BY:

Rob McCrandall

902630 Seneca  
217 of 234



Air Liquide America  
Specialty Gases LLC



# RATA CLASS

Dual-Analyzed Calibration Standard

1290 COMBERMERE STREET, TROY, MI 48083

Phone: 248-589-2950

Fax: 248-589-2134

## CERTIFICATE OF ACCURACY: Interference Free™ Multi-Component EPA Protocol Gas

### Assay Laboratory

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

P.O. No.: 2098

Project No.: 05-72612-003

### Customer

EAGLE MOUNTAIN SCIENTIFIC, INC.

PO#2098  
8905 AUTUMN OAKS DRIVE  
SUITE 2  
ROCKFORD MN 55373

### ANALYTICAL INFORMATION

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

Cylinder Number: ALM047942

Certification Date: 30Jan2009

Exp. Date: 30Jan2011

Cylinder Pressure\*\*\*: 1951 PSIG

COMPONENT	CERTIFIED CONCENTRATION (Moles)		ACCURACY**	TRACEABILITY
CARBON MONOXIDE	1,600	PPM	+/- 1%	Direct NIST and NMi
NITRIC OXIDE	1,610	PPM	+/- 1%	Direct NIST and NMi
SULFUR DIOXIDE *	1,560	PPM	+/- 1%	Direct NIST and NMi
NITROGEN - OXYGEN FREE		BALANCE		
TOTAL OXIDES OF NITROGEN	1,610.	PPM		Reference Value Only

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

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

\* This Protocol has been certified using corrected NIST SO2 standard values, per EPA guidance dated 7/24/96 and will not correlate with uncorrected Pro

### REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM 2637	01Aug2009	ALM025684	2505. PPM	CARBON MONOXIDE
NTRM 2631	01May2011	ALM041808	2780. PPM	NITRIC OXIDE
NTRM 1664	02Oct2011	AAL045456	2402. PPM	SULFUR DIOXIDE

### INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
FTIR//0928621	09Jan2009	FTIR
FTIR//0928621	08Jan2009	FTIR
FTIR//0928621	15Jan2009	FTIR

### ANALYZER READINGS

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

#### First Triad Analysis

##### CARBON MONOXIDE

Date: 23Jan2009 Response Unit:PPM

Z1=0.02383 R1=2510.158 T1=1606.581

R2=2516.082 Z2=0.22198 T2=1606.973

Z3=0.41310 T3=1609.124 R3=2518.733

Avg. Concentration: 1601. PPM

#### Second Triad Analysis

Date: 30Jan2009 Response Unit: PPM

Z1=0.07974 R1=2516.225 T1=1605.622

R2=2517.579 Z2=0.33099 T2=1607.775

Z3=0.45979 T3=1607.776 R3=2520.554

Avg. Concentration: 1599. PPM

#### Calibration Curve

Concentration = A + Bx + Cx2 + Dx3 + Ex4

r = 9.99991E-1

Constants: A = -1.24297E + 4

B = 1.97511E + 0 C = 0.00000E + 0

D = 0.00000E + 0 E = 0.00000E + 0

##### NITRIC OXIDE

Date: 23Jan2009 Response Unit:PPM

Z1=-0.03211 R1=2769.643 T1=1601.764

R2=2771.517 Z2=0.06935 T2=1603.347

Z3=0.39660 T3=1603.359 R3=2772.839

Avg. Concentration: 1608. PPM

Date: 30Jan2009 Response Unit: PPM

Z1=-0.21763 R1=2766.275 T1=1599.920

R2=2771.236 Z2=-0.03458 T2=1601.059

Z3=0.22617 T3=1601.228 R3=2772.362

Avg. Concentration: 1607. PPM

Concentration = A + Bx + Cx2 + Dx3 + Ex4

r = 9.99991E-1

Constants: A = 0.00000E + 0

B = 9.63598E-1 C = 1.26000E-4

D = 0.00000E + 0 E = 0.00000E + 0

##### SULFUR DIOXIDE \*

Date: 23Jan2009 Response Unit:PPM

Z1=-0.26695 R1=2402.019 T1=1563.625

R2=2403.218 Z2=0.35950 T2=1564.126

Z3=0.63436 T3=1564.646 R3=2404.900

Avg. Concentration: 1563. PPM

Date: 30Jan2009 Response Unit: PPM

Z1=-0.33107 R1=2408.827 T1=1562.751

R2=2410.286 Z2=0.14648 T2=1564.201

Z3=0.28544 T3=1565.602 R3=2410.589

Avg. Concentration: 1559. PPM

Concentration = A + Bx + Cx2 + Dx3 + Ex4

r = 9.99994E-1

Constants: A = 0.00000E + 0

B = 1.00552E + 0 C = 4.00000E-6

D = 0.00000E + 0 E = 0.00000E + 0

APPROVED BY:

Rob McCrandall

902630 Seneca  
218 of 234

# NOx Converter Efficiency Test

40 CFR Part 60, Method 20, Section 5.6.1 - Tedlar Bag

NOx Highest Peak (ppm)

NOx End of Test (ppm)

2 / 1 / 2010

▼

Date

5 : 40 : 00 PM

▲

▼

Start Time

6 : 10 : 00 PM

▲

▼

End Time

Directions: Fill a Tedlar bag with the mid value NOx and the 20% O2 about 50/50. Connect the bag immediately to the NOx analyzer directly in the back for 30 minutes.

NOx Converter Efficiency

< 2% Allowed

Or Alternate Method

EPA Alternate Document ALT-013 - NO2 Protocol 1 Bottle

51.16

NOx Bottle Value (ppm)

48.1

NOx Stable Reading (ppm)

3 / 17 / 2010

▼

Date

2 : 04 : 00 PM

▲

▼

Start Time

2 : 04 : 59 PM

▲

▼

End Time

Directions: Introduce NO2 Protocol 1 calibration gas directly into the analyzer in NOx mode. Gas must be between 40 to 60 ppm.

94.02

NOx Converter Efficiency

Pass

>= 90% Allowed

Clear

NO2 Gas

Valve

4

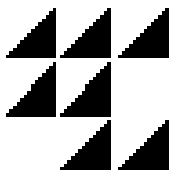
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## **Appendix F**

### **Test Plan**



**METROPOLITAN COUNCIL ENVIRONMENTAL SERVICES TEST PLAN  
SOURCE EMISSION INFORMATION COLLECTION REQUEST (ICR) SEWAGE  
SLUDGE INCINERATORS AT THE MCES SENECA PLANT**

Date Test Plan Written (/revised): 1/31/2010  
Scheduled Test Dates: (See Part VI, Item No.3)

**PART I. GENERAL INFORMATION**

1. Emission Facility: ..... Metropolitan Council Environmental Services  
Metropolitan Wastewater Treatment Plant  
  
Correspondence To: ..... Mary Gail Scott  
Environmental Compliance Manager  
390 Robert St N  
St. Paul, Minnesota 55101-1805  
Phone: (651) 602-1073 Fax: (651) 602-1130  
Email: [marygail.scott@metc.state.mn.us](mailto:marygail.scott@metc.state.mn.us)
2. Facility Contact Person: ..... David Quast, Principal Engineer  
Metropolitan Wastewater Treatment Plant  
2400 Childs Road  
St. Paul, MN 55106-6724  
Phone: (651) 602-8297 Fax: (651) 602-8846  
Email: [david.quast@metc.state.mn.us](mailto:david.quast@metc.state.mn.us)
3. MPCA File/Permit Number: ..... Permit # 03700043-4, AQ file No. 879A
4. Reason for Tests: ..... EPA Section 114 ICR request
5. Sources to be tested: ..... E.U. 001, Incinerator No. 1
6. Physical Location of Source: ..... Stationary sources located at:  
Seneca Wastewater Treatment Plant  
3750 Plant Road  
Eagan, MN 55122
7. Testing Company: ..... Eagle Mountain Scientific  
8905 Autumn Oaks Drive, Suite 2  
Rockford, Mn 55373  
Phone: (763) 477-4462  
Fax: (763) 477-5991  
Contact: Brian Durkop  
[bdurkop@eagle-msi.com](mailto:bdurkop@eagle-msi.com)

## PART II. TESTING REQUIREMENTS

1. Pollutants to be tested by request of EPA Sewage Sludge Incineration Information Collection Request.

Pollutant	Test Methods	Length of Test Run (3 each)	Target Reported Units of Measure
SO <sub>2</sub>	EPA Method 6C	60 minutes	ppmdv @ 7% O <sub>2</sub>
NO <sub>x</sub>	EPA Method 7E	60 minutes	ppmdv @ 7% O <sub>2</sub>
CO	EPA Method 10	60 minutes	ppmdv @ 7% O <sub>2</sub>
D/F, PCB*, PAH **	EPA Method 23 with CARB 429 analysis	240 minutes or 4.0 m <sup>3</sup>	ng/dscm @ 7% O <sub>2</sub> ug/dscm @ 7% O <sub>2</sub>
HCl/HF	EPA Method 26	240 minutes	lb/dry ton
PM 2.5	OTM 27	240 minutes	lb/dry ton
PM condensable	OTM 28	240 minutes	lb/dry ton

\* 12 PCB congeners, isotope dilution mass spectrometry combined with high resolution GC

\*\* High resolution GCMS

Proximate and Ultimate fuel analysis samples shall be taken and for each run

### PART III. OPERATING CONDITIONS

1. General operating parameters for each emission point to be tested:

Emission Unit 001	<b>Process Equipment Description:</b> EU 001 or Incinerator # 1 is a BSP Envirotech multiple hearth unit. The incinerator has seven hearths which normally fire 1.2 to 1.6 tons of dry sludge per hour. The unit is equipped to use natural gas as an auxiliary fuel. Pollution control is facilitated by an after burner, venturi scrubber and aftercooler. The effluent is exhausted to a common stack shared with EU 002. During testing the alternate incinerator will be locked out to ensure that exhaust gases in the stack are from the tested unit.
	<b>Process Rates/Operating Conditions During Test:</b> Sludge Feed Rate: Maximized, Approx. 1.2 - 1.6 dry tons per hour Natural Gas Consumption: Estimated @ 0 - 4000 cu ft/hr
	<b>Control Equipment Description:</b> The incinerator is equipped with an afterburner, a venturi, and an aftercooler.
	<b>Control Equipment Operating Parameters During Test:</b> Afterburner Operating temperature..... 1050-1400 °F Residence time ..... 1.2-1.6 sec. Gas oxygen content..... 5-7.5 %v/v Venturi scrubber Total water flow rate ..... 500-900gpm Pressure drop ..... 15-22 in WC After-cooler Water flow rate.....400-600 gpm. Inlet gas temperature ..... 140-190 °F

2. Auxiliary Fuel Description: Natural gas will be used as an auxiliary fuel if needed.

3. Normal range of process or operating rates for each emission unit:

Emission Units	Normal Range of Process or Operating Rates
EU 001	1.2 to 1.6 dry tons of sludge per hour

4. Description of how process equipment will be monitored:

<b>Emission Units</b>	<b>Process Equipment Description</b>	<b>Description of Process Monitoring During Testing</b>
EU 001	Sludge feed rate	Mag. meters - data recorded by plant computer, and laboratory solids analysis.
	Natural gas consumption	Gas meter - data recorded by plant computer

5. Description of how air pollution control equipment will be monitored:

<b>Emission Units</b>	<b>Control Equipment Description</b>	<b>Description of Control Equipment Monitoring During Testing</b>
EU 001	Afterburner temperature	Thermocouple - data recorded by plant computer
	Afterburner residence time	Afterburner volume divided by exhaust gas volumetric flow rate measured during testing
	Gas oxygen content	Rosemount oxygen meter in the afterburner - data recorded by plant computer.
	Scrubber water flow	Water flow meter - data recorded by plant computer.
	Scrubber temperature	Thermocouple - data recorded by plant computer.
	Scrubber pressure drop	Differential pressure sensor - data recorded by plant computer.

6. Testing schedule.

A proposed test schedule is listed below. It is a tentative schedule, subject to change regarding the availability of specific emission points, or other unavoidable delays due to weather, unscheduled maintenance, etc.

<b>Test Date</b>	<b>Emission Unit</b>	<b>Testing Method</b>
February 15, 2010	-	Setup
February 16, 2010	Unit 1	EPA 6C, 7E, 10, 23, 26, OTM-27/28
February 17, 2010	Unit 1	EPA 6C, 7E, 10, 23, 26, OTM-27/28

Note: See Attached Detailed Schedule (Figure 2)



#### **PART IV. TEST METHODS**

The table presented in Part II of this test plan outlines the test methodology that will be used by the stack-testing vendor. Further details on test methods to be conducted on each unit are provided below.

- EPA Method 1 for the location of sampling ports and points, once before testing.
- EPA Method 2 for velocity and volumetric flow rate. One measurement concurrently with each test run for every pollutant.
- EPA Method 3A for gas analysis. One integrated sample taken concurrently with each test run for every pollutant.
- EPA Method 4 for the determination of moisture in the flue gases. One test run concurrently with each test run for every pollutant.
- OTM-027 and OTM-028, for the determination of particulate matter less than 2.5 microns and including total condensable particulate. Three, four-hour runs are required. Total particulate matter will be determined by including the cyclone catch in a separate analysis. Total particulate, particulate matter less than 2.5 microns, condensable organics (back-half) and inorganic condensable (back-half) shall be reported in gr/dscf and mg/dsm<sup>3</sup> corrected to 7% O<sub>2</sub>. Oxygen or carbon dioxide diluent shall be obtained simultaneously with each pollutant run.
- EPA Method 23 for Dioxin/Furans, PCB's and PAH. Three, four-hour runs are required or 4 dsm<sup>3</sup> of sample collected. Diluent concentrations shall be obtained simultaneously with each Method 23 test run. Total tetra through octa dibenzo-p-dioxins and dibenzofuran, Electronic Reporting Tool Version 3 listed semi-volatile and PCB compounds shall be reported in ng/dsm<sup>3</sup> corrected to 7% O<sub>2</sub>.
- EPA Method 26(Modified) for HCL. Three, one-hour runs. Method modified to use large impingers for greater repeatability and detection limits. Same as Method 26A only non-isokinetic.

**Figure 1**

**Stack Information (Metropolitan Council, Seneca, 1, Stack)**

Stack Diameter  feet  inches  54 Area 15.9 ft<sup>2</sup>

Points per Diameter  Diameter 54 inches

Port Depth  inches Eff Diameter inches

☒ Circular Stack ☐ Square Stack

**Applicable Regulation**

☒ 40 CFR Part 75 ☐ 40 CFR Part 60 ☐ Both

**Gas Points**

- ☒ Stratification Failed or Not Conducted ☐ 12 Pt Strat Test Passed <= 5%
- ☐ No Stratification ☐ 12 Pt Strat Test Passed <= 10%
- ☐ Stratification Unknown ☐ 6 Pt Strat Test Passed <= 5%
- ☐ 3 Pt Strat Test Passed <= 5%

**NOTE: Select a measurement line that passed through the center of the duct in a direction through the stratification.**

**Moisture Points**

☐ Moisture RATA ☐ Convert Wet to Dry ☒ Flow Only

**Particulate and Flow Points**

Distance Upstream from Flow Disturbance (A)  912 Inches

Distance Downstream from Flow Disturbance (B)  552 Inches

# of Ports  2

☒ Particulate ☐ PM-10 ☐ Flow

Clear

**Gas RATA Points**

Long Measurement Line

Stratification Points

Point 1 9.02 Inches  
Point 2 27 Inches  
Point 3 44.98 Inches

Point 1 Inches  
Point 2 Inches  
Point 3 Inches  
Point 4 Inches  
Point 5 Inches  
Point 6 Inches  
Point 7 Inches  
Point 8 Inches  
Point 9 Inches  
Point 10 Inches  
Point 11 Inches  
Point 12 Inches

**Moisture Points**

Single Point

**Single point allowed for MW determination.**

Point 1 40 Inches

**Particulate and Flow Points**

Number of Points 12  
Duct Diameters A 16.8889  
Duct Diameters B 10.2222

Point 1 2.38 Inches  
Point 2 7.88 Inches  
Point 3 15.98 Inches  
Point 4 38.02 Inches  
Point 5 46.12 Inches  
Point 6 51.62 Inches

Point 7 Inches  
Point 8 Inches  
Point 9 Inches  
Point 10 Inches  
Point 11 Inches  
Point 12 Inches

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## Figure 2

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**Test Plan**  
**MCES Seneca Plant Test Plan**

**1/29/2010**

**Facility Information:**

MCES Seneca Wastewater Treatment Plant		
3750 Plant Road		
Eagan	MN	55122-1093
<b>Contact:</b> David Quast		
<b>Phone:</b> 651-602-8297		
<b>Fax:</b> 651-602-8846		
<b>Email:</b> david.quast@metc.state.mn.us		

**Testing Company:**

Eagle Mountain Scientific, Inc		
8905 Autumn Oaks Drive		
Suite 2		
Rockford	MN	55373
<b>Contact:</b> Brian Durkop		
<b>Phone:</b> 763-477-4462		
<b>Fax:</b> 763-477-5991		
<b>Email:</b> bdurkop@eagle-msi.com		

**Industry NAICS:** 221320      **AFS #:** 2703700043      **FRS #:** 110000545410

**Air Permit Number:**

03700043-4

**Permitted Source ID/Name:**

EU001      Incinerator 1

**Permitted Maximum Process Rate:**

1.51 dry tons/hr

**Max. Normal Operation Process Rate:**

1.2 to 1.6 dry tons of sludge per

**Target Process Test Rate**

1.2 to 1.6 dry tons of sludge

**SCC / Description** 50100515      Waste Disposal - Solid Waste Disposal - Government - Other Incineration - Sludge; Multiple Hearth

**1. What is the specific purpose for the proposed testing?**

EPA Section 114 ICR request.

**2. List all state and federal regulations that apply to the proposed testing:**

**3. Will the test results be used for other regulatory purposes (e.g., emission inventories, permit applications, etc.) beyond that stated above? If yes, explain.**

**4a. Enter the process data to be documented during testing.**

Process Parameter	Units	Target Value	Comments
Dry Sludge Feed Rate	Tons of Dry Sludge per Hour	1.4	1.2-1.6 dry tons per hour
Reactor Off Gas Oxygen	%		
Reactor Exit Gas Temperature	F		
Reactor Bed Temperature	F		
Wet Sludge Feed Rate	Wet Tons/hr		
Natural Gas Consumption	cu ft/hr	2000	0-4000 cu ft/hr

**4b. Enter the process lab data to be documented during testing.**

Analysis Required	Units	Comments
GCV	Btu/lb dry	

**Test Plan**  
**MCES Seneca Plant Test Plan**

**1/29/2010**

Moisture	%	
Moisture		
Moisture		
Ash	% dry	
Volatile Matter	% dry	
Fixed Carbon	% dry	
Carbon	% dry	
Hydrogen	% dry	
Nitrogen	% dry	
Sulfur	% dry	
Oxygen	% dry	
Ash	% As Recv	
Volatile Matter	% As Recv	
Fixed Carbon	% As Recv	
Carbon	% As Recv	
Hydrogen	% As Recv	
Nitrogen	% As Recv	
Sulfur	% As Recv	
Oxygen	% As Recv	
GCV	Btu/lb, Recv	

**5a. Please give a brief description of the source (including control equipment) and attach source or process flow diagram:**

EU 001 or Incinerator # 1 is a BSP Envirotech multiple hearth unit. The incinerator has seven hearths which normally fire 1.2 to 1.6 tons of dry sludge per hour. The unit is equipped to use natural gas as an auxiliary fuel. Pollution control is facilitated by an after burner, venturi scrubber and aftercooler. The effluent is exhausted to a common stack shared with EU 002. During testing the alternate incinerator will be locked out to ensure that exhaust gases in the stack are from the tested unit.

**5b. Control Devices:**

Control Device Name
VENTURI SCRUBBER
VENTURI SCRUBBER
AFTERBURNER
AFTERBURNER
AFTERBURNER
AFTERCOOLER
AFTERCOOLER

**6. Please enter sampling location information.**

Location	Round Duct Diam.	Rect. Duct Length /Width		Equiv. Diam	Distance from upstream dist.	Distance from downstream dist.	Number of Traverse Ports	Min.Travers Points
Stack	54	0	0	0	912	552	2	12

**7. Please provide the following information for each test parameter.**

Location	Target Parameter	Test Method	Number of Test Runs	Test Run Duration	Sample Points	Comments
----------	------------------	-------------	---------------------	-------------------	---------------	----------

**Test Plan**  
**MCES Seneca Plant Test Plan**  
**1/29/2010**

Stack	Sulfur Dioxide	Method 6C	3	60	0	
Stack	Nitrogen oxides (NOx)	Method 7E	3	60	0	
Stack	Carbon Monoxide	Method 10	3	60	0	
Stack	Total PM2.5	OTM - 27/28	3	240	0	lb/dry ton
Stack	2,3,3',4,4',5,5'-HpCB	Method 23	3	240	0	
Stack	2,3,3',4,4',5/2,3,3',4,4',5'-HxCB	Method 23	3	240	0	
Stack	2,3,3',4,4',5'-HxCB	Method 23	3	240	0	
Stack	2,3,3',4,4',5-HxCB	Method 23	3	240	0	
Stack	2,3,3',4,4'-PeCB	Method 23	3	240	0	
Stack	2,3',4,4',5,5'-HxCB	Method 23	3	240	0	
Stack	2',3,4,4',5-PeCB	Method 23	3	240	0	
Stack	2,3',4,4',5-PeCB	Method 23	3	240	0	
Stack	2,3,4,4',5-PeCB	Method 23	3	240	0	
Stack	2-Methylnaphthalene	Method 23	3	240	0	
Stack	3,3',4,4',5,5'-HxCB	Method 23	3	240	0	
Stack	3,3',4,4',5-PeCB	Method 23	3	240	0	
Stack	3,3',4,4'-TCB	Method 23	3	240	0	
Stack	3,4,4',5-TCB	Method 23	3	240	0	
Stack	Acenaphthene**	Method 23	3	240	0	
Stack	Acenaphthylene**	Method 23	3	240	0	
Stack	Anthracene**	Method 23	3	240	0	
Stack	Benzo(a)anthracene*	Method 23	3	240	0	
Stack	Benzo(a)pyrene*	Method 23	3	240	0	
Stack	Benzo(b)fluoranthene*	Method 23	3	240	0	
Stack	Benzo(e)pyrene	Method 23	3	240	0	
Stack	Benzo(ghi)perylene**	Method 23	3	240	0	
Stack	Benzo(k)fluoranthene*	Method 23	3	240	0	
Stack	Chrysene*	Method 23	3	240	0	
Stack	Dibenz(a,h)anthracene*	Method 23	3	240	0	
Stack	Fluoranthene**	Method 23	3	240	0	
Stack	Fluorene**	Method 23	3	240	0	
Stack	Indeno(1,2,3-cd)pyrene*	Method 23	3	240	0	
Stack	Naphthalene**	Method 23	3	240	0	
Stack	Perylene	Method 23	3	240	0	
Stack	Phenanthrene**	Method 23	3	240	0	
Stack	Pyrene**	Method 23	3	240	0	
Stack	Total Di-CBs	Method 23	3	240	0	
Stack	Total Dioxins	Method 23	3	240	0	
Stack	Total Furans	Method 23	3	240	0	
Stack	Total Hexa-CBs	Method 23	3	240	0	
Stack	Total Mono-CBs	Method 23	3	240	0	
Stack	Total Nona-CBs	Method 23	3	240	0	



**Test Plan**  
**MCES Seneca Plant Test Plan**

**1/29/2010**

Stack	Total Octa-CBs	Method 23	3	240	0	
Stack	Total Penta-CBs	Method 23	3	240	0	
Stack	Total Tetra-CBs	Method 23	3	240	0	
Stack	Total Tri-CBs	Method 23	3	240	0	
Stack	Hydrogen Chloride	Method 26	3	240	0	lb/dry ton
Stack	Hydrogen Fluoride	Method 26	3	240	0	lb/dry ton

**7b. Please select the Emissions / Concentrations for each location.**

Location	Test Method	Emissions / Concentrations	Corrected Analyte	Corrected Percent
Stack	Method 6C	ppm corrected	O2	7
Stack	Method 10	ppm corrected	O2	7
Stack	Method 7E	ppm corrected	O2	7
Stack	Method 23	ng/dscm corrected	O2	7
Stack	Method 23	ug/dscm corrected	O2	7

**8. Describe below or attach complete documentation of all modifications and/or deviations to the applicable test methods. If alternative methods requested, attach documentation of request**

☐ Yes ☒ No

**9. Does the proposed sampling location meet the minimum EPA Method 1 criteria for acceptable measurement sites? Please list below or attach the supporting documentation.**

☒ Yes ☐ No

**10. Has absence of cyclonic flow been verified per EPA Method 1 (Section 2.4)? If no, absence of cyclonic flow must be verified prior to testing. If yes, please attach supporting documentation.**

☐ Yes ☒ No

**11. Select the method that will determine the oxygen concentration :**

M3A-instrumental

**12. Do any of the proposed test methods require analysis of EPA audit samples? If yes, notify Regional Office at least 45 days prior to testing to allow for audit sample preparation and shipment.**

☐ Yes ☒ No

**13. Has all testing equipment been calibrated within the past year? If no, please explain.**

☒ Yes ☐ No

**14. Will all calibration gases be certified by EPA Traceability Protocol procedures? If No, describe certification procedure below.**

☒ Yes ☐ No ☐ N/A

**Test Plan**  
**MCES Seneca Plant Test Plan**

**1/29/2010**

**15. Is a dilution system (via EPA Method 205) proposed?**

☐ Yes ☒ No ☐ N/A

**16. If applicable, list the expected calibration gas concentrations for all proposed instrumental test methods. Include as much information as is known at this time.**

**17. What is the proposed test schedule?**

Setup- Febraury 15, 2010  
Test- February 16-17, 2010

**18. Additional comments:**

Emission concentrations for HCl, HF and PM2.5 will be reported in lb/ton dry sludge burned

**19. Required Personal Protection Equipment:**

Safety glasses with side shields, Steel toed boots, Hard Hat

---

**Permitted Facility Representative**      **Date**  
**Name:**  
**Title:**  
**Company:**  
**Sign Date:**

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**Testing Company Representative**      **Date**  
**Name:**  
**Title:**  
**Company:**  
**Sign Date:**