SEWAGE SLUDGE INCINERATOR
SECTION 114 TEST REPORT
ALCOSAN
PITTSBURGH, PENNSYLVANIA

Testing Dates: March 24, 25, and 26, 2010

Report Date: May 14, 2010

Prepared for:

Collective Efforts, LLC
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Pittsburgh, Pennsylvania 15229

Prepared by:

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PA Lab Registration #: 02-742

Project No. 10-068

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AIR/COMPLIANCE CONSULTANTS, INC.

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1 INTRODUCTION

Air/Compliance Consultants, Inc. (ACCI) was contracted by Collective Efforts, LLC to perform emissions testing on the sewage sludge incinerator (SSI) at the Alcosan facility in Pittsburgh, Pennsylvania. The purpose of the testing was to comply with the requirements of the United States Environmental Protection Agency (USEPA) information collection request (ICR) for SSI units. All testing was performed using the methodology detailed in the United States Environmental Protection Agency (USEPA) Code of Federal Regulations (CFR) 40 Part 60, Appendices and utilizing the enclosures from the ICR.

2 TEST DATE AND PERSONNEL

Testing was conducted on March 24, 25, and 26, 2010. ACCI testing personnel consisted of Mr. William Ondriezek, QSTI, Senior Scientist II; Mr. Eric White, QSTI, Project Scientist; Mr. Rob Frey, Vice President; Mr. Josh Varner, QSTI, Scientist; and Mr. Chris Bender and Mr. Christian Bartley, Scientists. Ms Susan English represented Collective Efforts for the test program. Mr. Bob Martire represented Alcosan and Messrs. Bill Rausch and Greg Poindexter represented the Allegheny County Health Department (ACHD). The following tables detail the contact personnel regarding this test program and the laboratories used for analyses:

FACILITY	CONSULTANT	TESTING FIRM
Mr. Bob Martire Alcosan 3300 Preble Avenue Pittsburgh, Pennsylvania 15233 (412) 734-8742 – Telephone (412) 734-8740 – Facsimile Robert.martire@alcosan.org	Ms. Susan K. English, PE Collective Efforts, LLC 462 Perry Highway, 2nd Floor Pittsburgh, Pennsylvania 15229 (412) 459-0114 – Telephone (412) 459-0117 – Facsimile senglish@collectiveefforts.com	Mr. William J. Ondriezek, Jr. Air/Compliance Consultants, Inc. 1050 William Pitt Way Pittsburgh, Pennsylvania 15238 (412) 826-3636 – Telephone (412) 826-3640 – Facsimile wondriezek@air-comp.com

USEPA METHOD 5/OTM28	USEPA METHODS 23, 26A, AND 29
Air/Compliance Consultants, Inc. Mr. Robert Frey 1050 William Pitt Way Pittsburgh, Pennsylvania 15238 (412) 826-3636 –Telephone rfrey@air-comp.com PA Lab Registration #02-742	Maxxam Analytics Inc. Mr. Clayton Johnson 5555 North Service Road Burlington, Ontario, L7L5H7 (905) 332-8788 –Telephone clayton.johnson@maxxamanalytics.com PA Lab Registration #06-353

3 PROCEDURES

3.1 Fieldwork

All source testing was conducted in accordance with CFR Title 40, Part 60, Appendix A, USEPA Methods 1 through 5/OTM-28, 6C, 7E, 10, 23, 26A, 29, 205, and the procedures outlined in the ICR enclosure.

3.1.1 Field Data Sheets

All field data sheets for the test procedures described below are included in Appendix A.

3.1.2 Testing Stations and Traverse Locations

The principles of USEPA Method 1, *Sample and Velocity Traverses for Stationary Sources*, were utilized to determine the number and location of the traverse points for the duct.

The sampling station for the collection of gas-flow data was located at the breeching duct of the SSI stack. The inside diameter (ID) of the stack, at the sampling location, was 36.5". The nearest upstream disturbance is 3.75' (1.2 duct diameters) and the nearest downstream disturbance is 12.5' (4.1 duct diameters) from the testing location. A total of 24 traverse points were chosen with 12 points sampled in each of 2 test ports (Figure 1). A copy of the cyclonic flow check data is included with the field data sheets in Appendix A.

3.1.3 Gas Flow and Temperature Measurements

The gas flow rate and temperature profiles for the gas stream were measured by conducting simultaneous velocity and temperature traverses during each sampling run. Gas velocity head was measured using a calibrated S-type Pitot tube that was connected to a manometer. The static

pressure was measured using the same Pitot tube and manometer. A Chrome-Alumel thermocouple attached to a digital indicator was used to measure the gas temperature at each of the traverse points. The gas flow and temperature measurements followed the principles of USEPA Method 2, *Determination of Stack Gas Velocity and Volumetric Flow Rate (S-Type Pitot Tube).*

3.1.4 CO_2 and O_2 Determination

The principles of USEPA Method 3A, *Gas Analysis for the Determination of Dry Molecular Weight, Instrumental Analyzer Procedure,* were utilized for the determination of oxygen (O_2) and carbon dioxide (CO_2) for the test program. A paramagnetic analyzer was used to continuously measure O_2 concentrations and a non-dispersive infrared (NDIR) analyzer was used to continuously measure CO_2 concentrations. An extractive gas-conditioning system was used to convey the sample to the gas analyzers. Nitrogen (N_2) concentration was determined by the difference.

3.1.5 Moisture Content Sampling

Moisture content sampling was conducted concurrently with each sampling run using the principles and sampling apparatus presented in USEPA Method 4, *Determination of Moisture Content in Stack Gases.* The parameters evaluated to determine the gas-stream moisture content were: sample gas volume, temperature and pressure, and impinger and silica gel moisture gain.

3.1.6 Total Particulate Matter Determinations

The total particulate (PM) emissions, consisting of total filterable (FM) and condensable (CPM), were determined in accordance with USEPA Methods 5, *Determination of Particulate Emissions from Stationary Sources*, and OTM-28.

Prior to sampling, all glassware was cleaned with soap and water, rinsed with tap water, deionized water (DI), acetone, and finally methylene chloride ($MeCl_2$). After cleaning, the glassware was baked at 300°C for at least 6 hours. The glassware was then rinsed with DI, distilled ultra-filtered water conforming to American Society for Testing and Materials (ASTM) D1193-06, Type 1. In addition, reagent blanks (150 milliliters [ml]) were analyzed prior to their use in the field according to Section 9.8 of OTM-28.

The sampling apparatus contained a glass-lined temperature-controlled probe equipped with a Type S Pitot tube and a sharp-edged glass button-hook nozzle. The glass probe liner and nozzle were connected utilizing a glass-coated stainless-steel union. The exit of the probe was connected to a high-efficiency glass-fiber filter supported in a glass filter holder inside an oven heated to 248°F ± 25°F. The exit of the filter holder was connected to a USEPA Method 23 type condenser, a dropout impinger, a full-sized modified Greenburg-Smith impinger, a Teflon 47 millimeter (mm) filter supported in a glass-filter holder containing a thermocouple. The sample train was then followed with a moisture trap consisting of a modified Greenburg-Smith impinger containing 100 ml of deionized water and an impinger containing a known quantity of silica gel.

Sampling was performed at an isokinetic rate with an isokinetic variation greater than 90% and less than 110%. The sampling train was leak-checked before and after each test run, and operated according to the procedures detailed in USEPA Method 5 with the addition of recording the outlet temperature of the CPM filter holder which did not exceed 85°F at any time during sampling. Each test run was 120 minutes in duration and had a minimum sample volume of 50 dry standard cubic feet (DSCF). Three test runs were performed on the exhaust duct.

At the conclusion of sampling, water was present prior to the CPM filter; accordingly, the post-test nitrogen purge procedures in Section 8.5.4 of OTM-28 were performed.

FPM was recovered and analyzed according to USEPA Method 5 procedures. The acetone rinse was evaporated to dryness, desiccated and weighed to a constant weight. The filter was desiccated and weighed to a constant weight. The total FPM catch is the sum of the front-half sample train acetone rinse plus the filter catch.

CPM, aqueous liquid impinger contents, organic rinses, and CPM filter were analyzed according to the procedures in Section 8.5.4 of OTM-28. Analyses included field reagent blanks of 150 ml acetone, 150 ml H_2O blank, and 150 ml $MeCl_2$. Additionally, a single field train blank was prepared and analyzed according to Section 9.10 of OTM-28. Laboratory data is located in Appendix B.

3.1.7 Determination of Sulfur Dioxide Emissions

The principles of USEPA Method 6C, *Determination of Sulfur Dioxide Emissions from Stationary Sources (Instrument Analyzer Procedure),* were used for this test program. A gas sample was continuously extracted from the exhaust duct, passed through a heated line, into a gas conditioner, and then a portion of the sample was conveyed to a Bovar Western Research 921W ultraviolet analyzer. Three 240-minute sampling runs were conducted on the exhaust duct; the average of the three sampling runs constituted the tests. Analyzer interference data is contained in Appendix C.

3.1.8 Determination of NO_x Emissions

The principles of USEPA Method 7E, *Determination of Nitrogen Oxides Emissions from Stationary Sources (Instrumental Analyzer Procedure),* were used for this test program. A gas sample was continuously extracted from the exhaust duct and a portion of the sample was conditioned and conveyed to a TECO chemiluminescent analyzer. Three 240-minute sampling runs were performed on the exhaust duct at the SSI.

3.1.9 Determination of Carbon Monoxide Emissions

The principles of USEPA Method 10, *Determination of Carbon Monoxide Emissions from Stationary Sources (Instrumental Analyzer Procedure),* were used for this test program. A gas sample was continuously extracted from the exhaust duct and a portion of the sample was conditioned and conveyed to a TECO gas filter correlation analyzer. Three 240-minute sampling runs were performed on the exhaust duct at the SSI.

3.1.10 Dioxin/Furan and PAH Determinations

USEPA Method 23, *Determination of Polychlorinated Dibenzo-p-Dioxins (PCDD's) and Polychlorinated Dibenzofurans (PCDF's) from Stationary Sources*, was used in this test program. In addition, the XAD-2 absorbent trap was prepared so that polycyclic aromatic hydrocarbons (PAHs) emissions using CARB Method 429, *Determination of Polycyclic Aromatic Hydrocarbon Emissions from Stationary Sources,* could be determined utilizing the same sample train.

3.1.10.1 Sample System Setup

The sampling apparatus contains a borosilicate glass or quartz-lined temperature-controlled probe equipped with a Type S Pitot tube and a sharp-edged borosilicate glass or quartz button-hook nozzle. The probe liner and nozzle were connected utilizing a glass coated stainless-steel union and graphite ferrules.

The exit of the probe was connected to a high-efficiency glass fiber filter supported in a glass-filter holder inside an oven heated to 248°F ± 25°F. The exit of the filter holder was connected to a horizontal condenser containing a thermocouple on the outlet, a sorbent cartridge containing XAD-2 resin, a knockout O-ring style impinger followed by a series of four full-sized O-ring type modified Greenburg-Smith style impingers prepped according to §4.3.2 of CARB Method 429. The knockout impinger was empty; Impingers 2 and 3 each contained 100 ml of 3 millimolar (mM) sodium bicarbonate and 2.4 mM sodium carbonate solution. Impinger 4 was empty and Impinger 5 contained a known quantity of silica gel.

The sample train was assembled, allowed to reach operating temperature, and leak checked by plugging the nozzle with a rubber septum and pulling a vacuum of approximately 15" of Hg.

3.1.10.2 Testing Procedures

Once an acceptable leak check of less than 0.02 cfm was achieved, the sampling train was placed at the first traverse point and sampling began immediately. During sampling, the outlet temperature of the condenser was maintained below 68°F utilizing an ice bath and re-circulating pump. The sampling train was operated at an isokinetic rate with an isokinetic variation greater than 90% and less than 110%.

At the conclusion of each 240-minute test run, the sample train was cooled sufficiently to allow the nozzle to be plugged with the rubber septum. The sampling train was leak-checked at a vacuum equal to or greater than the maximum value reached during sampling. An acceptable leakage rate was observed for each test run.

3.1.10.3 Sample Recovery and Reporting

The nozzle, probe, and front half of the filter holder were quantitatively rinsed with acetone, hexane, $MeCl_2$, and toluene three times. The volume of each rinse was recorded and subsequently added to Container No. 1, an amber glass sample bottle.

The filter was placed in a glass Petri dish, sealed with Teflon tape, and labeled as Container No. 2. The sorbent module was removed from the train, sealed with Teflon tape, and labeled accordingly. The back half of the sample train (i.e., back half of the filter holder and condenser) was rinsed three times with acetone, hexane, $MeCl_2$ and toluene. The volumes of these rinses was recorded and stored in an amber glass sample bottle designated as Container No. 3.

Container No. 4 contained the impinger contents. The impinger contents were quantitatively recovered and the contents added to the amber glass sample bottle labeled Container No. 4. The impingers were rinsed three times with acetone, hexane, $MeCl_2$ and toluene; these rinse volumes were recorded and the rinses were added to an amber glass sample bottle designated as Container No. 5.

All samples were maintained at 39°F or lower and protected from light. Each fraction was recorded on the sample chain of custody and transported to the laboratory for analysis along with one complete blank sample train. The PCDD's, PCDF's, and PAH's were extracted from the sample, separated by high-resolution gas chromatography, and measured by high-resolution mass spectroscopy. Analytical results, along with all method quality assurance/quality control data, are included in Appendix B.

3.1.11 Hydrogen Halide and Halogen Determinations

USEPA Method 26A, *Determination of Hydrogen Halide and Halogen Emissions from Stationary Sources, Isokinetic Method,* was utilized for this test program.

3.1.11.1 Sample System Setup

The sampling apparatus contained a borosilicate glass-lined temperature-controlled probe equipped with a Type S Pitot tube and a sharp-edged borosilicate glass button-hook nozzle. The

probe liner and nozzle were connected utilizing a glass-coated stainless-steel union and graphite ferrules.

The exit of the probe was connected to a Teflon filter supported in a glass-filter holder inside an oven heated to 248°F ± 25°F. The exit of the filter holder was connected to a knockout O-ring style impinger followed by a series of five full-sized O-ring type Greenburg-Smith style impingers. The knockout impinger contained 50 ml of 0.1 N sulfuric acid (H_2SO_4); Impingers 2 and 3 were standard tipped Greenburg-Smith containing 100 ml 0.1 N H_2SO_4. Impingers 3 and 4 were modified Greenburg-Smith containing 0.1 N sodium hydroxide (NaOH) and Impinger 6 contained a known quantity of silica gel.

The sample train was assembled, allowed to reach operating temperature, and leak checked by plugging the nozzle with a rubber septum and pulling a vacuum of approximately 15" of Hg.

3.1.11.2 Testing Procedures

Once an acceptable leak check of less than 0.02 cfm was achieved, the sampling train was placed at the first traverse point and sampling began immediately. The sampling train was operated at an isokinetic rate with an isokinetic variation greater than 90% and less than 110%.

Each test run was 120 minutes in duration and achieved a minimum sample volume of 90 DSCF. At the conclusion of each test run, the sample train was cooled sufficiently to allow the nozzle to be plugged with the rubber septum. The sampling train was leak-checked at a vacuum equal to or greater than the maximum value reached during sampling. An acceptable leakage rate was achieved for all test runs

3.1.11.3 Sample Recovery and Reporting

PM was not determined by this method, so Containers 1 and 2 are not applicable.

Container No. 3 – Knockout and Acid Impinger Catch for Moisture and Hydrogen Halide determination. The liquid was measured to the nearest ±1 ml using a graduated cylinder. The contents were transferred to a high density polyethylene (HDPE) sample bottle. The impingers were rinsed three times with water; these rinses were added to the same sample bottle. The bottle was labeled and stored at ambient temperature for shipment to the laboratory for analysis

by ion chromatography (IC). The halogens were analyzed by IC. USEPA Method 26A requires reagent blanks; a blank of the acid solution was analyzed with the samples. Analytical results, along with all method quality assurance/quality control data, are included in Appendix B with the laboratory results and narratives.

The hydrogen halides are solubilized in the acid solution; therefore, the basic solution was quantitatively recovered and discarded. The silica gel was transferred to the original container and weighed to the nearest ±0.5 g.

3.1.12 Determination of Metals

USEPA Method 29, Determination of Metals Emissions from Stationary Sources, was utilized for this test program.

3.1.12.1 Sample System Setup

The sampling apparatus contains a borosilicate glass-lined temperature-controlled probe equipped with a Type S Pitot tube and a sharp-edged borosilicate glass button-hook nozzle. The probe liner and nozzle were connected utilizing a glass-coated stainless-steel union and graphite ferrules.

The exit of the probe was connected to a quartz fiber filter supported in a glass-filter holder inside an oven heated to 248°F ± 25°F. The exit of the filter holder was connected to a series of seven O-ring style impingers. The first impinger was empty, the second (modified Greenburg-Smith) and third (standard Greenburg-Smith) impingers each contained 100 ml of 5% nitric acid (HNO_3) / 10% hydrogen peroxide (H_2O_2), the fourth (modified Greenburg-Smith) was empty, and the fifth and sixth (both modified Greenburg-Smith) contained 100 ml of acidic potassium permanganate ($KMnO_4$), and the seventh impinger contained pre-weighed silica gel. Glassware was be prepped according to §8.1.1 of USEPA Method 29 prior to assembly.

The sample train was assembled, allowed to reach operating temperature, and leak checked by plugging the nozzle with a rubber septum and pulling a vacuum of approximately 15" of Hg. Sampling did not proceed until an acceptable leak check of less than 0.02 cfm was achieved.

3.1.12.2 Testing Procedures

Once an acceptable leak check of less than 0.02 cfm was achieved, the sampling train was placed at the first traverse point and sampling began immediately. The sampling train was operated at an isokinetic rate with an isokinetic variation greater than 90% and less than 110%.

Each test run was 240 minutes in duration and had a minimum sample volume of 200 DSCF. At the conclusion of each test run, the sample train was cooled sufficiently to allow the nozzle to be plugged with the rubber septum. The sampling train was leak-checked at a vacuum equal to or greater than the maximum value reached during sampling. An acceptable leakage rate was observed for each test run.

At the conclusion of Run 3, it was noted that a backflush of the impinger system may have occurred. Laboratory results confirm that the impinger train did experience a backflush, therefore, the backhalf manganese levels measured during Run 3 were considered to be statistical anomalies. Results are presented utilizing the average of Runs 1 and 2 backhalf manganese levels for Run 3 as noted on the summary table.

3.1.12.3 Sample Recovery

PM was not determined by this method, so Containers 1 and 2 are not applicable.

Container No. 3 – The nozzle, probe, front-half of the filter holder and connections was rinsed with a total of 100 ml of 0.1 N HNO_3. The rinses were stored in a labeled, sealed glass bottle for shipment to the laboratory. The rinses were repeated with water and acetone; both of these rinses were discarded.

Container No. 4 (Impingers 1 through 3) - The liquid was measured to the nearest ±0.5 ml using a graduated cylinder. The contents were transferred to a glass sample bottle. The backhalf of the filter holder, connecting glassware and impingers, was rinsed with 100 ml 0.1 N HNO_3; these rinses were added to the same sample bottle. The bottle was labeled and stored at ambient temperature for shipment to the laboratory for analysis.

Container No. 5A (0.1 N HNO_3) – Impinger 4 was measured to the nearest ±0.5 ml using a graduated cylinder. The liquid along with the 100 ml 0.1 N HNO_3 rinse of the impinger was transferred to a glass sample bottle, labeled and stored for shipment to the laboratory.

Container 5B ($KMnO_4/H_2SO_4$ absorbing solution) – Impingers 5 and 6 were measured to the nearest ±0.5 ml using a graduated cylinder. The contents were transferred to a labeled amber glass sample bottle. The impingers were rinsed with exactly 100 ml of fresh acidified $KMnO_4$ for all three rinses. These rinses were added to the same container. Similarly, three rinses of the same impingers were performed using exactly 100 ml of H_2O. These rinses were also added to Container 5B. The sample bottle lid had a small hole to allow for pressure to release.

Container 5C (8 N HCl rinse and dilution) – Deposits remained on Impingers 5 and 6 following the rinses; therefore, a wash of 25 ml total of 8 N HCl was performed. The 25 ml of 8 N HCl was added to Impinger 5, swirled, then transferred to Impinger 6 and swirled. This wash was added to a labeled sample bottle that contained 200 ml of water.

Container 6 (silica gel) - The silica gel was transferred to the original container and weighed to the nearest ±0.5 g.

All samples were maintained at ambient temperature. Each fraction was recorded on the sample chain of custody and transported to the laboratory for analysis. USEPA Method 29 requires reagent blanks. The blanks were collected as described in §8.2 of USEPA Method 29, specifically containers 8A, 8B, 9, 10, 11, and 12. All blanks were analyzed with the samples. Analytical results, along with all method quality assurance/quality control data, are included in Appendix B.

3.1.13 Process Data

The production data for the SSI was recorded by Alcosan personnel.

3.2 Calculations

Emission calculations were completed using a computer spreadsheet format. The results of each pertinent parameter are detailed on the spreadsheet for each sampling run and provided in Appendix A.

3.3 Calibrations

The following field equipment calibrations are contained in Appendix C:

- Thermocouple
- Nozzle
- Dry Gas Meter and Orifice
- Pitot Tube
- Analyzer Interference Checks
- Calibration Gas Certificates

4 TESTING SUMMARY

The results of the testing performed are presented in Tables 1 through 5 and Table 6 contains the table nomenclature. A sample calculation for one test run is provided in Appendix D.

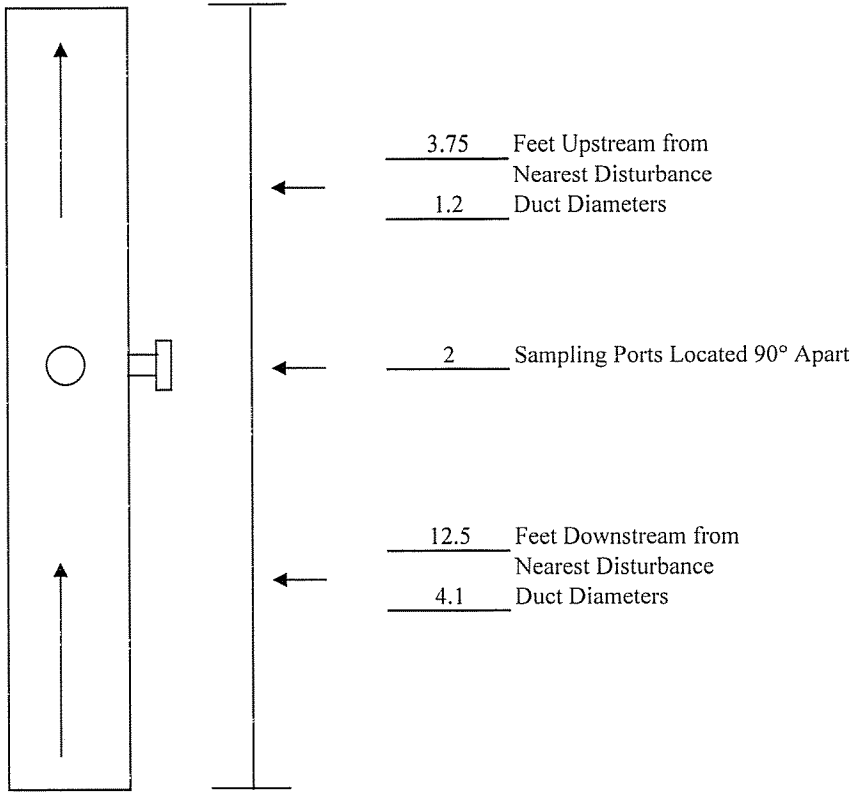
5 CONCLUSION

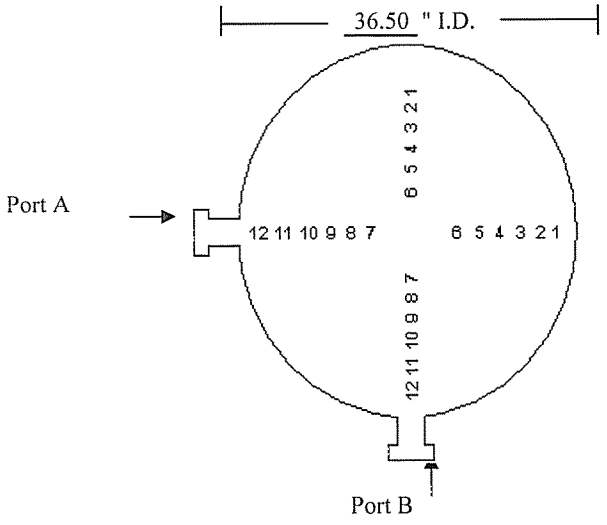
A test program has been conducted for Collective Efforts, LLC at the Alcosan Facility Sewage Sludge Incinerator located in Pittsburgh, Pennsylvania. Test results represent data that is considered to be representative of the emission rates at the prevailing operating conditions.

To the best of ACCI's knowledge, this source test report has been checked for completeness and the results contained herein are accurate, error-free, and representative of the actual emissions measured during testing.

Figure

AIR/COMPLIANCE CONSULTANTS, INC.
USEPA METHOD 1 DATA SHEET





Point Number Each Port	Method 1 Value (inches)
1	35.5
2	34.1
3	32.2
4	30.0
5	27.4
6	23.5
7	13.0
8	9.1
9	6.5
10	4.3
11	2.4
12	1.0

Air/Compliance Consultants, Inc.

STACK SAMPLE LOCATION SCHEMATIC Alcosan, Pittsburgh, Pennsylvania	Figure 1

Tables

Table 1. Particulate Emission Test Results, SSI
Alcosan, Pittsburgh, Pennsylvania

Test Data		Run 1	Run 2	Run 3	Average
Date		3/24/10	3/26/10	3/26/10	
Start Time		1:50 PM	8:00 AM	10:20 AM	
End Time		3:53 PM	10:03 AM	12:24 PM	
Duration	(mins)	120	120	120	
Flow Rate	(ACFM)	21,443	21,012	20,811	21,088
Flow Rate	(SCFM)	20,830	20,349	20,184	20,454
Flow Rate	(DSCFM)	20,444	19,859	19,764	20,022
Sample Volume	(DSCF)	80.477	78.913	78.340	79.243
Carbon Dioxide (CO_2)	(dry volume %)	6.07	6.20	6.41	6.23
Oxygen (O_2)	(dry volume %)	13.77	13.64	13.43	13.61
Water Vapor (H_2O)	(volume %)	1.86	2.41	2.08	2.11
Stack Temperature	(°F)	72.7	71.9	72.0	72.2
Percent of Isokinetic Sampling	(%)	99.2	100.1	99.8	99.7
Unit Operation					
Dry Sludge Feed	(tph)	1.88	1.88	1.88	1.88
Results					
Total Particulate (filterable and condensible) (Method 5/OTM28)					
Mass Collected	(mg)	20.2	18.4	16.9	18.5
Emission Concentration	(gr/DSCF)	0.0039	0.0036	0.0033	0.0036
Emission Rate	(lb/hr)	0.68	0.61	0.56	0.62
Emission Factor	(lb/ton dry sludge)	0.362	0.325	0.300	0.329
Filterable Particulate (Method 5)					
Mass Collected	(mg)	16.6	16.5	7.7	13.6
Emission Concentration	(gr/DSCF)	0.0032	0.0032	0.0015	0.003
Emission Rate	(lb/hr)	0.56	0.55	0.26	0.45
Emission Factor	(lb/ton dry sludge)	0.297	0.292	0.137	0.242
Condensible Particulate (Method OTM28)					
Inorganic Condensible Mass Collected	(mg)	3.3	1.4	8.2	4.3
Organic Condensible Mass Collected	(mg)	2.3	2.5	3.0	2.6
Total Condensible Mass Collected (blank corrected)	(mg)	3.6	1.9	9.2	4.9
Emission Concentration - Total Condensible	(gr/DSCF)	0.001	0.000	0.002	0.001
Emission Rate - Total Condensible	(lb/hr)	0.12	0.06	0.31	0.16
Emission Factor	(lb/ton dry sludge)	0.064	0.033	0.164	0.087

Table 2. Metals Testing Results
Alcosan, Pittsburgh, Pennsylvania

Test Data		Run 1	Run 2	Run 3	Average
Date		03/24/10	03/25/10	03/25/10	
Start Time		9:15 AM	8:25 AM	1:10 PM	
End Time		1:20 PM	12:28 PM	5:16 PM	
Duration	(mins)	240	240	240	
Flow Rate	(ACFM)	21,304	23,430	22,537	22,424
Flow Rate	(SCFM)	20,746	22,588	21,631	21,655
Flow Rate	(DSCFM)	20,290	22,235	21,190	21,238
Sample Volume	(DSCF)	220.424	242.136	235.231	232.597
Carbon Dioxide	(dry volume %)	5.94	6.31	6.22	6.16
Oxygen	(dry volume %)	13.87	13.61	13.30	13.59
Water Vapor	(volume %)	2.20	1.57	2.04	1.93
Stack Temperature	(°F)	74.5	75.3	77.6	75.8
Percent of Isokinetic Sampling	(%)	96.5	96.8	98.7	97.3
Unit Operation					
Dry Sludge Feed Rate	(tph)	1.88	1.88	1.88	1.88
Results					
Mercury (Method 29)					
Emission Mass	(ug)	57.12	69.19	62.65	62.99
Emission Concentration	(ug/DSCM)	9.15	10.09	9.41	9.55
Emission Rate	(lb/hr)	6.95E-04	8.40E-04	7.47E-04	7.61E-04
Emission Rate	(lb/ton product)	3.70E-04	4.47E-04	3.97E-04	4.05E-04
Antimony (Method 29)					
Emission Mass	(ug)	< 0.80	< 0.80	< 0.80	< 0.800
Emission Concentration	(ug/DSCM)	< 0.13	< 0.12	< 0.12	< 0.122
Emission Rate	(lb/hr)	< 9.74E-06	< 9.72E-06	< 9.53E-06	< 9.66E-06
Emission Rate	(lb/ton product)	< 5.18E-06	< 5.17E-06	< 5.07E-06	< 5.14E-06
Arsenic (Method 29)					
Emission Mass	(ug)	2.11	< 0.80	< 0.80	1.24
Emission Concentration	(ug/DSCM)	0.34	< 0.12	< 0.12	0.19
Emission Rate	(lb/hr)	2.57E-05	< 9.72E-06	< 9.53E-06	1.50E-05
Emission Rate	(lb/ton product)	1.37E-05	< 5.17E-06	< 5.07E-06	7.97E-06
Beryllium (Method 29)					
Emission Mass	(ug)	< 0.20	< 0.20	< 0.20	< 0.200
Emission Concentration	(ug/DSCM)	< 3.20E-02	< 0.03	< 0.03	< 0.030
Emission Rate	(lb/hr)	< 2.44E-06	< 2.43E-06	< 2.38E-06	< 2.42E-06
Emission Rate	(lb/ton product)	< 1.30E-06	< 1.29E-06	< 1.27E-06	< 1.29E-06
Cadmium (Method 29)					
Emission Mass	(ug)	2.04	1.49	1.02	1.51
Emission Concentration	(ug/DSCM)	0.326	0.22	0.15	0.23
Emission Rate	(lb/hr)	2.48E-05	1.80E-05	1.22E-05	1.83E-05
Emission Rate	(lb/ton product)	1.32E-05	9.60E-06	6.46E-06	9.75E-06

Table 2. Metals Testing Results
Alcosan, Pittsburgh, Pennsylvania

Test Data		Run 1	Run 2	Run 3	Average
Date		03/24/10	03/25/10	03/25/10	
Start Time		9:15 AM	8:25 AM	1:10 PM	
End Time		1:20 PM	12:28 PM	5:16 PM	
Duration	(mins)	240	240	240	
Chromium (Method 29)					
Emission Mass	(ug)	17.23	30.33	6.73	18.10
Emission Concentration	(ug/DSCM)	2.76	4.42	1.01	2.73
Emission Rate	(lb/hr)	2.10E-04	3.68E-04	8.02E-05	2.19E-04
Emission Rate	(lb/ton product)	1.12E-04	1.96E-04	4.27E-05	1.17E-04
Cobalt (Method 29)					
Emission Mass	(ug)	1.24	1.14	0.84	1.07
Emission Concentration	(ug/DSCM)	0.20	0.17	0.13	0.16
Emission Rate	(lb/hr)	1.51E-05	1.39E-05	1.00E-05	1.30E-05
Emission Rate	(lb/ton product)	8.05E-06	7.37E-06	5.32E-06	6.92E-06
Lead (Method 29)					
Emission Mass	(ug)	5.80	2.75	1.41	3.32
Emission Concentration	(ug/DSCM)	0.93	0.40	0.21	0.51
Emission Rate	(lb/hr)	7.06E-05	3.34E-05	1.68E-05	4.03E-05
Emission Rate	(lb/ton product)	3.76E-05	1.78E-05	8.94E-06	2.14E-05
Manganese (Method 29)					
Emission Mass	(ug)	72.18	63.95	50.52 *	62.22
Emission Concentration	(ug/DSCM)	11.56	9.33	7.58	9.49
Emission Rate	(lb/hr)	8.79E-04	7.77E-04	6.02E-04	7.53E-04
Emission Rate	(lb/ton product)	4.67E-04	4.13E-04	3.20E-04	4.00E-04
Nickel (Method 29)					
Emission Mass	(ug)	31.75	39.60	18.70	30.02
Emission Concentration	(ug/DSCM)	5.09	5.78	2.81	4.56
Emission Rate	(lb/hr)	3.87E-04	4.81E-04	2.23E-04	3.63E-04
Emission Rate	(lb/ton product)	2.06E-04	2.56E-04	1.19E-04	1.93E-04
Selenium (Method 29)					
Emission Mass	(ug)	14.92	8.95	< 2.00	8.62
Emission Concentration	(ug/DSCM)	2.39	1.31	< 0.30	1.33
Emission Rate	(lb/hr)	1.82E-04	1.09E-04	< 2.38E-05	1.05E-04
Emission Rate	(lb/ton product)	9.66E-05	5.78E-05	< 1.27E-05	5.57E-05

* Run 3 Manganese is the average of Runs 1 and 2 backhalf analyses due to contamination.

< indicates reportable detection limit used in calculation

Table 3. HCl and HF Testing Results, SSI
Alcosan, Pittsburgh, Pennsylvania

Test Data		Run 1	Run 2	Run 3	Average
Date		3/24/2010	3/26/2010	3/26/2010	
Start Time		1:50 PM	8:00 AM	10:20 AM	
End Time		3:53 PM	10:03 AM	12:24 PM	
Duration	(mins)	120	120	120	
Flow Rate	(ACFM)	21,627	22,250	22,623	22,167
Flow Rate	(SCFM)	20,825	21,318	21,728	21,290
Flow Rate	(DSCFM)	20,435	20,934	21,311	20,893
Sample Volume	(DSCF)	111.889	114.220	116.557	114.222
Carbon Dioxide	(dry volume %)	6.07	6.20	6.41	6.23
Oxygen	(dry volume %)	13.77	13.64	13.43	13.61
Water Vapor	(volume %)	1.87	1.80	1.92	1.86
Stack Temperature	(°F)	77.4	77.7	77.3	77.4
Percent of Isokinetic Sampling	(%)	97.3	97.0	97.2	97.2
Unit Operation					
Dry Sludge Feed Rate	(tph)	1.88	1.88	1.88	1.88
Results					
Hydrochloric Acid (HCl) (Method 26A)					
Emission Mass (total)	(mg)	0.640	1.200	0.460	0.767
Emission Concentration	(ppm_{dv})	0.133	0.245	0.092	0.157
Emission Rate	(lb/hr)	0.015	0.029	0.011	0.019
Emission Factor	(lb/ton dry sludge)	8.22E-03	1.55E-02	3.22E-03	8.97E-03
Hydrfluoric Acid (HF) (Method 26A)					
Emission Mass (total)	(mg)	< 0.250	< 0.250	< 0.250	< 0.250
Emission Concentration	(ppm_{dv})	< 0.095	< 0.093	< 0.091	< 0.093
Emission Rate	(lb/hr)	< 0.006	< 0.006	< 0.006	< 0.006
Emission Factor	(lb/ton dry sludge)	< 3.21E-03	< 3.22E-03	< 3.22E-03	< 3.21E-03

< indicates reportable detection limit used in calculation

Table 4. Dioxin/Furan and Gaseous Pollutants Emission Test Results, SSI Alcosan, Pittsburgh, Pennsylvania

Test Data		Run 1	Run 2	Run 3	Average
Date		3/24/10	3/25/10	3/25/10	
Start Time		9:15 AM	8:25 AM	1:10 PM	
End Time		1:20 PM	12:28 PM	5:16 PM	
Duration	(mins)	240	240	240	
Flow Rate	(ACFM)	20,840	21,586	21,509	21,312
Flow Rate	(SCFM)	20,384	20,900	20,824	20,703
Flow Rate	(DSCFM)	19,989	20,388	20,443	20,273
Sample Volume	(DSCF)	159.785	162.559	161.530	161.291
Carbon Dioxide (CO_2)	(dry volume %)	5.94	6.31	6.22	6.16
Oxygen (O_2)	(dry volume %)	13.87	13.61	13.30	13.59
Water Vapor (H_2O)	(volume %)	1.94	2.45	1.83	2.07
Stack Temperature	(°F)	72.1	73.0	73.0	72.7
Percent of Isokinetic Sampling	(%)	100.7	100.4	99.5	100.2
Unit Operation					
Dry Sludge Feed Rate	(tph)	1.88	1.88	1.88	1.88
Heat Input Based on Product Data	(MMBtu/hr)	100	100	100	100
F_d	(DSCF/MMBtu)	9,570	9,570	9,570	9,570
Results					
Carbon Monoxide (Method 10)					
Emission Concentration	(ppm_{dv})	3.86	3.64	4.34	3.95
Emission Concentration	(ppmv @ 7% O_2)	7.64	6.94	7.93	7.50
Emission Rate	(lb/hr)	0.34	0.32	0.39	0.35
Emission Rate based on Fd	(lb/MMBtu)	0.0080	0.0073	0.0083	0.0078
Nitrogen Oxides as NO_2 (Method 7E)					
Emission Concentration	(ppm_{dv})	90.6	108.0	112.0	103.5
Emission Concentration	(ppmv @ 7% O_2)	179.1	206.0	204.8	196.6
Emission Rate	(lb/hr)	13.0	15.8	16.4	15.0
Emission Rate based on Fd	(lb/MMBtu)	0.31	0.35	0.35	0.34
Sulfur Dioxide (Method 6C)					
Emission Concentration	(ppm_{dv})	0.10	0.75	1.50	0.78
Emission Concentration	(ppmv @ 7% O_2)	0.20	1.43	2.74	1.46
Emission Rate	(lb/hr)	0.02	0.15	0.31	0.16
Emission Rate based on Fd	(lb/MMBtu)	0.0005	0.0034	0.0065	0.0035
Dioxin/Furan (Method 23)					
TEF Mass Collected	(ng)	0.0081	0.0087	0.0083	0.0084
TEF Emission Concentration	(ng/m^3)	0.0018	0.0019	0.0018	0.0018
TEF Emission Rate	(ng/hr)	61.0	65.3	62.9	63.1
TEF Emission Concentration Corrected	(ng/m^3 @ 7% O_2)	0.0035	0.0036	0.0033	0.0035

Table 5. PAH and PCB Emission Test Results, March 24 and 25, 2010
Alcosan, Pittsburgh, Pennsylvania

Polyaromatic Hydrocarbons Results	**Run 1 - March 24, 2010**				**Run 2 - March 25, 2010**				**Run 3 - March 25, 2010**			
	ng	ng/m^3	µg/hr	µg/m^3 7% O_2	ng	ng/m^3	µg/hr	µg/m^3 7% O_2	ng	ng/m^3	µg/hr	µg/m^3 7% O_2
Naphthalene	2250.00	497.28	16888.78	983.13	2800.00	608.27	21070.12	1744.87	2570.00	561.87	19515.09	1544.27
2-Methylnaphthalene	1140.00	251.95	8556.98	498.12	908.00	197.25	6832.74	565.84	1130.00	247.05	8580.57	679.00
2-Chloronaphthalene	1.50	0.33	11.26	0.66	1.27	0.28	9.56	0.79	1.91	0.42	14.50	1.15
Acenaphthylene	388.00	85.75	2912.38	169.54	400.00	86.90	3010.02	249.27	424.00	92.70	3219.61	254.78
Acenaphthene	1130.00	249.74	8481.92	493.75	348.00	75.60	2618.71	216.86	484.00	105.81	3675.22	290.83
Fluorene	596.00	131.72	4473.65	260.42	568.00	123.39	4274.22	353.96	860.00	188.02	6530.34	516.76
Phenanthrene	1510.00	333.73	11334.25	659.79	1670.00	362.79	12566.82	1040.69	2260.00	494.09	17161.13	1358.00
Anthracene	88.00	19.45	660.54	38.45	132.00	28.68	993.31	82.26	197.00	43.07	1495.90	118.37
Fluoranthene	330.00	72.93	2477.02	144.19	472.00	102.54	3551.82	294.13	452.00	98.82	3432.23	271.60
Pyrene	272.00	60.12	2041.67	118.85	404.00	87.77	3040.12	251.76	370.00	80.89	2809.57	222.33
Benzo(a)anthracene	11.90	2.63	89.32	5.20	15.30	3.32	115.13	9.53	17.80	3.89	135.16	10.70
Chrysene	29.20	6.45	219.18	12.76	35.10	7.63	264.13	21.87	48.40	10.58	367.52	29.08
Benzo(b)fluoranthene	20.10	4.44	150.87	8.78	17.20	3.74	129.43	10.72	24.20	5.29	183.76	14.54
Benzo(k)fluoranthene	8.48	1.87	63.65	3.71	7.96	1.73	59.90	4.96	4.64	1.01	35.23	2.79
Benzo(e)pyrene	20.60	4.55	154.63	9.00	20.20	4.39	152.01	12.59	22.20	4.85	168.57	13.34
Benzo(a)pyrene	16.20	3.58	121.60	7.08	21.60	4.69	162.54	13.46	21.90	4.79	166.30	13.16
Perylene	<0.26	0.00	0.00	0.00	<0.26	0.00	0.00	0.00	5.08	1.11	38.57	3.05
Indeno(1,2,3-cd)pyrene	12.20	2.70	91.57	5.33	19.90	4.32	149.75	12.40	27.10	5.92	205.78	16.28
Dibenz(a,h)anthracene	<0.46	0.00	0.00	0.00	<0.46	0.00	0.00	0.00	<0.46	0.00	0.00	0.00
Benzo(g,h,i)perylene	27.90	6.17	209.42	12.19	51.60	11.21	388.29	32.16	57.60	12.59	437.38	34.61
PCB Results												
33'44'-TetraCB-(77)	<0.021	0.00	0.00	0.00	<0.017	0.00	0.00	0.00	<0.019	0.00	0.00	0.00
344'5-TetraCB-(81)	<0.20	0.00	0.00	0.00	<0.20	0.00	0.00	0.00	<0.20	0.00	0.00	0.00
233'44'-PentaCB-(105)	0.30	0.07	2.25	0.13	0.30	0.07	2.26	0.19	0.33	0.07	2.51	0.20
2344'5-PentaCB-(114)	<0.20	0.00	0.00	0.00	<0.20	0.00	0.00	0.00	<0.20	0.00	0.00	0.00
23'44'5-PentaCB-(118)	0.94	0.21	7.06	0.41	0.86	0.19	6.47	0.54	1.00	0.22	7.59	0.60
23'44'5'-PentaCB-(123)	<0.20	0.00	0.00	0.00	<0.20	0.00	0.00	0.00	<0.20	0.00	0.00	0.00
33'44'5-PentaCB-(126)	<0.20	0.00	0.00	0.00	<0.20	0.00	0.00	0.00	<0.20	0.00	0.00	0.00
HexaCB-(156)+(157)	<0.013	0.00	0.00	0.00	<0.40	0.00	0.00	0.00	<0.40	0.00	0.00	0.00
23'44'55'-HexaCB-(167)	<0.20	0.00	0.00	0.00	<0.20	0.00	0.00	0.00	<0.20	0.00	0.00	0.00
33'44'55'-HexaCB-(169)	<0.20	0.00	0.00	0.00	<0.20	0.00	0.00	0.00	<0.20	0.00	0.00	0.00
233'44'55'-HeptaCB-(189)	<0.20	0.00	0.00	0.00	<0.20	0.00	0.00	0.00	<0.20	0.00	0.00	0.00

Table 6

TABLE NOMENCLATURE

SYMBOL		DESCRIPTION	SYMBOL		DESCRIPTION	SYMBOL		DESCRIPTION
%	-	Percent	gr/DSCF	-	Grains per dry standard cubic feet	OSHA	-	Occupational Safety & Health Administration
% Volume	-	Percent by volume	gpm	-	Gallons per minute	PADEP	-	PA Department of Environmental Protection
°F	-	Degrees Fahrenheit	H_2O	-	Water	Pb	-	Lead
<	-	Less than	H_2SO_4	-	Sulfuric acid	PEL	-	Permissible exposure limit
>	-	Greater than	Hg	-	Mercury	PM	-	Particulate matter
AB	-	Acetone Blank	HI	-	Heat input	PM_{10}	-	Particulate matter less than 10 microns
ACFM	-	Actual cubic feet per minute	hr	-	Hour	ppb	-	Parts per billion
BHP	-	Brake horsepower	IC	-	Ion chromatography	PPE	-	Personal protective equipment
BTU	-	British thermal units	in H_2O	-	Inches of Water	ppm	-	Parts per million
C_3H_8	-	Propane	in Hg	-	Inches of Mercury	ppm_{dv}	-	Parts per million, dry volume
CE	-	Capture efficiency	Kg	-	Kilograms	ppm_{wv}	-	Parts per million, wet volume
CEMS	-	Continuous emission monitor system	lb	-	Pound	PTE	-	Permanent total enclosure
cf	-	Cubic foot	lb/hr	-	Pound per hour	RA	-	Relative Accuracy
CFR	-	Code of Federal Regulations	lb/lb-mole	-	Pound per pound mole	RATA	-	Relative Accuracy Test Audit
CH_4	-	Ethane	lb/MMBTU	-	Pound per million British thermal units	RM	-	Reference Method
Cl_2	-	Chlorine	m^3	-	Cubic meters	RMD	-	Relative mean difference
CO	-	Carbon monoxide	MDL	-	Minimum detection limit	S	-	Sulfur
CO_2	-	Carbon dioxide	mg	-	Milligrams	SCF	-	Standard cubic feet
COG	-	Coke oven gas	mg/g	-	Milligrams per gram	SCFM	-	Standard cubic feet per minute
DACF	-	Dry actual cubic feet	mL	-	Milliliter	SCM	-	Standard cubic meters
DACM	-	Dry actual cubic meters	mm HG	-	Millimeters of mercury	SO_2	-	Sulfur dioxide
DE	-	Destruction efficiency	MMBtu	-	Million British thermal units	STD	-	Standard
DSCF	-	Dry standard cubic feet	MMBtu/hr	-	Million British thermal units per hour	THC	-	Total hydrocarbons
DSCFM	-	Dry standard cubic feet per minute	MNOC	-	Maximum normal operating capacity	tph	-	Tons per hour
FID	-	Flame Ionization Detector	N_2	-	Nitrogen	tpy	-	Tons per year
ft	-	Foot	ND	-	Non-detectable	µg	-	Micrograms
ft/sec	-	Feet per second	NDO	-	Natural draft opening	µg/DSCM	-	Micrograms per dry standard cubic meter
Ft^2	-	Square feet	ng	-	Nanograms	USEPA	-	United States Environmental Protection Agency
Ft^3	-	Cubic feet	NMEVOC	-	Non-methane, non-ethane volatile organic compounds	VE	-	Visible emissions
ft^3/lb-mole	-	Cubic feet per pound mole	NMVOC	-	Non-methane volatile organic compound	VOC	-	Volatile organic compound
g	-	Grams	NO_2	-	Nitrous Oxide	vol.	-	Volume
g/mL	-	Gram per milliliter	NO_x	-	Oxides of Nitrogen	w/o	-	With out
GC	-	Gas Chromatography	O_2	-	Oxygen			

APPENDIX A

ACCI Field Data Sheets and Emissions Spreadsheets

Preliminary Determinations

AIR/COMPLIANCE CONSULTANTS INC.
USEPA METHOD 26A DATA SHEET

Prelim flows + Cyclonic ✓

Client: Collective efforts
Date: 3-24-10
Plant: Alcosan
Sampling Location: SSI stack
Project Number: 10-068
Test Crew: EW, JV, CB

Test Type: ~~Method 26A~~
Run Number:
Nozzle Dia:
Static Press, Ps: +.57
Barometric Press: 29.45
Ambient Temp: °F
K-factor (K_f)

Meter Delta H@:
Meter Correction:
Pitot Correction:
Control Box Num.:
Assumed Moisture:
Thermocouple ID:

Start Time:
Stop Time:
Umbilical Length:
Probe Number:
Pitot Number:
Filter Number:
Stack Diameter:

Traverse Point Number	Elapsed Time	Clock Time	Metered Volume (cf)	Velocity Head (ΔP)	Orifice Delta H in. H_2O	Meter Vacuum in. Hg	Stack Temp. °F	Probe Temp. Ts °F	Oven Temp. °F	Imp Out Temp °F	Meter Temp. °F		Comments
											IN/AVG	OUT	
		7:45						> 248°F	> 248°F	< 68°			Cyclonic ✓
A-1				.76			70						10
2				.73			70						5
3				.73			70						5
4				.75			70						5
5				.76			70						8
6				.79			70						4
7				.84			70						10
8				.86			70						3
9				.73			70						3
10				.72			70						6
11				.67			70						2
12		7:54		.66			70						2
TOTAL/AVERAGE				.8731									

Sample Train Leak Check

	(in. Hg)	Rate (ft³/m)
Initial		
Final		

Pitot Leak Check

Pressure	✓	✓
Static	+	✓

	1	2	3	Average
CO2				
O2				
CO				
N2				

Fyrite Kit #:

Imp	Contents	Final	Initial	Difference
1	.1N H_2SO_4		50	
2	.1N H_2SO_4		100	
3	.1N H_2SO_4		100	
4	.1NNaOH		100	
5	.1NNaOH		100	
6	.1NNaOH			
7	Silica Gel			

.210 nozzle

AIR/COMPLIANCE CONSULTANTS INC.
USEPA METHOD 26A DATA SHEET

Client: Collective efforts **Test Type:** Method 26A **Project Number:** 10-068

Date: **Run Number:** **Testers:**

K-factor (K_f): **Sampling Location:** SSI stack

Traverse Point Number	Elapsed Time	Clock Time	Metered Volume (cf)	Velocity Head (ΔP)	Orifice Delta H in. H_2O	Meter Vacuum in. Hg	Stack Temp. °F	Probe Temp. Ts °F	Oven Temp. °F	Imp Out Temp °F	Meter Temp. °F		Comments
											IN/AVG	OUT	
		7:55						> 248°F	> 248°F	< 68 °			cyclonic ✓
S1				.70			70						3
2				.77			70						7
3				.80			70						3
4				.87			70						7
5				.88			70						7
6				.91			70						6
7				.80			70						6
8				.78			70						5
9				.74			70						2
10				.74			70						2
11				.72			70						2
12				.68			70						2

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Stratification Check

Air/Compliance Consultants, Inc.

Client: Collective Efforts
Facility: Alcosan
Source ID: SSI
Project Number: 10-068
Date: 03/25/10

Test conducted in accordance with section 8.1.2 of Method 7E

yellow=calculation
blue=data entry

Requirements:
3 Point sampling across centroidal area (alternately 12 points)
Sampling must be done for 2x response time
Record average at each point and mean of traverse

Stack Diameter 36.5 inches
Response Time 47 seconds

Point	Probe Marking (inches)	O2 reading (ppm_v)	Diff. vs. Mean (% of mean)	Diff. from Mean (ppmv)
1	6.1	13.6	-0.16%	0.0
2	18.3	13.6	-0.26%	0.0
3	30.4	13.5	0.41%	0.1
	Mean of All Points	13.58	ppm_v	

Point	Probe Marking (inches)	CO_2 reading (ppm_v)	Diff. vs. Mean (% of mean)	Diff. from Mean (ppm_v)
1	6.1	6.5	0.32%	0.0
2	18.3	6.5	0.40%	0.0
3	30.4	6.6	-0.73%	0.0
	Mean of All Points	6.51	ppm_v	

Point	Probe Marking (inches)	CO reading (ppm_v)	Diff. vs. Mean (% of mean)	Diff. from Mean (ppm_v)
1	6.1	2.9	10.34%	0.3
2	18.3	3.1	1.82%	0.1
3	30.4	3.6	-12.16%	-0.4
	Mean of All Points	3.18	ppm_v	

Point	Probe Marking (inches)	NO_x reading (ppm_v)	Diff. vs. Mean (% of mean)	Diff. from Mean (ppm_v)
1	6.1	98.6	-0.85%	-0.8
2	18.3	97.3	0.51%	0.5
3	30.4	97.5	0.34%	0.3
	Mean of All Points	97.79	ppm_v	

Point	Probe Marking (inches)	SO_2 reading (ppm_v)	Diff. vs. Mean (% of mean)	Diff. from Mean (ppm_v)
1	6.1	-0.1	21.74%	0.0
2	18.3	-0.1	-8.39%	0.0
3	30.4	-0.1	-13.36%	0.0
	Mean of All Points	-0.09	ppm_v	

a) if concentration differs at each point by +/- 5% or +/-.5 ppm (whichever less restrictive)
single point sampling at point closest to mean

b) if concentration differs at each point by +/- 10% or +/- 1.0 ppm (whichever less restrictive)
tri point sampling at 16.7, 50 and 83.3 % of diameter

c) if conditions a) and b) fail, then 12 point sampling is required

USEPA Method 5/OTM28

AIR/COMPLIANCE CONSULTANTS INC.
USEPA METHOD 5/OTM28 DATA SHEET

Client: Collective Efforts
Date: 3-24-10
Plant: Alcosan
Sampling Location: SSI stack
Project Number: 10-068
Test Crew: EW, JV, CB

Test Type: USEPA 5 / OTM28
Run Number: one
Nozzle Dia: .210
Static Press, Ps: .57
Barometric Press: 29.28
Ambient Temp: 75 °F
K-factor (K_f) 2.03

Meter Delta H@: 1.753
Meter Correction: 1.000
Pitot Correction: 0.84
Control Box Num.: 1618
Assumed Moisture: 3%
Thermo Couple ID: 41-5

Start Time: 12:50
Stop Time: 15:53
Umbilical ID: 41-5
Probe Number: 41-5
Pitot Number: 41-5
Filter Numbers: FPM CPM
Measured Stack Diameter: 36.5"

Traverse Point Number	Elapsed Time	Clock Time	Metered Volume (cf)	Velocity Head (Δ P)	Orifice Delta H in. H_2O	Meter Vacuum in. Hg	Stack Temp. °F	Probe Temp. °F 248 +/- 25°	Oven Temp. °F 248 +/- 25°	CPM Filter Temp. °F ≤ 85°	Imp Out Temp °F ~ 68°	Meter Temp. °F IN/AVG	Meter Temp. °F OUT	Comments	Cyclonic Flow from Horizontal
		13:50	144.200												
A-1	5		147.532	.66	1.3	3.0	73	250	250	66	58	92	93		
2	10		151.001	.67	1.4	3.0	73	250	251	59	48	93	95	Pen died! RIP	
3	15		154.443	.69	1.4	3.0	73	250	251	57	49	94	93		
4	20		157.825	.66	1.3	3.0	73	250	246	54	48	95	93		
5	25		161.103	.66	1.3	3.0	73	250	250	54	48	97	93		
6	30		164.692	.75	1.5	3.5	72	250	250	53	46	97	93		
7	35		168.491	.82	1.7	4.0	72	250	249	53	48	99	94		
8	40		172.229	.82	1.7	4.0	72	250	252	52	47	99	94		
9	45		175.903	.81	1.6	4.0	72	250	250	52	48	100	95		
10	50		179.667	.84	1.7	4.0	73	250	249	53	47	100	95		
11	55		183.352	.80	1.6	4.0	72	250	251	53	48	101	95		
12	60	14:50	187.033	.78	1.6	4.0	73	250	249	53	47	101	95		
TOTAL/AVE															

Sample Train Leak Check

	(in. Hg)	Rate (ft³/m)
Initial	11.0	0.005
Final	11.0	0.005

	1	2	3	Average
CO2	CO	N2	S	
O2				
CO				
N2				

Imp	Contents	Final	Initial	Difference	H_2O Added
1	empty	14	0		
2	empty	0	0		
3	H_2O	100	100		
4	Silica	270.4	252.1		

Pitot Leak Check

Pressure	✓	✓
Static	✓	✓

Fyrite Kit#: _____

AIR/COMPLIANCE CONSULTANTS INC.
USEPA METHOD 5 DATA SHEET

Client: Collective Efforts | Test Type: USEPA 5 / OTM28 | Project Number: 10-068
Date: 3-24-10 | Run Number: One | Testers: EW, JV, CB
K-factor (K_f): 2.03 | Sampling Location: SSI stack

Traverse Point Number	Elapsed Time	Clock Time	Volume (cf)	Velocity Head (D P)	Orifice Delta H in. H_2O	Meter Vacuum in. Hg	Stack Temp. °F	Probe Temp. °F 248 +/- 25°	Oven Temp. °F 248 +/- 25°	CPM Filter Temp. °F ≤ 85°	Imp Out Temp < 68°	Meter Temp. °F IN/AVG	Meter Temp. °F OUT	Comments	Cyclonic Flow from Horizontal
	60	14:53													
B-1	65		190.731	.78	1.6	4.0	73	250	250	56	61	99	96		
2	70		194.410	.77	1.6	4.0	73	250	251	58	46	100	96		
3	75		198.071	.77	1.6	4.0	73	250	251	59	47	101	96		
4	80		201.862	.82	1.7	4.0	73	250	250	60	47	102	96		
5	85		205.673	.82	1.7	4.0	73	250	249	61	48	102	97		
6	90		209.334	.77	1.6	4.0	73	250	249	62	48	102	97		
7	95		212.803	.71	1.4	3.5	73	250	250	63	50	103	97		
8	100		216.243	.71	1.4	3.5	72	250	250	64	50	102	97		
9	105		220.022	.83	1.7	4.0	73	250	248	66	53	103	98		
10	110		223.552	.76	1.5	4.0	72	250	250	67	52	103	98		
11	115		227.115	.75	1.5	4.0	72	250	251	67	53	103	98		
12	120	15:53	230.731	.74	1.5	4.0	73	250	251	68	55	103	98		

ACCI 1 Minute Average Data Sheet: O2, CO2			
Client	Collective Efforts LLC	Unit	SSI
Project No	10-068	Operation	mnoc
Plant	Alcoan	Location	exhaust stack

MINUTE	DATE	TIME	O2 (DV %)	CO2 (DV %)
RUN 1				
1	2010/03/24	13:50:46	13.2	6.5
2	2010/03/24	13:51:46	13.2	6.5
3	2010/03/24	13:52:46	13.4	6.4
4	2010/03/24	13:53:46	13.3	6.5
5	2010/03/24	13:54:46	13.3	6.5
6	2010/03/24	13:55:46	13.2	6.6
7	2010/03/24	13:56.46	13.2	6.6
8	2010/03/24	13:57:46	13.2	6.5
9	2010/03/24	13:58:46	13.3	6.5
10	2010/03/24	13:59:46	13.3	6.5
11	2010/03/24	14:00:46	13.2	6.6
12	2010/03/24	14:01:46	13.2	6.6
13	2010/03/24	14:02:46	13.1	6.7
14	2010/03/24	14:03:46	13.1	6.7
15	2010/03/24	14:04:46	13.2	6.6
16	2010/03/24	14:05:46	13.1	6.6
17	2010/03/24	14:06:46	13.1	6.6
18	2010/03/24	14:07:46	13.2	6.6
19	2010/03/24	14:08:46	13.3	6.5
20	2010/03/24	14:09:46	13.3	6.5
21	2010/03/24	14:10:46	13.4	6.4
22	2010/03/24	14:11:46	13.4	6.3
23	2010/03/24	14:12:46	13.4	6.3
24	2010/03/24	14:13:46	13.5	6.3
25	2010/03/24	14:14:46	13.5	6.3
26	2010/03/24	14:15:46	13.5	6.3
27	2010/03/24	14:16:46	13.5	6.3
28	2010/03/24	14:17:46	13.6	6.2
29	2010/03/24	14:18:46	13.5	6.2
30	2010/03/24	14:19:46	13.5	6.3
31	2010/03/24	14:20:46	13.5	6.3
32	2010/03/24	14:21:46	13.4	6.3
33	2010/03/24	14:22:46	13.4	6.4
34	2010/03/24	14:23:46	13.4	6.4
35	2010/03/24	14:24:46	13.4	6.3
36	2010/03/24	14:25:46	13.5	6.3
37	2010/03/24	14:26:46	13.6	6.2
38	2010/03/24	14:27:46	13.5	6.3
39	2010/03/24	14:28:46	13.6	6.2
40	2010/03/24	14:29:46	13.6	6.2
41	2010/03/24	14:30:46	13.6	6.2
42	2010/03/24	14:31:46	13.6	6.2
43	2010/03/24	14:32:46	13.5	6.3
44	2010/03/24	14:33:46	14.1	5.9
45	2010/03/24	14:34:46	14.1	5.9
46	2010/03/24	14:35:46	14.2	5.8
47	2010/03/24	14:36:46	14.3	5.8
48	2010/03/24	14:37:46	14.2	5.8
49	2010/03/24	14:38:46	14.3	5.8
50	2010/03/24	14:39:46	14.2	5.8
51	2010/03/24	14:40:46	14.3	5.8
52	2010/03/24	14:41:46	14.3	5.8
53	2010/03/24	14:42:46	14.2	5.8
54	2010/03/24	14:43:46	14.2	5.9
55	2010/03/24	14:44:46	14.2	5.9
56	2010/03/24	14:45:46	14.1	5.9
57	2010/03/24	14:46:46	14.1	5.9
58	2010/03/24	14:47:46	14.1	5.9
59	2010/03/24	14:48:46	14.1	5.9
60	2010/03/24	14:49:46	14.1	5.9
61	2010/03/24	14:50:46	14.1	5.9
62	2010/03/24	14:51:46	14.2	5.9

ACCI 1 Minute Average Data Sheet: O2, CO2			
Client	Collective Efforts LLC	**Unit**	SSI
Project No	10-068	**Operation**	mnoc
Plant	Alcoan	**Location**	exhaust stack

MINUTE	DATE	TIME	O2 (DV %)	CO2 (DV %)
63	2010/03/24	14:52:46	14.1	5.9
64	2010/03/24	14:53:46	14.1	5.9
65	2010/03/24	14:54:46	14.2	5.9
66	2010/03/24	14:55:46	14.1	6.0
67	2010/03/24	14:56:46	14.0	6.0
68	2010/03/24	14:57:46	14.1	5.9
69	2010/03/24	14:58:46	14.1	5.9
70	2010/03/24	14:59:46	14.1	6.0
71	2010/03/24	15:00:46	14.1	5.9
72	2010/03/24	15:01:46	14.1	5.9
73	2010/03/24	15:02:46	14.2	5.9
74	2010/03/24	15:03:46	14.1	5.9
75	2010/03/24	15:04:46	14.1	5.9
76	2010/03/24	15:05:46	14.1	5.9
77	2010/03/24	15:06:46	14.1	5.9
78	2010/03/24	15:07:46	14.0	6.0
79	2010/03/24	15:08:46	14.1	5.9
80	2010/03/24	15:09:46	14.1	5.9
81	2010/03/24	15:10:46	14.1	6.0
82	2010/03/24	15:11:46	14.1	5.9
83	2010/03/24	15:12:46	14.1	5.9
84	2010/03/24	15:13:46	14.1	5.9
85	2010/03/24	15:14:46	14.1	5.9
86	2010/03/24	15:15:46	14.2	5.9
87	2010/03/24	15:16:46	14.2	5.9
88	2010/03/24	15:17:46	14.1	5.9
89	2010/03/24	15:18:46	14.1	5.9
90	2010/03/24	15:19:46	14.1	6.0
91	2010/03/24	15:20:46	14.1	5.9
92	2010/03/24	15:21:46	14.1	6.0
93	2010/03/24	15:22:46	14.0	6.0
94	2010/03/24	15:23:46	14.1	6.0
95	2010/03/24	15:24:46	14.1	5.9
96	2010/03/24	15:25:46	14.2	5.9
97	2010/03/24	15:26:46	14.1	5.9
98	2010/03/24	15:27:46	14.1	5.9
99	2010/03/24	15:28:46	14.0	6.0
100	2010/03/24	15:29:46	14.1	6.0
101	2010/03/24	15:30:46	14.1	5.9
102	2010/03/24	15:31:46	14.2	5.9
103	2010/03/24	15:32:46	14.2	5.9
104	2010/03/24	15:33:46	14.1	5.9
105	2010/03/24	15:34:46	14.2	5.9
106	2010/03/24	15:35:46	14.1	5.9
107	2010/03/24	15:36:46	14.1	5.9
108	2010/03/24	15:37:46	14.1	5.9
109	2010/03/24	15:38:46	14.2	5.9
110	2010/03/24	15:39.46	14.1	5.9
111	2010/03/24	15:40:46	14.1	5.9
112	2010/03/24	15:41:46	14.1	5.9
113	2010/03/24	15:42:46	14.1	5.9
114	2010/03/24	15:43:46	14.2	5.9
115	2010/03/24	15:44:46	14.1	5.9
116	2010/03/24	15:45:46	14.2	5.9
117	2010/03/24	15:46:46	14.2	5.9
118	2010/03/24	15:47:46	14.2	5.9
119	2010/03/24	15:48:46	14.1	5.9
120	2010/03/24	15:49:46	14.1	6.0
RUN 1 AVERAGES			**13.9**	**6.1**

Client:	Collective Efforts LLC		Test Date:	March 24, 2010	
Project No.:	10-068		Test Location:	exhaust stack	
Plant:	Alcoan		Test Run:	Run 1	
Unit:	SSI		Test Start Time:	1:50 PM	
Unit Operation:	mnoc		Test Finish Time:	3:53 PM	
Blue is data input.	Red is a calculation.	Pink is a reference to a cell on another sheet.		Green is a reference to a cell on this sheet.	
Data Input			**Calculations**		
Control Box:	1618		CO + N2	80.15	% dv
Meter $DH_{@}$ (0.75 scfm)	1.753	in. H_2O	Water Collected (V_f- V_i)	14.0	ml
Meter Calibration Factor (Yd)	1.000		Water Vapor Condensed (Vwc(std))	0.659	scf
Test Time (Theta)	120	minutes	Water Collected (W_f- W_i)	18.3	g
Barometric Pressure (Pbar)	29.28	in. Hg	Water Vapor in Silica Gel (Vwsg(std))	0.863	scf
Stack Static Pressure (Pg)	0.57	in. H_2O	Vol. Water Vapor in Gas Stand.(Vw(std))	1.522	scf
Stack Diameter (Ds) (L if rectangular)	36.5	inches	Volume Dry Gas Metered (Vm)	86.531	dacf
Stack Width (enter NA if circular)	NA	inches	Vol. Dry Gas Metered Stand.(Vm(std))	80.477	dscf
Nozzle Diameter (Dn) (NA if NA)	0.210	inches	Volume Dry Gas Metered ($Vm(m^3)$)	2.450	dacm
CO2	6.07	% dv	Vol. Dry Gas Metered Stand.($Vm(std)m^3$)	2.279	dscm
O2	13.77	% dv	Stack Absolute Pressure (Ps)	29.32	in. Hg
Product Rate (enter NA if not needed)	1.88	input ton/hr	Stack Absolute Temperature (Tsavg)	532.3	R
Is the input ton/hr metric? (YES=1)	0		H2O Vapor Pressure @ avg Stack Temp.	0.81	in. Hg
Pitot Tube Coefficient (Cp)	0.84		H2O in the gas at saturation (Bws)	0.0276	vol. fraction
Sample Calculation Title	Particulate and CEMS		H2O in the gas from test data (Bws)	0.0186	vol. fraction
F_d @ 68 F and 760 mm Hg (NA if NA)		dscf/MMBtu	H2O in the gas used (lower of the 2 Bws)	0.0186	vol. fraction
Standard Temperature	68	F	Is the Gas Stream Saturated With H2O?	NO	
Standard Pressure	760	mm Hg	Dry Gas Molecular Weight (Md)	29.52	lb/lb-mole
Pitot Tube Constant (Kp)	85.49		Wet Gas Molecular Weight (Ms)	29.31	lb/lb-mole
Calculations			Gas Velocity (Vs)	49.18	ft/s
Meter Temperature (Tm)	97.5	F	Is the stack circular or rectangular?	CIRCULAR	
Stack Temperature (Tsavg)	72.7	F	Area Stack (As)	7.266	ft^2
Orifice Pressure Drop (dHavg)	1.538	in. H_2O	Actual Gas Flowrate	21,443	acfm
GasVelocity Head (dP)^^avg	0.8699	in. H_2O^1/2	Standard Gas Flowrate	20,830	scfm
F_d @ Standard Conditions	NA	dscf/MMBtu	Dry Standard Gas Flowrate	20,444	dscfm
F_d @ Stan. Cond. & Actual O2	NA	dscf/MMBtu	Actual Gas Flowrate	607	acm/min
Heat Input Based on F_d	NA	MMBtu/hr	Standard Gas Flowrate	590	scm/min
K1method 4	0.04706	scf/ml	Dry Standard Gas Flowrate	579	dscm/min
K2method 4	0.04715	scf/g	Area Nozzle (An)	0.000241	ft^2
K1method 5	17.64	R/in. Hg	Percent of Isokinetic Sampling (I)	99.16	%
K4method 5	0.0945		**Particulate Matter**		
Standard lb-mole volume	385.3	ft^3/lb-mole	Product Rate	1.88	ton/hr
Particulate Matter			Acetone Wash Container No.	171g	
Product Rate		ton/hr	Inorganic Container No.	186q	
Front-Half Acetone Rinse (corrected)	13.39	mg	Organic Container No.	186k	
Front-Half Filter Particulate	3.25	mg	Front Half Filter No.	4025	
Total Front-Half Particulate Method 5	16.64	mg	Acetone Wash Volume (Vaw)	160	ml
Inorganic Fraction Particulate	3.26	mg	Acetone Wash Final (total) Weight 1	114237.60	mg
Organic Fraction Particulate	2.35	mg	Acetone Wash Final (total) Weight 2	114237.30	mg
Field Train Blank Condesible Particulate	2.00	mg	Acetone Wash Tare Weight 1	114222.80	mg
Total Condensible Particulate	3.61	mg	Acetone Wash Tare Weight 2	114222.80	mg
Total Particulate Mass (m_n)	20.24	mg	Acetone Wash Weight Gain	14.65	mg
TOTAL PARTICULATE			Residue in Acetone Wash (Wa)	1.26	mg
Particulate Concentration	0.0039	gr/dscf	Acetone Wash Particulate	13.39	mg
Particulate Emission Rate	0.680	lb/hr	Inorganic Gross Weight	0.30	mg
Particulate Emission Rate	0.3617	lb/ton prod.	Inorganic Tare Weight	0.10	mg
Particulate Emission Rate Based on F_d	NA	lb/MMBtu	Inorganic Fraction Particulate	3.30	mg
FILTERABLE PARTICULATE (METHOD 5)			Organic Gross Weight	0.30	mg
Particulate Concentration	0.0032	gr/dscf	Organic Tare Weight	0.00	mg
Particulate Emission Rate	0.559	lb/hr	Organic Fraction Particulate	2.35	mg
Particulate Emission Rate	0.2973	lb/ton prod.	Total Condensible Particulate	3.61	mg
Particulate Emission Rate Based on F_d	NA	lb/MMBtu	Front Half Filter Final (total) Weight 1	373.90	mg
CONDENSIBLE PARTICULATE (METHOD OTM28)			Front Half Filter Final (total) Weight 2	374.10	mg
Particulate Concentration	0.0007	gr/dscf	Front Half Filter Tare Weight 1	370.70	mg
Particulate Emission Rate	0.121	lb/hr	Front Half Filter Tare Weight 2	370.80	mg
Particulate Emission Rate	0.0644	lb/ton prod.	Front Half Filter Particulate	3.25	mg
Particulate Emission Rate Based on F_d	NA	lb/MMBtu	Total Particulate Mass (m_n)	20.24	mg
			Particulate Concentration	0.0039	gr/dscf
			Particulate Emission Rate	0.680	lb/hr
			Particulate Emission Rate	0.3617	lb/ton prod.
			Particulate Without Blank Correction	17.9000	mg
			Particulate Emission Rate Based on F_d	NA	lb/MMBtu
			Particulate Matter Acetone Blank		
			Acetone wash container No.	171j	
			Acetone density (ρ_a)	0.7899	g/ml
			Acetone blank volume (Va)	200.0	ml
			Final (total) weight 1 after evaporation	112,879.40	mg
			Final (total) weight 2 after evaporation	112,879.00	mg
			Final (total) weight difference (absolute value)	-0.40	mg
			Average final (total) weight after evaporation	112,879.20	mg
			Tare weight 1	112,872.20	mg
			Tare weight 2	112,872.00	mg
			Tare weight difference (absolute value)	-0.20	mg
			Average tare weight	112,872.10	mg
			Averge final (total) weight minus average tare weight	7.10	mg
			Mass of residue of acetone after evaporation (m_a)	7.10	mg
			Acetone blank residue concentration (Ca) calculated	0.0449	mg/g
			Acetone blank correction as a % of acetone mass	0.0045	%
			Acetone blank residue concentration (Ca) used	0.0100	mg/g

Collective Efforts LLC **Run 1** **F or C?** **F=1,C=0** 1

SSI

Point	Pitot DP (dP) (in. H2O)	SQRT dP (in. H2O)$^{1/2}$	Orifice DP (dH) (in. H2O)	Stack Temp (F)	Meter Temp In/Out (F or C)	(F or C)
A-1	0.66	0.812	1.3	73	92	93
2	0.67	0.819	1.4	73	92	93
3	0.69	0.831	1.4	73	94	93
4	0.66	0.812	1.3	73	95	93
5	0.66	0.812	1.3	73	97	93
6	0.75	0.866	1.5	72	97	93
7	0.82	0.906	1.7	72	99	94
8	0.82	0.906	1.7	72	99	94
9	0.81	0.900	1.6	72	100	95
10	0.84	0.917	1.7	73	100	95
11	0.80	0.894	1.6	72	101	95
12	0.78	0.883	1.6	73	101	95
B-1	0.78	0.883	1.6	73	99	96
2	0.77	0.877	1.6	73	100	96
3	0.77	0.877	1.6	73	101	96
4	0.82	0.906	1.7	73	102	96
5	0.82	0.906	1.7	73	102	97
6	0.77	0.877	1.6	73	102	97
7	0.71	0.843	1.4	73	103	97
8	0.71	0.843	1.4	72	102	97
9	0.83	0.911	1.7	73	103	98
10	0.76	0.872	1.5	72	103	98
11	0.75	0.866	1.5	72	103	98
12	0.74	0.860	1.5	73	103	98
Average	0.76	0.870	1.54	72.7		97.5

Initial volume	144.200	ft^3	Initial volume	0.000	liters
Final volume	230.731	ft^3	Final volume	0.000	liters
Total metered	86.531	dacf	Total metered	0.000	dry actual liters

Impinger	Final grams	Initial grams	Gram Gain	Final ml	Initial ml	ml Gain
1			0.0	14.0	0.0	14.0
2			0.0	0.0	0.0	0.0
3			0.0	100.0	100.0	0.0
4	270.4	252.1	18.3			0.0
5			0.0			0.0
6			0.0			0.0
7			0.0			0.0
8			0.0			0.0
9			0.0			0.0
10			0.0			0.0
Total	270.4	252.1	18.3	114.0	100.0	14.0
	W_f	W_i	(W_f- W_i)	V_f	V_i	(V_f- V_i)

ACCI CEM Calibration, Bias and Drift Data Sheet

Based on 40 CFR Part 60, Appendix A-4, Method 7E

Client	Collective Efforts LLC	Date	March 24, 2010
Project No	10-068	Location	exhaust stack
Plant	Alcoan	Run	Run 1
Unit	SSI	Start Time	13:50
Operation	mnoc	End Time	15:50
Tester(s)	bo, jv,ew,cb,rf		

Cal. Gas	LOW		MID		HIGH		Tank ID			Span	Conc. Units	Response Time (sec)	
	Conc.	(% of Span)	Conc.	(% of Span)	Conc.	(% of Span)	LOW	MID	HIGH			Up	Down
O2	N/A	N/A	10.01	44.5	22.47	100.0	N/A	cb001355	cc251892	22.47	d. vol. %	37	38
CO2	N/A	N/A	9.96	44.2	22.54	100.0	N/A	cc251892	cb001355	22.54	d. vol. %	36	37
LIMITS				40 % to 60 %		100%							

Gas	Upscale: Enter "Low" "Mid" or "High" below "Zero"	Actual Upscale Conc.	Analyzer Cal. Response	Initial Values: System Cal. Response	Initial Values: System Cal. Bias (% of Span)	Final Values: System Cal. Response	Final Values: System Cal. Bias (% of Span)	Drift (% of Span)	Span	Average of Initial and Final System Responses	Average Indicated Gas Conc.	Corrected Gas Conc.	Conc. Units
O2	Zero		0.0	0.1	0.45	0.1	0.45	0.00	22.47	0.1			
	Mid	10.01	10.1	10.1	0.00	10.1	0.00	0.00	22.47	10.1	13.86	13.77	d. vol. %
CO2	Zero		0.2	0.2	0.00	0.2	0.00	0.00	22.54	0.2			
	Mid	9.96	9.6	9.8	0.89	9.9	1.33	0.44	22.54	9.85	6.08	6.07	d. vol. %
LIMITS					+/- 5 %		+/- 5 %	+/- 3 %					

Gas	ZERO Analyzer Response (System for THC)	ZERO Analyzer Cal. Error (% of Span)	LOW Actual Conc.	LOW Analyzer Response (System for THC)	LOW Analyzer Cal. Error (% of Span)	LOW System Cal. Error (% of Actual)	MID Actual Conc.	MID Analyzer Response (System for THC)	MID Analyzer Cal. Error (% of Span)	MID System Cal. Error (% of Actual)	HIGH Actual Conc.	HIGH Analyzer Response (System for THC)	HIGH Analyzer Cal. Error (% of Span)	HIGH System Calibration Error (% of Actual)	Span	Conc. Units
O2	0.0	0.00					10.01	10.1	0.40		22.47	22.7	1.02		22.47	d. vol. %
CO2	0.2	0.89					9.96	9.6	-1.60		22.54	22.9	1.60		22.54	d. vol. %
LIMITS		+/- 2 %			+/- 2 %	+/- 5 %			+/- 2 %	+/- 5 %			+/- 2 %	+/- 5 %		

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AIR/COMPLIANCE CONSULTANTS INC.
USEPA METHOD 5/OTM28 DATA SHEET

Client: Collective Efforts
Date: 3-26-10
Plant: Alcosan
Sampling Location: SSI stack
Project Number: 10-068
Test Crew: EW, JW, CB

Test Type: USEPA 5 / OTM28
Run Number: Two
Nozzle Dia: .210
Static Press, Ps: +.56
Barometric Press: 29.15
Ambient Temp: 60 °F
K-factor (K_f) 1.92

Meter Delta H@: 1.753
Meter Correction: 1.000
Pitot Correction: 0.84
Control Box Num.: 1618
Assumed Moisture: 3%
Thermo Couple ID: 41-5

Start Time: 8:00
Stop Time: 10:03
Umbilical ID: 50' Umb. 3
Probe Number: 41-5
Pitot Number: 41-5
Filter Numbers: FPM 4046 CPM
Measured Stack Diameter: 36.5"

Traverse Point Number	Elapsed Time	Clock Time	Metered Volume (cf)	Velocity Head (Δ P)	Orifice Delta H in. H_2O	Meter Vacuum in. Hg	Stack Temp. °F	Probe Temp. °F 248 +/- 25°	Oven Temp. °F 248 +/- 25°	CPM Filter Temp. °F ≤ 85°	Imp Out Temp °F < 68°	Meter Temp. °F IN/AVG	Meter Temp. °F OUT	Comments	Cyclonic Flow from Horizontal
		8:00	569.850												
A-1	5		573.140	.68	1.3	4.0	73	249	252	62	56	59	59		
2	10		576.480	.71	1.4	3.5	77	250	250	59	46	59	59		
3	15		579.735	.68	1.3	3.5	72	250	252	58	49	60	59		
4	20		582.975	.69	1.3	3.5	71	250	249	58	49	61	59		
5	25		586.335	.74	1.4	3.5	71	250	250	58	49	62	59		
6	30		589.695	.73	1.4	3.5	71	250	250	58	50	63	59		
7	35		593.115	.74	1.5	3.5	72	250	250	58	50	63	59		
8	40		596.552	.74	1.5	3.5	72	250	248	59	51	63	59		
9	45		600.025	.79	1.5	4.0	72	250	251	59	51	63	59		
10	50		603.455	.80	1.5	3.5	72	250	248	59	52	64	60		
11	55		606.865	.76	1.35	3.5	72	250	250	60	53	64	60		
12	60	9:00	610.245	.75	1.4		72	250	252	60	53	65	60		
TOTAL/AVE															

Sample Train Leak Check

	(in. Hg)	Rate (ft^3/m)
Initial	15	0.005
Final	5	0.005

	1	2	3	Average
CO2		CEMS		
O2				
CO				
N2				

Imp	Contents	Final	Initial	Difference	H_2O Added
1	empty	42	0		150
2	empty	0	0		
3	H_2O	105	100		
4	Silica	265.3	231.0		

Pitot Leak Check

Pressure	✓	✓
Static	✓	✓

Fyrite Kit#: NA

AIR/COMPLIANCE CONSULTANTS INC.
USEPA METHOD 5 DATA SHEET

Client: Collective Efforts | Test Type: USEPA 5 / OTM28 | Project Number: 10-068
Date: 3-26-10 | Run Number: Test 0 | Testers: EW, JV, CB
K-factor (K_p): | Sampling Location: SSI stack

Traverse Point Number	Elapsed Time	Clock Time	Volume (cf)	Velocity Head (D P)	Orifice Delta H in. H_2O	Meter Vacuum in. Hg	Stack Temp. °F	Probe Temp. °F 248 +/- 25°	Oven Temp. °F 248 +/- 25°	CPM Filter Temp. °F ≤ 85°	Imp Out Temp < 68°	Meter Temp. °F IN/AVG	Meter Temp. °F OUT	Comments	Cyclonic Flow from Horizontal
		9:03													
B-1	65		613.490	.68	~~.68~~ .613	3.0	72	250	251	58	54	63	60		
2	70		616.770	.70	1.3	3.5	72	250	251	60	55	64	60		
3	75		620.035	.64	1.3	3.5	72	250	249	60	55	65	60		
4	80		623.270	.67	1.3	3.5	72	250	252	60	57	65	61		
5	85		626.620	.73	1.4	3.5	72	250	252	60	59	65	61		
6	90		630.025	.75	1.4	3.5	72	250	251	61	62	65	61		
7	95		633.395	.74	1.4	3.5	72	250	248	62	64	65	61		
8	100		636.745	.72	1.4	3.5	72	250	250	63	66	65	61		
9	~~105~~ 110		640.025	.70	1.3	3.5	72	250	249	63	67	66	61		
10	~~110~~ 115		643.270	~~.70~~ .69	1.3	3.5	72	250	251	64	69	66	61		
11	115		646.485	.69	1.3	3.5	72	250	250	65	70	67	62		Iced impingers
12	120	10:03	649.665	.71	1.4	3.5	72	250	251	65	~~70~~ 69 CB	67	62		

ACCI 1 Minute Average Data Sheet: O2, CO2			
Client	Collective Efforts LLC	Unit	SSI
Project No	10-068	Operation	mnoc
Plant	Alcoan	Location	exhaust stack

MINUTE	DATE	TIME	O2 (DV %)	CO2 (DV %)
RUN 2				
1	2010/03/26	08:00:17	13.5	6.4
2	2010/03/26	08:01:17	13.5	6.7
3	2010/03/26	08:02:17	13.5	6.5
4	2010/03/26	08:03:17	13.5	6.2
5	2010/03/26	08:04:17	13.4	6.2
6	2010/03/26	08:05:17	13.4	6.2
7	2010/03/26	08:06:17	13.4	6.2
8	2010/03/26	08:07:17	13.5	6.2
9	2010/03/26	08:08:17	13.5	6.2
10	2010/03/26	08:09:17	13.5	6.2
11	2010/03/26	08:10:17	13.6	6.1
12	2010/03/26	08:11:17	13.7	6.0
13	2010/03/26	08:12:17	13.7	6.0
14	2010/03/26	08:13:17	13.7	6.0
15	2010/03/26	08:14:17	13.7	6.0
16	2010/03/26	08:15:17	13.7	6.0
17	2010/03/26	08:16:17	13.7	6.0
18	2010/03/26	08:17:17	13.7	6.0
19	2010/03/26	08:18:17	13.7	6.0
20	2010/03/26	08:19:17	13.7	6.0
21	2010/03/26	08:20:17	13.7	6.0
22	2010/03/26	08:21:17	13.7	6.0
23	2010/03/26	08:22:17	13.6	6.1
24	2010/03/26	08:23:17	13.6	6.1
25	2010/03/26	08:24:17	13.6	6.1
26	2010/03/26	08:25:17	13.6	6.1
27	2010/03/26	08:26:17	13.5	6.1
28	2010/03/26	08.27:17	13.5	6.2
29	2010/03/26	08:28:17	13.5	6.2
30	2010/03/26	08:29:17	13.4	6.3
31	2010/03/26	08:30:17	13.4	6.3
32	2010/03/26	08:31:17	13.4	6.2
33	2010/03/26	08:32:17	13.5	6.2
34	2010/03/26	08:33:17	13.6	6.1
35	2010/03/26	08:34:17	13.6	6.1
36	2010/03/26	08:35:17	13.7	6.0
37	2010/03/26	08:36:17	13.6	6.1
38	2010/03/26	08:37:17	13.6	6.1
39	2010/03/26	08:38:17	13.6	6.1
40	2010/03/26	08:39:17	13.6	6.1
41	2010/03/26	08:40:17	13.6	6.1
42	2010/03/26	08:41:17	13.6	6.1
43	2010/03/26	08:42:17	13.6	6.1
44	2010/03/26	08:43:17	13.8	6.0
45	2010/03/26	08:44:17	13.9	5.9
46	2010/03/26	08:45:17	13.8	5.9
47	2010/03/26	08:46:17	13.8	5.9
48	2010/03/26	08:47:17	13.8	5.9
49	2010/03/26	08:48:17	13.8	5.9
50	2010/03/26	08:49:17	13.9	5.9
51	2010/03/26	08:50:17	13.8	5.9
52	2010/03/26	08:51:17	13.8	5.9
53	2010/03/26	08:52:17	13.8	5.9
54	2010/03/26	08:53:17	13.8	5.9
55	2010/03/26	08:54:17	13.8	5.9
56	2010/03/26	08:55:17	13.8	5.9
57	2010/03/26	08:56:17	13.8	5.9
58	2010/03/26	08:57:17	13.8	5.9
59	2010/03/26	08:58:17	13.8	5.9
60	2010/03/26	08:59:17	13.7	6.0
61	2010/03/26	09:00:17	13.5	6.2
62	2010/03/26	09:01:17	13.4	6.2
63	2010/03/26	09:02:17	13.4	6.2
64	2010/03/26	09:03:17	13.4	6.2
65	2010/03/26	09:04:17	13.4	6.2
66	2010/03/26	09:05:17	13.4	6.2

ACCI 1 Minute Average Data Sheet: O2, CO2			
Client	Collective Efforts LLC	**Unit**	SSI
Project No	10-068	**Operation**	mnoc
Plant	Alcoan	**Location**	exhaust stack

MINUTE	DATE	TIME	O2 (DV %)	CO2 (DV %)
67	2010/03/26	09:06:17	13.4	6.2
68	2010/03/26	09:07:17	13.4	6.2
69	2010/03/26	09:08:17	13.4	6.2
70	2010/03/26	09:09:17	13.4	6.2
71	2010/03/26	09:10:17	13.5	6.2
72	2010/03/26	09:11:17	13.5	6.2
73	2010/03/26	09:12:17	13.5	6.2
74	2010/03/26	09:13:17	13.5	6.2
75	2010/03/26	09:14:17	13.5	6.1
76	2010/03/26	09:15:17	13.6	6.1
77	2010/03/26	09:16:17	13.7	6.0
78	2010/03/26	09:17:17	13.8	5.9
79	2010/03/26	09:18:17	13.8	5.9
80	2010/03/26	09:19:17	13.8	5.9
81	2010/03/26	09:20:17	13.8	5.9
82	2010/03/26	09:21:17	13.8	5.9
83	2010/03/26	09:22:17	13.9	5.8
84	2010/03/26	09:23:17	13.9	5.8
85	2010/03/26	09:24:17	13.9	5.9
86	2010/03/26	09:25:17	13.9	5.8
87	2010/03/26	09:26:17	13.9	5.8
88	2010/03/26	09:27:17	13.9	5.8
89	2010/03/26	09:28:17	13.9	5.8
90	2010/03/26	09:29:17	14.0	5.8
91	2010/03/26	09:30:17	14.0	5.7
92	2010/03/26	09:31:17	14.0	5.8
93	2010/03/26	09:32:17	14.0	5.8
94	2010/03/26	09:33:17	14.0	5.7
95	2010/03/26	09:34:17	13.9	5.8
96	2010/03/26	09:35:17	13.9	5.8
97	2010/03/26	09:36:17	13.9	5.8
98	2010/03/26	09:37:17	14.0	5.8
99	2010/03/26	09:38:17	13.9	5.8
100	2010/03/26	09:39:17	13.9	5.8
101	2010/03/26	09:40:17	13.9	5.8
102	2010/03/26	09:41:17	13.9	5.8
103	2010/03/26	09:42:17	13.9	5.8
104	2010/03/26	09:43:17	14.0	5.8
105	2010/03/26	09:44:17	14.0	5.7
106	2010/03/26	09:45:17	14.0	5.7
107	2010/03/26	09:46:17	14.0	5.7
108	2010/03/26	09:47:17	14.0	5.7
109	2010/03/26	09:48:17	14.1	5.7
110	2010/03/26	09:49:17	14.1	5.7
111	2010/03/26	09:50:17	14.1	5.7
112	2010/03/26	09:51:17	14.1	5.7
113	2010/03/26	09:52:17	14.0	5.8
114	2010/03/26	09:53:17	13.9	5.8
115	2010/03/26	09:54:17	14.0	5.8
116	2010/03/26	09:55:17	14.0	5.8
117	2010/03/26	09:56:17	14.0	5.8
118	2010/03/26	09:57:17	14.0	5.8
119	2010/03/26	09:58:17	14.0	5.7
120	2010/03/26	09:59:17	13.9	5.9
RUN 2 AVERAGES			**13.7**	**6.0**

ACCI CEM Calibration, Bias and Drift Data Sheet

Based on 40 CFR Part 60, Appendix A-4, Method 7E

Client	Collective Efforts LLC	**Date**	March 26, 2010
Project No	10-068	**Location**	exhaust stack
Plant	Alcoan	**Run**	Run 2
Unit	SSI	**Start Time**	8:00
Operation	mnoc	**End Time**	10:00
Tester(s)	bo, jv,ew,cb,rf		

Cal. Gas	LOW		MID		HIGH		Tank ID			Span	Conc. Units
	Conc.	(% of Span)	Conc.	(% of Span)	Conc.	(% of Span)	LOW	MID	HIGH		
O2	N/A	N/A	10.01	44.5	22.47	100.0	N/A	eb001355	cc251892	22.47	d. vol. %
CO2	N/A	N/A	9.96	44.2	22.54	100.0	N/A	cc251892	eb001355	22.54	d. vol. %
LIMITS				**40 % to 60 %**		**100%**					

Gas	Upscale: Enter "Low" "Mid" or "High" below "Zero"	Actual Upscale Conc.	Analyzer Cal. Response	Initial Values		Final Values		Drift (% of Span)	Span	Average of Initial and Final System Responses	Average Indicated Gas Conc.	Corrected Gas Conc.	Conc. Units
				System Cal. Response	System Cal. Bias (% of Span)	System Cal. Response	System Cal. Bias (% of Span)						
O2	**Zero**		0.0	0.1	0.45	0.1	0.45	0.00	22.47	0.1			
	Mid	10.01	10.0	10.1	0.45	10.1	0.45	0.00	22.47	10.1	13.73	13.64	d. vol. %
CO2	**Zero**		0.2	0.2	0.00	0.2	0.00	0.00	22.54	0.2			
	Mid	9.96	9.7	9.5	-0.89	9.5	-0.89	0.00	22.54	9.5	5.99	6.20	d. vol. %
LIMITS					+/- 5 %		+/- 5 %	+/- 3 %					

Gas	ZERO Analyzer Response (System for THC)	ZERO Analyzer Cal. Error (% of Span)	LOW Actual Conc.	LOW Analyzer Response (System for THC)	LOW Analyzer Cal. Error (% of Span)	LOW System Cal. Error (% of Actual)	MID Actual Conc.	MID Analyzer Response (System for THC)	MID Analyzer Cal. Error (% of Span)	MID System Cal. Error (% of Actual)	HIGH Actual Conc.	HIGH Analyzer Response (System for THC)	HIGH Analyzer Cal. Error (% of Span)	HIGH System Calibration Error (% of Actual)	Span	Conc. Units
O2	0.0	0.00					10.01	10.0	-0.04		22.47	22.4	-0.31		22.47	d. vol. %
CO2	0.2	0.89					9.96	9.7	-1.15		22.54	22.5	-0.18		22.54	d. vol. %
LIMITS		+/- 2 %			+/- 2 %	+/- 5 %			+/- 2 %	+/- 5 %			+/- 2 %	+/- 5 %		

Client:	Collective Efforts LLC		Test Date:	March 26, 2010	
Project No.:	10-068		Test Location:	exhaust stack	
Plant:	Alcoan		Test Run:	Run 2	
Unit:	SSI		Test Start Time:	8:00 AM	
Unit Operation:	mnoc		Test Finish Time:	10:03 AM	
Blue is data input.	Red is a calculation.		Pink is a reference to a cell on another sheet.	Green is a reference to a cell on this sheet.	
Data Input			**Calculations**		
Control Box:	1618		CO + N2	80.16	% dv
Meter $DH@$ (0.75 scfm)	1.753	in. H_2O	Water Collected (V_f- V_i)	7.0	ml
Meter Calibration Factor (Yd)	1.000		Water Vapor Condensed (Vwc(std))	0.329	scf
Test Time (Theta)	120	minutes	Water Collected (W_f- W_i)	34.3	g
Barometric Pressure (Pbar)	29.15	in. Hg	Water Vapor in Silica Gel (Vwsg(std))	1.617	scf
Stack Static Pressure (Pg)	0.56	in. H_2O	Vol. Water Vapor in Gas Stand.(Vw(std))	1.947	scf
Stack Diameter (Ds) (L if rectangular)	36.5	inches	Volume Dry Gas Metered (Vm)	79.815	dacf
Stack Width (enter NA if circular)	NA	inches	Vol. Dry Gas Metered Stand.(Vm(std))	78.913	dscf
Nozzle Diameter (Dn) (NA if NA)	0.210	inches	Volume Dry Gas Metered ($Vm(m^3)$)	2.260	dacm
CO2	6.20	% dv	Vol. Dry Gas Metered Stand.($Vm(std)m^3$)	2.235	dscm
O2	13.64	% dv	Stack Absolute Pressure (Ps)	29.19	in. Hg
Product Rate (enter NA if not needed)	1.88	input ton/hr	Stack Absolute Temperature (Tsavg)	531.6	R
Is the input ton/hr metric? (YES=1)	0		H2O Vapor Pressure @ avg Stack Temp.	0.79	in. Hg
Pitot Tube Coefficient (Cp)	0.84		H2O in the gas at saturation (Bws)	0.0270	vol. fraction
Sample Calculation Title	Particulate and CEMS		H2O in the gas from test data (Bws)	0.0241	vol. fraction
F_d @ 68 F and 760 mm Hg (NA if NA)		dscf/MMBtu	H2O in the gas used (lower of the 2 Bws)	0.0241	vol. fraction
Standard Temperature	68	F	Is the Gas Stream Saturated With H2O?	NO	
Standard Pressure	760	mm Hg	Dry Gas Molecular Weight (Md)	29.54	lb/lb-mole
Pitot Tube Constant (Kp)	85.49		Wet Gas Molecular Weight (Ms)	29.26	lb/lb-mole
Calculations			Gas Velocity (Vs)	48.19	ft/s
Meter Temperature (Tm)	61.9	F	Is the stack circular or rectangular?	CIRCULAR	
Stack Temperature (Tsavg)	71.9	F	Area Stack (As)	7.266	ft^2
Orifice Pressure Drop (dHavg)	1.379	in. H_2O	Actual Gas Flowrate	21,012	acfm
GasVelocity Head (dP)^avg	0.8504	in. H_2O^1/2	Standard Gas Flowrate	20,349	scfm
F_d @ Standard Conditions	NA	dscf/MMBtu	Dry Standard Gas Flowrate	19,859	dscfm
F_d @ Stan. Cond. & Actual O2	NA	dscf/MMBtu	Actual Gas Flowrate	595	acm/min
Heat Input Based on F_d	NA	MMBtu/hr	Standard Gas Flowrate	576	scm/min
K1method 4	0.04706	scf/ml	Dry Standard Gas Flowrate	562	dscm/min
K2method 4	0.04715	scf/g	Area Nozzle (An)	0.000241	ft^2
K1method 5	17.64	R/in. Hg	Percent of Isokinetic Sampling (I)	100.10	%
K4method 5	0.0945		**Particulate Matter**		
Standard lb-mole volume	385.3	ft^3/lb-mole	Product Rate	1.88	ton/hr
Particulate Matter			Acetone Wash Container No.	171h	
Product Rate		ton/hr	Inorganic Container No.	186r	
Front-Half Acetone Rinse (corrected)	14.55	mg	Organic Container No.	186i	
Front-Half Filter Particulate	1.95	mg	Front Half Filter No.	4046	
Total Front-Half Particulate Method 5	16.50	mg	Acetone Wash Volume (Vaw)	152	ml
Inorganic Fraction Particulate	1.36	mg	Acetone Wash Final (total) Weight 1	110,014.8	mg
Organic Fraction Particulate	2.50	mg	Acetone Wash Final (total) Weight 2	110,014.6	mg
Total Condensible Particulate	1.86	mg	Acetone Wash Tare Weight 1	109,998.9	mg
Total Particulate Mass (m_n)	18.36	mg	Acetone Wash Tare Weight 2	109,999.0	mg
TOTAL PARTICULATE			Acetone Wash Weight Gain	15.7500	mg
Particulate Concentration	0.0036	gr/dscf	Residue in Acetone Wash (Wa)	1.20	mg
Particulate Emission Rate	0.611	lb/hr	Acetone Wash Particulate	14.55	mg
Particulate Emission Rate	0.3250	lb/ton prod.	Inorganic Gross Weight	0.30	mg
Particulate Emission Rate Based on F_d	NA	lb/MMBtu	Inorganic Tare Weight	0.10	mg
FILTERABLE PARTICULATE (METHOD 5)			Inorganic Fraction Particulate	1.40	mg
Particulate Concentration	0.0032	gr/dscf	Organic Gross Weight	0.50	mg
Particulate Emission Rate	0.549	lb/hr	Organic Tare Weight	0.10	mg
Particulate Emission Rate	0.2921	lb/ton prod.	Organic Fraction Particulate	2.50	mg
Particulate Emission Rate Based on F_d	NA	lb/MMBtu	Total Condensible Particulate	1.86	mg
CONDENSIBLE PARTICULATE (METHOD OTM28)			Front Half Filter Final (total) Weight 1	367.10	mg
Particulate Concentration	0.0004	gr/dscf	Front Half Filter Final (total) Weight 2	367.10	mg
Particulate Emission Rate	0.062	lb/hr	Front Half Filter Tare Weight 1	365.30	mg
Particulate Emission Rate	0.0329	lb/ton prod.	Front Half Filter Tare Weight 2	365.00	mg
Particulate Emission Rate Based on F_d	NA	lb/MMBtu	Front Half Filter Particulate	1.95	mg
			Total Particulate Mass (m_n)	18.36	mg
			Particulate Concentration	0.0036	gr/dscf
			Particulate Emission Rate	0.611	lb/hr
			Particulate Emission Rate	0.3250	lb/ton prod.
			Particulate Without Blank Correction	17.7000	mg
			Particulate Emission Rate Based on F_d	NA	lb/MMBtu
			Particulate Matter Acetone Blank		
			Acetone wash container No.	171j	
			Acetone density (ρ_a)	0.7899	g/ml
			Acetone blank volume (Va)	200.0	ml
			Final (total) weight 1 after evaporation	112,879.40	mg
			Final (total) weight 2 after evaporation	112,879.00	mg
			Final (total) weight difference (absolute value)	-0.40	mg
			Average final (total) weight after evaporation	112,879.20	mg
			Tare weight 1	112,872.20	mg
			Tare weight 2	112,872.00	mg
			Tare weight difference (absolute value)	-0.20	mg
			Average tare weight	112,872.10	mg
			Averge final (total) weight minus average tare weight	7.10	mg
			Mass of residue of acetone after evaporation (m_a)	7.10	mg
			Acetone blank residue concentration (Ca) calculated	0.0449	mg/g
			Acetone blank correction as a % of acetone mass	0.0045	%
			Acetone blank residue concentration (Ca) used	0.0100	mg/g

Collective Efforts LLC Run 2

SSI

F or C? F=1,C=0 1

Point	Pitot DP (dP) (in. H2O)	SQRT dP (in. H2O)^1/2	Orifice DP (dH) (in. H2O)	Stack Temp (F)	Meter Temp In (F or C)	Meter Temp Out (F or C)
A-1	0.68	0.825	1.3	73	59	59
2	0.71	0.843	1.4	72	59	59
3	0.68	0.825	1.3	72	60	59
4	0.69	0.831	1.3	71	61	59
5	0.74	0.860	1.4	71	62	59
6	0.73	0.854	1.4	71	63	59
7	0.78	0.883	1.5	72	63	59
8	0.79	0.889	1.5	72	63	59
9	0.79	0.889	1.5	72	63	59
10	0.80	0.894	1.5	72	64	60
11	0.76	0.872	1.5	72	64	60
12	0.75	0.866	1.4	72	65	60
B-1	0.68	0.825	1.3	72	63	60
2	0.70	0.837	1.3	72	64	60
3	0.69	0.831	1.3	72	65	60
4	0.67	0.819	1.3	72	65	61
5	0.73	0.854	1.4	72	65	61
6	0.75	0.866	1.4	72	65	61
7	0.74	0.860	1.4	72	65	61
8	0.72	0.849	1.4	72	65	61
9	0.70	0.837	1.3	72	66	61
10	0.69	0.831	1.3	72	66	61
11	0.69	0.831	1.3	72	67	62
12	0.71	0.843	1.4	72	67	62
Average	0.72	0.850	1.38	71.9		61.9

Initial volume	569.850	ft^3	Initial volume	0.000	liters
Final volume	649.665	ft^3	Final volume	0.000	liters
Total metered	79.815	dacf	Total metered	0.000	dry actual liters

Impinger	Final grams	Initial grams	Gram Gain	Final ml	Initial ml	ml Gain
1			0.0	2.0	0.0	2.0
2			0.0	0.0	0.0	0.0
3			0.0	105.0	100.0	5.0
4	265.3	231.0	34.3			0.0
5			0.0			0.0
6			0.0			0.0
7			0.0			0.0
8			0.0			0.0
9			0.0			0.0
10			0.0			0.0
Total	265.3	231.0	34.3	107.0	100.0	7.0
	W_f	W_i	(W_f- W_i)	V_f	V_i	(V_f- V_i)

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AIR/COMPLIANCE CONSULTANTS INC.
USEPA METHOD 5/OTM28 DATA SHEET

Client: Collective Efforts
Date: 3-26-10
Plant: Alcosan
Sampling Location: SSI stack
Project Number: 10-068
Test Crew: EW, TV, CB

Test Type: USEPA 5 / OTM28
Run Number: Three
Nozzle Dia: .210
Static Press, Ps: +.56
Barometric Press: 29.20
Ambient Temp: 62 °F
K-factor (K_f) 1.92

Meter Delta H@: 1.753
Meter Correction: 1.000
Pitot Correction: 0.84
Control Box Num.: 1618
Assumed Moisture: 3%
Thermo Couple ID: 41-5

Start Time: 10:20
Stop Time: 12:24
Umbilical ID: 50' w/ MB 8
Probe Number: 41-5
Pitot Number: 41-5
Filter Numbers: FPM 4707 CPM
Measured Stack Diameter: 36.5"

Traverse Point Number	Elapsed Time	Clock Time	Metered Volume (cf)	Velocity Head (Δ P)	Orifice Delta H in. H_2O	Meter Vacuum in. Hg	Stack Temp. °F	Probe Temp. °F 248 +/- 25°	Oven Temp. °F 248 +/- 25°	CPM Filter Temp. °F ≤ 85°	Imp Out Temp °F < 68°	Meter Temp. °F IN/AVG	Meter Temp. °F OUT	Comments	Cyclonic Flow from Horizontal
		10:20	650.000												
A-1	5		653.330	.68	1.3	2.5	75	250	250	48	59	62	61		
2	10		656.460	.65	1.2	2.0	75	250	251	57	45	64	61		
3	15		659.820	.66	1.3	2.0	73	250	251	73	46	65	62		
4	20		662.750	.65	1.2	2.0	72	250	251	57	48	67	62		
5	25		665.990	.66	1.3	2.0	72	250	251	58	48	67	62		
6	30		669.285	.72	1.4	2.0	71	250	249	58	49	68	63		
7	35		672.735	.80	1.5	2.5	71	250	247	59	50	68	63		
8	40		676.245	.81	1.6	2.5	71	250	250	60	50	69	63		
9	45		679.735	.78	1.5	2.5	71	250	249	61	50	68	63		
10	50		683.070	.72	1.4	2.5	72	250	248	62	50	68	65		
11	55		686.430	.75	1.4	2.5	72	250	248	62	51	68	63		
12	60	1:20	689.765	.72	1.4	2.5	72	250	252	63	52	68	64		
TOTAL/AVE															

Sample Train Leak Check

	(in. Hg)	Rate (ft^3/m)
Initial	15"	0.000
Final	16"	.005

Pitot Leak Check

Pressure	✓	✓
Static	✓	✓

	1	2	3	Average
CO2		CEMS		
O2				
CO				
N2				

Fyrite Kit#: NA

Imp	Contents	Final	Initial	Difference	H_2O Added
1	empty	4	0		40
2	empty	0	0		
3	H_2O	44	100		
4	Silica	761.6	744.3		

AIR/COMPLIANCE CONSULTANTS INC.

USEPA METHOD 5 DATA SHEET

594

Client: Collective Efforts **Test Type:** USEPA 5 / OTM28 **Project Number:** 10-068

Date: 3-26-10 **Run Number:** Three **Testers:** FW, JV, CR

K-factor (K_p): 1.92 **Sampling Location:** SSI stack

Traverse Point Number	Elapsed Time	Clock Time	Volume (cf)	Velocity Head (D P)	Orifice Delta H in. H_2O	Meter Vacuum in. Hg	Stack Temp. °F	Probe Temp. °F 248 +/- 25°	Oven Temp. °F 248 +/- 25°	CPM Filter Temp. °F ≤ 85°	Imp Out Temp < 68°	Meter Temp. °F IN/AVG	Meter Temp. °F OUT	Comments	Cyclonic Flow from Horizontal
		11:24													
S-1	65		692.995	.67	1.3	2.0	72	250	251	64	51	66	63		
2	70		696.230	.66	1.3	2.0	72	250	248	65	47	67	63		
3	75		699.503	.67	1.3	2.0	72	250	250	65	47	67	63		
4	80		702.866	.68	1.3	2.0	72	250	248	65	47	68	63		
5	85		706.235	.73	1.4	2.5	72	250	250	65	48	69	64		
6	90		709.625	.76	1.5	2.5	71	250	252	65	47	70	64		
7	95		713.060	.80	1.5	2.5	72	250	252	65	48	69	64		
8	100		716.475	.77	1.5	2.5	71	250	253	66	48	69	64		
9	105		719.835	.72	1.4	2.5	72	250	253	66	48	69	64		
10	110		723.110	.66	1.3	2.5	72	250	252	66	50	70	65		
11	115		726.375	.69	1.3	2.5	72	250	250	66	50	70	65		
12	120	12:24	729.644	.70	1.3	2.0	72	250	252	66	51	70	65		

ACCI 1 Minute Average Data Sheet: O2, CO2			
Client	Collective Efforts LLC	Unit	SSI
Project No	10-068	Operation	mnoc
Plant	Alcoan	Location	exhaust stack

MINUTE	DATE	TIME	O2 (DV %)	CO2 (DV %)
RUN 3				
1	2010/03/26	10:20:17	13.7	6.0
2	2010/03/26	10:21:17	13.6	6.1
3	2010/03/26	10:22:17	13.7	6.0
4	2010/03/26	10:23:17	13.8	5.9
5	2010/03/26	10:24:17	13.8	5.9
6	2010/03/26	10:25:17	13.7	6.0
7	2010/03/26	10:26:17	13.6	6.1
8	2010/03/26	10:27:17	13.6	6.1
9	2010/03/26	10:28:17	13.6	6.1
10	2010/03/26	10:29:17	13.6	6.1
11	2010/03/26	10:30:17	13.6	6.1
12	2010/03/26	10:31:17	13.5	6.2
13	2010/03/26	10:32:17	13.5	6.2
14	2010/03/26	10:33:17	13.5	6.2
15	2010/03/26	10:34:17	13.5	6.2
16	2010/03/26	10:35:17	13.5	6.2
17	2010/03/26	10:36:17	13.4	6.3
18	2010/03/26	10:37:17	13.4	6.3
19	2010/03/26	10:38:17	13.4	6.3
20	2010/03/26	10:39:17	13.4	6.3
21	2010/03/26	10:40:17	13.4	6.3
22	2010/03/26	10:41:17	13.5	6.2
23	2010/03/26	10:42:17	13.6	6.1
24	2010/03/26	10:43:17	13.7	6.0
25	2010/03/26	10:44:17	13.8	5.9
26	2010/03/26	10:45:17	13.8	6.0
27	2010/03/26	10:46:17	13.8	5.9
28	2010/03/26	10:47:17	13.8	6.0
29	2010/03/26	10:48:17	13.8	5.9
30	2010/03/26	10:49:17	13.9	5.8
31	2010/03/26	10:50:17	13.9	5.8
32	2010/03/26	10:51:17	13.9	5.8
33	2010/03/26	10:52:17	13.9	5.8
34	2010/03/26	10:53:17	13.9	5.8
35	2010/03/26	10:54:17	13.9	5.8
36	2010/03/26	10:55:17	14.0	5.8
37	2010/03/26	10:56:17	13.9	5.8
38	2010/03/26	10:57:17	13.9	5.9
39	2010/03/26	10:58:17	13.9	5.9
40	2010/03/26	10:59:17	13.8	6.0
41	2010/03/26	11:00:17	13.6	6.1
42	2010/03/26	11:01:17	13.6	6.2
43	2010/03/26	11:02:17	13.5	6.2
44	2010/03/26	11:03:17	13.5	6.2
45	2010/03/26	11:04:17	13.5	6.2
46	2010/03/26	11:05:17	13.5	6.2
47	2010/03/26	11:06:17	13.5	6.2
48	2010/03/26	11:07:17	13.5	6.3
49	2010/03/26	11:08:17	13.4	6.3
50	2010/03/26	11:09:17	13.4	6.3
51	2010/03/26	11:10:17	13.4	6.3
52	2010/03/26	11:11:17	13.4	6.3
53	2010/03/26	11:12:17	13.4	6.3
54	2010/03/26	11:13:17	13.4	6.3
55	2010/03/26	11:14:17	13.4	6.3
56	2010/03/26	11:15:17	13.5	6.2
57	2010/03/26	11:16:17	13.4	6.3
58	2010/03/26	11:17:17	13.4	6.3
59	2010/03/26	11:18:17	13.4	6.3
60	2010/03/26	11:19:17	13.4	6.3
61	2010/03/26	11:20:17	13.5	6.3
62	2010/03/26	11:21:17	13.4	6.3
63	2010/03/26	11:22:17	13.4	6.3
64	2010/03/26	11:23:17	13.5	6.2
65	2010/03/26	11:24:17	13.5	6.2
66	2010/03/26	11:25:17	13.5	6.2

ACCI 1 Minute Average Data Sheet: O2, CO2			
Client	Collective Efforts LLC	**Unit**	SSI
Project No	10-068	**Operation**	mnoc
Plant	Alcoan	**Location**	exhaust stack

MINUTE	DATE	TIME	O2 (DV %)	CO2 (DV %)
67	2010/03/26	11:26:17	13.5	6.2
68	2010/03/26	11:27:17	13.5	6.2
69	2010/03/26	11:28:17	13.5	6.2
70	2010/03/26	11:29:17	13.5	6.2
71	2010/03/26	11:30:17	13.5	6.2
72	2010/03/26	11:31:17	13.4	6.3
73	2010/03/26	11:32:17	13.4	6.3
74	2010/03/26	11:33:17	13.4	6.3
75	2010/03/26	11:34:17	13.4	6.3
76	2010/03/26	11:35:17	13.4	6.3
77	2010/03/26	11:36:17	13.4	6.3
78	2010/03/26	11:37:17	13.4	6.3
79	2010/03/26	11:38:17	13.4	6.3
80	2010/03/26	11:39:17	13.5	6.2
81	2010/03/26	11:40.17	13.5	6.2
82	2010/03/26	11:41:17	13.5	6.3
83	2010/03/26	11:42:17	13.4	6.3
84	2010/03/26	11:43:17	13.5	6.2
85	2010/03/26	11:44:17	13.5	6.2
86	2010/03/26	11:45:17	13.6	6.1
87	2010/03/26	11:46:17	13.6	6.1
88	2010/03/26	11:47:17	13.6	6.1
89	2010/03/26	11:48:17	13.7	6.1
90	2010/03/26	11:49:17	13.7	6.0
91	2010/03/26	11:50:17	13.7	6.0
92	2010/03/26	11:51:17	13.6	6.1
93	2010/03/26	11:52:17	13.6	6.1
94	2010/03/26	11:53:17	13.7	6.0
95	2010/03/26	11:54:17	13.6	6.1
96	2010/03/26	11:55:17	13.6	6.1
97	2010/03/26	11:56:17	13.6	6.1
98	2010/03/26	11:57:17	13.6	6.1
99	2010/03/26	11:58:17	13.7	6.0
100	2010/03/26	11:59:17	13.5	6.2
101	2010/03/26	12:00:17	13.3	6.4
102	2010/03/26	12:01:17	13.3	6.4
103	2010/03/26	12:02:17	13.3	6.4
104	2010/03/26	12:03:17	13.3	6.4
105	2010/03/26	12:04:17	13.1	6.5
106	2010/03/26	12:05:17	13.1	6.6
107	2010/03/26	12:06:17	13.1	6.6
108	2010/03/26	12:07:17	13.0	6.6
109	2010/03/26	12:08:17	13.2	6.5
110	2010/03/26	12:09:17	13.4	6.4
111	2010/03/26	12:10:17	13.4	6.3
112	2010/03/26	12:11:17	13.5	6.3
113	2010/03/26	12:12:17	13.5	6.3
114	2010/03/26	12:13:17	13.4	6.3
115	2010/03/26	12:14:17	13.5	6.3
116	2010/03/26	12:15:17	13.4	6.3
117	2010/03/26	12:16:17	13.4	6.4
118	2010/03/26	12:17:17	13.3	6.4
119	2010/03/26	12:18:17	13.3	6.4
120	2010/03/26	12:19:17	13.4	6.4
RUN 3 AVERAGES			**13.5**	**6.2**

ACCI CEM Calibration, Bias and Drift Data Sheet

Based on 40 CFR Part 60, Appendix A-4, Method 7E

Client	Collective Efforts LLC	**Date**	March 26, 2010
Project No	10-068	**Location**	exhaust stack
Plant	Alcoan	**Run**	Run 3
Unit	SSI	**Start Time**	10:20
Operation	mnoc	**End Time**	12:20
Tester(s)	bo, jv,ew,cb,rf		

Cal.	LOW		MID		HIGH		Tank ID				Conc.
Gas	Conc.	(% of Span)	Conc.	(% of Span)	Conc.	(% of Span)	LOW	MID	HIGH	Span	Units
O2	N/A	N/A	10.01	44.5	22.47	100.0	N/A	eb001355	cc251892	22.47	d. vol. %
CO2	N/A	N/A	9.96	44.2	22.54	100.0	N/A	cc251892	eb001355	22.54	d. vol. %
LIMITS				40 % to 60 %		100%					

	Upscale: Enter "Low" "Mid" or "High"			Initial Values		Final Values				Average of Initial and Final	Average Indicated	Corrected	
Gas	below "Zero"	Actual Upscale Conc.	Analyzer Cal. Response	System Cal. Response	System Cal. Bias (% of Span)	System Cal. Response	System Cal. Bias (% of Span)	Drift (% of Span)	Span	System Responses	Gas Conc.	Gas Conc.	Conc. Units
O2	Zero		0.0	0.1	0.45	0.0	0.00	-0.45	22.47	0.05			
	Mid	10.01	10.0	10.1	0.45	10.1	0.45	0.00	22.47	10.1	13.53	13.43	d. vol. %
CO2	Zero		0.2	0.2	0.00	0.2	0.00	0.00	22.54	0.2			
	Mid	9.96	9.7	9.5	-0.89	9.5	-0.89	0.00	22.54	9.5	6.18	6.41	d. vol. %
LIMITS					+/- 5 %		+/- 5 %	+/- 3 %					

	ZERO Analyzer Response	ZERO Analyzer Cal. Error	LOW	LOW Analyzer Response	LOW Analyzer Cal. Error	LOW System Cal. Error	MID	MID Analyzer Response	MID Analyzer Cal. Error	MID System Cal. Error	HIGH	HIGH Analyzer Response	HIGH Analyzer Cal. Error	HIGH System Calibration Error		Conc.
Gas	(System for THC)	(% of Span)	Actual Conc.	(System for THC)	(% of Span)	(% of Actual)	Actual Conc.	(System for THC)	(% of Span)	(% of Actual)	Actual Conc.	(System for THC)	(% of Span)	(% of Actual)	Span	Units
O2	0.0	0.00					10.01	10.0	-0.04		22.47	22.4	-0.31		22.47	d. vol. %
CO2	0.2	0.89					9.96	9.7	-1.15		22.54	22.5	-0.18		22.54	d. vol. %
LIMITS		+/- 2 %			+/- 2 %	+/- 5 %			+/- 2 %	+/- 5 %			+/- 2 %	+/- 5 %		

Client:	Collective Efforts LLC		Test Date:	March 26, 2010	
Project No.:	10-068		Test Location:	exhaust stack	
Plant:	Alcoan		Test Run:	Run 3	
Unit:	SSI		Test Start Time:	10:20 AM	
Unit Operation:	mnoc		Test Finish Time:	12:24 PM	
Blue is data input.	Red is a calculation.	Pink is a reference to a cell on another sheet.		Green is a reference to a cell on this sheet.	
Data Input			**Calculations**		
Control Box:	1618		CO + N2	80.16	% dv
Meter $DH_@$ (0.75 scfm)	1.753	in. H_2O	Water Collected (V_f- V_i)	18.0	ml
Meter Calibration Factor (Yd)	1.000		Water Vapor Condensed (Vwc(std))	0.847	scf
Test Time (Theta)	120	minutes	Water Collected (W_f- W_i)	17.3	g
Barometric Pressure (Pbar)	29.20	in. Hg	Water Vapor in Silica Gel (Vwsg(std))	0.816	scf
Stack Static Pressure (Pg)	0.56	in. H_2O	Vol. Water Vapor in Gas Stand.(Vw(std))	1.663	scf
Stack Diameter (Ds) (L if rectangular)	36.5	inches	Volume Dry Gas Metered (Vm)	79.645	dacf
Stack Width (enter NA if circular)	NA	inches	Vol. Dry Gas Metered Stand.(Vm(std))	78.340	dscf
Nozzle Diameter (Dn) (NA if NA)	0.210	inches	Volume Dry Gas Metered (Vm(m^3))	2.255	dacm
CO2	6.41	% dv	Vol. Dry Gas Metered Stand.(Vm(std)m^3)	2.218	dscm
O2	13.43	% dv	Stack Absolute Pressure (Ps)	29.24	in. Hg
Product Rate (enter NA if not needed)	1.88	input ton/hr	Stack Absolute Temperature (Tsavg)	531.7	R
Is the input ton/hr metric? (YES=1)	0		H2O Vapor Pressure @ avg Stack Temp.	0.79	in. Hg
Pitot Tube Coefficient (Cp)	0.84		H2O in the gas at saturation (Bws)	0.0271	vol. fraction
Sample Calculation Title	Particulate and CEMS		H2O in the gas from test data (Bws)	0.0208	vol. fraction
F_d @ 68 F and 760 mm Hg (NA if NA)		dscf/MMBtu	H2O in the gas used (lower of the 2 Bws)	0.0208	vol. fraction
Standard Temperature	68	F	Is the Gas Stream Saturated With H2O?	NO	
Standard Pressure	760	mm Hg	Dry Gas Molecular Weight (Md)	29.56	lb/lb-mole
Pitot Tube Constant (Kp)	85.49		Wet Gas Molecular Weight (Ms)	29.32	lb/lb-mole
Calculations			Gas Velocity (Vs)	47.73	ft/s
Meter Temperature (Tm)	65.5	F	Is the stack circular or rectangular?	CIRCULAR	
Stack Temperature (Tsavg)	72.0	F	Area Stack (As)	7.266	ft^2
Orifice Pressure Drop (dHavg)	1.371	in. H_2O	Actual Gas Flowrate	20,811	acfm
GasVelocity Head (dP)^^avg	0.8438	in. H_2O^1/2	Standard Gas Flowrate	20,184	scfm
F_d @ Standard Conditions	NA	dscf/MMBtu	Dry Standard Gas Flowrate	19,764	dscfm
F_d @ Stan. Cond. & Actual O2	NA	dscf/MMBtu	Actual Gas Flowrate	589	acm/min
Heat Input Based on F_d	NA	MMBtu/hr	Standard Gas Flowrate	572	scm/min
K1method 4	0.04706	scf/ml	Dry Standard Gas Flowrate	560	dscm/min
K2method 4	0.04715	scf/g	Area Nozzle (An)	0.000241	ft^2
K1method 5	17.64	R/in. Hg	Percent of Isokinetic Sampling (I)	99.84	%
K4method 5	0.0945		**Particulate Matter**		
Standard lb-mole volume	385.3	ft^3/lb-mole	Product Rate	1.88	ton/hr
Particulate Matter			Acetone Wash Container No.	171i	
Product Rate		ton/hr	Inorganic Container No.	186s	
Front-Half Acetone Rinse (corrected)	5.20	mg	Organic Container No.	186m	
Front-Half Filter Particulate	2.50	mg	Front Half Filter No.	4047	
Total Front-Half Particulate Method 5	7.70	mg	Acetone Wash Volume (Vaw)	146	ml
Inorganic Fraction Particulate	8.17	mg	Acetone Wash Final (total) Weight 1	114166.70	mg
Organic Fraction Particulate	3.05	mg	Acetone Wash Final (total) Weight 2	114167.10	mg
Total Condensible Particulate	9.22	mg	Acetone Wash Tare Weight 1	114160.50	mg
Total Particulate Mass (m_n)	16.91	mg	Acetone Wash Tare Weight 2	114160.60	mg
TOTAL PARTICULATE			Acetone Wash Weight Gain	6.35	mg
Particulate Concentration	0.0033	gr/dscf	Residue in Acetone Wash (Wa)	1.15	mg
Particulate Emission Rate	0.564	lb/hr	Acetone Wash Particulate	5.20	mg
Particulate Emission Rate	0.3002	lb/ton prod.	Inorganic Gross Weight	0.10	mg
Particulate Emission Rate Based on F_d	NA	lb/MMBtu	Inorganic Tare Weight	0.10	mg
FILTERABLE PARTICULATE (METHOD 5)			Inorganic Fraction Particulate	8.20	mg
Particulate Concentration	0.0015	gr/dscf	Organic Gross Weight	0.30	mg
Particulate Emission Rate	0.257	lb/hr	Organic Tare Weight	0.20	mg
Particulate Emission Rate	0.1366	lb/ton prod.	Organic Fraction Particulate	3.05	mg
Particulate Emission Rate Based on F_d	NA	lb/MMBtu	Total Condensible Particulate	9.22	mg
CONDENSIBLE PARTICULATE (METHOD OTM28)			Front Half Filter Final (total) Weight 1	366.90	mg
Particulate Concentration	0.0018	gr/dscf	Front Half Filter Final (total) Weight 2	367.00	mg
Particulate Emission Rate	0.308	lb/hr	Front Half Filter Tare Weight 1	364.60	mg
Particulate Emission Rate	0.1636	lb/ton prod.	Front Half Filter Tare Weight 2	364.30	mg
Particulate Emission Rate Based on F_d	NA	lb/MMBtu	Front Half Filter Particulate	2.50	mg
			Total Particulate Mass (m_n)	16.91	mg
			Particulate Concentration	0.0033	gr/dscf
			Particulate Emission Rate	0.564	lb/hr
			Particulate Emission Rate	0.3002	lb/ton prod.
			Particulate Without Blank Correction	8.8500	mg
			Particulate Emission Rate Based on F_d	NA	lb/MMBtu
			Particulate Matter Acetone Blank		
			Acetone wash container No.	171j	
			Acetone density (p_a)	0.7899	g/ml
			Acetone blank volume (Va)	200.0	ml
			Final (total) weight 1 after evaporation	112,879.40	mg
			Final (total) weight 2 after evaporation	112,879.00	mg
			Final (total) weight difference (absolute value)	-0.40	mg
			Average final (total) weight after evaporation	112,879.20	mg
			Tare weight 1	112,872.20	mg
			Tare weight 2	112,872.00	mg
			Tare weight difference (absolute value)	-0.20	mg
			Average tare weight	112,872.10	mg
			Averge final (total) weight minus average tare weight	7.10	mg
			Mass of residue of acetone after avaporation (m_a)	7.10	mg
			Acetone blank residue concentration (Ca) calculated	0.0449	mg/g
			Acetone blank correction as a % of acetone mass	0.0045	%
			Acetone blank residue concentration (Ca) used	0.0100	mg/g

Collective Efforts LLC **Run 3** F or C? F=1,C=0 1

SSI

Point	Pitot DP (dP) (in. H2O)	SQRT dP (in. H2O)$^{1/2}$	Orifice DP (dH) (in. H2O)	Stack Temp (F)	Meter Temp In/Out (F or C)	(F or C)
A-1	0.68	0.825	1.3	75	62	61
2	0.65	0.806	1.2	75	64	61
3	0.66	0.812	1.3	73	65	62
4	0.65	0.806	1.2	72	67	62
5	0.66	0.812	1.3	72	67	62
6	0.72	0.849	1.4	71	68	63
7	0.80	0.894	1.5	71	68	63
8	0.81	0.900	1.6	71	69	63
9	0.78	0.883	1.5	71	68	63
10	0.72	0.849	1.4	72	68	63
11	0.75	0.866	1.4	72	68	63
12	0.72	0.849	1.4	72	68	64
B-1	0.67	0.819	1.3	72	66	63
2	0.66	0.812	1.3	72	67	63
3	0.67	0.819	1.3	72	67	63
4	0.68	0.825	1.3	72	68	63
5	0.73	0.854	1.4	72	69	64
6	0.76	0.872	1.5	71	70	64
7	0.80	0.894	1.5	72	69	64
8	0.77	0.877	1.5	71	69	64
9	0.72	0.849	1.4	72	69	64
10	0.66	0.812	1.3	72	70	65
11	0.69	0.831	1.3	72	70	65
12	0.70	0.837	1.3	72	70	65
Average	0.71	0.844	1.37	72.0		65.5

Initial volume	650.000	ft^3	Initial volume	0.000	liters
Final volume	729.645	ft^3	Final volume	0.000	liters
Total metered	79.645	dacf	Total metered	0.000	dry actual liters

Impinger	Final grams	Initial grams	Gram Gain	Final ml	Initial ml	ml Gain
1			0.0	4.0	0.0	4.0
2			0.0	0.0	0.0	0.0
3			0.0	114.0	100.0	14.0
4	261.6	244.3	17.3			0.0
5			0.0			0.0
6			0.0			0.0
7			0.0			0.0
8			0.0			0.0
9			0.0			0.0
10			0.0			0.0
Total	261.6	244.3	17.3	118.0	100.0	18.0
	W_f	W_i	(W_f- W_i)	V_f	V_i	(V_f- V_i)

USEPA Method 23 and CEMs

AIR/COMPLIANCE CONSULTANTS INC.
USEPA METHOD 23 and
CARB 429 DATA SHEET

Client:	Collective Efforts	**Test Type:**	Method 23/CARB 429	**Meter Delta H@:**	1.753	**Start Time:**	9:15
Date:	3-24-10	**Run Number:**	0.UE	**Meter Correction:**	1.000	**Stop Time:**	13:20
Plant:	Alcosan	**Nozzle Dia:**	~~.256~~ .210	**Pitot Correction:**	0.84	**Umbilical Length:**	50' umb - 8
Sampling Location:	SSI stack	**Static Press, Ps:**	.57	**Control Box Num.:**	1618	**Probe Number:**	4'-5
		Barometric Press:	29.45	**Assumed Moisture:**	3%	**Pitot Number:**	4'-5
Project Number:	10-068	**Ambient Temp:**	78 °F	**Thermocouple ID:**	4'-5	**Filter Number:**	NA
Test Crew:	EW JV CR	**K-factor (K_f)**	3.19			**Stack Diameter:**	36.5"

Traverse Point Number	Elapsed Time	Clock Time	Metered Volume (cf)	Velocity Head (D P)	Orifice Delta H in. H_2O	Meter Vacuum in. Hg	Stack Temp. °F	Probe Temp. Ts °F	Oven Temp. °F	Imp Out Temp °F	Cond. Temp °F	Meter Temp. °F IN/AVG	Meter Temp. °F OUT	Notes
		9:15	975.800					248+-25°	248+-25°	< 68°	< 68°			
A-1	5		979.432	.81	1.6	11.0	72	250	253	46	46	79	79	1.99 ft³
1	10		982.963	.81	1.6	12.5	72	250	251	45	40	80	78	
A-2	15		986.721	.83	1.7	15.0	72	250	251	47	39	82	80	
2	20		990.479	.84	1.7	15.0	72	250	250	48	39	83	80	2.00
A-3	25		994.271	.87	1.7	15.0	72	250	250	51	40	84	81	
3	30		998.001	.87	1.7	15.0	72	250	252	50	40	84	81	
A-4	35		1001.516	.90	1.8	15.0	73	250	250	51	41	85	81	
4	40		1005.613	.91	1.8	15.0	72	250	248	50	41	85	82	
A-5	45		1009.442	.90	1.8	15.0	72	250	249	50	43	86	82	XAD TRAP #4
5	50		1013.263	.90	1.8	15.0	72	250	249	48	42	86	82	CB028483
A-6	55		1017.267	.89	1.8	15.5	72	250	248	49	42	87	83	FH 2412-01
6	60	10:15	1021.032	.89	1.8	15.5	72	250	248	48	42	87	83	
A-7	65		1024.901	.88	1.8	15.5	72	250	250	49	42	88	84	
7	70		1028.783	.88	1.8	15.5	72	250	249	48	42	88	84	
A-8	75		1032.081	.60	1.2	12.0	72	250	249	48	42	88	84	
8	80		1035.299	.61	1.2	12.0	72	250	252	48	43	89	85	
A-9	85		1038.371	.53	1.1	11.5	72	250	250	47	43	89	85	
9	90	10:45	1041.360	.52	1.0	11.0	72	250	250	48	44	90	86	
TOTAL/AVERAGE														

Sample Train Leak Check

	(in. Hg)	Rate (ft³/m)
Initial	10	0.010
Final	16.5	0.005

Pitot Leak Check

Pressure	✓	✓
Static	✓	✓

	1	2	3	Average
CO2				
O2	CEMS			
CO				
N2				

Fyrite Kit #: _____

IMP	Contents	Final	Initial	Difference
1	Empty	412	0	
2	$NaCHO_3/NaCO_3$	92	100	
3	$NaCHO_3/NaCO_3$	96	100	
4	Empty	2	0	
5	Silica Gel	281.2	246.2	

CR-2

AIR/COMPLIANCE CONSULTANTS INC.
USEPA METHOD 23 and
CARB 429 DATA SHEET

Client: Collective Efforts **Test Type:** Method 23/CARB 429 **Project Number:** 10-068

Date: 3-24-10 **Run Number:** One **Testers:** EW, JW, CB

K-factor (K_f): [ ] [ ] [ ] **Sampling Location:** SSI stack

Traverse Point Number	Elapsed Time	Clock Time	Metered Volume (cf)	Velocity Head (Δ P)	Orifice Delta H in. H_2O	Meter Vacuum in. Hg	Stack Temp. °F	Probe Temp. Ts °F 248 +/- 25°	Oven Temp. °F 248 +/- 25°	Imp Out Temp °F < 68°	Cond. Temp °F	Meter Temp. °F IN/AVG	Meter Temp. °F OUT	Notes
	90	10:45			1.6									
A-10	95		1044.231	.54	1.6	9.0	72	250	250	49	45	91	86	
10	100		1047.701	.70	1.4	13.0	72	250	251	50	46	91	86	
A-11	105		1051.180	.69	1.4	13.0	73	250	250	51	46	92	86	
11	110		1054.648	.68	1.4	13.0	72	250	249	53	48	92	87	
A-12	115		1057.972	.64	1.3	12.5	73	250	249	54	49	92	87	
12	120	11:15	1061.253	.64	1.3	12.5	73	250	250	56	51	92	87	Stopped - Port change 11:15
B-1	125	11:20	1064.676	.69	1.4	13.0	72	250	251	57	51	91	88	Started @ 11:20
1	130		1068.113	.69	1.4	13.0	72	250	250	57	49	93	88	
B-2	135		1071.660	.69	1.4	13.0	72	250	250	52	43	93	88	
2	140		1074.991	.69	1.4	13.0	72	250	250	50	42	93	89	
B-3	145		1078.362	.64	1.3	12.5	72	250	250	48	42	93	89	
3	150		1081.712	.64	1.3	12.5	71	250	248	49	42	93	89	
B-4	155		1085.051	.65	1.3	12.5	72	250	249	48	42	92	89	
4	160		1088.482	.65	1.3	12.5	72	250	252	49	43	93	89	
B-5	165		1091.856	.68	1.4	13.0	72	250	248	48	43	93	89	
5	170		1095.321	.68	1.4	13.0	72	250	249	50	44	93	89	
B-6	175		1098.792	.69	1.4	13.0	72	250	249	49	45	93	90	
6	180		1102.297	.68	1.4	13.5	72	250	250	51	46	93	90	
B-7	185		1105.845	.70	1.4	13.5	72	250	250	51	46	93	90	
7	190		1109.321	.70	1.4	13.5	72	250	246	54	48	94	90	
B-8	195		1112.903	.74	1.5	14.0	72	250	250	53	50	94	90	
8	200		1116.488	.73	1.5	14.0	72	250	251	51	45	94	90	
B-9	205		1120.091	.71	1.4	13.5	72	250	250	47	43	94	90	
9	210		1123.664	.73	1.5	14.0	72	250	250	48	43	94	91	
B-10	215		1127.023	.65	1.3	12.5	72	250	249	47	43	94	91	
10	220		1130.363	.66	1.3	12.5	72	250	251	48	43	95	91	
B-11	225		1133.711	.66	1.3	12.5	72	250	251	47	43	95	91	
11	230		1137.101	.67	1.3	12.5	73	250	250	49	43	95	92	
B-12	235		1140.442	.67	1.3	12.5	72	250	251	48	43	96	92	
12	240	13:20	1143.886	.68	1.4	13.0	72	250	249	49	43	96	92	

ACCI 1 Minute Average Data Sheet: O2, CO2, CO, NOx, SO2			
Client	Collective Efforts LLC	**Unit**	SSI
Project No	10-068	**Operation**	mnoc
Plant	Alcosan	**Location**	exhaust stack

MINUTE	DATE	TIME	O2 (DV %)	CO2 (DV %)	CO (PPMdv)	NOx (PPMdv)	SO2 (PPMdv)
RUN 1							
1	2010/03/24	09:15:46	13.2	6.8	4.3	109.3	0.0
2	2010/03/24	09:16:46	13.2	6.8	4.3	108.9	0.0
3	2010/03/24	09:17:46	13.2	6.8	4.3	109.2	0.0
4	2010/03/24	09:18:46	13.2	6.8	4.1	119.1	0.0
5	2010/03/24	09:19:46	13.2	6.7	3.7	115.8	0.0
6	2010/03/24	09:20:46	13.3	6.7	3.8	112.8	0.0
7	2010/03/24	09:21:46	13.2	6.8	3.8	113.7	0.0
8	2010/03/24	09:22:46	13.2	6.8	3.7	110.6	0.0
9	2010/03/24	09:23:46	13.2	6.7	4.3	113.3	0.0
10	2010/03/24	09:24:46	13.2	6.7	4.1	110.0	0.0
11	2010/03/24	09:25:46	13.3	6.7	4.3	108.4	0.0
12	2010/03/24	09:26:46	13.3	6.7	4.1	108.5	0.0
13	2010/03/24	09:27:46	13.2	6.7	3.9	113.8	0.0
14	2010/03/24	09:28:46	13.3	6.7	3.5	116.6	0.1
15	2010/03/24	09:29:46	13.3	6.6	3.7	109.5	0.1
16	2010/03/24	09:30.46	13.3	6.6	3.5	115.7	0.1
17	2010/03/24	09:31:46	13.4	6.6	3.7	105.8	0.1
18	2010/03/24	09:32:46	13.4	6.6	4.1	111.1	0.1
19	2010/03/24	09:33.46	13.4	6.5	3.9	107.8	0.1
20	2010/03/24	09:34:46	13.4	6.6	4.3	111.5	0.1
21	2010/03/24	09:35:46	13.3	6.7	3.7	121.1	0.1
22	2010/03/24	09:36:46	13.3	6.6	3.7	114.1	0.2
23	2010/03/24	09:37:46	13.3	6.7	3.3	118.3	0.1
24	2010/03/24	09:38:46	13.3	6.7	3.5	107.6	0.2
25	2010/03/24	09:39:46	13.4	6.6	3.9	115.9	0.2
26	2010/03/24	09:40:46	13.4	6.6	4.1	113.9	0.2
27	2010/03/24	09:41.46	13.4	6.6	4.1	107.8	0.2
28	2010/03/24	09.42:46	13.4	6.6	4.3	113.3	0.2
29	2010/03/24	09:43:46	13.3	6.7	4.3	117.8	0.2
30	2010/03/24	09:44.46	13.3	6.7	3.9	117.5	0.2
31	2010/03/24	09.45:46	13.3	6.7	3.9	113.2	0.2
32	2010/03/24	09:46:46	13.3	6.7	3.7	120.6	0.2
33	2010/03/24	09:47.46	13.2	6.7	4.1	117.1	0.2
34	2010/03/24	09:48:46	13.2	6.8	4.1	121.5	0.2
35	2010/03/24	09:49:46	13.2	6.8	4.3	122.7	0.2
36	2010/03/24	09:50:46	13.3	6.7	4.3	118.9	0.2
37	2010/03/24	09:51:46	13.3	6.6	4.2	114.4	0.2
38	2010/03/24	09:52:46	13.3	6.7	4.0	112.0	0.2
39	2010/03/24	09:53:46	13.4	6.6	4.0	119.4	0.2
40	2010/03/24	09:54:46	13.4	6.5	3.9	125.0	0.2
41	2010/03/24	09:55.46	13.5	6.5	4.1	113.5	0.3
42	2010/03/24	09:56:46	13.5	6.5	4.3	113.2	0.2
43	2010/03/24	09:57:46	13.4	6.5	4.3	114.8	0.2
44	2010/03/24	09:58:46	13.4	6.5	4.5	117.4	0.2
45	2010/03/24	09:59:46	13.4	6.5	4.3	121.8	0.3
46	2010/03/24	10:00:46	13.5	6.5	4.3	123.1	0.2
47	2010/03/24	10:01:46	13.4	6.5	4.3	117.7	0.2
48	2010/03/24	10:02:46	13.4	6.5	3.7	115.1	0.3
49	2010/03/24	10:03:46	13.4	6.6	3.9	112.3	0.2
50	2010/03/24	10:04:46	13.4	6.6	4.1	111.3	0.3
51	2010/03/24	10:05:46	13.4	6.5	4.3	120.6	0.2
52	2010/03/24	10:06:46	13.5	6.5	4.5	120.1	0.3
53	2010/03/24	10:07:46	13.4	6.6	4.3	110.5	0.3
54	2010/03/24	10:08:46	13.5	6.5	4.7	117.7	0.3
55	2010/03/24	10:09.46	13.4	6.5	4.3	121.7	0.2
56	2010/03/24	10:10:46	13.4	6.6	4.3	123.6	0.3
57	2010/03/24	10:11:46	13.4	6.6	4.1	116.0	0.3
58	2010/03/24	10:12.46	13.4	6.6	4.1	119.2	0.2
59	2010/03/24	10:13:46	13.4	6.6	4.1	129.1	0.2
60	2010/03/24	10:14:46	13.3	6.6	4.3	122.4	0.3
61	2010/03/24	10:15:46	13.4	6.6	4.3	117.9	0.2
62	2010/03/24	10:16:46	13.4	6.6	4.3	120.5	0.2
63	2010/03/24	10:17:46	13.4	6.6	4.3	122.5	0.3
64	2010/03/24	10:18:46	13.4	6.6	4.1	122.5	0.3
65	2010/03/24	10.19:46	13.4	6.6	4.1	127.5	0.3
66	2010/03/24	10:20:46	13.4	6.6	4.1	123.2	0.3

ACCI 1 Minute Average Data Sheet: O2, CO2, CO, NOx, SO2			
Client	Collective Efforts LLC	**Unit**	SSI
Project No	10-068	**Operation**	mnoc
Plant	Alcosan	**Location**	exhaust stack

MINUTE	DATE	TIME	O2 (DV %)	CO2 (DV %)	CO (PPMdv)	NOx (PPMdv)	SO2 (PPMdv)
67	2010/03/24	10:21:46	13.2	6.7	3.9	118.5	0.3
68	2010/03/24	10:22:46	13.2	6.7	4.3	120.6	0.3
69	2010/03/24	10:23:46	13.3	6.7	4.5	118.3	0.3
70	2010/03/24	10:24:46	13.3	6.6	4.8	119.7	0.3
71	2010/03/24	10:25:46	13.5	6.5	4.5	125.1	0.3
72	2010/03/24	10:26:46	13.4	6.5	4.3	125.2	0.3
73	2010/03/24	10:27:46	13.4	6.6	4.3	113.1	0.2
74	2010/03/24	10:28:46	13.4	6.6	4.4	118.9	0.3
75	2010/03/24	10:29:46	13.4	6.6	4.3	116.1	0.2
76	2010/03/24	10:30:46	13.4	6.6	4.3	119.5	0.3
77	2010/03/24	10:31:46	13.4	6.6	4.7	126.0	0.3
78	2010/03/24	10:32:46	13.4	6.6	4.8	121.1	0.3
79	2010/03/24	10:33:46	13.3	6.7	4.7	126.8	0.3
80	2010/03/24	10:34:46	13.4	6.6	4.6	121.6	0.3
81	2010/03/24	10:35:46	13.7	6.3	4.5	120.6	0.3
82	2010/03/24	10:36:46	14.2	5.9	4.3	115.8	0.3
83	2010/03/24	10:37:46	14.4	5.7	4.5	111.6	0.3
84	2010/03/24	10:38:46	14.2	5.8	4.7	103.0	0.3
85	2010/03/24	10:39:46	14.1	5.9	4.9	105.7	0.3
86	2010/03/24	10:40:46	14.0	6.1	5.3	113.1	0.3
87	2010/03/24	10:41:46	13.8	6.2	5.3	120.4	0.3
88	2010/03/24	10:42:46	13.6	6.4	5.3	113.5	0.3
89	2010/03/24	10:43:46	13.4	6.6	4.5	120.7	0.2
90	2010/03/24	10:44:46	13.3	6.7	4.3	123.2	0.2
91	2010/03/24	10:45:46	13.2	6.8	4.3	134.4	0.2
92	2010/03/24	10:46:46	13.1	6.9	4.3	134.9	0.3
93	2010/03/24	10:47:46	13.0	6.9	4.5	132.0	0.3
94	2010/03/24	10:48:46	13.0	7.0	4.7	138.0	0.3
95	2010/03/24	10:49:46	12.9	7.0	4.3	149.4	0.3
96	2010/03/24	10:50:46	12.9	7.1	4.8	138.5	0.2
97	2010/03/24	10:51:46	12.8	7.1	4.3	141.4	0.3
98	2010/03/24	10:52:46	12.8	7.2	4.3	137.6	0.3
99	2010/03/24	10:53:46	12.7	7.2	4.2	146.6	0.3
100	2010/03/24	10:54:46	13.6	6.5	4.3	149.0	0.3
101	2010/03/24	10:55:46	16.0	4.6	4.3	65.5	0.3
102	2010/03/24	10:56:46	14.7	5.5	4.3	74.3	0.2
103	2010/03/24	10:57:46	13.7	6.3	5.1	122.8	0.3
104	2010/03/24	10:58:46	13.5	6.5	5.1	134.3	0.3
105	2010/03/24	10:59:46	13.3	6.7	4.8	136.4	0.3
106	2010/03/24	11:00:46	13.1	6.9	4.5	132.1	0.2
107	2010/03/24	11:01:46	12.9	7.1	4.3	143.5	0.2
108	2010/03/24	11:02:46	12.7	7.3	4.3	143.3	0.2
109	2010/03/24	11:03:46	12.5	7.4	4.3	154.5	0.2
110	2010/03/24	11:04:46	13.7	6.4	4.3	141.6	0.3
111	2010/03/24	11:05:46	15.2	5.1	4.7	79.2	0.2
112	2010/03/24	11:06:46	14.5	5.6	5.3	106.7	0.2
113	2010/03/24	11:07:46	14.3	5.8	4.8	92.3	0.2
114	2010/03/24	11:08:46	14.7	5.4	5.0	81.5	0.3
115	2010/03/24	11:09:46	14.9	5.3	4.6	73.1	0.2
116	2010/03/24	11:10:46	14.8	5.3	4.3	70.1	0.2
117	2010/03/24	11:11:46	15.2	5.0	4.3	64.3	0.2
118	2010/03/24	11:12:46	15.1	5.1	4.6	64.9	0.2
119	2010/03/24	11:13:46	14.4	5.8	4.6	50.0	0.1
120	2010/03/24	11:14:46	14.6	5.6	5.3	47.9	0.2
121	2010/03/24	11:15:46	14.9	5.3	5.1	48.4	0.2
122	2010/03/24	11:16:46	14.8	5.3	5.4	51.2	0.2
123	2010/03/24	11:17:46	14.8	5.3	4.9	46.8	0.2
124	2010/03/24	11:18:46	15.2	5.0	5.2	45.5	0.2
125	2010/03/24	11:19:46	15.3	5.0	5.3	37.0	0.2
126	2010/03/24	11:20:46	15.3	4.9	5.5	36.0	0.2
127	2010/03/24	11:21:46	15.4	4.9	5.6	34.0	0.2
128	2010/03/24	11:22:46	15.6	4.6	6.0	33.2	0.2
129	2010/03/24	11:23:46	15.7	4.6	6.4	36.4	0.2
130	2010/03/24	11:24:46	15.7	4.5	6.7	38.8	0.2
131	2010/03/24	11:25:46	15.7	4.5	6.2	38.5	0.2
132	2010/03/24	11:26:46	15.7	4.5	6.3	37.9	0.2
133	2010/03/24	11:27:46	15.6	4.6	5.8	35.7	0.2

ACCI 1 Minute Average Data Sheet: O2, CO2, CO, NOx, SO2			
Client	Collective Efforts LLC	**Unit**	SSI
Project No	10-068	**Operation**	mnoc
Plant	Alcosan	**Location**	exhaust stack

MINUTE	DATE	TIME	O2 (DV %)	CO2 (DV %)	CO (PPMdv)	NOx (PPMdv)	SO2 (PPMdv)
134	2010/03/24	11:28:46	15.7	4.5	6.2	32.2	0.2
135	2010/03/24	11:29:46	16.0	4.3	6.4	37.1	0.2
136	2010/03/24	11:30:46	16.1	4.1	6.8	37.4	0.2
137	2010/03/24	11:31:46	16.2	4.1	7.1	36.9	0.2
138	2010/03/24	11:32:46	16.3	4.0	7.6	39.1	0.2
139	2010/03/24	11:33:46	16.4	3.9	7.6	39.3	0.2
140	2010/03/24	11:34:46	16.4	3.9	7.5	43.2	0.2
141	2010/03/24	11:35:46	16.4	3.9	7.5	42.7	0.2
142	2010/03/24	11:36:46	16.3	4.0	7.5	40.6	0.2
143	2010/03/24	11:37:46	16.3	4.0	7.5	40.0	0.2
144	2010/03/24	11:38:46	16.2	4.0	7.5	41.4	0.2
145	2010/03/24	11:39:46	16.3	4.0	7.7	42.4	0.2
146	2010/03/24	11:40:46	16.4	3.9	7.4	43.7	0.2
147	2010/03/24	11:41:46	16.2	4.0	7.5	49.8	0.2
148	2010/03/24	11:42:46	16.1	4.1	6.8	46.6	0.2
149	2010/03/24	11:43:46	16.1	4.1	6.7	46.4	0.2
150	2010/03/24	11:44:46	15.5	4.5	5.8	49.2	0.2
151	2010/03/24	11:45:46	15.4	4.5	7.2	49.7	0.2
152	2010/03/24	11:46:46	15.2	4.7	6.9	50.3	0.2
153	2010/03/24	11:47:46	15.3	4.7	6.8	46.8	0.3
154	2010/03/24	11:48:46	15.3	4.7	5.1	46.7	0.1
155	2010/03/24	11:49:46	15.2	4.7	3.7	44.8	0.1
156	2010/03/24	11:50:46	15.2	4.8	3.6	40.0	0.0
157	2010/03/24	11:51:46	15.1	4.8	3.3	50.0	0.1
158	2010/03/24	11:52:46	14.9	5.0	2.9	44.7	0.1
159	2010/03/24	11:53:46	14.8	5.0	3.0	43.4	0.1
160	2010/03/24	11:54:46	14.7	5.2	2.9	39.8	0.1
161	2010/03/24	11:55:46	14.7	5.1	3.0	40.5	0.1
162	2010/03/24	11:56:46	14.7	5.2	3.1	44.9	0.1
163	2010/03/24	11:57:46	14.6	5.2	3.9	44.0	0.0
164	2010/03/24	11:58:46	14.5	5.2	3.6	45.3	0.1
165	2010/03/24	11:59:46	14.4	5.3	3.8	44.8	0.0
166	2010/03/24	12:00:46	14.2	5.5	3.5	45.1	0.0
167	2010/03/24	12:01:46	14.2	5.5	3.2	42.7	0.0
168	2010/03/24	12:02:46	14.1	5.6	3.3	41.5	0.0
169	2010/03/24	12:03:46	14.2	5.5	3.3	46.2	0.1
170	2010/03/24	12:04:46	14.2	5.5	3.8	42.2	0.1
171	2010/03/24	12:05:46	14.3	5.5	3.8	45.4	0.1
172	2010/03/24	12:06:46	14.3	5.4	3.7	43.4	0.0
173	2010/03/24	12:07:46	14.3	5.5	3.8	43.6	0.0
174	2010/03/24	12:08:46	14.2	5.5	3.6	43.8	0.1
175	2010/03/24	12:09:46	14.2	5.5	3.0	44.5	0.0
176	2010/03/24	12:10:46	14.2	5.5	3.1	44.8	0.0
177	2010/03/24	12:11:46	14.2	5.5	3.3	47.2	0.0
178	2010/03/24	12:12:46	14.1	5.6	3.0	45.8	0.0
179	2010/03/24	12:13:46	14.2	5.5	3.5	45.6	0.1
180	2010/03/24	12:14:46	14.2	5.5	3.8	46.7	0.1
181	2010/03/24	12:15:46	14.2	5.5	3.5	44.5	0.0
182	2010/03/24	12:16:46	14.1	5.6	3.8	43.6	0.1
183	2010/03/24	12:17:46	14.2	5.5	3.4	43.6	0.1
184	2010/03/24	12:18:46	14.2	5.5	3.3	47.1	0.1
185	2010/03/24	12:19:46	14.2	5.5	3.3	45.1	0.1
186	2010/03/24	12:20:46	14.2	5.5	3.3	46.2	0.1
187	2010/03/24	12:21:46	14.0	5.6	3.6	44.7	0.0
188	2010/03/24	12:22:46	13.9	5.7	3.7	45.7	0.1
189	2010/03/24	12:23:46	13.9	5.7	3.8	51.9	0.1
190	2010/03/24	12:24:46	13.9	5.7	4.1	54.1	0.1
191	2010/03/24	12:25:46	14.1	5.6	3.6	54.3	0.0
192	2010/03/24	12:26:46	14.0	5.6	3.6	54.8	0.1
193	2010/03/24	12:27:46	14.0	5.7	3.4	52.5	0.1
194	2010/03/24	12:28:46	14.0	5.7	3.4	54.8	0.1
195	2010/03/24	12:29:46	13.9	5.7	3.4	55.3	0.1
196	2010/03/24	12:30:46	14.0	5.7	3.8	55.4	0.0
197	2010/03/24	12:31:46	14.0	5.7	3.8	57.4	0.0
198	2010/03/24	12:32:46	13.9	5.7	3.8	60.2	0.0
199	2010/03/24	12:33:46	13.9	5.8	3.6	57.9	0.0
200	2010/03/24	12:34:46	13.8	5.8	3.7	56.1	0.0

ACCI 1 Minute Average Data Sheet: O2, CO2, CO, NOx, SO2			
Client	Collective Efforts LLC	**Unit**	SSI
Project No	10-068	**Operation**	mnoc
Plant	Alcosan	**Location**	exhaust stack

MINUTE	DATE	TIME	O2 (DV %)	CO2 (DV %)	CO (PPMdv)	NOx (PPMdv)	SO2 (PPMdv)
201	2010/03/24	12:35:46	13.8	5.8	3.5	62.1	0.1
202	2010/03/24	12:36:46	13.7	5.9	3.3	64.2	0.0
203	2010/03/24	12:37:46	13.7	5.9	3.4	63.8	0.0
204	2010/03/24	12:38:46	13.7	5.9	3.7	62.0	0.1
205	2010/03/24	12:39:46	13.7	5.9	4.0	62.5	0.0
206	2010/03/24	12:40:46	13.7	5.9	3.7	64.9	0.0
207	2010/03/24	12:41:46	13.7	5.9	4.1	63.1	0.0
208	2010/03/24	12:42:46	13.7	5.9	3.7	67.5	0.0
209	2010/03/24	12:43:46	13.7	5.9	3.7	68.6	0.0
210	2010/03/24	12:44:46	13.6	6.0	3.7	70.6	0.1
211	2010/03/24	12:45:46	13.6	6.0	3.7	69.9	0.0
212	2010/03/24	12:46:46	13.6	6.0	3.7	66.9	0.0
213	2010/03/24	12:47:46	13.6	6.0	3.7	67.9	0.1
214	2010/03/24	12:48:46	13.6	6.0	4.1	74.4	0.1
215	2010/03/24	12:49:46	13.6	6.0	4.0	71.6	0.0
216	2010/03/24	12:50:46	13.6	6.0	4.2	70.2	0.0
217	2010/03/24	12:51:46	13.6	6.0	3.9	67.9	0.0
218	2010/03/24	12:52:46	13.6	6.0	3.8	69.0	0.1
219	2010/03/24	12:53:46	13.6	6.0	3.5	71.6	0.0
220	2010/03/24	12:54:46	13.6	6.0	3.7	69.4	0.0
221	2010/03/24	12:55:46	13.5	6.0	4.0	75.5	0.0
222	2010/03/24	12:56:46	13.5	6.1	3.8	75.2	0.0
223	2010/03/24	12:57:46	13.5	6.1	4.3	78.6	0.0
224	2010/03/24	12:58:46	13.5	6.0	4.1	80.6	0.0
225	2010/03/24	12:59:46	13.6	6.0	4.1	81.4	0.0
226	2010/03/24	13:00:46	13.6	6.0	3.9	78.5	0.0
227	2010/03/24	13:01:46	13.5	6.1	4.0	73.8	0.0
228	2010/03/24	13:02:46	13.5	6.1	3.9	75.6	0.0
229	2010/03/24	13:03:46	13.5	6.1	3.7	85.5	0.0
230	2010/03/24	13:04:46	13.5	6.1	3.9	81.8	0.0
231	2010/03/24	13:05:46	13.5	6.1	4.4	84.8	0.0
232	2010/03/24	13:06:46	13.5	6.2	4.4	84.9	0.0
233	2010/03/24	13:07:46	13.5	6.2	4.3	91.8	0.0
234	2010/03/24	13:08:46	13.4	6.2	4.1	89.2	0.0
235	2010/03/24	13:09:46	13.4	6.2	4.1	83.2	0.0
236	2010/03/24	13:10:46	13.3	6.3	3.9	81.5	0.0
237	2010/03/24	13:11:46	13.2	6.4	4.1	80.6	0.0
238	2010/03/24	13:12:46	13.3	6.3	4.3	87.6	0.0
239	2010/03/24	13:13:46	13.3	6.4	4.2	89.1	0.0
240	2010/03/24	13:14:46	13.3	6.4	4.3	86.1	0.0
		Minimum	12.5	3.9	2.9	32.2	0.0
		Maximum	16.4	7.4	7.7	154.5	0.3
RUN 1 AVERAGES			**14.0**	**5.9**	**4.4**	**85.3**	**0.1**

ACCI CEM Calibration, Bias and Drift Data Sheet
Based on 40 CFR Part 60, Appendix A-4, Method 7E

Client	Collective Efforts LLC	**Date**	March 24, 2010
Project No	10-068	**Location**	exhaust stack
Plant	Alcosan	**Run**	Run 1
Unit	SSI	**Start Time**	9:15
Operation	mnoc	**End Time**	13:15
Tester(s)	wo,jv,ew,cb,rf		

Cal.	LOW		MID		HIGH		Tank ID				Conc.	Response Time	
Gas	Conc.	(% of Span)	Conc.	(% of Span)	Conc.	(% of Span)	LOW	MID	HIGH	Span	Units	Up (sec)	Down (sec)
O2	N/A	N/A	10.01	44.5	22.47	100.0	N/A	eb001355	cc251892	22.47	d. vol. %	37	36
CO2	N/A	N/A	9.96	44.2	22.54	100.0	N/A	cc251892	eb001355	22.54	d. vol. %	35	35
CO	N/A	N/A	7	46.7	15	100.0	N/A	method 205	method 205 (6	15	ppmdv	47	46
NOx	N/A	N/A	120	46.2	260	100.0	N/A	method 205	Method 205 (9	260	ppmdv	46	45
SO2	N/A	N/A	5	50.0	10	100.0	N/A	method 205	method 205 (9	10	ppmdv	45	44
LIMITS				40 % to 60 %		100%							

Gas	Upscale: Enter "Low" "Mid" or "High" below "Zero"	Actual Upscale Conc.	Analyzer Cal. Response	Initial Values: System Cal. Response	Initial Values: System Cal. Bias (% of Span)	Final Values: System Cal. Response	Final Values: System Cal. Bias (% of Span)	Drift (% of Span)	Span	Average of Initial and Final System Responses	Average Indicated Gas Conc.	Corrected Gas Conc.	Conc. Units
O2	Zero		0.0	0.0	0.00	0.1	0.45	0.45	22.47	0.05			
	Mid	10.01	10.1	10.1	0.00	10.1	0.00	0.00	22.47	10.1	13.97	13.87	d. vol. %
CO2	Zero		0.2	0.1	-0.44	0.2	0.00	0.44	22.54	0.15			
	Mid	9.96	9.6	9.9	1.33	9.8	0.89	-0.44	22.54	9.85	5.94	5.94	d. vol. %
CO	Zero		0.0	0.6	4.00	0.4	2.67	-1.33	15	0.5			
	Mid	7	7.3	7.3	0.00	7.8	3.33	3.33	15	7.55	4.39	3.86	ppmdv
NOx	Zero		0.0	0.4	0.15	1.5	0.58	0.42	260	0.95			
	Mid	120	119.3	115.3	-1.54	110.0	-3.58	-2.04	260	112.65	85.28	90.60	ppmdv
SO2	Zero		-0.1	0.0	1.00	0.1	2.00	1.00	10	0.05			
	Mid	5	5.0	4.8	-2.00	4.8	-2.00	0.00	10	4.8	0.14	0.10	ppmdv
LIMITS					+/- 5 %		+/- 5 %	+/- 3 %					

Gas	ZERO Analyzer Response (System for THC)	ZERO Analyzer Cal. Error (% of Span)	LOW Actual Conc.	LOW Analyzer Response (System for THC)	LOW Analyzer Cal. Error (% of Span)	LOW System Cal. Error (% of Actual)	MID Actual Conc.	MID Analyzer Response (System for THC)	MID Analyzer Cal. Error (% of Span)	MID System Cal. Error (% of Actual)	HIGH Actual Conc.	HIGH Analyzer Response (System for THC)	HIGH Analyzer Cal. Error (% of Span)	HIGH System Calibration Error (% of Actual)	Span	Conc. Units
O2	0.0	0.00					10.01	10.1	0.40		22.47	22.7	1.02		22.47	d. vol. %
CO2	0.2	0.89					9.96	9.6	-1.60		22.54	22.9	1.60		22.54	d. vol. %
CO	0.0	0.00					7	7.3	2.00		15	15.2	1.33		15	ppmdv
NOx	0.0	0.00					120	119.3	-0.27		260	260.0	0.00		260	ppmdv
SO2	-0.1	-1.00					5	5.0	0.00		10	9.9	-1.00		10	ppmdv
LIMITS		+/- 2 %			+/- 2 %	+/- 5 %			+/- 2 %	+/- 5 %			+/- 2 %	+/- 5 %		

Client:	Collective Efforts LLC		Test Date:	March 24, 2010	
Project No.:	10-068		Test Location:	exhaust stack	
Plant:	Alcosan		Test Run:	Run 1	
Unit:	SSI		Test Start Time:	9:15 AM	
Unit Operation:	mnoc		Test Finish Time:	1:20 PM	
Blue is data input.	Red is a calculation.	Pink is a reference to a cell on another sheet.		Green is a reference to a cell on this sheet.	
Data Input			**Calculations**		
Control Box:	1618		CO + N2	80.19	% dv
Meter $DH_@$ (0.75 scfm)	1.753	in. H_2O	Water Collected (V_f - V_i)	32.0	ml
Meter Calibration Factor (Yd)	1.000		Water Vapor Condensed (Vwc(std))	1.506	scf
Test Time (Theta)	240	minutes	Water Collected (W_f - W_i)	35.0	g
Barometric Pressure (Pbar)	29.45	in. Hg	Water Vapor in Silica Gel (Vwsg(std))	1.650	scf
Stack Static Pressure (Pg)	0.57	in. H_2O	Vol. Water Vapor in Gas Stand.(Vw(std))	3.156	scf
Stack Diameter (Ds) (L if rectangular)	36.5	inches	Volume Dry Gas Metered (Vm)	168.086	dacf
Stack Width (enter NA if circular)	NA	inches	Vol. Dry Gas Metered Stand.(Vm(std))	159.785	dscf
Nozzle Diameter (Dn) (NA if NA)	0.210	inches	Volume Dry Gas Metered (Vm(m^3))	4.760	dacm
CO2	5.94	% dv	Vol. Dry Gas Metered Stand.(Vm(std)m^3)	4.525	dscm
O2	13.87	% dv	Stack Absolute Pressure (Ps)	29.49	in. Hg
Product Rate (enter NA if not needed)	1.88	input ton/hr	Stack Absolute Temperature (Tsavg)	531.8	R
Is the input ton/hr metric? (YES=1)	0		H2O Vapor Pressure @ avg Stack Temp.	0.79	in. Hg
Pitot Tube Coefficient (Cp)	0.84		H2O in the gas at saturation (Bws)	0.0269	vol. fraction
Sample Calculation Title	Particulate and CEMS		H2O in the gas from test data (Bws)	0.0194	vol. fraction
F_d @ 68 F and 760 mm Hg (NA if NA)	9,570	dscf/MMBtu	H2O in the gas used (lower of the 2 Bws)	0.0194	vol. fraction
Heat Input Based on Process Data	100	MMBtu/hr	Is the Gas Stream Saturated With H2O?	NO	
Standard Temperature	68	F	Dry Gas Molecular Weight (Md)	29.51	lb/lb-mole
Standard Pressure	760	mm Hg	Wet Gas Molecular Weight (Ms)	29.28	lb/lb-mole
Pitot Tube Constant (Kp)	85.49		Gas Velocity (Vs)	47.80	ft/s
Calculations			Is the stack circular or rectangular?	CIRCULAR	
Meter Temperature (Tm)	88.5	F	Area Stack (As)	7.266	ft^2
Stack Temperature (Tsavg)	72.1	F	Actual Gas Flowrate	20,840	acfm
Orifice Pressure Drop (dHavg)	1.452	in. H_2O	Standard Gas Flowrate	20,384	scfm
GasVelocity Head (dP)^avg	0.8480	in. H_2O^1/2	Dry Standard Gas Flowrate	19,989	dscfm
F_d @ Standard Conditions	9,570	dscf/MMBtu	Actual Gas Flowrate	590	acm/min
F_d @ Stan. Cond. & Actual O2	28,448	dscf/MMBtu	Standard Gas Flowrate	577	scm/min
Heat Input Based on F_d	42	MMBtu/hr	Dry Standard Gas Flowrate	566	dscm/min
K1method 4	0.04706	scf/ml	Area Nozzle (An)	0.000241	ft^2
K2method 4	0.04715	scf/g	Percent of Isokinetic Sampling (I)	100.68	%
K1method 5	17.64	R/in. Hg			
K4method 5	0.0945				
Standard lb-mole volume	385.3	ft^3/lb-mole			
Carbon Monoxide					
MW	28	lb/lb-mole			
O2 for Correction	7	vol. %			
Concentration	3.86	ppm_d,			
Concentration	7.64	ppm_d, 7% O2			
Concentration	0.0000003	lb/dscf			
Emission	0.34	lb/hr			
Emission	0.008	lb/MMBtu			
Emission	0.0034	lb/MMBtu			
Nitrogen Oxides (NOx) as NO2					
MW	46	lb/lb-mole			
O2 for Correction	7	vol. %			
Concentration	90.60	ppm_d,			
Concentration	179.11	ppm_d, 7% O2			
Concentration	0.0000108	lb/dscf			
Emission	12.97	lb/hr			
Emission	0.308	lb/MMBtu			
Emission	0.1297	lb/MMBtu			
Sulfur Dioxide (SO2)					
MW	64	lb/lb-mole			
O2 for Correction	7	vol. %			
Concentration	0.10	ppm_d,			
Concentration	0.20	ppm_d, 7% O2			
Concentration	0.0000000	lb/dscf			
Emission	0.02	lb/hr			
Emission	0.00047	lb/MMBtu			
Emission	0.0002	lb/MMBtu			

Collective Efforts LLC **Run 1** **F or C?**
SSI **F=1,C=0** 1

Point	Pitot DP (dP) (in. H2O)	SQRT dP (in. H2O)$^{1/2}$	Orifice DP (dH) (in. H2O)	Stack Temp (F)	Meter Temp In/Out (F or C)	(F or C)
A-1	0.81	0.900	1.6	72	79	79
1	0.81	0.900	1.6	72	80	78
2	0.83	0.911	1.7	72	82	80
2	0.84	0.917	1.7	72	83	80
3	0.87	0.933	1.7	72	84	81
3	0.87	0.933	1.7	72	84	81
4	0.90	0.949	1.8	73	85	81
4	0.91	0.954	1.8	72	85	82
5	0.90	0.949	1.8	72	86	82
5	0.90	0.949	1.8	72	86	82
6	0.89	0.943	1.8	72	87	83
6	0.89	0.943	1.8	72	87	83
7	0.88	0.938	1.8	72	88	84
7	0.88	0.938	1.8	72	88	84
8	0.60	0.775	1.2	72	88	84
8	0.61	0.781	1.2	72	89	85
9	0.53	0.728	1.1	72	89	85
9	0.52	0.721	1.0	72	90	86
10	0.54	0.735	1.0	72	91	86
10	0.70	0.837	1.4	72	91	86
11	0.69	0.831	1.4	73	92	86
11	0.68	0.825	1.4	72	92	87
12	0.64	0.800	1.3	73	92	87
12	0.64	0.800	1.3	73	92	87
B-1	0.69	0.831	1.4	72	91	88
1	0.69	0.831	1.4	72	93	88
2	0.69	0.831	1.4	72	93	88
2	0.69	0.831	1.4	72	93	89
3	0.64	0.800	1.3	72	93	89
3	0.64	0.800	1.3	71	93	89
4	0.65	0.806	1.3	72	92	89
4	0.65	0.806	1.3	72	93	89
5	0.68	0.825	1.4	72	93	89
5	0.68	0.825	1.4	72	93	89
6	0.69	0.831	1.4	72	93	90
6	0.68	0.825	1.4	72	93	90
7	0.70	0.837	1.4	72	93	90
7	0.70	0.837	1.4	72	94	90
8	0.74	0.860	1.5	72	94	90
8	0.73	0.854	1.5	72	94	90
9	0.71	0.843	1.4	72	94	90
9	0.73	0.854	1.5	72	94	91
10	0.65	0.806	1.3	72	94	91
10	0.66	0.812	1.3	72	95	91
11	0.66	0.812	1.3	72	95	91
11	0.67	0.819	1.3	73	95	92
12	0.67	0.819	1.3	72	96	92
12	0.68	0.825	1.4	72	96	92
Average	0.72	0.848	1.45	72.1		88.5

Initial volume	975.800	ft^3	Initial volume	0.000	liters
Final volume	1143.886	ft^3	Final volume	0.000	liters
leak check					
Total metered	168.086	dacf	Total metered	0.000	dry actual liters

Impinger	Final grams	Initial grams	Gram Gain	Final ml	Initial ml	ml Gain
1			0.0	42.0	0.0	42.0
2			0.0	92.0	100.0	-8.0
3			0.0	96.0	100.0	-4.0
4			0.0	2.0	0.0	2.0
5	281.2	246.2	35.0			0.0
6			0.0			0.0
7			0.0			0.0
8			0.0			0.0
9			0.0			0.0
10			0.0			0.0
Total	281.2	246.2	35.0	232.0	200.0	32.0
	W_f	W_i	(W_f - W_i)	V_f	V_i	(V_f - Vi)

Dioxin Furan

	Analyte	TEF	Raw Data mass (pg)	Adjusted Mass (ng)	TEF Adjusted Amount (ng)
2	2378-TCDD	1	3.4	0.00340	0.0034
1	2378-TCDF (DB 225)	0.1	5.3	0.00530	0.00053
3	12378-PeCDF	0.05	2.8	0.00280	0.00014
5	12378-PeCDD	0.5	2.1	0.00210	0.00105
4	23478-PeCDF	0.5	2.8	0.00280	0.0014
6	123478-HxCDF	0.1	2.1	0.00210	0.00021
7	123678-HxCDF	0.1	1.7	0.00170	0.00017
10	123478-HxCDD	0.1	2.3	0.00230	0.00023
11	123678-HxCDD	0.1	2.0	0.00200	0.0002
12	123789-HxCDD	0.1	2.0	0.00200	0.0002
8	234678-HxCDF	0.1	2.4	0.00240	0.00024
9	123789-HxCDF	0.1	2.5	0.00250	0.00025
13	1234678-HpCDF	0.01	3.8	0.00380	0.000038
15	1234678-HpCDD	0.01	3.2	0.00320	0.000032
14	1234789-HpCDF	0.01	2.4	0.00240	0.000024
16	1,2,3,4,6,7,8,9-OCDD	0.001	5.2	0.00520	0.0000052
17	1,2,3,4,6,7,8,9-OCDF	0.001	4.1	0.00410	0.0000041

TEF Factors taken from USEPA 40 CFR, Chapter 1, Part 266, Appendix IX, Table 4.0.1

TEF ADJUSTED TOTAL 0.00812

TEF Total Mass Collected	0.0081	ng
TEF Emission Concentration	0.002	ng/m^3
TEF Emission Rate	60.975	ng/hr
O2 for Correction	7	%
TEF Emission Concentration	0.0035	ng/m^3 7% O2

		EDL	TEF Total Mass Collected ng	TEF Emission Concentration ng/m^3	TEF Emission Rate ng/hr	TEF Emission Concentration ng/m^3 7% O2
Polyaromatic Hydrocarbons						
Naphthalene	2250	28	2250	497.3	16888.8	983.1
2-Methylnaphthalene	1140	0.86	1140	252.0	8557.0	498.1
2-Chloronaphthalene	1.50	0.11	1.5	0.3	11.3	0.7
Acenaphthylene	388	2.1	388	85.8	2912.4	169.5
Acenaphthene	1130	2.1	1130	249.7	8481.9	493.8
Fluorene	596	4.8	596	131.7	4473.7	260.4
Phenanthrene	1510	1.8	1510	333.7	11334.2	659.8
Anthracene	88.0	2.2	88	19.4	660.5	38.5
Fluoranthene	330	0.86	330	72.9	2477.0	144.2
Pyrene	272	0.77	272	60.1	2041.7	118.8
Benzo(a)anthracene	11.9	0.82	11.9	2.6	89.3	5.2
Chrysene	29.2	0.82	29.2	6.5	219.2	12.8
Benzo(b)fluoranthene	20.1	0.83	20.1	4.4	150.9	8.8
Benzo(k)fluoranthene	8.48	0.91	8.48	1.9	63.7	3.7
Benzo(e)pyrene	20.6	2.7	20.6	4.6	154.6	9.0
Benzo(a)pyrene	16.2	3.5	16.2	3.6	121.6	7.1
Perylene	<0.26	1.4	<0.26	0.0	0.0	0.0
Indeno(1,2,3-cd)pyrene	12.2	6.2	12.2	2.7	91.6	5.3
Dibenz(a,h)anthracene	<0.46	5.1	<0.46	0.0	0.0	0.0
Benzo(g,h,i)perylene	27.9	8.6	27.9	6.2	209.4	12.2
PCBs						0.0
33'44'-TetraCB-(77)	<0.021	0.021	<0.021	0.0	0.0	0.0
344'5-TetraCB-(81)	<0.20	0.021	<0.20	0.0	0.0	0.0
233'44'-PentaCB-(105)	0.30	0.017	0.3	0.1	2.3	0.1
2344'5-PentaCB-(114)	<0.20	0.025	<0.20	0.0	0.0	0.0
23'44'5-PentaCB-(118)	0.94	0.016	0.94	0.2	7.1	0.4
23'44'5'-PentaCB-(123)	<0.20	0.017	<0.20	0.0	0.0	0.0
33'44'5-PentaCB-(126)	<0.20	0.016	<0.20	0.0	0.0	0.0
HexaCB-(156)+(157)	<0.013	0.013	<0.013	0.0	0.0	0.0
23'44'55'-HexaCB-(167)	<0.20	0.021	<0.20	0.0	0.0	0.0
33'44'55'-HexaCB-(169)	<0.20	0.014	<0.20	0.0	0.0	0.0
233'44'55'-HeptaCB-(189)	<0.20	0.016	<0.20	0.0	0.0	0.0
TOTAL TOXIC EQUIVALENCY		0.021				

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AIR/COMPLIANCE CONSULTANTS INC.
USEPA METHOD 23 and
CARB 429 DATA SHEET

Client:	Collective Efforts	Test Type:	Method 23/CARB 429	Meter Delta H@:	1.753
Date:	3-25-10	Run Number:	Two	Meter Correction:	1.000
Plant:	Alcosan	Nozzle Dia:	.210	Pitot Correction:	0.84
Sampling Location:	SSI stack	Static Press, Ps:	+.57	Control Box Num.:	1618
		Barometric Press:	29.20	Assumed Moisture:	3%
Project Number:	10-068	Ambient Temp:	70 °F	Thermocouple ID:	41-5
Test Crew:	EW, CB, CB	K-factor (K_f)	1.94		

								Probe		Imp		Meter Temp. °F		
Traverse Point Number	Elapsed Time	Clock Time	Metered Volume (cf)	Velocity Head (D P)	Orifice Delta H in. H_2O	Meter Vacuum in. Hg	Stack Temp. °F	Temp. Ts °F	Oven Temp. °F	Out Temp °F	Cond. Temp °F			Notes
								248+/-25°	248+/-25°	< 68°	< 68°	IN/AVG	OUT	
		8:25	231.012											
A-1	5		234.492	.79	1.5	9.5	73	250	250	54	55	67	67	
1	10		237.921	.79	1.5	10.0	73	250	252	51	41	67	67	
A 2	15		241.512	.82	1.6	12.0	73	250	251	52	41	69	67	
2	20		244.991	.79	1.5	11.0	73	250	250	51	42	70	67	x10 Imp #3 0289483
A 3	25		248.590	.82	1.6	12.0	73	250	252	53	43	72	68	42411-01
3	30		252.166	.82	1.6	12.0	73	250	248	52	44	73	68	
A 4	35		255.767	.82	1.6	12.0	73	250	248	54	44	73	69	
4	40		259.366	.79	1.5	11.5	73	250	250	52	44	74	69	
A 5	45		262.883	.75	1.5	11.0	73	250	250	53	44	74	69	
5	50		266.252	.72	1.4	10.5	73	250	250	52	44	74	70	
A 6	55		269.549	.66	1.3	10.0	73	250	250	53	45	75	70	
6	60		273.087	.75	1.5	11.5	73	250	249	53	45	76	70	
A 7	65		276.621	.76	1.5	12.0	73	250	250	55	46	76	71	
7	70		280.200	.75	1.5	12.0	73	250	251	55	46	77	71	
A 8	75		283.557	.73	1.4	11.0	73	250	250	57	47	77	71	
8	80		286.901	.71	1.4	11.0	73	250	249	56	47	77	72	
A 9	85		290.278	.71	1.4	11.0	73	250	250	58	48	77	72	
9	90		293.612	.68	1.3	10.5	73	250	249	59	50	77	72	
TOTAL/AVERAGE														

Sample Train Leak Check

	(in. Hg)	Rate (ft³/m)
Initial	15	0.000
Final	15	0.005

Pitot Leak Check

Pressure	✓	✓
Static	✓	✓

	1	2	3	Average
CO2				
O2	CEMS			
CO				
N2				

Fyrite Kit #: _____

IMP	Contents	Final	Initial	Difference
1	Empty	45	0	
2	$NaCHO_3/NaCO_3$	94	100	
3	$NaCHO_3/NaCO_3$	100	100	
4	Empty	6	0	
5	Silica Gel	300.9	259.2	

AIR/COMPLIANCE CONSULTANTS INC.
USEPA METHOD 23 and
CARB 429 DATA SHEET

Client: Collective Efforts **Test Type:** Method 23/CARB 429 **Project Number:** 10-068

Date: 3-25-10 **Run Number:** Two **Testers:** EW, CB, CB

K-factor (K_p): 1.96 **Sampling Location:** SSI stack

Traverse Point Number	Elapsed Time	Clock Time	Metered Volume (cf)	Velocity Head (Δ P)	Orifice Delta H in. H_2O	Meter Vacuum in. Hg	Stack Temp. °F	Probe Temp. Ts °F 248 +/- 25 °	Oven Temp. °F 248 +/- 25 °	Imp Out Temp °F < 68 °	Cond. Temp °F	Meter Temp. °F IN/AVG	Meter Temp. °F OUT	Notes
A-10	95		296.964	.68	1.3	10.5	73	250	251	56	41	78	73	
10	100		300.362	.71	1.4	11.0	73	250	248	51	39	78	73	
A-11	105		303.654	.67	1.3	10.5	73	250	251	49	39	79	73	
11	110		306.973	.67	1.3	10.5	73	250	249	48	38	79	74	1.96
A-12	115		310.288	.65	1.3	10.5	73	250	253	48	39	79	74	
12	120	10:25	313.612	.65	1.3	10.5	73	250	251	47	39	79	74	Stopped Port change
B-1	125	10:28	317.155	.75	1.5	12.0	73	250	250	49	45	79	77	Started @ 10:28
1	130		320.732	.77	1.5	12.0	73	250	246	45	40	80	75	
B 2	135		324.233	.77	1.5	12.0	73	250	248	47	40	80	75	
2	140		327.748	.78	1.5	12.0	72	250	250	46	40	80	75	
B3	145		331.279	.78	1.5	12.0	73	250	250	47	40	80	75	
3	150		334.799	.75	1.5	12.0	73	250	248	46	40	80	75	
B4	155		338.315	.77	1.5	12.0	74	250	250	47	40	80	75	
4	160		341.991	.75	1.5	12.0	72	250	249	47	41	80	76	
B5	165		345.495	.84	1.6	12.0	73	250	250	49	43	81	76	
5	170		349.111	.84	1.6	12.0	73	250	251	49	43	81	76	
B6	175		352.771	.82	1.6	12.0	73	250	249	49	43	81	76	
6	180		356.490	.86	1.7	12.5	73	250	250	51	45	81	76	
B7	185		360.133	.82	1.6	12.0	73	250	250	51	46	81	76	
7	190		363.745	.81	1.6	12.0	73	250	250	53	46	81	77	
B8	195		367.369	.81	1.6	12.0	73	250	250	54	48	81	77	
8	200		371.137	.81	1.6	12.0	73	250	251	56	49	81	77	
B9	205		374.514	.78	1.5	11.5	73	250	252	52	44	81	77	
9	210		378.060	.78	1.5	11.5	73	250	251	51	43	81	77	
B-10	215		381.617	.81	1.6	12.0	73	250	250	48	43	81	77	
10	220		385.241	.81	1.6	12.0	73	250	250	49	43	82	77	
B 11	225		388.788	.79	1.5	11.5	73	250	251	47	43	81	77	1.5 ESW
11	230		392.329	.79	1.5	11.5	73	250	251	48	44	81	77	
B12	235		395.858	.77	1.5	11.5	73	250	250	47	44	81	77	
12	240	12:28	399.394	.74	1.5	11.5	73	250	251	49	45	82	77	

ACCI 1 Minute Average Data Sheet: O2, CO2, CO, NOx, SO2			
Client	Collective Efforts LLC	**Unit**	SSI
Project No	10-068	**Operation**	mnoc
Plant	Alcosan	**Location**	exhaust stack

MINUTE	DATE	TIME	O2 (DV %)	CO2 (DV %)	CO (PPMdv)	NOx (PPMdv)	SO2 (PPMdv)
RUN 2							
1	2010/03/25	08:25:12	13.5	6.3	2.4	120.0	0.7
2	2010/03/25	08:26:12	13.5	6.3	2.3	119.7	0.7
3	2010/03/25	08:27:12	13.4	6.3	2.3	120.4	0.7
4	2010/03/25	08:28:12	13.5	6.2	2.4	118.0	0.7
5	2010/03/25	08:29:12	13.5	6.2	2.3	120.4	0.8
6	2010/03/25	08:30:12	13.5	6.3	2.3	118.0	0.7
7	2010/03/25	08:31:12	13.6	6.2	2.4	114.7	0.7
8	2010/03/25	08:32:12	13.5	6.3	2.3	119.1	0.7
9	2010/03/25	08:33:12	13.6	6.2	2.4	117.8	0.7
10	2010/03/25	08:34:12	13.6	6.1	2.3	111.2	0.7
11	2010/03/25	08:35:12	13.7	6.1	2.3	100.9	0.8
12	2010/03/25	08:36:12	13.7	6.1	2.8	104.9	0.7
13	2010/03/25	08:37:12	13.7	6.1	2.9	111.7	0.8
14	2010/03/25	08:38:12	13.6	6.2	2.4	115.7	0.8
15	2010/03/25	08:39:12	13.6	6.2	2.4	113.9	0.8
16	2010/03/25	08:40:12	13.7	6.1	2.3	112.0	0.7
17	2010/03/25	08:41:12	13.6	6.1	2.3	114.6	0.8
18	2010/03/25	08:42:12	13.7	6.1	2.3	110.6	0.7
19	2010/03/25	08:43:12	13.7	6.1	2.3	109.8	0.7
20	2010/03/25	08:44:12	13.6	6.2	2.4	107.8	0.8
21	2010/03/25	08:45:12	13.7	6.1	2.8	104.7	0.7
22	2010/03/25	08:46:12	13.8	6.0	3.3	104.5	0.7
23	2010/03/25	08:47:12	13.8	6.0	3.3	109.6	0.8
24	2010/03/25	08:48:12	13.7	6.1	2.8	114.3	0.7
25	2010/03/25	08:49:12	13.8	6.0	2.8	110.3	0.7
26	2010/03/25	08:50:12	13.7	6.1	3.3	108.2	0.7
27	2010/03/25	08:51:12	13.6	6.2	3.3	113.4	0.7
28	2010/03/25	08:52:12	13.6	6.2	2.8	114.8	0.8
29	2010/03/25	08:53:12	13.7	6.1	2.3	103.4	0.7
30	2010/03/25	08:54:12	13.6	6.1	2.8	104.7	0.7
31	2010/03/25	08:55:12	13.7	6.1	2.8	107.7	0.7
32	2010/03/25	08:56:12	13.7	6.1	2.3	109.3	0.7
33	2010/03/25	08:57:12	13.7	6.1	2.3	110.3	0.7
34	2010/03/25	08:58:12	13.6	6.1	1.9	112.3	0.7
35	2010/03/25	08:59:12	13.6	6.2	1.8	119.2	0.7
36	2010/03/25	09:00:12	13.6	6.2	2.8	123.2	0.7
37	2010/03/25	09:01:12	13.5	6.3	3.3	121.6	0.7
38	2010/03/25	09:02:12	13.5	6.3	3.3	123.4	0.7
39	2010/03/25	09:03:12	13.5	6.3	3.3	118.3	0.8
40	2010/03/25	09:04:12	13.4	6.3	3.3	116.1	0.7
41	2010/03/25	09:05:12	13.5	6.2	3.3	115.3	0.7
42	2010/03/25	09:06:12	13.5	6.2	3.3	119.9	0.7
43	2010/03/25	09:07:12	13.5	6.3	3.3	128.2	0.7
44	2010/03/25	09:08:12	13.6	6.2	3.3	120.3	0.7
45	2010/03/25	09:09:12	13.6	6.2	3.3	116.3	0.7
46	2010/03/25	09:10:12	13.5	6.2	3.3	121.8	0.7
47	2010/03/25	09:11:12	13.5	6.3	3.3	125.5	0.8
48	2010/03/25	09:12:12	13.4	6.3	3.3	112.5	0.7
49	2010/03/25	09:13:12	13.5	6.3	3.3	104.4	0.7
50	2010/03/25	09:14:12	13.6	6.2	2.8	115.3	0.7
51	2010/03/25	09:15:12	13.5	6.2	2.3	119.1	0.7
52	2010/03/25	09:16:12	13.4	6.3	2.3	120.5	0.7
53	2010/03/25	09:17:12	13.5	6.3	2.4	122.2	0.7
54	2010/03/25	09:18:12	13.6	6.2	2.4	116.1	0.7
55	2010/03/25	09:19:12	13.5	6.3	2.8	115.7	0.8
56	2010/03/25	09:20:12	13.6	6.2	3.3	120.6	0.7
57	2010/03/25	09:21:12	13.5	6.3	3.3	122.8	0.7
58	2010/03/25	09:22:12	13.5	6.3	3.3	116.5	0.7
59	2010/03/25	09:23:12	13.5	6.2	3.3	108.9	0.7
60	2010/03/25	09:24:12	13.5	6.3	3.3	110.2	0.7
61	2010/03/25	09:25:12	13.6	6.2	2.8	112.9	0.8
62	2010/03/25	09:26:12	13.7	6.1	2.8	114.8	0.8
63	2010/03/25	09:27:12	13.7	6.1	3.3	110.5	0.8
64	2010/03/25	09:28:12	13.6	6.2	3.3	107.5	0.8
65	2010/03/25	09:29:12	13.6	6.2	3.3	112.4	0.8
66	2010/03/25	09:30:12	13.5	6.2	3.3	112.4	0.7

ACCI 1 Minute Average Data Sheet: O2, CO2, CO, NOx, SO2			
Client	Collective Efforts LLC	**Unit**	SSI
Project No	10-068	**Operation**	mnoc
Plant	Alcosan	**Location**	exhaust stack

MINUTE	DATE	TIME	O2 (DV %)	CO2 (DV %)	CO (PPMdv)	NOx (PPMdv)	SO2 (PPMdv)
67	2010/03/25	09:31:12	13.6	6.2	3.3	114.7	0.8
68	2010/03/25	09:32:12	13.6	6.2	3.4	117.8	0.8
69	2010/03/25	09:33:12	13.5	6.2	2.8	116.5	0.8
70	2010/03/25	09:34:12	13.5	6.3	2.8	112.6	0.7
71	2010/03/25	09:35:12	13.6	6.2	3.3	111.8	0.8
72	2010/03/25	09:36:12	13.5	6.3	2.9	111.1	0.8
73	2010/03/25	09:37:12	13.6	6.2	2.8	106.6	0.8
74	2010/03/25	09:38:12	13.6	6.2	3.3	106.6	0.8
75	2010/03/25	09:39:12	13.6	6.2	3.3	112.5	0.8
76	2010/03/25	09:40:12	13.6	6.2	3.3	113.2	0.8
77	2010/03/25	09:41:12	13.6	6.2	3.3	105.3	0.8
78	2010/03/25	09:42:12	13.6	6.2	3.3	100.9	0.8
79	2010/03/25	09:43:12	13.6	6.2	3.3	105.0	0.8
80	2010/03/25	09:44:12	13.5	6.3	3.3	117.5	0.8
81	2010/03/25	09:45:12	13.6	6.2	3.3	121.0	0.8
82	2010/03/25	09:46:12	13.5	6.2	3.3	110.6	0.8
83	2010/03/25	09:47:12	13.5	6.2	3.8	114.1	0.8
84	2010/03/25	09:48:12	13.5	6.3	3.8	117.9	0.9
85	2010/03/25	09:49:12	13.5	6.3	3.3	116.9	0.9
86	2010/03/25	09:50:12	13.5	6.3	3.3	122.4	0.9
87	2010/03/25	09:51:12	13.6	6.2	3.3	118.8	0.9
88	2010/03/25	09:52:12	13.5	6.2	3.3	116.2	0.9
89	2010/03/25	09:53:12	13.6	6.2	3.3	120.7	0.9
90	2010/03/25	09:54:12	13.5	6.3	3.8	120.7	0.9
91	2010/03/25	09:55:12	13.5	6.3	4.3	113.7	0.8
92	2010/03/25	09:56:12	13.6	6.2	4.3	108.4	0.9
93	2010/03/25	09:57:12	13.6	6.2	3.8	115.1	0.9
94	2010/03/25	09:58:12	13.6	6.2	3.3	121.2	0.9
95	2010/03/25	09:59:12	13.7	6.1	3.3	106.1	0.9
96	2010/03/25	10:00:12	13.6	6.2	3.3	103.7	0.9
97	2010/03/25	10:01:12	13.6	6.2	3.3	116.5	0.9
98	2010/03/25	10:02:12	13.6	6.2	3.3	115.4	0.9
99	2010/03/25	10:03:12	13.6	6.2	3.8	113.5	0.9
100	2010/03/25	10:04:12	13.6	6.2	3.8	123.9	0.9
101	2010/03/25	10:05:12	13.4	6.3	3.3	126.7	1.0
102	2010/03/25	10:06:12	13.4	6.3	3.3	109.6	1.0
103	2010/03/25	10:07:12	13.4	6.3	2.8	114.6	0.9
104	2010/03/25	10:08:12	13.5	6.2	2.8	122.4	1.0
105	2010/03/25	10:09:12	13.5	6.2	3.3	121.4	1.0
106	2010/03/25	10:10:12	13.5	6.2	3.4	114.1	1.0
107	2010/03/25	10:11:12	13.6	6.2	3.3	112.1	1.0
108	2010/03/25	10:12:12	13.5	6.2	3.3	115.4	1.0
109	2010/03/25	10:13:12	13.6	6.1	3.8	114.8	0.9
110	2010/03/25	10:14:12	13.6	6.1	3.8	116.8	1.0
111	2010/03/25	10:15:12	13.6	6.1	3.8	113.6	1.0
112	2010/03/25	10:16:12	13.6	6.2	3.8	124.5	1.0
113	2010/03/25	10:17:12	13.6	6.2	3.3	125.3	1.0
114	2010/03/25	10:18:12	13.6	6.1	3.8	114.4	0.9
115	2010/03/25	10:19:12	13.5	6.2	4.3	115.3	1.0
116	2010/03/25	10:20:12	13.6	6.2	4.3	114.6	1.0
117	2010/03/25	10:21:12	13.5	6.2	4.3	115.1	1.0
118	2010/03/25	10:22:12	13.5	6.2	4.3	113.0	1.0
119	2010/03/25	10:23:12	13.4	6.3	4.3	112.3	1.1
120	2010/03/25	10:24:12	13.4	6.4	3.8	117.6	1.0
121	2010/03/25	10:25:12	13.3	6.4	3.3	120.4	1.0
122	2010/03/25	10:26:12	13.4	6.4	3.3	126.4	1.0
123	2010/03/25	10:27:12	13.4	6.4	3.3	122.3	1.0
124	2010/03/25	10:28:12	13.4	6.4	3.3	122.8	1.1
125	2010/03/25	10:29:12	13.3	6.4	3.3	128.9	1.1
126	2010/03/25	10:30:12	13.3	6.4	3.3	120.7	1.1
127	2010/03/25	10:31:12	13.4	6.3	3.3	110.9	1.1
128	2010/03/25	10:32:12	13.5	6.3	3.3	109.0	1.2
129	2010/03/25	10:33:12	13.4	6.4	3.3	112.3	1.1
130	2010/03/25	10:34:12	13.4	6.3	3.3	114.7	1.1
131	2010/03/25	10:35:12	13.5	6.3	3.8	112.2	1.1
132	2010/03/25	10:36:12	13.5	6.3	4.3	103.6	1.1
133	2010/03/25	10:37:12	13.5	6.3	4.4	103.5	1.1

ACCI 1 Minute Average Data Sheet: O2, CO2, CO, NOx, SO2			
Client	Collective Efforts LLC	**Unit**	SSI
Project No	10-068	**Operation**	mnoc
Plant	Alcosan	**Location**	exhaust stack

MINUTE	DATE	TIME	O2 (DV %)	CO2 (DV %)	CO (PPMdv)	NOx (PPMdv)	SO2 (PPMdv)
134	2010/03/25	10:38:12	13.5	6.2	4.3	113.1	1.2
135	2010/03/25	10:39:12	13.6	6.2	4.3	102.2	1.1
136	2010/03/25	10:40:12	13.5	6.3	4.3	106.1	1.1
137	2010/03/25	10:41:12	13.4	6.3	3.8	120.8	1.1
138	2010/03/25	10:42:12	13.4	6.3	3.3	117.5	1.2
139	2010/03/25	10:43:12	13.5	6.2	3.3	115.7	1.2
140	2010/03/25	10:44:12	13.5	6.3	3.3	117.1	1.2
141	2010/03/25	10:45:12	13.5	6.3	3.8	107.0	1.2
142	2010/03/25	10:46:12	13.5	6.2	3.8	114.6	1.2
143	2010/03/25	10:47:12	13.5	6.3	3.3	107.6	1.2
144	2010/03/25	10:48:12	13.6	6.2	3.3	96.7	1.2
145	2010/03/25	10:49:12	13.5	6.2	3.3	103.9	1.2
146	2010/03/25	10:50:12	13.5	6.2	3.3	101.7	1.2
147	2010/03/25	10:51:12	13.6	6.2	3.3	94.2	1.2
148	2010/03/25	10:52:12	13.6	6.2	3.3	105.4	1.2
149	2010/03/25	10:53:12	13.5	6.3	3.3	114.6	1.3
150	2010/03/25	10:54:12	13.5	6.3	3.8	107.9	1.2
151	2010/03/25	10:55:12	13.6	6.2	4.3	102.4	1.3
152	2010/03/25	10:56:12	13.6	6.2	4.3	102.9	1.3
153	2010/03/25	10:57:12	13.6	6.2	4.3	102.9	1.3
154	2010/03/25	10:58:12	13.5	6.2	4.3	106.0	1.2
155	2010/03/25	10:59:12	13.4	6.3	4.3	110.9	1.3
156	2010/03/25	11:00:12	13.5	6.3	3.8	100.6	1.3
157	2010/03/25	11:01:12	13.5	6.3	3.8	96.0	1.3
158	2010/03/25	11:02:12	13.5	6.2	4.3	107.3	1.3
159	2010/03/25	11:03:12	13.6	6.2	4.3	108.4	1.2
160	2010/03/25	11:04:12	13.5	6.3	4.3	109.8	1.3
161	2010/03/25	11:05:12	13.5	6.3	4.3	110.9	1.3
162	2010/03/25	11:06:12	13.5	6.3	4.3	107.7	1.3
163	2010/03/25	11:07:12	13.5	6.2	4.3	103.9	1.4
164	2010/03/25	11:08:12	13.5	6.2	3.8	107.5	1.3
165	2010/03/25	11:09:12	13.5	6.3	3.8	119.2	1.4
166	2010/03/25	11:10:12	13.5	6.3	4.3	126.0	1.3
167	2010/03/25	11:11:12	13.4	6.3	3.8	114.9	1.3
168	2010/03/25	11:12:12	13.5	6.3	3.8	100.2	1.3
169	2010/03/25	11:13:12	13.5	6.3	3.8	100.5	1.3
170	2010/03/25	11:14:12	13.5	6.3	3.3	105.9	1.4
171	2010/03/25	11:15:12	13.4	6.4	3.3	108.7	1.4
172	2010/03/25	11:16:12	13.4	6.3	3.3	104.2	1.3
173	2010/03/25	11:17:12	13.4	6.3	3.3	95.9	1.4
174	2010/03/25	11:18:12	13.5	6.3	3.3	100.5	1.4
175	2010/03/25	11:19:12	13.4	6.3	3.3	104.0	1.4
176	2010/03/25	11:20:12	13.4	6.4	3.8	101.5	1.4
177	2010/03/25	11:21:12	13.4	6.4	3.8	102.2	1.4
178	2010/03/25	11:22:12	13.3	6.5	3.3	100.3	1.4
179	2010/03/25	11:23:12	13.2	6.5	3.3	101.3	1.4
180	2010/03/25	11:24:12	13.3	6.5	3.3	111.1	1.4
181	2010/03/25	11:25:12	13.4	6.4	2.9	112.6	1.4
182	2010/03/25	11:26:12	13.3	6.4	2.8	105.9	1.4
183	2010/03/25	11:27:12	13.3	6.4	3.3	99.5	1.4
184	2010/03/25	11:28:12	13.4	6.4	3.3	99.3	1.4
185	2010/03/25	11:29:12	13.4	6.4	3.4	102.7	1.5
186	2010/03/25	11:30:12	13.3	6.4	3.3	102.2	1.4
187	2010/03/25	11:31:12	13.3	6.4	3.3	97.0	1.3
188	2010/03/25	11:32:12	13.4	6.4	3.8	105.7	1.4
189	2010/03/25	11:33:12	13.3	6.4	3.8	113.5	1.5
190	2010/03/25	11:34:12	13.2	6.5	3.8	104.7	1.4
191	2010/03/25	11:35:12	13.3	6.4	3.8	98.7	1.4
192	2010/03/25	11:36:12	13.4	6.3	3.3	99.4	1.5
193	2010/03/25	11:37:12	13.4	6.4	3.8	115.2	1.4
194	2010/03/25	11:38:12	13.4	6.4	4.3	114.9	1.4
195	2010/03/25	11:39:12	13.4	6.4	4.3	103.0	1.4
196	2010/03/25	11:40:12	13.6	6.2	4.3	96.3	1.5
197	2010/03/25	11:41:12	13.7	6.1	4.3	82.8	1.5
198	2010/03/25	11:42:12	13.8	6.1	4.3	80.9	1.5
199	2010/03/25	11:43:12	13.9	6.0	3.8	76.9	1.4
200	2010/03/25	11:44:12	13.8	6.0	3.8	77.5	1.4

ACCI 1 Minute Average Data Sheet: O2, CO2, CO, NOx, SO2			
Client	Collective Efforts LLC	**Unit**	SSI
Project No	10-068	**Operation**	mnoc
Plant	Alcosan	**Location**	exhaust stack

MINUTE	DATE	TIME	O2 (DV %)	CO2 (DV %)	CO (PPMdv)	NOx (PPMdv)	SO2 (PPMdv)
201	2010/03/25	11:45:12	13.8	6.0	4.3	77.8	1.4
202	2010/03/25	11:46:12	13.8	6.0	4.3	79.7	1.4
203	2010/03/25	11:47:12	13.8	6.0	4.3	80.5	1.4
204	2010/03/25	11:48:12	13.9	6.0	4.3	70.0	1.4
205	2010/03/25	11:49:12	13.9	5.9	4.3	63.0	1.4
206	2010/03/25	11:50:12	13.8	6.0	3.8	70.3	1.4
207	2010/03/25	11:51:12	13.8	6.0	3.8	80.1	1.5
208	2010/03/25	11:52:12	13.8	6.0	4.3	78.7	1.5
209	2010/03/25	11:53:12	13.9	5.9	4.3	68.2	1.5
210	2010/03/25	11:54:12	14.0	5.8	4.3	70.5	1.5
211	2010/03/25	11:55:12	14.0	5.9	4.8	76.6	1.5
212	2010/03/25	11:56:12	13.9	6.0	5.3	84.1	1.4
213	2010/03/25	11:57:12	13.9	5.9	4.8	78.0	1.5
214	2010/03/25	11:58:12	13.9	5.9	4.3	74.6	1.5
215	2010/03/25	11:59:12	13.8	6.0	4.3	73.0	1.5
216	2010/03/25	12:00:12	13.9	5.9	4.3	69.3	1.6
217	2010/03/25	12:01:12	14.0	5.9	4.3	71.1	1.6
218	2010/03/25	12:02:12	13.9	5.9	4.3	71.4	1.5
219	2010/03/25	12:03:12	13.9	5.9	4.8	70.3	1.6
220	2010/03/25	12:04:12	13.9	5.9	4.8	71.9	1.5
221	2010/03/25	12:05:12	14.0	5.9	4.3	75.6	1.5
222	2010/03/25	12:06:12	13.9	6.0	4.3	72.1	1.5
223	2010/03/25	12:07:12	13.9	6.0	4.3	68.6	1.6
224	2010/03/25	12:08:12	13.8	6.0	4.3	70.1	1.6
225	2010/03/25	12:09:12	13.8	6.0	4.3	74.5	1.5
226	2010/03/25	12:10:12	13.8	6.0	4.3	70.9	1.6
227	2010/03/25	12:11:12	13.9	5.9	4.3	70.5	1.6
228	2010/03/25	12:12:12	13.9	5.9	4.8	69.2	1.6
229	2010/03/25	12:13:12	13.9	6.0	4.8	64.6	1.7
230	2010/03/25	12:14:12	13.9	6.0	4.3	69.4	1.6
231	2010/03/25	12:15:12	13.9	5.9	4.3	66.5	1.6
232	2010/03/25	12:16:12	13.9	5.9	4.3	64.2	1.7
233	2010/03/25	12:17:12	13.9	6.0	4.3	69.3	1.7
234	2010/03/25	12:18:12	13.8	6.0	4.3	69.7	1.6
235	2010/03/25	12:19:12	13.8	6.0	4.3	69.7	1.6
236	2010/03/25	12:20:12	13.8	6.1	4.7	69.4	1.7
237	2010/03/25	12:21:12	13.9	6.0	4.9	68.6	1.7
238	2010/03/25	12:22:12	13.8	6.0	4.3	64.9	1.6
239	2010/03/25	12:23:12	13.8	6.0	4.7	64.4	1.6
240	2010/03/25	12:24:12	13.7	6.1	4.9	74.5	1.7
		Minimum	13.2	5.8	1.8	63.0	0.7
		Maximum	14.0	6.5	5.3	128.9	1.7
RUN 2 AVERAGES			**13.6**	**6.2**	**3.5**	**104.7**	**1.1**

ACCI CEM Calibration, Bias and Drift Data Sheet
Based on 40 CFR Part 60, Appendix A-4, Method 7E

Client	Collective Efforts LLC	**Date**	March 25, 2010
Project No	10-068	**Location**	exhaust stack
Plant	Alcosan	**Run**	Run 2
Unit	SSI	**Start Time**	8:25
Operation	mnoc	**End Time**	12:25
Tester(s)	wo,jv,ew,cb,rf		

Cal.	LOW		MID		HIGH		Tank ID				Conc.	Response Time	
Gas	Conc.	(% of Span)	Conc.	(% of Span)	Conc.	(% of Span)	LOW	MID	HIGH	Span	Units	Up (sec)	Down (sec)
O2	N/A	N/A	10.01	44.5	22.47	100.0	N/A	eb001355	cc251892	22.47	d. vol. %	37	36
CO2	N/A	N/A	9.96	44.2	22.54	100.0	N/A	cc251892	eb001355	22.54	d. vol. %	35	35
CO	N/A	N/A	7	46.7	15	100.0	N/A	method 205	method 205 (6	15	ppmdv	47	46
NOx	N/A	N/A	120	46.2	260	100.0	N/A	method 205	Method 205 (9	260	ppmdv	46	45
SO2	N/A	N/A	5	50.0	10	100.0	N/A	method 205	method 205 (9	10	ppmdv	45	44
LIMITS				40 % to 60 %		100%							

	Upscale: Enter "Low" "Mid" or "High"			Initial Values		Final Values				Average of Initial and Final System	Average Indicated	Corrected	
Gas	below "Zero"	Actual Upscale Conc.	Analyzer Cal. Response	System Cal. Response	System Cal. Bias (% of Span)	System Cal. Response	System Cal. Bias (% of Span)	Drift (% of Span)	Span	Responses	Gas Conc.	Gas Conc.	Conc. Units
O2	Zero		-0.1	0.1	0.89	0.0	0.45	-0.45	22.47	0.05			
	Mid	10.01	10.1	10.0	-0.45	10.0	-0.45	0.00	22.47	10	13.58	13.61	d. vol. %
CO2	Zero		0.1	0.1	0.00	0.2	0.44	0.44	22.54	0.15			
	Mid	9.96	9.7	9.6	-0.44	9.8	0.44	0.89	22.54	9.7	6.20	6.31	d. vol. %
CO	Zero		0.0	-0.6	-4.00	-0.2	-1.33	2.67	15	-0.4			
	Mid	7	6.9	7.3	2.67	7.0	0.67	-2.00	15	7.15	3.52	3.64	ppmdv
NOx	Zero		0.0	2.5	0.96	2.5	0.96	0.00	260	2.5			
	Mid	120	121.3	117.4	-1.50	114.9	-2.46	-0.96	260	116.15	104.74	107.95	ppmdv
SO2	Zero		0.1	0.5	4.00	0.4	3.00	-1.00	10	0.45			
	Mid	5	5.1	4.7	-4.00	4.7	-4.00	0.00	10	4.7	1.09	0.75	ppmdv
LIMITS					+/- 5 %		+/- 5 %	+/- 3 %					

Gas	ZERO Analyzer Response (System for THC)	ZERO Analyzer Cal. Error (% of Span)	LOW Actual Conc.	LOW Analyzer Response (System for THC)	LOW Analyzer Cal. Error (% of Span)	LOW System Cal. Error (% of Actual)	MID Actual Conc.	MID Analyzer Response (System for THC)	MID Analyzer Cal. Error (% of Span)	MID System Cal. Error (% of Actual)	HIGH Actual Conc.	HIGH Analyzer Response (System for THC)	HIGH Analyzer Cal. Error (% of Span)	HIGH System Calibration Error (% of Actual)	Span	Conc. Units
O2	-0.1	-0.45					10.01	10.1	0.40		22.47	22.6	0.58		22.47	d. vol. %
CO2	0.1	0.44					9.96	9.7	-1.15		22.54	22.8	1.15		22.54	d. vol. %
CO	0.0	0.00					7	6.9	-0.67		15	15.2	1.33		15	ppmdv
NOx	0.0	0.00					120	121.3	0.50		260	258.1	-0.73		260	ppmdv
SO2	0.1	1.00					5	5.1	1.00		10	10.0	0.00		10	ppmdv
LIMITS		+/- 2 %			+/- 2 %	+/- 5 %			+/- 2 %	+/- 5 %			+/- 2 %	+/- 5 %		

Client:	Collective Efforts LLC		Test Date:	March 25, 2010	
Project No.:	10-068		Test Location:	exhaust stack	
Plant:	Alcosan		Test Run:	Run 2	
Unit:	SSI		Test Start Time:	8:25 AM	
Unit Operation:	mnoc		Test Finish Time:	12:28 PM	
Blue is data input.	Red is a calculation.	Pink is a reference to a cell on another sheet.		Green is a reference to a cell on this sheet.	
Data Input			**Calculations**		
Control Box:	1618		CO + N2	80.08	% dv
Meter $DH_@$ (0.75 scfm)	1.753	in. H_2O	Water Collected (V_f- V_i)	45.0	ml
Meter Calibration Factor (Yd)	1.000		Water Vapor Condensed (Vwc(std))	2.118	scf
Test Time (Theta)	240	minutes	Water Collected (W_f- W_i)	41.7	g
Barometric Pressure (Pbar)	29.20	in. Hg	Water Vapor in Silica Gel (Vwsg(std))	1.966	scf
Stack Static Pressure (Pg)	0.57	in. H_2O	Vol. Water Vapor in Gas Stand.(Vw(std))	4.084	scf
Stack Diameter (Ds) (L if rectangular)	36.5	inches	Volume Dry Gas Metered (Vm)	168.382	dacf
Stack Width (enter NA if circular)	NA	inches	Vol. Dry Gas Metered Stand.(Vm(std))	162.559	dscf
Nozzle Diameter (Dn) (NA if NA)	0.210	inches	Volume Dry Gas Metered (Vm(m^3))	4.768	dacm
CO2	6.31	% dv	Vol. Dry Gas Metered Stand.(Vm(std)m^3)	4.603	dscm
O2	13.61	% dv	Stack Absolute Pressure (Ps)	29.24	in. Hg
Product Rate (enter NA if not needed)	1.88	input ton/hr	Stack Absolute Temperature (Tsavg)	532.6	R
Is the input ton/hr metric? (YES=1)	0		H2O Vapor Pressure @ avg Stack Temp.	0.82	in. Hg
Pitot Tube Coefficient (Cp)	0.84		H2O in the gas at saturation (Bws)	0.0280	vol. fraction
Sample Calculation Title	Particulate and CEMS		H2O in the gas from test data (Bws)	0.0245	vol. fraction
F_d @ 68 F and 760 mm Hg (NA if NA)	9,570	dscf/MMBtu	H2O in the gas used (lower of the 2 Bws)	0.0245	vol. fraction
Heat Input Based on Process Data	100	MMBtu/hr	Is the Gas Stream Saturated With H2O?	NO	
Standard Temperature	68	F	Dry Gas Molecular Weight (Md)	29.55	lb/lb-mole
Standard Pressure	760	mm Hg	Wet Gas Molecular Weight (Ms)	29.27	lb/lb-mole
Pitot Tube Constant (Kp)	85.49		Gas Velocity (Vs)	49.51	ft/s
Calculations			Is the stack circular or rectangular?	CIRCULAR	
Meter Temperature (Tm)	75.5	F	Area Stack (As)	7.266	ft^2
Stack Temperature (Tsavg)	73.0	F	Actual Gas Flowrate	21,586	acfm
Orifice Pressure Drop (dHavg)	1.492	in. H_2O	Standard Gas Flowrate	20,900	scfm
GasVelocity Head (dP)^^avg	0.8737	in. H_2O^1/2	Dry Standard Gas Flowrate	20,388	dscfm
F_d @ Standard Conditions	9,570	dscf/MMBtu	Actual Gas Flowrate	611	acm/min
F_d @ Stan. Cond. & Actual O2	27,452	dscf/MMBtu	Standard Gas Flowrate	592	scm/min
Heat Input Based on F_d	45	MMBtu/hr	Dry Standard Gas Flowrate	577	dscm/min
K1method 4	0.04706	scf/ml	Area Nozzle (An)	0.000241	ft^2
K2method 4	0.04715	scf/g	Percent of Isokinetic Sampling (I)	100.42	%
K1method 5	17.64	R/in. Hg			
K4method 5	0.0945				
Standard lb-mole volume	385.3	ft^3/lb-mole			
Carbon Monoxide					
MW	28	lb/lb-mole			
O2 for Correction	7	vol. %			
Concentration	3.64	ppm_d,			
Concentration	6.94	ppm_d, 7% O2			
Concentration	0.0000003	lb/dscf			
Emission	0.32	lb/hr			
Emission	0.007	lb/MMBtu			
Emission	0.0032	lb/MMBtu			
Nitrogen Oxides (NOx) as NO2					
MW	46	lb/lb-mole			
O2 for Correction	7	vol. %			
Concentration	107.95	ppm_d,			
Concentration	205.95	ppm_d, 7% O2			
Concentration	0.0000129	lb/dscf			
Emission	15.77	lb/hr			
Emission	0.354	lb/MMBtu			
Emission	0.1577	lb/MMBtu			
Sulfur Dioxide (SO2)					
MW	64	lb/lb-mole			
O2 for Correction	7	vol. %			
Concentration	0.75	ppm_d,			
Concentration	1.43	ppm_d, 7% O2			
Concentration	0.0000001	lb/dscf			
Emission	0.15	lb/hr			
Emission	0.003	lb/MMBtu			
Emission	0.0015	lb/MMBtu			

Collective Efforts LLC **Run 2** **F or C?**
SSI **F=1,C=0** 1

Point	Pitot DP (dP) (in. H2O)	SQRT dP (in. H2O)$^{1/2}$	Orifice DP (dH) (in. H2O)	Stack Temp (F)	Meter Temp In (F or C)	Meter Temp Out (F or C)
A-1	0.79	0.889	1.5	73	67	67
1	0.79	0.889	1.5	73	67	67
2	0.82	0.906	1.6	73	69	67
2	0.79	0.889	1.5	73	70	67
3	0.82	0.906	1.6	73	72	68
3	0.82	0.906	1.6	73	73	68
4	0.82	0.906	1.6	73	73	69
4	0.79	0.889	1.5	73	74	69
5	0.75	0.866	1.5	73	74	69
5	0.72	0.849	1.4	73	74	70
6	0.66	0.812	1.3	73	75	70
6	0.75	0.866	1.5	73	76	70
7	0.76	0.872	1.5	73	76	71
7	0.75	0.866	1.5	73	77	71
8	0.73	0.854	1.4	73	77	71
8	0.71	0.843	1.4	73	77	72
9	0.71	0.843	1.4	73	77	72
9	0.68	0.825	1.3	73	77	72
10	0.68	0.825	1.3	73	78	73
10	0.71	0.843	1.4	73	78	73
11	0.67	0.819	1.3	73	79	73
11	0.67	0.819	1.3	73	79	74
12	0.65	0.806	1.3	73	79	74
12	0.65	0.806	1.3	73	79	74
B-1	0.75	0.866	1.5	73	79	74
1	0.77	0.877	1.5	73	80	75
2	0.77	0.877	1.5	73	80	75
2	0.78	0.883	1.5	72	80	75
3	0.78	0.883	1.5	73	80	75
3	0.75	0.866	1.5	73	80	75
4	0.77	0.877	1.5	74	80	75
4	0.75	0.866	1.5	72	80	76
5	0.84	0.917	1.6	73	81	76
5	0.84	0.917	1.6	73	81	76
6	0.82	0.906	1.6	73	81	76
6	0.86	0.927	1.7	73	81	76
7	0.82	0.906	1.6	73	81	76
7	0.81	0.900	1.6	73	81	77
8	0.81	0.900	1.6	73	81	77
8	0.81	0.900	1.6	73	81	77
9	0.78	0.883	1.5	73	81	77
9	0.78	0.883	1.5	73	81	77
10	0.81	0.900	1.6	73	81	77
10	0.81	0.900	1.6	73	82	77
11	0.79	0.889	1.5	73	81	77
11	0.79	0.889	1.5	73	81	77
12	0.77	0.877	1.5	73	81	77
12	0.74	0.860	1.5	73	82	77
Average	0.76	0.874	1.49	73.0		75.5

Initial volume	231.012	ft^3	Initial volume	0.000	liters
Final volume	399.394	ft^3	Final volume	0.000	liters
leak checks		ft3			
Total metered	168.382	dacf	Total metered	0.000	dry actual liters

Impinger	Final grams	Initial grams	Gram Gain	Final ml	Initial ml	ml Gain
1			0.0	45.0	0.0	45.0
2			0.0	94.0	100.0	-6.0
3			0.0	100.0	100.0	0.0
4			0.0	6.0	0.0	6.0
5	300.9	259.2	41.7			0.0
6			0.0			0.0
7			0.0			0.0
8			0.0			0.0
9			0.0			0.0
10			0.0			0.0
Total	300.9	259.2	41.7	245.0	200.0	45.0
	W_f	W_i	(W_f- W_i)	V_f	V_i	(V_f- Vi)

Dioxin Furan

	Analyte	TEF	Raw Data mass (ng)	Adjusted Mass (ng)	TEF Adjusted Amount (ng)
2	2378-TCDD	1	4.0	0.00400	0.004
1	2378-TCDF (DB 225)	0.1	5.9	0.00590	0.00059
3	12378-PeCDF	0.05	2.0	0.00200	0.0001
5	12378-PeCDD	0.5	2.5	0.00250	0.00125
4	23478-PeCDF	0.5	2.0	0.00200	0.001
6	123478-HxCDF	0.1	2.3	0.00230	0.00023
7	123678-HxCDF	0.1	2.0	0.00200	0.0002
10	123478-HxCDD	0.1	2.4	0.00240	0.00024
11	123678-HxCDD	0.1	2.1	0.00210	0.00021
12	123789-HxCDD	0.1	2.1	0.00210	0.00021
8	234678-HxCDF	0.1	2.7	0.00270	0.00027
9	123789-HxCDF	0.1	2.8	0.00280	0.00028
13	1234678-HpCDF	0.01	4.0	0.00400	0.00004
15	1234678-HpCDD	0.01	2.3	0.00230	0.000023
14	1234789-HpCDF	0.01	2.6	0.00260	0.000026
16	1,2,3,4,6,7,8,9-OCDD	0.001	5.5	0.00550	0.0000055
17	1,2,3,4,6,7,8,9-OCDF	0.001	4.2	0.00420	0.0000042

TEF Factors taken from USEPA 40 CFR, Chapter 1, Part 266, Appendix IX, Table 4.0.1

TEF ADJUSTED TOTAL 0.00868

TEF Total Mass Collected	0.0087	ng
TEF Emission Concentration	0.002	ng/m^3
TEF Emission Rate	65.308	ng/hr
O2 for Correction	7	%
TEF Emission Concentration	0.0036	ng/m^3 7% O2

		EDL	TEF Total Mass Collected ng	TEF Emission Concentration ng/m^3	TEF Emission Rate ng/hr	TEF Emission Concentration ng/m^3 7% O2
Polyaromatic Hydrocarbons						
Naphthalene	2800	34	2800	608.3	21070.1	1744.9
2-Methylnaphthalene	908	4.7	908	197.3	6832.7	565.8
2-Chloronaphthalene	1.27	0.15	1.27	0.3	9.6	0.8
Acenaphthylene	400	1.1	400	86.9	3010.0	249.3
Acenaphthene	348	1.2	348	75.6	2618.7	216.9
Fluorene	568	7.3	568	123.4	4274.2	354.0
Phenanthrene	1670	2.9	1670	362.8	12566.8	1040.7
Anthracene	132	3.5	132	28.7	993.3	82.3
Fluoranthene	472	1.1	472	102.5	3551.8	294.1
Pyrene	404	0.97	404	87.8	3040.1	251.8
Benzo(a)anthracene	15.3	0.88	15.3	3.3	115.1	9.5
Chrysene	35.1	1.2	35.1	7.6	264.1	21.9
Benzo(b)fluoranthene	17.2	1.1	17.2	3.7	129.4	10.7
Benzo(k)fluoranthene	7.96	1.4	7.96	1.7	59.9	5.0
Benzo(e)pyrene	20.2	2.4	20.2	4.4	152.0	12.6
Benzo(a)pyrene	21.6	3.1	21.6	4.7	162.5	13.5
Perylene	<0.26	3.1	<0.26	0.0	0.0	0.0
Indeno(1,2,3-cd)pyrene	19.9	13	19.9	4.3	149.7	12.4
Dibenz(a,h)anthracene	<0.46	8.2	<0.46	0.0	0.0	0.0
Benzo(g,h,i)perylene	51.6	15	51.6	11.2	388.3	32.2
PCBs						0.0
33'44'-TetraCB-(77)	<0.017	0.017	<0.017	0.0	0.0	0.0
344'5-TetraCB-(81)	<0.20	0.017	<0.20	0.0	0.0	0.0
233'44'-PentaCB-(105)	0.30	0.018	0.3	0.1	2.3	0.2
2344'5-PentaCB-(114)	<0.20	0.020	<0.20	0.0	0.0	0.0
23'44'5-PentaCB-(118)	0.86	0.017	0.86	0.2	6.5	0.5
23'44'5'-PentaCB-(123)	<0.20	0.017	<0.20	0.0	0.0	0.0
33'44'5-PentaCB-(126)	<0.20	0.017	<0.20	0.0	0.0	0.0
HexaCB-(156)+(157)	<0.40	0.034	<0.40	0.0	0.0	0.0
23'44'55'-HexaCB-(167)	<0.20	0.016	<0.20	0.0	0.0	0.0
33'44'55'-HexaCB-(169)	<0.20	0.010	<0.20	0.0	0.0	0.0
233'44'55'-HeptaCB-(189)	<0.20	0.0099	<0.20	0.0	0.0	0.0
TOTAL TOXIC EQUIVALENCY						

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AIR/COMPLIANCE CONSULTANTS INC.
USEPA METHOD 23 and
CARB 429 DATA SHEET

Client:	Collective Efforts	**Test Type:**	Method 23/CARB 429	**Meter Delta H@:**	1.753	**Start Time:**	13:10
Date:	3-25-10	**Run Number:**	Three	**Meter Correction:**	1.000	**Stop Time:**	17:16
Plant:	Alcosan	**Nozzle Dia:**	.310	**Pitot Correction:**	0.84	**Umbilical Length:**	50' umb #8
Sampling Location:	SSI stack	**Static Press, Ps:**	+.57	**Control Box Num.:**	1618	**Probe Number:**	41-5
		Barometric Press:	29.20	**Assumed Moisture:**	3%	**Pitot Number:**	41-5
Project Number:	10-068	**Ambient Temp:**	70 °F	**Thermocouple ID:**	41-5	**Filter Number:**	
Test Crew:	EW, CB, CB	**K-factor (K_p)**	1.96			**Stack Diameter:**	30.5"

Traverse Point Number	Elapsed Time	Clock Time	Metered Volume (cf)	Velocity Head (D P)	Orifice Delta H in. H_2O	Meter Vacuum in. Hg	Stack Temp. °F	Probe Temp. Ts °F	Oven Temp. °F	Imp Out Temp °F	Cond. Temp °F	Meter Temp. °F		Notes
								248+-25°	248+/-25°	< 68°	< 68°	IN/AVG	OUT	
		13:10	400.059											
A-1	5		403.448	.69	1.4	13.5	73	250	249	54	58	78	77	
1	10		406.751	.70	1.4	14.0	73	250	249	43	41	78	77	
A-2	15		410.202	.69	1.4	17.5	73	250	249	46	40	79	78	
2	20		413.603	.69	1.4	17.0	73	250	249	47	41	79	78	
A-3	25		417.051	.72	1.4	17.0	73	250	251	50	42	79	78	
3	30		420.482	.72	1.4	17.0	73	250	249	50	42	79	78	
A-4	35		423.987	.70	1.4	17.5	73	250	252	51	43	79	78	
4	40		427.335	.72	1.4	17.5	73	250	249	50	43	79	78	XAD Trap #1 GB028483
A-5	45		430.734	.73	1.4	17.5	73	250	251	51	43	80	78	
5	50		434.225	.75	1.5	17.0	73	250	249	50	43	80	78	FH 2409-1
A-6	55		437.725	.75	1.5	16.0	73	250	250	51	42	80	78	
6	60		441.241	.74	1.5	15.0	73	250	250	49	42	80	78	
A-7	65		444.792	.74	1.5	15.0	73	250	250	50	42	81	79	
7	70		448.234	.79	1.5	15.5	73	250	251	49	42	81	79	
A-8	75		451.542	.80	1.6	16.0	73	250	249	50	43	82	79	
8	80		455.351	.78	1.5	15.5	73	250	251	50	43	82	79	
A-9	85		458.731	.78	1.5	15.5	73	250	248	51	44	82	79	
9	90		462.039	.77	1.5	15.0	73	250	251	50	44	82	79	
TOTAL/AVERAGE														

Sample Train Leak Check

	(in. Hg)	Rate (ft³/m)
Initial	15	0.005
Final	19	0.000

	1	2	3	Average
CO2				
O2				
CO				
N2				

IMP	Contents	Final	Initial	Difference
1	Empty	30	0	
2	$NaCHO_3/NaCO_3$	80	100	
3	$NaCHO_3/NaCO_3$	86	100	
4	Empty	6	0	
5	Silica Gel	280.5	238.6	

Pitot Leak Check

Pressure	✓	✓
Static	✓	✓

Fyrite Kit #: _____

AIR/COMPLIANCE CONSULTANTS INC.
USEPA METHOD 23 and
CARB 429 DATA SHEET

Client: Collective Efforts **Test Type:** Method 23/CARB 429 **Project Number:** 10-068

Date: 3-25-10 **Run Number:** Three **Testers:** EW, CB, CB

K-factor (K_p): 1.98 **Sampling Location:** SSI stack

Traverse Point Number	Elapsed Time	Clock Time	Metered Volume (cf)	Velocity Head (Δ P)	Orifice Delta H in. H_2O	Meter Vacuum in. Hg	Stack Temp. °F	Probe Temp. Ts °F 248 +/- 25°	Oven Temp. °F 248 +/- 25°	Imp Out Temp °F < 68°	Cond. Temp °F	Meter Temp. °F IN/AVG	Meter Temp. °F OUT	Notes
A-10	95		465.347	.72	1.4	15.0	73	250	253	52	45	82	80	
10	100		468.245	.72	1.4	15.0	73	250	250	51	44	82	80	Stopped @ 14:48 * pump died
A-11	105		471.718	.70	1.4	15.5	73	250	252	52	46	82	80	Started @ 14:50
11	110		475.149	.72	1.4	15.5	73	250	249	52	46	82	80	
A-12	115		478.601	.70	1.4	16.0	73	250	250	54	47	81	80	1.98 Kf
12	120	15:12	482.015	.70	1.4	16.0	73	250	247	54	47	81	80	Stopped port change
B-1	125	15:16	485.382	.68	1.3	15.0	73	250	251	55	57	82	80	Started @ 15:16
1	130		488.761	.72	1.4	15.5	73	250	248	58	51	85	81	
B-2	135		492.357	.74	1.5	16.5	73	250	252	58	52	85	81	
2	140		495.992	.76	1.5	16.5	73	250	252	54	49	85	81	
B-3	145		499.511	.76	1.5	16.5	73	250	249	51	46	86	81	
3	150		503.099	.76	1.5	16.5	73	250	251	48	46	86	82	
B-4	155		506.652	.74	1.5	16.5	73	250	252	47	45	86	82	
4	160		510.231	.74	1.5	16.5	73	250	249	45	46	86	82	
B-5	165		513.790	.74	1.5	16.5	73	250	248	47	46	86	82	
5	170		517.351	.75	1.5	16.5	73	250	253	48	46	87	82	
B-6	175		520.901	.77	1.5	16.5	73	250	250	47	46	87	83	
6	180		524.482	.77	1.5	16.5	73	250	250	48	47	88	83	
B-7	185		528.110	.80	1.6	17.0	73	250	250	47	47	88	83	
7	190		531.790	.81	1.6	17.0	73	250	252	49	47	89	84	
B-8	195		535.441	.83	1.6	17.0	73	250	253	48	47	89	84	
8	200		539.101	.83	1.6	17.0	73	250	250	49	48	89	84	
B-9	205		542.865	.86	1.7	18.0	73	250	247	48	47	88	84	
9	210		546.631	.84	1.7	18.0	73	250	251	49	47	88	84	
B-10	215		550.462	.86	1.7	18.0	73	250	248	48	45	87	84	
10	220		554.233	.86	1.7	18.0	73	250	248	49	45	85	84	
B-11	225		558.001	.84	1.7	18.0	73	250	249	48	45	84	84	
11	230		561.805	.84	1.7	18.0	73	250	248	49	45	84	83	
B 12	235		565.590	.83	1.6	17.0	73	250	249	49	49	84	83	
12	240	17:16	569.375	.83	1.6	17.0	74	250	250	49	46	83	82	

ACCI 1 Minute Average Data Sheet: O2, CO2, CO, NOx, SO2			
Client	Collective Efforts LLC	**Unit**	SSI
Project No	10-068	**Operation**	mnoc
Plant	Alcosan	**Location**	exhaust stack

MINUTE	DATE	TIME	O2 (DV %)	CO2 (DV %)	CO (PPMdv)	NOx (PPMdv)	SO2 (PPMdv)
RUN 3							
1	2010/03/25	13:10:12	13.1	6.5	2.9	91.6	1.8
2	2010/03/25	13:11:12	13.1	6.5	3.0	88.4	1.8
3	2010/03/25	13:12:12	13.0	6.5	3.2	90.3	1.8
4	2010/03/25	13:13:12	13.1	6.5	3.3	88.1	1.8
5	2010/03/25	13:14:12	13.1	6.5	3.3	89.3	1.8
6	2010/03/25	13:15:12	13.1	6.5	3.2	93.5	1.8
7	2010/03/25	13:16:12	13.1	6.5	3.1	94.0	1.8
8	2010/03/25	13:17:12	13.0	6.5	3.0	91.1	1.8
9	2010/03/25	13:18:12	13.1	6.5	2.8	89.6	1.8
10	2010/03/25	13:19:12	13.1	6.5	2.9	89.6	1.8
11	2010/03/25	13:20:12	13.1	6.4	3.2	91.2	1.8
12	2010/03/25	13:21.12	13.1	6.4	3.6	91.1	1.8
13	2010/03/25	13:22:12	13.0	6.5	3.6	93.9	1.8
14	2010/03/25	13:23:12	13.0	6.5	3.5	95.6	1.8
15	2010/03/25	13:24:12	13.0	6.5	3.4	93.2	1.8
16	2010/03/25	13:25:12	13.0	6.5	3.2	92.9	1.8
17	2010/03/25	13:26:12	13.0	6.5	3.3	94.4	1.8
18	2010/03/25	13:27:12	13.1	6.5	3.5	92.4	1.8
19	2010/03/25	13:28:12	13.1	6.4	3.5	93.4	1.8
20	2010/03/25	13:29:12	13.2	6.4	3.7	92.1	1.8
21	2010/03/25	13:30:12	13.2	6.3	3.9	89.4	1.8
22	2010/03/25	13:31:12	13.3	6.3	3.7	87.5	1.8
23	2010/03/25	13:32:12	13.3	6.3	3.4	87.3	1.8
24	2010/03/25	13:33:12	13.3	6.3	3.4	90.2	1.8
25	2010/03/25	13:34:12	13.3	6.3	3.3	86.5	1.8
26	2010/03/25	13:35:12	13.3	6.3	3.3	85.7	1.8
27	2010/03/25	13:36:12	13.2	6.3	3.3	88.6	1.8
28	2010/03/25	13:37:12	13.2	6.4	3.5	88.9	1.7
29	2010/03/25	13:38:12	13.2	6.4	3.7	92.0	1.8
30	2010/03/25	13:39:12	13.3	6.3	3.6	88.5	1.8
31	2010/03/25	13:40:12	13.3	6.3	3.4	87.7	1.8
32	2010/03/25	13:41:12	13.3	6.3	3.3	93.9	1.8
33	2010/03/25	13:42:12	13.3	6.3	3.3	94.1	1.8
34	2010/03/25	13.43:12	13.2	6.3	3.0	85.1	1.8
35	2010/03/25	13:44:12	13.3	6.3	2.9	84.5	1.8
36	2010/03/25	13:45:12	13.3	6.3	3.1	85.5	1.8
37	2010/03/25	13.46:12	13.3	6.3	3.4	85.7	1.8
38	2010/03/25	13:47:12	13.2	6.3	3.6	88.1	1.8
39	2010/03/25	13:48.12	13.2	6.3	3.9	86.0	1.8
40	2010/03/25	13:49:12	13.2	6.4	4.0	88.8	1.8
41	2010/03/25	13:50:12	13.2	6.4	3.9	90.2	1.8
42	2010/03/25	13.51:12	13.2	6.3	3.4	87.4	1.8
43	2010/03/25	13:52:12	13.2	6.4	3.3	90.4	1.8
44	2010/03/25	13:53:12	13.2	6.4	3.2	90.7	1.8
45	2010/03/25	13:54:12	13.2	6.4	3.3	85.4	1.8
46	2010/03/25	13:55:12	13.2	6.4	3.7	87.8	1.8
47	2010/03/25	13:56.12	13.1	6.4	3.8	91.4	1.8
48	2010/03/25	13:57:12	13.1	6.5	3.8	98.3	1.8
49	2010/03/25	13:58:12	13.1	6.4	3.7	103.6	1.8
50	2010/03/25	13:59.12	13.1	6.4	3.4	101.5	1.8
51	2010/03/25	14:00:12	13.2	6.4	3.4	102.3	1.8
52	2010/03/25	14:01:12	13.2	6.4	3.3	102.7	1.8
53	2010/03/25	14.02:12	13.2	6.3	3.3	97.7	1.8
54	2010/03/25	14:03:12	13.2	6.3	3.3	90.9	1.8
55	2010/03/25	14:04:12	13.2	6.4	3.6	96.7	1.8
56	2010/03/25	14:05:12	13.1	6.4	3.8	100.2	1.8
57	2010/03/25	14.06:12	13.1	6.4	3.7	99.0	1.8
58	2010/03/25	14:07:12	13.1	6.5	3.6	98.3	1.8
59	2010/03/25	14:08.12	13.1	6.5	3.5	100.0	1.8
60	2010/03/25	14:09:12	13.1	6.5	3.4	103.0	1.9
61	2010/03/25	14:10:12	13.1	6.5	3.6	104.8	1.9
62	2010/03/25	14:11.12	13.1	6.4	3.7	106.9	1.9
63	2010/03/25	14:12:12	13.2	6.4	3.9	104.4	1.8
64	2010/03/25	14:13:12	13.1	6.4	4.0	108.6	1.8
65	2010/03/25	14:14:12	13.2	6.3	3.9	111.5	1.8
66	2010/03/25	14:15:12	13.4	6.2	3.8	100.4	1.8

ACCI 1 Minute Average Data Sheet: O2, CO2, CO, NOx, SO2			
Client	Collective Efforts LLC	**Unit**	SSI
Project No	10-068	**Operation**	mnoc
Plant	Alcosan	**Location**	exhaust stack

MINUTE	DATE	TIME	O2 (DV %)	CO2 (DV %)	CO (PPMdv)	NOx (PPMdv)	SO2 (PPMdv)
67	2010/03/25	14:16:12	13.5	6.1	3.4	92.8	1.8
68	2010/03/25	14:17:12	13.5	6.0	3.2	82.3	1.8
69	2010/03/25	14:18:12	13.6	6.0	3.2	80.2	1.8
70	2010/03/25	14:19:12	13.6	6.0	3.3	81.2	1.8
71	2010/03/25	14:20:12	13.6	6.0	3.4	76.0	1.8
72	2010/03/25	14:21:12	13.5	6.0	3.7	73.7	1.8
73	2010/03/25	14:22:12	13.5	6.0	4.0	70.8	1.8
74	2010/03/25	14:23:12	13.5	6.1	3.9	75.5	1.7
75	2010/03/25	14:24:12	13.5	6.0	3.6	83.2	1.7
76	2010/03/25	14:25:12	13.6	6.0	3.4	83.8	1.7
77	2010/03/25	14:26:12	13.7	5.9	3.2	79.5	1.7
78	2010/03/25	14:27:12	13.7	5.9	3.1	77.8	1.7
79	2010/03/25	14:28:12	13.7	5.9	3.3	78.4	1.8
80	2010/03/25	14:29:12	13.7	5.9	3.5	78.2	1.7
81	2010/03/25	14:30:12	13.7	5.9	3.6	79.9	1.7
82	2010/03/25	14:31:12	13.7	5.9	3.7	80.1	1.8
83	2010/03/25	14:32:12	13.7	5.9	3.6	78.3	1.7
84	2010/03/25	14:33:12	13.7	5.9	3.4	76.9	1.7
85	2010/03/25	14:34:12	13.6	6.0	3.3	77.7	1.7
86	2010/03/25	14:35:12	13.6	6.0	3.3	79.9	1.7
87	2010/03/25	14:36:12	13.7	5.9	3.3	76.6	1.7
88	2010/03/25	14:37:12	13.7	5.9	3.4	73.3	1.7
89	2010/03/25	14:38:12	13.7	5.9	3.6	74.3	1.7
90	2010/03/25	14:39:12	13.7	5.9	3.9	77.8	1.7
91	2010/03/25	14:40:12	13.6	6.0	4.0	76.9	1.7
92	2010/03/25	14:41:12	13.6	6.0	3.6	79.1	1.7
93	2010/03/25	14:42:12	13.6	6.0	3.4	84.2	1.7
94	2010/03/25	14:43:12	13.6	6.0	3.5	85.2	1.7
95	2010/03/25	14:44:12	13.5	6.1	3.6	84.9	1.7
96	2010/03/25	14:45:12	13.5	6.1	3.5	86.3	1.7
97	2010/03/25	14:46:12	13.5	6.1	3.7	82.8	1.7
98	2010/03/25	14:47:12	13.5	6.1	3.8	83.4	1.7
99	2010/03/25	14:48:12	13.5	6.0	3.9	85.4	1.6
100	2010/03/25	14:49:12	13.5	6.1	4.0	81.4	1.6
101	2010/03/25	14:50:12	13.5	6.1	3.9	80.4	1.6
102	2010/03/25	14:51:12	13.4	6.1	3.7	83.2	1.6
103	2010/03/25	14:52:12	13.4	6.1	3.5	82.6	1.6
104	2010/03/25	14:53:12	13.4	6.2	3.4	87.1	1.7
105	2010/03/25	14:54:12	13.4	6.2	3.8	95.8	1.7
106	2010/03/25	14:55:12	13.4	6.2	4.2	95.1	1.6
107	2010/03/25	14:56:12	13.4	6.2	4.2	93.0	1.7
108	2010/03/25	14:57:12	13.3	6.2	4.3	97.9	1.6
109	2010/03/25	14:58:12	13.3	6.2	4.1	98.9	1.6
110	2010/03/25	14:59:12	13.3	6.2	4.0	94.6	1.6
111	2010/03/25	15:00:12	13.3	6.2	3.9	93.4	1.6
112	2010/03/25	15:01:12	13.3	6.3	3.7	97.0	1.6
113	2010/03/25	15:02:12	13.3	6.3	3.7	100.5	1.6
114	2010/03/25	15:03:12	13.4	6.2	3.9	98.1	1.6
115	2010/03/25	15:04:12	13.4	6.2	4.2	97.4	1.6
116	2010/03/25	15:05:12	13.4	6.2	4.2	102.5	1.6
117	2010/03/25	15:06:12	13.4	6.2	4.2	103.6	1.6
118	2010/03/25	15:07:12	13.4	6.2	4.2	99.0	1.6
119	2010/03/25	15:08:12	13.3	6.2	4.1	101.5	1.6
120	2010/03/25	15:09:12	13.4	6.2	4.0	104.3	1.6
121	2010/03/25	15:10:12	13.4	6.1	4.1	95.8	1.6
122	2010/03/25	15:11:12	13.4	6.2	4.3	92.7	1.5
123	2010/03/25	15:12:12	13.4	6.2	4.6	98.7	1.6
124	2010/03/25	15:13:12	13.4	6.2	5.0	100.3	1.6
125	2010/03/25	15:14:12	13.4	6.1	5.0	98.0	1.6
126	2010/03/25	15:15:12	13.5	6.1	4.8	99.3	1.6
127	2010/03/25	15:16:12	13.5	6.1	4.6	96.8	1.5
128	2010/03/25	15:17:12	13.4	6.1	4.5	96.0	1.5
129	2010/03/25	15:18:12	13.3	6.1	4.6	93.4	1.5
130	2010/03/25	15:19:12	13.3	6.1	4.6	92.9	1.5
131	2010/03/25	15:20:12	13.4	6.1	4.7	96.7	1.5
132	2010/03/25	15:21:12	13.4	6.1	5.0	93.7	1.5
133	2010/03/25	15:22:12	13.4	6.0	5.2	90.3	1.5

ACCI 1 Minute Average Data Sheet: O2, CO2, CO, NOx, SO2			
Client	Collective Efforts LLC	**Unit**	SS1
Project No	10-068	**Operation**	mnoc
Plant	Alcosan	**Location**	exhaust stack

MINUTE	DATE	TIME	O2 (DV %)	CO2 (DV %)	CO (PPMdv)	NOx (PPMdv)	SO2 (PPMdv)
134	2010/03/25	15:23:12	13.4	6.1	5.1	93.9	1.5
135	2010/03/25	15:24:12	13.4	6.1	4.9	97.8	1.5
136	2010/03/25	15:25:12	13.4	6.1	4.9	101.0	1.5
137	2010/03/25	15:26:12	13.3	6.1	5.1	102.5	1.5
138	2010/03/25	15:27:12	13.3	6.1	5.0	102.3	1.5
139	2010/03/25	15:28:12	13.3	6.1	4.9	106.7	1.5
140	2010/03/25	15:29:12	13.3	6.2	5.2	107.6	1.5
141	2010/03/25	15:30:12	13.3	6.1	5.3	105.0	1.5
142	2010/03/25	15:31:12	13.3	6.1	5.2	102.0	1.5
143	2010/03/25	15:32:12	13.2	6.2	4.9	101.3	1.5
144	2010/03/25	15:33:12	13.2	6.2	4.9	111.0	1.5
145	2010/03/25	15:34:12	13.3	6.1	4.8	112.4	1.5
146	2010/03/25	15:35:12	13.3	6.1	4.5	106.2	1.5
147	2010/03/25	15:36:12	13.3	6.1	4.5	107.1	1.5
148	2010/03/25	15:37:12	13.3	6.1	4.8	113.8	1.6
149	2010/03/25	15:38:12	13.3	6.0	5.0	110.5	1.6
150	2010/03/25	15:39:12	13.3	6.1	5.1	107.0	1.6
151	2010/03/25	15:40:12	13.3	6.1	5.3	108.8	1.5
152	2010/03/25	15:41:12	13.3	6.1	5.2	105.8	1.5
153	2010/03/25	15:42:12	13.4	6.0	4.8	106.2	1.5
154	2010/03/25	15:43:12	13.4	6.0	4.6	104.3	1.6
155	2010/03/25	15:44:12	13.4	6.0	4.6	104.5	1.6
156	2010/03/25	15:45:12	13.4	6.0	4.9	104.9	1.6
157	2010/03/25	15:46:12	13.3	6.1	5.2	107.4	1.6
158	2010/03/25	15:47:12	13.3	6.1	5.3	109.1	1.6
159	2010/03/25	15:48:12	13.3	6.1	5.4	109.2	1.6
160	2010/03/25	15:49:12	13.4	6.0	5.1	111.6	1.6
161	2010/03/25	15:50:12	13.4	6.0	5.0	109.6	1.5
162	2010/03/25	15:51:12	13.3	6.0	4.9	111.8	1.5
163	2010/03/25	15:52:12	13.3	6.1	4.6	116.9	1.5
164	2010/03/25	15:53:12	13.3	6.1	4.5	116.5	1.6
165	2010/03/25	15:54:12	13.3	6.1	4.6	116.0	1.5
166	2010/03/25	15:55:12	13.3	6.1	5.1	118.6	1.5
167	2010/03/25	15:56:12	13.2	6.1	5.3	116.7	1.5
168	2010/03/25	15:57:12	13.2	6.1	5.1	115.3	1.5
169	2010/03/25	15:58:12	13.2	6.1	5.2	118.2	1.6
170	2010/03/25	15:59:12	13.2	6.1	5.2	120.6	1.6
171	2010/03/25	16:00:12	13.2	6.2	5.0	120.3	1.5
172	2010/03/25	16:01:12	13.2	6.1	4.9	121.4	1.5
173	2010/03/25	16:02:12	13.3	6.1	4.9	119.8	1.5
174	2010/03/25	16:03:12	13.2	6.2	5.2	118.3	1.5
175	2010/03/25	16:04:12	13.2	6.2	5.3	123.6	1.5
176	2010/03/25	16:05:12	13.2	6.2	5.4	124.3	1.5
177	2010/03/25	16:06:12	13.2	6.2	5.3	122.7	1.5
178	2010/03/25	16:07:12	13.3	6.1	5.2	117.7	1.5
179	2010/03/25	16:08:12	13.2	6.2	4.9	118.9	1.5
180	2010/03/25	16:09:12	13.2	6.2	4.7	124.3	1.5
181	2010/03/25	16:10:12	13.2	6.2	4.8	122.7	1.4
182	2010/03/25	16:11:12	13.1	6.2	4.9	127.9	1.4
183	2010/03/25	16:12:12	13.1	6.3	5.3	132.6	1.4
184	2010/03/25	16:13:12	13.1	6.2	5.5	129.2	1.4
185	2010/03/25	16:14:12	13.2	6.2	5.5	127.5	1.4
186	2010/03/25	16:15:12	13.2	6.2	5.4	130.3	1.4
187	2010/03/25	16:16:12	13.2	6.2	5.4	135.1	1.4
188	2010/03/25	16:17:12	13.2	6.2	5.3	137.3	1.4
189	2010/03/25	16:18:12	13.2	6.2	5.2	134.2	1.4
190	2010/03/25	16:19:12	13.2	6.2	5.4	130.7	1.4
191	2010/03/25	16:20:12	13.1	6.3	5.5	129.6	1.4
192	2010/03/25	16:21:12	13.1	6.3	5.8	129.2	1.4
193	2010/03/25	16:22:12	13.1	6.3	6.0	135.2	1.4
194	2010/03/25	16:23:12	13.0	6.4	5.8	142.0	1.3
195	2010/03/25	16:24:12	13.0	6.4	5.5	141.7	1.4
196	2010/03/25	16:25:12	13.1	6.3	5.5	144.1	1.3
197	2010/03/25	16:26:12	13.1	6.3	5.5	144.4	1.3
198	2010/03/25	16:27:12	13.1	6.3	5.4	134.7	1.3
199	2010/03/25	16:28:12	13.1	6.3	5.4	137.1	1.3
200	2010/03/25	16:29:12	13.0	6.3	5.6	139.7	1.3

ACCI 1 Minute Average Data Sheet: O2, CO2, CO, NOx, SO2			
Client	Collective Efforts LLC	**Unit**	SS1
Project No	10-068	**Operation**	mnoc
Plant	Alcosan	**Location**	exhaust stack

MINUTE	DATE	TIME	O2 (DV %)	CO2 (DV %)	CO (PPMdv)	NOx (PPMdv)	SO2 (PPMdv)
201	2010/03/25	16:30:12	12.9	6.4	5.8	136.2	1.4
202	2010/03/25	16:31:12	12.9	6.4	5.9	137.4	1.4
203	2010/03/25	16:32:12	12.9	6.4	5.8	135.4	1.4
204	2010/03/25	16:33:12	12.9	6.4	5.6	136.1	1.4
205	2010/03/25	16:34:12	13.0	6.4	5.7	136.0	1.4
206	2010/03/25	16:35:12	13.0	6.3	5.6	137.2	1.4
207	2010/03/25	16:36:12	13.0	6.4	5.5	141.1	1.5
208	2010/03/25	16:37:12	12.9	6.4	5.7	142.7	1.6
209	2010/03/25	16:38:12	12.9	6.4	6.0	145.3	1.5
210	2010/03/25	16:39:12	13.0	6.4	6.1	141.5	1.4
211	2010/03/25	16:40:12	13.0	6.3	6.0	134.3	1.3
212	2010/03/25	16:41:12	13.0	6.3	5.7	131.1	1.3
213	2010/03/25	16:42:12	13.0	6.4	5.5	134.9	1.3
214	2010/03/25	16:43:12	12.9	6.4	5.3	141.3	1.2
215	2010/03/25	16:44:12	12.9	6.4	5.3	148.2	1.2
216	2010/03/25	16:45:12	13.0	6.3	5.3	144.1	1.2
217	2010/03/25	16:46:12	13.3	6.1	5.5	131.2	1.2
218	2010/03/25	16:47:12	13.4	6.0	5.6	124.6	1.2
219	2010/03/25	16:48:12	13.5	5.9	5.7	123.4	1.2
220	2010/03/25	16:49:12	13.6	5.9	5.7	117.6	1.2
221	2010/03/25	16:50:12	13.6	5.9	5.5	111.5	1.2
222	2010/03/25	16.51:12	13.5	5.9	5.3	109.6	1.2
223	2010/03/25	16:52:12	13.4	6.0	5.2	113.5	1.2
224	2010/03/25	16:53:12	13.3	6.1	5.3	119.3	1.2
225	2010/03/25	16:54:12	13.3	6.2	5.4	124.7	1.2
226	2010/03/25	16:55:12	13.3	6.1	5.6	124.8	1.2
227	2010/03/25	16:56.12	13.4	6.1	5.9	124.3	1.2
228	2010/03/25	16:57:12	13.3	6.1	5.9	127.4	1.2
229	2010/03/25	16:58:12	13.4	6.1	5.6	125.0	1.2
230	2010/03/25	16:59:12	13.4	6.0	5.2	118.1	1.2
231	2010/03/25	17:00:12	13.3	6.1	5.0	121.0	1.2
232	2010/03/25	17:01:12	13.3	6.1	4.8	127.1	1.2
233	2010/03/25	17.02:12	13.3	6.1	4.7	131.1	1.2
234	2010/03/25	17:03:12	13.3	6.1	5.1	128.5	1.2
235	2010/03/25	17:04:12	13.4	6.1	5.4	127.5	1.2
236	2010/03/25	17:05:12	13.4	6.1	5.5	126.5	1.2
237	2010/03/25	17:06:12	13.4	6.0	5.4	124.5	1.2
238	2010/03/25	17:07:12	13.3	6.1	5.3	127.3	1.2
239	2010/03/25	17:08:12	13.3	6.1	5.2	128.1	1.2
240	2010/03/25	17:09.12	13.4	6.1	5.1	124.7	1.2
		Minimum	12.9	5.9	2.8	70.8	1.2
		Maximum	13.7	6.5	6.1	148.2	1.9
RUN 3 AVERAGES			**13.3**	**6.2**	**4.4**	**104.7**	**1.6**

ACCI CEM Calibration, Bias and Drift Data Sheet
Based on 40 CFR Part 60, Appendix A-4, Method 7E

Client	Collective Efforts LLC	**Date**	March 25, 2010
Project No	10-068	**Location**	exhaust stack
Plant	Alcosan	**Run**	Run 3
Unit	SSI	**Start Time**	13:10
Operation	mnoc	**End Time**	17:10
Tester(s)	wo,jv,ew,cb,rf		

Cal.	LOW		MID		HIGH		Tank ID				Conc.	Response Time	
Gas	Conc.	(% of Span)	Conc.	(% of Span)	Conc.	(% of Span)	LOW	MID	HIGH	Span	Units	Up (sec)	Down (sec)
O2	N/A	N/A	10.01	44.5	22.47	100.0	N/A	eb001355	cc251892	22.47	d. vol. %	37	36
CO2	N/A	N/A	9.96	44.2	22.54	100.0	N/A	cc251892	eb001355	22.54	d. vol. %	35	35
CO	N/A	N/A	7	46.7	15	100.0	N/A	method 205	method 205 (6	15	ppmdv	47	46
NOx	N/A	N/A	120	46.2	260	100.0	N/A	method 205	Method 205 (9	260	ppmdv	46	45
SO2	N/A	N/A	5	50.0	10	100.0	N/A	method 205	method 205 (9	10	ppmdv	45	44
LIMITS				40 % to 60 %		100%							

	Upscale: Enter "Low" "Mid" or "High"			Initial Values		Final Values				Average of Initial and Final	Average Indicated	Corrected	
Gas	below "Zero"	Actual Upscale Conc.	Analyzer Cal. Response	System Cal. Response	System Cal. Bias (% of Span)	System Cal. Response	System Cal. Bias (% of Span)	Drift (% of Span)	Span	System Responses	Gas Conc.	Gas Conc.	Conc. Units
O2	Zero		-0.1	0.0	0.45	0.0	0.45	0.00	22.47	0			
	Mid	10.01	10.1	10.0	-0.45	10.0	-0.45	0.00	22.47	10	13.28	13.30	d. vol. %
CO2	Zero		0.1	0.2	0.44	0.2	0.44	0.00	22.54	0.2			
	Mid	9.96	9.7	9.8	0.44	9.8	0.44	0.00	22.54	9.8	6.20	6.22	d. vol. %
CO	Zero		0.0	-0.2	-1.33	0.1	0.67	2.00	15	-0.05			
	Mid	7	6.9	7.0	0.67	7.2	2.00	1.33	15	7.1	4.38	4.34	ppmdv
NOx	Zero		0.0	2.5	0.96	2.5	0.96	0.00	260	2.5			
	Mid	120	121.3	114.9	-2.46	109.0	-4.73	-2.27	260	111.95	104.68	112.02	ppmdv
SO2	Zero		0.1	0.4	3.00	0.1	0.00	-3.00	10	0.25			
	Mid	5	5.1	4.7	-4.00	4.7	-4.00	0.00	10	4.7	1.58	1.50	ppmdv
LIMITS					+/- 5 %		+/- 5 %	+/- 3 %					

Gas	ZERO Analyzer Response (System for THC)	ZERO Analyzer Cal. Error (% of Span)	LOW Actual Conc.	LOW Analyzer Response (System for THC)	LOW Analyzer Cal. Error (% of Span)	LOW System Cal. Error (% of Actual)	MID Actual Conc.	MID Analyzer Response (System for THC)	MID Analyzer Cal. Error (% of Span)	MID System Cal. Error (% of Actual)	HIGH Actual Conc.	HIGH Analyzer Response (System for THC)	HIGH Analyzer Cal. Error (% of Span)	HIGH System Calibration Error (% of Actual)	Span	Conc. Units
O2	-0.1	-0.45					10.01	10.1	0.40		22.47	22.6	0.58		22.47	d. vol. %
CO2	0.1	0.44					9.96	9.7	-1.15		22.54	22.8	1.15		22.54	d. vol. %
CO	0.0	0.00					7	6.9	-0.67		15	15.2	1.33		15	ppmdv
NOx	0.0	0.00					120	121.3	0.50		260	258.1	-0.73		260	ppmdv
SO2	0.1	1.00					5	5.1	1.00		10	10.0	0.00		10	ppmdv
LIMITS		+/- 2 %			+/- 2 %	+/- 5 %			+/- 2 %	+/- 5 %			+/- 2 %	+/- 5 %		

Client:	Collective Efforts LLC		Test Date:	March 25, 2010	
Project No.:	10-068		Test Location:	exhaust stack	
Plant:	Alcosan		Test Run:	Run 3	
Unit:	SSI		Test Start Time:	1:10 PM	
Unit Operation:	mnoc		Test Finish Time:	5:16 PM	
Blue is data input.	Red is a reference.	Pink is a reference to a cell on another sheet.		Green is a reference to a cell on this sheet.	
Data Input			**Calculations**		
Control Box:	1618		CO + N2	80.48	% dv
Meter $DH_@$ (0.75 scfm)	1.753	in. H_2O	Water Collected (V_f- V_i)	22.0	ml
Meter Calibration Factor (Yd)	1.000		Water Vapor Condensed (Vwc(std))	1.035	scf
Test Time (Theta)	240	minutes	Water Collected (W_f- W_i)	41.9	g
Barometric Pressure (Pbar)	29.20	in. Hg	Water Vapor in Silica Gel (Vwsg(std))	1.976	scf
Stack Static Pressure (Pg)	0.57	in. H_2O	Vol. Water Vapor in Gas Stand.(Vw(std	3.011	scf
Stack Diameter (Ds) (L if rectangular)	36.5	inches	Volume Dry Gas Metered (Vm)	169.316	dacf
Stack Width (enter NA if circular)	NA	inches	Vol. Dry Gas Metered Stand.(Vm(std))	161.530	dscf
Nozzle Diameter (Dn) (NA if NA)	0.210	inches	Volume Dry Gas Metered (Vm(m^3))	4.795	dacm
CO2	6.22	% dv	Vol. Dry Gas Metered Stand.(Vm(std)m	4.574	dscm
O2	13.30	% dv	Stack Absolute Pressure (Ps)	29.24	in. Hg
Product Rate (enter NA if not needed)	1.88	input ton/hr	Stack Absolute Temperature (Tsavg)	532.7	R
Is the input ton/hr metric? (YES=1)	0		H2O Vapor Pressure @ avg Stack Temp	0.82	in. Hg
Pitot Tube Coefficient (Cp)	0.84		H2O in the gas at saturation (Bws)	0.0280	vol. fraction
Sample Calculation Title	Particulate and CEMS		H2O in the gas from test data (Bws)	0.0183	vol. fraction
F_d @ 68 F and 760 mm Hg (NA if NA)	9.570	dscf/MMBtu	H2O in the gas used (lower of the 2 Bws	0.0183	vol. fraction
Heat Input Based on Process Data	100	MMBtu/hr	Is the Gas Stream Saturated With H2O?	NO	
Standard Temperature	68	F	Dry Gas Molecular Weight (Md)	29.53	lb/lb-mole
Standard Pressure	760	mm Hg	Wet Gas Molecular Weight (Ms)	29.32	lb/lb-mole
Pitot Tube Constant (Kp)	85.49		Gas Velocity (Vs)	49.34	ft/s
Calculations			Is the stack circular or rectangular?	CIRCULAR	
Meter Temperature (Tm)	82.0	F	Area Stack (As)	7.266	ft^2
Stack Temperature (Tsavg)	73.0	F	Actual Gas Flowrate	21,509	acfm
Orifice Pressure Drop (dHavg)	1.502	in. H_2O	Standard Gas Flowrate	20,824	scfm
GasVelocity Head (dP)' 'avg	0.8713	in. H_2O^1/2	Dry Standard Gas Flowrate	20,443	dscfm
F_d @ Standard Conditions	9,570	dscf/MMBtu	Actual Gas Flowrate	609	acm/min
F_d @ Stan. Cond. & Actual O2	26,303	dscf/MMBtu	Standard Gas Flowrate	590	scm/min
Heat Input Based on F_d	47	MMBtu/hr	Dry Standard Gas Flowrate	579	dscm/min
K1method 4	0.04706	scf/ml	Area Nozzle (An)	0.000241	ft^2
K2method 4	0.04715	scf/g	Percent of Isokinetic Sampling (I)	99.52	%
K1method 5	17.64	R/in. Hg			
K4method 5	0.0945				
Standard lb-mole volume	385.3	ft^3/lb-mole			
Carbon Monoxide					
MW	28	lb/lb-mole			
O2 for Correction	7	vol. %			
Concentration	4.34	ppm_{dv}			
Concentration	7.93	ppm_{dv} 7% O2			
Concentration	0.0000003	lb/dscf			
Emission	0.39	lb/hr			
Emission	0.008	lb/MMBtu			
Emission	0.0039	lb/MMBtu			
Nitrogen Oxides (NOx) as NO2					
MW	46	lb/lb-mole			
O2 for Correction	7	vol. %			
Concentration	112.02	ppm_{dv}			
Concentration	204.77	ppm_{dv} 7% O2			
Concentration	0.0000134	lb/dscf			
Emission	16.40	lb/hr			
Emission	0.352	lb/MMBtu			
Emission	0.1640	lb/MMBtu			
Sulfur Dioxide (SO2)					
MW	64	lb/lb-mole			
O2 for Correction	7	vol. %			
Concentration	1.50	ppm_{dv}			
Concentration	2.74	ppm_{dv} 7% O2			
Concentration	0.0000002	lb/dscf			
Emission	0.31	lb/hr			
Emission	0.007	lb/MMBtu			
Emission	0.0031	lb/MMBtu			

Collective Efforts LLC **Run 3** **F or C?**
SSI **F=1,C=0** 1

Point	Pitot DP (dP) (in. H2O)	SQRT dP (in. $H_2O)^{1/2}$	Orifice DP (dH (in. H2O)	Stack Temp (F)	Meter Temp In/Out (F or C)	(F or C)
A-1	0.69	0.831	1.4	73	78	77
1	0.70	0.837	1.4	73	78	77
2	0.69	0.831	1.4	73	79	78
2	0.69	0.831	1.4	73	79	78
3	0.72	0.849	1.4	73	79	78
3	0.72	0.849	1.4	73	79	78
4	0.70	0.837	1.4	73	79	78
4	0.72	0.849	1.4	73	79	78
5	0.73	0.854	1.4	73	80	78
5	0.75	0.866	1.5	73	80	78
6	0.75	0.866	1.5	73	80	78
6	0.74	0.860	1.5	73	80	78
7	0.74	0.860	1.5	73	81	79
7	0.79	0.889	1.5	73	81	79
8	0.80	0.894	1.6	73	82	79
8	0.78	0.883	1.5	73	82	79
9	0.78	0.883	1.5	73	82	79
9	0.77	0.877	1.5	73	82	79
10	0.72	0.849	1.4	73	82	80
10	0.72	0.849	1.4	73	82	80
11	0.70	0.837	1.4	73	82	80
11	0.72	0.849	1.4	73	82	80
12	0.70	0.837	1.4	73	81	80
12	0.70	0.837	1.4	73	81	80
B-1	0.68	0.825	1.3	73	82	80
1	0.72	0.849	1.4	73	85	81
2	0.74	0.860	1.5	73	85	81
2	0.76	0.872	1.5	73	85	81
3	0.76	0.872	1.5	73	86	81
3	0.76	0.872	1.5	73	86	82
4	0.74	0.860	1.5	73	86	82
4	0.74	0.860	1.5	73	86	82
5	0.74	0.860	1.5	73	86	82
5	0.75	0.866	1.5	73	87	82
6	0.77	0.877	1.5	73	87	83
6	0.77	0.877	1.5	73	88	83
7	0.80	0.894	1.6	73	88	83
7	0.81	0.900	1.6	73	89	84
8	0.83	0.911	1.6	73	89	84
8	0.83	0.911	1.6	73	89	84
9	0.86	0.927	1.7	73	88	84
9	0.84	0.917	1.7	73	88	84
10	0.86	0.927	1.7	73	87	84
10	0.86	0.927	1.7	73	85	84
11	0.84	0.917	1.7	73	84	84
11	0.84	0.917	1.7	73	84	83
12	0.83	0.911	1.6	73	84	83
12	0.83	0.911	1.6	74	83	82
Average	0.76	0.871	1.50	73.0		82.0

Initial volume	400.059	ft^3	Initial volume	0.000	liters
Final volume	569.375	ft^3	Final volume	0.000	liters
leak checks		ft3			
Total metered	169.316	dacf	Total metered	0.000	dry actual liters

Impinger	Final grams	Initial grams	Gram Gain	Final ml	Initial ml	ml Gain
1			0.0	30.0	0.0	30.0
2			0.0	90.0	100.0	-10.0
3			0.0	96.0	100.0	-4.0
4			0.0	6.0	0.0	6.0
5	280.5	238.6	41.9			0.0
6			0.0			0.0
7			0.0			0.0
8			0.0			0.0
9			0.0			0.0
10			0.0			0.0
Total	280.5	238.6	41.9	222.0	200.0	22.0
	W_f	W_i	(W_f- W_i)	V_f	V_i	(V_f- Vi)

Dioxin Furan

	Analyte	TEF	Raw Data mass (ng)	Adjusted Mass (ng)	TEF Adjusted Amount (ng)
2	2378-TCDD	1	3.8	0.00380	0.0038
1	2378-TCDF (DB 225)	0.1	3.8	0.00380	0.00038
3	12378-PeCDF	0.05	2.3	0.00230	0.000115
5	12378-PeCDD	0.5	2.2	0.00220	0.0011
4	23478-PeCDF	0.5	2.3	0.00230	0.00115
6	123478-HxCDF	0.1	2.4	0.00240	0.00024
7	123678-HxCDF	0.1	2.0	0.00200	0.0002
10	123478-HxCDD	0.1	2.3	0.00230	0.00023
11	123678-HxCDD	0.1	2.0	0.00200	0.0002
12	123789-HxCDD	0.1	2.0	0.00200	0.0002
8	234678-HxCDF	0.1	2.8	0.00280	0.00028
9	123789-HxCDF	0.1	2.9	0.00290	0.00029
13	1234678-HpCDF	0.01	4.3	0.00430	0.000043
15	1234678-HpCDD	0.01	2.1	0.00210	0.000021
14	1234789-HpCDF	0.01	2.6	0.00260	0.000026
16	1,2,3,4,6,7,8,9-OCDD	0.001	4.3	0.00430	0.0000043
17	1,2,3,4,6,7,8,9-OCDF	0.001	4.4	0.00440	0.0000044

TEF Factors taken from USEPA 40 CFR, Chapter 1, Part 266, Appendix IX, Table 4.0.1

TEF ADJUSTED TOTAL 0.00828

TEF Total Mass Collected	0.0083	ng
TEF Emission Concentration	0.002	ng/m³
TEF Emission Rate	62.902	ng/hr
O2 for Correction	7	%
TEF Emission Concentration	0.0033	ng/m³ 7% O2

Polyaromatic Hydrocarbons		EDL	TEF Total Mass Collected ng	TEF Emission Concentration ng/m³	TEF Emission Rate ng/hr	TEF Emission Concentration ng/m³ 7% O2
Naphthalene	2570	11	2570	561.9	19515.1	1544.3
2-Methylnaphthalene	1130	3.1	1130	247.0	8580.6	679.0
2-Chloronaphthalene	1.91	0.16	1.91	0.4	14.5	1.1
Acenaphthylene	424	4.2	424	92.7	3219.6	254.8
Acenaphthene	484	1.6	484	105.8	3675.2	290.8
Fluorene	860	6.4	860	188.0	6530.3	516.8
Phenanthrene	2260	3.6	2260	494.1	17161.1	1358.0
Anthracene	197	4.3	197	43.1	1495.9	118.4
Fluoranthene	452	1.9	452	98.8	3432.2	271.6
Pyrene	370	1.7	370	80.9	2809.6	222.3
Benzo(a)anthracene	17.8	2.3	17.8	3.9	135.2	10.7
Chrysene	48.4	2.4	48.4	10.6	367.5	29.1
Benzo(b)fluoranthene	24.2	1.7	24.2	5.3	183.8	14.5
Benzo(k)fluoranthene	4.64	2.1	4.64	1.0	35.2	2.8
Benzo(e)pyrene	22.2	3.3	22.2	4.9	168.6	13.3
Benzo(a)pyrene	21.9	4.3	21.9	4.8	166.3	13.2
Perylene	5.08	3.8	5.08	1.1	38.6	3.1
Indeno(1,2,3-cd)pyrene	27.1	20	27.1	5.9	205.8	16.3
Dibenz(a,h)anthracene	<0.46	120000	<0.46	0.0	0.0	0.0
Benzo(g,h,i)perylene	57.6	20	57.6	12.6	437.4	34.6
PCBs						0.0
33'44'-TetraCB-(77)	<0.019	0.019	<0.019	0.0	0.0	0.0
344'5-TetraCB-(81)	<0.20	0.019	<0.20	0.0	0.0	0.0
233'44'-PentaCB-(105)	0.33	0.017	0.33	0.1	2.5	0.2
2344'5-PentaCB-(114)	<0.20	0.025	<0.20	0.0	0.0	0.0
23'44'5-PentaCB-(118)	1.0	0.017	1	0.2	7.6	0.6
23'44'5'-PentaCB-(123)	<0.20	0.017	<0.20	0.0	0.0	0.0
33'44'5-PentaCB-(126)	<0.20	0.017	<0.20	0.0	0.0	0.0
HexaCB-(156)+(157)	<0.40	0.035	<0.40	0.0	0.0	0.0
23'44'55'-HexaCB-(167)	<0.20	0.0086	<0.20	0.0	0.0	0.0
33'44'55'-HexaCB-(169)	<0.20	0.012	<0.20	0.0	0.0	0.0
233'44'55'-HeptaCB-(189)	<0.20	0.010	<0.20	0.0	0.0	0.0
TOTAL TOXIC EQUIVALENCY						

USEPA Method 26A

AIR/COMPLIANCE CONSULTANTS INC.
USEPA METHOD 26A DATA SHEET

Client:	Collective efforts	**Test Type:**	Method 26A	**Meter Delta H@:**	1.533	**Start Time:**	1350
Date:	3/24/10	**Run Number:**	1	**Meter Correction:**	1.0004	**Stop Time:**	1553
Plant:	Alcosan	**Nozzle Dia:**	.250	**Pitot Correction:**	0.84	**Umbilical Length:**	50'
Sampling Location:	SSI stack	**Static Press, Ps:**	+.5	**Control Box Num.:**	1462	**Probe Number:**	4'-3
		Barometric Press:	29.28	**Assumed Moisture:**	5%	**Pitot Number:**	4'-3
Project Number:	10-068	**Ambient Temp:**	75° °F	**Thermocouple ID:**	4'-3	**Filter Number:**	NA
Test Crew:	AL EW BO CBen RF	**K-factor (K_f)**				**Stack Diameter:**	36.5"

Traverse Point Number	Elapsed Time	Clock Time	Metered Volume (cf)	Velocity Head (ΔP)	Orifice Delta H in. H_2O	Meter Vacuum in. Hg	Stack Temp. °F	Probe Temp. Ts °F > 248°F	Oven Temp. °F > 248°F	Imp Out Temp °F < 68°	Meter Temp. °F IN/AVG	Meter Temp. °F OUT	Comments
	0		729.100										
A1	5		733.900	.78	2.5	4.5	78	250	253	45	90	90	3.55
2	10		739.000	.78	2.7	5.0	78	256	257	40	91	90	
3	15		743.920	.80	2.8	5.0	79	256	256	41	93	90	
4	20		749.145	.82	2.9	5.0	78	255	256	40	95	90	
5	25		754.240	.78	2.8	5.0	79	255	255	41	97	91	
6	30		759.435	.84	2.9	5.0	78	255	256	42	98	91	
7	35		765.000	.92	3.2	5.5	78	255	256	41	99	92	
8	40		770.160	.87	3.0	5.0	78	255	255	41	100	92	
9	45		775.230	.80	2.8	5.0	78	255	257	42	100	92	
10	50		780.200	.77	2.7	5.0	77	254	257	42	100	93	
11	55		785.160	.78	2.7	5.0	77	255	257	43	101	93	
12	60		790.050	.75	2.6	5.0	76	255	255	43	101	93	

TOTAL/AVERAGE

Sample Train Leak Check

	(in. Hg)	Rate (ft^3/m)
Initial	15"	0.00
Final	15"	0.00

Pitot Leak Check

Pressure	✓	✓
Static	✓	✓

	1	2	3	Average
CO2				
O2				
CO				
N2				

Fyrite Kit #:

Imp	Contents	Final	Initial	Difference
1	.1N H_2SO_4	62	50	
2	.1N H_2SO_4	106	100	
3	.1N H_2SO_4	104	100	
4	.1NNaOH	160	100	
5	.1NNaOH	96	100	
~~6~~	~~.1NNaOH~~			
7	Silica Gel	240.6	218.3	

AIR/COMPLIANCE CONSULTANTS INC.

USEPA METHOD 26A DATA SHEET

Client: Collective efforts **Test Type:** Method 26A **Project Number:** 10-068

Date: 3/24/10 **Run Number:** 1 **Testers:** EV SW BO OSen. KF

K-factor (K_f): **Sampling Location:** SSI stack

Traverse Point Number	Elapsed Time	Clock Time	Metered Volume (cf)	Velocity Head (ΔP)	Orifice Delta H in. H_2O	Meter Vacuum in. Hg	Stack Temp. °F	Probe Temp. Ts °F > 248°F	Oven Temp. °F > 248°F	Imp Out Temp °F < 68°	Meter Temp. °F IN/AVG	Meter Temp. °F OUT	Comments
	60		790.050										
61	5		795.155	.80	2.8	5.0	75	256	257	48	98	93	
2	10		800.310	.77	2.7	5.0	77	255	257	44	98	94	
3	15		805.170	.78	2.7	5.0	77	255	255	45	101	94	
4	20		810.170	.78	2.7	5.0	76	255	256	45	102	94	
5	25		815.270	.80	2.8	5.0	75	256	256	45	102	94	
6	30		820.165	.74	2.6	4.5	77	255	254	45	102	95	
7	35		824.835	.66	2.3	4.5	77	255	254	45	103	95	
8	40		827.350	.61	2.1	4.0	77	255	253	46	102	95	
9	45		833.910	.68	2.4	4.0	78	255	254	46	103	95	
10	50		838.770	.72	2.5	4.0	78	255	255	47	103	96	K=3.59
11	55		843.605	.70	2.5	4.0	78	254	255	48	103	96	
12	120		848.520	.67	2.4	4.0	78	255	256	48	103	96	

ACCI 1 Minute Average Data Sheet: O2, CO2			
Client	Collective Efforts LLC	**Unit**	SSI
Project No	10-068	**Operation**	mnoc
Plant	Alcosan	**Location**	exhaust stack

MINUTE	DATE	TIME	O2 (DV %)	CO2 (DV %)
RUN 1				
1	2010/03/24	13:50:46	13.2	6.5
2	2010/03/24	13:51:46	13.2	6.5
3	2010/03/24	13:52:46	13.4	6.4
4	2010/03/24	13:53:46	13.3	6.5
5	2010/03/24	13:54:46	13.3	6.5
6	2010/03/24	13:55:46	13.2	6.6
7	2010/03/24	13:56:46	13.2	6.6
8	2010/03/24	13:57:46	13.2	6.5
9	2010/03/24	13:58:46	13.3	6.5
10	2010/03/24	13:59:46	13.3	6.5
11	2010/03/24	14:00:46	13.2	6.6
12	2010/03/24	14:01:46	13.2	6.6
13	2010/03/24	14:02:46	13.1	6.7
14	2010/03/24	14:03:46	13.1	6.7
15	2010/03/24	14:04:46	13.2	6.6
16	2010/03/24	14:05:46	13.1	6.6
17	2010/03/24	14:06:46	13.1	6.6
18	2010/03/24	14:07:46	13.2	6.6
19	2010/03/24	14:08:46	13.3	6.5
20	2010/03/24	14:09:46	13.3	6.5
21	2010/03/24	14:10:46	13.4	6.4
22	2010/03/24	14:11:46	13.4	6.3
23	2010/03/24	14:12:46	13.4	6.3
24	2010/03/24	14:13:46	13.5	6.3
25	2010/03/24	14:14:46	13.5	6.3
26	2010/03/24	14:15:46	13.5	6.3
27	2010/03/24	14:16:46	13.5	6.3
28	2010/03/24	14:17:46	13.6	6.2
29	2010/03/24	14:18:46	13.5	6.2
30	2010/03/24	14:19:46	13.5	6.3
31	2010/03/24	14:20:46	13.5	6.3
32	2010/03/24	14:21:46	13.4	6.3
33	2010/03/24	14:22:46	13.4	6.4
34	2010/03/24	14:23:46	13.4	6.4
35	2010/03/24	14:24:46	13.4	6.3
36	2010/03/24	14:25:46	13.5	6.3
37	2010/03/24	14:26:46	13.6	6.2
38	2010/03/24	14:27:46	13.5	6.3
39	2010/03/24	14:28:46	13.6	6.2
40	2010/03/24	14:29:46	13.6	6.2
41	2010/03/24	14:30:46	13.6	6.2
42	2010/03/24	14:31:46	13.6	6.2
43	2010/03/24	14:32:46	13.5	6.3
44	2010/03/24	14:33:46	14.1	5.9
45	2010/03/24	14:34:46	14.1	5.9
46	2010/03/24	14:35:46	14.2	5.8
47	2010/03/24	14:36:46	14.3	5.8
48	2010/03/24	14:37:46	14.2	5.8
49	2010/03/24	14:38:46	14.3	5.8
50	2010/03/24	14:39:46	14.2	5.8
51	2010/03/24	14:40:46	14.3	5.8

ACCI 1 Minute Average Data Sheet: O2, CO2			
Client	Collective Efforts LLC	**Unit**	SSI
Project No	10-068	**Operation**	mnoc
Plant	Alcosan	**Location**	exhaust stack

MINUTE	DATE	TIME	O2 (DV %)	CO2 (DV %)
52	2010/03/24	14:41:46	14.3	5.8
53	2010/03/24	14:42:46	14.2	5.8
54	2010/03/24	14:43:46	14.2	5.9
55	2010/03/24	14:44:46	14.2	5.9
56	2010/03/24	14:45:46	14.1	5.9
57	2010/03/24	14:46:46	14.1	5.9
58	2010/03/24	14:47:46	14.1	5.9
59	2010/03/24	14:48:46	14.1	5.9
60	2010/03/24	14:49:46	14.1	5.9
61	2010/03/24	14:50:46	14.1	5.9
62	2010/03/24	14:51:46	14.2	5.9

ACCI 1 Minute Average Data Sheet: O2, CO2			
Client	Collective Efforts LLC	**Unit**	SSI
Project No	10-068	**Operation**	mnoc
Plant	Alcosan	**Location**	exhaust stack

MINUTE	DATE	TIME	O2 (DV %)	CO2 (DV %)
63	2010/03/24	14:52:46	14.1	5.9
64	2010/03/24	14:53:46	14.1	5.9
65	2010/03/24	14:54:46	14.2	5.9
66	2010/03/24	14:55:46	14.1	6.0
67	2010/03/24	14:56:46	14.0	6.0
68	2010/03/24	14:57:46	14.1	5.9
69	2010/03/24	14:58:46	14.1	5.9
70	2010/03/24	14:59:46	14.1	6.0
71	2010/03/24	15:00:46	14.1	5.9
72	2010/03/24	15:01:46	14.1	5.9
73	2010/03/24	15:02:46	14.2	5.9
74	2010/03/24	15:03:46	14.1	5.9
75	2010/03/24	15:04:46	14.1	5.9
76	2010/03/24	15:05:46	14.1	5.9
77	2010/03/24	15:06:46	14.1	5.9
78	2010/03/24	15:07:46	14.0	6.0
79	2010/03/24	15:08:46	14.1	5.9
80	2010/03/24	15:09:46	14.1	5.9
81	2010/03/24	15:10:46	14.1	6.0
82	2010/03/24	15:11:46	14.1	5.9
83	2010/03/24	15:12:46	14.1	5.9
84	2010/03/24	15:13:46	14.1	5.9
85	2010/03/24	15:14:46	14.1	5.9
86	2010/03/24	15:15:46	14.2	5.9
87	2010/03/24	15:16:46	14.2	5.9
88	2010/03/24	15:17:46	14.1	5.9
89	2010/03/24	15:18:46	14.1	5.9
90	2010/03/24	15:19:46	14.1	6.0
91	2010/03/24	15:20:46	14.1	5.9
92	2010/03/24	15:21:46	14.1	6.0
93	2010/03/24	15:22:46	14.0	6.0
94	2010/03/24	15:23:46	14.1	6.0
95	2010/03/24	15:24:46	14.1	5.9
96	2010/03/24	15:25:46	14.2	5.9
97	2010/03/24	15:26:46	14.1	5.9
98	2010/03/24	15:27:46	14.1	5.9
99	2010/03/24	15:28:46	14.0	6.0
100	2010/03/24	15:29:46	14.1	6.0
101	2010/03/24	15:30:46	14.1	5.9
102	2010/03/24	15:31:46	14.2	5.9
103	2010/03/24	15:32:46	14.2	5.9
104	2010/03/24	15:33:46	14.1	5.9
105	2010/03/24	15:34:46	14.2	5.9
106	2010/03/24	15:35:46	14.1	5.9
107	2010/03/24	15:36:46	14.1	5.9
108	2010/03/24	15:37:46	14.1	5.9
109	2010/03/24	15:38:46	14.2	5.9
110	2010/03/24	15:39:46	14.1	5.9
111	2010/03/24	15:40:46	14.1	5.9
112	2010/03/24	15:41:46	14.1	5.9
113	2010/03/24	15:42:46	14.1	5.9
114	2010/03/24	15:43:46	14.2	5.9

ACCI 1 Minute Average Data Sheet: O2, CO2			
Client	Collective Efforts LLC	**Unit**	SSI
Project No	10-068	**Operation**	mnoc
Plant	Alcosan	**Location**	exhaust stack

MINUTE	DATE	TIME	O2 (DV %)	CO2 (DV %)
115	2010/03/24	15:44:46	14.1	5.9
116	2010/03/24	15:45:46	14.2	5.9
117	2010/03/24	15:46:46	14.2	5.9
118	2010/03/24	15:47:46	14.2	5.9
119	2010/03/24	15:48:46	14.1	5.9
120	2010/03/24	15:49:46	14.1	6.0
RUN 1 AVERAGES			**13.9**	**6.1**

ACCI CEM Calibration, Bias and Drift Data Sheet
Based on 40 CFR Part 60, Appendix A-4, Method 7E

Client	Collective Efforts LLC	**Date**	March 24, 2010
Project No	10-068	**Location**	exhaust stack
Plant	Alcosan	**Run**	Run 1
Unit	SSI	**Start Time**	13:50
Operation	mnoc	**End Time**	15:50
Tester(s)	bo,jv,rf,cb,ew		

Cal.	LOW		MID		HIGH		Tank ID				Conc.
Gas	Conc.	(% of Span)	Conc.	(% of Span)	Conc.	(% of Span)	LOW	MID	HIGH	Span	Units
O2	N/A	N/A	10.01	44.5	22.47	100.0	N/A	eb001355	cc251892	22.47	d. vol. %
CO2	N/A	N/A	9.96	44.2	22.54	100.0	N/A	cc251892	eb001355	22.54	d. vol. %
LIMITS				40 % to 60 %		100%					

Gas	Upscale: Enter "Low" "Mid" or "High" below "Zero"	Actual Upscale Conc.	Analyzer Cal. Response	Initial Values: System Cal. Response	Initial Values: System Cal. Bias (% of Span)	Final Values: System Cal. Response	Final Values: System Cal. Bias (% of Span)	Drift (% of Span)	Span	Average of Initial and Final System Responses	Average Indicated Gas Conc.	Corrected Gas Conc.	Conc. Units
O2	Zero		0.0	0.1	0.45	0.1	0.45	0.00	22.47	0.1			
	Mid	10.01	10.1	10.1	0.00	10.1	0.00	0.00	22.47	10.1	13.86	13.77	d. vol. %
CO2	Zero		0.2	0.2	0.00	0.2	0.00	0.00	22.54	0.2			
	Mid	9.96	9.6	9.8	0.89	9.9	1.33	0.44	22.54	9.85	6.08	6.07	d. vol. %
LIMITS					+/- 5 %		+/- 5 %	+/- 3 %					

Gas	ZERO Analyzer Response (System for THC)	ZERO Analyzer Cal. Error (% of Span)	LOW Actual Conc.	LOW Analyzer Response (System for THC)	LOW Analyzer Cal. Error (% of Span)	LOW System Cal. Error (% of Actual)	MID Actual Conc.	MID Analyzer Response (System for THC)	MID Analyzer Cal. Error (% of Span)	MID System Cal. Error (% of Actual)	HIGH Actual Conc.	HIGH Analyzer Response (System for THC)	HIGH Analyzer Cal. Error (% of Span)	HIGH System Calibration Error (% of Actual)	Span	Conc. Units
O2	0.0	0.00					10.01	10.1	0.40		22.47	22.7	1.02		22.47	d. vol. %
CO2	0.2	0.89					9.96	9.6	-1.60		22.54	22.9	1.60		22.54	d. vol. %
LIMITS		+/- 2 %			+/- 2 %	+/- 5 %			+/- 2 %	+/- 5 %			+/- 2 %	+/- 5 %		

Client:	Collective Efforts LLC	Test Date:	March 24, 2010
Project No.:	10-068	Test Location:	exhaust stack
Plant:	Alcosan	Test Run:	Run 1
Unit:	SSI	Test Start Time:	1:50 PM
Unit Operation:	mnoc	Test Finish Time:	3:53 PM

Blue is data input. Red is a calculation. Pink is a reference to a cell on another sheet. Green is a reference to a cell on this sheet.

Data Input

Control Box:	1462	
Meter $DH_@$ (0.75 scfm)	1.533	in. H_2O
Meter Calibration Factor (Yd)	1.004	
Test Time (Theta)	120	minutes
Barometric Pressure (Pbar)	29.28	in. Hg
Stack Static Pressure (Pg)	0.57	in. H_2O
Stack Diameter (Ds) (L if rectangular)	36.5	inches
Stack Width (enter 0 if circular stack)	0.0	inches
Nozzle Diameter (Dn)	0.250	inches
CO2	6.07	% dv
O2	13.77	% dv
Pitot Tube Coefficient (Cp)	0.84	
Sample Calculation Title	Method 26A Test Results	
Product Rate	1.88	ton/hr
F_d @ 68 F and 760 mm Hg		dscf/MMBtu
Standard Temperature	68	F
Standard Pressure	760	mm Hg
Pitot Tube Constant (Kp)	85.49	

Calculations

Meter Temperature (Tm)	96.3	F
Stack Temperature (Tsavg)	77.4	F
Orifice Pressure Drop (dHavg)	2.671	in. H_2O
GasVelocity Head (dP)''avg	0.8735	in. H_2O^1/2
F_d @ Standard Conditions	NA	dscf/MMBtu
F_d @ Stan. Cond. & Actual O2	NA	dscf/MMBtu
Heat Input Based on F_d	NA	MMBtu/hr
K1method 4	0.04706	scf/ml
K2method 4	0.04715	scf/g
K1method 5	17.64	R/in. Hg
K4method 5	0.0945	
Standard lb-mole volume	385.3	ft^3/lb-mole

Method 26

Hydrochloric Acid (HCl)

Emission Mass (prior to CE)	0.64	mg
Emission Mass (CE impinger)	0	mg
Emission Mass (total)	0.64	mg
Emission Mass	0.64	mg
Collection Efficiency	1.0000	%
Molecular Weight	36.46097	lb/lb-mole
Emission Concentration	0.2020	mg/DSCM
Emission Concentration	1.26E-08	lb/dscf
Emission Concentration	0.1333	ppm_{dv}
Emission Rate	0.0155	lb/hr
Emission Rate	NA	lb/MMBTU
Emission Rate	0.0082	lb/ton product

Calculations

CO + N2	80.15	% dv
Water Collected (V_f- V_i)	23.0	ml
Water Vapor Condensed (Vwc(std))	1.082	scf
Water Collected (W_f- W_i)	22.3	g
Water Vapor in Silica Gel (Vwsg(std))	1.051	scf
Vol. Water Vapor in Gas Stand.(Vw(std))	2.134	scf
Volume Dry Gas Metered (Vm)	119.220	dacf
Vol. Dry Gas Metered Stand.(Vm(std))	111.889	dscf
Volume Dry Gas Metered (Vm(m^3))	3.376	dacm
Vol. Dry Gas Metered Stand.(Vm(std)m^3)	3.168	dscm
Stack Absolute Pressure (Ps)	29.32	in. Hg
Stack Absolute Temperature (Tsavg)	537.0	R
H2O Vapor Pressure @ avg Stack Temp.	0.95	in. Hg
H2O in the gas at saturation (Bws)	0.0323	vol. fraction
H2O in the gas from test data (Bws)	0.0187	vol. fraction
H2O in the gas used (lower of the 2 Bws)	0.0187	vol. fraction
Is the Gas Stream Saturated With H2O?	NO	
Dry Gas Molecular Weight (Md)	29.52	lb/lb-mole
Wet Gas Molecular Weight (Ms)	29.31	lb/lb-mole
Gas Velocity (Vs)	49.61	ft/s
Is the stack circular or rectangular?	CIRCULAR	
Area Stack (As)	7.266	ft^2
Actual Gas Flowrate	21,627	acfm
Standard Gas Flowrate	20,825	scfm
Dry Standard Gas Flowrate	20,435	dscfm
Actual Gas Flowrate	612	acm/min
Standard Gas Flowrate	590	scm/min
Dry Standard Gas Flowrate	579	dscm/min
Area Nozzle (An)	0.000341	ft^2
Percent of Isokinetic Sampling (I)	97.32	%

Hydrogen Fluoride (HF)

Emission Mass (prior to CE)	0.2500	mg
Emission Mass detection limit	0.2500	mg
Emission Mass (CE impinger)	0.0000	mg
Emission Mass (total)	0.2500	mg
Emission Mass	0.2500	mg
Collection Efficiency	1.0000	%
Molecular Weight	20.00637	lb/lb-mole
Emission Concentration	0.0789	mg/DSCM
Emission Concentration	4.93E-09	lb/dscf
Emission Concentration	0.0949	ppm_{dv}
Emission Rate	0.0060	lb/hr
Emission Rate	NA	lb/MMBTU
Emission Rate	3.21E-03	lb/ton product

Collective Efforts LLC **Run 1** **F or C?**
SSI **F=1,C=0** 1

Point	Pitot DP (dP) (in. H2O)	SQRT dP (in. H2O)$^{1/2}$	Orifice DP (dH) (in. H2O)	Stack Temp (F)	Meter Temp In/Out (F or C)	(F or C)
A-1	0.72	0.849	2.5	78	90	90
2	0.78	0.883	2.7	78	91	90
3	0.80	0.894	2.8	79	93	90
4	0.82	0.906	2.9	78	95	90
5	0.79	0.889	2.8	79	97	91
6	0.84	0.917	2.9	78	98	91
7	0.92	0.959	3.2	78	99	92
8	0.87	0.933	3.0	78	100	92
9	0.80	0.894	2.8	78	100	92
10	0.77	0.877	2.7	77	100	93
11	0.78	0.883	2.7	77	101	93
12	0.75	0.866	2.6	76	101	93
B-1	0.80	0.894	2.8	75	98	93
2	0.77	0.877	2.7	77	99	94
3	0.78	0.883	2.7	77	101	94
4	0.78	0.883	2.7	76	102	94
5	0.80	0.894	2.8	75	102	94
6	0.74	0.860	2.6	77	102	95
7	0.66	0.812	2.3	77	103	95
8	0.61	0.781	2.1	77	102	95
9	0.68	0.825	2.4	78	103	95
10	0.72	0.849	2.5	78	103	96
11	0.70	0.837	2.5	78	103	96
12	0.67	0.819	2.4	78	103	96
Average	0.76	0.874	2.67	77.4		96.3

Initial volume	729.100	ft^3	Initial volume	0.000	liters
Final volume	848.320	ft^3	Final volume	0.000	liters
leak check volume		ft3			
Total metered	119.220	dacf	Total metered	0.000	dry actual liters

Impinger	Final grams	Initial grams	Gram Gain	Final ml	Initial ml	ml Gain
1			0.0	62.0	50.0	12.0
2			0.0	106.0	100.0	6.0
3			0.0	109.0	100.0	9.0
4			0.0	100.0	100.0	0.0
5			0.0	96.0	100.0	-4.0
6	240.6	218.3	22.3			0.0
7			0.0			0.0
8			0.0			0.0
9			0.0			0.0
10			0.0			0.0
Total	240.6	218.3	22.3	473.0	450.0	23.0
	W_f	W_i	(W_f- W_i)	V_f	V_i	(V_f- Vi)

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AIR/COMPLIANCE CONSULTANTS INC.
USEPA METHOD 26A DATA SHEET

Client:	Collective efforts	Test Type:	Method 26A	Meter Delta H@:	1.533	Start Time:	0800
Date:	3/26/10	Run Number:	2	Meter Correction:	1.004	Stop Time:	1003
Plant:	Alcosan	Nozzle Dia:	.250	Pitot Correction:	0.84	Umbilical Length:	50'
Sampling Location:	SSI stack	Static Press, Ps:	+.57	Control Box Num.:	1462	Probe Number:	3'-3
		Barometric Press:	29.15	Assumed Moisture:	3%	Pitot Number:	3'-3
Project Number:	10-068	Ambient Temp:	65 °F	Thermocouple ID:	3'-3	Filter Number:	NA
Test Crew:	[illegible]	K-factor (K_f)				Stack Diameter:	36.5"

Traverse Point Number	Elapsed Time	Clock Time	Metered Volume (cf)	Velocity Head (ΔP)	Orifice Delta H in. H_2O	Meter Vacuum in. Hg	Stack Temp. °F	Probe Temp. Ts °F > 248°F	Oven Temp. °F > 248°F	Imp Out Temp °F < 68°	Meter Temp. °F IN/AVG	Meter Temp. °F OUT	Comments
	0		357.745										
A1	5		356.530	.80	2.6	5.5	79	[illegible]	255	[illegible]	62	62	K = 3.33
2	10		361.270	.77	2.5	5.0	74	254	255	45	65	62	
3	15		366.000	.78	2.5	5.0	77	255	253	51	68	62	
4	20		370.995	.85	2.8	5.5	76	255	252	55	69	63	
5	25		375.950	.85	2.8	5.5	76	255	253	58	70	63	
6	30		380.170	.92	3.0	6.0	75	255	253	58	70	64	
7	35		386.340	.92	3.0	6.0	78	255	254	59	71	64	
8	40		391.445	.88	2.9	6.0	79	255	254	59	71	65	
9	45		396.310	.78	2.5	5.5	78	255	254	59	71	65	
10	50		401.060	.80	2.6	5.5	78	255	253	59	71	65	
11	55		405.720	.75	2.4	5.0	77	255	252	60	72	65	
12	60		410.320	.74	2.4	5.0	77	255	253	60	72	65	
TOTAL/AVERAGE													

Sample Train Leak Check

	(in. Hg)	Rate (ft³/m)
Initial	14"	0.000
Final	7"	0.000

Pitot Leak Check

Pressure	✓	✓
Static	✓	✓

	1	2	3	Average
CO2				
O2				
CO				
N2				

Fyrite Kit #:

Imp	Contents	Final	Initial	Difference
1	.1N H_2SO_4	50	50	
2	.1N H_2SO_4	106	100	
3	.1N H_2SO_4	109	100	
4	.1NNaOH	102	100	
5	.1NNaOH	100	100	
6	~~.1NNaOH~~			
7	Silica Gel	251.2	223.7	

AIR/COMPLIANCE CONSULTANTS INC.

USEPA METHOD 26A DATA SHEET

Client: Collective efforts **Test Type:** Method 26A **Project Number:** 10-068

Date: 3/26/10 **Run Number:** 2 **Testers:** JV SW CBaylor BO RF

K-factor (K_f): **Sampling Location:** SSI stack

Traverse Point Number	Elapsed Time	Clock Time	Metered Volume (cf)	Velocity Head (ΔP)	Orifice Delta H in. H_2O	Meter Vacuum in. Hg	Stack Temp. °F	Probe Temp. Ts °F	Oven Temp. °F	Imp Out Temp °F	Meter Temp. °F		Comments
											IN/AVG	OUT	
	00		410.320					> 248°F	> 248°F	< 68°			
B1	5	923	415.070	.76	2.5	5.0	77	255	251	58	72	66	
2	10		419.640	.72	2.3	4.5	77	254	254	56	71	66	
3	15		424.670	.87	2.8	5.5	79	255	252	53	72	66	
4	20		429.655	.90	2.9	5.5	79	255	257	52	72	66	
5	25		434.790	.89	2.4	5.5	79	255	254	51	72	67	
6	30		440.070	.91	3.0	5.5	78	255	253	51	73	67	
7	35		444.840	.82	2.7	5.5	78	255	250	51	73	67	
8	40		449.615	.77	2.5	5.5	78	255	254	51	73	67	
9	45		454.310	.74	2.4	5.5	79	255	253	51	73	67	
10	50		458.970	.71	2.3	5.0	78	255	254	50	73	67	
11	55		463.365	.72	2.3	5.0	77	255	251	51	73	67	
12	100		467.810	.69	2.2	4.5	77	255	250	47	74	68	

ACCI 1 Minute Average Data Sheet: O2, CO2			
Client	Collective Efforts LLC	**Unit**	SSI
Project No	10-068	**Operation**	mnoc
Plant	Alcosan	**Location**	exhaust stack

MINUTE	DATE	TIME	O2 (DV %)	CO2 (DV %)
RUN 2				
1	2010/03/26	08:00:17	13.5	6.4
2	2010/03/26	08:01:17	13.5	6.7
3	2010/03/26	08:02:17	13.5	6.5
4	2010/03/26	08:03:17	13.5	6.2
5	2010/03/26	08:04:17	13.4	6.2
6	2010/03/26	08:05:17	13.4	6.2
7	2010/03/26	08:06:17	13.4	6.2
8	2010/03/26	08:07:17	13.5	6.2
9	2010/03/26	08:08:17	13.5	6.2
10	2010/03/26	08:09:17	13.5	6.2
11	2010/03/26	08:10:17	13.6	6.1
12	2010/03/26	08:11:17	13.7	6.0
13	2010/03/26	08:12:17	13.7	6.0
14	2010/03/26	08:13:17	13.7	6.0
15	2010/03/26	08:14:17	13.7	6.0
16	2010/03/26	08:15:17	13.7	6.0
17	2010/03/26	08:16:17	13.7	6.0
18	2010/03/26	08:17:17	13.7	6.0
19	2010/03/26	08:18:17	13.7	6.0
20	2010/03/26	08:19:17	13.7	6.0
21	2010/03/26	08:20:17	13.7	6.0
22	2010/03/26	08:21:17	13.7	6.0
23	2010/03/26	08:22:17	13.6	6.1
24	2010/03/26	08:23:17	13.6	6.1
25	2010/03/26	08:24:17	13.6	6.1
26	2010/03/26	08:25:17	13.6	6.1
27	2010/03/26	08:26:17	13.5	6.1
28	2010/03/26	08:27:17	13.5	6.2
29	2010/03/26	08:28:17	13.5	6.2
30	2010/03/26	08:29:17	13.4	6.3
31	2010/03/26	08:30:17	13.4	6.3
32	2010/03/26	08:31:17	13.4	6.2
33	2010/03/26	08:32:17	13.5	6.2
34	2010/03/26	08:33:17	13.6	6.1
35	2010/03/26	08:34:17	13.6	6.1
36	2010/03/26	08:35:17	13.7	6.0
37	2010/03/26	08:36:17	13.6	6.1
38	2010/03/26	08:37:17	13.6	6.1
39	2010/03/26	08:38:17	13.6	6.1
40	2010/03/26	08:39:17	13.6	6.1
41	2010/03/26	08:40:17	13.6	6.1
42	2010/03/26	08:41:17	13.6	6.1
43	2010/03/26	08:42:17	13.6	6.1
44	2010/03/26	08:43:17	13.8	6.0
45	2010/03/26	08:44:17	13.9	5.9
46	2010/03/26	08:45:17	13.8	5.9
47	2010/03/26	08:46:17	13.8	5.9
48	2010/03/26	08:47:17	13.8	5.9
49	2010/03/26	08:48:17	13.8	5.9
50	2010/03/26	08:49:17	13.9	5.9
51	2010/03/26	08:50:17	13.8	5.9

ACCI 1 Minute Average Data Sheet: O2, CO2			
Client	Collective Efforts LLC	**Unit**	SSI
Project No	10-068	**Operation**	mnoc
Plant	Alcosan	**Location**	exhaust stack

MINUTE	DATE	TIME	O2 (DV %)	CO2 (DV %)
52	2010/03/26	08:51:17	13.8	5.9
53	2010/03/26	08:52:17	13.8	5.9
54	2010/03/26	08:53:17	13.8	5.9
55	2010/03/26	08:54:17	13.8	5.9
56	2010/03/26	08:55:17	13.8	5.9
57	2010/03/26	08:56:17	13.8	5.9
58	2010/03/26	08:57:17	13.8	5.9
59	2010/03/26	08:58:17	13.8	5.9
60	2010/03/26	08:59:17	13.7	6.0
61	2010/03/26	09:00:17	13.5	6.2
62	2010/03/26	09:01:17	13.4	6.2
63	2010/03/26	09:02:17	13.4	6.2
64	2010/03/26	09:03:17	13.4	6.2
65	2010/03/26	09:04:17	13.4	6.2
66	2010/03/26	09:05:17	13.4	6.2
67	2010/03/26	09:06:17	13.4	6.2
68	2010/03/26	09:07:17	13.4	6.2
69	2010/03/26	09:08:17	13.4	6.2
70	2010/03/26	09:09:17	13.4	6.2
71	2010/03/26	09:10:17	13.5	6.2
72	2010/03/26	09:11:17	13.5	6.2
73	2010/03/26	09:12:17	13.5	6.2
74	2010/03/26	09:13:17	13.5	6.2
75	2010/03/26	09:14:17	13.5	6.1
76	2010/03/26	09:15:17	13.6	6.1
77	2010/03/26	09:16:17	13.7	6.0
78	2010/03/26	09:17:17	13.8	5.9
79	2010/03/26	09:18:17	13.8	5.9
80	2010/03/26	09:19:17	13.8	5.9
81	2010/03/26	09:20:17	13.8	5.9
82	2010/03/26	09:21:17	13.8	5.9
83	2010/03/26	09:22:17	13.9	5.8
84	2010/03/26	09:23:17	13.9	5.8
85	2010/03/26	09:24:17	13.9	5.9
86	2010/03/26	09:25:17	13.9	5.8
87	2010/03/26	09:26:17	13.9	5.8
88	2010/03/26	09:27:17	13.9	5.8
89	2010/03/26	09:28:17	13.9	5.8
90	2010/03/26	09:29:17	14.0	5.8
91	2010/03/26	09:30:17	14.0	5.7
92	2010/03/26	09:31:17	14.0	5.8
93	2010/03/26	09:32:17	14.0	5.8
94	2010/03/26	09:33:17	14.0	5.7
95	2010/03/26	09:34:17	13.9	5.8
96	2010/03/26	09:35:17	13.9	5.8
97	2010/03/26	09:36:17	13.9	5.8
98	2010/03/26	09:37:17	14.0	5.8
99	2010/03/26	09:38:17	13.9	5.8
100	2010/03/26	09:39:17	13.9	5.8
101	2010/03/26	09:40:17	13.9	5.8
102	2010/03/26	09:41:17	13.9	5.8
103	2010/03/26	09:42:17	13.9	5.8

ACCI 1 Minute Average Data Sheet: O2, CO2			
Client	Collective Efforts LLC	**Unit**	SSI
Project No	10-068	**Operation**	mnoc
Plant	Alcosan	**Location**	exhaust stack

MINUTE	DATE	TIME	O2 (DV %)	CO2 (DV %)
104	2010/03/26	09:43:17	14.0	5.8
105	2010/03/26	09:44:17	14.0	5.7
106	2010/03/26	09:45:17	14.0	5.7
107	2010/03/26	09:46:17	14.0	5.7
108	2010/03/26	09:47:17	14.0	5.7
109	2010/03/26	09:48:17	14.1	5.7
110	2010/03/26	09:49:17	14.1	5.7
111	2010/03/26	09:50:17	14.1	5.7
112	2010/03/26	09:51:17	14.1	5.7
113	2010/03/26	09:52:17	14.0	5.8
114	2010/03/26	09:53:17	13.9	5.8
115	2010/03/26	09:54:17	14.0	5.8
116	2010/03/26	09:55:17	14.0	5.8
117	2010/03/26	09:56:17	14.0	5.8
118	2010/03/26	09:57:17	14.0	5.8
119	2010/03/26	09:58:17	14.0	5.7
120	2010/03/26	09:59:17	13.9	5.9
RUN 2 AVERAGES			**13.7**	**6.0**

ACCI CEM Calibration, Bias and Drift Data Sheet
Based on 40 CFR Part 60, Appendix A-4, Method 7E

Client	Collective Efforts LLC	**Date**	March 26, 2010
Project No	10-068	**Location**	exhaust stack
Plant	Alcosan	**Run**	Run 2
Unit	SSI	**Start Time**	8:00
Operation	mnoc	**End Time**	10:00
Tester(s)	bo,jv,rf,cb,ew		

Cal.	LOW		MID		HIGH		Tank ID				Conc.
Gas	Conc.	(% of Span)	Conc.	(% of Span)	Conc.	(% of Span)	LOW	MID	HIGH	Span	Units
O2	N/A	N/A	10.01	44.5	22.47	100.0	N/A	eb001355	cc251892	22.47	d. vol. %
CO2	N/A	N/A	9.96	44.2	22.54	100.0	N/A	cc251892	eb001355	22.54	d. vol. %
LIMITS				40 % to 60 %		100%					

Gas	Upscale: Enter "Low" "Mid" or "High" below "Zero"	Actual Upscale Conc.	Analyzer Cal. Response	Initial Values: System Cal. Response	Initial Values: System Cal. Bias (% of Span)	Final Values: System Cal. Response	Final Values: System Cal. Bias (% of Span)	Drift (% of Span)	Span	Average of Initial and Final System Responses	Average Indicated Gas Conc.	Corrected Gas Conc.	Conc. Units
O2	Zero		0.0	0.1	0.45	0.1	0.45	0.00	22.47	0.1			
	Mid	10.01	10.0	10.1	0.45	10.1	0.45	0.00	22.47	10.1	13.73	13.64	d. vol. %
CO2	Zero		0.2	0.2	0.00	0.2	0.00	0.00	22.54	0.2			
	Mid	9.96	9.7	9.5	-0.89	9.5	-0.89	0.00	22.54	9.5	5.99	6.20	d. vol. %
LIMITS					+/- 5 %		+/- 5 %	+/- 3 %					

Gas	ZERO Analyzer Response (System for THC)	ZERO Analyzer Cal. Error (% of Span)	LOW Actual Conc.	LOW Analyzer Response (System for THC)	LOW Analyzer Cal. Error (% of Span)	LOW System Cal. Error (% of Actual)	MID Actual Conc.	MID Analyzer Response (System for THC)	MID Analyzer Cal. Error (% of Span)	MID System Cal. Error (% of Actual)	HIGH Actual Conc.	HIGH Analyzer Response (System for THC)	HIGH Analyzer Cal. Error (% of Span)	HIGH System Calibration Error (% of Actual)	Span	Conc. Units
O2	0.0	0.00					10.01	10.0	-0.04		22.47	22.4	-0.31		22.47	d. vol. %
CO2	0.2	0.89					9.96	9.7	-1.15		22.54	22.5	-0.18		22.54	d. vol. %
LIMITS		+/- 2 %			+/- 2 %	+/- 5 %			+/- 2 %	+/- 5 %			+/- 2 %	+/- 5 %		

Client:	Collective Efforts LLC	Test Date:	March 26, 2010
Project No.:	10-068	Test Location:	exhaust stack
Plant:	Alcosan	Test Run:	Run 2
Unit:	SSI	Test Start Time:	8:00 AM
Unit Operation:	mnoc	Test Finish Time:	10:03 AM

Blue is data input. Red is a calculation. Pink is a reference to a cell on another sheet. Green is a reference to a cell on this sheet.

Data Input

Control Box:	1462	
Meter $DH_@$ (0.75 scfm)	1.533	in. H_2O
Meter Calibration Factor (Yd)	1.004	
Test Time (Theta)	120	minutes
Barometric Pressure (Pbar)	29.15	in. Hg
Stack Static Pressure (Pg)	0.57	in. H_2O
Stack Diameter (Ds) (L if rectangular)	36.5	inches
Stack Width (enter 0 if circular stack)	0.0	inches
Nozzle Diameter (Dn)	0.250	inches
CO2	6.20	% dv
O2	13.64	% dv
Pitot Tube Coefficient (Cp)	0.84	
Sample Calculation Title	Method 26A Test Results	
Product Rate	1.88	ton/hr
F_d @ 68 F and 760 mm Hg		dscf/MMBtu
Standard Temperature	68	F
Standard Pressure	760	mm Hg
Pitot Tube Constant (Kp)	85.49	

Calculations

Meter Temperature (Tm)	68.1	F
Stack Temperature (Tsavg)	77.7	F
Orifice Pressure Drop (dHavg)	2.617	in. H_2O
GasVelocity Head (dP)^avg	0.8968	in. H_2O^1/2
F_d @ Standard Conditions	0	dscf/MMBtu
F_d @ Stan. Cond. & Actual O2	0	dscf/MMBtu
Heat Input Based on F_d	NA	MMBtu/hr
K1method 4	0.04706	scf/ml
K2method 4	0.04715	scf/g
K1method 5	17.64	R/in. Hg
K4method 5	0.0945	
Standard lb-mole volume	385.3	ft^3/lb-mole

Calculations

CO + N2	80.16	% dv
Water Collected (V_f- V_i)	17.0	ml
Water Vapor Condensed (Vwc(std))	0.800	scf
Water Collected (W_f- W_i)	27.5	g
Water Vapor in Silica Gel (Vwsg(std))	1.297	scf
Vol. Water Vapor in Gas Stand.(Vw(std))	2.097	scf
Volume Dry Gas Metered (Vm)	116.065	dacf
Vol. Dry Gas Metered Stand.(Vm(std))	114.220	dscf
Volume Dry Gas Metered (Vm(m^3))	3.287	dacm
Vol. Dry Gas Metered Stand.(Vm(std)m^3)	3.234	dscm
Stack Absolute Pressure (Ps)	29.19	in. Hg
Stack Absolute Temperature (Tsavg)	537.3	R
H2O Vapor Pressure @ avg Stack Temp.	0.96	in. Hg
H2O in the gas at saturation (Bws)	0.0328	vol. fraction
H2O in the gas from test data (Bws)	0.0180	vol. fraction
H2O in the gas used (lower of the 2 Bws)	0.0180	vol. fraction
Is the Gas Stream Saturated With H2O?	NO	
Dry Gas Molecular Weight (Md)	29.54	lb/lb-mole
Wet Gas Molecular Weight (Ms)	29.33	lb/lb-mole
Gas Velocity (Vs)	51.03	ft/s
Is the stack circular or rectangular?	CIRCULAR	
Area Stack (As)	7.266	ft^2
Actual Gas Flowrate	22,250	acfm
Standard Gas Flowrate	21,318	scfm
Dry Standard Gas Flowrate	20,934	dscfm
Actual Gas Flowrate	630	acm/min
Standard Gas Flowrate	604	scm/min
Dry Standard Gas Flowrate	593	dscm/min
Area Nozzle (An)	0.000341	ft^2
Percent of Isokinetic Sampling (I)	96.98	%

Method 26

Hydrochloric Acid (HCl)

Emission Mass (prior to CE)	1.20	mg
Emission Mass (CE impinger)	0.0	mg
Emission Mass (total)	1.2	mg
Emission Mass	1.2	mg
Collection Efficiency	1.0000	%
Molecular Weight	36.46097	lb/lb-mole
Emission Concentration	0.3710	mg/DSCM
Emission Concentration	2.32E-08	lb/dscf
Emission Concentration	0.2448	ppm_{dv}
Emission Rate	0.0291	lb/hr
Emission Rate	NA	lb/MMBTU
Emission Rate	0.0155	lb/ton product

Hydrogen Fluoride (HF)

Emission Mass (prior to CE)	0.2500	mg
Emission Mass detection limit	0.2500	mg
Emission Mass (CE impinger)	0.0000	mg
Emission Mass (total)	0.2500	mg
Emission Mass	0.2500	mg
Collection Efficiency	1.0000	%
Molecular Weight	20.00637	lb/lb-mole
Emission Concentration	0.0773	mg/DSCM
Emission Concentration	4.83E-09	lb/dscf
Emission Concentration	0.0929	ppm_{dv}
Emission Rate	0.0061	lb/hr
Emission Rate	NA	lb/MMBTU
Emission Rate	3.22E-03	lb/ton product

Collective Efforts LLC **Run 2** **F or C? F=1,C=0** 1

exhaust stack

Point	Pitot DP (dP) (in. H2O)	SQRT dP (in. H2O)^1/2	Orifice DP (dH) (in. H2O)	Stack Temp (F)	Meter Temp In/Out (F or C)	(F or C)
A-1	0.80	0.8944	2.6	79	62	62
2	0.77	0.8775	2.5	78	65	62
3	0.78	0.8832	2.5	77	68	62
4	0.85	0.9220	2.8	76	69	63
5	0.85	0.9220	2.8	76	70	63
6	0.92	0.9592	3.0	75	70	64
7	0.92	0.9592	3.0	78	71	64
8	0.88	0.9381	2.9	79	71	65
9	0.78	0.8832	2.5	78	71	65
10	0.80	0.8944	2.6	78	71	65
11	0.75	0.8660	2.4	77	72	65
12	0.74	0.8602	2.4	77	72	65
B-1	0.76	0.8718	2.5	77	70	66
2	0.72	0.8485	2.3	77	71	66
3	0.87	0.9327	2.8	79	72	66
4	0.90	0.9487	2.9	79	72	66
5	0.89	0.9434	2.9	79	72	67
6	0.91	0.9539	3.0	78	73	67
7	0.82	0.9055	2.7	78	73	67
8	0.77	0.8775	2.5	78	73	67
9	0.74	0.8602	2.4	79	73	67
10	0.71	0.8426	2.3	78	73	67
11	0.72	0.8485	2.3	77	73	67
12	0.69	0.8307	2.2	77	74	68
Average	0.81	0.897	2.62	77.7		68.1

Initial volume	351.745	ft^3	Initial volume	0.000	liters
Final volume	467.810	ft^3	Final volume	0.000	liters
leak check		ft3			
Total metered	116.065	dacf	Total metered	0.000	dry actual liters

Impinger	Final grams	Initial grams	Gram Gain	Final ml	Initial ml	ml Gain
1			0.0	50.0	50.0	0.0
2			0.0	106.0	100.0	6.0
3			0.0	109.0	100.0	9.0
4			0.0	102.0	100.0	2.0
5			0.0	100.0	100.0	0.0
6	251.2	223.7	27.5			0.0
7			0.0			0.0
8			0.0			0.0
9			0.0			0.0
10			0.0			0.0
Total	251.2	223.7	27.5	467.0	450.0	17.0
	W_f	W_i	(W_f- W_i)	V_f	V_i	(V_f- Vi)

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AIR/COMPLIANCE CONSULTANTS INC.

USEPA METHOD 26A DATA SHEET

Client:	Collective efforts	**Test Type:**	Method 26A	**Meter Delta H@:**	1.533	**Start Time:**	1020
Date:	3/26/10	**Run Number:**	3	**Meter Correction:**	1.004	**Stop Time:**	1224
Plant:	Alcosan	**Nozzle Dia:**	.250	**Pitot Correction:**	0.84	**Umbilical Length:**	50'
Sampling Location:	SSI stack	**Static Press, Ps:**	+.57	**Control Box Num.:**	1462	**Probe Number:**	3'-1
		Barometric Press:	29.2	**Assumed Moisture:**	3%	**Pitot Number:**	3'-1
Project Number:	10-068	**Ambient Temp:**	70° °F	**Thermocouple ID:**	43-1	**Filter Number:**	NA
Test Crew:	JV EW CBarr BO RF	**K-factor (K_f)**				**Stack Diameter:**	36.5"

Traverse Point Number	Elapsed Time	Clock Time	Metered Volume (cf) 460.350 / 466.350	Velocity Head (ΔP)	Orifice Delta H in. H_2O	Meter Vacuum in. Hg	Stack Temp. °F	Probe Temp. Ts °F > 248°F	Oven Temp. °F > 248°F	Imp Out Temp °F < 68°	Meter Temp. °F IN/AVG	Meter Temp. °F OUT	Comments
A1	5		473.270	.80	2.6	3.0	80	256	255	53	67	60	K=3.36
2	10		478.150	.82	2.7	4.0	80	255	255	54	71	67	
3	15		483.200	.84	2.8	4.5	79	255	254	59	73	67	
4	20		488.200	.86	2.8	4.5	79	255	254	60	74	68	
5	25		493.300	.86	2.8	4.5	78	255	253	52	74	68	
6	30		498.325	.87	2.9	4.5	77	255	253	46	75	68	
7	35		503.560	.90	3.0	4.5	77	255	252	45	75	68	
8	40		508.650	.91	3.0	4.5	75	255	254	43	76	69	
9	45		513.675	.85	2.8	4.5	76	255	254	43	76	69	
10	50		518.460	.78	2.6	4.5	78	255	252	43	76	69	
11	55		523.320	.78	2.6	4.5	78	255	252	43	76	69	
12	60		528.110	.78	2.6	4.5	78	255	254	43	76	69	

TOTAL/AVERAGE

Sample Train Leak Check

	(in. Hg)	Rate (ft³/m)
Initial	10	0.000
Final	6	0.010

Pitot Leak Check

Pressure	✓	✓
Static	✓	✓

	1	2	3	Average
CO2				
O2				
CO				
N2				

Fyrite Kit #:

Imp	Contents	Final	Initial	Difference
1	.1N H_2SO_4	56	50	
2	.1N H_2SO_4	116	100	
3	.1N H_2SO_4	104	100	
4	.1NNaOH	100	100	
5	.1NNaOH	98	100	
6	.1NNaOH	290.8	266.4	
7	Silica Gel			

AIR/COMPLIANCE CONSULTANTS INC.
USEPA METHOD 26A DATA SHEET

Client: Collective efforts **Test Type:** Method 26A **Project Number:** 10-068

Date: 3/26/10 **Run Number:** 3 **Testers:** IV EW CBarker BO RF

K-factor (K_f): [ ] [ ] [ ] **Sampling Location:** SSI stack

Traverse Point Number	Elapsed Time	Clock Time	Metered Volume (cf)	Velocity Head (ΔP)	Orifice Delta H in. H_2O	Meter Vacuum in. Hg	Stack Temp. °F	Probe Temp. Ts °F	Oven Temp. °F	Imp Out Temp °F	Meter Temp. °F		Comments
											IN/AVG	OUT	
	0		528.110					> 248°F	> 248°F	< 68°			
B1	5	1124	532.870	.75	2.5	4.5	76	256	251	45	72	69	
2	10		537.420	.70	2.3	4.5	77	255	252	42	73	69	
3	15		542.100	.74	2.4	4.5	77	255	253	43	75	69	
4	20		546.960	.77	2.5	4.5	77	255	253	44	75	69	
5	25		550.590	.77	2.5	4.5	77	255	253	44	76	69	
6	30		556.645	.86	2.8	5.0	76	255	252	45	76	70	
7	35		561.695	.91	3.0	5.0	76	255	253	45	77	70	
8	40		566.910	.93	3.1	5.0	76	255	253	46	77	70	
9	45		572.580	.93	3.1	5.0	77	255	253	44	77	70	
10	50		577.320	.90	3.0	5.0	77	255	252	46	77	70	
11	55		582.400	.89	2.9	5.0	77	255	253	47	77	70	
12	120		587.410	.84	2.8	5.0	77	254	252	48	77	70	

ACCI 1 Minute Average Data Sheet: O2, CO2			
Client	Collective Efforts LLC	**Unit**	SSI
Project No	10-068	**Operation**	mnoc
Plant	Alcosan	**Location**	exhaust stack

MINUTE	DATE	TIME	O2 (DV %)	CO2 (DV %)
RUN 3				
1	2010/03/26	10:20:17	13.7	6.0
2	2010/03/26	10:21:17	13.6	6.1
3	2010/03/26	10:22:17	13.7	6.0
4	2010/03/26	10:23:17	13.8	5.9
5	2010/03/26	10:24:17	13.8	5.9
6	2010/03/26	10:25:17	13.7	6.0
7	2010/03/26	10:26:17	13.6	6.1
8	2010/03/26	10:27:17	13.6	6.1
9	2010/03/26	10:28:17	13.6	6.1
10	2010/03/26	10:29:17	13.6	6.1
11	2010/03/26	10:30:17	13.6	6.1
12	2010/03/26	10:31:17	13.5	6.2
13	2010/03/26	10:32:17	13.5	6.2
14	2010/03/26	10:33:17	13.5	6.2
15	2010/03/26	10:34:17	13.5	6.2
16	2010/03/26	10:35:17	13.5	6.2
17	2010/03/26	10:36:17	13.4	6.3
18	2010/03/26	10:37:17	13.4	6.3
19	2010/03/26	10:38:17	13.4	6.3
20	2010/03/26	10:39:17	13.4	6.3
21	2010/03/26	10:40:17	13.4	6.3
22	2010/03/26	10:41:17	13.5	6.2
23	2010/03/26	10:42:17	13.6	6.1
24	2010/03/26	10:43:17	13.7	6.0
25	2010/03/26	10:44:17	13.8	5.9
26	2010/03/26	10:45:17	13.8	6.0
27	2010/03/26	10:46:17	13.8	5.9
28	2010/03/26	10:47:17	13.8	6.0
29	2010/03/26	10:48:17	13.8	5.9
30	2010/03/26	10:49:17	13.9	5.8
31	2010/03/26	10:50:17	13.9	5.8
32	2010/03/26	10:51:17	13.9	5.8
33	2010/03/26	10:52:17	13.9	5.8
34	2010/03/26	10:53:17	13.9	5.8
35	2010/03/26	10:54:17	13.9	5.8
36	2010/03/26	10:55:17	14.0	5.8
37	2010/03/26	10:56:17	13.9	5.8
38	2010/03/26	10:57:17	13.9	5.9
39	2010/03/26	10:58:17	13.9	5.9
40	2010/03/26	10:59:17	13.8	6.0
41	2010/03/26	11:00:17	13.6	6.1
42	2010/03/26	11:01:17	13.6	6.2
43	2010/03/26	11:02:17	13.5	6.2
44	2010/03/26	11:03:17	13.5	6.2
45	2010/03/26	11:04:17	13.5	6.2
46	2010/03/26	11:05:17	13.5	6.2
47	2010/03/26	11:06:17	13.5	6.2
48	2010/03/26	11:07:17	13.5	6.3
49	2010/03/26	11:08:17	13.4	6.3
50	2010/03/26	11:09:17	13.4	6.3
51	2010/03/26	11:10:17	13.4	6.3

ACCI 1 Minute Average Data Sheet: O2, CO2			
Client	Collective Efforts LLC	**Unit**	SSI
Project No	10-068	**Operation**	mnoc
Plant	Alcosan	**Location**	exhaust stack

MINUTE	DATE	TIME	O2 (DV %)	CO2 (DV %)
52	2010/03/26	11:11:17	13.4	6.3
53	2010/03/26	11:12:17	13.4	6.3
54	2010/03/26	11:13:17	13.4	6.3
55	2010/03/26	11:14:17	13.4	6.3
56	2010/03/26	11:15:17	13.5	6.2
57	2010/03/26	11:16:17	13.4	6.3
58	2010/03/26	11:17:17	13.4	6.3
59	2010/03/26	11:18:17	13.4	6.3
60	2010/03/26	11:19:17	13.4	6.3
61	2010/03/26	11:20:17	13.5	6.3
62	2010/03/26	11:21:17	13.4	6.3
63	2010/03/26	11:22:17	13.4	6.3
64	2010/03/26	11:23:17	13.5	6.2
65	2010/03/26	11:24:17	13.5	6.2
66	2010/03/26	11:25:17	13.5	6.2
67	2010/03/26	11:26:17	13.5	6.2
68	2010/03/26	11:27:17	13.5	6.2
69	2010/03/26	11:28:17	13.5	6.2
70	2010/03/26	11:29:17	13.5	6.2
71	2010/03/26	11:30:17	13.5	6.2
72	2010/03/26	11:31:17	13.4	6.3
73	2010/03/26	11:32:17	13.4	6.3
74	2010/03/26	11:33:17	13.4	6.3
75	2010/03/26	11:34:17	13.4	6.3
76	2010/03/26	11:35:17	13.4	6.3
77	2010/03/26	11:36:17	13.4	6.3
78	2010/03/26	11:37:17	13.4	6.3
79	2010/03/26	11:38:17	13.4	6.3
80	2010/03/26	11:39:17	13.5	6.2
81	2010/03/26	11:40:17	13.5	6.2
82	2010/03/26	11:41:17	13.5	6.3
83	2010/03/26	11:42:17	13.4	6.3
84	2010/03/26	11:43:17	13.5	6.2
85	2010/03/26	11:44:17	13.5	6.2
86	2010/03/26	11:45:17	13.6	6.1
87	2010/03/26	11:46:17	13.6	6.1
88	2010/03/26	11:47:17	13.6	6.1
89	2010/03/26	11:48:17	13.7	6.1
90	2010/03/26	11:49:17	13.7	6.0
91	2010/03/26	11:50:17	13.7	6.0
92	2010/03/26	11:51:17	13.6	6.1
93	2010/03/26	11:52:17	13.6	6.1
94	2010/03/26	11:53:17	13.7	6.0
95	2010/03/26	11:54:17	13.6	6.1
96	2010/03/26	11:55:17	13.6	6.1
97	2010/03/26	11:56:17	13.6	6.1
98	2010/03/26	11:57:17	13.6	6.1
99	2010/03/26	11:58:17	13.7	6.0
100	2010/03/26	11:59:17	13.5	6.2
101	2010/03/26	12:00:17	13.3	6.4
102	2010/03/26	12:01:17	13.3	6.4
103	2010/03/26	12:02:17	13.3	6.4

ACCI 1 Minute Average Data Sheet: O2, CO2			
Client	Collective Efforts LLC	**Unit**	SSI
Project No	10-068	**Operation**	mnoc
Plant	Alcosan	**Location**	exhaust stack

MINUTE	DATE	TIME	O2 (DV %)	CO2 (DV %)
104	2010/03/26	12:03:17	13.3	6.4
105	2010/03/26	12:04:17	13.1	6.5
106	2010/03/26	12:05:17	13.1	6.6
107	2010/03/26	12:06:17	13.1	6.6
108	2010/03/26	12:07:17	13.0	6.6
109	2010/03/26	12:08:17	13.2	6.5
110	2010/03/26	12:09:17	13.4	6.4
111	2010/03/26	12:10:17	13.4	6.3
112	2010/03/26	12:11:17	13.5	6.3
113	2010/03/26	12:12:17	13.5	6.3
114	2010/03/26	12:13:17	13.4	6.3
115	2010/03/26	12:14:17	13.5	6.3
116	2010/03/26	12:15:17	13.4	6.3
117	2010/03/26	12:16:17	13.4	6.4
118	2010/03/26	12:17:17	13.3	6.4
119	2010/03/26	12:18:17	13.3	6.4
120	2010/03/26	12:19:17	13.4	6.4
RUN 3 AVERAGES			**13.5**	**6.2**

ACCI CEM Calibration, Bias and Drift Data Sheet
Based on 40 CFR Part 60, Appendix A-4, Method 7E

Client	Collective Efforts LLC	**Date**	March 26, 2010
Project No	10-068	**Location**	exhaust stack
Plant	Alcosan	**Run**	Run 3
Unit	SSI	**Start Time**	10:20
Operation	mnoc	**End Time**	12:20
Tester(s)	bo,jv,rf,cb,ew		

Cal.	LOW		MID		HIGH		Tank ID				Conc.
Gas	Conc.	(% of Span)	Conc.	(% of Span)	Conc.	(% of Span)	LOW	MID	HIGH	Span	Units
O2	N/A	N/A	10.01	44.5	22.47	100.0	N/A	eb001355	cc251892	22.47	d. vol. %
CO2	N/A	N/A	9.96	44.2	22.54	100.0	N/A	cc251892	eb001355	22.54	d. vol. %
LIMITS				40 % to 60 %		100%					

	Upscale: Enter "Low" "Mid" or "High"			Initial Values		Final Values				Average of Initial and Final	Average Indicated		
Gas	below "Zero"	Actual Upscale Conc.	Analyzer Cal. Response	System Cal. Response	System Cal. Bias (% of Span)	System Cal. Response	System Cal. Bias (% of Span)	Drift (% of Span)	Span	System Responses	Gas Conc.	Corrected Gas Conc.	Conc. Units
O2	Zero		0.0	0.1	0.45	0.0	0.00	-0.45	22.47	0.05			
	Mid	10.01	10.0	10.1	0.45	10.1	0.45	0.00	22.47	10.1	13.53	13.43	d. vol. %
CO2	Zero		0.2	0.2	0.00	0.2	0.00	0.00	22.54	0.2			
	Mid	9.96	9.7	9.5	-0.89	9.5	-0.89	0.00	22.54	9.5	6.18	6.41	d. vol. %
LIMITS					+/- 5 %		+/- 5 %	+/- 3 %					

Gas	ZERO Analyzer Response (System for THC)	ZERO Analyzer Cal. Error (% of Span)	LOW Actual Conc.	LOW Analyzer Response (System for THC)	LOW Analyzer Cal. Error (% of Span)	LOW System Cal. Error (% of Actual)	MID Actual Conc.	MID Analyzer Response (System for THC)	MID Analyzer Cal. Error (% of Span)	MID System Cal. Error (% of Actual)	HIGH Actual Conc.	HIGH Analyzer Response (System for THC)	HIGH Analyzer Cal. Error (% of Span)	HIGH System Calibration Error (% of Actual)	Span	Conc. Units
O2	0.0	0.00					10.01	10.0	-0.04		22.47	22.4	-0.31		22.47	d. vol. %
CO2	0.2	0.89					9.96	9.7	-1.15		22.54	22.5	-0.18		22.54	d. vol. %
LIMITS		+/- 2 %			+/- 2 %	+/- 5 %			+/- 2 %	+/- 5 %			+/- 2 %	+/- 5 %		

Client:	Collective Efforts LLC	Test Date:	March 26, 2010
Project No.:	10-068	Test Location:	exhaust stack
Plant:	Alcosan	Test Run:	Run 3
Unit:	SSI	Test Start Time:	10:20 AM
Unit Operation:	mnoc	Test Finish Time:	12:24 PM

Blue is data input. Red is a calculation. Pink is a reference to a cell on another sheet. Green is a reference to a cell on this sheet.

Data Input

Control Box:	1462	
Meter $DH_@$ (0.75 scfm)	1.533	in. H_2O
Meter Calibration Factor (Yd)	1.004	
Test Time (Theta)	120	minutes
Barometric Pressure (Pbar)	29.20	in. Hg
Stack Static Pressure (Pg)	0.57	in. H_2O
Stack Diameter (Ds) (L if rectangular)	36.5	inches
Stack Width (enter 0 if circular stack)	0.0	inches
Nozzle Diameter (Dn)	0.250	inches
CO2	6.41	% dv
O2	13.43	% dv
Pitot Tube Coefficient (Cp)	0.84	
Sample Calculation Title	Method 26A Test Results	
Product Rate	1.88	ton/hr
F_d @ 68 F and 760 mm Hg		dscf/MMBtu
Standard Temperature	68	F
Standard Pressure	760	mm Hg
Pitot Tube Constant (Kp)	85.49	

Calculations

Meter Temperature (Tm)	71.9	F
Stack Temperature (Tsavg)	77.3	F
Orifice Pressure Drop (dHavg)	2.754	in. H_2O
GasVelocity Head (dP)^^avg	0.9131	in. H_2O^1/2
F_d @ Standard Conditions	0	dscf/MMBtu
F_d @ Stan. Cond. & Actual O2	0	dscf/MMBtu
Heat Input Based on F_d	NA	MMBtu/hr
K1method 4	0.04706	scf/ml
K2method 4	0.04715	scf/g
K1method 5	17.64	R/in. Hg
K4method 5	0.0945	
Standard lb-mole volume	385.3	ft^3/lb-mole

Calculations

CO + N2	80.16	% dv
Water Collected (V_f- V_i)	24.0	ml
Water Vapor Condensed (Vwc(std))	1.129	scf
Water Collected (W_f- W_i)	24.4	g
Water Vapor in Silica Gel (Vwsg(std))	1.150	scf
Vol. Water Vapor in Gas Stand.(Vw(std))	2.280	scf
Volume Dry Gas Metered (Vm)	119.060	dacf
Vol. Dry Gas Metered Stand.(Vm(std))	116.557	dscf
Volume Dry Gas Metered ($Vm(m^3)$)	3.371	dacm
Vol. Dry Gas Metered Stand.($Vm(std)m^3$)	3.301	dscm
Stack Absolute Pressure (Ps)	29.24	in. Hg
Stack Absolute Temperature (Tsavg)	537.0	R
H2O Vapor Pressure @ avg Stack Temp.	0.94	in. Hg
H2O in the gas at saturation (Bws)	0.0323	vol. fraction
H2O in the gas from test data (Bws)	0.0192	vol. fraction
H2O in the gas used (lower of the 2 Bws)	0.0192	vol. fraction
Is the Gas Stream Saturated With H2O?	NO	
Dry Gas Molecular Weight (Md)	29.56	lb/lb-mole
Wet Gas Molecular Weight (Ms)	29.34	lb/lb-mole
Gas Velocity (Vs)	51.89	ft/s
Is the stack circular or rectangular?	CIRCULAR	
Area Stack (As)	7.266	ft^2
Actual Gas Flowrate	22,623	acfm
Standard Gas Flowrate	21,728	scfm
Dry Standard Gas Flowrate	21.311	dscfm
Actual Gas Flowrate	641	acm/min
Standard Gas Flowrate	615	scm/min
Dry Standard Gas Flowrate	603	dscm/min
Area Nozzle (An)	0.000341	ft^2
Percent of Isokinetic Sampling (I)	97.21	%

Method 26

Hydrochloric Acid (HCl)		
Emission Mass (prior to CE)	0.46	mg
Emission Mass (CE impinger)	0.0	mg
Emission Mass (total)	0.46	mg
Emission Mass	0.46	mg
Collection Efficiency	1.0000	%
Molecular Weight	36.46097	lb/lb-mole
Emission Concentration	0.1394	mg/DSCM
Emission Concentration	8.70E-09	lb/dscf
Emission Concentration	0.0919	ppm_{dv}
Emission Rate	0.0111	lb/hr
Emission Rate	NA	lb/MMBTU
Emission Rate	0.0059	lb/ton product

Hydrogen Fluoride (HF)		
Emission Mass (prior to CE)	0.2500	mg
Emission Mass detection limit	0.2500	mg
Emission Mass (CE impinger)	0.0000	mg
Emission Mass (total)	0.2500	mg
Emission Mass	0.2500	mg
Collection Efficiency	1.0000	%
Molecular Weight	20.00637	lb/lb-mole
Emission Concentration	0.0757	mg/DSCM
Emission Concentration	4.73E-09	lb/dscf
Emission Concentration	0.0911	ppm_{dv}
Emission Rate	0.0060	lb/hr
Emission Rate	NA	lb/MMBTU
Emission Rate	3.22E-03	lb/ton product

Collective Efforts LLC **Run 3** **F or C?**
SSI **F=1,C=0** 1

Point	Pitot DP (dP) (in. H2O)	SQRT dP (in. H2O)$^{1/2}$	Orifice DP (dH) (in. H2O)	Stack Temp (F)	Meter Temp In/Out (F or C)	(F or C)
A-1	0.80	0.8944	2.6	80	67	67
2	0.82	0.9055	2.7	80	71	67
3	0.84	0.9165	2.8	79	73	67
4	0.86	0.9274	2.8	79	74	68
5	0.86	0.9274	2.8	78	74	68
6	0.87	0.9327	2.9	77	75	68
7	0.90	0.9487	3.0	77	75	68
8	0.91	0.9539	3.0	75	76	69
9	0.85	0.9220	2.8	76	76	69
10	0.78	0.8832	2.6	78	76	69
11	0.78	0.8832	2.6	78	76	69
12	0.78	0.8832	2.6	78	76	69
B-1	0.75	0.8660	2.5	76	72	69
2	0.70	0.8367	2.3	77	73	69
3	0.74	0.8602	2.4	77	75	69
4	0.77	0.8775	2.5	77	75	69
5	0.77	0.8775	2.5	77	76	69
6	0.86	0.9274	2.8	76	76	70
7	0.91	0.9539	3.0	76	77	70
8	0.93	0.9644	3.1	76	77	70
9	0.93	0.9644	3.1	77	77	70
10	0.90	0.9487	3.0	77	77	70
11	0.89	0.9434	2.9	77	77	70
12	0.84	0.9165	2.8	77	77	71
Average	0.84	0.913	2.75	77.3		71.9

Initial volume	468.350	ft^3	Initial volume	0.000	liters	
Final volume	587.410	ft^3	Final volume	0.000	liters	
leak check		ft3				
Total metered	119.060	dacf	Total metered	0.000	dry actual liters	

Impinger	Final grams	Initial grams	Gram Gain	Final ml	Initial ml	ml Gain
1			0.0	56.0	50.0	6.0
2			0.0	116.0	100.0	16.0
3			0.0	104.0	100.0	4.0
4			0.0	100.0	100.0	0.0
5			0.0	98.0	100.0	-2.0
6	290.8	266.4	24.4			0.0
7			0.0			0.0
8			0.0			0.0
9			0.0			0.0
10			0.0			0.0
Total	290.8	266.4	24.4	474.0	450.0	24.0
	W_f	W_i	(W_f- W_i)	V_f	V_i	(V_f- Vi)

Method 29

AIR/COMPLIANCE CONSULTANTS INC.
USEPA METHOD 29 DATA SHEET

Client: Collective Efforts
Date: 3/24/10
Plant: Alcosan
Sampling Location: SSI stack
Project Number: 10-068
Test Crew: JV EW GO CBeck RF

Test Type: 29
Run Number: 1
Nozzle Dia: .210 , .250 BO
Static Press, Ps: +.57
Barometric Press: 29.45
Ambient Temp: 75 °F
K-factor (K_f)

Meter Delta H@: 1.533
Meter Correction: 1.004
Pitot Correction: 0.84
Control Box Num.: 1462
Assumed Moisture: 3%
Thermocouple ID: 41-3

Start Time: 915
Stop Time: 13:20
Umbilical Length: 50'
Probe Number: 41-3
Pitot Number: 41-3
Filter Number: NA
Stack Diameter: 36.5"

Traverse Point Number	Elapsed Time	Clock Time	Metered Volume (cf)	Velocity Head (D P)	Orifice Delta H in. H_2O	Meter Vacuum in. Hg	Stack Temp. °F	Probe Temp. Ts °F	Oven Temp. °F	Imp Out Temp °F	Meter Temp. °F		Comments
								248+/-25°	248+/-25°	≤ 68°	IN/AVG	OUT	
		0	498.150										
A1		5	502.950	.84	2.8	4.0	77	245	250	52	74	74	K=3.43
1		10	507.990	.83	2.8	4.0	76	244	250	52	75	74	
2		15	513.230	.89	3.0	4.5	76	245	250	58	78	74	
2		20	518.420	.89	3.0	4.5	74	245	250	64	81	75	
3		25	523.620	.90	3.0	4.5	74	245	251	64	83	76	
3		30	528.820	.88	3.0	4.5	73	245	250	63	85	76	
4		35	534.040	.90	3.0	4.5	74	245	249	63	87	77	
4		40	539.230	.89	3.0	4.5	75	245	248	61	88	78	
5		45	544.440	.90	3.0	4.5	75	245	251	62	90	80	
5		50	549.665	.89	3.0	4.5	74	245	251	56	90	80	
6		55	554.890	.88	3.0	4.5	73	245	250	52	91	81	K=3.46
6		60	560.100	.89	3.0	4.5	75	245	250	50	92	82	
7		65	565.320	.84	2.9	4.0	73	245	250	48	92	82	
7		10	570.450	.84	2.9	4.0	74	245	250	46	93	83	
8		15	575.350	.80	2.7	4.0	72	245	249	46	93	84	
8		20	580.320	.80	2.7	4.0	71	245	249	45	93	84	

TOTAL/AVERAGE

Sample Train Leak Check

	(in. Hg)	Rate (ft³/m)
Initial	10.0	0.005
Final	11.0	.005

Pitot Leak Check

Pressure		
Static		

	1	2	3	Average
CO2				
O2				
CO				
N2				

Fyrite Kit #: _____

IMP	Contents	Final	Initial	Difference
1	HNO3/H2O2	100	138	38
2	HNO3/H2O2	100	110	10
3	Empty	0	12	12
4	KMnO4	100	106	6
5	KMnO4	100	101	1
6	Silica Gel	297.8	259.7	

AIR/COMPLIANCE CONSULTANTS INC.
USEPA METHOD 29 DATA SHEET

Client: Collective Efforts **Test Type:** 29 **Project Number:** 10-068

Date: 3/24/10 **Run Number:** 1 **Testers:** JV EW BO CBeck RF

K-factor (K_f): [ ] [ ] [ ] **Sampling Location:** SSI stack

Traverse Point Number	Elapsed Time	Clock Time	Metered Volume (cf)	Velocity Head (Δ P)	Orifice Delta H in. H_2O	Meter Vacuum in. Hg	Stack Temp. °F	Probe Temp. Ts °F	Oven Temp. °F	Imp Out Temp °F	Meter Temp. °F		Comments
	20		580.320					248+/-25°	248+/-25°	< 68°	IN/AVG	OUT	
A4	25		585.220	.79	2.7	4.0	71	245	250	45	93	85	
4	30		590.100	.78	2.6	4.0	71	245	250	44	94	85	
10	35		594.820	.72	2.4	3.5	71	245	250	45	94	86	
10	40		599.440	.70	2.4	3.5	71	245	251	45	94	86	
11	45		603.945	.65	2.2	3.0	72	245	250	45	94	86	
11	50		608.320	.62	2.1	3.0	76	245	250	45	95	87	
12	55		612.570	.60	2.0	3.0	75	245	250	46	95	87	
12	120		616.860	.60	2.0	3.0	73	245	250	47	95	87	
~~B1~~	~~5~~												
~~B7~~	5		621.185	.65	~~2.3~~	3.5	75	245	250	51	91	87	K=3.55
~~1~~	10		626.040	.72	2.5	~~4.0~~	74	244	249	45	94	87	
2	15		~~630.~~ 630.920	.72	2.5	4.0	75	244	250	48	95	88	
2	20		635.890	.76	2.7	~~4.0~~	~~76~~	245	250	45	96	88	
3	25	640.645 ←	~~635.890~~ 640.645	.76	2.7	4.0	75	246	250	46	96	88	
~~3~~	30	645.645	645.645	.76	~~2.8~~	4.0	76	245	250	45	96	89	ΔH = 645.685
4	35		650.390	.72	2.6	4.0	76	245	250	45	97	89	
4	40		655.215	.76	2.7	4.0	76	245	249	45	97	89	
5	45		660.160	.73	2.6	4.0	76	245	251	45	97	89	
5	50		664.725	.70	2.5	3.5	77	245	249	46	97	90	
6	55		669.320	.68	2.4	3.5	77	245	249	46	97	90	
6	180		673.825	.64	2.3	3.0	77	245	250	47	97	90	

AIR/COMPLIANCE CONSULTANTS INC.
USEPA METHOD 29 DATA SHEET

Client: Collective Efforts **Test Type:** 29 **Project Number:** 10-068

Date: 3/24/10 **Run Number:** 1 **Testers:** JV EW SO CBeale RF

K-factor (K_f): [ ] [ ] [ ] **Sampling Location:** SSI stack

Traverse Point Number	Elapsed Time	Clock Time	Metered Volume (cf)	Velocity Head (Δ P)	Orifice Delta H in. H_2O	Meter Vacuum in. Hg	Stack Temp. °F	Probe Temp. Ts °F	Oven Temp. °F	Imp Out Temp °F	Meter Temp. °F		Comments
	180		673.425					248+/-25°	248+/-25°	< 68°	IN/AVG	OUT	
6?	5		678.670	.74	2.6	4.0	77	246	251	47	97	90	
7	10		683.200	.67	2.4	3.5	78	245	249	47	98	91	
8	15		687.690	.66	2.3	3.5	76	245	251	47	98	91	
8	20		692.200	.67	2.4	3.0	76	245	251	47	98	91	
9	25		696.865	.70	2.4	3.0	76	245	250	47	98	91	
9	30		701.570	.70	2.5	3.5	74	245	251	47	99	91	
10	35		706.315	.71	2.5	3.5	74	245	248	47	99	91	
10	40		711.045	.70	2.5	3.5	77	245	249	42	99	92	
11	45		715.530	.65	2.3	3.5	74	245	260	47	99	92	
11	50		719.955	.64	2.3	3.0	72	245	248	48	99	92	
12	55		724.400	.67	2.2	3.0	72	245	248	48	99	92	
12	240		728.930	.62	2.2	3.0	72	245	247	48	99	92	

ACCI 1 Minute Average Data Sheet: O2, CO2			
Client	Collective Efforts LLC	**Unit**	SSI
Project No	10-068	**Operation**	mnoc
Plant	Alcosan	**Location**	exhaust stack

MINUTE	DATE	TIME	O2 (DV %)	CO2 (DV %)
RUN 1				
1	2010/03/24	09:15:46	13.2	6.8
2	2010/03/24	09:16:46	13.2	6.8
3	2010/03/24	09:17:46	13.2	6.8
4	2010/03/24	09:18:46	13.2	6.8
5	2010/03/24	09:19:46	13.2	6.7
6	2010/03/24	09:20:46	13.3	6.7
7	2010/03/24	09:21:46	13.2	6.8
8	2010/03/24	09:22:46	13.2	6.8
9	2010/03/24	09:23:46	13.2	6.7
10	2010/03/24	09:24:46	13.2	6.7
11	2010/03/24	09:25:46	13.3	6.7
12	2010/03/24	09:26:46	13.3	6.7
13	2010/03/24	09:27:46	13.2	6.7
14	2010/03/24	09:28:46	13.3	6.7
15	2010/03/24	09:29:46	13.3	6.6
16	2010/03/24	09:30:46	13.3	6.6
17	2010/03/24	09:31:46	13.4	6.6
18	2010/03/24	09:32:46	13.4	6.6
19	2010/03/24	09:33:46	13.4	6.5
20	2010/03/24	09:34:46	13.4	6.6
21	2010/03/24	09:35:46	13.3	6.7
22	2010/03/24	09:36:46	13.3	6.6
23	2010/03/24	09:37:46	13.3	6.7
24	2010/03/24	09:38:46	13.3	6.7
25	2010/03/24	09:39:46	13.4	6.6
26	2010/03/24	09:40:46	13.4	6.6
27	2010/03/24	09:41:46	13.4	6.6
28	2010/03/24	09:42:46	13.4	6.6
29	2010/03/24	09:43:46	13.3	6.7
30	2010/03/24	09:44:46	13.3	6.7
31	2010/03/24	09:45:46	13.3	6.7
32	2010/03/24	09:46:46	13.3	6.7
33	2010/03/24	09:47:46	13.2	6.7
34	2010/03/24	09:48:46	13.2	6.8
35	2010/03/24	09:49:46	13.2	6.8
36	2010/03/24	09:50:46	13.3	6.7
37	2010/03/24	09:51:46	13.3	6.6
38	2010/03/24	09:52:46	13.3	6.7
39	2010/03/24	09:53:46	13.4	6.6
40	2010/03/24	09:54:46	13.4	6.5
41	2010/03/24	09:55:46	13.5	6.5
42	2010/03/24	09:56:46	13.5	6.5
43	2010/03/24	09:57:46	13.4	6.5
44	2010/03/24	09:58:46	13.4	6.5
45	2010/03/24	09:59:46	13.4	6.5
46	2010/03/24	10:00:46	13.5	6.5
47	2010/03/24	10:01.46	13.4	6.5
48	2010/03/24	10:02:46	13.4	6.5
49	2010/03/24	10:03:46	13.4	6.6
50	2010/03/24	10:04:46	13.4	6.6
51	2010/03/24	10:05:46	13.4	6.5
52	2010/03/24	10:06:46	13.5	6.5
53	2010/03/24	10:07:46	13.4	6.6
54	2010/03/24	10:08:46	13.5	6.5
55	2010/03/24	10:09:46	13.4	6.5
56	2010/03/24	10:10:46	13.4	6.6
57	2010/03/24	10:11:46	13.4	6.6
58	2010/03/24	10:12:46	13.4	6.6
59	2010/03/24	10:13:46	13.4	6.6
60	2010/03/24	10:14:46	13.3	6.6
61	2010/03/24	10:15:46	13.4	6.6
62	2010/03/24	10:16:46	13.4	6.6
63	2010/03/24	10:17:46	13.4	6.6
64	2010/03/24	10:18:46	13.4	6.6
65	2010/03/24	10:19:46	13.4	6.6
66	2010/03/24	10.20:46	13.4	6.6

ACCI 1 Minute Average Data Sheet: O2, CO2			
Client	Collective Efforts LLC	**Unit**	SSI
Project No	10-068	**Operation**	mnoc
Plant	Alcosan	**Location**	exhaust stack

MINUTE	DATE	TIME	O2 (DV %)	CO2 (DV %)
67	2010/03/24	10:21:46	13.2	6.7
68	2010/03/24	10:22:46	13.2	6.7
69	2010/03/24	10:23:46	13.3	6.7
70	2010/03/24	10:24:46	13.3	6.6
71	2010/03/24	10:25:46	13.5	6.5
72	2010/03/24	10:26:46	13.4	6.5
73	2010/03/24	10:27:46	13.4	6.6
74	2010/03/24	10:28.46	13.4	6.6
75	2010/03/24	10:29:46	13.4	6.6
76	2010/03/24	10:30:46	13.4	6.6
77	2010/03/24	10:31:46	13.4	6.6
78	2010/03/24	10:32:46	13.4	6.6
79	2010/03/24	10:33:46	13.3	6.7
80	2010/03/24	10:34:46	13.4	6.6
81	2010/03/24	10:35:46	13.7	6.3
82	2010/03/24	10:36.46	14.2	5.9
83	2010/03/24	10:37:46	14.4	5.7
84	2010/03/24	10:38:46	14.2	5.8
85	2010/03/24	10:39.46	14.1	5.9
86	2010/03/24	10:40:46	14.0	6.1
87	2010/03/24	10:41:46	13.8	6.2
88	2010/03/24	10:42.46	13.6	6.4
89	2010/03/24	10:43:46	13.4	6.6
90	2010/03/24	10:44:46	13.3	6.7
91	2010/03/24	10:45:46	13.2	6.8
92	2010/03/24	10:46:46	13.1	6.9
93	2010/03/24	10:47.46	13.0	6.9
94	2010/03/24	10:48:46	13.0	7.0
95	2010/03/24	10:49:46	12.9	7.0
96	2010/03/24	10:50.46	12.9	7.1
97	2010/03/24	10:51:46	12.8	7.1
98	2010/03/24	10:52:46	12.8	7.2
99	2010/03/24	10:53:46	12.7	7.2
100	2010/03/24	10:54:46	13.6	6.5
101	2010/03/24	10:55.46	16.0	4.6
102	2010/03/24	10:56:46	14.7	5.5
103	2010/03/24	10:57:46	13.7	6.3
104	2010/03/24	10:58:46	13.5	6.5
105	2010/03/24	10:59:46	13.3	6.7
106	2010/03/24	11:00:46	13.1	6.9
107	2010/03/24	11:01:46	12.9	7.1
108	2010/03/24	11:02:46	12.7	7.3
109	2010/03/24	11:03:46	12.5	7.4
110	2010/03/24	11:04:46	13.7	6.4
111	2010/03/24	11:05:46	15.2	5.1
112	2010/03/24	11:06:46	14.5	5.6
113	2010/03/24	11:07:46	14.3	5.8
114	2010/03/24	11:08:46	14.7	5.4
115	2010/03/24	11:09:46	14.9	5.3
116	2010/03/24	11:10:46	14.8	5.3
117	2010/03/24	11:11:46	15.2	5.0
118	2010/03/24	11:12:46	15.1	5.1
119	2010/03/24	11:13:46	14.4	5.8
120	2010/03/24	11:14:46	14.6	5.6
121	2010/03/24	11:15.46	14.9	5.3
122	2010/03/24	11:16:46	14.8	5.3
123	2010/03/24	11:17:46	14.8	5.3
124	2010/03/24	11:18.46	15.2	5.0
125	2010/03/24	11:19:46	15.3	5.0
126	2010/03/24	11:20:46	15.3	4.9
127	2010/03/24	11:21:46	15.4	4.9
128	2010/03/24	11:22:46	15.6	4.6
129	2010/03/24	11:23:46	15.7	4.6
130	2010/03/24	11:24.46	15.7	4.5
131	2010/03/24	11:25:46	15.7	4.5
132	2010/03/24	11:26:46	15.7	4.5
133	2010/03/24	11:27:46	15.6	4.6

ACCI 1 Minute Average Data Sheet: O2, CO2			
Client	Collective Efforts LLC	**Unit**	SSI
Project No	10-068	**Operation**	mnoc
Plant	Alcosan	**Location**	exhaust stack

MINUTE	DATE	TIME	O2 (DV %)	CO2 (DV %)
134	2010/03/24	11:28:46	15.7	4.5
135	2010/03/24	11:29:46	16.0	4.3
136	2010/03/24	11:30:46	16.1	4.1
137	2010/03/24	11:31:46	16.2	4.1
138	2010/03/24	11:32:46	16.3	4.0
139	2010/03/24	11:33:46	16.4	3.9
140	2010/03/24	11:34:46	16.4	3.9
141	2010/03/24	11:35:46	16.4	3.9
142	2010/03/24	11:36:46	16.3	4.0
143	2010/03/24	11:37:46	16.3	4.0
144	2010/03/24	11:38:46	16.2	4.0
145	2010/03/24	11:39:46	16.3	4.0
146	2010/03/24	11:40:46	16.4	3.9
147	2010/03/24	11:41:46	16.2	4.0
148	2010/03/24	11:42:46	16.1	4.1
149	2010/03/24	11:43:46	16.1	4.1
150	2010/03/24	11:44:46	15.5	4.5
151	2010/03/24	11:45:46	15.4	4.5
152	2010/03/24	11:46:46	15.2	4.7
153	2010/03/24	11:47:46	15.3	4.7
154	2010/03/24	11:48:46	15.3	4.7
155	2010/03/24	11:49:46	15.2	4.7
156	2010/03/24	11:50:46	15.2	4.8
157	2010/03/24	11:51:46	15.1	4.8
158	2010/03/24	11:52:46	14.9	5.0
159	2010/03/24	11:53:46	14.8	5.0
160	2010/03/24	11:54:46	14.7	5.2
161	2010/03/24	11:55:46	14.7	5.1
162	2010/03/24	11:56:46	14.7	5.2
163	2010/03/24	11:57:46	14.6	5.2
164	2010/03/24	11:58:46	14.5	5.2
165	2010/03/24	11:59:46	14.4	5.3
166	2010/03/24	12:00:46	14.2	5.5
167	2010/03/24	12:01:46	14.2	5.5
168	2010/03/24	12:02:46	14.1	5.6
169	2010/03/24	12:03:46	14.2	5.5
170	2010/03/24	12:04:46	14.2	5.5
171	2010/03/24	12:05:46	14.3	5.5
172	2010/03/24	12:06:46	14.3	5.4
173	2010/03/24	12:07.46	14.3	5.5
174	2010/03/24	12:08:46	14.2	5.5
175	2010/03/24	12:09:46	14.2	5.5
176	2010/03/24	12:10:46	14.2	5.5
177	2010/03/24	12:11:46	14.2	5.5
178	2010/03/24	12:12:46	14.1	5.6
179	2010/03/24	12:13:46	14.2	5.5
180	2010/03/24	12:14:46	14.2	5.5
181	2010/03/24	12:15:46	14.2	5.5
182	2010/03/24	12:16:46	14.1	5.6
183	2010/03/24	12:17:46	14.2	5.5
184	2010/03/24	12:18:46	14.2	5.5
185	2010/03/24	12:19:46	14.2	5.5
186	2010/03/24	12:20:46	14.2	5.5
187	2010/03/24	12:21:46	14.0	5.6
188	2010/03/24	12:22:46	13.9	5.7
189	2010/03/24	12:23:46	13.9	5.7
190	2010/03/24	12:24:46	13.9	5.7
191	2010/03/24	12:25:46	14.1	5.6
192	2010/03/24	12:26:46	14.0	5.6
193	2010/03/24	12:27.46	14.0	5.7
194	2010/03/24	12:28:46	14.0	5.7
195	2010/03/24	12:29:46	13.9	5.7
196	2010/03/24	12:30:46	14.0	5.7
197	2010/03/24	12:31:46	14.0	5.7
198	2010/03/24	12:32:46	13.9	5.7
199	2010/03/24	12:33.46	13.9	5.8
200	2010/03/24	12:34:46	13.8	5.8

ACCI 1 Minute Average Data Sheet: O2, CO2			
Client	Collective Efforts LLC	**Unit**	SSI
Project No	10-068	**Operation**	mnoc
Plant	Alcosan	**Location**	exhaust stack

MINUTE	DATE	TIME	O2 (DV %)	CO2 (DV %)
201	2010/03/24	12:35:46	13.8	5.8
202	2010/03/24	12:36.46	13.7	5.9
203	2010/03/24	12:37:46	13.7	5.9
204	2010/03/24	12:38:46	13.7	5.9
205	2010/03/24	12.39:46	13.7	5.9
206	2010/03/24	12:40:46	13.7	5.9
207	2010/03/24	12:41:46	13.7	5.9
208	2010/03/24	12.42:46	13.7	5.9
209	2010/03/24	12:43:46	13.7	5.9
210	2010/03/24	12:44:46	13.6	6.0
211	2010/03/24	12:45:46	13.6	6.0
212	2010/03/24	12:46:46	13.6	6.0
213	2010/03/24	12:47:46	13.6	6.0
214	2010/03/24	12:48:46	13.6	6.0
215	2010/03/24	12:49:46	13.6	6.0
216	2010/03/24	12:50:46	13.6	6.0
217	2010/03/24	12:51:46	13.6	6.0
218	2010/03/24	12:52:46	13.6	6.0
219	2010/03/24	12:53.46	13.6	6.0
220	2010/03/24	12:54:46	13.6	6.0
221	2010/03/24	12:55:46	13.5	6.0
222	2010/03/24	12.56.46	13.5	6.1
223	2010/03/24	12:57:46	13.5	6.1
224	2010/03/24	12:58:46	13.5	6.0
225	2010/03/24	12:59:46	13.6	6.0
226	2010/03/24	13:00:46	13.6	6.0
227	2010/03/24	13:01:46	13.5	6.1
228	2010/03/24	13:02:46	13.5	6.1
229	2010/03/24	13:03:46	13.5	6.1
230	2010/03/24	13:04.46	13.5	6.1
231	2010/03/24	13:05:46	13.5	6.1
232	2010/03/24	13:06:46	13.5	6.2
233	2010/03/24	13:07:46	13.5	6.2
234	2010/03/24	13:08:46	13.4	6.2
235	2010/03/24	13:09:46	13.4	6.2
236	2010/03/24	13:10:46	13.3	6.3
237	2010/03/24	13:11:46	13.2	6.4
238	2010/03/24	13:12:46	13.3	6.3
239	2010/03/24	13:13:46	13.3	6.4
240	2010/03/24	13:14:46	13.3	6.4
RUN 1 AVERAGES			**14.0**	**5.9**

ACCI CEM Calibration, Bias and Drift Data Sheet
Based on 40 CFR Part 60, Appendix A-4, Method 7E

Client	Collective Efforts LLC	**Date**	March 24, 2010
Project No	10-068	**Location**	exhaust stack
Plant	Alcosan	**Run**	Run 1
Unit	SSI	**Start Time**	9:15
Operation	mnoc	**End Time**	13:15
Tester(s)	wo,ew,jv,cb,rf		

Cal.	LOW		MID		HIGH		Tank ID				Conc.
Gas	Conc.	(% of Span)	Conc.	(% of Span)	Conc.	(% of Span)	LOW	MID	HIGH	Span	Units
O2	N/A	N/A	10.01	44.5	22.47	100.0	N/A	eb001355	cc251892	22.47	d. vol. %
CO2	N/A	N/A	9.96	44.2	22.54	100.0	N/A	cc251892	eb001355	22.54	d. vol. %
LIMITS				40 % to 60 %		100%					

	Upscale: Enter "Low" "Mid" or "High"			Initial Values		Final Values				Average of Initial and Final	Average Indicated	Corrected	
Gas	below "Zero"	Actual Upscale Conc.	Analyzer Cal. Response	System Cal. Response	System Cal. Bias (% of Span)	System Cal. Response	System Cal. Bias (% of Span)	Drift (% of Span)	Span	System Responses	Gas Conc.	Gas Conc.	Conc. Units
O2	Zero		0.0	0.0	0.00	0.1	0.45	0.45	22.47	0.05			
	Mid	10.01	10.1	10.1	0.00	10.1	0.00	0.00	22.47	10.1	13.97	13.87	d. vol. %
CO2	Zero		0.2	0.1	-0.44	0.2	0.00	0.44	22.54	0.15			
	Mid	9.96	9.6	9.9	1.33	9.8	0.89	-0.44	22.54	9.85	5.94	5.94	d. vol. %
LIMITS					+/- 5 %		+/- 5 %	+/- 3 %					

Gas	ZERO Analyzer Response (System for THC)	ZERO Analyzer Cal. Error (% of Span)	LOW Actual Conc.	LOW Analyzer Response (System for THC)	LOW Analyzer Cal. Error (% of Span)	LOW System Cal. Error (% of Actual)	MID Actual Conc.	MID Analyzer Response (System for THC)	MID Analyzer Cal. Error (% of Span)	MID System Cal. Error (% of Actual)	HIGH Actual Conc.	HIGH Analyzer Response (System for THC)	HIGH Analyzer Cal. Error (% of Span)	HIGH System Calibration Error (% of Actual)	Span	Conc. Units
O2	0.0	0.00					10.01	10.1	0.40		22.47	22.7	1.02		22.47	d. vol. %
CO2	0.2	0.89					9.96	9.6	-1.60		22.54	22.9	1.60		22.54	d. vol. %
LIMITS		+/- 2 %			+/- 2 %	+/- 5 %			+/- 2 %	+/- 5 %			+/- 2 %	+/- 5 %		

Client:	Collective Efforts LLC	Test Date:	March 24, 2010
Project No..	10-068	Test Location:	exhaust stack
Plant:	Alcosan	Test Run:	Run 1
Unit:	SSI	Test Start Time:	9:15 AM
Unit Operation:	mnoc	Test Finish Time:	1:20 PM

Blue is data input. Red is a calculation. Pink is a reference to a cell on another sheet. Green is a reference to a cell on this sheet.

Data Input

Control Box:	1462	
Meter $DH_@$ (0.75 scfm)	1.533	in. H_2O
Meter Calibration Factor (Yd)	1.004	
Test Time (Theta)	240	minutes
Barometric Pressure (Pbar)	29.45	in. Hg
Stack Static Pressure (Pg)	0.57	in. H_2O
Stack Diameter (Ds) (L if rectangular)	36.5	inches
Stack Width (enter 0 if circular stack)	0.0	inches
Nozzle Diameter (Dn)	0.250	inches
CO2	5.94	% dv
O2	13.87	% dv
Pitot Tube Coefficient (Cp)	0.84	
Sample Calculation Title	Metals Testing Results	
F_d @ 68 F and 760 mm Hg		dscf/MMBtu
Standard Temperature	68	F
Standard Pressure	760	mm Hg
Pitot Tube Constant (Kp)	85.49	

Calculations

Meter Temperature (Tm)	89.4	F
Stack Temperature (Tsavg)	74.5	F
Orifice Pressure Drop (dHavg)	2.592	in. H_2O
GasVelocity Head (dP)''avg	0.8645	in. H_2O^1/2
F_d @ Standard Conditions	NA	dscf/MMBtu
F_d @ Stan. Cond. & Actual O2	0	dscf/MMBtu
Heat Input Based on F_d	NA	MMBtu/hr
K1method 4	0.04706	scf/ml
K2method 4	0.04715	scf/g
K1method 5	17.64	R/in. Hg
K4method 5	0.0945	
Standard lb-mole volume	385.3	ft^3/lb-mole

Production Rate

Product Rate		metric ton/hr
Product Rate	1.88	ton/hr

Calculations

CO + N2	80.19	% dv
Water Collected (V_f - V_i)	67.0	ml
Water Vapor Condensed (Vwc(std))	3.153	scf
Water Collected (W_f - W_i)	38.1	g
Water Vapor in Silica Gel (Vwsg(std))	1.796	scf
Vol. Water Vapor in Gas Stand.(Vw(std))	4.949	scf
Volume Dry Gas Metered (Vm)	230.680	dacf
Vol. Dry Gas Metered Stand.(Vm(std))	220.424	dscf
Volume Dry Gas Metered (Vm(m^3))	6.532	dacm
Vol. Dry Gas Metered Stand.(Vm(std)m^3)	6.242	dscm
Stack Absolute Pressure (Ps)	29.49	in. Hg
Stack Absolute Temperature (Tsavg)	534.1	R
H2O Vapor Pressure @ avg Stack Temp.	0.86	in. Hg
H2O in the gas at saturation (Bws)	0.0292	vol. fraction
H2O in the gas from test data (Bws)	0.0220	vol. fraction
H2O in the gas used (lower of the 2 Bws)	0.0220	vol. fraction
Is the Gas Stream Saturated With H2O?	NO	
Dry Gas Molecular Weight (Md)	29.51	lb/lb-mole
Wet Gas Molecular Weight (Ms)	29.25	lb/lb-mole
Gas Velocity (Vs)	48.87	ft/s
Is the stack circular or rectangular?	CIRCULAR	
Area Stack (As)	7.266	ft^
Actual Gas Flowrate	21,304	acfm
Standard Gas Flowrate	20,746	scfm
Dry Standard Gas Flowrate	20,290	dscfm
Actual Gas Flowrate	603	acm/min
Standard Gas Flowrate	587	scm/min
Dry Standard Gas Flowrate	575	dscm/min
Area Nozzle (An)	0.000341	ft^2
Percent of Isokinetic Sampling (I)	96.54	%

Metals

Mercury			Cobalt		
Emission Mass	57.119	(ug)	Emission Mass (Front Half)	1.12	(ug)
			Emission Mass (Back Half)	0.12	(ug)
Emission Mass (total)	57.12	(ug)	Emission Mass (total)	1.24	(ug)
Emission Mass	57.12	(ug)	Emission Mass	1.24	(ug)
Collection Efficiency	1.0000	(%)	Collection Efficiency	0.9999	(%)
Emission Concentration	9.151	(ug/DSCM)	Emission Concentration	0.199	(ug/DSCM)
Emission Rate	6.95E-04	(lb/hr)	Emission Rate	1.51E-05	(lb/hr)
Emission Rate	NA	(lb/MMBTU)	Emission Rate	NA	(lb/MMBTU)
Emission Rate	3.70E-04	(lb/ton product)	Emission Rate	8.05E-06	(lb/ton product)

Collective Efforts LLC **Run 1** **F or C?**
SSI **F=1,C=0** 1

Point	Pitot DP (dP) (in. H2O)	SQRT dP $(in. H2O)^{1/2}$	Orifice DP (dH) (in. H2O)	Stack Temp (F)	Meter Temp In/Out (F or C)	(F or C)
A-1	0.84	0.917	2.8	77	74	74
1	0.83	0.911	2.8	76	75	74
2	0.89	0.943	3.0	76	78	74
2	0.89	0.943	3.0	74	81	75
3	0.90	0.949	3.0	74	83	76
3	0.88	0.938	3.0	73	85	76
4	0.90	0.949	3.0	74	87	77
4	0.89	0.943	3.0	75	88	78
5	0.90	0.949	3.0	75	90	80
5	0.89	0.943	3.0	74	90	80
6	0.88	0.938	3.0	73	91	81
6	0.89	0.943	3.0	75	92	82
7	0.84	0.917	2.9	73	92	82
7	0.84	0.917	2.9	74	93	83
8	0.80	0.894	2.7	72	93	84
8	0.80	0.894	2.7	71	93	84
9	0.79	0.889	2.7	71	93	85
9	0.78	0.883	2.6	71	94	85
10	0.72	0.849	2.4	71	94	86
10	0.70	0.837	2.4	71	94	86
11	0.65	0.806	2.2	72	94	86
11	0.62	0.787	2.1	76	95	87
12	0.60	0.775	2.0	75	95	87
12	0.60	0.775	2.0	73	95	87
B-1	0.65	0.806	2.3	75	91	87
1	0.72	0.849	2.5	74	94	87
2	0.72	0.849	2.5	75	95	88
2	0.76	0.872	2.7	76	96	88
3	0.76	0.872	2.7	75	96	88
3	0.78	0.883	2.8	76	96	89
4	0.72	0.849	2.6	76	97	89
4	0.76	0.872	2.7	76	97	89
5	0.73	0.854	2.6	76	97	89
5	0.70	0.837	2.5	77	97	90
6	0.68	0.825	2.4	77	97	90
6	0.64	0.800	2.3	77	97	90
7	0.74	0.860	2.6	77	97	90
7	0.67	0.819	2.4	78	98	91
8	0.66	0.812	2.3	76	98	91
8	0.67	0.819	2.4	76	98	91
9	0.70	0.837	2.4	76	98	91
9	0.70	0.837	2.5	74	99	91
10	0.71	0.843	2.5	74	99	91
10	0.70	0.837	2.5	77	99	92
11	0.65	0.806	2.3	74	99	92
11	0.64	0.800	2.3	72	99	92
12	0.62	0.787	2.2	72	99	92
12	0.62	0.787	2.2	72	99	92

Antimony		
Emission Mass (Front Half)	0.80	(ug)
Emission Mass (Back Half)	0.00	(ug)
Emission Mass (total)	0.80	(ug)
Emission Mass	0.80	(ug)
Collection Efficiency	1.0000	(%)
Emission Concentration	0.128	(ug/DSCM)
Emission Rate	9.74E-06	(lb/hr)
Emission Rate	NA	(lb/MMBTU)
Emission Rate	5.18E-06	(lb/ton product)
Arsenic		
Emission Mass (Front Half)	1.91	(ug)
Emission Mass (Back Half)	0.20	(ug)
Emission Mass (total)	2.11	(ug)
Emission Mass	2.11	(ug)
Collection Efficiency	0.9999	(%)
Emission Concentration	0.338	(ug/DSCM)
Emission Rate	2.57E-05	(lb/hr)
Emission Rate	NA	(lb/MMBTU)
Emission Rate	1.37E-05	(lb/ton product)
Beryllium		
Emission Mass (Front Half)	0.20	(ug)
Emission Mass (Back Half)	0.00	(ug)
Emission Mass (total)	0.20	(ug)
Emission Mass	0.20	(ug)
Collection Efficiency	1.0000	(%)
Emission Concentration	0.032	(ug/DSCM)
Emission Rate	2.44E-06	(lb/hr)
Emission Rate	NA	(lb/MMBTU)
Emission Rate	1.30E-06	(lb/ton product)
Cadmium		
Emission Mass (Front Half)	1.38	(ug)
Emission Mass (Back Half)	0.66	(ug)
Emission Mass (total)	2.04	(ug)
Emission Mass	2.04	(ug)
Collection Efficiency	0.9997	(%)
Emission Concentration	0.326	(ug/DSCM)
Emission Rate	2.48E-05	(lb/hr)
Emission Rate	NA	(lb/MMBTU)
Emission Rate	1.32E-05	(lb/ton product)
Chromium		
Emission Mass (Front Half)	16.60	(ug)
Emission Mass (Back Half)	0.63	(ug)
Emission Mass (total)	17.23	(ug)
Emission Mass	17.23	(ug)
Collection Efficiency	1.0000	(%)
Emission Concentration	2.760	(ug/DSCM)
Emission Rate	2.10E-04	(lb/hr)
Emission Rate	NA	(lb/MMBTU)
Emission Rate	1.12E-04	(lb/ton product)

Lead		
Emission Mass (Front Half)	5.44	(ug)
Emission Mass (Back Half)	0.36	(ug)
Emission Mass (total)	5.80	(ug)
Emission Mass	5.80	(ug)
Collection Efficiency	0.9999	(%)
Emission Concentration	0.929	(ug/DSCM)
Emission Rate	7.06E-05	(lb/hr)
Emission Rate	NA	(lb/MMBTU)
Emission Rate	3.76E-05	(lb/ton product)
Manganese		
Emission Mass (Front Half)	69.30	(ug)
Emission Mass (Back Half)	2.88	(ug)
Emission Mass (total)	72.18	(ug)
Emission Mass	72.18	(ug)
Collection Efficiency	1.0000	(%)
Emission Concentration	11.564	(ug/DSCM)
Emission Rate	8.79E-04	(lb/hr)
Emission Rate	NA	(lb/MMBTU)
Emission Rate	4.67E-04	(lb/ton product)
Nickel		
Emission Mass (Front Half)	30.40	(ug)
Emission Mass (Back Half)	1.35	(ug)
Emission Mass (total)	31.75	(ug)
Emission Mass	31.75	(ug)
Collection Efficiency	1.0000	(%)
Emission Concentration	5.087	(ug/DSCM)
Emission Rate	3.87E-04	(lb/hr)
Emission Rate	NA	(lb/MMBTU)
Emission Rate	2.06E-04	(lb/ton product)
Selenium		
Emission Mass (Front Half)	13.60	(ug)
Emission Mass (Back Half)	1.32	(ug)
Emission Mass (total)	14.92	(ug)
Emission Mass	14.92	(ug)
Collection Efficiency	0.9999	(%)
Emission Concentration	2.390	(ug/DSCM)
Emission Rate	1.82E-04	(lb/hr)
Emission Rate	NA	(lb/MMBTU)
Emission Rate	9.66E-05	(lb/ton product)

Average	0.75	0.865	2.59	74.5		89.4
Initial volume	498.150	ft^3	Initial volume	0.000	liters	
Final volume	728.830	ft^3	Final volume	0.000	liters	
Total metered	230.680	dacf	Total metered	0.000	dry actual liters	

Impinger	Final grams	Initial grams	Gram Gain	Final ml	Initial ml	ml Gain
1			0.0	138.0	100.0	38.0
2			0.0	110.0	100.0	10.0
3			0.0	12.0	0.0	12.0
4			0.0	106.0	100.0	6.0
5			0.0	101.0	100.0	1.0
6	297.8	259.7	38.1			0.0
7			0.0			0.0
8			0.0			0.0
9			0.0			0.0
10			0.0			0.0
Total	297.8	259.7	38.1	467.0	400.0	67.0
	W_f	W_i	$(W_f - W_i)$	V_f	V_i	$(V_f - Vi)$

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AIR/COMPLIANCE CONSULTANTS INC.
USEPA METHOD 29 DATA SHEET

Client: Collective Efforts
Date: 3/25/10
Plant: Alcosan
Sampling Location: SSI stack
Project Number: 10-068
Test Crew: EW BO RF ~~CWB~~ CB

Test Type: M 29
Run Number: ~~ONE~~ TWO
Nozzle Dia: ~~.125~~ .250
Static Press, Ps: +.57
Barometric Press: 29.20
Ambient Temp: 70 °F
K-factor (K_f): 3.41 | 3.47 |

Meter Delta H@: 1.533
Meter Correction: 1.004
Pitot Correction: .84
Control Box Num.: 1462
Assumed Moisture: 3%
Thermocouple ID: 4-3

Start Time: 0825
Stop Time: 1228
Umbilical Length: 50#7
Probe Number: 4-3
Pitot Number: 4-3
Filter Number: NA
Stack Diameter: 36.5"

Traverse Point Number	Elapsed Time	Clock Time	Metered Volume (cf)	Velocity Head (D P)	Orifice Delta H in. H_2O	Meter Vacuum in. Hg	Stack Temp. °F	Probe Temp. Ts °F	Oven Temp. °F	Imp Out Temp °F	Meter Temp. °F		Comments
								248+/-25°	248+/-25°	< 68°	IN/AVG	OUT	
		825	848.900										K=3.41
B1	5		853.305	.73	2.4	5.0	72	255	256	59	67	67	
1	10		857.815	.72	2.4	5.0	72	254	250	50	69	67	
2	15		862.945	.87	2.9	5.5	73	255	252	53	71	67	
2	20		867.875	.88	2.9	5.5	74	254	253	54	74	68	
3	25		873.195	.99	3.3	6.0	74	255	255	53	77	69	
3	30		878.645	.99	3.4	6.5	75	255	258	52	78	69	K=3.47
4	35		884.075	1.0	3.4	6.5	76	255	255	52	79	70	
4	40		889.550	1.0	3.4	6.5	74	256	253	52	80	71	
5	45		895.025	1.0	3.4	6.5	74	255	255	52	81	72	
5	50		900.505	1.0	3.4	6.5	75	255	255	54	82	72	
6	55		906.245	1.1	3.8	7.0	75	255	253	53	83	73	
6	60		912.590	1.1	3.8	7.0	75	255	255	53	84	74	
7	65		917.125	.92	3.1	6.0	76	255	255	54	84	74	
7	70		922.370	.97	3.3	6.5	76	255	255	54	85	75	
8	75		927.590	.93	3.2	6.0	75	254	255	54	85	76	
8	80		932.940	.97	3.3	6.5	76	255	254	54	86	76	
	TOTAL/AVERAGE												

Sample Train Leak Check

	(in. Hg)	Rate (ft³/m)
Initial	15"	0.00
Final	10"	0.00

Pitot Leak Check

Pressure	✓	+/-
Static	✓	+/-

	1	2	3	Average
CO2	14	14	14	14
O2	4	4	4	4
CO				
N2				

Fyrite Kit #: CFM6

IMP	Contents	Final	Initial	Difference
1	HNO3/H2O2	140	100	
2	HNO3/H2O2	112	100	
3	Empty	18	0	
4	KMnO4	99	100	
5	KMnO4	100	100	
6	Silica Gel	245.1	246.7	

AIR/COMPLIANCE CONSULTANTS INC.
USEPA METHOD 29 DATA SHEET

Client: Collective Efforts **Test Type:** 29 **Project Number:** 10-068

Date: 3/25/10 **Run Number:** TWO **Testers:** EW BO RF CWB CB

K-factor (K_f): 3.47 | 3.54 | **Sampling Location:** SSI stack

Traverse Point Number	Elapsed Time	Clock Time	Metered Volume (cf)	Velocity Head (Δ P)	Orifice Delta H in. H_2O	Meter Vacuum in. Hg	Stack Temp. °F	Probe Temp. Ts °F 248+/-25°	Oven Temp. °F 248+/-25°	Imp Out Temp °F < 68°	Meter Temp. °F IN/AVG	Meter Temp. °F OUT	Comments
													K=3.47
B9	85		938.085	.90	3.1	6.0	76	254	255	54	86	76	
9	90		943.300	.90	3.1	6.0	76	254	255	54	86	77	
10	95		948.440	.86	3.0	6.0	75	256	256	56	87	78	
10	100		953.565	.87	3.0	6.0	76	255	255	55	87	78	K=3.54
11	105		958.650	.83	2.9	5.5	74	255	254	55	87	78	
11	110		963.745	.84	2.9	5.5	75	255	255	56	88	78	
12	115		968.790	.78	2.7	5.5	74	255	256	57	88	79	
12	120	1025	973.517	.79	2.7	5.5	74	255	256	57	88	79	PORT CHANGE
A1	125	1028	978.525	.82	2.9	5.5	76	256	255	59	85	79	
1	130		983.610	.82	2.9	5.5	75	254	254	57	87	79	
2	135		988.845	.89	3.1	6.0	76	255	256	59	88	80	
2	140		994.070	.86	3.0	6.0	76	255	255	60	89	80	
3	145		999.480	.95	3.3	6.5	77	256	255	61	89	80	
3	150		1004.820	.92	3.2	6.0	77	256	255	61	89	80	
4	155		1010.415	.99	3.5	6.5	76	255	260	63	89	81	
4	160		1016.005	.99	3.5	6.5	76	255	253	59	90	81	
5	165		1021.610	1.0	3.5	6.5	77	255	252	52	90	81	
5	170		1027.235	1.0	3.5	6.5	77	255	253	51	90	82	
6	175		1032.875	1.0	3.5	6.5	75	255	252	50	90	82	
6	180		1038.335	.96	3.3	6.5	77	255	253	49	90	82	
7	185		1043.890	.97	3.4	6.5	76	255	252	49	90	82	
7	190		1049.485	.97	3.4	6.5	76	255	253	47	90	82	
8	195		1054.650	.87	3.0	6.0	75	255	253	47	91	82	
8	200		1059.865	.86	3.0	6.0	75	255	253	48	91	82	

AIR/COMPLIANCE CONSULTANTS INC.

USEPA METHOD 29 DATA SHEET

Client: Collective Efforts **Test Type:** 29 **Project Number:** 10-068

Date: 3/25/10 **Run Number:** TWO **Testers:** EW BO RF CwB CB

K-factor (K_f): 3.54 **Sampling Location:** SSI stack

Traverse Point Number	Elapsed Time	Clock Time	Metered Volume (cf)	Velocity Head (Δ P)	Orifice Delta H in. H_2O	Meter Vacuum in. Hg	Stack Temp. °F	Probe Temp. Ts °F 248+/-25°	Oven Temp. °F 248+/-25°	Imp Out Temp °F < 68°	Meter Temp. °F IN/AVG	Meter Temp. °F OUT	Comments
													K=3.54
9	205		1064.950	.81	2.8	5.5	75	255	253	49	91	83	
9	210		1070.015	.81	2.8	5.5	75	255	253	48	91	83	
10	215		1075.065	.80	2.8	5.5	76	255	253	48	91	83	
10	220		1080.195	.82	2.9	5.5	75	255	253	49	91	83	
11	225		1085.275	.80	2.8	5.5	76	255	252	49	91	83	
11	230		1090.340	.78	2.8	5.5	76	255	253	49	91	83	
12	235		1095.490	.82	2.9	6.0	75	256	253	49	91	83	
12	240	1228	1100.544	.78	2.8	5.5	76	255	254	50	91	83	

ACCI 1 Minute Average Data Sheet: O2, CO2			
Client	Collective Efforts LLC	**Unit**	SSI
Project No	10-068	**Operation**	mnoc
Plant	Alcosan	**Location**	exhaust stack

MINUTE	DATE	TIME	O2 (DV %)	CO2 (DV %)
RUN 2				
1	2010/03/25	08:25:12	13.5	6.3
2	2010/03/25	08:26:12	13.5	6.3
3	2010/03/25	08:27:12	13.4	6.3
4	2010/03/25	08:28:12	13.5	6.2
5	2010/03/25	08:29:12	13.5	6.2
6	2010/03/25	08:30:12	13.5	6.3
7	2010/03/25	08:31:12	13.6	6.2
8	2010/03/25	08:32:12	13.5	6.3
9	2010/03/25	08:33:12	13.6	6.2
10	2010/03/25	08:34:12	13.6	6.1
11	2010/03/25	08:35:12	13.7	6.1
12	2010/03/25	08:36:12	13.7	6.1
13	2010/03/25	08:37:12	13.7	6.1
14	2010/03/25	08:38:12	13.6	6.2
15	2010/03/25	08:39:12	13.6	6.2
16	2010/03/25	08:40:12	13.7	6.1
17	2010/03/25	08:41:12	13.6	6.1
18	2010/03/25	08:42:12	13.7	6.1
19	2010/03/25	08:43:12	13.7	6.1
20	2010/03/25	08:44:12	13.6	6.2
21	2010/03/25	08:45:12	13.7	6.1
22	2010/03/25	08:46:12	13.8	6.0
23	2010/03/25	08:47:12	13.8	6.0
24	2010/03/25	08:48:12	13.7	6.1
25	2010/03/25	08:49:12	13.8	6.0
26	2010/03/25	08:50:12	13.7	6.1
27	2010/03/25	08:51:12	13.6	6.2
28	2010/03/25	08:52:12	13.6	6.2
29	2010/03/25	08:53:12	13.7	6.1
30	2010/03/25	08:54:12	13.6	6.1
31	2010/03/25	08:55:12	13.7	6.1
32	2010/03/25	08:56:12	13.7	6.1
33	2010/03/25	08:57:12	13.7	6.1
34	2010/03/25	08:58:12	13.6	6.1
35	2010/03/25	08:59:12	13.6	6.2
36	2010/03/25	09:00:12	13.6	6.2
37	2010/03/25	09:01:12	13.5	6.3
38	2010/03/25	09:02:12	13.5	6.3
39	2010/03/25	09:03:12	13.5	6.3
40	2010/03/25	09:04:12	13.4	6.3
41	2010/03/25	09:05:12	13.5	6.2
42	2010/03/25	09:06:12	13.5	6.2
43	2010/03/25	09:07:12	13.5	6.3
44	2010/03/25	09:08:12	13.6	6.2
45	2010/03/25	09:09:12	13.6	6.2
46	2010/03/25	09:10:12	13.5	6.2
47	2010/03/25	09:11:12	13.5	6.3
48	2010/03/25	09:12:12	13.4	6.3
49	2010/03/25	09:13:12	13.5	6.3
50	2010/03/25	09:14:12	13.6	6.2
51	2010/03/25	09:15:12	13.5	6.2
52	2010/03/25	09:16:12	13.4	6.3
53	2010/03/25	09:17:12	13.5	6.3
54	2010/03/25	09:18:12	13.6	6.2
55	2010/03/25	09:19:12	13.5	6.3
56	2010/03/25	09:20:12	13.6	6.2
57	2010/03/25	09:21:12	13.5	6.3
58	2010/03/25	09:22:12	13.5	6.3
59	2010/03/25	09:23:12	13.5	6.2
60	2010/03/25	09:24:12	13.5	6.3
61	2010/03/25	09:25:12	13.6	6.2
62	2010/03/25	09:26:12	13.7	6.1
63	2010/03/25	09:27:12	13.7	6.1
64	2010/03/25	09:28:12	13.6	6.2
65	2010/03/25	09:29:12	13.6	6.2
66	2010/03/25	09:30:12	13.5	6.2

ACCI 1 Minute Average Data Sheet: O2, CO2			
Client	Collective Efforts LLC	**Unit**	SSI
Project No	10-068	**Operation**	mnoc
Plant	Alcosan	**Location**	exhaust stack

MINUTE	DATE	TIME	O2 (DV %)	CO2 (DV %)
67	2010/03/25	09:31:12	13.6	6.2
68	2010/03/25	09:32:12	13.6	6.2
69	2010/03/25	09:33:12	13.5	6.2
70	2010/03/25	09:34:12	13.5	6.3
71	2010/03/25	09:35:12	13.6	6.2
72	2010/03/25	09:36:12	13.5	6.3
73	2010/03/25	09:37:12	13.6	6.2
74	2010/03/25	09:38:12	13.6	6.2
75	2010/03/25	09:39:12	13.6	6.2
76	2010/03/25	09:40:12	13.6	6.2
77	2010/03/25	09:41:12	13.6	6.2
78	2010/03/25	09:42:12	13.6	6.2
79	2010/03/25	09:43:12	13.6	6.2
80	2010/03/25	09:44:12	13.5	6.3
81	2010/03/25	09:45:12	13.6	6.2
82	2010/03/25	09:46:12	13.5	6.2
83	2010/03/25	09:47:12	13.5	6.2
84	2010/03/25	09:48:12	13.5	6.3
85	2010/03/25	09:49:12	13.5	6.3
86	2010/03/25	09:50:12	13.5	6.3
87	2010/03/25	09:51:12	13.6	6.2
88	2010/03/25	09:52:12	13.5	6.2
89	2010/03/25	09:53:12	13.6	6.2
90	2010/03/25	09:54:12	13.5	6.3
91	2010/03/25	09:55:12	13.5	6.3
92	2010/03/25	09:56:12	13.6	6.2
93	2010/03/25	09:57:12	13.6	6.2
94	2010/03/25	09:58:12	13.6	6.2
95	2010/03/25	09:59:12	13.7	6.1
96	2010/03/25	10:00:12	13.6	6.2
97	2010/03/25	10:01:12	13.6	6.2
98	2010/03/25	10:02:12	13.6	6.2
99	2010/03/25	10:03:12	13.6	6.2
100	2010/03/25	10:04:12	13.6	6.2
101	2010/03/25	10:05:12	13.4	6.3
102	2010/03/25	10:06:12	13.4	6.3
103	2010/03/25	10:07:12	13.4	6.3
104	2010/03/25	10:08:12	13.5	6.2
105	2010/03/25	10:09:12	13.5	6.2
106	2010/03/25	10:10:12	13.5	6.2
107	2010/03/25	10:11:12	13.6	6.2
108	2010/03/25	10:12:12	13.5	6.2
109	2010/03/25	10:13:12	13.6	6.1
110	2010/03/25	10:14:12	13.6	6.1
111	2010/03/25	10:15:12	13.6	6.1
112	2010/03/25	10:16:12	13.6	6.2
113	2010/03/25	10:17:12	13.6	6.2
114	2010/03/25	10:18:12	13.6	6.1
115	2010/03/25	10:19:12	13.5	6.2
116	2010/03/25	10:20:12	13.6	6.2
117	2010/03/25	10:21:12	13.5	6.2
118	2010/03/25	10:22:12	13.5	6.2
119	2010/03/25	10:23:12	13.4	6.3
120	2010/03/25	10:24:12	13.4	6.4
121	2010/03/25	10:25:12	13.3	6.4
122	2010/03/25	10:26:12	13.4	6.4
123	2010/03/25	10:27:12	13.4	6.4
124	2010/03/25	10:28:12	13.4	6.4
125	2010/03/25	10:29:12	13.3	6.4
126	2010/03/25	10:30:12	13.3	6.4
127	2010/03/25	10:31:12	13.4	6.3
128	2010/03/25	10:32:12	13.5	6.3
129	2010/03/25	10:33:12	13.4	6.4
130	2010/03/25	10:34:12	13.4	6.3
131	2010/03/25	10:35:12	13.5	6.3
132	2010/03/25	10:36:12	13.5	6.3
133	2010/03/25	10:37:12	13.5	6.3

ACCI 1 Minute Average Data Sheet: O2, CO2			
Client	Collective Efforts LLC	**Unit**	SSI
Project No	10-068	**Operation**	mnoc
Plant	Alcosan	**Location**	exhaust stack

MINUTE	DATE	TIME	O2 (DV %)	CO2 (DV %)
134	2010/03/25	10:38:12	13.5	6.2
135	2010/03/25	10:39:12	13.6	6.2
136	2010/03/25	10:40:12	13.5	6.3
137	2010/03/25	10:41:12	13.4	6.3
138	2010/03/25	10:42:12	13.4	6.3
139	2010/03/25	10:43:12	13.5	6.2
140	2010/03/25	10:44:12	13.5	6.3
141	2010/03/25	10:45:12	13.5	6.3
142	2010/03/25	10:46:12	13.5	6.2
143	2010/03/25	10:47:12	13.5	6.3
144	2010/03/25	10:48:12	13.6	6.2
145	2010/03/25	10:49:12	13.5	6.2
146	2010/03/25	10:50:12	13.5	6.2
147	2010/03/25	10:51:12	13.6	6.2
148	2010/03/25	10:52:12	13.6	6.2
149	2010/03/25	10:53:12	13.5	6.3
150	2010/03/25	10:54:12	13.5	6.3
151	2010/03/25	10:55:12	13.6	6.2
152	2010/03/25	10:56:12	13.6	6.2
153	2010/03/25	10:57:12	13.6	6.2
154	2010/03/25	10:58:12	13.5	6.2
155	2010/03/25	10:59:12	13.4	6.3
156	2010/03/25	11:00:12	13.5	6.3
157	2010/03/25	11:01:12	13.5	6.3
158	2010/03/25	11:02:12	13.5	6.2
159	2010/03/25	11:03:12	13.6	6.2
160	2010/03/25	11:04:12	13.5	6.3
161	2010/03/25	11:05:12	13.5	6.3
162	2010/03/25	11:06:12	13.5	6.3
163	2010/03/25	11:07:12	13.5	6.2
164	2010/03/25	11:08:12	13.5	6.2
165	2010/03/25	11:09:12	13.5	6.3
166	2010/03/25	11:10:12	13.5	6.3
167	2010/03/25	11:11:12	13.4	6.3
168	2010/03/25	11:12:12	13.5	6.3
169	2010/03/25	11:13:12	13.5	6.3
170	2010/03/25	11:14:12	13.5	6.3
171	2010/03/25	11:15:12	13.4	6.4
172	2010/03/25	11:16:12	13.4	6.3
173	2010/03/25	11:17:12	13.4	6.3
174	2010/03/25	11:18:12	13.5	6.3
175	2010/03/25	11:19:12	13.4	6.3
176	2010/03/25	11:20:12	13.4	6.4
177	2010/03/25	11:21:12	13.4	6.4
178	2010/03/25	11:22:12	13.3	6.5
179	2010/03/25	11:23:12	13.2	6.5
180	2010/03/25	11:24:12	13.3	6.5
181	2010/03/25	11:25:12	13.4	6.4
182	2010/03/25	11:26:12	13.3	6.4
183	2010/03/25	11:27:12	13.3	6.4
184	2010/03/25	11:28:12	13.4	6.4
185	2010/03/25	11:29:12	13.4	6.4
186	2010/03/25	11:30:12	13.3	6.4
187	2010/03/25	11:31:12	13.3	6.4
188	2010/03/25	11:32:12	13.4	6.4
189	2010/03/25	11:33:12	13.3	6.4
190	2010/03/25	11:34:12	13.2	6.5
191	2010/03/25	11:35:12	13.3	6.4
192	2010/03/25	11:36:12	13.4	6.3
193	2010/03/25	11:37:12	13.4	6.4
194	2010/03/25	11:38:12	13.4	6.4
195	2010/03/25	11:39:12	13.4	6.4
196	2010/03/25	11:40:12	13.6	6.2
197	2010/03/25	11:41:12	13.7	6.1
198	2010/03/25	11:42:12	13.8	6.1
199	2010/03/25	11:43:12	13.9	6.0
200	2010/03/25	11:44:12	13.8	6.0

ACCI 1 Minute Average Data Sheet: O2, CO2			
Client	Collective Efforts LLC	**Unit**	SSI
Project No	10-068	**Operation**	mnoc
Plant	Alcosan	**Location**	exhaust stack

MINUTE	DATE	TIME	O2 (DV %)	CO2 (DV %)
201	2010/03/25	11:45:12	13.8	6.0
202	2010/03/25	11:46:12	13.8	6.0
203	2010/03/25	11:47:12	13.8	6.0
204	2010/03/25	11:48:12	13.9	6.0
205	2010/03/25	11:49:12	13.9	5.9
206	2010/03/25	11:50:12	13.8	6.0
207	2010/03/25	11:51:12	13.8	6.0
208	2010/03/25	11:52.12	13.8	6.0
209	2010/03/25	11:53:12	13.9	5.9
210	2010/03/25	11:54:12	14.0	5.8
211	2010/03/25	11:55:12	14.0	5.9
212	2010/03/25	11:56:12	13.9	6.0
213	2010/03/25	11:57:12	13.9	5.9
214	2010/03/25	11:58:12	13.9	5.9
215	2010/03/25	11:59:12	13.8	6.0
216	2010/03/25	12:00:12	13.9	5.9
217	2010/03/25	12:01:12	14.0	5.9
218	2010/03/25	12:02:12	13.9	5.9
219	2010/03/25	12:03:12	13.9	5.9
220	2010/03/25	12:04:12	13.9	5.9
221	2010/03/25	12:05:12	14.0	5.9
222	2010/03/25	12:06:12	13.9	6.0
223	2010/03/25	12:07:12	13.9	6.0
224	2010/03/25	12:08:12	13.8	6.0
225	2010/03/25	12:09:12	13.8	6.0
226	2010/03/25	12:10:12	13.8	6.0
227	2010/03/25	12:11:12	13.9	5.9
228	2010/03/25	12:12:12	13.9	5.9
229	2010/03/25	12:13:12	13.9	6.0
230	2010/03/25	12:14:12	13.9	6.0
231	2010/03/25	12:15:12	13.9	5.9
232	2010/03/25	12:16:12	13.9	5.9
233	2010/03/25	12:17:12	13.9	6.0
234	2010/03/25	12:18:12	13.8	6.0
235	2010/03/25	12:19.12	13.8	6.0
236	2010/03/25	12:20:12	13.8	6.1
237	2010/03/25	12:21:12	13.9	6.0
238	2010/03/25	12:22:12	13.8	6.0
239	2010/03/25	12:23:12	13.8	6.0
240	2010/03/25	12:24:12	13.7	6.1
RUN 2 AVERAGES			**13.6**	**6.2**

ACCI CEM Calibration, Bias and Drift Data Sheet
Based on 40 CFR Part 60, Appendix A-4, Method 7E

Client	Collective Efforts LLC	**Date**	March 25, 2010
Project No	10-068	**Location**	exhaust stack
Plant	Alcosan	**Run**	Run 2
Unit	SSI	**Start Time**	8:25
Operation	mnoc	**End Time**	12:25
Tester(s)	wo,ew,jv,cb,rf		

Cal.	LOW		MID		HIGH		Tank ID				Conc.
Gas	Conc.	(% of Span)	Conc.	(% of Span)	Conc.	(% of Span)	LOW	MID	HIGH	Span	Units
O2	N/A	N/A	10.01	44.5	22.47	100.0	N/A	eb001355	cc251892	22.47	d. vol. %
CO2	N/A	N/A	9.96	44.2	22.54	100.0	N/A	cc251892	eb001355	22.54	d. vol. %
LIMITS				40 % to 60 %		100%					

	Upscale: Enter "Low" "Mid" or "High"			Initial Values		Final Values				Average of Initial and Final	Average Indicated	Corrected	
Gas	below "Zero"	Actual Upscale Conc.	Analyzer Cal. Response	System Cal. Response	System Cal. Bias (% of Span)	System Cal. Response	System Cal. Bias (% of Span)	Drift (% of Span)	Span	System Responses	Gas Conc.	Gas Conc.	Conc. Units
O2	Zero		-0.1	0.1	0.89	0.0	0.45	-0.45	22.47	0.05			
	Mid	10.01	10.1	10.0	-0.45	10.0	-0.45	0.00	22.47	10	13.58	13.61	d. vol. %
CO2	Zero		0.1	0.1	0.00	0.2	0.44	0.44	22.54	0.15			
	Mid	9.96	9.7	9.6	-0.44	9.8	0.44	0.89	22.54	9.7	6.20	6.31	d. vol. %
LIMITS					+/- 5 %		+/- 5 %	+/- 3 %					

	ZERO Analyzer Response	ZERO Analyzer Cal. Error	LOW	LOW Analyzer Response	LOW Analyzer Cal. Error	LOW System Cal. Error	MID	MID Analyzer Response	MID Analyzer Cal. Error	MID System Cal. Error	HIGH	HIGH Analyzer Response	HIGH Analyzer Cal. Error	HIGH System Calibration Error		
Gas	(System for THC)	(% of Span)	Actual Conc.	(System for THC)	(% of Span)	(% of Actual)	Actual Conc.	(System for THC)	(% of Span)	(% of Actual)	Actual Conc.	(System for THC)	(% of Span)	(% of Actual)	Span	Conc. Units
O2	-0.1	-0.45					10.01	10.1	0.40		22.47	22.6	0.58		22.47	d. vol. %
CO2	0.1	0.44					9.96	9.7	-1.15		22.54	22.8	1.15		22.54	d. vol. %
LIMITS		+/- 2 %			+/- 2 %	+/- 5 %			+/- 2 %	+/- 5 %			+/- 2 %	+/- 5 %		

Client:	Collective Efforts LLC	Test Date:	March 25, 2010
Project No.:	10-068	Test Location:	exhaust stack
Plant:	Alcosan	Test Run:	Run 2
Unit:	SSI	Test Start Time:	8:25 AM
Unit Operation:	mnoc	Test Finish Time:	12:28 PM

Blue is data input. Red is a calculation. Pink is a reference to a cell on another sheet. Green is a reference to a cell on this sheet.

Data Input

Control Box:	1462	
Meter $DH_@$ (0.75 scfm)	1.533	in. H_2O
Meter Calibration Factor (Yd)	1.004	
Test Time (Theta)	240	minutes
Barometric Pressure (Pbar)	29.20	in. Hg
Stack Static Pressure (Pg)	0.57	in. H_2O
Stack Diameter (Ds) (L if rectangular)	36.5	inches
Stack Width (enter 0 if circular stack)	0.0	inches
Nozzle Diameter (Dn)	0.250	inches
CO2	6.31	% dv
O2	13.61	% dv
Pitot Tube Coefficient (Cp)	0.84	
Sample Calculation Title	Metals Testing Results	
F_d @ 68 F and 760 mm Hg	0	dscf/MMBtu
Standard Temperature	68	F
Standard Pressure	760	mm Hg
Pitot Tube Constant (Kp)	85.49	

Calculations

Meter Temperature (Tm)	81.7	F
Stack Temperature (Tsavg)	75.3	F
Orifice Pressure Drop (dHavg)	3.113	in. H_2O
GasVelocity Head (dP)^^avg	0.9480	in. H_2O^1/2
F_d @ Standard Conditions	NA	dscf/MMBtu
F_d @ Stan. Cond. & Actual O2	0	dscf/MMBtu
Heat Input Based on F_d	NA	MMBtu/hr
K1method 4	0.04706	scf/ml
K2method 4	0.04715	scf/g
K1method 5	17.64	R/in. Hg
K4method 5	0.0945	
Standard lb-mole volume	385.3	ft^3/lb-mole

Production Rate

Product Rate		metric ton/hr
Product Rate	1.88	ton/hr

Calculations

CO + N2	80.08	% dv
Water Collected (V_f - V_i)	69.0	ml
Water Vapor Condensed (Vwc(std))	3.247	scf
Water Collected (W_f - W_i)	12.8	g
Water Vapor in Silica Gel (Vwsg(std))	0.604	scf
Vol. Water Vapor in Gas Stand.(Vw(std))	3.851	scf
Volume Dry Gas Metered (Vm)	251.644	dacf
Vol. Dry Gas Metered Stand.(Vm(std))	242.136	dscf
Volume Dry Gas Metered (Vm(m^3))	7.126	dacm
Vol. Dry Gas Metered Stand.(Vm(std)m^3)	6.857	dscm
Stack Absolute Pressure (Ps)	29.24	in. Hg
Stack Absolute Temperature (Tsavg)	534.9	R
H2O Vapor Pressure @ avg Stack Temp.	0.88	in. Hg
H2O in the gas at saturation (Bws)	0.0302	vol. fraction
H2O in the gas from test data (Bws)	0.0157	vol. fraction
H2O in the gas used (lower of the 2 Bws)	0.0157	vol. fraction
Is the Gas Stream Saturated With H2O?	NO	
Dry Gas Molecular Weight (Md)	29.55	lb/lb-mole
Wet Gas Molecular Weight (Ms)	29.37	lb/lb-mole
Gas Velocity (Vs)	53.74	ft/s
Is the stack circular or rectangular?	CIRCULAR	
Area Stack (As)	7.266	ft^
Actual Gas Flowrate	23,430	acfm
Standard Gas Flowrate	22,588	scfm
Dry Standard Gas Flowrate	22,235	dscfm
Actual Gas Flowrate	663	acm/min
Standard Gas Flowrate	640	scm/min
Dry Standard Gas Flowrate	630	dscm/min
Area Nozzle (An)	0.000341	ft^2
Percent of Isokinetic Sampling (I)	96.78	%

Metals

Mercury			Cobalt		
Emission Mass	69.185	(ug)	Emission Mass (Front Half)	0.94	(ug)
			Emission Mass (Back Half)	0.20	(ug)
Emission Mass (total)	69.19	(ug)	Emission Mass (total)	1.14	(ug)
Emission Mass	69.19	(ug)	Emission Mass	1.14	(ug)
Collection Efficiency	1.0000	(%)	Collection Efficiency	0.9998	(%)
Emission Concentration	10.090	(ug/DSCM)	Emission Concentration	0.166	(ug/DSCM)
Emission Rate	8.40E-04	(lb/hr)	Emission Rate	1.39E-05	(lb/hr)
Emission Rate	NA	(lb/MMBTU)	Emission Rate	NA	(lb/MMBTU)
Emission Rate	4.47E-04	(lb/ton product)	Emission Rate	7.37E-06	(lb/ton product)

Collective Efforts LLC Run 2 — **F or C? F=1,C=0** 1

SSI

Point	Pitot DP (dP) (in. H2O)	SQRT dP (in. H2O)^1/2	Orifice DP (dH) (in. H2O)	Stack Temp (F)	Meter Temp In/Out (F or C)	(F or C)
A-1	0.73	0.8544	2.4	72	67	67
1	0.72	0.8485	2.4	72	69	67
2	0.87	0.9327	2.9	73	71	67
2	0.88	0.9381	2.9	74	74	68
3	0.99	0.9950	3.3	74	77	69
3	0.99	0.9950	3.4	75	78	69
4	1.00	1.0000	3.4	76	79	70
4	1.00	1.0000	3.4	74	80	71
5	1.00	1.0000	3.4	74	81	72
5	1.00	1.0000	3.4	75	82	72
6	1.10	1.0488	3.8	75	83	73
6	1.10	1.0488	3.8	75	84	74
7	0.92	0.9592	3.1	76	84	74
7	0.97	0.9849	3.3	76	85	75
8	0.93	0.9644	3.2	75	85	76
8	0.97	0.9849	3.3	76	86	76
9	0.90	0.9487	3.1	76	86	76
9	0.90	0.9487	3.1	76	86	77
10	0.88	0.9381	3.0	75	87	78
10	0.87	0.9327	3.0	76	87	78
11	0.83	0.9110	2.9	74	87	78
11	0.84	0.9165	2.9	75	88	78
12	0.78	0.8832	2.7	74	88	79
12	0.79	0.8888	2.7	74	88	79
B-1	0.82	0.906	2.9	76	85	79
1	0.82	0.906	2.9	75	87	79
2	0.89	0.943	3.1	76	88	80
2	0.86	0.927	3.0	76	89	80
3	0.95	0.975	3.3	77	89	80
3	0.92	0.959	3.2	77	89	80
4	0.99	0.995	3.5	76	89	81
4	0.99	0.995	3.5	76	90	81
5	1.00	1.000	3.5	77	90	81
5	1.00	1.000	3.5	77	90	82
6	1.00	1.000	3.5	75	90	82
6	0.96	0.980	3.3	77	90	82
7	0.97	0.985	3.4	76	90	82
7	0.97	0.985	3.4	76	90	82
8	0.87	0.933	3.0	75	91	82
8	0.86	0.927	3.0	75	91	82
9	0.81	0.900	2.8	75	91	83
9	0.81	0.900	2.8	75	91	83
10	0.80	0.894	2.8	76	91	83
10	0.82	0.906	2.9	75	91	83
11	0.80	0.894	2.8	76	91	83
11	0.78	0.883	2.8	76	91	83
12	0.82	0.906	2.9	75	91	83
12	0.78	0.883	2.8	76	91	83

Antimony		
Emission Mass (Front Half)	0.80	(ug)
Emission Mass (Back Half)	0.00	(ug)
Emission Mass (total)	0.80	(ug)
Emission Mass	0.80	(ug)
Collection Efficiency	1.0000	(%)
Emission Concentration	0.117	(ug/DSCM)
Emission Rate	9.72E-06	(lb/hr)
Emission Rate	NA	(lb/MMBTU)
Emission Rate	5.17E-06	(lb/ton product)

Arsenic		
Emission Mass (Front Half)	0.80	(ug)
Emission Mass (Back Half)	0.00	(ug)
Emission Mass (total)	0.80	(ug)
Emission Mass	0.80	(ug)
Collection Efficiency	1.0000	(%)
Emission Concentration	0.117	(ug/DSCM)
Emission Rate	9.72E-06	(lb/hr)
Emission Rate	NA	(lb/MMBTU)
Emission Rate	5.17E-06	(lb/ton product)

Beryllium		
Emission Mass (Front Half)	0.20	(ug)
Emission Mass (Back Half)	0.00	(ug)
Emission Mass (total)	0.20	(ug)
Emission Mass	0.20	(ug)
Collection Efficiency	1.0000	(%)
Emission Concentration	0.029	(ug/DSCM)
Emission Rate	2.43E-06	(lb/hr)
Emission Rate	NA	(lb/MMBTU)
Emission Rate	1.29E-06	(lb/ton product)

Cadmium		
Emission Mass (Front Half)	0.74	(ug)
Emission Mass (Back Half)	0.75	(ug)
Emission Mass (total)	1.49	(ug)
Emission Mass	1.49	(ug)
Collection Efficiency	0.9995	(%)
Emission Concentration	0.217	(ug/DSCM)
Emission Rate	1.80E-05	(lb/hr)
Emission Rate	NA	(lb/MMBTU)
Emission Rate	9.60E-06	(lb/ton product)

Chromium		
Emission Mass (Front Half)	29.70	(ug)
Emission Mass (Back Half)	0.63	(ug)
Emission Mass (total)	30.33	(ug)
Emission Mass	30.33	(ug)
Collection Efficiency	1.0000	(%)
Emission Concentration	4.423	(ug/DSCM)
Emission Rate	3.68E-04	(lb/hr)
Emission Rate	NA	(lb/MMBTU)
Emission Rate	1.96E-04	(lb/ton product)

Lead		
Emission Mass (Front Half)	2.24	(ug)
Emission Mass (Back Half)	0.51	(ug)
Emission Mass (total)	2.75	(ug)
Emission Mass	2.75	(ug)
Collection Efficiency	0.9998	(%)
Emission Concentration	0.401	(ug/DSCM)
Emission Rate	3.34E-05	(lb/hr)
Emission Rate	NA	(lb/MMBTU)
Emission Rate	1.78E-05	(lb/ton product)

Manganese		
Emission Mass (Front Half)	61.0	(ug)
Emission Mass (Back Half)	2.95	(ug)
Emission Mass (total)	63.95	(ug)
Emission Mass	63.95	(ug)
Collection Efficiency	1.0000	(%)
Emission Concentration	9.327	(ug/DSCM)
Emission Rate	7.77E-04	(lb/hr)
Emission Rate	NA	(lb/MMBTU)
Emission Rate	4.13E-04	(lb/ton product)

Nickel		
Emission Mass (Front Half)	38.40	(ug)
Emission Mass (Back Half)	1.20	(ug)
Emission Mass (total)	39.60	(ug)
Emission Mass	39.60	(ug)
Collection Efficiency	1.0000	(%)
Emission Concentration	5.775	(ug/DSCM)
Emission Rate	4.81E-04	(lb/hr)
Emission Rate	NA	(lb/MMBTU)
Emission Rate	2.56E-04	(lb/ton product)

Selenium		
Emission Mass (Front Half)	8.30	(ug)
Emission Mass (Back Half)	0.65	(ug)
Emission Mass (total)	8.95	(ug)
Emission Mass	8.95	(ug)
Collection Efficiency	0.9999	(%)
Emission Concentration	1.305	(ug/DSCM)
Emission Rate	1.09E-04	(lb/hr)
Emission Rate	NA	(lb/MMBTU)
Emission Rate	5.78E-05	(lb/ton product)

Average	0.90	0.948	3.11	75.3		81.7
Initial volume	848.900	ft^3	Initial volume	0.000	liters	
Final volume	1100.544	ft^3	Final volume	0.000	liters	
Total metered	251.644	dacf	Total metered	0.000	dry actual liters	

Impinger	Final grams	Initial grams	Gram Gain	Final ml	Initial ml	ml Gain
1			0.0	140.0	100.0	40.0
2			0.0	112.0	100.0	12.0
3			0.0	18.0	0.0	18.0
4			0.0	99.0	100.0	-1.0
5			0.0	100.0	100.0	0.0
6	259.1	246.3	12.8			0.0
7			0.0			0.0
8			0.0			0.0
9			0.0			0.0
10			0.0			0.0
Total	259.1	246.3	12.8	469.0	400.0	69.0
	W_f	W_i	$(W_f - W_i)$	V_f	V_i	$(V_f - V_i)$

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AIR/COMPLIANCE CONSULTANTS INC.

USEPA METHOD 29 DATA SHEET

Client:	Collective Efforts	**Test Type:**	29	**Meter Delta H@:**	1.533	**Start Time:**	1310
Date:	3/25/10	**Run Number:**	THREE	**Meter Correction:**	1.004	**Stop Time:**	1716
Plant:	Alcosan	**Nozzle Dia:**	.250	**Pitot Correction:**	.84	**Umbilical Length:**	50-7
Sampling Location:	SSI stack	**Static Press, Ps:**	+.57	**Control Box Num.:**	1462	**Probe Number:**	4-3
		Barometric Press:	29.20	**Assumed Moisture:**	3%	**Pitot Number:**	4-3
Project Number:	10-068	**Ambient Temp:**	70 °F	**Thermocouple ID:**	4-3	**Filter Number:**	NA
Test Crew:	EW BO RF CWB CB	**K-factor (K_f)**	3.54			**Stack Diameter:**	36.5"

Traverse Point Number	Elapsed Time	Clock Time	Metered Volume (cf)	Velocity Head (D P)	Orifice Delta H in. H_2O	Meter Vacuum in. Hg	Stack Temp. °F	Probe Temp. Ts °F	Oven Temp. °F	Imp Out Temp °F	Meter Temp. °F		Comments
											IN/AVG	OUT	
		1310	103.820					248+/-25°	248+/-25°	< 68°			K=3.54
A1	5		108.650	.77	2.7	6.0	79	254	254	56	80	80	
1	10		113.695	.79	2.7	6.0	78	254	252	53	83	80	
2	15		118.495	.75	2.6	5.5	78	254	253	58	86	80	
2	20		123.390	.75	2.6	5.5	79	255	253	59	86	80	
3	25		128.315	.77	2.7	6.0	77	255	253	60	87	80	
3	30		133.235	.77	2.7	6.0	78	255	252	61	88	81	
4	35		138.165	.76	2.6	6.0	78	255	254	62	88	81	
4	40		143.410	.77	2.7	6.0	78	255	253	63	89	81	
5	45		148.000	.81	2.8	6.0	78	255	253	64	89	82	
5	50		153.205	.82	2.9	6.0	78	255	253	65	89	82	
6	55		158.075	.77	2.7	6.0	78	255	254	62	90	83	
6	60		163.055	.77	2.7	6.0	78	254	253	59	90	83	
7	65		167.950	.74	2.6	5.5	76	256	253	57	90	83	
7	70		172.920	.76	2.7	6.0	77	255	254	56	90	83	
8	75		178.215	.89	3.1	7.0	78	254	253	56	90	83	
8	80		183.530	.86	3.0	7.0	79	255	252	56	91	84	
		TOTAL/AVERAGE											

Sample Train Leak Check

	(in. Hg)	Rate (ft³/m)
Initial	15"	0.00
Final	10"	0.00

Pitot Leak Check

Pressure	√	+/-
Static	√	+/-

	1	2	3	Average
CO2		C9 MS		
O2				
CO				
N2				

Fyrite Kit #: _____

IMP	Contents	Final	Initial	Difference
1	HNO3/H2O2	152	100	
2	HNO3/H2O2	100	100	
3	Empty	0	0	
4	KMnO4	102	100	
5	KMnO4	102	100	
6	Silica Gel	2428	2448	

AIR/COMPLIANCE CONSULTANTS INC.

USEPA METHOD 29 DATA SHEET

Client: Collective Efforts **Test Type:** 29 **Project Number:** 10-068

Date: 3/25/10 **Run Number:** THREE **Testers:** FAW BG RF CWB CB

K-factor (K_f): 3.54 **Sampling Location:** SSI stack

Traverse Point Number	Elapsed Time	Clock Time	Metered Volume (cf)	Velocity Head (Δ P)	Orifice Delta H in. H_2O	Meter Vacuum in. Hg	Stack Temp. °F	Probe Temp. Ts °F	Oven Temp. °F	Imp Out Temp °F	Meter Temp. °F		Comments
								248+/-25°	248+/-25°	< 68°	IN/AVG	OUT	K=3.54
A9	85		188.810	.85	3.0	7.0	78	256	254	57	91	84	
9	90		194.075	.86	3.0	7.0	78	255	253	57	91	84	
10	95		199.435	.89	3.2	7.0	77	255	253	58	91	85	
10	100		204.815	.89	3.2	7.0	77	256	253	58	92	85	
11	105		210.125	.85	3.6	7.0	78	255	253	59	92	85	
11	110		215.485	.87	3.1	6.5	78	255	252	60	92	85	
12	115		220.780	.84	3.0	~~7.0~~ 6.5	79	255	252	61	92	86	
12	120	1510	226.090	.86	3.0	6.5	78	255	252	62	92	86	
B1	125	1516	230.995	.75	2.7	6.0	78	255	253	63	90	86	
1	130		235.935	.75	2.7	6.0	77	254	252	63	92	86	
2	135		241.065	.79	2.8	6.0	78	255	254	56	92	86	
2	140		246.355	.82	2.9	6.5	78	254	253	53	92	86	
3	145		251.450	.82	2.9	6.5	79	255	252	53	92	86	
3	150		256.600	.80	2.8	6.5	78	255	253	54	92	86	
4	155		261.735	.83	2.9	6.0	79	255	253	54	92	86	
4	160		266.840	.83	2.9	6.0	79	255	252	54	92	86	
5	165		272.030	.84	3.0	6.0	79	255	253	55	92	87	
5	170		277.295	.85	3.0	6.5	79	255	253	55	93	87	
6	175		282.535	.86	3.0	6.5	78	255	254	55	93	87	
6	180		287.785	.86	3.0	6.5	78	256	253	56	94	87	
7	185		293.040	.86	3.0	6.5	78	255	253	56	94	87	
7	190		298.565	.96	3.4	7.0	77	255	252	58	95	89	
8	195		304.105	.93	3.3	7.0	77	255	253	59	95	88	
8	200		309.545	.92	3.3	7.0	77	255	253	59	95	88	

AIR/COMPLIANCE CONSULTANTS INC.
USEPA METHOD 29 DATA SHEET

Client: Collective Efforts **Test Type:** 29 **Project Number:** 10-068

Date: 3/25/10 **Run Number:** THREE **Testers:** EW BO RF CWB CB

K-factor (K_f): 3.54 **Sampling Location:** SSI stack

Traverse Point Number	Elapsed Time	Clock Time	Metered Volume (cf)	Velocity Head (Δ P)	Orifice Delta H in. H_2O	Meter Vacuum in. Hg	Stack Temp. °F	Probe Temp. Ts °F	Oven Temp. °F	Imp Out Temp °F	Meter Temp. °F		Comments
			309.545					248+/-25°	248+/-25°	< 68°	IN/AVG	OUT	K=3.54
139	205		314.960	.92	3.3	7.0	75	255	252	61	95	89	
9	210		320.475	.92	3.3	7.0	76	255	254	62	94	89	
10	215		325.830	.90	3.2	7.0	75	255	254	62	94	89	
10	220		331.035	.79	2.8	6.5	75	255	253	64	94	89	
11	225		336.080	.81	2.9	6.0	76	255	252	64	94	89	
11	230		340.175	.80	2.8	6.0	78	255	250	65	94	88	
12	235		345.270	.82	2.9	6.0	76	255	254	65	94	88	
12	240		351.315	.80	2.8	6.0	77	255	252	65	93	88	

ACCI 1 Minute Average Data Sheet: O2, CO2			
Client	Collective Efforts LLC	**Unit**	SS1
Project No	10-068	**Operation**	mnoc
Plant	Alcosan	**Location**	exhaust stack

MINUTE	DATE	TIME	O2 (DV %)	CO2 (DV %)
RUN 3				
1	2010/03/25	13:10:12	13.1	6.5
2	2010/03/25	13:11:12	13.1	6.5
3	2010/03/25	13:12:12	13.0	6.5
4	2010/03/25	13:13:12	13.1	6.5
5	2010/03/25	13:14:12	13.1	6.5
6	2010/03/25	13:15:12	13.1	6.5
7	2010/03/25	13:16:12	13.1	6.5
8	2010/03/25	13:17:12	13.0	6.5
9	2010/03/25	13:18:12	13.1	6.5
10	2010/03/25	13:19:12	13.1	6.5
11	2010/03/25	13:20:12	13.1	6.4
12	2010/03/25	13:21:12	13.1	6.4
13	2010/03/25	13:22:12	13.0	6.5
14	2010/03/25	13:23:12	13.0	6.5
15	2010/03/25	13:24:12	13.0	6.5
16	2010/03/25	13:25:12	13.0	6.5
17	2010/03/25	13:26:12	13.0	6.5
18	2010/03/25	13:27:12	13.1	6.5
19	2010/03/25	13:28:12	13.1	6.4
20	2010/03/25	13:29:12	13.2	6.4
21	2010/03/25	13:30:12	13.2	6.3
22	2010/03/25	13:31:12	13.3	6.3
23	2010/03/25	13:32:12	13.3	6.3
24	2010/03/25	13:33:12	13.3	6.3
25	2010/03/25	13:34:12	13.3	6.3
26	2010/03/25	13:35:12	13.3	6.3
27	2010/03/25	13:36:12	13.2	6.3
28	2010/03/25	13:37:12	13.2	6.4
29	2010/03/25	13:38:12	13.2	6.4
30	2010/03/25	13:39:12	13.3	6.3
31	2010/03/25	13:40:12	13.3	6.3
32	2010/03/25	13:41:12	13.3	6.3
33	2010/03/25	13:42:12	13.3	6.3
34	2010/03/25	13:43:12	13.2	6.3
35	2010/03/25	13:44:12	13.3	6.3
36	2010/03/25	13:45:12	13.3	6.3
37	2010/03/25	13:46:12	13.3	6.3
38	2010/03/25	13:47:12	13.2	6.3
39	2010/03/25	13:48:12	13.2	6.3
40	2010/03/25	13:49:12	13.2	6.4
41	2010/03/25	13:50:12	13.2	6.4
42	2010/03/25	13:51:12	13.2	6.3
43	2010/03/25	13:52:12	13.2	6.4
44	2010/03/25	13:53:12	13.2	6.4
45	2010/03/25	13:54:12	13.2	6.4
46	2010/03/25	13:55:12	13.2	6.4
47	2010/03/25	13:56:12	13.1	6.4
48	2010/03/25	13:57:12	13.1	6.5
49	2010/03/25	13:58:12	13.1	6.4
50	2010/03/25	13:59:12	13.1	6.4
51	2010/03/25	14:00:12	13.2	6.4
52	2010/03/25	14:01:12	13.2	6.4
53	2010/03/25	14:02:12	13.2	6.3
54	2010/03/25	14:03:12	13.2	6.3
55	2010/03/25	14:04:12	13.2	6.4
56	2010/03/25	14:05:12	13.1	6.4
57	2010/03/25	14:06:12	13.1	6.4
58	2010/03/25	14:07:12	13.1	6.5
59	2010/03/25	14:08:12	13.1	6.5
60	2010/03/25	14:09:12	13.1	6.5
61	2010/03/25	14:10:12	13.1	6.5
62	2010/03/25	14:11:12	13.1	6.4
63	2010/03/25	14:12:12	13.2	6.4
64	2010/03/25	14:13:12	13.1	6.4
65	2010/03/25	14:14:12	13.2	6.3
66	2010/03/25	14:15:12	13.4	6.2

ACCI 1 Minute Average Data Sheet: O2, CO2			
Client	Collective Efforts LLC	**Unit**	SSI
Project No	10-068	**Operation**	mnoc
Plant	Alcosan	**Location**	exhaust stack

MINUTE	DATE	TIME	O2 (DV %)	CO2 (DV %)
67	2010/03/25	14.16.12	13.5	6.1
68	2010/03/25	14:17:12	13.5	6.0
69	2010/03/25	14:18:12	13.6	6.0
70	2010/03/25	14:19:12	13.6	6.0
71	2010/03/25	14:20:12	13.6	6.0
72	2010/03/25	14:21.12	13.5	6.0
73	2010/03/25	14.22:12	13.5	6.0
74	2010/03/25	14:23:12	13.5	6.1
75	2010/03/25	14:24:12	13.5	6.0
76	2010/03/25	14:25:12	13.6	6.0
77	2010/03/25	14:26:12	13.7	5.9
78	2010/03/25	14:27:12	13.7	5.9
79	2010/03/25	14:28:12	13.7	5.9
80	2010/03/25	14:29:12	13.7	5.9
81	2010/03/25	14.30:12	13.7	5.9
82	2010/03/25	14:31:12	13.7	5.9
83	2010/03/25	14:32:12	13.7	5.9
84	2010/03/25	14:33:12	13.7	5.9
85	2010/03/25	14:34:12	13.6	6.0
86	2010/03/25	14:35:12	13.6	6.0
87	2010/03/25	14:36:12	13.7	5.9
88	2010/03/25	14:37:12	13.7	5.9
89	2010/03/25	14:38:12	13.7	5.9
90	2010/03/25	14:39:12	13.7	5.9
91	2010/03/25	14:40:12	13.6	6.0
92	2010/03/25	14:41:12	13.6	6.0
93	2010/03/25	14:42:12	13.6	6.0
94	2010/03/25	14:43:12	13.6	6.0
95	2010/03/25	14:44:12	13.5	6.1
96	2010/03/25	14:45:12	13.5	6.1
97	2010/03/25	14:46:12	13.5	6.1
98	2010/03/25	14:47:12	13.5	6.1
99	2010/03/25	14:48:12	13.5	6.0
100	2010/03/25	14.49:12	13.5	6.1
101	2010/03/25	14:50:12	13.5	6.1
102	2010/03/25	14:51:12	13.4	6.1
103	2010/03/25	14.52:12	13.4	6.1
104	2010/03/25	14:53:12	13.4	6.2
105	2010/03/25	14:54.12	13.4	6.2
106	2010/03/25	14:55:12	13.4	6.2
107	2010/03/25	14:56:12	13.4	6.2
108	2010/03/25	14:57:12	13.3	6.2
109	2010/03/25	14:58:12	13.3	6.2
110	2010/03/25	14:59:12	13.3	6.2
111	2010/03/25	15:00:12	13.3	6.2
112	2010/03/25	15:01:12	13.3	6.3
113	2010/03/25	15:02:12	13.3	6.3
114	2010/03/25	15:03:12	13.4	6.2
115	2010/03/25	15:04:12	13.4	6.2
116	2010/03/25	15:05:12	13.4	6.2
117	2010/03/25	15:06:12	13.4	6.2
118	2010/03/25	15:07:12	13.4	6.2
119	2010/03/25	15:08:12	13.3	6.2
120	2010/03/25	15.09:12	13.4	6.2
121	2010/03/25	15:10:12	13.4	6.1
122	2010/03/25	15:11:12	13.4	6.2
123	2010/03/25	15.12:12	13.4	6.2
124	2010/03/25	15:13:12	13.4	6.2
125	2010/03/25	15:14:12	13.4	6.1
126	2010/03/25	15:15:12	13.5	6.1
127	2010/03/25	15:16:12	13.5	6.1
128	2010/03/25	15:17:12	13.4	6.1
129	2010/03/25	15:18:12	13.3	6.1
130	2010/03/25	15:19:12	13.3	6.1
131	2010/03/25	15:20:12	13.4	6.1
132	2010/03/25	15:21:12	13.4	6.1
133	2010/03/25	15:22:12	13.4	6.0

ACCI 1 Minute Average Data Sheet: O2, CO2			
Client	Collective Efforts LLC	**Unit**	SSI
Project No	10-068	**Operation**	mnoc
Plant	Alcosan	**Location**	exhaust stack

MINUTE	DATE	TIME	O2 (DV %)	CO2 (DV %)
134	2010/03/25	15:23:12	13.4	6.1
135	2010/03/25	15:24.12	13.4	6.1
136	2010/03/25	15:25:12	13.4	6.1
137	2010/03/25	15:26:12	13.3	6.1
138	2010/03/25	15:27:12	13.3	6.1
139	2010/03/25	15:28:12	13.3	6.1
140	2010/03/25	15:29:12	13.3	6.2
141	2010/03/25	15:30:12	13.3	6.1
142	2010/03/25	15:31:12	13.3	6.1
143	2010/03/25	15:32:12	13.2	6.2
144	2010/03/25	15:33:12	13.2	6.2
145	2010/03/25	15:34:12	13.3	6.1
146	2010/03/25	15:35:12	13.3	6.1
147	2010/03/25	15:36:12	13.3	6.1
148	2010/03/25	15:37:12	13.3	6.1
149	2010/03/25	15:38:12	13.3	6.0
150	2010/03/25	15:39:12	13.3	6.1
151	2010/03/25	15:40:12	13.3	6.1
152	2010/03/25	15:41.12	13.3	6.1
153	2010/03/25	15:42:12	13.4	6.0
154	2010/03/25	15:43:12	13.4	6.0
155	2010/03/25	15:44:12	13.4	6.0
156	2010/03/25	15:45:12	13.4	6.0
157	2010/03/25	15:46:12	13.3	6.1
158	2010/03/25	15:47.12	13.3	6.1
159	2010/03/25	15:48:12	13.3	6.1
160	2010/03/25	15:49.12	13.4	6.0
161	2010/03/25	15:50:12	13.4	6.0
162	2010/03/25	15:51:12	13.3	6.0
163	2010/03/25	15:52:12	13.3	6.1
164	2010/03/25	15:53:12	13.3	6.1
165	2010/03/25	15:54:12	13.3	6.1
166	2010/03/25	15:55:12	13.3	6.1
167	2010/03/25	15:56:12	13.2	6.1
168	2010/03/25	15:57:12	13.2	6.1
169	2010/03/25	15:58:12	13.2	6.1
170	2010/03/25	15:59:12	13.2	6.1
171	2010/03/25	16.00:12	13.2	6.2
172	2010/03/25	16:01:12	13.2	6.1
173	2010/03/25	16:02:12	13.3	6.1
174	2010/03/25	16:03:12	13.2	6.2
175	2010/03/25	16:04:12	13.2	6.2
176	2010/03/25	16:05:12	13.2	6.2
177	2010/03/25	16:06:12	13.2	6.2
178	2010/03/25	16:07:12	13.3	6.1
179	2010/03/25	16:08:12	13.2	6.2
180	2010/03/25	16:09:12	13.2	6.2
181	2010/03/25	16:10:12	13.2	6.2
182	2010/03/25	16:11.12	13.1	6.2
183	2010/03/25	16:12:12	13.1	6.3
184	2010/03/25	16:13:12	13.1	6.2
185	2010/03/25	16.14:12	13.2	6.2
186	2010/03/25	16:15:12	13.2	6.2
187	2010/03/25	16:16:12	13.2	6.2
188	2010/03/25	16:17.12	13.2	6.2
189	2010/03/25	16:18:12	13.2	6.2
190	2010/03/25	16:19:12	13.2	6.2
191	2010/03/25	16:20:12	13.1	6.3
192	2010/03/25	16:21:12	13.1	6.3
193	2010/03/25	16:22:12	13.1	6.3
194	2010/03/25	16:23:12	13.0	6.4
195	2010/03/25	16:24:12	13.0	6.4
196	2010/03/25	16:25:12	13.1	6.3
197	2010/03/25	16:26:12	13.1	6.3
198	2010/03/25	16:27:12	13.1	6.3
199	2010/03/25	16:28:12	13.1	6.3
200	2010/03/25	16.29.12	13.0	6.3

ACCI 1 Minute Average Data Sheet: O2, CO2			
Client	Collective Efforts LLC	**Unit**	SSI
Project No	10-068	**Operation**	mnoc
Plant	Alcosan	**Location**	exhaust stack

MINUTE	DATE	TIME	O2 (DV %)	CO2 (DV %)
201	2010/03/25	16:30:12	12.9	6.4
202	2010/03/25	16:31:12	12.9	6.4
203	2010/03/25	16:32:12	12.9	6.4
204	2010/03/25	16:33:12	12.9	6.4
205	2010/03/25	16:34:12	13.0	6.4
206	2010/03/25	16:35:12	13.0	6.3
207	2010/03/25	16:36:12	13.0	6.4
208	2010/03/25	16:37:12	12.9	6.4
209	2010/03/25	16:38:12	12.9	6.4
210	2010/03/25	16:39.12	13.0	6.4
211	2010/03/25	16:40:12	13.0	6.3
212	2010/03/25	16:41:12	13.0	6.3
213	2010/03/25	16:42.12	13.0	6.4
214	2010/03/25	16:43:12	12.9	6.4
215	2010/03/25	16:44:12	12.9	6.4
216	2010/03/25	16:45:12	13.0	6.3
217	2010/03/25	16:46:12	13.3	6.1
218	2010/03/25	16:47.12	13.4	6.0
219	2010/03/25	16:48:12	13.5	5.9
220	2010/03/25	16:49:12	13.6	5.9
221	2010/03/25	16:50.12	13.6	5.9
222	2010/03/25	16:51:12	13.5	5.9
223	2010/03/25	16:52:12	13.4	6.0
224	2010/03/25	16:53:12	13.3	6.1
225	2010/03/25	16:54:12	13.3	6.2
226	2010/03/25	16:55:12	13.3	6.1
227	2010/03/25	16:56:12	13.4	6.1
228	2010/03/25	16:57:12	13.3	6.1
229	2010/03/25	16:58:12	13.4	6.1
230	2010/03/25	16:59:12	13.4	6.0
231	2010/03/25	17:00:12	13.3	6.1
232	2010/03/25	17:01:12	13.3	6.1
233	2010/03/25	17:02:12	13.3	6.1
234	2010/03/25	17:03:12	13.3	6.1
235	2010/03/25	17:04:12	13.4	6.1
236	2010/03/25	17:05:12	13.4	6.1
237	2010/03/25	17:06:12	13.4	6.0
238	2010/03/25	17:07:12	13.3	6.1
239	2010/03/25	17:08:12	13.3	6.1
240	2010/03/25	17.09.12	13.4	6.1
RUN 3 AVERAGES			**13.3**	**6.2**

ACCI CEM Calibration, Bias and Drift Data Sheet
Based on 40 CFR Part 60, Appendix A-4, Method 7E

Client	Collective Efforts LLC	**Date**	March 25, 2010
Project No	10-068	**Location**	exhaust stack
Plant	Alcosan	**Run**	Run 3
Unit	SSI	**Start Time**	13:10
Operation	mnoc	**End Time**	17:10
Tester(s)	wo,ew,jv,cb,rf		

Cal.	LOW		MID		HIGH		Tank ID				Conc.
Gas	Conc.	(% of Span)	Conc.	(% of Span)	Conc.	(% of Span)	LOW	MID	HIGH	Span	Units
O2	N/A	N/A	10.01	44.5	22.47	100.0	N/A	eb001355	cc251892	22.47	d. vol. %
CO2	N/A	N/A	9.96	44.2	22.54	100.0	N/A	cc251892	eb001355	22.54	d. vol. %
LIMITS				**40 % to 60 %**		**100%**					

	Upscale: Enter "Low" "Mid" or "High"			Initial Values		Final Values				Average of Initial and Final	Average Indicated	Corrected	
Gas	below "Zero"	Actual Upscale Conc.	Analyzer Cal. Response	System Cal. Response	System Cal. Bias (% of Span)	System Cal. Response	System Cal. Bias (% of Span)	Drift (% of Span)	Span	System Responses	Gas Conc.	Gas Conc.	Conc. Units
O2	**Zero**		-0.1	0.0	0.45	0.0	0.45	0.00	22.47	0			
	Mid	10.01	10.1	10.0	-0.45	10.0	-0.45	0.00	22.47	10	13.28	13.30	d. vol. %
CO2	**Zero**		0.1	0.2	0.44	0.2	0.44	0.00	22.54	0.2			
	Mid	9.96	9.7	9.8	0.44	9.8	0.44	0.00	22.54	9.8	6.20	6.22	d. vol. %
LIMITS					**+/- 5 %**		**+/- 5 %**	**+/- 3 %**					

Gas	ZERO Analyzer Response (System for THC)	ZERO Analyzer Cal. Error (% of Span)	LOW Actual Conc.	LOW Analyzer Response (System for THC)	LOW Analyzer Cal. Error (% of Span)	LOW System Cal. Error (% of Actual)	MID Actual Conc.	MID Analyzer Response (System for THC)	MID Analyzer Cal. Error (% of Span)	MID System Cal. Error (% of Actual)	HIGH Actual Conc.	HIGH Analyzer Response (System for THC)	HIGH Analyzer Cal. Error (% of Span)	HIGH System Calibration Error (% of Actual)	Span	Conc. Units
O2	-0.1	-0.45					10.01	10.1	0.40		22.47	22.6	0.58		22.47	d. vol. %
CO2	0.1	0.44					9.96	9.7	-1.15		22.54	22.8	1.15		22.54	d. vol. %
LIMITS		**+/- 2 %**			**+/- 2 %**	**+/- 5 %**			**+/- 2 %**	**+/- 5 %**			**+/- 2 %**	**+/- 5 %**		

Client:	Collective Efforts LLC	Test Date:	March 25, 2010
Project No.:	10-068	Test Location:	exhaust stack
Plant:	Alcosan	Test Run:	Run 3
Unit:	SSI	Test Start Time:	1:10 PM
Unit Operation:	mnoc	Test Finish Time:	5:16 PM

Blue is data input. Red is a calculation. Pink is a reference to a cell on another sheet. Green is a reference to a cell on this sheet.

Data Input			**Calculations**		
Control Box:	1462		CO + N2	80.48	% dv
Meter $DH_@$ (0.75 scfm)	1.533	in. H_2O	Water Collected (V_f- V_i)	56.0	ml
Meter Calibration Factor (Yd)	1.004		Water Vapor Condensed (Vwc(std))	2.635	scf
Test Time (Theta)	240	minutes	Water Collected (W_f- W_i)	48.0	g
Barometric Pressure (Pbar)	29.20	in. Hg	Water Vapor in Silica Gel (Vwsg(std))	2.263	scf
Stack Static Pressure (Pg)	0.57	in. H_2O	Vol. Water Vapor in Gas Stand.(Vw(std))	4.899	scf
Stack Diameter (Ds) (L if rectangul	36.5	inches	Volume Dry Gas Metered (Vm)	247.495	dacf
Stack Width (enter 0 if circular stac	0.0	inches	Vol. Dry Gas Metered Stand.(Vm(std))	235.231	dscf
Nozzle Diameter (Dn)	0.250	inches	Volume Dry Gas Metered ($Vm(m^3)$)	7.008	dacm
CO2	6.22	% dv	Vol. Dry Gas Metered Stand.($Vm(std)m^3$)	6.661	dscm
O2	13.30	% dv	Stack Absolute Pressure (Ps)	29.24	in. Hg
Pitot Tube Coefficient (Cp)	0.84		Stack Absolute Temperature (Tsavg)	537.3	R
Sample Calculation Title	Metals Testing Results		H2O Vapor Pressure @ avg Stack Temp.	0.96	in. Hg
F_d @ 68 F and 760 mm Hg	0	dscf/MMBtu	H2O in the gas at saturation (Bws)	0.0327	vol. fraction
Standard Temperature	68	F	H2O in the gas from test data (Bws)	0.0204	vol. fraction
Standard Pressure	760	mm Hg	H2O in the gas used (lower of the 2 Bws)	0.0204	vol. fraction
Pitot Tube Constant (Kp)	85.49		Is the Gas Stream Saturated With H2O?	NO	
Calculations			Dry Gas Molecular Weight (Md)	29.53	lb/lb-mole
Meter Temperature (Tm)	88.1	F	Wet Gas Molecular Weight (Ms)	29.29	lb/lb-mole
Stack Temperature (Tsavg)	77.6	F	Gas Velocity (Vs)	51.69	ft/s
Orifice Pressure Drop (dHavg)	2.915	in. H_2O	Is the stack circular or rectangular?	CIRCULAR	
GasVelocity Head (dP)^^avg	0.9086	in. H_2O^1/2	Area Stack (As)	7.266	ft^
F_d @ Standard Conditions	NA	dscf/MMBtu	Actual Gas Flowrate	22,537	acfm
F_d @ Stan. Cond. & Actual O2	0	dscf/MMBtu	Standard Gas Flowrate	21,631	scfm
Heat Input Based on F_d	NA	MMBtu/hr	Dry Standard Gas Flowrate	21,190	dscfm
K1method 4	0.04706	scf/ml	Actual Gas Flowrate	638	acm/min
K2method 4	0.04715	scf/g	Standard Gas Flowrate	613	scm/min
K1method 5	17.64	R/in. Hg	Dry Standard Gas Flowrate	600	dscm/min
K4method 5	0.0945		Area Nozzle (An)	0.000341	ft^2
Standard lb-mole volume	385.3	ft^3/lb-mole	Percent of Isokinetic Sampling (I)	98.65	%
Production Rate					
Product Rate		metric ton/hr			
Product Rate	1.88	ton/hr			

Metals

Mercury			**Cobalt**		
Emission Mass	62.654	(ug)	Emission Mass (Front Half)	0.32	(ug)
			Emission Mass (Back Half)	0.52	(ug)
Emission Mass (total)	62.65	(ug)	Emission Mass (total)	0.84	(ug)
Emission Mass	62.65	(ug)	Emission Mass	0.84	(ug)
Collection Efficiency	1.0000	(%)	Collection Efficiency	0.9994	(%)
Emission Concentration	9.406	(ug/DSCM)	Emission Concentration	0.126	(ug/DSCM)
Emission Rate	7.47E-04	(lb/hr)	Emission Rate	1.00E-05	(lb/hr)
Emission Rate	NA	(lb/MMBTU)	Emission Rate	NA	(lb/MMBTU)
Emission Rate	3.97E-04	(lb/ton product)	Emission Rate	5.32E-06	(lb/ton product)
Antimony			**Lead**		
Emission Mass (Front Half)	0.80	(ug)	Emission Mass (Front Half)	0.91	(ug)
Emission Mass (Back Half)	0.00	(ug)	Emission Mass (Back Half)	0.50	(ug)
Emission Mass (total)	0.80	(ug)	Emission Mass (total)	1.41	(ug)
Emission Mass	0.80	(ug)	Emission Mass	1.41	(ug)
Collection Efficiency	1.0000	(%)	Collection Efficiency	0.9996	(%)
Emission Concentration	0.120	(ug/DSCM)	Emission Concentration	0.212	(ug/DSCM)
Emission Rate	9.53E-06	(lb/hr)	Emission Rate	1.68E-05	(lb/hr)
Emission Rate	NA	(lb/MMBTU)	Emission Rate	NA	(lb/MMBTU)
Emission Rate	5.07E-06	(lb/ton product)	Emission Rate	8.94E-06	(lb/ton product)

Collective Efforts LLC **Run 3** **F or C?**
SSI **F=1,C=0** 1

Point	Pitot DP (dP) (in. H2O)	SQRT dP (in. H2O)$^{1/2}$	Orifice DP (dH) (in. H2O)	Stack Temp (F)	Meter Temp In/Out (F or C)	(F or C)
A-1	0.77	0.8775	2.7	79	80	80
1	0.79	0.8888	2.7	78	83	80
2	0.75	0.8660	2.6	78	86	80
2	0.75	0.8660	2.6	79	86	80
3	0.77	0.8775	2.7	77	87	80
3	0.77	0.8775	2.7	78	88	81
4	0.76	0.8718	2.6	78	88	81
4	0.77	0.8775	2.7	78	89	81
5	0.81	0.9000	2.8	78	89	82
5	0.82	0.9055	2.9	78	89	82
6	0.77	0.8775	2.7	78	90	83
6	0.77	0.8775	2.7	78	90	83
7	0.74	0.8602	2.6	76	90	83
7	0.76	0.8718	2.7	77	90	83
8	0.87	0.9327	3.1	78	90	83
8	0.86	0.9274	3.0	79	91	84
9	0.85	0.9220	3.0	78	91	84
9	0.86	0.9274	3.0	78	91	84
10	0.89	0.9434	3.2	77	91	85
10	0.89	0.9434	3.2	77	92	85
11	0.85	0.9220	3.0	78	92	85
11	0.87	0.9327	3.1	78	92	85
12	0.84	0.9165	3.0	79	92	86
12	0.86	0.9274	3.0	78	92	86
B-1	0.75	0.866	2.7	78	90	86
1	0.75	0.866	2.7	77	92	86
2	0.79	0.889	2.8	78	92	86
2	0.82	0.906	2.9	78	92	86
3	0.82	0.906	2.9	79	92	86
3	0.80	0.894	2.8	78	92	86
4	0.83	0.911	2.9	79	92	86
4	0.83	0.911	2.9	79	92	86
5	0.84	0.917	3.0	79	92	87
5	0.85	0.922	3.0	79	93	87
6	0.86	0.927	3.0	78	93	87
6	0.86	0.927	3.0	78	94	87
7	0.86	0.927	3.0	78	94	87
7	0.96	0.980	3.4	77	95	88
8	0.93	0.964	3.3	77	95	88
8	0.92	0.959	3.3	77	95	88
9	0.92	0.959	3.3	75	95	89
9	0.92	0.959	3.3	76	94	89
10	0.90	0.949	3.2	75	94	89
10	0.79	0.889	2.8	75	94	89
11	0.81	0.900	2.9	76	94	89
11	0.80	0.894	2.8	78	94	88
12	0.82	0.906	2.9	76	94	88
12	0.80	0.894	2.8	77	93	88

Arsenic		
Emission Mass (Front Half)	0.80	(ug)
Emission Mass (Back Half)	0.00	(ug)
Emission Mass (total)	0.80	(ug)
Emission Mass	0.80	(ug)
Collection Efficiency	1.0000	(%)
Emission Concentration	0.120	(ug/DSCM)
Emission Rate	9.53E-06	(lb/hr)
Emission Rate	NA	(lb/MMBTU)
Emission Rate	5.07E-06	(lb/ton product)

Beryllium		
Emission Mass (Front Half)	0.20	(ug)
Emission Mass (Back Half)	0.00	(ug)
Emission Mass (total)	0.20	(ug)
Emission Mass	0.20	(ug)
Collection Efficiency	1.0000	(%)
Emission Concentration	0.030	(ug/DSCM)
Emission Rate	2.38E-06	(lb/hr)
Emission Rate	NA	(lb/MMBTU)
Emission Rate	1.27E-06	(lb/ton product)

Cadmium		
Emission Mass (Front Half)	0.20	(ug)
Emission Mass (Back Half)	0.82	(ug)
Emission Mass (total)	1.02	(ug)
Emission Mass	1.02	(ug)
Collection Efficiency	0.9992	(%)
Emission Concentration	0.153	(ug/DSCM)
Emission Rate	1.22E-05	(lb/hr)
Emission Rate	NA	(lb/MMBTU)
Emission Rate	6.46E-06	(lb/ton product)

Chromium		
Emission Mass (Front Half)	5.06	(ug)
Emission Mass (Back Half)	1.67	(ug)
Emission Mass (total)	6.73	(ug)
Emission Mass	6.73	(ug)
Collection Efficiency	0.9998	(%)
Emission Concentration	1.010	(ug/DSCM)
Emission Rate	8.02E-05	(lb/hr)
Emission Rate	NA	(lb/MMBTU)
Emission Rate	4.27E-05	(lb/ton product)

Manganese		
Emission Mass (Front Half)	47.60	(ug)
Emission Mass (Back Half)	2.92	(ug)
Emission Mass (total)	50.52	(ug)
Emission Mass	50.52	(ug)
Collection Efficiency	0.9999	(%)
Emission Concentration	7.584	(ug/DSCM)
Emission Rate	6.02E-04	(lb/hr)
Emission Rate	NA	(lb/MMBTU)
Emission Rate	3.20E-04	(lb/ton product)

Nickel		
Emission Mass (Front Half)	17.40	(ug)
Emission Mass (Back Half)	1.30	(ug)
Emission Mass (total)	18.70	(ug)
Emission Mass	18.70	(ug)
Collection Efficiency	0.9999	(%)
Emission Concentration	2.807	(ug/DSCM)
Emission Rate	2.23E-04	(lb/hr)
Emission Rate	NA	(lb/MMBTU)
Emission Rate	1.19E-04	(lb/ton product)

Selenium		
Emission Mass (Front Half)	2.00	(ug)
Emission Mass (Back Half)	0.00	(ug)
Emission Mass (total)	2.00	(ug)
Emission Mass	2.00	(ug)
Collection Efficiency	1.0000	(%)
Emission Concentration	0.300	(ug/DSCM)
Emission Rate	2.38E-05	(lb/hr)
Emission Rate	NA	(lb/MMBTU)
Emission Rate	1.27E-05	(lb/ton product)

Average	0.83		0.909	2.91	77.6		88.1
Initial volume	103.820	ft^3		Initial volume	0.000	liters	
Final volume	351.315	ft^3		Final volume	0.000	liters	
Total metered	247.495	dacf		Total metered	0.000	dry actual liters	

Impinger	Final grams	Initial grams	Gram Gain	Final ml	Initial ml	ml Gain
1			0.0	152.0	100.0	52.0
2			0.0	100.0	100.0	0.0
3			0.0	0.0	0.0	0.0
4			0.0	102.0	100.0	2.0
5			0.0	102.0	100.0	2.0
6	292.8	244.8	48.0			0.0
7			0.0			0.0
8			0.0			0.0
9			0.0			0.0
10			0.0			0.0
Total	292.8	244.8	48.0	456.0	400.0	56.0
	W_f	W_i	$(W_f - W_i)$	V_f	V_i	$(V_f - Vi)$

APPENDIX B

Laboratory Data

EPA METHOD 5
ACETONE BLANK ANALYTICAL DATA

Client: Collective Efforts LLC
Project No: 10-068
Location: Alcoan
Blank Sample Date: March 26, 2010
Test Date(s): 3/24-26/10
Analysis Dates: April 2, 2010
Analyst: rf
Acetone Blank No: **171j**

ACETONE BLANK	UNITS	
Acetone density (p_a)	g/ml	0.7899
Acetone blank volume (Va)	ml	200
Final (total) weight 1	mg	112,879.40
Final (total) weight 2	mg	112,879.00
Final (total) weight difference (absolute value) [1]	mg	-0.40
Average final (total) weight	mg	112,879.20
Tare weight 1	mg	112,872.20
Tare weight 2	mg	112,872.00
Tare weight difference (absolute value) [1]	mg	-0.20
Average tare weight	mg	112,872.10
Average final (total) weight minus average tare weight	mg	7.10
Mass of residue of acetone (m_a) [2]	mg	7.10
Acetone blank residue concentration (Ca) calculated [3]	mg/g	0.0449
Acetone blank correction as a % of acetone mass	%	0.0045
Acetone blank residue concentration (Ca) used [4]	**mg/g**	**0.0100**

ANALYST SIGNATURE: [5] _____

COMMENTS: _____

NOTES:

(1) "Constant weight" is defined in EPA Method 5 as "a difference of no more than 0.5 mg or 1 percent of total weight less tare weight, whichever is greater, between two consecutive weighings."

(2) If the "Mass of residue of acetone after evaporation" is negative, the value will be set equal to 0.

(3) Units of mg/g are being used instead of mg/mg.

(4) The maximum allowable blank correction is 0.001 % of the weight of acetone used for recovery of the sample train. 0.001 % is equivalent to 0.01 mg/g. If "Ca calculated" is greater than 0.01 mg/g, "Ca used" will be set equal to 0.01 mg/g.

(5) By signing, the analyst is certifying that "to the best of their knowledge" the analytical data have been checked for completeness, and that the results presented are accurate, error-free, legible, and have been conducted in accordance with the methods in the approved protocol.

g/ml - Grams per milliliter
mg - Milligrams
mg/g - Milligrams per gram
ml - Milliliters

EPA METHOD 5
METHLYENE CHLORIDE BLANK ANALYTICAL DATA

Client: Collective Efforts LLC
Project No: 10-068
Location: Alcoan
Blank Sample Date: March 26, 2010
Test Date(s): 3/24-26/10
Analysis Dates: April 2, 2010
Analyst: rf

METHYLENE CHLORIDE BLANK	UNITS	
$MeCl_2$ blank number		186n
$MeCl_2$ density (Pa)	g/ml	1.3255
$MeCl_2$ blank volume (Va)	ml	250
Final (total) weight 1	mg	2,486.50
Final (total) weight 2	mg	2,486.80
Final (total) weight difference (absolute value) [1]	mg	0.30
Average final (total) weight	mg	2,486.65
Tare weight 1	mg	2,484.50
Tare weight 2	mg	2,484.40
Tare weight difference (absolute value) [1]	mg	-0.10
Average tare weight	mg	2,484.45
Average final (total) weight minus average tare weight	mg	2.20
Methylene Chloride Blank	**mg/g**	**0.0066**

ANALYST SIGNATURE: [3] _____

COMMENTS: _____

NOTES:

(1) "Constant weight" is defined in EPA Method 5 as "a difference of no more than 0.5 mg or 1 percent of total weight less tare weight, whichever is greater, between two consecutive weighings."

(2) If the "Mass of residue of $MeCl_2$ after evaporation" is negative, the value will be set equal to 0.

(3) By signing, the analyst is certifying that "to the best of their knowledge" the analytical data have been checked for completeness, and that the results presented are accurate, error-free, legible, and have been conducted in accordance with the methods in the approved protocol.

g/ml - Grams per milliliter
mg - Milligrams
mg/g - Milligrams per gram
ml - Milliliters

EPA METHOD 5
WATER BLANK ANALYTICAL DATA

Client: Collective Efforts LLC
Project No: 10-068
Location: Alcoan
Blank Sample Date: March 26, 2010
Test Date(s): 3/24-26/10
Analysis Dates: 40270
Analyst: rf

WATER BLANK	UNITS	
Water blank number		186t
Water Density (Pa)	g/ml	1.000
Water blank volume (Va)	ml	150
Final (total) weight 1	mg	2,369.30
Final (total) weight 2	mg	2,369.40
Final (total) weight difference (absolute value) (1)	mg	0.10
Average final (total) weight	mg	2,369.35
Tare weight 1	mg	2,368.00
Tare weight 2	mg	2,368.00
Tare weight difference (absolute value) (1)	mg	0.00
Average tare weight	mg	2,368.00
Average final (total) weight minus average tare weight	mg	1.35
Water blank Total Weight	**mg/g**	**0.0090**

ANALYST SIGNATURE: (3) _____

COMMENTS: _____

NOTES:

(1) "Constant weight" is defined in EPA Method 5 as "a difference of no more than 0.5 mg or 1 percent of total weight less tare weight, whichever is greater, between two consecutive weighings."

(2) If the "Mass of residue of water after evaporation" is negative, the value will be set equal to 0.

(3) By signing, the analyst is certifying that "to the best of their knowledge" the analytical data have been checked for completeness, and that the results presented are accurate, error-free, legible, and have been conducted in accordance with the methods in the approved protocol.

g/ml - Grams per milliliter
mg - Milligrams
mg/g - Milligrams per gram
ml - Milliliters

EPA METHOD 5/OTM28
FIELD TRAIN BLANK ANALYTICAL DATA

Client: Collective Efforts LLC
Project No: 10-068
Location: Alcoan
Blank Sample Date: March 26, 2010
Test Date(s): 3/24-26/10
Analysis Dates: April 2, 2010
Analyst: rf

INORGANIC FRACTION FIELD TRAIN BLANK	UNITS	
Water Blank Beaker number		na
Water density (p_a)	g/ml	1.0000
Water blank volume (Va)	ml	164
Evaporated water blank volume	ml	10
Evaporated water blank tin number		186p
Final (total) weight 1 tin	mg	2,352.20
Final (total) weight 2 tin	mg	2,352.50
Final (total) weight difference (absolute value) (1)	mg	0.30
Average final (total) weight	mg	2,352.35
Tare weight 1 tin	mg	2,351.90
Tare weight 2 tin	mg	2,352.00
Tare weight difference (absolute value) (1)	mg	0.10
Average tare weight	mg	2,351.95
Average final (total) weight minus average tare weight	mg	0.40
Mass of residue of water (m_{ib})	**mg**	**0.40**

ORGANIC FRACTION FIELD TRAIN BLANK	UNITS	
MeCl2 Blank Beaker number		186o
MeCl2 density (p_a)	g/ml	1.3255
MeCl2 blank volume (Va)	ml	155
Evaporated MeCl2 blank volume	ml	10
Evaporated MeCl2 blank tin number		186o
Final (total) weight 1 tin	mg	2,427.40
Final (total) weight 2 tin	mg	2,427.20
Final (total) weight difference (absolute value) (1)	mg	-0.20
Average final (total) weight	mg	2,427.30
Tare weight 1 tin	mg	2,425.00
Tare weight 2 tin	mg	2,425.10
Tare weight difference (absolute value) (1)	mg	0.10
Average tare weight	mg	2,425.05
Average final (total) weight minus average tare weight	mg	2.25
Mass of residue of MeCl2 (m_{ob})	**mg**	**2.25**

Total Field Train blank (m_{fb})	**mg**	**2.0000**

ANALYST SIGNATURE: (5) _____

COMMENTS: _____

NOTES:

(1) "Constant weight" is defined in EPA Method 5 as "a difference of no more than 0.5 mg or 1 percent of total weight less tare weight, whichever is greater, between two

EPA METHOD 5
PARTICULATE ANALYTICAL DATA

Client: Collective Efforts LLC
Project No: 10-068
Location: Alcoa
Test Date(s): March 24. 2010
Analysis Dates: April 2. 2010
Analyst: rf
Blank No: 171j

	UNITS	RUN NO. 1	RUN NO. 2	RUN NO. 3
ACETONE WASH				
Acetone wash container No		171g	171h	171i
Acetone volume used in wash (Vaw)	ml	160 0	152 0	146 0
Acetone density (ρ_a)	g/ml	0 7899	0 7899	0 7899
Acetone blank residue concentration (Ca)	mg/g	0 0100	0 0100	0 0100
Weight of residue in acetone wash (Wa)	mg	1 2638	1 2006	1 1533
Final (total) weight 1	mg	114237 60	110014 80	114166 70
Final (total) weight 2	mg	114237 30	110014 60	114167 10
Final (total) weight difference (absolute value) [1]	mg	0 30	0 20	0 40
Average final (total) weight	mg	114,237 45	110,014 70	114,166 90
Tare weight 1	mg	114222 80	109998 90	114160 50
Tare weight 2	mg	114222 80	109999 00	114160 60
Tare weight difference (absolute value) [1]	mg	0 00	0 10	0 10
Average tare weight	mg	114,222 80	109,998 95	114,160 55
Weight gain	mg	14 65	15 75	6 35
Acetone blank (Wa)	mg	1 2638	1 2006	1 1533
Weight of particulate matter in acetone wash	mg	13 39	14 55	5 20
CONDENSIBLE PARTICULATE				
Inorganic Fraction (H_2O)				
Container No		186q	186r	186s
Inorganic Fraction volume	ml	142 00	94 00	158 00
Sample alliquot	ml	0 00	0 00	0 00
Sample less alliquot	ml	142 00	94 00	158 00
pH		7 2	7 4	7 1
Water density (Pa)	g/ml	1 000	1 000	1 000
Final (total) weight 1	mg	2363 50	2353 90	2267 60
Final (total) weight 2	mg	2363 20	2353 60	2267 50
Final (total) weight difference (absolute value) [1]	mg	0 30	0 30	0 10
Average final (total) weight	mg	2,363 35	2,353 75	2,267 55
Tare weight 1	mg	2360 10	2352 40	2259 30
Tare weight 2	mg	2360 00	2352 30	2259 40
Tare weight difference (absolute value) [1]	mg	0 10	0 10	0 10
Average tare weight	mg	2,360 05	2,352 35	2,259 35
Inorganic Fraction particulate weight [2]	mg	3 30	1 40	8 20
Normality of NH_4OH	N	0 01	0 01	0 01
Volume of Titrant	ml	0 26	0 25	0 20
Mass of NH4	mg	0 04	0 04	0 03
Weight of inorganic fraction, ammonia corrected	mg	3 26	1 36	8 17
Organic Fraction ($MeCl_2$)				
Container No		186k	186l	186m
Organic Fraction volume	ml	162 00	175 00	190 00
$MeCl_2$ density (Pa)	g/ml	1 326	1 326	1 326
Final (total) weight 1	mg	2324 20	2255 00	2335 00
Final (total) weight 2	mg	2324 50	2255 50	2334 70
Final (total) weight difference (absolute value) [1]	mg	0 30	0 50	0 30
Average final (total) weight	mg	2,324 35	2,255 25	2,334 85
Tare weight 1	mg	2322 00	2252 70	2331 70
Tare weight 2	mg	2322 00	2252 80	2331 90
Tare weight difference (absolute value) [1]	mg	0 00	0 10	0 20
Average final (total) weight		2,322 00	2,252 75	2,331 80
Organic Fraction particulate weight [2]	mg	2 35	2 50	3 05
Total weight of condensible particulate	mg	5 61	3 86	11 22
$MeCl_2$ and Water Blank Total	mg	2 00	2 00	2 00
Total weight of condensible particulate - blank	mg	3 61	1 86	9 22
FRONT HALF FILTER				
Filter No		4025	4046	4047
Final (total) weight 1	mg	373 90	367 10	366 90
Final (total) weight 2	mg	374 10	367 10	367 00
Final (total) weight difference (absolute value) [1]	mg	0 20	0 00	0 10
Average final (total) weight	mg	374 00	367 10	366 95
Tare weight 1	mg	370 70	365 30	364 60
Tare weight 2	mg	370 80	365 00	364 30
Tare weight difference (absolute value) [1]	mg	0 10	0 30	0 30
Average tare weight	mg	370 75	365 15	364 45
Weight of particulate matter on front half filter (weight gain)	mg	3 25	1 95	2 50
TOTAL PARTICULATE				
Weight of particulate in acetone wash [2]	mg	13 39	14 55	5 20
Total weight of condensible particulate - blank	mg	3 61	1 86	9 22
Weight of particulate on front half filter [2]	mg	3 25	1 95	2 50
TOTAL WEIGHT OF PARTICULATE (m_n)	mg	**20.24**	**18.36**	**16.91**

ANALYST SIGNATURE: [3]

COMMENTS:

NOTES:

(1) "Constant weight" is defined in EPA Method 5 as "a difference of no more than 0.5 mg or 1 percent of total weight less tare weight, whichever is greater, between two consecutive weighings."

(2) If a particulate weight is negative, the value will be set equal to 0

(3) By signing, the analyst is certifying that "to the best of their knowledge" the analytical data have been checked for completeness, and that the results presented are accurate, error-free, legible, and have been conducted in accordance with the methods in the approved protocol.

g/ml - Grams per milliliter
mg - Milligrams
mg/g - Milligrams per gram
ml - Milliliters

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Your P.O. #: 10-031

Your Project #: 10-068
Site:ALCOSAN
Your C.O.C. #: 2379

Attention: Rob Frey
Air Compliance Consultants Inc
1050 William Pitt Way
Pittsburgh, PA
USA 15238

Report Date: 2010/04/14

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B036859
Received: 2010/03/26, 19:39

Sample Matrix: Stack Sampling Train
Samples Received: 4

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
Hydrogen Halides in H2SO4 Imp. (1)	4	2010/04/07	2010/04/07	BRL SOP-00108	EPA Method 26A
Volume of Sulfuric Acid Impinger	4	N/A	2010/04/07		

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

Encryption Key

Lina Barreto

14 Apr 2010 13:03:06 -04:00

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

LINA BARRETO, Project Manager Assistant
Email: Lina.Barreto@maxxamanalytics.com
Phone# (905) 817-5700

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Total cover pages: 1

Maxxam Job #: B036859
Report Date: 2010/04/14

Air Compliance Consultants Inc
Client Project #: 10-068
Project name: ALCOSAN
Your P.O. #: 10-031

RESULTS OF ANALYSES OF STACK SAMPLING TRAIN

Maxxam ID		FL1884	FL1885	FL1915	FL1916		
Sampling Date		2010/03/20 10:20	2010/03/24 15:53	2010/03/24 10:03	2010/03/26 10:20		
COC Number		2379	2379	2379	2379		
	Units	**BLANK 0.1N H2SO4 M26A**	**RUN 1-M26A**	**RUN 2-M26A**	**RUN 3-M26A**	**RDL**	**QC Batch**
Volume	ml	380	290	370	380	1	2118642
Miscellaneous Parameters							
Hydrochloric Acid	ug	<250	640	1200	460	250	2118646
Hydrofluoric Acid	ug	<250	<250	<250	<250	250	2118646

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B036859
Report Date: 2010/04/14

Air Compliance Consultants Inc
Client Project #: 10-068
Project name: ALCOSAN
Your P.O. #: 10-031

Test Summary

Maxxam ID FL1884 **Collected** 2010/03/20
Sample ID BLANK 0.1N H2SO4 M26A **Shipped**
Matrix Stack Sampling Train **Received** 2010/03/26

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Hydrogen Halides in H2SO4 Imp.	IC/SPEC	2118646	2010/04/07	2010/04/07	A_S
Volume of Sulfuric Acid Impinger		2118642	N/A	2010/04/07	A_S

Maxxam ID FL1885 **Collected** 2010/03/24
Sample ID RUN 1-M26A **Shipped**
Matrix Stack Sampling Train **Received** 2010/03/26

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Hydrogen Halides in H2SO4 Imp.	IC/SPEC	2118646	2010/04/07	2010/04/07	A_S
Volume of Sulfuric Acid Impinger		2118642	N/A	2010/04/07	A_S

Maxxam ID FL1885 Dup **Collected** 2010/03/24
Sample ID RUN 1-M26A **Shipped**
Matrix Stack Sampling Train **Received** 2010/03/26

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Hydrogen Halides in H2SO4 Imp.	IC/SPEC	2118646	2010/04/07	2010/04/07	A_S

Maxxam ID FL1915 **Collected** 2010/03/24
Sample ID RUN 2-M26A **Shipped**
Matrix Stack Sampling Train **Received** 2010/03/26

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Hydrogen Halides in H2SO4 Imp.	IC/SPEC	2118646	2010/04/07	2010/04/07	A_S
Volume of Sulfuric Acid Impinger		2118642	N/A	2010/04/07	A_S

Maxxam ID FL1916 **Collected** 2010/03/26
Sample ID RUN 3-M26A **Shipped**
Matrix Stack Sampling Train **Received** 2010/03/26

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Hydrogen Halides in H2SO4 Imp.	IC/SPEC	2118646	2010/04/07	2010/04/07	A_S
Volume of Sulfuric Acid Impinger		2118642	N/A	2010/04/07	A_S

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B036859
Report Date: 2010/04/14

Air Compliance Consultants Inc
Client Project #: 10-068
Project name: ALCOSAN
Your P.O. #: 10-031

GENERAL COMMENTS

Results relate only to the items tested.

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Air Compliance Consultants Inc
Attention: Rob Frey
Client Project #: 10-068
P.O. #: 10-031
Project name: ALCOSAN

Quality Assurance Report

Maxxam Job Number: GB036859

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	%Recovery	Units	QC Limits
2118646 A_S	Matrix Spike (FL1885)	Hydrochloric Acid	2010/04/07		95	%	80 - 120
		Hydrofluoric Acid	2010/04/07		100	%	80 - 120
	Spiked Blank	Hydrochloric Acid	2010/04/07		98	%	90 - 110
		Hydrofluoric Acid	2010/04/07		102	%	90 - 110
	Method Blank	Hydrochloric Acid	2010/04/07	<250		ug	
		Hydrofluoric Acid	2010/04/07	<250		ug	
	RPD - Sample/Sample Dup	Hydrochloric Acid	2010/04/07	NC		%	20

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.
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.
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.

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

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Your P.O. #: 10-031

Your Project #: 10-068
Site: ALCOSAN COLLECTIVE EFFORTS

Attention: Rob Frey
Air Compliance Consultants Inc
1050 William Pitt Way
Pittsburgh, PA
USA 15238

Report Date: 2010/04/09

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B036715
Received: 2010/03/26, 19:39

Sample Matrix: Stack Sampling Train
Samples Received: 4

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
Dioxins/Furans in Air (Method 23) (1)	2	2010/03/29	2010/03/31	BRL SOP-00404	EPA1613Bmod(M23/23A)
Dioxins/Furans in Air (Method 23) (1)	2	2010/03/29	2010/04/01	BRL SOP-00404	EPA1613Bmod(M23/23A)
PAHs in Air (CARB429)	4	2010/03/29	2010/04/07	BRL SOP-00201	CARB429mod(CARB429)
PCB Congeners in Air (1668A)	4	2010/03/29	2010/04/01	BRL SOP-00408, 409	EPA 1668A (0010) mod

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

Encryption Key

Lina Barreto

12 Apr 2010 10:55:03 -04:00

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

LINA BARRETO, Project Manager Assistant
Email: Lina.Barreto@maxxamanalytics.com
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Total cover pages: 1

Maxxam Job #: B036715
Report Date: 2010/04/09

Air Compliance Consultants Inc
Client Project #: 10-068
Project name: ALCOSAN COLLECTIVE EFFORTS
Your P.O. #: 10-031

RESULTS OF ANALYSES OF STACK SAMPLING TRAIN

Maxxam ID		FL0682						
Sampling Date		2010/03/25			TOXIC EQUIVALENCY		# of	
	Units	BLANK-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
Polyaromatic Hydrocarbons								
Naphthalene	ng	1270 (1)	5.2	22				2111378
2-Methylnaphthalene	ng	444	1.0	3.1				2111378
2-Chloronaphthalene	ng	<0.15	0.12	0.15				2111378
Acenaphthylene	ng	12.4	0.70	0.32				2111378
Acenaphthene	ng	46.8	0.82	0.40				2111378
Fluorene	ng	111	2.8	0.49				2111378
Phenanthrene	ng	276	1.9	0.67				2111378
Anthracene	ng	13.2	2.3	0.31				2111378
Fluoranthene	ng	83.2	0.98	0.65				2111378
Pyrene	ng	78.0	0.88	0.52				2111378
Benzo(a)anthracene	ng	5.40	0.82	0.17				2111378
Chrysene	ng	8.32	0.83	0.33				2111378
Benzo(b)fluoranthene	ng	3.16	0.77	0.59				2111378
Benzo(k)fluoranthene	ng	1.33	0.91	0.35				2111378
Benzo(e)pyrene	ng	2.80	1.3	0.43				2111378
Benzo(a)pyrene	ng	<0.31	1.7	0.31				2111378
Perylene	ng	<0.26	1.4	0.26				2111378
Indeno(1,2,3-cd)pyrene	ng	3.96	3.9	0.30				2111378
Dibenz(a,h)anthracene	ng	<0.46	3.5	0.46				2111378
Benzo(g,h,i)perylene	ng	4.48	4.1	0.23				2111378
PCBs								
33'44'-TetraCB-(77)	ng	<0.20	0.015	0.20	0.00010	0.0000015		2111379
344'5-TetraCB-(81)	ng	<0.20	0.010	0.20	0.00030	0.0000030		2111379
233'44'-PentaCB-(105)	ng	<0.20	0.025	0.20	0.000030	0.00000075		2111379
2344'5-PentaCB-(114)	ng	<0.20	0.012	0.20	0.000030	0.00000036		2111379
23'44'5-PentaCB-(118)	ng	<0.012	0.012	0.20	0.000030	0.00000036		2111379
23'44'5'-PentaCB-(123)	ng	<0.20	0.012	0.20	0.000030	0.00000036		2111379
33'44'5-PentaCB-(126)	ng	<0.20	0.012	0.20	0.10	0.0012		2111379

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) EMCL - PAH analysis - Exceeds Maximum Calibration Limit

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Maxxam Job #: B036715
Report Date: 2010/04/09

Air Compliance Consultants Inc
Client Project #: 10-068
Project name: ALCOSAN COLLECTIVE EFFORTS
Your P.O. #: 10-031

RESULTS OF ANALYSES OF STACK SAMPLING TRAIN

Maxxam ID		FL0682						
Sampling Date		2010/03/25			TOXIC EQUIVALENCY		# of	
	Units	BLANK-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
HexaCB-(156)+(157)	ng	<0.010	0.010	0.40	0.000030	0.00000030		2111379
23'44'55'-HexaCB-(167)	ng	<0.20	0.0099	0.20	0.000030	0.00000030		2111379
33'44'55'-HexaCB-(169)	ng	<0.20	0.010	0.20	0.030	0.00030		2111379
233'44'55'-HeptaCB-(189)	ng	<0.20	0.0078	0.20	0.000030	0.00000023		2111379
TOTAL TOXIC EQUIVALENCY	ng					0.0015		
Surrogate Recovery (%)								
2-Methylnaphthalene-2H10	%	99						2111378
Acenaphthylene-2H8	%	96						2111378
Benz(a)anthracene-2H12	%	103						2111378
Benzo(a)pyrene-2H12	%	106						2111378
Benzo(b)fluoranthene-2H12	%	136						2111378
Benzo(g,h,i)perylene-2H12	%	34 (1)						2111378
Benzo(k)fluoranthene-2H12	%	127						2111378
Chrysene-2H12	%	97						2111378
Dibenzo(a,h)anthracene-2H14	%	35 (1)						2111378
Fluoranthene-2H10	%	96						2111378
Fluorene-2H10	%	115						2111378
Indeno(1,2,3-c,d)pyrene-2H12	%	37 (1)						2111378
Naphthalene-2H8	%	108						2111378
Perylene-2H12	%	119						2111378
Phenanthrene-2H10	%	115						2111378
Terphenyl-2H14	%	71						2111378
C13-233'44'55'-HeptaCB-(189)	%	91						2111379
C13-233'44'5-HexaCB-(156)	%	92						2111379
C13-233'44'5'-HexaCB-(157)	%	92						2111379
C13-233'44'-PentaCB-(105)	%	95						2111379
C13-23'44'55'-HexaCB-(167)	%	93						2111379
C13-2344'5-PentaCB-(114)	%	92						2111379
C13-23'44'5-PentaCB-(118)	%	93						2111379

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

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Maxxam Job #: B036715
Report Date: 2010/04/09

Air Compliance Consultants Inc
Client Project #: 10-068
Project name: ALCOSAN COLLECTIVE EFFORTS
Your P.O. #: 10-031

RESULTS OF ANALYSES OF STACK SAMPLING TRAIN

Maxxam ID		FL0682						
Sampling Date		2010/03/25			TOXIC EQUIVALENCY		# of	
	Units	BLANK-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
C13-2'344'5-PentaCB-(123)	%	94						2111379
C13-33'44'55'-HexaCB-(169)	%	95						2111379
C13-33'44'5-PentaCB-(126)	%	96						2111379
C13-33'44'-TetraCB-(77)	%	83						2111379
C13-344'5-TetraCB-(81)	%	87						2111379

EDL = Estimated Detection Limit
QC Batch = Quality Control Batch
TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
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Client Project #: 10-068
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RESULTS OF ANALYSES OF STACK SAMPLING TRAIN

Maxxam ID		FL0683						
Sampling Date		2010/03/24			TOXIC EQUIVALENCY		# of	
	Units	RUN 1-M23/PCB/C429	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
Polyaromatic Hydrocarbons								
Naphthalene	ng	2250 (1)	28	22				2111378
2-Methylnaphthalene	ng	1140 (1)	0.86	3.1				2111378
2-Chloronaphthalene	ng	1.50	0.11	0.15				2111378
Acenaphthylene	ng	388	2.1	0.32				2111378
Acenaphthene	ng	1130 (1)	2.1	0.40				2111378
Fluorene	ng	596	4.8	0.49				2111378
Phenanthrene	ng	1510 (1)	1.8	0.67				2111378
Anthracene	ng	88.0	2.2	0.31				2111378
Fluoranthene	ng	330	0.86	0.65				2111378
Pyrene	ng	272	0.77	0.52				2111378
Benzo(a)anthracene	ng	11.9	0.82	0.17				2111378
Chrysene	ng	29.2	0.82	0.33				2111378
Benzo(b)fluoranthene	ng	20.1	0.83	0.59				2111378
Benzo(k)fluoranthene	ng	8.48	0.91	0.35				2111378
Benzo(e)pyrene	ng	20.6	2.7	0.43				2111378
Benzo(a)pyrene	ng	16.2	3.5	0.31				2111378
Perylene	ng	<0.26	1.4	0.26				2111378
Indeno(1,2,3-cd)pyrene	ng	12.2	6.2	0.30				2111378
Dibenz(a,h)anthracene	ng	<0.46	5.1	0.46				2111378
Benzo(g,h,i)perylene	ng	27.9	8.6	0.23				2111378
PCBs								
33'44'-TetraCB-(77)	ng	<0.021	0.021	0.20	0.00010	0.0000021		2111379
344'5-TetraCB-(81)	ng	<0.20	0.021	0.20	0.00030	0.0000063		2111379
233'44'-PentaCB-(105)	ng	0.30	0.017	0.20	0.000030	0.0000090		2111379
2344'5-PentaCB-(114)	ng	<0.20	0.025	0.20	0.000030	0.00000075		2111379
23'44'5-PentaCB-(118)	ng	0.94	0.016	0.20	0.000030	0.000028		2111379
23'44'5'-PentaCB-(123)	ng	<0.20	0.017	0.20	0.000030	0.00000051		2111379

RDL = Reportable Detection Limit
EDL = Estimated Detection Limit
QC Batch = Quality Control Batch
TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
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(1) EMCL - PAH analysis - Exceeds Maximum Calibration Limit

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RESULTS OF ANALYSES OF STACK SAMPLING TRAIN

Maxxam ID		FL0683						
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	Units	RUN 1-M23/PCB/C429	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
33'44'5-PentaCB-(126)	ng	<0.20	0.016	0.20	0.10	0.0016		2111379
HexaCB-(156)+(157)	ng	<0.013	0.013	0.40	0.000030	0.00000039		2111379
23'44'55'-HexaCB-(167)	ng	<0.20	0.021	0.20	0.000030	0.00000063		2111379
33'44'55'-HexaCB-(169)	ng	<0.20	0.014	0.20	0.030	0.00042		2111379
233'44'55'-HeptaCB-(189)	ng	<0.20	0.016	0.20	0.000030	0.00000048		2111379
TOTAL TOXIC EQUIVALENCY	ng					0.0021		
Surrogate Recovery (%)								
2-Methylnaphthalene-2H10	%	91						2111378
Acenaphthylene-2H8	%	30 (1)						2111378
Benz(a)anthracene-2H12	%	69						2111378
Benzo(a)pyrene-2H12	%	65						2111378
Benzo(b)fluoranthene-2H12	%	144						2111378
Benzo(g,h,i)perylene-2H12	%	30 (1)						2111378
Benzo(k)fluoranthene-2H12	%	145						2111378
Chrysene-2H12	%	70						2111378
Dibenzo(a,h)anthracene-2H14	%	31 (1)						2111378
Fluoranthene-2H10	%	95						2111378
Fluorene-2H10	%	115						2111378
Indeno(1,2,3-c,d)pyrene-2H12	%	35 (1)						2111378
Naphthalene-2H8	%	98						2111378
Perylene-2H12	%	40 (1)						2111378
Phenanthrene-2H10	%	103						2111378
Terphenyl-2H14	%	101						2111378
C13-233'44'55'-HeptaCB-(189)	%	95						2111379
C13-233'44'5-HexaCB-(156)	%	91						2111379
C13-233'44'5'-HexaCB-(157)	%	91						2111379
C13-233'44'-PentaCB-(105)	%	94						2111379
C13-23'44'55'-HexaCB-(167)	%	94						2111379

EDL = Estimated Detection Limit
QC Batch = Quality Control Batch
TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
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(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

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RESULTS OF ANALYSES OF STACK SAMPLING TRAIN

Maxxam ID		FL0683						
Sampling Date		2010/03/24			TOXIC EQUIVALENCY		# of	
	Units	RUN 1-M23/PCB/C429	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
C13-2344'5-PentaCB-(114)	%	91						2111379
C13-23'44'5-PentaCB-(118)	%	91						2111379
C13-2'344'5-PentaCB-(123)	%	94						2111379
C13-33'44'55'-HexaCB-(169)	%	96						2111379
C13-33'44'5-PentaCB-(126)	%	92						2111379
C13-33'44'-TetraCB-(77)	%	86						2111379
C13-344'5-TetraCB-(81)	%	90						2111379

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.
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RESULTS OF ANALYSES OF STACK SAMPLING TRAIN

Maxxam ID		FL0684						
Sampling Date		2010/03/25			TOXIC EQUIVALENCY		# of	
	Units	RUN 2-M23/PCB/C429	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
Polyaromatic Hydrocarbons								
Naphthalene	ng	2800 (1)	34	22				2111378
2-Methylnaphthalene	ng	908	4.7	3.1				2111378
2-Chloronaphthalene	ng	1.27	0.15	0.15				2111378
Acenaphthylene	ng	400	1.1	0.32				2111378
Acenaphthene	ng	348	1.2	0.40				2111378
Fluorene	ng	568	7.3	0.49				2111378
Phenanthrene	ng	1670 (1)	2.9	0.67				2111378
Anthracene	ng	132	3.5	0.31				2111378
Fluoranthene	ng	472	1.1	0.65				2111378
Pyrene	ng	404	0.97	0.52				2111378
Benzo(a)anthracene	ng	15.3	0.88	0.17				2111378
Chrysene	ng	35.1	1.2	0.33				2111378
Benzo(b)fluoranthene	ng	17.2	1.1	0.59				2111378
Benzo(k)fluoranthene	ng	7.96	1.4	0.35				2111378
Benzo(e)pyrene	ng	20.2	2.4	0.43				2111378
Benzo(a)pyrene	ng	21.6	3.1	0.31				2111378
Perylene	ng	<0.26	3.1	0.26				2111378
Indeno(1,2,3-cd)pyrene	ng	19.9	13	0.30				2111378
Dibenz(a,h)anthracene	ng	<0.46	8.2	0.46				2111378
Benzo(g,h,i)perylene	ng	51.6	15	0.23				2111378
PCBs								
33'44'-TetraCB-(77)	ng	<0.017	0.017	0.20	0.00010	0.0000017		2111379
344'5-TetraCB-(81)	ng	<0.20	0.017	0.20	0.00030	0.0000051		2111379
233'44'-PentaCB-(105)	ng	0.30	0.018	0.20	0.000030	0.0000090		2111379
2344'5-PentaCB-(114)	ng	<0.20	0.020	0.20	0.000030	0.00000060		2111379
23'44'5-PentaCB-(118)	ng	0.86	0.017	0.20	0.000030	0.000026		2111379
23'44'5'-PentaCB-(123)	ng	<0.20	0.017	0.20	0.000030	0.00000051		2111379

RDL = Reportable Detection Limit
EDL = Estimated Detection Limit
QC Batch = Quality Control Batch
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(1) EMCL - PAH analysis - Exceeds Maximum Calibration Limit

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Maxxam ID		FL0684						
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	Units	RUN 2-M23/PCB/C429	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
33'44'5-PentaCB-(126)	ng	<0.20	0.017	0.20	0.10	0.0017		2111379
HexaCB-(156)+(157)	ng	<0.40	0.034	0.40	0.000030	0.0000010		2111379
23'44'55'-HexaCB-(167)	ng	<0.20	0.016	0.20	0.000030	0.00000048		2111379
33'44'55'-HexaCB-(169)	ng	<0.20	0.010	0.20	0.030	0.00030		2111379
233'44'55'-HeptaCB-(189)	ng	<0.20	0.0099	0.20	0.000030	0.00000030		2111379
TOTAL TOXIC EQUIVALENCY	ng					0.0020		
Surrogate Recovery (%)								
2-Methylnaphthalene-2H10	%	83						2111378
Acenaphthylene-2H8	%	70						2111378
Benz(a)anthracene-2H12	%	73						2111378
Benzo(a)pyrene-2H12	%	83						2111378
Benzo(b)fluoranthene-2H12	%	139						2111378
Benzo(g,h,i)perylene-2H12	%	22 (1)						2111378
Benzo(k)fluoranthene-2H12	%	123						2111378
Chrysene-2H12	%	58						2111378
Dibenzo(a,h)anthracene-2H14	%	26 (1)						2111378
Fluoranthene-2H10	%	85						2111378
Fluorene-2H10	%	113						2111378
Indeno(1,2,3-c,d)pyrene-2H12	%	27 (1)						2111378
Naphthalene-2H8	%	99						2111378
Perylene-2H12	%	83						2111378
Phenanthrene-2H10	%	92						2111378
Terphenyl-2H14	%	111						2111378
C13-233'44'55'-HeptaCB-(189)	%	98						2111379
C13-233'44'5-HexaCB-(156)	%	97						2111379
C13-233'44'5'-HexaCB-(157)	%	97						2111379
C13-233'44'-PentaCB-(105)	%	99						2111379
C13-23'44'55'-HexaCB-(167)	%	99						2111379

EDL = Estimated Detection Limit
QC Batch = Quality Control Batch
TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
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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.

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RESULTS OF ANALYSES OF STACK SAMPLING TRAIN

Maxxam ID		FL0684						
Sampling Date		2010/03/25			TOXIC EQUIVALENCY		# of	
	Units	RUN 2-M23/PCB/C429	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
C13-2344'5-PentaCB-(114)	%	98						2111379
C13-23'44'5-PentaCB-(118)	%	99						2111379
C13-2'344'5-PentaCB-(123)	%	99						2111379
C13-33'44'55'-HexaCB-(169)	%	100						2111379
C13-33'44'5-PentaCB-(126)	%	99						2111379
C13-33'44'-TetraCB-(77)	%	91						2111379
C13-344'5-TetraCB-(81)	%	93						2111379

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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Maxxam Job #: B036715
Report Date: 2010/04/09

Air Compliance Consultants Inc
Client Project #: 10-068
Project name: ALCOSAN COLLECTIVE EFFORTS
Your P.O. #: 10-031

RESULTS OF ANALYSES OF STACK SAMPLING TRAIN

Maxxam ID		FL0685						
Sampling Date		2010/03/25			TOXIC EQUIVALENCY		# of	
	Units	RUN 3-M23/PCB/C429	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
Polyaromatic Hydrocarbons								
Naphthalene	ng	2570 (1)	11	22				2111378
2-Methylnaphthalene	ng	1130 (1)	3.1	3.1				2111378
2-Chloronaphthalene	ng	1.91	0.16	0.15				2111378
Acenaphthylene	ng	424	4.2	0.32				2111378
Acenaphthene	ng	484	1.6	0.40				2111378
Fluorene	ng	860	6.4	0.49				2111378
Phenanthrene	ng	2260 (1)	3.6	0.67				2111378
Anthracene	ng	197	4.3	0.31				2111378
Fluoranthene	ng	452	1.9	0.65				2111378
Pyrene	ng	370	1.7	0.52				2111378
Benzo(a)anthracene	ng	17.8	2.3	0.17				2111378
Chrysene	ng	48.4	2.4	0.33				2111378
Benzo(b)fluoranthene	ng	24.2	1.7	0.59				2111378
Benzo(k)fluoranthene	ng	4.64	2.1	0.35				2111378
Benzo(e)pyrene	ng	22.2	3.3	0.43				2111378
Benzo(a)pyrene	ng	21.9	4.3	0.31				2111378
Perylene	ng	5.08	3.8	0.26				2111378
Indeno(1,2,3-cd)pyrene	ng	27.1	20	0.30				2111378
Dibenz(a,h)anthracene	ng	<0.46	120000	0.46				2111378
Benzo(g,h,i)perylene	ng	57.6	20	0.23				2111378
PCBs								
33'44'-TetraCB-(77)	ng	<0.019	0.019	0.20	0.00010	0.0000019		2111379
344'5-TetraCB-(81)	ng	<0.20	0.019	0.20	0.00030	0.0000057		2111379
233'44'-PentaCB-(105)	ng	0.33	0.017	0.20	0.000030	0.0000099		2111379
2344'5-PentaCB-(114)	ng	<0.20	0.025	0.20	0.000030	0.00000075		2111379
23'44'5-PentaCB-(118)	ng	1.0	0.017	0.20	0.000030	0.000030		2111379
23'44'5'-PentaCB-(123)	ng	<0.20	0.017	0.20	0.000030	0.00000051		2111379

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) EMCL - PAH analysis - Exceeds Maximum Calibration Limit

Maxxam Job #: B036715
Report Date: 2010/04/09

Air Compliance Consultants Inc
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Project name: ALCOSAN COLLECTIVE EFFORTS
Your P.O. #: 10-031

RESULTS OF ANALYSES OF STACK SAMPLING TRAIN

Maxxam ID		FL0685						
Sampling Date		2010/03/25			TOXIC EQUIVALENCY		# of	
	Units	RUN 3-M23/PCB/C429	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
33'44'5-PentaCB-(126)	ng	<0.20	0.017	0.20	0.10	0.0017		2111379
HexaCB-(156)+(157)	ng	<0.40	0.035	0.40	0.000030	0.0000011		2111379
23'44'55'-HexaCB-(167)	ng	<0.20	0.0086	0.20	0.000030	0.00000026		2111379
33'44'55'-HexaCB-(169)	ng	<0.20	0.012	0.20	0.030	0.00036		2111379
233'44'55'-HeptaCB-(189)	ng	<0.20	0.010	0.20	0.000030	0.00000030		2111379
TOTAL TOXIC EQUIVALENCY	ng					0.0021		
Surrogate Recovery (%)								
2-Methylnaphthalene-2H10	%	93						2111378
Acenaphthylene-2H8	%	86						2111378
Benz(a)anthracene-2H12	%	40 (1)						2111378
Benzo(a)pyrene-2H12	%	93						2111378
Benzo(b)fluoranthene-2H12	%	145						2111378
Benzo(g,h,i)perylene-2H12	%	25 (1)						2111378
Benzo(k)fluoranthene-2H12	%	123						2111378
Chrysene-2H12	%	35 (1)						2111378
Dibenzo(a,h)anthracene-2H14	%	25 (1)						2111378
Fluoranthene-2H10	%	85						2111378
Fluorene-2H10	%	114						2111378
Indeno(1,2,3-c,d)pyrene-2H12	%	23 (1)						2111378
Naphthalene-2H8	%	111						2111378
Perylene-2H12	%	98						2111378
Phenanthrene-2H10	%	114						2111378
Terphenyl-2H14	%	149						2111378
C13-233'44'55'-HeptaCB-(189)	%	98						2111379
C13-233'44'5-HexaCB-(156)	%	94						2111379
C13-233'44'5'-HexaCB-(157)	%	94						2111379
C13-233'44'-PentaCB-(105)	%	95						2111379
C13-23'44'55'-HexaCB-(167)	%	96						2111379

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.

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Air Compliance Consultants Inc
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Your P.O. #: 10-031

RESULTS OF ANALYSES OF STACK SAMPLING TRAIN

Maxxam ID		FL0685						
Sampling Date		2010/03/25			TOXIC EQUIVALENCY		# of	
	Units	RUN 3-M23/PCB/C429	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
C13-2344'5-PentaCB-(114)	%	92						2111379
C13-23'44'5-PentaCB-(118)	%	93						2111379
C13-2'344'5-PentaCB-(123)	%	97						2111379
C13-33'44'55'-HexaCB-(169)	%	93						2111379
C13-33'44'5-PentaCB-(126)	%	100						2111379
C13-33'44'-TetraCB-(77)	%	92						2111379
C13-344'5-TetraCB-(81)	%	97						2111379

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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Your P.O. #: 10-031

DIOXINS AND FURANS BY HRMS (STACK SAMPLING TRAIN)

Maxxam ID		FL0682						
Sampling Date		2010/03/25			TOXIC EQUIVALENCY		# of	
	Units	BLANK-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
Dioxins & Furans								
2,3,7,8-Tetra CDD *	pg	<40	3.0	40	1.00	3.00		2113969
1,2,3,7,8-Penta CDD	pg	<40	2.0	40	1.00	2.00		2113969
1,2,3,4,7,8-Hexa CDD	pg	<40	2.3	40	0.100	0.230		2113969
1,2,3,6,7,8-Hexa CDD	pg	<40	2.0	40	0.100	0.200		2113969
1,2,3,7,8,9-Hexa CDD	pg	<40	2.0	40	0.100	0.200		2113969
1,2,3,4,6,7,8-Hepta CDD	pg	<40	2.1	40	0.0100	0.0210		2113969
1,2,3,4,6,7,8,9-Octa CDD	pg	<400	4.6	400	0.000300	0.00138		2113969
Total Tetra CDD	pg	<40	3.0	40				2113969
Total Penta CDD	pg	<40	2.0	40				2113969
Total Hexa CDD	pg	<40 (1)	2.4	40				2113969
Total Hepta CDD	pg	<40	2.1	40				2113969
2,3,7,8-Tetra CDF **	pg	<40	2.8	40	0.100	0.280		2113969
1,2,3,7,8-Penta CDF	pg	<40	2.3	40	0.0300	0.0690		2113969
2,3,4,7,8-Penta CDF	pg	<40	2.2	40	0.300	0.660		2113969
1,2,3,4,7,8-Hexa CDF	pg	<40	2.1	40	0.100	0.210		2113969
1,2,3,6,7,8-Hexa CDF	pg	<40	1.7	40	0.100	0.170		2113969
2,3,4,6,7,8-Hexa CDF	pg	<40	2.4	40	0.100	0.240		2113969
1,2,3,7,8,9-Hexa CDF	pg	<40	2.5	40	0.100	0.250		2113969
1,2,3,4,6,7,8-Hepta CDF	pg	<40 (1)	2.7	40	0.0100	0.0270		2113969
1,2,3,4,7,8,9-Hepta CDF	pg	<40	2.4	40	0.0100	0.0240		2113969
1,2,3,4,6,7,8,9-Octa CDF	pg	<400	4.3	400	0.000300	0.00129		2113969
Total Tetra CDF	pg	<40	2.8	40				2113969
Total Penta CDF	pg	<40	2.2	40				2113969
Total Hexa CDF	pg	<40	2.1	40				2113969
Total Hepta CDF	pg	<40 (1)	3.0	40				2113969
Toxic Equivalency	pg	<2.8	2.8	N/A				2113969
TOTAL TOXIC EQUIVALENCY	pg					7.58		

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.

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Maxxam Job #: B036715
Report Date: 2010/04/09

Air Compliance Consultants Inc
Client Project #: 10-068
Project name: ALCOSAN COLLECTIVE EFFORTS
Your P.O. #: 10-031

DIOXINS AND FURANS BY HRMS (STACK SAMPLING TRAIN)

Maxxam ID		FL0682						
Sampling Date		2010/03/25			TOXIC EQUIVALENCY		# of	
	Units	BLANK-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
Surrogate Recovery (%)								
C13-1234678 HeptaCDD *	%	110						2113969
C13-1234678 HeptaCDF **	%	105						2113969
C13-123478 HexaCDD	%	91						2113969
C13-123478 HexaCDF	%	105						2113969
C13-1234789 HeptaCDF	%	105						2113969
C13-123678 HexaCDD	%	103						2113969
C13-123678 HexaCDF	%	86						2113969
C13-12378 PentaCDD	%	100						2113969
C13-12378 PentaCDF	%	96						2113969
C13-123789 HexaCDF	%	94						2113969
C13-23478 PentaCDF	%	101						2113969
C13-2378 TetraCDD	%	65						2113969
C13-2378 TetraCDF	%	66						2113969
C13-Octachlorodibenzo-p-Dioxin	%	111						2113969
Cl37-2378 TetraCDD	%	100						2113969

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

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Maxxam Job #: B036715
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Air Compliance Consultants Inc
Client Project #: 10-068
Project name: ALCOSAN COLLECTIVE EFFORTS
Your P.O. #: 10-031

DIOXINS AND FURANS BY HRMS (STACK SAMPLING TRAIN)

Maxxam ID		FL0683						
Sampling Date		2010/03/24			TOXIC EQUIVALENCY		# of	
	Units	RUN 1-M23/PCB/C429	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
Dioxins & Furans								
2,3,7,8-Tetra CDD *	pg	<40	3.4	40	1.00	3.40		2113969
1,2,3,7,8-Penta CDD	pg	<40	2.1	40	1.00	2.10		2113969
1,2,3,4,7,8-Hexa CDD	pg	<40	2.3	40	0.100	0.230		2113969
1,2,3,6,7,8-Hexa CDD	pg	<40	2.0	40	0.100	0.200		2113969
1,2,3,7,8,9-Hexa CDD	pg	<40	2.0	40	0.100	0.200		2113969
1,2,3,4,6,7,8-Hepta CDD	pg	<40 (1)	3.2	40	0.0100	0.0320		2113969
1,2,3,4,6,7,8,9-Octa CDD	pg	<400	5.2	400	0.000300	0.00156		2113969
Total Tetra CDD	pg	<40	3.4	40				2113969
Total Penta CDD	pg	<40	2.1	40				2113969
Total Hexa CDD	pg	<40 (1)	2.3	40				2113969
Total Hepta CDD	pg	<40 (1)	3.2	40				2113969
2,3,7,8-Tetra CDF **	pg	<40 (2)	5.3	40	0.100	0.530		2113969
1,2,3,7,8-Penta CDF	pg	<40	2.8	40	0.0300	0.0840		2113969
2,3,4,7,8-Penta CDF	pg	<40	2.8	40	0.300	0.840		2113969
1,2,3,4,7,8-Hexa CDF	pg	<40	2.1	40	0.100	0.210		2113969
1,2,3,6,7,8-Hexa CDF	pg	<40	1.7	40	0.100	0.170		2113969
2,3,4,6,7,8-Hexa CDF	pg	<40	2.4	40	0.100	0.240		2113969
1,2,3,7,8,9-Hexa CDF	pg	<40	2.5	40	0.100	0.250		2113969
1,2,3,4,6,7,8-Hepta CDF	pg	<40 (1)	3.8	40	0.0100	0.0380		2113969
1,2,3,4,7,8,9-Hepta CDF	pg	<40	2.4	40	0.0100	0.0240		2113969
1,2,3,4,6,7,8,9-Octa CDF	pg	<400	4.1	400	0.000300	0.00123		2113969
Total Tetra CDF	pg	<40	3.0	40				2113969
Total Penta CDF	pg	<40	2.8	40				2113969
Total Hexa CDF	pg	<40	2.1	40				2113969

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.
(2) RT > 3 seconds - PCDD/DF analysis - Peak detected exceeds expected retention time (from internal standard) by greater than 3 seconds.
RT > 2 seconds - PCDD/DF analysis - Peak detected exceeds expected retention time (from monitering ion peak) by greater than 2 seconds.

Maxxam Job #: B036715
Report Date: 2010/04/09

Air Compliance Consultants Inc
Client Project #: 10-068
Project name: ALCOSAN COLLECTIVE EFFORTS
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DIOXINS AND FURANS BY HRMS (STACK SAMPLING TRAIN)

Maxxam ID		FL0683						
Sampling Date		2010/03/24			TOXIC EQUIVALENCY		# of	
	Units	RUN 1-M23/PCB/C429	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
Total Hepta CDF **	pg	<40 (1)	4.3	40				2113969
Toxic Equivalency	pg	<5.3	5.3	N/A				2113969
TOTAL TOXIC EQUIVALENCY	pg					8.55		
Surrogate Recovery (%)								
C13-1234678 HeptaCDD *	%	100						2113969
C13-1234678 HeptaCDF	%	99						2113969
C13-123478 HexaCDD	%	93						2113969
C13-123478 HexaCDF	%	111						2113969
C13-1234789 HeptaCDF	%	104						2113969
C13-123678 HexaCDD	%	101						2113969
C13-123678 HexaCDF	%	84						2113969
C13-12378 PentaCDD	%	107						2113969
C13-12378 PentaCDF	%	104						2113969
C13-123789 HexaCDF	%	96						2113969
C13-23478 PentaCDF	%	101						2113969
C13-2378 TetraCDD	%	81						2113969
C13-2378 TetraCDF	%	82						2113969
C13-Octachlorodibenzo-p-Dioxin	%	90						2113969
Cl37-2378 TetraCDD	%	99						2113969

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.

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DIOXINS AND FURANS BY HRMS (STACK SAMPLING TRAIN)

Maxxam ID		FL0684						
Sampling Date		2010/03/25			TOXIC EQUIVALENCY		# of	
	Units	RUN 2-M23/PCB/C429	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
Dioxins & Furans								
2,3,7,8-Tetra CDD *	pg	<40	4.0	40	1.00	4.00		2113969
1,2,3,7,8-Penta CDD	pg	<40	2.5	40	1.00	2.50		2113969
1,2,3,4,7,8-Hexa CDD	pg	<40	2.4	40	0.100	0.240		2113969
1,2,3,6,7,8-Hexa CDD	pg	<40	2.1	40	0.100	0.210		2113969
1,2,3,7,8,9-Hexa CDD	pg	<40	2.1	40	0.100	0.210		2113969
1,2,3,4,6,7,8-Hepta CDD	pg	<40	2.3	40	0.0100	0.0230		2113969
1,2,3,4,6,7,8,9-Octa CDD	pg	<400	5.5	400	0.000300	0.00165		2113969
Total Tetra CDD	pg	<40	4.0	40				2113969
Total Penta CDD	pg	<40	2.5	40				2113969
Total Hexa CDD	pg	<40 (1)	2.3	40				2113969
Total Hepta CDD	pg	<40	2.3	40				2113969
2,3,7,8-Tetra CDF **	pg	<40 (1)	5.9	40	0.100	0.590		2113969
1,2,3,7,8-Penta CDF	pg	<40	2.0	40	0.0300	0.0600		2113969
2,3,4,7,8-Penta CDF	pg	<40	2.0	40	0.300	0.600		2113969
1,2,3,4,7,8-Hexa CDF	pg	<40	2.3	40	0.100	0.230		2113969
1,2,3,6,7,8-Hexa CDF	pg	<40	2.0	40	0.100	0.200		2113969
2,3,4,6,7,8-Hexa CDF	pg	<40	2.7	40	0.100	0.270		2113969
1,2,3,7,8,9-Hexa CDF	pg	<40	2.8	40	0.100	0.280		2113969
1,2,3,4,6,7,8-Hepta CDF	pg	<40 (1)	4.0	40	0.0100	0.0400		2113969
1,2,3,4,7,8,9-Hepta CDF	pg	<40	2.6	40	0.0100	0.0260		2113969
1,2,3,4,6,7,8,9-Octa CDF	pg	<400	4.2	400	0.000300	0.00126		2113969
Total Tetra CDF	pg	<40	2.3	40				2113969
Total Penta CDF	pg	<40	2.0	40				2113969
Total Hexa CDF	pg	<40	2.4	40				2113969
Total Hepta CDF	pg	<40 (1)	4.5	40				2113969
Toxic Equivalency	pg	<5.9	5.9	N/A				2113969

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 Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B036715
Report Date: 2010/04/09

Air Compliance Consultants Inc
Client Project #: 10-068
Project name: ALCOSAN COLLECTIVE EFFORTS
Your P.O. #: 10-031

DIOXINS AND FURANS BY HRMS (STACK SAMPLING TRAIN)

Maxxam ID		FL0684						
Sampling Date		2010/03/25			TOXIC EQUIVALENCY		# of	
	Units	RUN 2-M23/PCB/C429	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
TOTAL TOXIC EQUIVALENCY	pg					9.48		
Surrogate Recovery (%)								
C13-1234678 HeptaCDD *	%	95						2113969
C13-1234678 HeptaCDF **	%	99						2113969
C13-123478 HexaCDD	%	95						2113969
C13-123478 HexaCDF	%	108						2113969
C13-1234789 HeptaCDF	%	96						2113969
C13-123678 HexaCDD	%	105						2113969
C13-123678 HexaCDF	%	89						2113969
C13-12378 PentaCDD	%	111						2113969
C13-12378 PentaCDF	%	106						2113969
C13-123789 HexaCDF	%	92						2113969
C13-23478 PentaCDF	%	100						2113969
C13-2378 TetraCDD	%	81						2113969
C13-2378 TetraCDF	%	84						2113969
C13-Octachlorodibenzo-p-Dioxin	%	84						2113969
Cl37-2378 TetraCDD	%	98						2113969

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 #: B036715
Report Date: 2010/04/09

Air Compliance Consultants Inc
Client Project #: 10-068
Project name: ALCOSAN COLLECTIVE EFFORTS
Your P.O. #: 10-031

DIOXINS AND FURANS BY HRMS (STACK SAMPLING TRAIN)

Maxxam ID		FL0685						
Sampling Date		2010/03/25			TOXIC EQUIVALENCY		# of	
	Units	RUN 3-M23/PCB/C429	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
Dioxins & Furans								
2,3,7,8-Tetra CDD *	pg	<40	3.8	40	1.00	3.80		2113969
1,2,3,7,8-Penta CDD	pg	<40	2.2	40	1.00	2.20		2113969
1,2,3,4,7,8-Hexa CDD	pg	<40	2.3	40	0.100	0.230		2113969
1,2,3,6,7,8-Hexa CDD	pg	<40	2.0	40	0.100	0.200		2113969
1,2,3,7,8,9-Hexa CDD	pg	<40	2.0	40	0.100	0.200		2113969
1,2,3,4,6,7,8-Hepta CDD	pg	<40	2.1	40	0.0100	0.0210		2113969
1,2,3,4,6,7,8,9-Octa CDD	pg	<400	4.3	400	0.000300	0.00129		2113969
Total Tetra CDD	pg	<40	3.8	40				2113969
Total Penta CDD	pg	<40	2.2	40				2113969
Total Hexa CDD	pg	<40 (1)	2.8	40				2113969
Total Hepta CDD	pg	<40	2.1	40				2113969
2,3,7,8-Tetra CDF **	pg	<40 (1)	3.8	40	0.100	0.380		2113969
1,2,3,7,8-Penta CDF	pg	<40	2.3	40	0.0300	0.0690		2113969
2,3,4,7,8-Penta CDF	pg	<40	2.3	40	0.300	0.690		2113969
1,2,3,4,7,8-Hexa CDF	pg	<40	2.4	40	0.100	0.240		2113969
1,2,3,6,7,8-Hexa CDF	pg	<40	2.0	40	0.100	0.200		2113969
2,3,4,6,7,8-Hexa CDF	pg	<40	2.8	40	0.100	0.280		2113969
1,2,3,7,8,9-Hexa CDF	pg	<40	2.9	40	0.100	0.290		2113969
1,2,3,4,6,7,8-Hepta CDF	pg	<40 (1)	4.3	40	0.0100	0.0430		2113969
1,2,3,4,7,8,9-Hepta CDF	pg	<40	2.6	40	0.0100	0.0260		2113969
1,2,3,4,6,7,8,9-Octa CDF	pg	<400	4.4	400	0.000300	0.00132		2113969
Total Tetra CDF	pg	<40	2.8	40				2113969
Total Penta CDF	pg	<40	2.3	40				2113969
Total Hexa CDF	pg	<40	2.5	40				2113969
Total Hepta CDF	pg	<40 (1)	4.9	40				2113969
Toxic Equivalency	pg	<3.8	3.8	N/A				2113969

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.
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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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Maxxam Job #: B036715
Report Date: 2010/04/09

Air Compliance Consultants Inc
Client Project #: 10-068
Project name: ALCOSAN COLLECTIVE EFFORTS
Your P.O. #: 10-031

DIOXINS AND FURANS BY HRMS (STACK SAMPLING TRAIN)

Maxxam ID		FL0685						
Sampling Date		2010/03/25			TOXIC EQUIVALENCY		# of	
	Units	RUN 3-M23/PCB/C429	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
TOTAL TOXIC EQUIVALENCY	pg					8.87		
Surrogate Recovery (%)								
C13-1234678 HeptaCDD *	%	91						2113969
C13-1234678 HeptaCDF **	%	98						2113969
C13-123478 HexaCDD	%	95						2113969
C13-123478 HexaCDF	%	109						2113969
C13-1234789 HeptaCDF	%	106						2113969
C13-123678 HexaCDD	%	104						2113969
C13-123678 HexaCDF	%	87						2113969
C13-12378 PentaCDD	%	109						2113969
C13-12378 PentaCDF	%	111						2113969
C13-123789 HexaCDF	%	95						2113969
C13-23478 PentaCDF	%	97						2113969
C13-2378 TetraCDD	%	86						2113969
C13-2378 TetraCDF	%	89						2113969
C13-Octachlorodibenzo-p-Dioxin	%	80						2113969
Cl37-2378 TetraCDD	%	97						2113969

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

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Report Date: 2010/04/09

Air Compliance Consultants Inc
Client Project #: 10-068
Project name: ALCOSAN COLLECTIVE EFFORTS
Your P.O. #: 10-031

Test Summary

Maxxam ID FL0682 **Collected** 2010/03/25
Sample ID BLANK-M23 **Shipped**
Matrix Stack Sampling Train **Received** 2010/03/26

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Dioxins/Furans in Air (Method 23)	HRMS/MS	2113969	2010/03/29	2010/03/31	KKS
PAHs in Air (CARB429)	HRMS/MS	2111378	2010/03/29	2010/04/07	EM
PCB Congeners in Air (1668A)	HRMS/MSEC	2111379	2010/03/29	2010/04/01	BY

Maxxam ID FL0683 **Collected** 2010/03/24
Sample ID RUN 1-M23/PCB/C429 **Shipped**
Matrix Stack Sampling Train **Received** 2010/03/26

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Dioxins/Furans in Air (Method 23)	HRMS/MS	2113969	2010/03/29	2010/03/31	KKS
PAHs in Air (CARB429)	HRMS/MS	2111378	2010/03/29	2010/04/07	EM
PCB Congeners in Air (1668A)	HRMS/MSEC	2111379	2010/03/29	2010/04/01	BY

Maxxam ID FL0684 **Collected** 2010/03/25
Sample ID RUN 2-M23/PCB/C429 **Shipped**
Matrix Stack Sampling Train **Received** 2010/03/26

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Dioxins/Furans in Air (Method 23)	HRMS/MS	2113969	2010/03/29	2010/04/01	KKS
PAHs in Air (CARB429)	HRMS/MS	2111378	2010/03/29	2010/04/07	EM
PCB Congeners in Air (1668A)	HRMS/MSEC	2111379	2010/03/29	2010/04/01	BY

Maxxam ID FL0685 **Collected** 2010/03/25
Sample ID RUN 3-M23/PCB/C429 **Shipped**
Matrix Stack Sampling Train **Received** 2010/03/26

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Dioxins/Furans in Air (Method 23)	HRMS/MS	2113969	2010/03/29	2010/04/01	KKS
PAHs in Air (CARB429)	HRMS/MS	2111378	2010/03/29	2010/04/07	EM
PCB Congeners in Air (1668A)	HRMS/MSEC	2111379	2010/03/29	2010/04/01	BY

Maxxam Job #: B036715
Report Date: 2010/04/09

Air Compliance Consultants Inc
Client Project #: 10-068
Project name: ALCOSAN COLLECTIVE EFFORTS
Your P.O. #: 10-031

GENERAL COMMENTS

PCDD/DF Analysis :LCS / LCS Duplicate calculated vs: mspike

PAH Analysis : Some of the surrogate recoveries are outside of standard ranges due to matrix interferences. Artifact naphthalene was found in the lab blank biasing the spiked blank recoveries high.

Results relate only to the items tested.

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Air Compliance Consultants Inc
Attention: Rob Frey
Client Project #: 10-068
P.O. #: 10-031
Project name: ALCOSAN COLLECTIVE EFFORTS

Quality Assurance Report

Maxxam Job Number: GB036715

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	%Recovery	Units	QC Limits
2111378 EM	Spiked Blank	2-Methylnaphthalene-2H10	2010/04/06		108	%	50 - 150
		Acenaphthylene-2H8	2010/04/06		95	%	50 - 150
		Benz(a)anthracene-2H12	2010/04/06		124	%	50 - 150
		Benzo(a)pyrene-2H12	2010/04/06		90	%	50 - 150
		Benzo(b)fluoranthene-2H12	2010/04/06		121	%	50 - 150
		Benzo(g,h,i)perylene-2H12	2010/04/06		55	%	50 - 150
		Benzo(k)fluoranthene-2H12	2010/04/06		103	%	50 - 150
		Chrysene-2H12	2010/04/06		126	%	50 - 150
		Dibenzo(a,h)anthracene-2H14	2010/04/06		64	%	50 - 150
		Fluoranthene-2H10	2010/04/06		95	%	50 - 150
		Indeno(1,2,3-c,d)pyrene-2H12	2010/04/06		62	%	50 - 150
		Naphthalene-2H8	2010/04/06		131	%	50 - 150
		Perylene-2H12	2010/04/06		103	%	50 - 150
		Phenanthrene-2H10	2010/04/06		123	%	50 - 150
		Naphthalene	2010/04/06		180 (1)	%	60 - 140
	RPD	Naphthalene	2010/04/06	23.6		%	50
	Spiked Blank	2-Methylnaphthalene	2010/04/06		120	%	60 - 140
	RPD	2-Methylnaphthalene	2010/04/06	9.6		%	50
	Spiked Blank	2-Chloronaphthalene	2010/04/06		94	%	N/A
	RPD	2-Chloronaphthalene	2010/04/06	5.5		%	50
	Spiked Blank	Acenaphthylene	2010/04/06		115	%	60 - 140
	RPD	Acenaphthylene	2010/04/06	0		%	50
	Spiked Blank	Acenaphthene	2010/04/06		117	%	60 - 140
	RPD	Acenaphthene	2010/04/06	1.7		%	50
	Spiked Blank	Fluorene	2010/04/06		115	%	60 - 140
	RPD	Fluorene	2010/04/06	2.6		%	50
	Spiked Blank	Phenanthrene	2010/04/06		100	%	60 - 140
	RPD	Phenanthrene	2010/04/06	0		%	50
	Spiked Blank	Anthracene	2010/04/06		91	%	60 - 140
	RPD	Anthracene	2010/04/06	4.3		%	50
	Spiked Blank	Fluoranthene	2010/04/06		110	%	60 - 140
	RPD	Fluoranthene	2010/04/06	3.7		%	50
	Spiked Blank	Pyrene	2010/04/06		98	%	60 - 140
	RPD	Pyrene	2010/04/06	1.0		%	50
	Spiked Blank	Benzo(a)anthracene	2010/04/06		108	%	60 - 140
	RPD	Benzo(a)anthracene	2010/04/06	3.8		%	50
	Spiked Blank	Chrysene	2010/04/06		92	%	60 - 140
	RPD	Chrysene	2010/04/06	3.2		%	50
	Spiked Blank	Benzo(b)fluoranthene	2010/04/06		87	%	60 - 140
	RPD	Benzo(b)fluoranthene	2010/04/06	6.7		%	50
	Spiked Blank	Benzo(k)fluoranthene	2010/04/06		84	%	60 - 140
	RPD	Benzo(k)fluoranthene	2010/04/06	4.9		%	50
	Spiked Blank	Benzo(e)pyrene	2010/04/06		98	%	60 - 140
	RPD	Benzo(e)pyrene	2010/04/06	0		%	50
	Spiked Blank	Benzo(a)pyrene	2010/04/06		97	%	60 - 140
	RPD	Benzo(a)pyrene	2010/04/06	9.8		%	50
	Spiked Blank	Perylene	2010/04/06		85	%	60 - 140
	RPD	Perylene	2010/04/06	3.5		%	50
	Spiked Blank	Indeno(1,2,3-cd)pyrene	2010/04/06		104	%	60 - 140
	RPD	Indeno(1,2,3-cd)pyrene	2010/04/06	1		%	50
	Spiked Blank	Dibenz(a,h)anthracene	2010/04/06		102	%	60 - 140
	RPD	Dibenz(a,h)anthracene	2010/04/06	0		%	50
	Spiked Blank	Benzo(g,h,i)perylene	2010/04/06		105	%	60 - 140
	RPD	Benzo(g,h,i)perylene	2010/04/06	1.9		%	50
	Method Blank	2-Methylnaphthalene-2H10	2010/04/06		124	%	50 - 150

Air Compliance Consultants Inc
Attention: Rob Frey
Client Project #: 10-068
P.O. #: 10-031
Project name: ALCOSAN COLLECTIVE EFFORTS

Quality Assurance Report (Continued)

Maxxam Job Number: GB036715

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	%Recovery	Units	QC Limits
2111378 EM	Method Blank	Acenaphthylene-2H8	2010/04/06		97	%	50 - 150
		Benz(a)anthracene-2H12	2010/04/06		102	%	50 - 150
		Benzo(a)pyrene-2H12	2010/04/06		100	%	50 - 150
		Benzo(b)fluoranthene-2H12	2010/04/06		122	%	50 - 150
		Benzo(g,h,i)perylene-2H12	2010/04/06		61	%	50 - 150
		Benzo(k)fluoranthene-2H12	2010/04/06		102	%	50 - 150
		Chrysene-2H12	2010/04/06		104	%	50 - 150
		Dibenzo(a,h)anthracene-2H14	2010/04/06		68	%	50 - 150
		Fluoranthene-2H10	2010/04/06		102	%	50 - 150
		Indeno(1,2,3-c,d)pyrene-2H12	2010/04/06		66	%	50 - 150
		Naphthalene-2H8	2010/04/06		149	%	50 - 150
		Perylene-2H12	2010/04/06		117	%	50 - 150
		Phenanthrene-2H10	2010/04/06		142	%	50 - 150
		Naphthalene	2010/04/06	560, EDL=0.52		ng	
		2-Methylnaphthalene	2010/04/06	4.5, EDL=0.43		ng	
		2-Chloronaphthalene	2010/04/06	<0.076, EDL=0.076		ng	
		Acenaphthylene	2010/04/06	0.62, EDL=0.44		ng	
		Acenaphthene	2010/04/06	0.54, EDL=0.43		ng	
		Fluorene	2010/04/06	0.98, EDL=0.67		ng	
		Phenanthrene	2010/04/06	1.94, EDL=0.34		ng	
		Anthracene	2010/04/06	<0.41, EDL=0.41		ng	
		Fluoranthene	2010/04/06	1.20, EDL=0.26		ng	
		Pyrene	2010/04/06	1.56, EDL=0.24		ng	
		Benzo(a)anthracene	2010/04/06	<0.34, EDL=0.34		ng	
		Chrysene	2010/04/06	<0.29, EDL=0.29		ng	
		Benzo(b)fluoranthene	2010/04/06	<0.24, EDL=0.24		ng	
		Benzo(k)fluoranthene	2010/04/06	<0.28, EDL=0.28		ng	
		Benzo(e)pyrene	2010/04/06	<0.34, EDL=0.34		ng	
		Benzo(a)pyrene	2010/04/06	<0.44, EDL=0.44		ng	
		Perylene	2010/04/06	<0.38, EDL=0.38		ng	
		Indeno(1,2,3-cd)pyrene	2010/04/06	<0.65, EDL=0.65		ng	
		Dibenz(a,h)anthracene	2010/04/06	<0.62, EDL=0.62		ng	
		Benzo(g,h,i)perylene	2010/04/06	<0.80, EDL=0.80		ng	
2111379 BY	Spiked Blank	C13-233'44'55'-HeptaCB-(189)	2010/04/01		97	%	20 - 150
		C13-233'44'5-HexaCB-(156)	2010/04/01		98	%	20 - 150
		C13-233'44'5'-HexaCB-(157)	2010/04/01		98	%	20 - 150
		C13-233'44'-PentaCB-(105)	2010/04/01		99	%	20 - 150
		C13-23'44'55'-HexaCB-(167)	2010/04/01		99	%	20 - 150
		C13-2344'5-PentaCB-(114)	2010/04/01		94	%	20 - 150
		C13-23'44'5-PentaCB-(118)	2010/04/01		97	%	20 - 150
		C13-2'344'5-PentaCB-(123)	2010/04/01		99	%	20 - 150
		C13-33'44'55'-HexaCB-(169)	2010/04/01		102	%	20 - 150
		C13-33'44'5-PentaCB-(126)	2010/04/01		100	%	20 - 150
		C13-33'44'-TetraCB-(77)	2010/04/01		87	%	20 - 150
		C13-344'5-TetraCB-(81)	2010/04/01		94	%	20 - 150
		33'44'-TetraCB-(77)	2010/04/01		111	%	N/A
	RPD	33'44'-TetraCB-(77)	2010/04/01	1.8		%	20
	Spiked Blank	344'5-TetraCB-(81)	2010/04/01		106	%	N/A
	RPD	344'5-TetraCB-(81)	2010/04/01	0.9		%	20
	Spiked Blank	233'44'-PentaCB-(105)	2010/04/01		105	%	N/A
	RPD	233'44'-PentaCB-(105)	2010/04/01	4.7		%	20
	Spiked Blank	2344'5-PentaCB-(114)	2010/04/01		110	%	N/A
	RPD	2344'5-PentaCB-(114)	2010/04/01	0.9		%	20
	Spiked Blank	23'44'5-PentaCB-(118)	2010/04/01		110	%	N/A
	RPD	23'44'5-PentaCB-(118)	2010/04/01	0.9		%	20

Air Compliance Consultants Inc
Attention: Rob Frey
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P.O. #: 10-031
Project name: ALCOSAN COLLECTIVE EFFORTS

Quality Assurance Report (Continued)

Maxxam Job Number: GB036715

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	%Recovery	Units	QC Limits
2111379 BY	Spiked Blank	23'44'5'-PentaCB-(123)	2010/04/01		108	%	N/A
	RPD	23'44'5'-PentaCB-(123)	2010/04/01	1.8		%	20
	Spiked Blank	33'44'5-PentaCB-(126)	2010/04/01		108	%	N/A
	RPD	33'44'5-PentaCB-(126)	2010/04/01	0.9		%	20
	Spiked Blank	HexaCB-(156)+(157)	2010/04/01		106	%	N/A
	RPD	HexaCB-(156)+(157)	2010/04/01	2.8		%	20
	Spiked Blank	23'44'55'-HexaCB-(167)	2010/04/01		104	%	N/A
	RPD	23'44'55'-HexaCB-(167)	2010/04/01	1		%	20
	Spiked Blank	33'44'55'-HexaCB-(169)	2010/04/01		102	%	N/A
	RPD	33'44'55'-HexaCB-(169)	2010/04/01	8.5		%	20
	Spiked Blank	233'44'55'-HeptaCB-(189)	2010/04/01		101	%	N/A
	RPD	233'44'55'-HeptaCB-(189)	2010/04/01	1		%	N/A
	Method Blank	C13-233'44'55'-HeptaCB-(189)	2010/04/01		99	%	20 - 150
		C13-233'44'5-HexaCB-(156)	2010/04/01		95	%	20 - 150
		C13-233'44'5'-HexaCB-(157)	2010/04/01		95	%	20 - 150
		C13-233'44'-PentaCB-(105)	2010/04/01		94	%	20 - 150
		C13-23'44'55'-HexaCB-(167)	2010/04/01		94	%	20 - 150
		C13-2344'5-PentaCB-(114)	2010/04/01		91	%	20 - 150
		C13-23'44'5-PentaCB-(118)	2010/04/01		93	%	20 - 150
		C13-2'344'5-PentaCB-(123)	2010/04/01		94	%	20 - 150
		C13-33'44'55'-HexaCB-(169)	2010/04/01		98	%	20 - 150
		C13-33'44'5-PentaCB-(126)	2010/04/01		92	%	20 - 150
		C13-33'44'-TetraCB-(77)	2010/04/01		84	%	20 - 150
		C13-344'5-TetraCB-(81)	2010/04/01		87	%	20 - 150
		33'44'-TetraCB-(77)	2010/04/01	<0.012, EDL=0.012		ng	
		344'5-TetraCB-(81)	2010/04/01	<0.012, EDL=0.012		ng	
		233'44'-PentaCB-(105)	2010/04/01	<0.010, EDL=0.010		ng	
		2344'5-PentaCB-(114)	2010/04/01	<0.010, EDL=0.010		ng	
		23'44'5-PentaCB-(118)	2010/04/01	<0.0099, EDL=0.0099		ng	
		23'44'5'-PentaCB-(123)	2010/04/01	<0.010, EDL=0.010		ng	
		33'44'5-PentaCB-(126)	2010/04/01	<0.010, EDL=0.010		ng	
		HexaCB-(156)+(157)	2010/04/01	<0.010, EDL=0.010		ng	
		23'44'55'-HexaCB-(167)	2010/04/01	<0.0085, EDL=0.0085		ng	
		33'44'55'-HexaCB-(169)	2010/04/01	<0.0088, EDL=0.0088		ng	
		233'44'55'-HeptaCB-(189)	2010/04/01	<0.0074, EDL=0.0074		ng	
2113969 KKS	Spiked Blank	C13-1234678 HeptaCDD	2010/03/31		108	%	25 - 130
		C13-1234678 HeptaCDF	2010/03/31		95	%	25 - 130
		C13-123678 HexaCDD	2010/03/31		93	%	40 - 130
		C13-123678 HexaCDF	2010/03/31		73	%	40 - 130
		C13-12378 PentaCDD	2010/03/31		87	%	40 - 130
		C13-12378 PentaCDF	2010/03/31		82	%	40 - 130
		C13-123789 HexaCDF	2010/03/31		87	%	40 - 130
		C13-2378 TetraCDD	2010/03/31		55	%	40 - 130
		C13-2378 TetraCDF	2010/03/31		56	%	40 - 130
		C13-Octachlorodibenzo-p-Dioxin	2010/03/31		111	%	25 - 130
		2,3,7,8-Tetra CDD	2010/03/31		100	%	80 - 140
	RPD	2,3,7,8-Tetra CDD	2010/03/31	NC		%	20
	Spiked Blank	1,2,3,7,8-Penta CDD	2010/03/31		104	%	80 - 140
	RPD	1,2,3,7,8-Penta CDD	2010/03/31	NC		%	20
	Spiked Blank	1,2,3,4,7,8-Hexa CDD	2010/03/31		103	%	80 - 140
	RPD	1,2,3,4,7,8-Hexa CDD	2010/03/31	NC		%	20
	Spiked Blank	1,2,3,6,7,8-Hexa CDD	2010/03/31		121	%	80 - 140
	RPD	1,2,3,6,7,8-Hexa CDD	2010/03/31	NC		%	20
	Spiked Blank	1,2,3,7,8,9-Hexa CDD	2010/03/31		120	%	80 - 140
	RPD	1,2,3,7,8,9-Hexa CDD	2010/03/31	NC		%	20

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Air Compliance Consultants Inc
Attention: Rob Frey
Client Project #: 10-068
P.O. #: 10-031
Project name: ALCOSAN COLLECTIVE EFFORTS

Quality Assurance Report (Continued)

Maxxam Job Number: GB036715

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	%Recovery	Units	QC Limits
2113969 KKS	Spiked Blank	1,2,3,4,6,7,8-Hepta CDD	2010/03/31		90	%	80 - 140
	RPD	1,2,3,4,6,7,8-Hepta CDD	2010/03/31	NC		%	20
	Spiked Blank	1,2,3,4,6,7,8,9-Octa CDD	2010/03/31		98	%	80 - 140
	RPD	1,2,3,4,6,7,8,9-Octa CDD	2010/03/31	NC		%	20
	Spiked Blank	2,3,7,8-Tetra CDF	2010/03/31		97	%	80 - 140
	RPD	2,3,7,8-Tetra CDF	2010/03/31	NC		%	20
	Spiked Blank	1,2,3,7,8-Penta CDF	2010/03/31		102	%	80 - 140
	RPD	1,2,3,7,8-Penta CDF	2010/03/31	NC		%	20
	Spiked Blank	2,3,4,7,8-Penta CDF	2010/03/31		102	%	80 - 140
	RPD	2,3,4,7,8-Penta CDF	2010/03/31	NC		%	20
	Spiked Blank	1,2,3,4,7,8-Hexa CDF	2010/03/31		103	%	80 - 140
	RPD	1,2,3,4,7,8-Hexa CDF	2010/03/31	NC		%	20
	Spiked Blank	1,2,3,6,7,8-Hexa CDF	2010/03/31		109	%	80 - 140
	RPD	1,2,3,6,7,8-Hexa CDF	2010/03/31	NC		%	20
	Spiked Blank	2,3,4,6,7,8-Hexa CDF	2010/03/31		119	%	80 - 140
	RPD	2,3,4,6,7,8-Hexa CDF	2010/03/31	NC		%	20
	Spiked Blank	1,2,3,7,8,9-Hexa CDF	2010/03/31		110	%	80 - 140
	RPD	1,2,3,7,8,9-Hexa CDF	2010/03/31	NC		%	20
	Spiked Blank	1,2,3,4,6,7,8-Hepta CDF	2010/03/31		101	%	80 - 140
	RPD	1,2,3,4,6,7,8-Hepta CDF	2010/03/31	NC		%	20
	Spiked Blank	1,2,3,4,7,8,9-Hepta CDF	2010/03/31		100	%	80 - 140
	RPD	1,2,3,4,7,8,9-Hepta CDF	2010/03/31	NC		%	20
	Spiked Blank	1,2,3,4,6,7,8,9-Octa CDF	2010/03/31		107	%	80 - 140
	RPD	1,2,3,4,6,7,8,9-Octa CDF	2010/03/31	NC		%	20
	Method Blank	C13-1234678 HeptaCDD	2010/03/31		111	%	25 - 130
		C13-1234678 HeptaCDF	2010/03/31		108	%	25 - 130
		C13-123678 HexaCDD	2010/03/31		97	%	40 - 130
		C13-123678 HexaCDF	2010/03/31		82	%	40 - 130
		C13-12378 PentaCDD	2010/03/31		97	%	40 - 130
		C13-12378 PentaCDF	2010/03/31		93	%	40 - 130
		C13-123789 HexaCDF	2010/03/31		99	%	40 - 130
		C13-2378 TetraCDD	2010/03/31		62	%	40 - 130
		C13-2378 TetraCDF	2010/03/31		64	%	40 - 130
		C13-Octachlorodibenzo-p-Dioxin	2010/03/31		115	%	25 - 130
		2,3,7,8-Tetra CDD	2010/03/31	<3.5, EDL=3.5		pg	
		1,2,3,7,8-Penta CDD	2010/03/31	<2.2, EDL=2.2		pg	
		1,2,3,4,7,8-Hexa CDD	2010/03/31	<2.5, EDL=2.5		pg	
		1,2,3,6,7,8-Hexa CDD	2010/03/31	<2.2, EDL=2.2		pg	
		1,2,3,7,8,9-Hexa CDD	2010/03/31	<2.1, EDL=2.1		pg	
		1,2,3,4,6,7,8-Hepta CDD	2010/03/31	<2.1, EDL=2.1		pg	
		1,2,3,4,6,7,8,9-Octa CDD	2010/03/31	<4.8, EDL=4.8		pg	
		Total Tetra CDD	2010/03/31	<3.5, EDL=3.5		pg	
		Total Penta CDD	2010/03/31	<2.2, EDL=2.2		pg	
		Total Hexa CDD	2010/03/31	<2.3, EDL=2.3		pg	
		Total Hepta CDD	2010/03/31	<2.1, EDL=2.1		pg	
		2,3,7,8-Tetra CDF	2010/03/31	<2.3, EDL=2.3		pg	
		1,2,3,7,8-Penta CDF	2010/03/31	<2.3, EDL=2.3		pg	
		2,3,4,7,8-Penta CDF	2010/03/31	<2.3, EDL=2.3		pg	
		1,2,3,4,7,8-Hexa CDF	2010/03/31	<2.1, EDL=2.1		pg	
		1,2,3,6,7,8-Hexa CDF	2010/03/31	<1.8, EDL=1.8		pg	
		2,3,4,6,7,8-Hexa CDF	2010/03/31	<2.5, EDL=2.5		pg	
		1,2,3,7,8,9-Hexa CDF	2010/03/31	<2.6, EDL=2.6		pg	
		1,2,3,4,6,7,8-Hepta CDF	2010/03/31	<2.5, EDL=2.5 (2)		pg	
		1,2,3,4,7,8,9-Hepta CDF	2010/03/31	<2.4, EDL=2.4		pg	
		1,2,3,4,6,7,8,9-Octa CDF	2010/03/31	<4.3, EDL=4.3		pg	

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Air Compliance Consultants Inc
Attention: Rob Frey
Client Project #: 10-068
P.O. #: 10-031
Project name: ALCOSAN COLLECTIVE EFFORTS

Quality Assurance Report (Continued)

Maxxam Job Number: GB036715

QA/QC Batch Num	Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	%Recovery	Units	QC Limits
2113969	KKS	Method Blank	Total Tetra CDF	2010/03/31	<2.3, EDL=2.3		pg	
			Total Penta CDF	2010/03/31	<2.3, EDL=2.3		pg	
			Total Hexa CDF	2010/03/31	<2.2, EDL=2.2		pg	
			Total Hepta CDF	2010/03/31	<2.8, EDL=2.8 (2)		pg	
			Toxic Equivalency	2010/03/31	<2.3, EDL=2.3		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.

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Your P.O. #: 10-031

Your Project #: 10-068
Site:ALCOSAN
Your C.O.C. #: 0795

Attention: Rob Frey
Air Compliance Consultants Inc
1050 William Pitt Way
Pittsburgh, PA
USA 15238

Report Date: 2010/04/13

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B037072
Received: 2010/03/26, 19:39

Sample Matrix: Stack Sampling Train
Samples Received: 4

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
Mercury 3C in HCl Rinse (1)	3	2010/04/01	2010/04/06	BRL SOP-00104	EPA M29 / M0060
Mercury 2B in HNO3/H2O2 Imp. (1)	4	2010/04/01	2010/04/05	BRL SOP-00104	EPA M29 / M0060
Mercury 3B in KMnO4/H2SO4 Imp. (1)	4	2010/03/31	2010/04/01	BRL SOP-00104	EPA M29 / M0060
Mercury 1B in Filter + Rinse (M29) (1)	4	2010/04/08	2010/04/09	BRL SOP-00104	EPA Method 29
Metals B.H. in H2O2/HNO3 Imp.(6010C) (1)	4	2010/04/08	2010/04/12	CAM SOP-00408 / BRL SOP-00102	EPA 6010C / M29
Metals F.H. in Filter + Rinse (6010C) (1)	4	2010/04/08	2010/04/12	CAM SOP-00408 / BRL SOP-00102	EPA 6010C / M29
Metals B.H. in H2O2/HNO3 Imp.(6020) (1)	4	2010/04/08	2010/04/08	BRL SOP-00103 / BRL SOP-00102	EPA 6020 / M29
Metals F.H. in Filter + Rinses (6020) (1)	4	2010/04/08	2010/04/09	BRL SOP-00103/ BRL SOP-00102	EPA 6020 / M29

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

Encryption Key

Lina Barreto

13 Apr 2010 17:25:26 -04:00

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

LINA BARRETO, Project Manager Assistant
Email: Lina.Barreto@maxxamanalytics.com
Phone# (905) 817-5700

==========

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. For Service Group specific validation please refer to the Validation Signature Page.

Your P.O. #: 10-031

Your Project #: 10-068
Site:ALCOSAN
Your C.O.C. #: 0795

Attention: Rob Frey
Air Compliance Consultants Inc
1050 William Pitt Way
Pittsburgh, PA
USA 15238

Report Date: 2010/04/13

CERTIFICATE OF ANALYSIS

Maxxam Analytics Inc. Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section.

Total cover pages: 2

Maxxam Job #: B037072
Report Date: 2010/04/13

Air Compliance Consultants Inc
Client Project #: 10-068
Project name: ALCOSAN
Your P.O. #: 10-031

MERCURY BY COLD VAPOUR AA (STACK SAMPLING TRAIN)

Maxxam ID		FL2748		FL2749		FL2750		FL2751		
Sampling Date		2010/03/25 13:10		2010/03/24 09:15		2010/03/25 08:25		2010/03/25 13:10		
COC Number		0795		0795		0795		0795		
	Units	**BLANK-M29**	**RDL**	**RUN 1-M29**	**RDL**	**RUN 2-M29**	**RDL**	**RUN 3-M29**	**RDL**	**QC Batch**
Metals										
1B Mercury (Hg)	ug	<0.015	0.015	0.509	0.015	0.225	0.015	0.124	0.015	2119675
2B Mercury (Hg)	ug	<0.15	0.15	4.99	0.18	7.46	0.19	8.11	0.17	2114370
3B Mercury (Hg)	ug	<0.0085	0.0085	3.82	0.025	30.8	0.25	1.02	0.025	2113919
3C Mercury (Hg)	ug			47.8	0.25	30.7	0.25	53.4	0.25	2114975

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B037072
Report Date: 2010/04/13

Air Compliance Consultants Inc
Client Project #: 10-068
Project name: ALCOSAN
Your P.O. #: 10-031

ELEMENTS BY ICP-AES (STACK SAMPLING TRAIN)

Maxxam ID		FL2748	FL2749	FL2750	FL2751		
Sampling Date		2010/03/25 13:10	2010/03/24 09:15	2010/03/25 08:25	2010/03/25 13:10		
COC Number		0795	0795	0795	0795		
	Units	**BLANK-M29**	**RUN 1-M29**	**RUN 2-M29**	**RUN 3-M29**	**RDL**	**QC Batch**
Metals							
Back Half Phosphorus (P)	ug	406	27	413	27	15	2119498
Front Half Phosphorus (P)	ug	<30	230	177	43	30	2119678

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B037072
Report Date: 2010/04/13

Air Compliance Consultants Inc
Client Project #: 10-068
Project name: ALCOSAN
Your P.O. #: 10-031

ELEMENTS BY ICP/MS (STACK SAMPLING TRAIN)

Maxxam ID		FL2748		FL2749	FL2750		FL2751		
Sampling Date		2010/03/25 13:10		2010/03/24 09:15	2010/03/25 08:25		2010/03/25 13:10		
COC Number		0795		0795	0795		0795		
	Units	**BLANK-M29**	**RDL**	**RUN 1-M29**	**RUN 2-M29**	**RDL**	**RUN 3-M29**	**RDL**	**QC Batch**
Metals									
Back Half Antimony (Sb)	ug	<0.20	0.20	<0.20	<0.20	0.20	<1.0	1.0	2119497
Front Half Antimony (Sb)	ug	<0.40	0.40	<0.80	<0.80	0.80	<0.80	0.80	2119679
Back Half Arsenic (As)	ug	<0.20	0.20	<0.20	<0.20	0.20	<1.0	1.0	2119497
Front Half Arsenic (As)	ug	<0.40	0.40	1.91	<0.80	0.80	<0.80	0.80	2119679
Back Half Beryllium (Be)	ug	<0.050	0.050	<0.050	<0.050	0.050	<0.25	0.25	2119497
Front Half Beryllium (Be)	ug	<0.10	0.10	<0.20	<0.20	0.20	<0.20	0.20	2119679
Back Half Cadmium (Cd)	ug	0.068	0.050	0.656	0.746	0.050	0.82	0.25	2119497
Front Half Cadmium (Cd)	ug	<0.10	0.10	1.38	0.74	0.20	<0.20	0.20	2119679
Back Half Chromium (Cr)	ug	0.23	0.15	0.63	0.63	0.15	1.67	0.75	2119497
Front Half Chromium (Cr)	ug	1.03	0.30	16.6	29.7	0.60	5.06	0.60	2119679
Back Half Cobalt (Co)	ug	<0.050	0.050	0.123	0.201	0.050	0.52	0.25	2119497
Front Half Cobalt (Co)	ug	<0.10	0.10	1.12	0.94	0.20	0.32	0.20	2119679
Back Half Lead (Pb)	ug	0.16	0.10	0.36	0.51	0.10	<0.50	0.50	2119497
Front Half Lead (Pb)	ug	0.22	0.20	5.44	2.24	0.40	0.91	0.40	2119679
Back Half Manganese (Mn)	ug	0.71	0.25	2.88	2.95	0.25	15500	1.3	2119497
Front Half Manganese (Mn)	ug	0.88	0.75	69.3	61.0	1.5	47.6	1.5	2119679
Back Half Nickel (Ni)	ug	0.42	0.25	1.35	1.20	0.25	<1.3	1.3	2119497
Front Half Nickel (Ni)	ug	3.90	0.50	30.4	38.4	1.0	17.4	1.0	2119679
Back Half Selenium (Se)	ug	<0.50	0.50	1.32	0.65	0.50	<2.5	2.5	2119497
Front Half Selenium (Se)	ug	<1.0	1.0	13.6	8.3	2.0	<2.0	2.0	2119679

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B037072
Report Date: 2010/04/13

Air Compliance Consultants Inc
Client Project #: 10-068
Project name: ALCOSAN
Your P.O. #: 10-031

Test Summary

Maxxam ID FL2748 **Collected** 2010/03/25
Sample ID BLANK-M29 **Shipped**
Matrix Stack Sampling Train **Received** 2010/03/26

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Mercury 2B in HNO3/H2O2 Imp.	CVAA	2114370	2010/04/01	2010/04/05	FFS
Mercury 3B in KMnO4/H2SO4 Imp.	CVAA	2113919	2010/03/31	2010/04/01	FFS
Mercury 1B in Filter + Rinse (M29)	CVAA	2119675	2010/04/08	2010/04/09	FFS
Metals B.H. in H2O2/HNO3 Imp.(6010C)	ICP	2119498	2010/04/08	2010/04/12	APT
Metals F.H. in Filter + Rinse (6010C)	ICP	2119678	2010/04/08	2010/04/12	APT
Metals B.H. in H2O2/HNO3 Imp.(6020)	ICP1/MS	2119497	2010/04/08	2010/04/08	N_R
Metals F.H. in Filter + Rinses (6020)	ICP1/MS	2119679	2010/04/08	2010/04/09	N_R

Maxxam ID FL2749 **Collected** 2010/03/24
Sample ID RUN 1-M29 **Shipped**
Matrix Stack Sampling Train **Received** 2010/03/26

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Mercury 3C in HCl Rinse	CVAA	2114975	2010/04/01	2010/04/06	FFS
Mercury 2B in HNO3/H2O2 Imp.	CVAA	2114370	2010/04/01	2010/04/05	FFS
Mercury 3B in KMnO4/H2SO4 Imp.	CVAA	2113919	2010/03/31	2010/04/01	FFS
Mercury 1B in Filter + Rinse (M29)	CVAA	2119675	2010/04/08	2010/04/09	FFS
Metals B.H. in H2O2/HNO3 Imp.(6010C)	ICP	2119498	2010/04/08	2010/04/12	APT
Metals F.H. in Filter + Rinse (6010C)	ICP	2119678	2010/04/08	2010/04/12	APT
Metals B.H. in H2O2/HNO3 Imp.(6020)	ICP1/MS	2119497	2010/04/08	2010/04/08	N_R
Metals F.H. in Filter + Rinses (6020)	ICP1/MS	2119679	2010/04/08	2010/04/09	N_R

Maxxam ID FL2749 Dup **Collected** 2010/03/24
Sample ID RUN 1-M29 **Shipped**
Matrix Stack Sampling Train **Received** 2010/03/26

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Mercury 2B in HNO3/H2O2 Imp.	CVAA	2114370	2010/04/05	2010/04/05	FFS
Mercury 3B in KMnO4/H2SO4 Imp.	CVAA	2113919	2010/04/01	2010/04/01	FFS
Mercury 1B in Filter + Rinse (M29)	CVAA	2119675	2010/04/09	2010/04/09	FFS
Metals B.H. in H2O2/HNO3 Imp.(6010C)	ICP	2119498	2010/04/12	2010/04/12	APT
Metals F.H. in Filter + Rinse (6010C)	ICP	2119678	2010/04/12	2010/04/12	APT
Metals B.H. in H2O2/HNO3 Imp.(6020)	ICP1/MS	2119497	2010/04/08	2010/04/08	N_R
Metals F.H. in Filter + Rinses (6020)	ICP1/MS	2119679	2010/04/13	2010/04/09	N_R

Maxxam ID FL2750 **Collected** 2010/03/25
Sample ID RUN 2-M29 **Shipped**
Matrix Stack Sampling Train **Received** 2010/03/26

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Mercury 3C in HCl Rinse	CVAA	2114975	2010/04/01	2010/04/06	FFS
Mercury 2B in HNO3/H2O2 Imp.	CVAA	2114370	2010/04/01	2010/04/05	FFS
Mercury 3B in KMnO4/H2SO4 Imp.	CVAA	2113919	2010/03/31	2010/04/01	FFS
Mercury 1B in Filter + Rinse (M29)	CVAA	2119675	2010/04/08	2010/04/09	FFS
Metals B.H. in H2O2/HNO3 Imp.(6010C)	ICP	2119498	2010/04/08	2010/04/12	APT
Metals F.H. in Filter + Rinse (6010C)	ICP	2119678	2010/04/08	2010/04/12	APT
Metals B.H. in H2O2/HNO3 Imp.(6020)	ICP1/MS	2119497	2010/04/08	2010/04/08	N_R
Metals F.H. in Filter + Rinses (6020)	ICP1/MS	2119679	2010/04/08	2010/04/09	N_R

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Maxxam Job #: B037072
Report Date: 2010/04/13

Air Compliance Consultants Inc
Client Project #: 10-068
Project name: ALCOSAN
Your P.O. #: 10-031

Test Summary

Maxxam ID FL2750 Dup — **Collected** 2010/03/25
Sample ID RUN 2-M29 — **Shipped**
Matrix Stack Sampling Train — **Received** 2010/03/26

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Mercury 3C in HCl Rinse	CVAA	2114975	2010/04/05	2010/04/06	FFS

Maxxam ID FL2751 — **Collected** 2010/03/25
Sample ID RUN 3-M29 — **Shipped**
Matrix Stack Sampling Train — **Received** 2010/03/26

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Mercury 3C in HCl Rinse	CVAA	2114975	2010/04/01	2010/04/06	FFS
Mercury 2B in HNO3/H2O2 Imp.	CVAA	2114370	2010/04/01	2010/04/05	FFS
Mercury 3B in KMnO4/H2SO4 Imp.	CVAA	2113919	2010/03/31	2010/04/01	FFS
Mercury 1B in Filter + Rinse (M29)	CVAA	2119675	2010/04/08	2010/04/09	FFS
Metals B.H. in H2O2/HNO3 Imp.(6010C)	ICP	2119498	2010/04/08	2010/04/12	APT
Metals F.H. in Filter + Rinse (6010C)	ICP	2119678	2010/04/08	2010/04/12	APT
Metals B.H. in H2O2/HNO3 Imp.(6020)	ICP1/MS	2119497	2010/04/08	2010/04/08	N_R
Metals F.H. in Filter + Rinses (6020)	ICP1/MS	2119679	2010/04/08	2010/04/09	N_R

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MERCURY BY COLD VAPOUR AA (STACK SAMPLING TRAIN)

Mercury 1B in Filter + Rinse (M29): Method spikes and one of the matrix spikes is acceptable, hence the data is reported.

ELEMENTS BY ICP/MS (STACK SAMPLING TRAIN)

Metals B.H. in H2O2/HNO3 Imp.(6020): Extra 5x dilution was required for sample FL2751 due to the matrix (suspected trace Potassium Permanganate present)
Post digestion duplicate and spike was done on sample FL2749.
The Blank Spike recoveries are low for elements in QC solution A, solution B elements and all other QCs are ok. Suspect spiking error.

Metals F.H. in Filter + Rinses (6020): Extra 2x dilution was required for all samples except FL2748, due to the matrix.
Post digestion duplicate and spike was done on sample FL2749.

Results relate only to the items tested.

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Air Compliance Consultants Inc
Attention: Rob Frey
Client Project #: 10-068
P.O. #: 10-031
Project name: ALCOSAN

Quality Assurance Report

Maxxam Job Number: GB037072

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	%Recovery	Units	QC Limits
2113919 FFS	Reagent Blank	3B Mercury (Hg)	2010/04/01	<0.013		ug	
	Matrix Spike (FL2749)	3B Mercury (Hg)	2010/04/01		108	%	85 - 115
	MS/MSD RPD	3B Mercury (Hg)	2010/04/01	13.5		%	20
	Spiked Blank	3B Mercury (Hg)	2010/04/01		103	%	90 - 110
	RPD	3B Mercury (Hg)	2010/04/01	1.2		%	20
	Method Blank	3B Mercury (Hg)	2010/04/01	<0.025		ug	
	RPD - Sample/Sample Dup	3B Mercury (Hg)	2010/04/01	2.0		%	20
2114370 FFS	Matrix Spike (FL2749)	2B Mercury (Hg)	2010/04/05		102	%	85 - 115
	MS/MSD RPD	2B Mercury (Hg)	2010/04/05	0.5		%	20
	Spiked Blank	2B Mercury (Hg)	2010/04/05		104	%	90 - 110
	RPD	2B Mercury (Hg)	2010/04/05	0.3		%	20
	Method Blank	2B Mercury (Hg)	2010/04/05	<0.015		ug	
	RPD - Sample/Sample Dup	2B Mercury (Hg)	2010/04/05	4.0		%	20
2114975 FFS	Reagent Blank	3C Mercury (Hg)		TBA		ug	
	Matrix Spike (FL2750)	3C Mercury (Hg)	2010/04/06		87	%	85 - 115
	MS/MSD RPD	3C Mercury (Hg)	2010/04/06	1.5		%	20
	Spiked Blank	3C Mercury (Hg)	2010/04/06		104	%	90 - 110
	RPD	3C Mercury (Hg)	2010/04/06	1.6		%	20
	Method Blank	3C Mercury (Hg)	2010/04/06	<0.025		ug	
	RPD - Sample/Sample Dup	3C Mercury (Hg)	2010/04/06	2.5		%	20
2119497 N_R	Matrix Spike (FL2749)	Back Half Antimony (Sb)	2010/04/08		100	%	70 - 130
	MS/MSD RPD	Back Half Antimony (Sb)	2010/04/08	2.0		%	20
	Matrix Spike (FL2749)	Back Half Arsenic (As)	2010/04/08		95	%	70 - 130
	MS/MSD RPD	Back Half Arsenic (As)	2010/04/08	1.1		%	20
	Matrix Spike (FL2749)	Back Half Beryllium (Be)	2010/04/08		97	%	70 - 130
	MS/MSD RPD	Back Half Beryllium (Be)	2010/04/08	1.0		%	20
	Matrix Spike (FL2749)	Back Half Cadmium (Cd)	2010/04/08		97	%	70 - 130
	MS/MSD RPD	Back Half Cadmium (Cd)	2010/04/08	2.0		%	20
	Matrix Spike (FL2749)	Back Half Chromium (Cr)	2010/04/08		99	%	70 - 130
	MS/MSD RPD	Back Half Chromium (Cr)	2010/04/08	3.0		%	20
	Matrix Spike (FL2749)	Back Half Cobalt (Co)	2010/04/08		100	%	70 - 130
	MS/MSD RPD	Back Half Cobalt (Co)	2010/04/08	3.0		%	20
	Matrix Spike (FL2749)	Back Half Lead (Pb)	2010/04/08		100	%	70 - 130
	MS/MSD RPD	Back Half Lead (Pb)	2010/04/08	0		%	20
	Matrix Spike (FL2749)	Back Half Manganese (Mn)	2010/04/08		98	%	70 - 130
	MS/MSD RPD	Back Half Manganese (Mn)	2010/04/08	3.0		%	20
	Matrix Spike (FL2749)	Back Half Nickel (Ni)	2010/04/08		102	%	70 - 130

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Air Compliance Consultants Inc
Attention: Rob Frey
Client Project #: 10-068
P.O. #: 10-031
Project name: ALCOSAN

Quality Assurance Report (Continued)

Maxxam Job Number: GB037072

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	%Recovery	Units	QC Limits
2119497 N_R	MS/MSD RPD	Back Half Nickel (Ni)	2010/04/08	2.9		%	20
	Matrix Spike (FL2749)	Back Half Selenium (Se)	2010/04/08		89	%	70 - 130
	MS/MSD RPD	Back Half Selenium (Se)	2010/04/08	1.1		%	20
	Spiked Blank	Back Half Antimony (Sb)	2010/04/08		104	%	85 - 115
	RPD	Back Half Antimony (Sb)	2010/04/08	3.3		%	20
	Spiked Blank	Back Half Arsenic (As)	2010/04/08		86	%	85 - 115
	RPD	Back Half Arsenic (As)	2010/04/08	0.6		%	20
	Spiked Blank	Back Half Beryllium (Be)	2010/04/08		84 (1)	%	85 - 115
	RPD	Back Half Beryllium (Be)	2010/04/08	1.9		%	20
	Spiked Blank	Back Half Cadmium (Cd)	2010/04/08		85	%	85 - 115
	RPD	Back Half Cadmium (Cd)	2010/04/08	6.2		%	20
	Spiked Blank	Back Half Chromium (Cr)	2010/04/08		83 (1)	%	85 - 115
	RPD	Back Half Chromium (Cr)	2010/04/08	4.3		%	20
	Spiked Blank	Back Half Cobalt (Co)	2010/04/08		84 (1)	%	85 - 115
	RPD	Back Half Cobalt (Co)	2010/04/08	7.2		%	20
	Spiked Blank	Back Half Lead (Pb)	2010/04/08		85	%	85 - 115
	RPD	Back Half Lead (Pb)	2010/04/08	2.2		%	20
	Spiked Blank	Back Half Manganese (Mn)	2010/04/08		87	%	85 - 115
	RPD	Back Half Manganese (Mn)	2010/04/08	5.0		%	20
	Spiked Blank	Back Half Nickel (Ni)	2010/04/08		86	%	85 - 115
	RPD	Back Half Nickel (Ni)	2010/04/08	5.2		%	20
	Spiked Blank	Back Half Selenium (Se)	2010/04/08		82 (1)	%	85 - 115
	RPD	Back Half Selenium (Se)	2010/04/08	1.8		%	20
	Method Blank	Back Half Antimony (Sb)	2010/04/08	<0.20		ug	
	RPD	Back Half Antimony (Sb)	2010/04/08	NC		%	20
	Method Blank	Back Half Arsenic (As)	2010/04/08	<0.20		ug	
	RPD	Back Half Arsenic (As)	2010/04/08	NC		%	20
	Method Blank	Back Half Beryllium (Be)	2010/04/08	<0.050		ug	
	RPD	Back Half Beryllium (Be)	2010/04/08	NC		%	20
	Method Blank	Back Half Cadmium (Cd)	2010/04/08	<0.050		ug	
	RPD	Back Half Cadmium (Cd)	2010/04/08	NC		%	20
	Method Blank	Back Half Chromium (Cr)	2010/04/08	<0.15		ug	
	RPD	Back Half Chromium (Cr)	2010/04/08	NC		%	20
	Method Blank	Back Half Cobalt (Co)	2010/04/08	<0.050		ug	
	RPD	Back Half Cobalt (Co)	2010/04/08	NC		%	20
	Method Blank	Back Half Lead (Pb)	2010/04/08	0.20, RDL=0.10		ug	
	RPD	Back Half Lead (Pb)	2010/04/08	NC		%	20
	Method Blank	Back Half Manganese (Mn)	2010/04/08	<0.25		ug	
	RPD	Back Half Manganese (Mn)	2010/04/08	NC		%	20
	Method Blank	Back Half Nickel (Ni)	2010/04/08	<0.25		ug	
	RPD	Back Half Nickel (Ni)	2010/04/08	NC		%	20
	Method Blank	Back Half Selenium (Se)	2010/04/08	<0.50		ug	
	RPD	Back Half Selenium (Se)	2010/04/08	NC		%	20
	RPD - Sample/Sample Dup	Back Half Antimony (Sb)	2010/04/08	NC		%	20
		Back Half Arsenic (As)	2010/04/08	NC		%	20
		Back Half Beryllium (Be)	2010/04/08	NC		%	20
		Back Half Cadmium (Cd)	2010/04/08	0.5		%	20
		Back Half Chromium (Cr)	2010/04/08	NC		%	20
		Back Half Cobalt (Co)	2010/04/08	NC		%	20
		Back Half Lead (Pb)	2010/04/08	NC		%	20
		Back Half Manganese (Mn)	2010/04/08	1.9		%	20
		Back Half Nickel (Ni)	2010/04/08	0.2		%	20

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Quality Assurance Report (Continued)

Maxxam Job Number: GB037072

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	%Recovery	Units	QC Limits
2119497 N_R	RPD - Sample/Sample Dup	Back Half Selenium (Se)	2010/04/08	NC		%	20
2119498 APT	Matrix Spike (FL2749)	Back Half Phosphorus (P)	2010/04/12		100	%	80 - 120
	Spiked Blank	Back Half Phosphorus (P)	2010/04/12		106	%	90 - 110
	RPD	Back Half Phosphorus (P)	2010/04/12	2.2		%	20
	Method Blank	Back Half Phosphorus (P)	2010/04/12	<15		ug	
	RPD - Sample/Sample Dup	Back Half Phosphorus (P)	2010/04/12	NC		%	20
2119675 FFS	Reagent Blank	1B Mercury (Hg)	2010/04/09	<0.015		ug	
	Matrix Spike (FL2749)	1B Mercury (Hg)	2010/04/09		90	%	85 - 115
	MS/MSD RPD	1B Mercury (Hg)	2010/04/09	7.6		%	20
	Spiked Blank	1B Mercury (Hg)	2010/04/09		95	%	90 - 110
	RPD	1B Mercury (Hg)	2010/04/09	5.3		%	20
	Method Blank	1B Mercury (Hg)	2010/04/09	<0.015		ug	
	RPD - Sample/Sample Dup	1B Mercury (Hg)	2010/04/09	2.0		%	20
2119678 APT	Matrix Spike (FL2749)	Front Half Phosphorus (P)	2010/04/13		114	%	80 - 120
	Spiked Blank	Front Half Phosphorus (P)	2010/04/12		106	%	90 - 110
	RPD	Front Half Phosphorus (P)	2010/04/12	2.4		%	20
	Method Blank	Front Half Phosphorus (P)	2010/04/12	<30		ug	
	RPD - Sample/Sample Dup	Front Half Phosphorus (P)	2010/04/12	0.5		%	20
2119679 N_R	Matrix Spike (FL2749)	Front Half Antimony (Sb)	2010/04/09		102	%	70 - 130
	MS/MSD RPD	Front Half Antimony (Sb)	2010/04/09	1		%	20
	Matrix Spike (FL2749)	Front Half Arsenic (As)	2010/04/09		99	%	70 - 130
	MS/MSD RPD	Front Half Arsenic (As)	2010/04/09	0		%	20
	Matrix Spike (FL2749)	Front Half Beryllium (Be)	2010/04/09		102	%	70 - 130
	MS/MSD RPD	Front Half Beryllium (Be)	2010/04/09	3.0		%	20
	Matrix Spike (FL2749)	Front Half Cadmium (Cd)	2010/04/09		101	%	70 - 130
	MS/MSD RPD	Front Half Cadmium (Cd)	2010/04/09	1		%	20
	Matrix Spike (FL2749)	Front Half Chromium (Cr)	2010/04/09		103	%	70 - 130
	MS/MSD RPD	Front Half Chromium (Cr)	2010/04/09	1		%	20
	Matrix Spike (FL2749)	Front Half Cobalt (Co)	2010/04/09		98	%	70 - 130
	MS/MSD RPD	Front Half Cobalt (Co)	2010/04/09	0		%	20
	Matrix Spike (FL2749)	Front Half Lead (Pb)	2010/04/09		104	%	70 - 130
	MS/MSD RPD	Front Half Lead (Pb)	2010/04/09	1		%	20
	Matrix Spike (FL2749)	Front Half Manganese (Mn)	2010/04/09		101	%	70 - 130
	MS/MSD RPD	Front Half Manganese (Mn)	2010/04/09	3.9		%	20
	Matrix Spike (FL2749)	Front Half Nickel (Ni)	2010/04/09		100	%	70 - 130

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Quality Assurance Report (Continued)

Maxxam Job Number: GB037072

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	%Recovery	Units	QC Limits
2119679 N_R	MS/MSD RPD	Front Half Nickel (Ni)	2010/04/09	0		%	20
	Matrix Spike (FL2749)	Front Half Selenium (Se)	2010/04/09		97	%	70 - 130
	MS/MSD RPD	Front Half Selenium (Se)	2010/04/09	1.0		%	20
	Spiked Blank	Front Half Antimony (Sb)	2010/04/09		102	%	85 - 115
	RPD	Front Half Antimony (Sb)	2010/04/09	0.9		%	20
	Spiked Blank	Front Half Arsenic (As)	2010/04/09		103	%	85 - 115
	RPD	Front Half Arsenic (As)	2010/04/09	1.3		%	20
	Spiked Blank	Front Half Beryllium (Be)	2010/04/09		102	%	85 - 115
	RPD	Front Half Beryllium (Be)	2010/04/09	2.8		%	20
	Spiked Blank	Front Half Cadmium (Cd)	2010/04/09		101	%	85 - 115
	RPD	Front Half Cadmium (Cd)	2010/04/09	1.5		%	20
	Spiked Blank	Front Half Chromium (Cr)	2010/04/09		102	%	85 - 115
	RPD	Front Half Chromium (Cr)	2010/04/09	0.4		%	20
	Spiked Blank	Front Half Cobalt (Co)	2010/04/09		99	%	85 - 115
	RPD	Front Half Cobalt (Co)	2010/04/09	4.5		%	20
	Spiked Blank	Front Half Lead (Pb)	2010/04/09		104	%	85 - 115
	RPD	Front Half Lead (Pb)	2010/04/09	0.4		%	20
	Spiked Blank	Front Half Manganese (Mn)	2010/04/09		97	%	85 - 115
	RPD	Front Half Manganese (Mn)	2010/04/09	3.7		%	20
	Spiked Blank	Front Half Nickel (Ni)	2010/04/09		102	%	85 - 115
	RPD	Front Half Nickel (Ni)	2010/04/09	0.9		%	20
	Spiked Blank	Front Half Selenium (Se)	2010/04/09		102	%	85 - 115
	RPD	Front Half Selenium (Se)	2010/04/09	3.2		%	20
	Method Blank	Front Half Antimony (Sb)	2010/04/09	<0.40		ug	
	RPD	Front Half Antimony (Sb)	2010/04/09	NC		%	20
	Method Blank	Front Half Arsenic (As)	2010/04/09	<0.40		ug	
	RPD	Front Half Arsenic (As)	2010/04/09	NC		%	20
	Method Blank	Front Half Beryllium (Be)	2010/04/09	<0.10		ug	
	RPD	Front Half Beryllium (Be)	2010/04/09	NC		%	20
	Method Blank	Front Half Cadmium (Cd)	2010/04/09	<0.10		ug	
	RPD	Front Half Cadmium (Cd)	2010/04/09	NC		%	20
	Method Blank	Front Half Chromium (Cr)	2010/04/09	<0.30		ug	
	RPD	Front Half Chromium (Cr)	2010/04/09	NC		%	20
	Method Blank	Front Half Cobalt (Co)	2010/04/09	<0.10		ug	
	RPD	Front Half Cobalt (Co)	2010/04/09	NC		%	20
	Method Blank	Front Half Lead (Pb)	2010/04/09	<0.20		ug	
	RPD	Front Half Lead (Pb)	2010/04/09	NC		%	20
	Method Blank	Front Half Manganese (Mn)	2010/04/09	<0.75		ug	
	RPD	Front Half Manganese (Mn)	2010/04/09	NC		%	20
	Method Blank	Front Half Nickel (Ni)	2010/04/09	<0.50		ug	
	RPD	Front Half Nickel (Ni)	2010/04/09	NC		%	20
	Method Blank	Front Half Selenium (Se)	2010/04/09	<1.0		ug	
	RPD	Front Half Selenium (Se)	2010/04/09	NC		%	20
	RPD - Sample/Sample Dup	Front Half Antimony (Sb)	2010/04/09	NC		%	20
		Front Half Arsenic (As)	2010/04/09	NC		%	20
		Front Half Beryllium (Be)	2010/04/09	NC		%	20
		Front Half Cadmium (Cd)	2010/04/09	0.4		%	20
		Front Half Chromium (Cr)	2010/04/09	1.0		%	20
		Front Half Cobalt (Co)	2010/04/09	2.7		%	20
		Front Half Lead (Pb)	2010/04/09	1		%	20
		Front Half Manganese (Mn)	2010/04/09	1.2		%	20
		Front Half Nickel (Ni)	2010/04/09	1.9		%	20

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Quality Assurance Report (Continued)

Maxxam Job Number: GB037072

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	%Recovery	Units	QC Limits
2119679 N_R	RPD - Sample/Sample Dup	Front Half Selenium (Se)	2010/04/09	2.4		%	20

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.
Reagent Blank: A blank matrix containing all reagents used in the analytical procedure. Used to determine any analytical contamination.
Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.
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.
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.

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

APPENDIX C

Quality Assurance/Quality Control Data

	Previous Cal	New Cal	% Difference
Y	1.005	1.004	0.147
dH	1.559	1.533	1.665

Air Compliance Consultants, Inc.
EPA Method 5
Meter Box Calibration
Pre-Test Orifice Method
English Meter Box Units, English K' Factor
Apex Orifices

Model #: C-5000
Serial #: 1462

Date: ——————> 02/17/10 60.00
Barometric Pressure: ——> 29.33 (in. Hg)
Theoretical Critical Vacuum:—> 13.83 (in. Hg)

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

DRY GAS METER READINGS									CRITICAL ORIFICE READINGS					
					Initial Temps.		Final Temps.					Ambient Temperature		
dH (in H2O)	Time (min)	Volume Initial (cu ft)	Volume Final (cu ft)	Volume Total (cu ft)	Inlet (deg F)	Outlet (deg F)	Inlet (deg F)	Outlet (deg F)	Orifice Serial# (number)	K' Orifice Coefficient (see above)	Actual Vacuum (in Hg)	Initial (deg F)	Final (deg F)	Average (deg F)
0.45	15.00	1010.880	1017.167	6.287	63.0	60.0	63.0	62.0	47	0.3241	22.5	61.0	61.0	61.0
0.85	10.00	986.763	992.433	5.670	57.0	56.0	59.0	57.0	55	0.4409	21.0	59.0	60.0	59.5
1.50	11.00	1002.647	1010.787	8.140	61.0	59.0	63.0	60.0	63	0.5737	19.5	59.0	60.0	59.5
2.80	10.00	992.523	1002.544	10.021	58.0	58.0	62.0	59.0	73	0.7830	17.0	59.0	59.0	59.0
4.10	10.00	1017.237	1029.205	11.968	63.0	62.0	68.0	63.0	81	0.9440	14.0	62.0	62.0	62.0

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

DRY GAS METER — VOLUME CORRECTED	
Vm(std) (cu ft)	Vm(std) (liters)
6.238	176.7
5.684	161.0
8.118	229.9
10.055	284.8
11.938	338.1

ORIFICE		
VOLUME CORRECTED		VOLUME NOMINAL
Vcr(std) (cu ft)	Vcr(std) (liters)	Vcr (cu ft)
6.247	176.9	6.291
5.674	160.7	5.697
8.121	230.0	8.154
10.081	285.5	10.112
12.118	343.2	12.227

DRY GAS METER — CALIBRATION FACTOR	
Y Value (number)	Variation (number)
1.001	-0.002
0.998	-0.005
1.000	-0.003
1.003	-0.001
1.015	0.012
Avg Y—> 1.004	

ORIFICE CALIBRATION FACTOR		
dH@		
Value (in H2O)	Value (mm H2O)	Variation (in H2O)
1.470	37.34	-0.063
1.501	38.12	-0.033
1.555	39.50	0.022
1.557	39.54	0.024
1.584	40.22	0.050
Avg dH@—> 1.533	38.94	

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

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

SIGNED: _____ Date: 02-17-10

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Air/Compliance Consultants, Inc.

Alternative Method 5 Post-Test Calibration Check			
Client:	Collective Efforts LLC		
Facility:	Alcosan		
Source ID:	SSI		
Project Number:	10-068		
Date:	3/25/2010		
Control Box ID:	1618		
	Run 1	**Run 2**	**Run 3**
Data Input			
Test time (min)	240	240	240
Volume Dry Gas Metered (dacf)	168.086	168.382	169.316
Meter Temperature (F)	88.5	75.5	82.0
Barometric Pressure (in. Hg)	29.45	29.20	29.20
Orifice Pressure Drop (in. H_2O)	1.45	1.49	1.50
Dry Gas Molecular Weight (lb/lb mol)	29.51	29.55	29.53
Original Meter Correction Value	1.000	1.000	1.000
Meter $DH_@$ (in. H_2O)	1.753	1.753	1.753
Calculated Values			
Dry Gas Meter Calibration check value (Yqa)	**0.991**	**0.994**	**0.999**
Percent Difference (%)	**-0.88%**	**-0.56%**	**-0.13%**
Results			
Average Dry Gas Meter Calibration Check Value (Y	**0.995**		
Original Meter Correction Value (Y orig)	**1.000**		
Percent Difference (%)	**-0.52%**	**Pass**	

Test conducted in accordance with EMC ALT-009 - Allowable ±5%

Yqa=(time/dacf)*(sqrt((0.0319*(Tm+460))/(DH@*(Pbar+(DHavg/13.6)))*(29/Md))*SQRT(Dhavg))

	Previous Cal	New Cal	% Difference
Y	0.997	1.000	0.335
dH	1.755	1.753	0.120

Air Compliance Consultants, Inc.
EPA Method 5
Meter Box Calibration
Pre-Test Orifice Method
English Meter Box Units, English K' Factor
Apex Orifices

Model #: C-5000
Serial #: 1618

Date: ——————> 02/17/10 60.00
Barometric Pressure: ——> 29.33 (in. Hg)
Theoretical Critical Vacuum:—> 13.83 (in. Hg)

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

DRY GAS METER READINGS									-CRITICAL ORIFICE READINGS-					
					Initial Temps.		Final Temps.					– Ambient Temperature –		
dH (in H2O)	Time (min)	Volume Initial (cu ft)	Volume Final (cu ft)	Volume Total (cu ft)	Inlet (deg F)	Outlet (deg F)	Inlet (deg F)	Outlet (deg F)	Orifice Serial# (number)	K' Orifice Coefficient (see above)	Actual Vacuum (in Hg)	Initial (deg F)	Final (deg F)	Average (deg F)
0.50	15.00	955.733	962.031	6.298	67.0	63.0	66.0	64.0	47	0.3241	22.5	62.0	62.0	62.0
0.97	10.00	932.237	937.919	5.682	62.0	60.0	63.0	61.0	55	0.4409	21.0	61.0	62.0	61.5
1.70	10.00	948.208	955.624	7.416	66.0	62.0	68.0	63.0	63	0.5737	19.0	62.0	63.0	62.5
3.20	10.00	938.028	948.141	10.113	63.0	61.0	67.0	62.0	73	0.7830	17.0	62.0	62.0	62.0
4.75	10.00	962.123	974.375	12.252	66.0	64.0	73.0	65.0	81	0.9440	14.0	62.0	62.0	62.0

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

— DRY GAS METER — VOLUME CORRECTED	
Vm(std) (cu ft)	Vm(std) (liters)
6.214	176.0
5.651	160.0
7.343	208.0
10.080	285.5
12.172	344.7

——— ORIFICE ———		
VOLUME CORRECTED		VOLUME NOMINAL
Vcr(std) (cu ft)	Vcr(std) (liters)	Vcr (cu ft)
6.241	176.7	6.297
5.663	160.4	5.708
7.361	208.5	7.434
10.052	284.7	10.141
12.118	343.2	12.227

— DRY GAS METER — CALIBRATION FACTOR	
Y Value (number)	Variation (number)
1.004	0.004
1.002	0.002
1.002	0.002
0.997	-0.003
0.996	-0.005
Avg Y—> 1.000	

——— ORIFICE ——— CALIBRATION FACTOR		
dH@		
Value (in H2O)	Value (mm H2O)	Variation (in H2O)
1.635	41.53	-0.118
1.719	43.66	-0.034
1.783	45.28	0.030
1.800	45.72	0.047
1.828	46.42	0.075
Avg dH@—> 1.753	44.52	

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

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

SIGNED: _____ Date: 02-17-10

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Air/Compliance Consultants, Inc.

Alternative Method 5 Post-Test Calibration Check			
Client:	PSU		
Facility:	State College, PA		
Source ID:	WCSP		
Project Number:	06-209		
Date:	1/12-13/2010		
Control Box ID:	1618		
	Run 1	**Run 2**	**Run 3**
Data Input			
Test time (min)	120	120	120
Volume Dry Gas Metered (dacf)	86.531	79.815	79.645
Meter Temperature (F)	97.5	61.9	65.5
Barometric Pressure (in. Hg)	29.28	29.15	29.20
Orifice Pressure Drop (in. H_2O)	1.54	1.38	1.37
Dry Gas Molecular Weight (lb/lb mol)	29.52	29.54	29.56
Original Meter Correction Value	1.000	1.000	1.000
Meter $DH_@$ (in. H_2O)	1.753	1.753	1.753
Calculated Values			
Dry Gas Meter Calibration check value (Yqa)	**1.001**	**0.997**	**0.998**
Percent Difference (%)	**0.12%**	**-0.31%**	**-0.19%**
Results			
Average Dry Gas Meter Calibration Check Value (Y	**0.999**		
Original Meter Correction Value (Y orig)	**1.000**		
Percent Difference (%)	**-0.13%**	**Pass**	

Test conducted in accordance with EMC ALT-009 - Allowable ±5%

Yqa=(time/dacf)*(sqrt((0.0319*(Tm+460))/(DH@*(Pbar+(DHavg/13.6)))*(29/Md))*SQRT(Dhavg))

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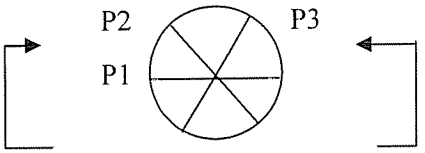
Air/Compliance Consultants, Inc. (ACCI)
Nozzle Calibration Data Sheet

Date	Calibrated By	Nozzle ID #	Nozzle Diameter (inches)			Hi-Lo	D_{avg}
			D1	D2	D3	Delta D	
3-24-10	ESW	GN-17	.250	.250	.250	.000	.250
3-24-10	ESW	GN-9	.250	.250	.249	.001	.2497 = .250

Where:

D1, D2, D3 = Three different nozzle diameters at 60 degrees to each other, each measured to the nearest 0.001 in.



MEASUREMENT PLANE

Delta D = Maximum distance between any two diameters, must be $\leq$ 0.004 in.

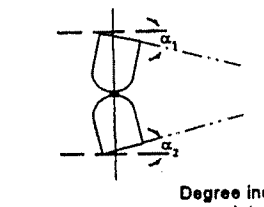
D_{avg} = (D1 + D2 + D3) / 3

INSTRUCTIONS:

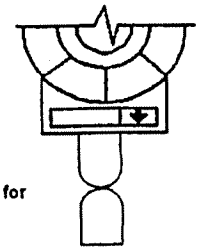
1. Inspect the nozzle for nicks, dents and corrosion. If these are found, they should be corrected before calibration.
2. Place a reference mark on the nozzle. Place the nozzle at the center of figure aligned with point P1. Measure and record D1.
3. Rotate the nozzle so that the reference mark is aligned with point P2. Measure and record D2.
4. Rotate the nozzle so that the reference mark is aligned with point P3. Measure and record D3.
5. Calculate Delta D and D_{avg}.

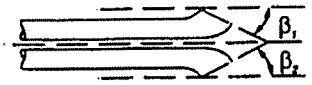
Checked by: 3-24-10 Calibrated by Caliper ID# CAL-9
(Signature / Date)

Air/Compliance Consultants, Inc. (ACCI)
Type S Pitot Tube Inspection Data Sheet

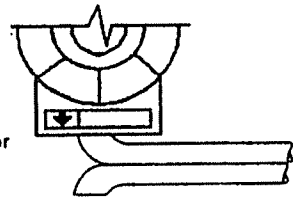


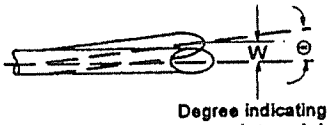
Degree indicating level position for determining α_1 and α_2.



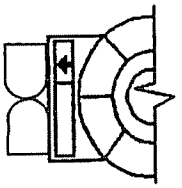


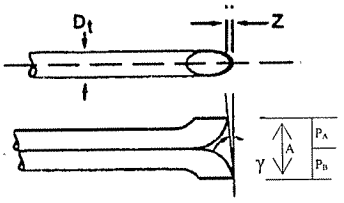
Degree indicating level position for determining β_1 and β_2.

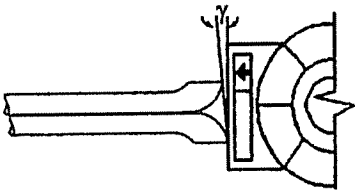




Degree indicating level position for determining Θ.







Degree indicating level position for determining γ then calculate Z.

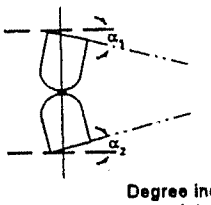
Allowable Range/Parameter		*Value*
Level and perpendicular?		Y☑ N☐
Obstruction?		Y☐ N☑
Damaged?		Y☐ N☑
$\alpha 1$	$(-10° < \alpha 1 < +10°)$	0
$\alpha 2$	$(-10° < \alpha 2 < +10°)$	0
$\beta 1$	$(-5° < \beta 1 < +5°)$	0
$\beta 2$	$(-5° < \beta 2 < +5°)$	0
γ	$(-2° < \alpha 1 < +2°)$	0
θ	$(-1° < \alpha 1 < +1°)$	0
A	(for 1/4 " OD, 0.526 to 0.750 for 3/8" OD, 0.788 to 1.125)	1.122
Z =	A sin γ ($\leq$ 0.125")	0.000
W =	A sin θ ($\leq$ 0.03125")	0.000
P_A	(for 1/4 " OD, 0.263 to 0.375 for 3/8" OD, 0.394 to 0.563)	.561
P_B	(for 1/4 " OD, 0.263 to 0.375 for 3/8" OD, 0.394 to 0.563)	.561
$P_A - P_B$	(-0.063 to 0.063")	0.000
D_T	(3/16" $\leq D_t \leq$ 3/8")	.371

Certification:

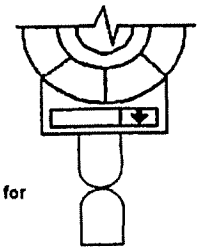
I certify that the Type S Pitot Tube/Probe ID# 41-S calibrated by Caliper ID # Cal-8 meets or exceeds all specifications, criteria and/or applicable design features and is hereby assigned a Pitot tube calibration factor C_P of 0.84.

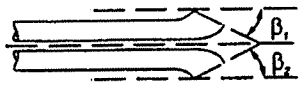
Checked by: _____ 3-24-10
(Signature / Date)

Air/Compliance Consultants, Inc. (ACCI)
Type S Pitot Tube Inspection Data Sheet

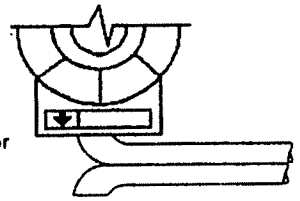


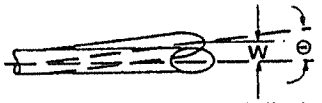
Degree indicating level position for determining α_1 and α_2.



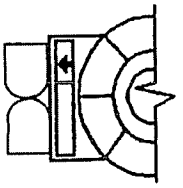


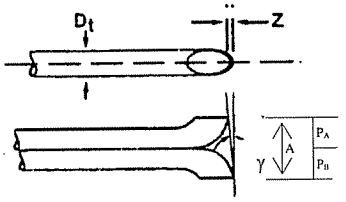
Degree indicating level position for determining β_1 and β_2.

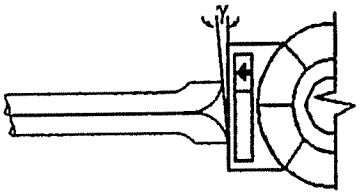




Degree indicating level position for determining Θ.







Degree indicating level position for determining γ then calculate Z.

Allowable Range/Parameter		*Value*
Level and perpendicular?		Y☑ N☐
Obstruction?		Y☐ N☑
Damaged?		Y☐ N☑
α1	(-10° < α1 < + 10°)	1
α2	(-10° < α2 < + 10°)	0
β1	(-5° < β1 < + 5°)	0
β2	(-5° < β2 < + 5°)	0
γ	(-2° < α1 < + 2°)	0
θ	(-1° < α1 < + 1°)	0
A	(for 1/4 " OD, 0.526 to 0.750 for 3/8" OD, 0.788 to 1.125)	1.120
Z =	A sin γ (≤ 0.125")	0.005
W =	A sin θ (≤ 0.03125")	0.000
P_A	(for 1/4 " OD, 0.263 to 0.375 for 3/8" OD, 0.394 to 0.563)	.561
P_B	(for 1/4 " OD, 0.263 to 0.375 for 3/8" OD, 0.394 to 0.563)	.559
$P_A - P_B$	(-0.063 to 0.063")	0.000
D_T	(3/16" ≤ D_t ≤ 3/8")	.372

Certification:

I certify that the Type S Pitot Tube/Probe ID# 4'-3 calibrated by Caliper ID # Cal-8 meets or exceeds all specifications, criteria and/or applicable design features and is hereby assigned a Pitot tube calibration factor C_P of 0.84.

Checked by: _____ 3-24-10
(Signature / Date)

Air/Compliance Consultants, Inc. (ACCI)
Thermocouple Calibration Data Sheet

Probe I.D.: 41-3 ***Dry Gas Meter I.D.:*** 1462

Standard Used: NIST Certified Thermocouple Probe ID # 920213 ***Temperature Scale:*** °F

Converted to: °R (Equation= 460 + °F result) CTC-2

Post Test

Temperature Range	Reference Thermometer (°R)	Probe Thermometer (°R)	Absolute Temperature Difference (%)
Ice Bath	492	492	0
Room Temp.	538	538	0
Stack Temp.	532	533	.19 %

Criteria are:
The Absolute Temperature Difference within 1.5% of Reference Standard used.
Section 10.3.2 of USEPA Method 2

Checked by: _____ 3-26-10
(Signature / Date)

Air/Compliance Consultants, Inc. (ACCI)
Thermocouple Calibration Data Sheet

Probe I.D.: 4'-5 ***Dry Gas Meter I.D.:*** 1618

Standard Used: NIST Certified Thermocouple Probe ID # 920213 ***Temperature Scale:*** °F

Converted to: °R (Equation= 460 + °F result) ↖ CTC-2

Post Test

Temperature Range	Reference Thermometer (°R)	Probe Thermometer (°R)	Absolute Temperature Difference (%)
Ice Bath	493	493	0
Room Temp.	539	539	0
Stack Temp.	532	533	.19 %

Criteria are:
The Absolute Temperature Difference within 1.5% of Reference Standard used.
Section 10.3.2 of USEPA Method 2

Checked by: _____ 3-26-10
(Signature / Date)

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Exh. 210

Liquid Technology Corporation

Industry Leader in Specialty Gases, Equipment and Service

Certificate of Analysis

- EPA PROTOCOL GAS -

Customer	Jackson Welding (Pittsburgh, PA)
Date	August 18, 2009
Delivery Receipt	DR-25723
Gas Standard	10.00% CO2, 22.50% Oxygen/Nitrogen-EPA PROTOCOL
Final Analysis Date	August 07, 2009
Expiration Date	August 07, 2012
Component	Carbon Dioxide, Oxygen
Balance Gas	Nitrogen

Analytical Data: **DO NOT USE BELOW 150 psig**

EPA Protocol, Section No. 2.2, Procedure G-1

Reported Concentrations

Carbon Dioxide: 9.96% +/- 0.09%

Oxygen: 22.47% +/- 0.22%

Nitrogen: Balance

Reference Standards:

SRM/GMIS:	GMIS	GMIS/GMIS
Cylinder Number:	CC-165377	CC-85458/CC-85469
Concentration:	10 05% CO2/N2	20 97% O2/N2 - 25.25% O2/N2
Expiration Date:	04/06/11	04/15/11 - 03/04/10

Certification Instrumentation

Component:	Carbon Dioxide	Oxygen
Make/Model:	Agilent 7890A	Servomex 244a
Serial Number:	CN10736166	1847
Principal of Measurement:	GC-TCD	Paramagnetic
Last Calibration:	July 07, 2009	July 01, 2009

Cylinder Data

Cylinder Serial Number:	CC-251892	Cylinder Outlet:	CGA 590
Cylinder Volume:	140 Cubic Feet	Cylinder Pressure:	2000 psig, 70°F

Analytical Uncertainty and NIST Traceability are in compliance with EPA-600/R-97/121.

Certified by: Mike Duncan

Mike Duncan

Unmatched Excellence

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Airgas

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

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Customer:	CRAFTON		
Part Number:	E03NI67E15A3611	Reference Number:	32-112928670-1
Cylinder Number:	XC000527B	Cylinder Volume:	160 Cu.Ft.
Laboratory:	MIC - Royal Oak-32 - MI	Cylinder Pressure:	2015 PSIG
Analysis Date:	Nov 16, 2009	Valve Outlet:	590

Expiration Date: Nov 16, 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
OXYGEN	10.00 %	10.01 %	G1	+/- 1% NIST Traceable
CARBON DIOXIDE	22.50 %	22.54 %	G2	+/- 2% NIST Traceable
NITROGEN	Balance			

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM	98051110	SG9168292BAL	9.507% OXYGEN/NITROGEN	Jan 01, 2010
NTRM	04060402	XC034387B	19.84% CARBON DIOXIDE/NITROGEN	May 15, 2012

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
E/N 54, 20% FS CO2, Nicolet 6700	Fourier Transform Infrared (FTIR)	Oct 20, 2009
E/N 51, 10%FS O2, Rosemont 755R	Paramagnetic (Para)	Oct 26, 2009

Triad Data Available Upon Request

Notes:

QA Approval

In. 3097

Liquid Technology Corporation

Industry Leader in Specialty Gases, Equipment and Service

Certificate of Analysis

- EPA PROTOCOL GAS -

Customer	Jackson Welding (Pittsburgh, PA)
Date	October 29, 2009
Delivery Receipt	DR-26508
Gas Standard	495.0 ppm Nitric Oxide/Nitrogen - EPA PROTOCOL
Final Analysis Date	October 28, 2009
Expiration Date	October 28, 2011
Component	Nitric Oxide
Balance Gas	Nitrogen

Analytical Data: **DO NOT USE BELOW 150 psig**

EPA Protocol, Section No. 2.2, Procedure G-1

Reported Concentrations

Nitric Oxide: 507.4 ppm +/- 5.0 ppm

Nitrogen: Balance

Total Oxides of Nitrogen: 509.9 ppm

** NOx for Reference Use Only **

Reference Standards:

SRM/GMIS:	GMIS	GMIS
Cylinder Number:	CC-158975	CC-166610
Concentration:	437.5 ppm NO/Nitrogen	748.2 ppm NO/Nitrogen
Expiration Date:	November 14, 2010	July 24, 2010

Certification Instrumentation

Component:	Nitric Oxide
Make/Model:	Nicolet-NEXUS 470
Serial Number:	AEP99000154
Principal of Measurement:	FTIR
Last Calibration:	October 15, 2009

Cylinder Data

Cylinder Serial Number:	EB-0019886	Cylinder Outlet:	CGA 660
Cylinder Volume:	140 Cubic Feet	Cylinder Pressure:	2000 psig, 70°F

Analytical Uncertainty and NIST Traceability are in compliance with EPA-600/R-97/121.

Certified by: Mike Duncan

Mike Duncan

Unmatched Excellence

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~ www.liquidtechcorp.com ~

I- 43862

Airgas

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

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

Customer.	PITTSBURGH/CRAFTON		
Part Number.	E02NI99E15A01M4	Reference Number.	32-112805089-1
Cylinder Number.	CC14491	Cylinder Volume:	144 Cu Ft
Laboratory.	MIC - Royal Oak - MI	Cylinder Pressure.	2015 PSIG
Analysis Date.	Mar 30, 2009	Valve Outlet:	660

Expiration Date: Mar 30, 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
NITRIC OXIDE	995.0 PPM	982 4 PPM	G1	+/- 1% NIST Traceable
NITROGEN	Balance			
Total oxides of nitrogen		984 4 PPM		For Reference Only

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM	08060617	CC255655	1025 3PPM NITRIC OXIDE/NITROGEN	May 01 2012

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
E/N 54. 1000 ppmFS NO Nicolet 6700	Fourier Transform Infrared (FTIR)	Mar 12. 2009

Triad Data Available Upon Request

Notes.

QA Approval

Airgas

Airgas Specialty Gases
6421 Monclova Road
Maumee, OH 43537-9760
(419) 893-7226
Fax: (419) 893-2963
www.airgas.com

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Part Number:	E02NI99E15A0928	Reference Number:	113-124122084-2
Cylinder Number:	CC266639	Cylinder Volume:	144 Cu Ft
Laboratory:	ASG - Maumee - OH	Cylinder Pressure:	2015 PSIG
Analysis Date:	Jan 23, 2008	Valve Outlet:	350

Expiration Date: Jan 23, 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 Uncertainity
CARBON MONOXIDE	600.0 PPM	605.5 PPM	G1	+/- 1% NIST Traceable
NITROGEN	Balance			

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM	051207	CC180329	2453PPM CARBON MONOXIDE/NITROGEN	Feb 02, 2009
NTRM	051205	CC180694	495.8PPM CARBON MONOXIDE/NITROGEN	Feb 02, 2009

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
023-Horiba VIA-510	NDIR	Jan 08, 2008

Triad Data Available Upon Request

Notes:

QA Approval

164871

Liquid Technology Corporation

Industry Leader in Specialty Gases, Equipment and Service

Certificate of Analysis

- EPA PROTOCOL GAS -

Customer	Jackson Welding - (Pittsburgh, PA)
Date	September 18, 2008
Delivery Receipt	DR-22620
Gas Standard	5995 ppm Carbon Monoxide/Nitrogen - EPA PROTOCOL GAS
Final Analysis Date	September 10, 2008
Expiration Date	September 10, 2011

DO NOT USE BELOW 150 psig

Analytical Data:
EPA Protocol, Section No. 2.2, Procedure G-1.

Reported Concentrations:
Carbon Monoxide: 5885 ppm +/- 58 ppm
Nitrogen: Balance

Reference Standards

SRM/GMIS	GMIS	GMIS
Cylinder Number:	CC-231419	CC-166530
Concentration:	4874 ppm CO/Nitrogen	1.00% CO/Nitrogen
Expiration Date:	September 14, 2010	February 10, 2010

Certification Instrumentation

Component:	Carbon Monoxide
Make/Model:	Nicolet NEXUS 470
Serial Number:	AEP99000154
Principal of Measurement:	FTIR
Last Calibration:	September 09, 2008

Cylinder Data

Cylinder Number:	CC-129121	Cylinder Volume:	140 Cubic Feet
Cylinder Outlet:	CGA 350	Cylinder Pressure:	2000 psig, 70°F
Expiration Date:	September 10, 2011		

Analytical Uncertainty and NIST Traceability are in compliance with EPA-600/R-97/121.

Certified by:
Date: September 18, 2008

Unmatched Excellence

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Inv. 173224

Airgas

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

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

Customer:	STOCK		
Part Number:	E02NI99E15A0350	Reference Number:	32-112782191-7
Cylinder Number:	SG9166551BAL	Cylinder Volume:	144 Cu Ft
Laboratory:	MIC - Royal Oak - MI	Cylinder Pressure:	2015 PSIG
Analysis Date:	Dec 16, 2008	Valve Outlet:	660

Expiration Date: Dec 16, 2010

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

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty
SULFUR DIOXIDE	50 00 PPM	52 25 PPM	G1	+/- 1% NIST Traceable
NITROGEN	Balance			

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM	07120204	CC240103	100 7PPM SULFUR DIOXIDE/NITROGEN	May 01, 2011

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
E/N 54. 100ppmFS SO2, Nicolet 6700	Fourier Transform Infrared (FTIR)	Nov 21. 2008

Triad Data Available Upon Request

Notes.

AFM

QA Approval

Inv. 173224

Airgas

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

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

Customer:	PITTS/CRAFTON		
Part Number:	E02NI99E15AC649	Reference Number:	32-112796315-1
Cylinder Number:	CC197679	Cylinder Volume:	144 Cu Ft.
Laboratory:	MIC - Royal Oak - MI	Cylinder Pressure:	2015 PSIG
Analysis Date:	Feb 04, 2009	Valve Outlet:	660

Expiration Date: Feb 04, 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
SULFUR DIOXIDE	95.00 PPM	97.97 PPM	G1	+/- 1% NIST Traceable
NITROGEN	Balance			

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM	07120204	CC240103	100.7PPM SULFUR DIOXIDE/NITROGEN	May 01, 2011

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
E/N 54. 100ppmFS SO2. Nicolet 6700	Fourier Transform Infrared (FTIR)	Jan 16, 2009

Triad Data Available Upon Request

Notes: Order#514093

QA Approval

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Series 4040

System S/N 2807

ENVIRONICS FLOW CONTROLLER CALIBRATION SHEET

MFC#: 1 Size: 10000 SCCM

SERIAL NUMBER 765000001

This flow controller was calibrated using a Sierra Cal Bench ™, a NIST traceable Primary Flow Standard Calibration System This calibration was performed with Nitrogen at a standard reference temperature and pressure of 32° and 29 92 in HG This is not performance data This data is used by the system operating modes to improve the flow accuracy

	Set Flow	True Flow
5 %	500 0 SCCM	500 548 SCCM
10 %	1000 0 SCCM	1037 334 SCCM
20 %	2000 0 SCCM	2087 990 SCCM
30 %	3000 0 SCCM	3110 266 SCCM
40 %	4000 0 SCCM	4115 405 SCCM
50 %	5000 0 SCCM	5102 829 SCCM
60 %	6000 0 SCCM	6083 814 SCCM
70 %	7000 0 SCCM	7068 538 SCCM
80 %	8000 0 SCCM	8065 572 SCCM
90 %	9000 0 SCCM	9074 160 SCCM
100 %	10000 0 SCCM	10136 408 SCCM

Verified by: Terri Lundmark Date: 1-18-10

Computerized Gas Mixing / Dilution / Calibration Systems

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World Wide Web: http://www.environics.com E-mail: info@environics.com

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Series 4040

System S/N 2807

ENVIRONICS FLOW CONTROLLER CALIBRATION SHEET

MFC#: 2 Size: 10000 SCCM

SERIAL NUMBER 751700005

This flow controller was calibrated using a Sierra Cal Bench ™, a NIST traceable Primary Flow Standard Calibration System This calibration was performed with Nitrogen at a standard reference temperature and pressure of 32° and 29 92 in HG This is not performance data This data is used by the system operating modes to improve the flow accuracy

	Set Flow	True Flow
5 %	500 0 SCCM	520 346 SCCM
10 %	1000 0 SCCM	1063 875 SCCM
20 %	2000 0 SCCM	2124 386 SCCM
30 %	3000 0 SCCM	3149 808 SCCM
40 %	4000 0 SCCM	4147 672 SCCM
50 %	5000 0 SCCM	5119 140 SCCM
60 %	6000 0 SCCM	6088 551 SCCM
70 %	7000 0 SCCM	7056 474 SCCM
80 %	8000 0 SCCM	8035 270 SCCM
90 %	9000 0 SCCM	9044 444 SCCM
100 %	10000 0 SCCM	10101 287 SCCM

Verified by: Terrie Lundmark Date: 1-18-10

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Series 4040

System S/N 2807

ENVIRONICS FLOW CONTROLLER CALIBRATION SHEET

MFC#: 3 Size: 1000 SCCM

SERIAL NUMBER 764800003

This flow controller was calibrated using a Sierra Cal Bench ™, a NIST traceable Primary Flow Standard Calibration System. This calibration was performed with Nitrogen at a standard reference temperature and pressure of 32° and 29.92 In HG This is not performance data This data is used by the system operating modes to improve the flow accuracy

	Set Flow	True Flow
5 %	50.0 SCCM	42.987 SCCM
10 %	100.0 SCCM	91.720 SCCM
20 %	200.0 SCCM	189.601 SCCM
30 %	300.0 SCCM	287.250 SCCM
40 %	400.0 SCCM	384.895 SCCM
50 %	500.0 SCCM	482.814 SCCM
60 %	600.0 SCCM	582.007 SCCM
70 %	700.0 SCCM	683.683 SCCM
80 %	800.0 SCCM	788.600 SCCM
90 %	900.0 SCCM	898.493 SCCM
100 %	1000.0 SCCM	1014.662 SCCM

Verified by: Terri Lundmark Date: 1-18-10

Computerized Gas Mixing / Dilution / Calibration Systems

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World Wide Web: http://www environics com E-mail: info@environics com

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Series 4040

System S/N 2807

ENVIRONICS FLOW CONTROLLER CALIBRATION SHEET

MFC#: 4 Size: 100 SCCM

SERIAL NUMBER 764700002

This flow controller was calibrated using a Sierra Cal Bench ™, a NIST traceable Primary Flow Standard Calibration System This calibration was performed with Nitrogen at a standard reference temperature and pressure of 32° and 29.92 in.HG This is not performance data. This data is used by the system operating modes to improve the flow accuracy.

	Set Flow	True Flow
5 %	5.0 SCCM	4.838 SCCM
10 %	10.0 SCCM	9.839 SCCM
20 %	20.0 SCCM	19.971 SCCM
30 %	30.0 SCCM	30.217 SCCM
40 %	40.0 SCCM	40.425 SCCM
50 %	50.0 SCCM	50.583 SCCM
60 %	60.0 SCCM	60.691 SCCM
70 %	70.0 SCCM	70.765 SCCM
80 %	80.0 SCCM	80.784 SCCM
90 %	90.0 SCCM	90.866 SCCM
100 %	100.0 SCCM	100.865 SCCM

Verified by: Terri Lundmark Date: 1-18-10

Computerized Gas Mixing / Dilution / Calibration Systems

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World Wide Web: http://www.environics.com E-mail: info@environics.com

ACCI CEM Verification of Gas Dilution System for Field Instrument Calibrations
Based on EMTIC TM-205

Client	Collective Efforts	Date	March 24, 2010
Project No	10-068	Location	stack exhaust
Plant	Alcosan	Series No.	4040
Unit	SSI	S/N	2807
Operation	mnoc	Last Calibration	1/18/2010
Tester(s)	wo	Next Calibration	1/18/2011

Mass Flow Controller	2
Component of Protocol Calibration Gas Used	so2
Concentration of Protocol Gas Used	97.97

Section 3.2.3 Prepared Dilutions	Analyzer Output	Section 3.2.4 Difference from Single Injection and the Average Instrument Response	Section 3.2.5 Difference from Average Output Concentration and the Predicted Concentration
Predicted Concentration 1	75.00		
Instrument Response 1	75.00	0.00%	
Instrument Response 2	75.00	0.00%	0.00%
Instrument Response 3	75.00	0.00%	
Average Response	75.00		
		+/- 2 % Allowable	+/- 2 % Allowable
Predicted Concentration 2	52.25		
Instrument Response 1	52.00	0.00%	
Instrument Response 2	52.00	0.00%	-0.48%
Instrument Response 3	52.00	0.00%	
Average Response	52.00		
		+/- 2 % Allowable	+/- 2 % Allowable

Section 3.2.6 Mid-Level Supply Gas	Analyzer Output	Difference between Protocol Concentration and Average Instrument Response
Mid-Level Gas Concentration	52.25	
Instrument Response 1	52.00	
Instrument Response 2	52.00	-0.41%
Instrument Response 3	52.10	
Average Response	52.03	
		+/- 2 % Allowable

ACCI CEM Verification of Gas Dilution System for Field Instrument Calibrations
Based on EMTIC TM-205

Client	Collective Efforts	Date	March 24, 2010
Project No	10-068	Location	stack exhaust
Plant	Alcosan	Series No.	4040
Unit	SSI	S/N	2807
Operation	mnoc	Last Calibration	1/18/2010
Tester(s)	wo	Next Calibration	1/18/2011

Mass Flow Controller	3
Component of Protocol Calibration Gas Used	Nox
Concentration of Protocol Gas Used	982.40

Section 3.2.3 Prepared Dilutions	Analyzer Output	Section 3.2.4 Difference from Single Injection and the Average Instrument Response	Section 3.2.5 Difference from Average Output Concentration and the Predicted Concentration
Predicted Concentration 1	750.00		
Instrument Response 1	749.00	0.04%	
Instrument Response 2	749.00	0.04%	-0.18%
Instrument Response 3	748.00	-0.09%	
Average Response	748.67		
		+/- 2 % Allowable	+/- 2 % Allowable

Section 3.2.6 Mid-Level Supply Gas	Analyzer Output	Difference between Protocol Concentration and Average Instrument Response
Mid-Level Gas Concentration	507.40	
Instrument Response 1	507.00	
Instrument Response 2	507.10	-0.05%
Instrument Response 3	507.30	
Average Response	507.13	
		+/- 2 % Allowable

Predicted Concentration 2	507.40		
Instrument Response 1	507.00	0.00%	
Instrument Response 2	507.00	0.00%	-0.08%
Instrument Response 3	507.00	0.00%	
Average Response	507.00		
		+/- 2 % Allowable	+/- 2 % Allowable

ACCI CEM Verification of Gas Dilution System for Field Instrument Calibrations
Based on EMTIC TM-205

Client	Collective Efforts	Date	March 24, 2010
Project No	10-068	Location	stack exhaust
Plant	Alcosan	Series No.	4040
Unit	SSI	S/N	2807
Operation	mnoc	Last Calibration	1/18/2010
Tester(s)	wo	Next Calibration	1/18/2011

Mass Flow Controller	4
Component of Protocol Calibration Gas Used	co
Concentration of Protocol Gas Used	5885.00

Section 3.2.3 Prepared Dilutions	Analyzer Output	Section 3.2.4 Difference from Single Injection and the Average Instrument Response	Section 3.2.5 Difference from Average Output Concentration and the Predicted Concentration
Predicted Concentration 1	900.00		0.00%
Instrument Response 1	900.00	0.00%	
Instrument Response 2	900.00	0.00%	
Instrument Response 3	900.00	0.00%	
Average Response	900.00		
		+/- 2 % Allowable	+/- 2 % Allowable

Predicted Concentration 2	605.50		-0.09%
Instrument Response 1	605.00	-0.08%	
Instrument Response 2	605.00	-0.08%	
Instrument Response 3	604.80	-0.12%	
Average Response	604.93		
		+/- 2 % Allowable	+/- 2 % Allowable

Section 3.2.6 Mid-Level Supply Gas	Analyzer Output	Difference between Protocol Concentration and Average Instrument Response
Mid-Level Gas Concentration	605.50	0.03%
Instrument Response 1	606.00	
Instrument Response 2	606.00	
Instrument Response 3	605.00	
Average Response	605.67	
		+/- 2 % Allowable

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In. 315

Liquid Technology Corporation

Industry Leader in Specialty Gases, Equipment and Service

Certificate of Analysis

- EPA PROTOCOL GAS -

** Re-certification **

Customer	Jackson Welding (Pittsburgh, PA)
Date	September 14, 2009
Delivery Receipt	DR-26058
Gas Standard	45.0 - 55.0 ppm NO2, 0.500% Oxygen/Nitrogen-EPA PROTOCOL
Purchase Order	M-10076
Final Analysis Date	September 11, 2009
Expiration Date	September 11, 2011

DO NOT USE BELOW 150 psig

Cylinder Data

Cylinder Serial Number:	CC-251979	Cylinder Outlet:	CGA 660
Cylinder Volume:	122.6 Cubic Feet	Cylinder Pressure:	1750 psig, 70°F
Expiration Date:	September 11, 2011		

Analytical Data

EPA Protocol, Section No. 2.2, Procedure G-1

- Replicate Concentrations (NO2) -
Nitrogen Dioxide: 50.7 ppm +/- 0.50 ppm
Oxygen: 0.503% +/- 0.005%
Nitrogen: Balance

Reference Standard(s):

SRM/GMIS:	GMIS	GMIS/GMIS
Cylinder Number:	CC-178320	CC-159140/CC-159109
Concentration:	50.9 ppm NO2/Nitrogen	0.400% Oxygen/N2 - 1.00% Oxygen/N2
Expiration Date:	03/26/11	11/16/10 - 06/24/10

Certification Instrumentation

Component:	Nitrogen Dioxide	Oxygen
Make/Model:	Nicolet - NEXUS 470	Servomex 244a
Serial Number:	AEP99000154	1847
Principal of Measurement:	FTIR	Paramagnetic
Last Calibration:	September 11, 2009	August 10, 2009

Analytical uncertainty and NIST Traceability are in compliance with EPA-600/R-97/121.

Certified by: Mike Duncan

Mike Duncan

Original Data: 51.7 ppm NO2, 0.503% Oxygen/Nitrogen (February 13, 2009)

Unmatched Excellence

2564 Pemberton Drive ~ Apopka, Florida 32703 ~ Phone (407)-292-2990 ~ Fax (407)-292-3313
~ www.liquidtechcorp.com ~

NO_X Interference Test for Oxides of Nitrogen Analyzer,

Trailer:	TECO NOX Analyzer Model 42CHL
Date:	9-Dec-04
Analyzer Range:	0 to 1,000 ppm_v
Serial #:	427308305

Test Gas	Gas Cylinder Concentration (ppm_v)	NO_X Analyzer Response (ppm_v)	Difference Percent of Span	Suggested Concentration (ppm_v)
Carbon Monoxide	600	0	0.00%	500 +/- 50 ppm
Sulfur Dioxide	246	0	0.00%	200 +/- 20 ppm
Carbon Dioxide	9.74	-1	-0.10%	10.0 +/- 1%
Oxygen	22.5	-1	-0.10%	20.9 +/- 1%
	Total Difference Response		-0.2%	

Notes: Acceptance criteria is the sum of analyzer response must be less than 2 percent. Performed in accordance with 40 CFR, Part 60, USEPA Method 7E, Section 6.2 and Method 20, Section 5.4

NO_X	Oxides of nitrogen.
ppm_v	Parts per million by volume.
USEPA	U.S. Environmental Protection Agency.

NOX Analyzer Converter Efficiency Test,

Trailer:	TECO NO_X Analyzer 42CHL
Date:	03/24/10
Analyzer Range:	0-1000
Serial #:	427308305

Test conducted in accordance with section 8 2 4 1 of Method 7E

Requirements

NO2 EPA Protocol gas between 40 and 60 ppm
Calibrated NOx analyzer to NO standard
Direct injection of NO2 gas to analyzer must result in a 90% efficiency calculated using Eq 7E-7

Eff $NO_2 = C_{DIR}/Cv * 100$

C_{DIR} = 50.8
C_V = 50.70

Eff NO_2 = 100.2 **Pass (must be greater than 90%)**

Note: C_{DIR} = Analyzer response to NO2 gas injection to analyzer
CV = Certified concentration of EPA traceable NO2 calibration gas

		O2	CO2	CO	Nox	SO2
2010/03/24	08:18:46	0.5	0.2	2.3	50.8	0.7

AMETEK AB-921W-9202-2
Sulfur Dioxide Interference Check Test Results,December 2005

Test Data		Run 1	Run 2	Run 3	Average	
Date		December 19, 2005	December 19, 2005	December 19, 2005		
Start Time		7:58 AM	9:15 AM	10:38 AM		
End Time		8:58 AM	10:15 AM	11:38 AM		
Sulfur Dioxide (SO_2) - Modified Method 6 Results						
Sample Volume	(L)	60	60	60		
Emission Concentration	(mg)	19.88	17.89	20.14		
Emission Concentration	(ppm_{dv})	126.46	113.80	128.12	122.79	
Sulfur Dioxide (SO_2) - Method 6C Results						
Emission Concentration	(ppm_{dv})	123.60	111.80	125.70	120.37	
Results						Limit
Percent Difference	(%)	2.3%	1.8%	1.9%		7.0%
Interference Results		PASS	PASS	PASS		

CEM results have been bias calibration corrected.

L	Liter
mg	Milligrams
ppm_{dv}	Parts per million dry volume
%	Percent

O_2 Interference Test.

Analyzer:	Servomex
Date:	12/19/05
Analyzer Range:	0 to 25 percent
Serial #:	3858

Test Gas	Gas Cylinder Concentration (ppm_v)	O_2 Analyzer Response (%)	Difference Percent of Span
Nitric Oxide	25.3	0.0	0.00%
Sulfur Dioxide	51.4	0.0	0.00%
Carbon Monoxide	62.2	0.0	0.00%
Carbon Dioxide			
	Total Difference Response		0.00%

Notes: CO_2 interference is not evaluated due to O_2 / CO_2 cylinder mixture.
Servomex instrument specifications indicate no interferences with paramagnetic analysis.
Acceptance criteria is the sum of analyzer response must be less than 2 percent.
Performed in accordance with 40 CFR, Part 60, Appendix A, USEPA Method 3A,Section 6.2 and Method 20, Section 5.4

CO_2	Carbon Dioxide
O_2	Oxygen.
%	Percent.
ppm_v	Parts per million by volume.
USEPA	U.S. Environmental Protection Agency.

CO_2 Interference Test.

Analyzer:	Servomex
Date:	12/19/05
Analyzer Range:	0 to 25 percent
Serial #:	3858

Test Gas	Gas Cylinder Concentration (ppm_v)	O_2 Analyzer Response (%)	Difference Percent of Span
Nitric Oxide	25.3	0.0	0.00%
Sulfur Dioxide	51.4	0.0	0.00%
Carbon Monoxide	62.2	0.0	0.00%
Oxygen			
	Total Difference Response		0.00%

Notes: O_2 interference is not evaluated due to O_2 / CO_2 cylinder mixture.
Servomex instrument specifications indicate no interferences with infrared analysis.
Acceptance criteria is the sum of analyzer response must be less than 2 percent.
Performed in accordance with 40 CFR, Part 60, Appendix A, USEPA Method 3A,Section 6.2 and Method 20, Section 5.4

CO_2	Carbon Dioxide
O_2	Oxygen.
%	Percent.
ppm_v	Parts per million by volume.
USEPA	U.S. Environmental Protection Agency.

Carbon Monoxide Interference Test.

Trailer	TECO Model 48 Gas Filter Correlation CO Analyzer
Date	20-Aug-07
Analyzer Range	0-1000 ppm

Test Gas	Concentration (%)	Allowable Interference (ppm)	CO Analyzer Response (ppm)
Carbon dioxide	17.90	10	-1.2
Carbon dioxide	9.85	10	-1.1
Carbon dioxide	0	10	0

Allowable Interference is indicated if the CO analyzer response to each of the gases is less than 1 percent of the applicable measurement range of the analyzer.

CO	Carbon monoxide.
ppmv	Parts per million by volume.
ppm	Parts per million.
USEPA	U.S. Environmental Protection Agency.

APPENDIX D

Sample Calculations

ACCI SAMPLE CALCULATIONS
Particulate and CEMS
Collective Efforts LLC
10-068
Alcosan
SSI
mnoc
March 24, 2010
exhaust stack
Run 1

Vf	232.0	ml	Tstandard	68	F
Vi	200.0	ml	Pstandard	760	mm Hg
Wf	281.2	g	K1method 4	0.04706	scf/ml
Wi	246.2	g	K2method 4	0.04715	scf/g
Vm	168.086	dacf	K1method 5	17.64	R/in. Hg
Vm	0.000	dry actual liters	K4method 5	0.0945	
Yd	1.0000		$V/n_{standard}$	385.3	ft3/lb-mole
Pbar	29.45	in. Hg	Kp	85.49	
dHavg	1.45	in. H2O	p_a	(pg)	(ng)
Tm	88.5	F	π	3.141593	
O2	13.87	% dv	Ds (or L)	36.50	inches
CO2	5.94	% dv	Stack Width (W)	NA	inches
Pg	0.57	in. H2O	Dn	0.210	inches
Cp	0.84		Time	240	minutes
$(dP)^{1/2}$avg	0.848	in. H2O^1/2	Tsavg	72.1	F
F_d	9,570	dscf/MMBtu	Product rate	0.00	0.00
			An	0.0002	ft2
D&F data					
TEF Adjusted Total	0.0081233	ng			
2378-TCDD	1.000	TEF			
CEMS DATA					
Sulfur Dioxide			Oxides of Nitrogen (NOX)		
$Caverage_{SO2}$	0.14	ppmdv	$Caverage_{NO2}$	85.3	ppmdv
C_{0SO2}	0.05	ppmdv	C_{0MO2}	1.0	ppmdv
Cma_{SO2}	5.00	ppmdv	Cma_{NO2}	120.0	ppmdv
Cm_{SO2}	4.80	ppmdv	Cm_{NO2}	112.7	ppmdv
Carbon Monoxide			THC		
$Caveragec_O$	4.39	ppmdv	O_2 Correction	7.0	vol. %
C_{0CO}	0.50	ppmdv	MW SO2	64.0	lb/lb-mole
Cma_{CO}	7.00	ppmdv	MW NO2	46.0	lb/lb-mole
Cm_{CO}	7.55	ppmdv			
MW CO	28.0	lb/lb-mole			

1. Volume of Water Vapor Condensed (Vwc)

Vwc(std) = K1method 4 * (Vf - Vi)

K1method 4=	0.04706 scf/ml
Vf=	232.0 ml
Vi=	200.0 ml
Vwc(std)=	1.506 scf

2. Volume of Water Vapor Collected in Silica Gel (Vwsg)

Vwsg(std) = K2method 4 * (Wf - Wi)

K2method 4=	0.04715 scf/g
Wf=	281.2 g
Wi=	246.2 g
Vwsg(std)=	1.650 scf

3. Total Volume of Water Vapor in Gas Sample (Vw)

Vw(std) = Vwc(std) + Vwsg(std)

Vwc(std)=	1.506	scf
Vwsg(std)=	1.650	scf
Vw(std)=	3.156	scf

4. Volume of Gas Metered

Vm = Volume metered in dacf + Volume metred in dry actual liters * (1 cf / 28.317 liters)

Volume metered in dacf=	168.086	dacf
Volume metered in dry actual liters=	0.000	dry actual liters
Vm=	168.086	dacf

$Vm(m^3)$ = Vm * (1 m^3 / 35.3145 cf)

Vm=	168.086	dacf
$Vm(m^3)$=	4.760	dacm

5. Volume of Gas Metered , dry basis, STD

Vm(std) = (K1method 5 * Vm * Yd * (Pbar + (dHavg/13.6))) / (Tm + 460)

K1method 5=	17.64	R/in. Hg
Vm=	168.086	dacf
Yd=	1.0000	
Pbar=	29.45	in. Hg
dHavg=	1.45	in. H2O
Tm=	88.5	F
Vm(std)=	159.785	dscf

$Vm(std)m^3$ = Vm(std) * (1 m^3 / 35.3145 cf)

Vm(std)=	159.785	dscf
$Vm(std)m^3$=	4.525	dscm

6. Water Vapor in the Gas Stream

Bws used = the lower of $SP_{H2O@Tsavg}$ / Ps

and Vw(std) / (Vm(std) + Vw(std))

Bws = $SP_{H2O@Tsavg}$ / Ps With a maximum allowable value of 1.0

$SP_{H2O@Tsavg}$ = The saturation pressure of water at stack temperature

1997 ASHRAE Handbook page 6.2 Eq. (6)

EXP(C8/T + C9 +C10*T + C11*T^2 + C12*T^3 + C13*ln(T)) * (29.921/14.696)

T = Tsavg + 459.67

Tsavg=	72.1	F
T=	531.8	R
C8=	-1.044040E+04	
C9=	-1.1294650E+01	
C10=	-2.702236E-02	
C11=	1.289036E-05	
C12=	-2.478068E-09	
C13=	6.545967E+00	
$SP_{H2O@Tsavg}$=	0.79	in. Hg
Ps=	29.49	in. Hg
Bws=	0.0269	vol. fraction

Bws = Vw(std) / (Vm(std) + Vw(std))

Vw(std)=	3.156	scf
Vm(std)=	159.785	dscf
Bws=	0.0194	vol. fraction
Bws used=	0.0194	vol. fraction

7. Carbon Monoxide and Nitrogen in gas

CO + N2 = 100 - (CO2 + O2)		
CO2=	5.94	% dv
O2=	13.87	% dv
CO + N2=	80.19	% dv

8. Molecular weight of dry gas stream

Md = 0.44 * CO2 %dv + 0.32 * O2 %dv + 0.28 * (CO + N2 %dv)		
CO2=	5.94	% dv
O2=	13.87	% dv
CO + N2=	80.19	% dv
Md=	29.51	lb/lb-mole

9. Molecular weight of wet gas stream

Ms = Md * (1 - Bws) + 18 * Bws		
Md=	29.51	lb/lb-mole
Bws=	0.0194	vol. fraction
Ms=	29.28	lb/lb-mole

10. Stack Pressure

Ps = Pbar + Pg/13.6		
Pbar=	29.45	in. Hg
Pg=	0.57	in. H2O
Ps=	29.49	in. Hg

11. Average Stack Gas Velocity

Vs = Kp * Cp * $(dP)^{1/2}$avg * ((Tsavg + 460) / (Ps * Ms))^1/2		
Kp=	85.49	
Cp=	0.84	
$(dP)^{1/2}$avg=	0.8480	in. H2O^1/2
Tsavg=	72.1	F
Ps=	29.49	in. Hg
Ms=	29.28	lb/lb-mole
Vs=	47.80	ft/s

12. Area of the Stack

If W = 0, the stack is circular.

Circular

As = PI * (Ds)^2 / 4 * (1 ft / 12 in.)^2		
PI=	3.141593	
Ds=	36.50	inches
As=	7.27	ft2

Rectangular

As = L * W * (1 ft / 12 in.)^2		
L=	0.00	inches
W=	NA	inches
As=	0.00	ft2

13. Stack Gas Flow Rate, Actual

Qacfm = Vs * As * 60		
Vs=	47.80	ft/s
As=	7.27	ft2
Qacfm=	20,840	acfm

Qacm/min = Qacfm * (1 m^3 / 35.3145 cf)		
Qacfm=	20,840	acfm
Qacm/min=	590	acm/min

14. Stack Gas Flow Rate, Standard

Qscfm = Qacfm * ((Tstandard + 460) / (Tsavg + 460)) * (Ps / Pstandard)

Qacfm=	20,840	acfm
Tstandard=	68	F
Tsavg=	72.1	F
Ps=	29.49	in. Hg
Pstandard=	29.92	in. Hg
Qscfm=	20,384	scfm

Qscm/min = Qscfm * (1 m^3 / 35.3145 cf)

Qscfm=	20,384	scfm
Qscm/min=	577	scm/min

15. Stack Gas Flow Rate, Dry Standard

Qdscfm = Qscfm * (1 - Bws)

Qscfm=	20,384	scfm
Bws=	0.0194	vol. fraction
Qdscfm=	19,989	dscfm

Qdscm/min = Qdscfm * (1 m^3 / 35.3145 cf)

Qdscfm=	19,989	dscfm
Qdscm/min=	566	dscm/min

16. Percent Isokinetic

I = K4method 5 * (Tsavg + 460) * Vm(std) / (Ps * Vs * An * Theta * (1 - Bws))

K4method5=	0.0945	
Tsavg=	72.1	F
Vm(std)=	159.785	dscf
Ps=	29.49	in. Hg
Vs=	47.80	ft/s
An=	0.000241	ft2
Theta=	240	minutes
Bws=	0.0194	vol. fraction
I=	100.68	%

25. Heat Input (HI) (MMBtu/hr)

HI = Qscfm * 60 * ((100 - Bws) / F_d) * ((20.9 - O2) / 20.9)

Qscfm=	20,384	scfm
Bws=	0.0194	vol. fraction
F_d=	9570	dscf/MMBtu
O2=	13.87	% dv
HI=	42	MMBtu/hr

27. Sulfur dioxide concentration (ppmdv)

C_{SO2} = ($Caverage_{SO2}$ - C_{0SO2}) * Cma_{SO2} / (Cm_{SO2} - C_{0SO2})

$Caverage_{SO2}$=	0.14	ppmdv
C_{0SO2}=	0.05	ppmdv
Cma_{SO2}=	5.00	ppmdv
Cm_{SO2}=	4.80	ppmdv
C_{SO2}=	0.10	ppmdv

28. Sulfur dioxide emission rate (lb/hr)

SO2(lb/hr) = C_{SO2} / 1,000,000 * Qdscfm * (60 min / 1 hour) / $V/n_{standard}$ * $SO2_{MW}$

C_{SO2}=	0.10	ppmdv
Qdscfm=	19,989	dscfm
$V/n_{standard}$=	385.3	ft3/lb-mole
$SO2_{MW}$=	64.0	lb/lb-mole
SO2(lb/hr)=	0.02	lb/hr

29. Sulfur dioxide emission rate (lb/MM Btu)

SO2(lb/MM Btu) = SO2(lb/hr) / heat input (MM Btu/hr)

SO2(lb/hr)=	0.02	lb/hr
Heat input=	100.000	MMBtu/hr
SO2(lb/MM Btu)=	0.00020	lb/MM Btu

30. Oxides of Nitrogen concentration (ppmdv)

$C_{NOx} = (Caverage_{NOx} - C_{0NOx}) * Cma_{NOx} / (Cm_{NOx} - C_{0NOx})$

$Caverage_{NOx}$=	85.28	ppmdv
C_{0NOx}=	0.95	ppmdv
Cma_{NOx}=	120.00	ppmdv
Cm_{NOx}=	112.65	ppmdv
C_{NOx}=	90.60	ppmdv

31. Oxides of Nitrogen emission rate (lb/hr)

$NOx(lb/hr) = C_{NOx} / 1{,}000{,}000 * Qdscfm * (60 \text{ min} / 1 \text{ hour}) / V/n_{standard} * NOx_{MW}$

C_{NOx}=	90.60	ppmdv
Qdscfm=	19,989	dscfm
$V/n_{standard}$=	385.3	ft3/lb-mole
NOx_{MW}=	46.0	lb/lb-mole
NOx(lb/hr)=	12.97	lb/hr

32. Oxides of Nitrogen emission rate (lb/MM Btu)

NOx(lb/MM Btu) = NOx(lb/hr) / heat input (MM Btu/hr)

NOx(lb/hr)=	12.97	lb/hr
Heat input=	100	MMBtu/hr
NOx(lb/MM Btu)=	0.12972	lb/MM Btu

33. Carbon Monoxide concentration (ppmdv)

$C_{CO} = (Caverage_{CO} - C_{0CO}) * Cma_{CO} / (Cm_{CO} - C_{0CO})$

$Caverage_{CO}$=	4.39	ppmdv
C_{0CO}=	0.50	ppmdv
Cma_{CO}=	7.00	ppmdv
Cm_{CO}=	7.55	ppmdv
C_{CO}=	3.86	ppmdv

34. Carbon Monoxide emission rate (lb/hr)

$CO(lb/hr) = C_{CO} / 1{,}000{,}000 * Qdscfm * (60 \text{ min} / 1 \text{ hour}) / V/n_{standard} * CO_{MW}$

C_{CO}=	3.86	ppmdv
Qdscfm=	19,989	dscfm
$V/n_{standard}$=	385.3	ft3/lb-mole
CO_{MW}=	28.0	lb/lb-mole
CO(lb/hr)=	0.34	lb/hr

35. PCDD/PCDF TEF Adjusted Amount

PCDD/PCDF Adj Amt = TEFcompound * Mass Detected

TEF compound 2378-TCDD =	1.0	TEF
Mass Detected =	0.0034	ng
PCDD/PCDF Adj Amt =	0.0034	ng

19. PCDD/PCDF Emission Concentration (ng/m^3)

ng/m^3 = PCDD/PCDF Total Mass Collected /$Vm(std)m^3$

Total Mass Collected =	0.0081	ng
$Vm(std)m^3$ =	4.525	dscm
ng/m^3	0.0018	ng/m^3

20. PCDD/PCDF Emission Rate (ng/hr)

ng/hr = ng/m^3 * Qdscm/min * 60		
ng/m^3 =	0.0018	ng/m3
Qdscm/min =	566	dscm/min
ng/hr =	60.97	ng/hr

21. PCDD/PCDF Corrected at 7.0 % O2

PCDD/PCDF corrected= Cdf * (20.9 - $O2_{dfcorrection}$) / (20.9 - O2)

CDF =	0.0018	ng/m^3
$O2_{dfcorrection}$=	7.0	%
O2=	13.87	% dv
PCDD/PCDF corrected =	0.004	ng/m^3

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ACCI SAMPLE CALCULATIONS
Method 26A Test Results
Collective Efforts LLC
10-068
Alcosan
SSI
mnoc
March 24, 2010
exhaust stack
Run 1

Vf	473.0	ml	Tstandard	68	F
Vi	450.0	ml	Pstandard	760	mm Hg
Wf	240.6	g	K1method 4	0.04706	scf/ml
Wi	218.3	g	K2method 4	0.04715	scf/g
	119.220	dacf	K1method 5	17.64	R/in. Hg
	0.000	dry actual liters	K4method 5	0.0945	
Yd	1.0040		$V/n_{standard}$	385.3	ft3/lb-mole
Pbar	29.28	in. Hg	Kp	85.49	
dHavg	2.67	in. H2O			
Tm	96.3	F	π	3.141593	
O2	13.77	% dv	Ds (or L)	36.50	inches
CO2	6.07	% dv	Stack Width (W)	0.00	inches
Pg	0.57	in. H2O	Dn	0.250	inches
Cp	0.84		Time	120	minutes
$(dP)^{1/2}$avg	0.874	in. H2O^1/2	Tsavg	77.4	F
F_d	NA	dscf/MMBtu			

1. Volume of Water Vapor Condensed (Vwc)

Vwc(std) = K1method 4 * (Vf - Vi)

K1method 4=	0.04706	scf/ml
Vf=	473.0	ml
Vi=	450.0	ml
Vwc(std)=	1.082	scf

2. Volume of Water Vapor Collected in Silica Gel (Vwsg)

Vwsg(std) = K2method 4 * (Wf - Wi)

K2method 4=	0.04715	scf/g
Wf=	240.6	g
Wi=	218.3	g
Vwsg(std)=	1.051	scf

3. Total Volume of Water Vapor in Gas Sample (Vw)

Vw(std) = Vwc(std) + Vwsg(std)

Vwc(std)=	1.082	scf
Vwsg(std)=	1.051	scf
Vw(std)=	2.134	scf

4. Volume of Gas Metered

Vm = Volume metered in dacf + Volume metred in dry actual liters * (1 cf / 28.317 liters)

Volume metered in dacf=	119.220	dacf
Volume metered in dry actual liters=	0.000	dry actual liters
Vm=	119.220	dacf

$Vm(m^3)$ = Vm * (1 m^3 / 35.3145 cf)

Vm=	119.220	dacf
$Vm(m^3)$=	3.376	dacm

5. Volume of Gas Metered , dry basis, STD

Vm(std) = (K1method 5 * Vm * Yd * (Pbar + (dHavg/13.6))) / (Tm + 460)

K1method 5=	17.64	R/in. Hg
Vm=	119.220	dacf
Yd=	1.0040	
Pbar=	29.28	in. Hg
dHavg=	2.67	in. H2O
Tm=	96.3	F
Vm(std)=	111.889	dscf

$Vm(std)m^3$ = Vm(std) * (1 m^3 / 35.3145 cf)

Vm(std)=	111.889	dscf
$Vm(std)m^3$=	3.168	dscm

6. Water Vapor in the Gas Stream

Bws used = the lower of $SP_{H2O@Tsavg}$ / Ps

and Vw(std) / (Vm(std) + Vw(std))

Bws = $SP_{H2O@Tsavg}$ / Ps With a maximum allowable value of 1.0

$SP_{H2O@Tsavg}$= The saturation pressure of water at stack temperature

1997 ASHRAE Handbook page 6.2 Eq. (6)

EXP(C8/T + C9 +C10*T + C11*T^2 + C12*T^3 + C13*ln(T)) * (29.921/14.696)

T = Tsavg + 459.67

Tsavg=	77.4	F
T=	537.0	R
C8=	-1.044040E+04	
C9=	-1.1294650E+01	
C10=	-2.702236E-02	
C11=	1.289036E-05	
C12=	-2.478068E-09	
C13=	6.545967E+00	
$SP_{H2O@Tsavg}$=	0.95	in. Hg
Ps=	29.32	in. Hg
Bws=	0.0323	vol. fraction

Bws = Vw(std) / (Vm(std) + Vw(std))

Vw(std)=	2.134	scf
Vm(std)=	111.889	dscf
Bws=	0.0187	vol. fraction
Bws used=	0.0187	vol. fraction

7. Carbon Monoxide and Nitrogen in gas

CO + N2 = 100 - (CO2 + O2)

CO2=	6.07	% dv
O2=	13.77	% dv
CO + N2=	80.15	% dv

8. Molecular weight of dry gas stream

Md = 0.44 * CO2 %dv + 0.32 * O2 %dv + 0.28 * (CO + N2 %dv)

CO2=	6.07	% dv
O2=	13.77	% dv
CO + N2=	80.15	% dv
Md=	29.52	lb/lb-mole

9. Molecular weight of wet gas stream

Ms = Md * (1 - Bws) + 18 * Bws

Md=	29.52	lb/lb-mole
Bws=	0.0187	vol. fraction
Ms=	29.31	lb/lb-mole

10. Stack Pressure

Ps = Pbar + Pg/13.6

Pbar=	29.28	in. Hg
Pg=	0.57	in. H2O
Ps=	29.32	in. Hg

11. Average Stack Gas Velocity

Vs = Kp * Cp * $(dP)^{1/2}$avg * ((Tsavg + 460) / (Ps * Ms))^1/2

Kp=	85.49	
Cp=	0.84	
$(dP)^{1/2}$avg=	0.8735	in. H2O^1/2
Tsavg=	77.4	F
Ps=	29.32	in. Hg
Ms=	29.31	lb/lb-mole
Vs=	49.61	ft/s

12. Area of the Stack

If W = 0, the stack is circular.

Circular

As = PI * (Ds)^2 / 4 * (1 ft / 12 in.)^2

PI=	3.141593	
Ds=	36.50	inches
As=	7.27	ft2

Rectangular

As = L * W * (1 ft / 12 in.)^2

L=	0.00	inches
W=	0.00	inches
As=	0.00	ft2

13. Stack Gas Flow Rate, Actual

Qacfm = Vs * As * 60

Vs=	49.61	ft/s
As=	7.27	ft2
Qacfm=	21,627	acfm

Qacm/min = Qacfm * (1 m^3 / 35.3145 cf)

Qacfm=	21,627	acfm
Qacm/min=	612	acm/min

14. Stack Gas Flow Rate, Standard

Qscfm = Qacfm * ((Tstandard + 460) / (Tsavg + 460)) * (Ps / Pstandard)

Qacfm=	21,627	acfm
Tstandard=	68	F
Tsavg=	77.4	F
Ps=	29.32	in. Hg
Pstandard=	29.92	in. Hg
Qscfm=	20,825	scfm

Qscm/min = Qscfm * (1 m^3 / 35.3145 cf)

Qscfm=	20,825	scfm
Qscm/min=	590	scm/min

15. Stack Gas Flow Rate, Dry Standard

Qdscfm = Qscfm * (1 - Bws)

Qscfm=	20,825	scfm
Bws=	0.0187	vol. fraction
Qdscfm=	20,435	dscfm

Qdscm/min = Qdscfm * (1 m^3 / 35.3145 cf)

Qdscfm=	20,435	dscfm
Qdscm/min=	579	dscm/min

16. Area of the Nozzle

An = PI * (Dn)^2 / 4 * (1 ft / 12 in.)^2

PI=	3.141593	
Dn=	0.250	inches
An=	0.000341	ft2

17. Percent Isokinetic

I = K4method 5 * (Tsavg + 460) * Vm(std) / (Ps * Vs * An * Theta * (1 - Bws))

K4method5=	0.0945	
Tsavg=	77.4	F
Vm(std)=	111.889	dscf
Ps=	29.32	in. Hg
Vs=	49.61	ft/s
An=	0.000341	ft2
Theta=	120	minutes
Bws=	0.0187	vol. fraction
I=	97.32	%

18. Hydrochloric Acid Emission Concentration (mg/DSCM)

$E_{HCl}=C_{HCl}/Vm(std)m^3$

C_{HCl}=	0.64	mg
$Vm(std)m^3$=	3.168	DSCM
EHCl=	0.202	mg/DSCM

19. Hydrochloric Acid Emission Concentration (lb/dscf)

$E_{HCl}=C_{HCl}*(1/1000)*(1/453.593)/Vm(std)$

CHCl=	0.64	mg
Vm(std)=	111.889	dscf
E_{HCl}=	1.261E-08	lb/dscf

20. Hydrochloric Acid Emission Concentration (ppm_{dv})

$E_{HCl}=E_{HCl}/MW*V/n_{standard}*1000000$

EHCl=	1.261E-08	lb/dscf
MWHCl=	36.46097	lb/lb-mole
$V/n_{standard}$=	385.3	ft3/lb-mole
EHCl=	0.133	ppm_{dv}

21. Hydrochloric Acid Emission Rate (lb/hr)

$E_{HCl}= E_{HCl} * Q_{DSCFM}*60min/hr$

E_{HCl}=	1.261E-08	lb/dscf
Q_{DSCFM}=	20,435	dscfm
E_{HCl}=	0.015	lb/hr

23. Hydrogen Fluoride Emission Concentration (mg/DSCM)

$E_{Cl}=C_{Cl}/Vm(std)m^3$

CHF=	0.25	mg
$Vm(std)m^3$=	3.168	DSCM
E_{HF}=	0.079	mg/DSCM

24. HF Emission Concentration (lb/dscf)

$E_{HF}=C_{HF}*(1/1000)*(1/453.593)/Vm(std)$

C_{Cl}=	0.25	mg
Vm(std)=	111.889	lb/dscf
E_{HF}=	4.926E-09	lb/dscf

25. HF Emission Concentration (ppm_{dv})

$E_{HF}=E_{HF}/MW*V/n_{standard}*1000000$

E_{HF}=	4.926E-09	lb/dscf
MW_{HF}=	20.00637	lb/lb-mole
$V/n_{standard}$=	385.3	ft3/lb-mole
E_{HF}=	0.095	ppm_{dv}

26. HF Emission Rate (lb/hr)

$E_{HF}= E_{HF} * Q_{DSCFM}*60min/hr$

E_{CHF}=	4.926E-09	lb/dscf
Q_{DSCFM}=	20,435	dscfm
E_{HF}=	0.006	lb/hr

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ACCI SAMPLE CALCULATIONS
Metals Testing Results
Collective Efforts LLC
10-068
Alcosan
SSI
mnoc
March 24, 2010
exhaust stack
Run 1

Vf	467.0	ml	Tstandard	68	F
Vi	400.0	ml	Pstandard	760	mm Hg
Wf	297.8	g	K1method 4	0.04706	scf/ml
Wi	259.7	g	K2method 4	0.04715	scf/g
	230.680	dacf	K1method 5	17.64	R/in. Hg
	0.000	dry actual liters	K4method 5	0.0945	
Yd	1.0040		$V/n_{standard}$	385.3	ft3/lb-mole
Pbar	29.45	in. Hg	Kp	85.49	
dHavg	2.59	in. H2O			
Tm	89.4	F	π	3.141593	
O2	13.87	% dv	Ds (or L)	36.50	inches
CO2	5.94	% dv	Stack Width (W)	0.00	inches
Pg	0.57	in. H2O	Dn	0.250	inches
Cp	0.84		Time	240	minutes
$(dP)^{1/2}$avg	0.865	in. H2O^1/2	Tsavg	74.5	F
F_d	NA	dscf/MMBtu	Product rate	1.88	ton/hr

1. Volume of Water Vapor Condensed (Vwc)

Vwc(std) = K1method 4 * (Vf - Vi)

K1method 4=	0.04706	scf/ml
Vf=	467.0	ml
Vi=	400.0	ml
Vwc(std)=	3.153	scf

2. Volume of Water Vapor Collected in Silica Gel (Vwsg)

Vwsg(std) = K2method 4 * (Wf - Wi)

K2method 4=	0.04715	scf/g
Wf=	297.8	g
Wi=	259.7	g
Vwsg(std)=	1.796	scf

3. Total Volume of Water Vapor in Gas Sample (Vw)

Vw(std) = Vwc(std) + Vwsg(std)

Vwc(std)=	3.153	scf
Vwsg(std)=	1.796	scf
Vw(std)=	4.949	scf

4. Volume of Gas Metered

Vm = Volume metered in dacf + Volume metred in dry actual liters * (1 cf / 28.317 liters)

Volume metered in dacf=	230.680	dacf
Volume metered in dry actual liters=	0.000	dry actual liters
Vm=	230.680	dacf

$Vm(m^3)$ = Vm * (1 m^3 / 35.3145 cf)

Vm=	230.680	dacf
$Vm(m^3)$=	6.532	dacm

5. Volume of Gas Metered , dry basis, STD

Vm(std) = (K1method 5 * Vm * Yd * (Pbar + (dHavg/13.6))) / (Tm + 460)

K1method 5=	17.64	R/in. Hg
Vm=	230.680	dacf
Yd=	1.0040	
Pbar=	29.45	in. Hg
dHavg=	2.59	in. H2O
Tm=	89.4	F
Vm(std)=	220.424	dscf

$Vm(std)m^3 = Vm(std) * (1\ m^3 / 35.3145\ cf)$

Vm(std)=	220.424	dscf
$Vm(std)m^3$=	6.242	dscm

6. Water Vapor in the Gas Stream

Bws used = the lower of $SP_{H2O@Tsavg} / Ps$

and $Vw(std) / (Vm(std) + Vw(std))$

Bws = $SP_{H2O@Tsavg} / Ps$ With a maximum allowable value of 1.0

$SP_{H2O@Tsavg}$= The saturation pressure of water at stack temperature

1997 ASHRAE Handbook page 6.2 Eq. (6)

EXP(C8/T + C9 +C10*T + C11*T^2 + C12*T^3 + C13*ln(T)) * (29.921/14.696)

T = Tsavg + 459.67

Tsavg=	74.5	F
T=	534.1	R
C8=	-1.044040E+04	
C9=	-1.1294650E+01	
C10=	-2.702236E-02	
C11=	1.289036E-05	
C12=	-2.478068E-09	
C13=	6.545967E+00	
$SP_{H2O@Tsavg}$=	0.86	in. Hg
Ps=	29.49	in. Hg
Bws=	0.0292	vol. fraction

Bws = Vw(std) / (Vm(std) + Vw(std))

Vw(std)=	4.949	scf
Vm(std)=	220.424	dscf
Bws=	0.0220	vol. fraction
Bws used=	0.0220	vol. fraction

7. Carbon Monoxide and Nitrogen in gas

CO + N2 = 100 - (CO2 + O2)

CO2=	5.94	% dv
O2=	13.87	% dv
CO + N2=	80.19	% dv

8. Molecular weight of dry gas stream

Md = 0.44 * CO2 %dv + 0.32 * O2 %dv + 0.28 * (CO + N2 %dv)

CO2=	5.94	% dv
O2=	13.87	% dv
CO + N2=	80.19	% dv
Md=	29.51	lb/lb-mole

9. Molecular weight of wet gas stream

Ms = Md * (1 - Bws) + 18 * Bws

Md=	29.51	lb/lb-mole
Bws=	0.0220	vol. fraction
Ms=	29.25	lb/lb-mole

10. Stack Pressure

Ps = Pbar + Pg/13.6

Pbar=	29.45	in. Hg
Pg=	0.57	in. H2O
Ps=	29.49	in. Hg

11. Average Stack Gas Velocity

Vs = Kp * Cp * $(dP)^{1/2}$avg * ((Tsavg + 460) / (Ps * Ms))^1/2

Kp=	85.49	
Cp=	0.84	
$(dP)^{1/2}$avg=	0.8645	in. H2O^1/2
Tsavg=	74.5	F
Ps=	29.49	in. Hg
Ms=	29.25	lb/lb-mole
Vs=	48.87	ft/s

12. Area of the Stack

If W = 0, the stack is circular.

Circular

As = PI * (Ds)^2 / 4 * (1 ft / 12 in.)^2

PI=	3.141593	
Ds=	36.50	inches
As=	7.27	ft2

Rectangular

As = L * W * (1 ft / 12 in.)^2

L=	0.00	inches
W=	0.00	inches
As=	0.00	ft2

13. Stack Gas Flow Rate, Actual

Qacfm = Vs * As * 60

Vs=	48.87	ft/s
As=	7.27	ft2
Qacfm=	21,304	acfm

Qacm/min = Qacfm * (1 m^3 / 35.3145 cf)

Qacfm=	21,304	acfm
Qacm/min=	603	acm/min

14. Stack Gas Flow Rate, Standard

Qscfm = Qacfm * ((Tstandard + 460) / (Tsavg + 460)) * (Ps / Pstandard)

Qacfm=	21,304	acfm
Tstandard=	68	F
Tsavg=	74.5	F
Ps=	29.49	in. Hg
Pstandard=	29.92	in. Hg
Qscfm=	20,746	scfm

Qscm/min = Qscfm * (1 m^3 / 35.3145 cf)

Qscfm=	20,746	scfm
Qscm/min=	587	scm/min

15. Stack Gas Flow Rate, Dry Standard

Qdscfm = Qscfm * (1 - Bws)

Qscfm=	20,746	scfm
Bws=	0.0220	vol. fraction
Qdscfm=	20,290	dscfm

Qdscm/min = Qdscfm * (1 m^3 / 35.3145 cf)

Qdscfm=	20,290	dscfm
Qdscm/min=	575	dscm/min

16. Area of the Nozzle

An = PI * (Dn)^2 / 4 * (1 ft / 12 in.)^2

PI=	3.141593	
Dn=	0.250	inches
An=	0.000341	ft2

17. Percent Isokinetic

I = K4method 5 * (Tsavg + 460) * Vm(std) / (Ps * Vs * An * Theta * (1 - Bws))

K4method5=	0.0945	
Tsavg=	74.5	F
Vm(std)=	220.424	dscf
Ps=	29.49	in. Hg
Vs=	48.87	ft/s
An=	0.000341	ft2
Theta=	240	minutes
Bws=	0.0220	vol. fraction
I=	96.54	%

18. Mercury Emission Concentration (ug/DSCM)

EC=(Emission mass)/Vmstd

Emission Mass=	57.12	ug
Vm(std)m^3=	6.242	DSCM
EC=	9.15	ug/DSCM

19. Mercury Emission Rate (lb/hr)

E=(Emission Mass)*(1/1000000)/Vm(std) * Qdscfm*60*(1/453.593)

Emission Mass	57.12	ug
Vm(std)=	220.424	dscf
Qdscfm=	20290.18	dscfm
E=	6.95E-04	lb/hr

21. Mercury Emission Rate (lb/ton product)

E=(lb/hr) / (ton product/hr)

E=	6.95E-04	lb/hr
Material Produced	1.88	ton/hr
E=	0.000369942	lb/ton product

Nomenclature

NOMENCLATURE

SYMBOL		DESCRIPTION
ACFM	-	Actual cubic feet per minute
A_s	-	Stack Area
AB	-	Acetone Blank
AB1	-	Acetone Blank Tare Weight 1
AB2	-	Acetone Blank Tare Weight 2
ABF1	-	Acetone Blank Final Weight 1
ABF2	-	Acetone Blank Final Weight 2
AT1	-	Acetone Rinse Tare Weight 1
AT2	-	Acetone Rinse Tare Weight 2
A_n	-	Nozzle Area
B_{wo}	-	Moisture content of sample gas, measured impinger collection
B_{ws}	-	Moisture content of sample gas, wet saturated
BTU	-	British Thermal Units
C	-	Carbon
C_3H_8	-	Propane
Ca	-	Acetone Blank Correction
C_M	-	Average of initial and final system calibration bias check responses for the upscale gas, ppm
cf	-	Cubic foot
C_{MA}	-	Actual concentration of the upscale calibration gas, ppm
C_d	-	Concentration of Particulate Emissions
C_O	-	Average of initial and final system calibration bias check responses for the zero gas, ppm
CO	-	Carbon monoxide
CO_2	-	Carbon dioxide
C_p	-	Pitot co-efficient, 0.84 for S-type, 0.99 for standard (English units)
E_{NOX}	-	Emission rate of Oxides of nitrogen as NO2, lb/hr
DACF	-	Dry actual cubic feet
DSCF	-	Dry standard cubic feet
DACM	-	Dry actual cubic meters
DSCFM	-	Dry standard cubic feet per minute
dscf/MMBtu	-	Dry standard cubic feet per Million British Thermal Units (units for Fd)
D_S	-	Stack diameter
D_N	-	Nozzle diameter
°F	-	Degrees Fahrenheit
ft	-	foot
F1	-	Filter Final Weight 1
F2	-	Filter Final Weight 2
FT1	-	Filter Tare Weight 1
FT2	-	Filter Tare Weight 2
F_c	-	CO2 based F-Factor for natural gas (1,040 SCF/MMBtu)
F_d	-	F-factor
Ft^2	-	Square feet
Ft^3	-	Cubic feet
FTIR	-	Fourier Transform Infrared
ft^3/lb-mole	-	Cubic feet per pound mole
ft/sec	-	Feet per second
g	-	Grams
g/mL	-	Gram per milliliter
gr/DSCF	-	Grains per dry standard cubic feet

HI	-	Heat Input
ΔH_{avg}	-	Average pressure drop across the meter box during test run, inches H2O
H_2O	-	Water
Hg	-	Mercury
hr	-	Hour
in Hg	-	Inches of Mercury
in H_2O	-	Inches of Water
$\sqrt{inH_2O}$	-	Square root of Inches of Water
I	-	Isokinetic Sampling
K1 method 5	-	Conversion to standard conditions, 17.64 °R/inches Hg
K1 method 4	-	Conversion to standard conditions, 0.04707 f3/ml
K2 method 4	-	Conversion to standard conditions, 0.04715 ft3/g
K4 method 5	-	Conversion to standard conditions, 0.0945
K_p	-	Pitot tube constant, 85.49 for English units
Kg	-	Killograms
L	-	Length of Stack if Rectangular
lb	-	Pound
lb/lb-mole	-	Pound per pound mole
lb-mole	-	Pound mole
lb/hr	-	Pound per hour
lb/MMBTU	-	Pound per million British thermal units
ma	-	Average Final (total) weight after evaporation - Average Tare Weigth of Acetone Blank
m^3	-	Cubic meters
mg	-	Milligrams
mg/g	-	Milligrams per gram
mL	-	Milliliter
M_d	-	Molecular weight of stack gas mixture, dry basis
MMBTU	-	Million British Thermal Units
MMBtu/hr	-	Million British Thermal Units per hour
mm HG	-	Millimeters of Mercury
M_n	-	Mass of particulate matter, g
M_s	-	Molecular weight of stack gas mixture, wet basis
M_{SAT}	-	Ratio of vapor pressure of water at stack conditions to stack pressure
M_W	-	Molecular weight of a specific compound or element
N_2	-	Nitrogen
O_2	-	Oxygen
ng	-	Nanograms
NMNEVOC	-	Non-Methane, Non-Ethane Volatile Organic Compounds
NO_x	-	Oxides of Nitrogen
NO_2	-	Nitrous Oxide
%	-	Percent
% Volume	-	Percent by volume
% dv	-	Percent by volume, dry basis
ΔP	-	Gas velocity pressure, in H2O
P_a	-	Density of Acetone
P_{BAR}	-	Barometric pressure, in H2O
P_S	-	Static Pressure, in H2O
P_g	-	Total pressure of gas at stack conditions
P_{STD}	-	Standard pressure, 760 mmHG
$\sqrt{(P)_{AVG}}$	-	Averag of the square root of gas velocity pressure, in H2O
ppm_{dv}	-	Parts per million, volume and dry basis
ppb_{dv}	-	Parts per billion, volume and dry basis
Q_{ACFM}	-	Flow rate of stack gas, actual cubic feet per minute
Q_{SCFM}	-	Flow rate of stack gas, standard cubic feet per minute
Q_{DSCFM}	-	Flow rate of stack gas, dry standard cubic feet per minute

°R	-	Degrees Rankin
°R/in. Hg	-	Degrees Rankin per inches of Mercury
scf/ml	-	Standard cubic feet per milliliter
scf/g	-	Standard cubic feet per gram
SCFM	-	Standard cubic feet per minute
SCM	-	Standard cubic meters
SCF	-	Standard cubic feet
$SP_{H2O@Tavg}$	-	Saturation pressure of water at average stack temperature
STD	-	Standard
s	-	Second
T	-	Stack Temperature
tph	-	Tons per hour
ton/yr	-	Tons per year
T_M	-	Temperature of the dry gas meter
T_S	-	Temperature of the stack
T_{STD}	-	Standard temperature, 68 °F
THC	-	Total Hydrocarbons
ug	-	Micrograms
Va	-	Volume of Acetone Blank, in mL
Vaw	-	Volume of Acetone Rinse, in mL
vol.	-	Volume
V/n_{std}	-	Volume mole in standard conditions, in cubic feet per pound mole
V_{lc}	-	Total volume of water vapor condensed, at STP
V_m	-	Volume of sample gas measured by the dry gas meter
V_{MSTD}	-	Volume of sample gas measured by the dry gas meter, corrrected to standard conditions
VOC	-	Volatile Organic Compounds
V_S	-	Velocity of stack gas, ft/s
$V_{Wc(std)}$	-	Volume of water condensed, corrected to standard conditions
$V_{Wsg(std)}$	-	Volume of water collected in silica gel, corrected to standard conditions
$V_{W(std)}$	-	Volume of water vapor in gas stream, corrected to standard conditions
Y_d	-	Dry gas meter calibration factor
V_f	-	Final volume of water
V_i	-	Initial volume of water
W1	-	Acetone Rinse Final Weight 1
W2	-	Acetone Rinse Final Weight 2
W	-	Width of Stack if Rectangular
Wa	-	Weight of Acetone
W_f	-	Final weight
W_i	-	Initial weight