

EMISSION COMPLIANCE SURVEY

MONITORING REPORT

March 2009 Survey

Prepared for:

First American Scientific Corporation

Surrey, B.C.

Prepared by:

A. LANFRANCO & ASSOCIATES INC.

Surrey, B.C.

April 2009

TABLE OF CONTENTS

	Page
SUMMARY	i
1.0 INTRODUCTION	1
2.0 PROCESS DESCRIPTION	2
3.0 METHODOLOGY	3
3.1 Sampling Techniques	3
3.2 Analytical Techniques	3
4.0 RESULTS	5
5.0 DISCUSSION OF RESULTS	8

APPENDICES

Appendix 1 – CEM Minutely Averages and Computer Outputs of Measured and Calculated Data

Appendix 2 – Formulae and Nomenclature

Appendix 3 - Field Data Sheets and Process Information

Appendix 4 - Calibration Data

SUMMARY

The following table presents the individual test results for the listed parameters for the First American Scientific Corporation cyclone exhaust duct, tested on March 30, 2009.

PARAMETER	WOODWASTE		DE-INKING SLUDGE	
	RESULT		RESULT	
	RUN 1	RUN 2	RUN 1	RUN 2
Particulate (mg/Sm ³)	121	513	1348	36.1
THC (mg/Sm ³)	113	247	53	48
Flowrate (Sm ³ /min)	20.4	20.0	19.9	21.1
Temperature (°C)	61.9	68.8	76.3	58.3

THC = total hydrocarbons

All results are at standard conditions of 20°C and 101.3 KPa (dry).

1.0 INTRODUCTION

In March 2009, First American Scientific Corporation of Surrey, B.C., retained A. Lanfranco and Associates Inc. of Surrey, B.C., to conduct an emission survey on the cyclone exhaust duct at their plant at 30764 South Fraser Way, Abbotsford, B.C

The purpose of the survey was to measure and report emission parameters from the exhaust duct of the KDS Micronex system. The testing was conducted to determine general performance specifications in relation to EPA permitted particulate, and organic discharges.

This report documents the methods used and results found for duplicate emission tests for each condition, conducted on March 30, 2009.

2.0 PROCESS DESCRIPTION

First American Scientific Corp's plant on South Fraser Way in Abbotsford is a "biomass" processing facility. Waste and/or raw material is processed in a grinding/drying process which results in the generation of a fine, dry powder, which is used for "green" fuel or fertilizer applications.

Dust laden flue gases generated in the grinder/dryer are cleaned by particle knock-out and a cyclone which discharges the flue gas via a 12 inch exhaust duct.

There is no pollution control device currently in use, other than the mechanical separator (cyclone).

3.0 METHODOLOGY

The sampling and analytical methods used throughout this survey conform to the procedures outlined in the B.C. "Source Testing Code" 1995 Edition, and the B.C. air analytical manual.

3.1 Sampling Techniques

Samples from the stack were collected from 1 port a Napp sample train (Fig. 1) equipped with a heated three foot stainless steel probe and heated filter assembly. The sample ports were greater than eight diameters downstream and 2.8 diameters upstream of the nearest disturbances. From this criteria a 12 point, 2 traverse sampling regime was established for the woodwaste particulate tests, and a 6 point, 1 traverse sampling regime was established for the de-inking sludge tests. Each point (equal area method) was sampled for 5 minutes resulting in the final sample volumes of about 1.4 standard cubic meters for the woodwaste tests and 0.54 cubic meters for the de-inking sludge.

Velocities were measured with an S-type pitot tube and oil manometer. The probe and connecting glassware were brushed and rinsed with distilled water and acetone into a glass sample bottle after sample completion. Flue gas analysis (O_2 and CO_2) were conducted with the CEM system used for CO and organics. Cyclonic flow was not present in the stack as shown by previous flow angle data.

CEM System for Organics

Continuous emission monitoring (CEM) was conducted for Organics (THC) using the A. Lanfranco and Associates Inc. CEM monitoring mobile laboratory. This unit is a one ton trailer with the following instrumentation:

THC CA Model 300H FID THC Analyzer with ranges from 1 - 100000 ppm as methane.

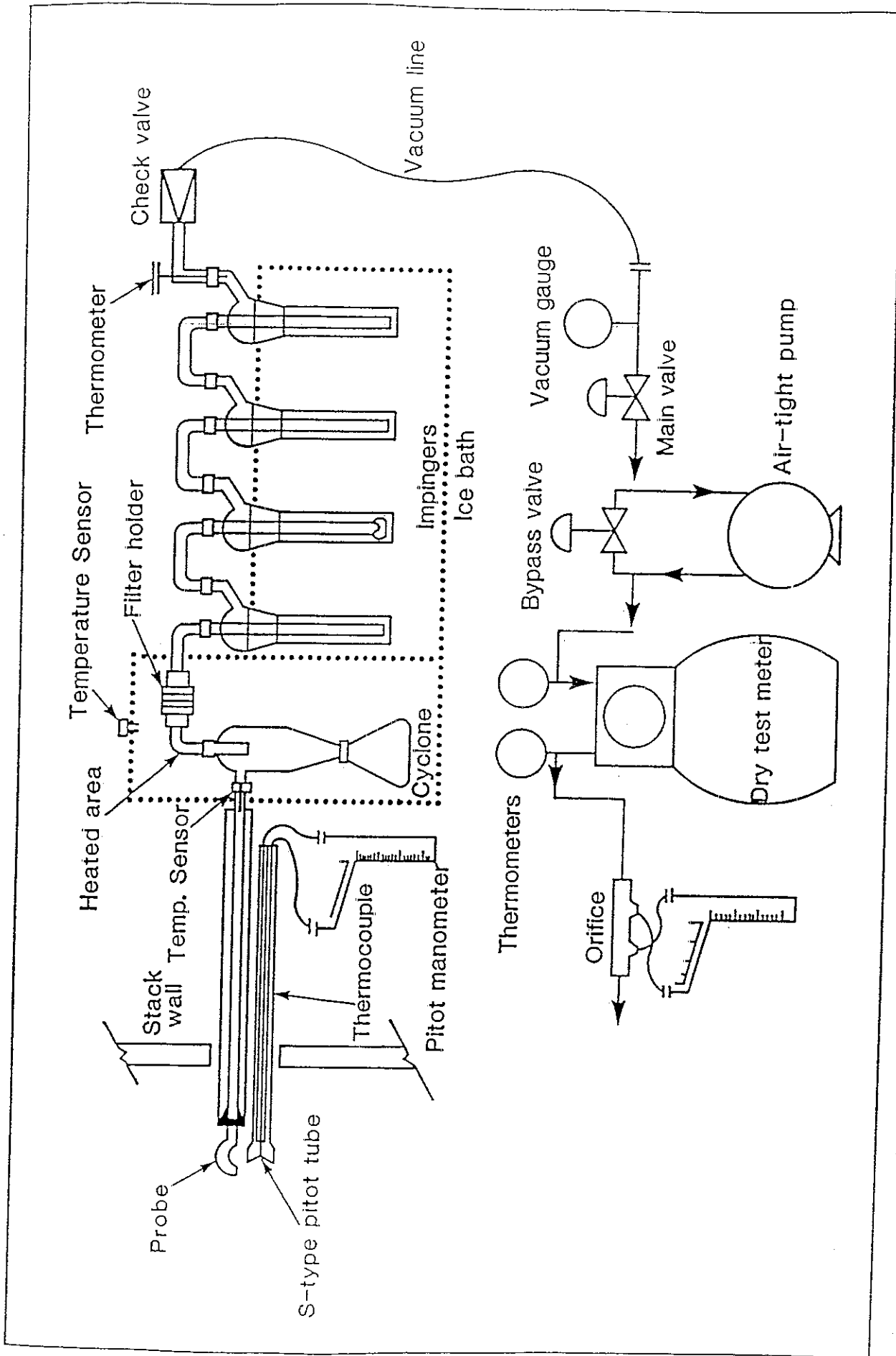


Figure 1 Particulate Sampling Train

A diagram of the sampling, conditioning and analyzer system is provided in Figure 2. With this system, the stack gas is withdrawn from the source through a coarse filter and stainless steel probe with associated pumps, filters and heated sampling lines. The THC analyzer withdrew a sidestream of the filtered gas for hot FID analysis

Prior to the compliance testing and between each test, all measuring instrumentation was calibrated with Protocol 1 and NIST Traceable 1% certified calibration gas standards. Calibration gas certificates are appended.

3.2 Analytical Techniques

Gravimetric analysis of the particulate samples was conducted by A. Lanfranco and Associates Inc. at their Surrey laboratory. The filters were conditioned by 105°C drying, desiccation for 24 hours, and weighing of the particulate. Probe washings were evaporated to dryness in pyrex beakers, desiccated for 24 hours and weighed.

CEM Calibration Sequences

All calibrations for this survey were conducted by challenging the analyzers with calibration gas introduced at the probe end of the system. This provided a QA/QC check on system bias and showed the integrity of the overall sampling/conditioning system. The initial and between test calibrations consisted of a check of zero and span drift, followed by calibration with a zero and at least two span gases. Span gases utilized were selected as those which most closely approximated the anticipated pollutant/diluent concentrations.

CEM data was collected by a data acquisition system by comparing stack gas responses to calibration gas responses.

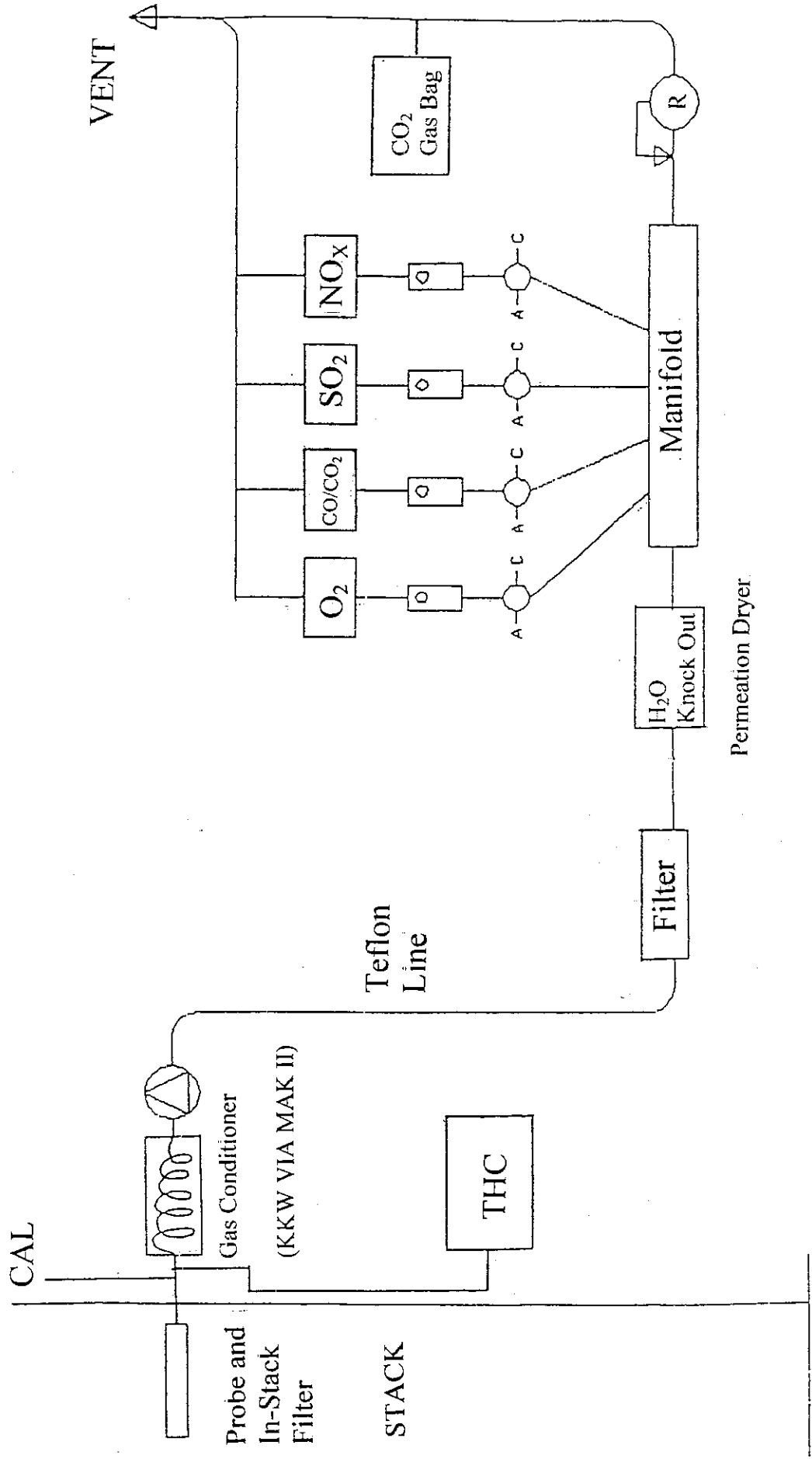


Figure 2

CONTINUOUS GAS SCHEMATIC

Calibration gas mixtures used were:

Cylinder No.	THC (ppm)
Zero Gas	0
Low Methane*	40.3
Hi Methane*	92.1
Ambient Air	-

* EPA Protocol Gas

4.0 RESULTS

The results of the particulate and stack parameters were calculated using a computer program consistent with reporting requirements of the GVRD and MWLAP. Standard conditions used were 20°C and 101.3 kPa (dry)

Detailed test results are presented in Tables 1 and 2. Supporting data is presented in Tables 3, 4 and the Appendices.

CEM minutely averages are presented in Appendix 1.

TABLE 1 WOODWASTE EMISSION RESULTS

Parameter	Test 1	Test 2	Average
Test Date	March 30/09	March 30/09	
Test Time	10:10 - 11:10	13:50 - 14:50	
Duration (minutes)	60	60	60
Particulate (mg/Sm ³)	121	513	317
Particulate (kg/hr)	0.1	0.6	0.4
Particulate(kg/day)	3.5	14.8	9.2
THC(mg/Sm ³)	113	247	180
Flowrate (Sm ³ /min)	20.4	20.0	20.2
Flowrate(acm/min)	25.9	26.5	26.2
Temperature (°C)	61.9	68.8	65.3
O ₂ (vol % dry)	21.0	21.0	21.0
CO ₂ (vol % dry)	0.0	0.0	0.0
H ₂ O (vol %)	10.4	12.2	11.3
Isokinetic Variation (%)	97.7	101.2	99.4

standard conditions of 20 deg C and
101.3kPa

TABLE 2 DE:INKING SLUDGE EMISSION RESULTS

Parameter	Test 1	Test 2	Average
Test Date	March 30/09	March 30/09	
Test Time	15:20 - 15:50	16:10 - 16:40	
Duration (minutes)	30	30	30
Particulate (mg/Sm ³)	1348	36.1	692
Particulate (Kg/hr)	1.6	0.05	0.8
Particulate(Kg/day)	38.7	1.1	19.9
THC(mg/Sm ³)	53	48	51
Flowrate (Sm ³ /min)	19.9	21.1	20.5
Flowrate(acm/min)	27.1	27.7	27.4
Temperature (°C)	76.3	58.3	67.3
O ₂ (vol % dry)	21.0	21.0	21.0
CO ₂ (vol % dry)	0.0	0.0	0.0
H ₂ O (vol %)	12.8	14.2	13.5
Isokinetic Variation (%)	101.4	105.3	103.4

standard conditions of 20 deg C and
101.3kPa

TABLE 3 GRAVIMETRIC RESULTS

	Filter Particulate (mg)	Probe and Washings Particulate (mg)	Total Particulate (mg)
WOODWASTE			
Test 1	166.1	8.6	174.7
Test 2	742.8	11.5	754.3
DE-INKING SLUDGE			
Test 1	1060.5	29.3	1089.8
Test 2	24.6	7.5	32.1

TABLE 4 PROCESS OPERATING CONDITIONS

Test	Waste Type	Process Rate (lb/hr)	Waste H ₂ O (%)	Production Rate (lb/hr)	Product H ₂ O (%)
1	Wood	437	35	294	4.0
2	Wood	655	28	483	6.5
1	DeInk Sludge	380	46	218	6.0
2	DeInk Sludge	734	46	501	18

5.0 DISCUSSION OF RESULTS

Variable particulate emission results were determined during the woodwaste and deinking sludge operating modes. Particulate emissions during the deinking sludge processing was very high during Test 1 (1348 mg/Sm³), but reduced to only about 36 mg/Sm³ during Test 2. THC was somewhat variable during woodwaste tests, but was very similar (and lower) for the deinking sludge tests.

No problems were encountered in sample collection or analysis and the process operated in a steady manner during the stack survey. All particulate samples were collected isokinetically and all measuring instrumentation was operated within the calibrated ranges.

The testing was conducted by certified field personnel.

The results are therefore reported with confidence, and are considered to be an accurate representation of emission characteristics for the process conditions maintained on the test date.

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	RESULT	
	RUN 1	RUN 2

Particulate (mg/Sm ³)	1348	36.1
THC (mg/Sm ³)	53	48
Flowrate (Sm ³ /min)	19.9	21.1
Temperature (°C)	76.3	58.3

THC = total hydrocarbons

All results are at standard conditions of 20°C and 101.3 KPa (dry)

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The results of the particulate and stack parameters were calculated using a computer program consistent with reporting requirements of the GVRD and MWLAP. Standard conditions used were 20°C and 101.3 kPa (dry)

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CEM minutely averages are presented in Appendix 1.

TABLE 2 DE-INKING SLUDGE EMISSION RESULTS

Parameter	Test 1	Test 2	Average
Test Date	March 30/09	March 30/09	
Test Time	15:20 - 15:50	16:10 - 16:40	
Duration (minutes)	30	30	30
Particulate (mg/Sm ³)	1348	36.1	692
Particulate (Kg/hr)	1.6	0.05	0.8
Particulate(Kg/day)	38.7	1.1	19.9
IHC(mg/Sm ³)	53	48	51
Flowrate (Sm ³ /min)	19.9	21.1	20.5
Flowrate(acm/min)	27.1	27.7	27.4
Temperature (°C)	76.3	58.3	67.3
O ₂ (vol % dry)	21.0	21.0	21.0
CO ₂ (vol % dry)	0.0	0.0	0.0
H ₂ O (vol %)	12.8	14.2	13.5
Isokinetic Variation (%)	101.4	105.3	103.4

standard conditions of 20 deg C and
101.3kPa

TABLE 3 GRAVIMETRIC RESULTS

	Filter Particulate (mg)	Probe and Washings Particulate (mg)	Total Particulate (mg)
DE-INKING SLUDGE			
Test 1	1060.5	29.3	1089.8
Test 2	24.6	7.5	32.1

TABLE 4 PROCESS OPERATING CONDITIONS

Test	Waste Type	Process Rate (lb/hr)	Waste H ₂ O (%)	Production Rate (lb/hr)	Product H ₂ O (%)
1	DeInk Sludge	380	46	218	6.0
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Variable particulate emission results were determined during the deinking sludge operating mode. Particulate emissions during the deinking sludge processing was very high during Test 1 (1348 mg/Sm³), but reduced to only about 36 mg/Sm³ during Test 2. IHC was somewhat variable but was lower for the second of the deinking sludge tests.

No problems were encountered in sample collection or analysis. All particulate samples were collected isokinetically and all measuring instrumentation was operated within the calibrated ranges.

The testing was conducted by certified field personnel.

The results are therefore reported with confidence, and are considered to be an accurate representation of emission characteristics for the process conditions maintained on the test date.

APPENDIX 1

**CEM MINUTELY AVERAGES AND COMPUTER
OUTPUTS OF MEASURED
AND CALCULATED DATA**

Client: FASC
Jobsite: Abbotsford Plant
Source: Exhaust Duct

Date: March 30/09
Run: 1 - DE:Inking Sludge
Run Time: 15:20 - 15:50

Particulate Concentration: 1347.7 mg/dscm 0.5889 gr/dscf
 989.0 mg/Acm 0.4322 gr/Acf

Emission Rate: 1.61 Kg/hr 3.552 lb/hr

Sample Gas Volume: 0.8087 dscm 28.558 dscf
Total Sample Time: 30.0 minutes

Average Isokineticity: 101.4 %

Flue Gas Characteristics

Moisture: 12.81 %

Temperature 76.3 oC 169.3 oF

Flow 19.9 dscm/min 704 dscf/min
 0.33 dscm/sec 11.7 dscf/sec
 27.1 Acm/min 959 Acf/min

Velocity 6.201 m/sec 20.35 f/sec

Gas Analysis 21.00 % O₂ 0.00 % CO₂

28.840 Mol Wt (g/gmole) Dry 27.452 Mol Wt (g/gmole) Wet

*** Standard Conditions:** Metric: 20 deg C, 101.325 kPa
 Imperial: 68 deg F, 29.92 in Hg

Client: FASC
Jobsite: Abbotsford Plant
Source: Exhaust Duct

Date: March 30/09
Run: 1 - DE:Inking Sludge
Run Time: 15:20 - 15:50

Control Unit (Y) 1.0055
Nozzle Diameter (in.) 0.4383
Pitot Factor 0.8408
Baro. Press. (in. Hg) 30.00
Static Press. (in. H₂O) 0.25
Stack Height (ft) 5.0
Stack Diameter (in.) 12.0
Stack Area (sq. ft.) 0.785
Minutes Per Reading 5.0
Minutes Per Point 5.0

Gas Analysis (Vol. %):

	CO ₂	O ₂
	0.00	21.00
	0.00	21.00
	0.00	21.00
Average =	0.00	21.00

Condensate Collection:

Impinger 1 (grams)	62.0
Impinger 2 (grams)	16.0
Impinger 3 (grams)	2.0
Impinger 4 (grams)	9.1

Total Gain (grams) 89.1

Collection:

Filter (grams)	1.0605
Washings (grams)	0.0293
Impinger (grams)	0.0000
Total (grams)	1.0898

Traverse	Point	Time (min.)	Dry Gas Meter (ft ³)	Pitot ^P (in. H ₂ O)	Orifice ^H (in. H ₂ O)	Dry Gas Temperature		Stack (oF)	Wall Dist. (in.)	Isokin (%)
						Inlet (oF)	Outlet (oF)			
		0.0	279.200							
1	1	5.0	284.060	0.110	3.00	73	68	176	0.5	102.8
	2	10.0	288.950	0.110	3.00	77	73	172	1.8	102.2
	3	15.0	293.850	0.110	3.00	80	75	174	3.6	102.1
	4	20.0	298.500	0.100	2.70	82	75	169	8.4	101.0
	5	25.0	303.150	0.100	2.70	84	75	165	10.2	100.5
	6	30.0	307.800	0.100	2.70	85	75	160	11.5	100.0
			Average:	0.105	2.850	80.2	73.5	169.3		101.4

Client: FASC
Jobsite: Abbotsford Plant
Source: Exhaust Duct

Date: March 30/09
Run: 2 - DE:Inking Sludge
Run Time: 16:10 - 16:40

Particulate Concentration: **36.1 mg/dscm** 0.0158 g/dscf
 27.5 mg/Acm 0.0120 g/Acf

Emission Rate: 0.05 Kg/hr 0.101 lb/hr

Sample Gas Volume: 0.8899 dscm 31.427 dscf
Total Sample Time: 30.0 minutes

Average Isokineticity: 105.3 %

Flue Gas Characteristics

Moisture: 14.22 %

Temperature 58.3 oC 137.0 oF

Flow 21.1 dscm/min 746 dscf/min
 0.35 dscm/sec 12.4 dscf/sec
 27.7 Acm/min 980 Acf/min

Velocity 6.339 m/sec 20.80 f/sec

Gas Analysis 21.00 % O₂ 0.00 % CO₂

28.840 Mol Wt (g/gmole) Dry 27.298 Mol Wt (g/gmole) Wet

*** Standard Conditions:** Metric: 20 deg C, 101.325 kPa
 Imperial: 68 deg F, 29.92 in Hg

Client: FASC
Jobsite: Abbotsford Plant
Source: Exhaust Duct

Date: March 30/09
Run: 2 - DE:Inking Sludge
Run Time: 16:10 - 16:40

Control Unit (Y) 1 0055
Nozzle Diameter (in.) 0 4383
Pitot Factor 0 8408
Baro. Press. (in. Hg) 30 00
Static Press. (in. H2O) 0 25
Stack Height (ft) 5 0
Stack Diameter (in.) 12 0
Stack Area (sq ft.) 0 785
Minutes Per Reading 5 0
Minutes Per Point 5 0

Gas Analysis (Vol. %):

	CO2	O2
	0.00	21.00
	0.00	21.00
	0.00	21.00
Average =	0.00	21.00

Condensate Collection:

Impinger 1 (grams)	76 0
Impinger 2 (grams)	24 0
Impinger 3 (grams)	2 0
Impinger 4 (grams)	8 7

Total Gain (grams) 110.7

Collection:

Filter (grams)	0.0246
Washings (grams)	0.0075
Impinger (grams)	0.0000
Total (grams)	0.0321

Traverse	Point	Time (min.)	Dry Gas Meter (ft3)	Pitot ^P (in. H2O)	Orifice ^H (in. H2O)	Dry Gas Temperature		Stack (oF)	Wall Dist. (in.)	Isokin (%)
						Inlet (oF)	Outlet (oF)			
		0 0	308.130							
1	1	5.0	313.520	0.120	3.35	80	72	140	0.5	106.4
	2	10.0	318.870	0.120	3.35	83	76	139	1.8	104.9
	3	15.0	324.250	0.120	3.35	85	77	138	3.6	105.1
	4	20.0	329.420	0.110	3.10	86	77	136	8.4	105.1
	5	25.0	334.590	0.110	3.10	86	77	135	10.2	105.0
	6	30.0	339.770	0.110	3.10	87	76	134	11.5	105.2
			Average:	0.115	3.225	84.5	75.8	137.0		105.3

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METLab CEM Report

Client: FASC Moisture % =
Source: Exhaust Duct 12.81
Run: Sludge - 1

Year:	2009	
Date	Time	THC (ppm as CH4)
30-Mar	1521	31.1
30-Mar	1522	44.6
30-Mar	1523	54.8
30-Mar	1524	60.4
30-Mar	1525	60.6
30-Mar	1526	64.8
30-Mar	1527	67.3
30-Mar	1528	69.4
30-Mar	1529	72.6
30-Mar	1530	73.7
30-Mar	1531	74.7
30-Mar	1532	73.6
30-Mar	1533	76.6
30-Mar	1534	80.0
30-Mar	1535	79.7
30-Mar	1536	80.7
30-Mar	1537	77.7
30-Mar	1538	75.6
30-Mar	1539	81.8
30-Mar	1540	82.8
30-Mar	1541	74.6
30-Mar	1542	72.5
30-Mar	1543	69.4
30-Mar	1544	66.3
30-Mar	1545	68.4
30-Mar	1546	68.4
30-Mar	1547	65.7
30-Mar	1548	69.6
30-Mar	1549	71.5
30-Mar	1550	74.6
Average		69.4
Minimum		31.1
Maximum		82.8
Mass Concentration (mg/m3 dry)		53.2

Calibration Summary	
Gas (Cert. Value)	92.1
Initial Gas Check	91.4
Final Gas Check	94.6
Initial Zero Drift	2.5
Final Zero Drift	5.0

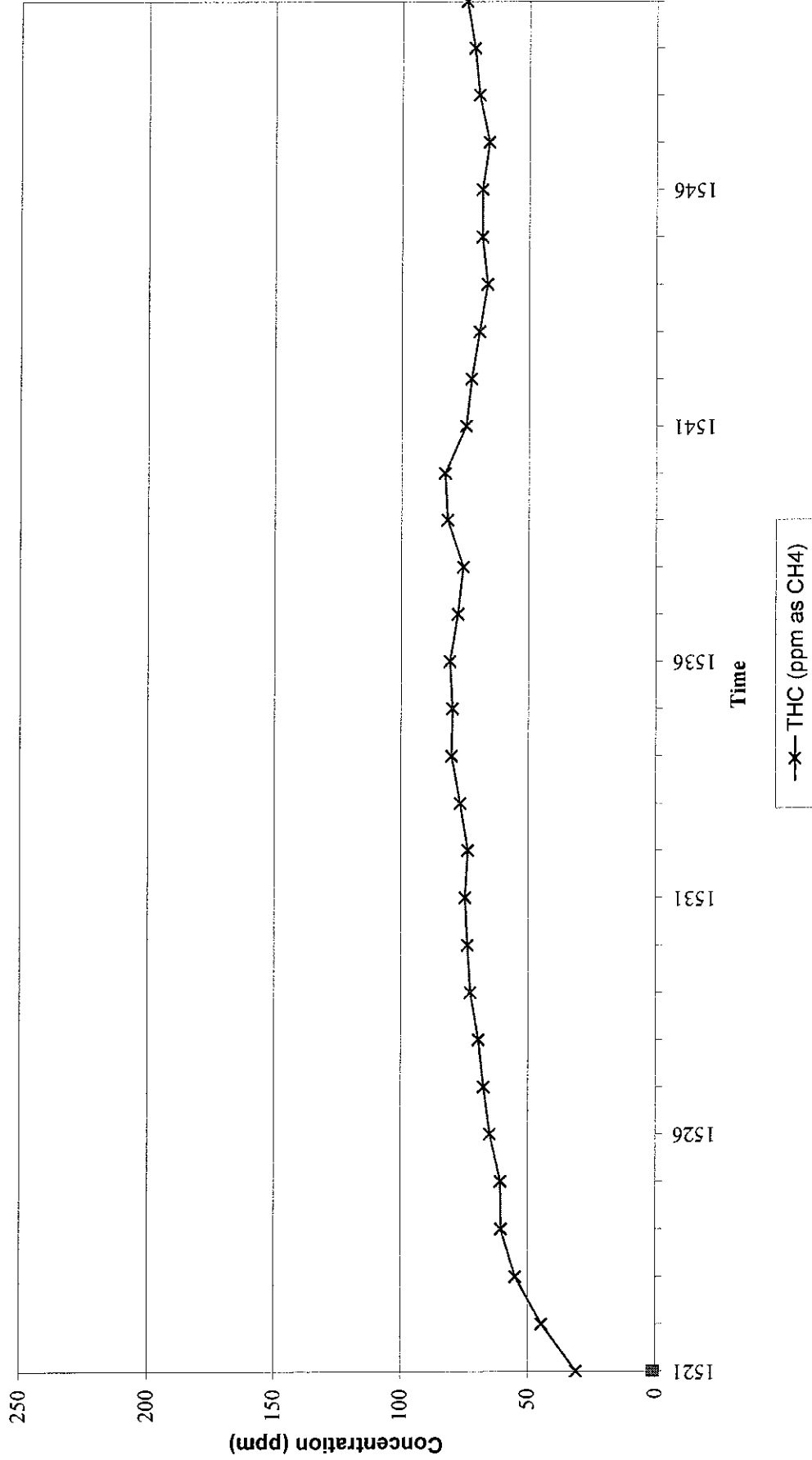
A. Lanfranco and Associates Inc.
METLab CEM Report

Client: FASC Moisture % =
Source: Exhaust Duct 14.20
Run: Sludge - 2

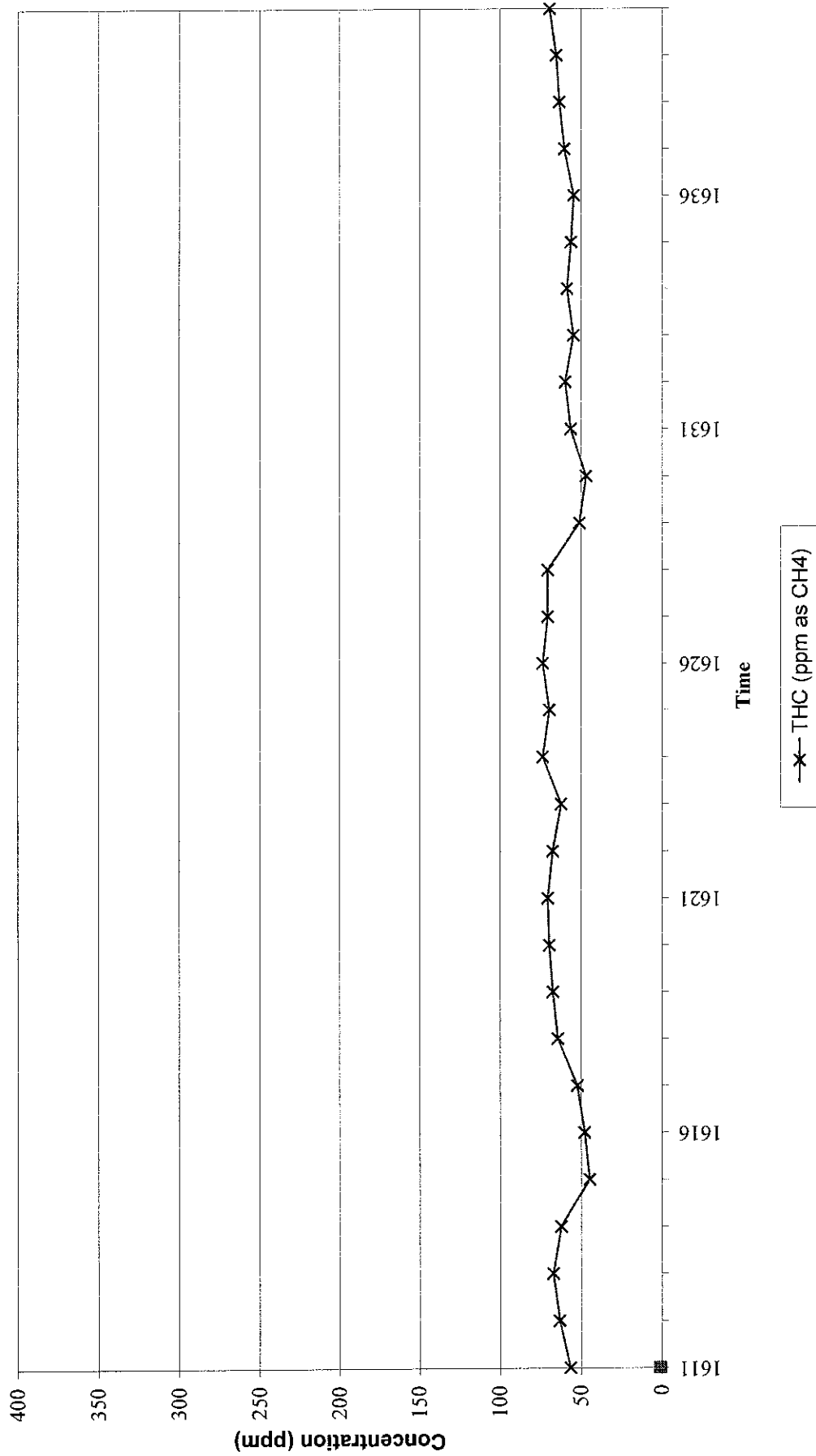
Year:	2009	
Date	Time	THC (ppm as CH4)
30-Mar	1611	56.4
30-Mar	1612	63.2
30-Mar	1613	67.0
30-Mar	1614	62.3
30-Mar	1615	44.8
30-Mar	1616	47.9
30-Mar	1617	52.1
30-Mar	1618	64.4
30-Mar	1619	67.4
30-Mar	1620	69.5
30-Mar	1621	70.5
30-Mar	1622	67.4
30-Mar	1623	62.3
30-Mar	1624	73.6
30-Mar	1625	69.5
30-Mar	1626	73.6
30-Mar	1627	70.5
30-Mar	1628	70.5
30-Mar	1629	51.0
30-Mar	1630	46.8
30-Mar	1631	56.1
30-Mar	1632	59.7
30-Mar	1633	54.5
30-Mar	1634	58.5
30-Mar	1635	56.1
30-Mar	1636	54.5
30-Mar	1637	60.2
30-Mar	1638	63.3
30-Mar	1639	65.4
30-Mar	1640	69.3
Average		61.6
Minimum		44.8
Maximum		73.6
Mass Concentration (mg/m3 dry)		47.9

Calibration Summary	
Gas (Cert. Value)	92.1
Initial Gas Check	94.6
Final Gas Check	95.3
Initial Zero Drift	5.0
Final Zero Drift	6.0

Exhaust Duct - Run 1 De-inking Sludge (March 30, 2009)
First American Scientific Corp.
METLab CEM Results



Exhaust Duct - Run 2 De-inking Sludge (March 30, 2009)
First American Scientific Corp.
METLab CEM Results



APPENDIX 2

FORMULAE AND NOMENCLATURE

FORMULAE

1. $W_p = W_f + W_w$
2. $P_m = P_b + \frac{\Delta H}{13.6}$
3. $P_s = P_b + \frac{\Delta P_s}{13.6}$
4. $V_{m_{std}} = \frac{V_m P_m}{T_m} * \frac{I_{std}}{P_{std}}$
5. $mg/dscm = \frac{W_p}{V_{m_{std}}} / 35.315$ $mg/dscm @ 12\% CO_2 = Mg/dscm * \frac{12}{\%CO_2}$
 $mg/dscm @ 11\% O_2 = Mg/dscm * \frac{9.9}{(20.9 - O_2)}$
6. $V_s = 85.49 * C_p (avg \Delta P) * \frac{I_s}{M_s * P_s}$
7. $M_d = 0.44(\%CO_2) + 0.32(\%O_2) + 0.28(CO + N_2)$
8. $M_s = M_d * \frac{100 - \%H_2O}{100} + 0.18(\%H_2O)$
9. $V_{tot} = V_{m_{std}} + V_{c_{std}}$
10. $\% H_2O = \frac{V_{c_{std}} * 100}{V_{tot}}$
11. $V_{c_{std}} = V_c * 0.0473$
12. $Q_a = V_s * 60 * A_s$
13. $Q_{std} = Q_a * \frac{T_{std}}{T_s} * \frac{P_s}{P_{std}} * \frac{1 - \%H_2O}{100}$
14. $I = \frac{1.667 * I_s * (0.00267 * V_c + V_m P_m / I_m)}{\sum * V_s * P_s * A_n}$

NOMENCLATURE

Wf	= weight of particulate on filter (grams)
Ww	= weight of particulate in washings (grams)
Wp	= total weight of particulate (grams)
Vm	= gas meter sample volume (ft ³)
V _{mstd}	= gas meter sample volume @ standard conditions (ft ³)
Pb	= barometric pressure (mm Hg or inches of Hg)
ΔPs	= stack static pressure (inches of H ₂ O)
Pm	= meter pressure (mm Hg or inches of Hg)
ΔH	= orifice differential pressure (inches of H ₂ O)
Σ	= sampling time total (min.)
Tm	= meter temperature (°R)
Tstd	= 528 °R
P std	= 760 mm Hg or 29.92 inches of Hg
Vs	= average stack gas velocity (ft / sec.)
Cp	= pitot correction factor (dimensionless)
(avg. ΔP)	= average velocity pressure (inches of H ₂ O)
Md	= molecular weight dry (lb/lb mole)
Ms	= molecular weight wet (lb/lb mole)
% H ₂ O	= percent water vapour
Vc	= volume of condensate collected (mL)
V _{cstd}	= standard volume of moisture (ft ³)
I	= overall isokinetic variation (%)
Qa	= volumetric flowrate at stack conditions (ft ³ / min.)
An	= sample nozzle area (ft ²)
Qstd	= volumetric flowrate at standard conditions (standard ft ³ / min.)

APPENDIX 3

FIELD DATA SHEETS and

PROCESS INFORMATION

CEM FIELD DATA SHEET

① ml

Plant : FASC - Abbotsford Technician : ML
 Source : _____ Ambient Temp °C : _____
 Date : Mar 30/09 Bar. Pressure in Hg : _____

Cylinder Gas Pressure (psi)

1 Gas	2 Gas	3 Gas	4 Gas	5 Gas	N ₂	O ₂	H ₂	Comb Air	Low Prop	Mid Prop	High Prop

Certified Gas Value (ppm)

CEM Readings

Time	Source	O ₂	CO ₂	CO	THC	SO ₂	NO _x	Response Time (sec)	
	N ₂				1.07			NO _x up	
	92.1				94.1			NO _x dn	
	40.3				41.5			O ₂ up	
	N ₂				1.04			O ₂ dn	
								CO up	
* Test 1	Station clock 1 hr behind								CO dn
	10:15 - 11:15							CO ₂ up	
	(eq: 15 - 10:15)				Fascwood 1.DAT			CO ₂ dn	
								SO ₂ up	
	N ₂				3.81			SO ₂ dn	
	92.1				91.3			THC up	
								THC dn	
Test 2	13:50 - 14:50								
					fascwood 2.DAT				
	N ₂				6.5				
	92.1				89				

APPENDIX 4

CALIBRATION DATA

S - TYPE PITOT CALIBRATION FORM

Date: Jan-08-09
 Technician: Jordan Lang
 Pitot I D : A.L. 3C
 Nozzle I D : 0 250

Approx. Wind Vel.	Pitot Vel. Pressure		S-Type Pitot Vel. Press.		Pitot Coefficient
	Ft/sec.	Δ Pref.	Cref. SQRT(Δ Pref.)	Δ Ps	
10.00	0.070	0.26193	0.100	0.31623	0.83670
20.00	0.350	0.58569	0.500	0.70711	0.84630
30.00	0.420	0.64159	0.720	0.84853	0.84680
40.00	0.750	0.85737	1.010	1.00499	0.83320

AVERAGE Cp = 0.8408

Calibration Equation: $C_p = C_{ref} \cdot \text{SQRT}(\Delta P_{ref} / \Delta P_s)$

$C_{ref} = 0.99$

Where:

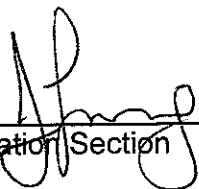
ΔP_{ref} = velocity pressure measured by reference pitot

C_{ref} = coefficient of reference pitot

ΔP_s = velocity pressure measured by S - type pitot

C_p = coefficient of S - type pitot

AUTHORIZATION



 Calibration Section

Model #: N-31
 Serial #: D-945-c

Date: Nov. 14 2008
 Barometric Pressure: 30.31 (in. Hg)
 Theoretical Critical Vacuum: 14.30 (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)²(min).
 !!!!!!!!

***** DRY GAS METER READINGS *****										***** CRITICAL ORIFICE READINGS *****									
dh (in H2O)	Time (min)	Volume (cu ft)		Initial Temps. (deg F)		Final Temps. (deg F)		Orifice Serial# (number)	K' Orifice Coefficient (see above)	Actual Vacuum (in Hg)	-- Ambient Temperature -- (deg F)		Average (deg F)	K _o (value)					
		Initial	Final	Inlet	Outlet	Inlet	Outlet				Initial	Final							
0.29	15.00	482.300	487.049	67.0	64.0	73.0	67.0	40	0.2408	21.0	59.0	60.0	59.5	0.764					
0.61	15.00	475.495	482.300	63.0	61.0	70.0	63.0	48	0.3560	18.0	59.0	60.0	59.5	0.758					
1.18	15.00	464.700	473.855	65.0	61.0	68.0	66.0	55	0.4606	16.0	54.0	60.0	57.0	0.732					
1.92	15.00	487.049	498.638	75.0	68.0	80.0	70.0	63	0.5956	14.0	59.0	60.0	59.5	0.724					

***** RESULTS *****										
--- DRY GAS METER ---					----- ORIFICE -----					
VOLUME CORRECTED Vm(std) (cu ft)	VOLUME CORRECTED Vc(std) (cu ft)	VOLUME CORRECTED Vc(std) (liters)	VOLUME NOMINAL Vcr (cu ft)	VOLUME CORRECTED Y (number)	VARIATION (number)	Value (in H2O)	Value (mm H2O)	VARIATION (in H2O)	K _o (value)	
4.815	136.4	4.803	4.667	0.998	-0.008	1.619	41.13	-0.063	0.764	
6.951	196.8	7.101	6.900	1.022	0.016	1.569	39.85	-0.113	0.758	
9.350	264.8	9.210	8.906	0.985	-0.021	1.799	45.69	0.117	0.732	
11.674	330.6	11.881	11.544	1.018	0.012	1.741	44.21	0.059	0.724	
Average Y -----> 1.0055					Average dh@ -----> 1.68					Average K _o -----> 0.745

TEMPERATURE CALIBRATION			
Reference Temperature Set-Point (deg F)	Temperature Device Reading (deg F)	Variation (deg F)	Results Percent of Absolute
32	29	-3	-0.61%
100	96	-4	-0.71%
500	492	-8	-0.83%
800	795	-5	-0.40%
1700	1685	-15	-0.69%

Calibration Standard -----> Omega Model CL23A S/N:T-218768

Note: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is +0.02.
 For Orifice Calibration Factor dh@, the orifice differential pressure in inches of H2O that equates to 0.75 cfm of air at 68 F and 29.92 inches of Hg, acceptable tolerance of individual values from the average is +0.2.
 For Temperature Devices, the reading must be within 1.5% of certified calibration standard (absolute temperature) to be acceptable.

SIGNED:  Date: Nov. 14, 2008

A. LANFRANCO and ASSOCIATES INC.

ENVIRONMENTAL CONSULTANTS

NOZZLE DIAMETER CALIBRATION FORM

Technician: J Lang
Date: Jan-08-09

Signature: 

Nozzle I.D.	d1	d2	d3	difference	average	average area
XXXX	0.1160	0.1160	0.1150	0.0010	0.1157	0.0000730
XXXIII	0.1210	0.1200	0.1210	0.0010	0.1207	0.0000794
XXXI	0.1340	0.1340	0.1340	0.0000	0.1340	0.0000979
# 2	0.1650	0.1650	0.1640	0.0010	0.1647	0.0001479
I	0.1780	0.1770	0.1760	0.0020	0.1770	0.0001709
# 3	0.1720	0.1720	0.1700	0.0020	0.1713	0.0001601
# 4	0.1840	0.1860	0.1850	0.0020	0.1850	0.0001867
III	0.1850	0.1830	0.1850	0.0020	0.1843	0.0001853
XXIX	0.1840	0.1840	0.1840	0.0000	0.1840	0.0001847
XXXI	0.1920	0.1910	0.1920	0.0010	0.1917	0.0002004
IV	0.2310	0.2300	0.2310	0.0010	0.2307	0.0002902
0.233	0.2240	0.2230	0.2250	0.0020	0.2240	0.0002737
XX	0.2540	0.2550	0.2530	0.0020	0.2540	0.0003519
V	0.2530	0.2530	0.2530	0.0000	0.2530	0.0003491
XXVIII	0.2580	0.2570	0.2580	0.0010	0.2577	0.0003621
VI	0.2730	0.2730	0.2750	0.0020	0.2737	0.0004085
0.269	0.2740	0.2730	0.2720	0.0020	0.2730	0.0004065
0.265	0.2690	0.2700	0.2710	0.0020	0.2700	0.0003976
277	0.2670	0.2680	0.2690	0.0020	0.2680	0.0003917
XXI *	0.2690	0.2680	0.2700	0.0020	0.2690	0.0003947
0.275	0.2750	0.2720	0.2720	0.0030	0.2730	0.0004065
VII	0.2800	0.2800	0.2810	0.0010	0.2803	0.0004286
0.280	0.2880	0.2880	0.2880	0.0000	0.2880	0.0004524
XXII *	0.3110	0.3100	0.3100	0.0010	0.3103	0.0005253
XIV	0.3050	0.3030	0.3030	0.0020	0.3037	0.0005029
SN	0.3020	0.2990	0.2990	0.0030	0.3000	0.0004909
0.284	0.3010	0.3020	0.3010	0.0010	0.3013	0.0004952
XXVII	0.3150	0.3160	0.3170	0.0020	0.3160	0.0005446
0.311	0.3020	0.3010	0.2990	0.0030	0.3007	0.0004931
XXXVII	0.3270	0.3290	0.3280	0.0020	0.3280	0.0005868
XXXVIII	0.3250	0.3270	0.3270	0.0020	0.3263	0.0005808
XXXVI	0.3270	0.3260	0.3260	0.0010	0.3263	0.0005808
XXVI	0.3280	0.3280	0.3280	0.0000	0.3280	0.0005868
X	0.3740	0.3730	0.3720	0.0020	0.3730	0.0007588
IX	0.3680	0.3680	0.3680	0.0000	0.3680	0.0007386
0.362	0.3980	0.3990	0.3990	0.0010	0.3987	0.0006669
0.278	0.4050	0.4060	0.4070	0.0020	0.4060	0.0008990
XI	0.4100	0.4090	0.4120	0.0030	0.4103	0.0009183
XII *	0.4180	0.4170	0.4180	0.0010	0.4177	0.0009515
XV	0.4390	0.4400	0.4400	0.0010	0.4397	0.0010543
XXIV	0.4340	0.4350	0.4330	0.0020	0.4340	0.0010273
XVI *	0.4330	0.4320	0.4310	0.0020	0.4320	0.0010179
XXV	0.4390	0.4380	0.4380	0.0010	0.4383	0.0010479
XXXIX	0.4920	0.4920	0.4910	0.0010	0.4917	0.0013185
XXIII	0.4970	0.4980	0.4990	0.0020	0.4980	0.0013527
XVII *	0.5620	0.5620	0.5630	0.0010	0.5623	0.0017247
XIII	0.6380	0.6400	0.6390	0.0020	0.6390	0.0022270

Where:

(a) D1, D2, D3 = three different nozzle diameters; each diameter must be measured to within (0.025mm) 0.001 in.

(b) Difference = maximum difference between any two diameters; must be less than or equal to (0.1mm) 0.004 in

(c) Average = average of D1, D2 and D3



Praxair
 5700 South Alameda Street
 Los Angeles, CA 90058
 Telephone: (323) 585-2154
 Facsimile: (323) 585-0582

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

CUSTOMER A IAN FRANCO

P.O NUMBER

REFERENCE STANDARD

COMPONENT	* NISI SRM NO.	CYLINDER NO.	CONCENTRATION
SULFUR DIOXIDE GMIS	vs SRM#1693	CC 19018	10.4 ppm
MEIHANE GMIS	vs SRM#2750	SA 20162	48.05 ppm

ANALYZER READINGS

R=REFERENCE STANDARD

Z=ZERO GAS

C=GAS CANDIDATE

1. COMPONENT	SULFUR DIOXIDE GMIS	ANALYZER MAKE-MODEL-S/N	ROSEMOUNT. 890129303600	10001F0
ANALYTICAL PRINCIPLE	ULTRAVIOLET ABSORPTION		LAST CALIBRATION DATE	08/02/07
FIRST ANALYSIS DATE	07/26/07		SECOND ANALYSIS DATE	08/03/07
Z 0	R 86.1	C 84.9	CONC. 10.2	Z 0
R 86.3	Z 0	C 84.2	CONC. 10.1	R 76.3
Z 0	C 84.0	R 86.2	CONC. 10.1	Z 0
U/M mV	MEAN TEST ASSAY	10.1	U/M mV	MEAN TEST ASSAY
2. COMPONENT	MEIHANE GMIS	ANALYZER MAKE-MODEL-S/N	HP 5890 SERIES II	S/N 3310A48533
ANALYTICAL PRINCIPLE	GC/ FLAME IONIZATION		LAST CALIBRATION DATE	07/02/07
FIRST ANALYSIS DATE	07/26/07		SECOND ANALYSIS DATE	
Z 0	R 1.9743	C 1.6557	CONC. 40.3	Z
R 1.9812	Z 0	C 1.6597	CONC. 40.2	R
Z 0	C 1.6604	R 1.9793	CONC. 40.3	Z
U/M AREA	MEAN TEST ASSAY	40.3	U/M AREA	MEAN TEST ASSAY

Values not valid below 150 psig.

THIS CYLINDER NO.	CC 199146	CERTIFIED CONCENTRATION	
HAS BEEN CERTIFIED ACCORDING TO SECTION	EPA-600/R97/121	SULFUR DIOXIDE (±2%)	10.1 ppm
OF TRACEABILITY PROTOCOL NO.	Rev 9/97	MEIHANE	40.3 ppm
PROCEDURE	G1	NITROGEN	BALANCE
CERTIFIED ACCURACY	± 1 % NISI TRACEABLE		
CYLINDER PRESSURE	2000 PSIG		
CERTIFICATION DATE	08/03/07		
EXPIRATION DATE	02/03/08	TERM	6 MONTHS

ANALYZED BY

PK
PHIL KIM

CERTIFIED BY

HS
HENRY KOUNG

IMPORTANT

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Praxair
 5700 South Alameda Street
 Los Angeles, CA 90058
 Telephone: (323) 585-2154
 Facsimile: (714) 542-6689

DocNumber: 00000005328

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

Customer & Order Information:

A LAN FRANCO

Praxair Order Number 06719932-00
 Customer P O Number
 Customer Reference Number PD999

Fill Date:
 Part Number: NI MER2E-AS
 Lot Number 109818303
 Cylinder Style & Outlet: AS 350
 Cylinder Pressure & Volume: 2000 psi 140 cu ft

Certified Concentration:

Expiration Date:	7/10/2011	Analytical Uncertainty:
Cylinder Number:	SA 5445	
92.1 ppm METHANE		± 1 %
Balance NITROGEN		

NOx ppm = N/A NOx Values for Reference Only

Certification Information: Certification Date 7/10/2008 Term 36 Months Expiration Date 7/10/2011

This cylinder was certified according to the 1997 EPA Traceability Protocol, Document #EPA-600/R-97/121 using Procedure G1
 Do Not Use this Standard if Pressure is less than 150 PSIG

Analytical Data:

(R=Reference Standard, Z=Zero Gas, C=Gas Candidate)

1 Component: METHANE

Requested Concentration: 93 ppm
 Certified Concentration: 92.1 ppm
 Instrument Used: HORIBA, FIA-510, 851135122
 Analytical Method: Flame Ionization Detector
 Last Multipoint Calibration: 6/19/2008

Reference Standard Type: GMS
 Ref Std Cylinder #: CC 115659
 Ref Std Conc: 101 ppm
 Ref Std Traceable to SRM #: vs. 2751
 SRM Sample #: 212-09-AL
 SRM Cylinder #: SX-20000

First Analysis Data:		Date: 7/10/2008	
Z: 0	R: 101	C: 92.1	Conc: 92.1
R: 101	Z: 0	C: 92.1	Conc: 92.1
Z: 0	C: 92.1	R: 101	Conc: 92.1
UOM: PPM	Mean Test Assay:		92.1 PPM

Second Analysis Data:		Date:	
Z: 0	R: 0	C: 0	Conc: 0
R: 0	Z: 0	C: 0	Conc: 0
Z: 0	C: 0	R: 0	Conc: 0
UOM: PPM	Mean Test Assay:		0 PPM

Analyzed by:

Peter Su

Certified by:

Helena Tran

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CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

CUSTOMER A LAN FRANCO

P.O NUMBER

REFERENCE STANDARD

COMPONENTI
 MEIHANE GMIS

NISI SRM NO.
 vs. SRM#2751

CYLINDER NO.
 SA 20217

CONCENTRATION
 96.7 ppm

ANALYZER READINGS

R=REFERENCE STANDARD

Z=ZERO GAS

C=GAS CANDIDATE

I COMPONENTI	MEIHANE GMIS	ANALYZER MAKE-MODEL-S/N	HORIBA, FID-510. 851135122
ANALYTICAL PRINCIPLE	Flame Ionization Detector	LAST CALIBRATION DATE	07/02/07
FIRST ANALYSIS DATE	07/26/07	SECOND ANALYSIS DATE	
Z 0	R 96.7	C 93.5	CONC 93.5
R 96.7	Z 0	C 93.5	CONC 93.5
Z 0	C 93.5	R 96.7	CONC 93.5
U/M ppm	MEAN TEST ASSAY	93.5	U/M ppm


All values not valid below 150 psig.
 G2 ANALYSIS DONE @ 20 % DILUTION POINT SIEC INC. SGD-710C GAS DIVIDER
 ASSAY DATE & RESULT: 07/26/07, 468 ppm CH4/N2

THIS CYLINDER NO. CC 258409	CERTIFIED CONCENTRATION
HAS BEEN CERTIFIED ACCORDING TO SECTION OF TRACEABILITY PROTOCOL NO. REV 9/97	EPA-630/R97/121 MEIHANE 468 ppm
PROCEDURE G2 REV 08/25/99	NITROGEN BALANCE
CERTIFIED ACCURACY ± 2 % NIST TRACEABLE	
CYLINDER PRESSURE 2000 PSIG	
CERTIFICATION DATE 07/26/07	
EXPIRATION DATE 07/26/10 TERM 36 MONTHS	

ANALYZED BY


 ERIC YOUNG

CERTIFIED BY


 PABLO REYES

IMPORTANT

Information contained herein has been prepared at your request by qualified experts within Praxair Distribution, Inc. While we believe that the information is accurate within the limits of the analytical methods employed and is complete to the extent of the specific analyses performed, we make no warranty or representation as to the suitability of the use of the information for any particular purpose. The information is offered with the understanding that any use of the information is at the sole discretion and risk of the user. In no event shall liability of Praxair Distribution, Inc. arising out of the use of the information contained herein exceed the fee established for providing such information.

Mark Lanfranco

From: Peter Hausmanis [peter@fasc.net]
Sent: Friday, April 03, 2009 2:51 PM
To: Mark Lanfranco
Subject: RE: Test Parameters

Mark;

Here are the test parameters:

Test 1: Wood

Feed Rate: 437 lb/hr at 35% moisture content Production Rate: 294 lb/hr at 4% moisture content Water Removal: 142 lb/hr

Test 2: Wood

Feed Rate: 655 lb/hr at 28% moisture content Production Rate: 483 lb/hr at 6.5% moisture content Water Removal: 150 lb/hr

Test 3: De-Inking Sludge

Feed Rate: 380 lb/hr at 46% moisture content Production Rate: 218 lb/hr at 6% moisture content Water Removal: 162 lb/hr

Test 4: De-Inking Sludge

Feed Rate: 734 lb/hr at 46% moisture content Production Rate: 501 lb/hr at 18% moisture content Water Removal: 247 lb/hr

Peter Hausmanis
Senior Engineer
First American Scientific Corporation
7621 Vantage Way, Unit 26
Delta, BC, Canada V4G 1A6
Cell: 604 897 8743
Tel: 604 940 6220
Fax: 604 940 6221
Canada Country Code: 001
Website: www.fasc.net

-----Original Message-----

From: Mark Lanfranco [mailto:mark.lanfranco@alanfranco.com]
Sent: Thursday, March 26, 2009 11:18 AM
To: peter@fasc.net
Subject: RE: Test Parameters

Peter,

We will plan to arrive on site at 1pm. Setup should not take more than 1 hour. See you then.

-Mark

-----Original Message-----

From: Peter Hausmanis [mailto:peter@fasc.net]
Sent: Thursday, March 26, 2009 12:55 PM
To: Mark Lanfranco
Subject: RE: Test Parameters

Al

S.H.

2.62
20.90

60°
145°

Woodwaste

PLANT	FASC		IMPINGER	INITIAL	FINAL	TOTAL GAIN
RUN No	1 Woodwaste		VOLUMES	(mL)	(mL)	(mL)
LOCATION	Exhaust duct		Imp. # 1	100	192	82
DATE	March 30/09		Imp. # 2	100	128	26
OPERATOR			Imp. # 3	0	4	4
CONTROL UNIT	Y 1,0055		Imp. # 4	200		
BAROMETRIC PRESSURE, IN. Hg	30.00		Upstream Diameters			
ASSUMED MOISTURE, Bw/2%	12%		Downstream Diameters			

PROBE TIP DIAMETER, IN.	0.4177
PROBE LENGTH, FT / Cp	3-C 0.8908
FILTER NUMBER	H-6
STATIC PRESSURE, IN. H ₂ O	+0.25
STACK DIAMETER	12.0"
STACK HEIGHT	945-C
INITIAL LEAK TEST	0.008 15"
FINAL LEAK TEST	0.010 15"

Point	Clock Time	Dry Gas Meter Ft ³	Pitot IN. H ₂ O ΔP	Orifice ΔH IN. H ₂ O	Dry Gas Temp. °F		Pump Vac. IN. Hg Gauge	Temperature °F			Fvries		
					Inlet °F	Outlet °F		Box	Probe	Impinger Exit	Stack	CO ₂ Vol. %	O ₂ Vol. %
1	10:10	177.00	0.10	2.10	47	40	4	268	220	45	128	0.0	21.0
2		185.45	0.11	2.30	51	41	4	257	232	45	132		
3		189.60	0.10	2.10	58	42	4	251	236	45	141		
4		193.35	0.10	2.10	64	48	5	269	245	45	146		
5		197.70	0.09	1.85	69	50	5	272	239	45	144		
6	10:40	201.40	0.08	1.67	71	52	5	257	241	45	159		
1	10:40	205.75	0.11	2.31	70	50	5	269	245	45	146		
2		210.09	0.11	2.31	78	54	5	272	239	45	144		
3		214.44	0.11	2.31	79	55	5	257	241	45	159		
4		218.55	0.10	2.10	86	67	5	257	241	45	159		
5		222.66	0.10	2.10	87	67	5						
6	11:10	226.80	0.10	2.10	88	67	5						

2.73 90°
22.65 160°

PLANT	FASC	PROBE TIP DIAMETER, IN.	0.9177	IMPINGER	INITIAL	FINAL	TOTAL GAIN
RUN No	2	PROBE LENGTH, FT / Cp	0.840 P	VOLUMES	(mL)	(mL)	(mL)
LOCATION	Eschbachert, Wood Waste Part	FILTER NUMBER	H-7	Imp. # 1	100	210	110
DATE	March 30/09	STATIC PRESSURE, IN. H ₂ O	± 0.25	Imp. # 2	100	125	25
OPERATOR	MARK LANFRANCO + J.H. + J.L.	STACK DIAMETER	12.0"	Imp. # 3	0	4	4
CONTROL UNIT / Y	1.0055	STACK HEIGHT	945 C	Imp. # 4	200		
BAROMETRIC PRESSURE, IN. Hg		30.00		Upstream Diameters			
ASSUMED MOISTURE, Bw %		10 %		Downstream Diameters			
INITIAL LEAK TEST		0.008 15"					
FINAL LEAK TEST		0.008 16"					

Point	Clock Time	Dry Gas Meter Ft ³	Pitot IN. H ₂ O ΔP	Orifice ΔH IN. H ₂ O	Dry Gas Temp. °F		Pump Vac. IN. Hg Gauge	Temperature °F		Impinger Exit	Stack	CO ₂ Vol. %	O ₂ Vol. %
					Inlet °F	Outlet °F		Box	Probe				
1	13:50	227.01	0.11	2.45	66	62	3	267	229	47	132	0.0	21.0
2		231.56	0.11	2.45	70	64	3				145		
3		236.00	0.10	2.25	74	65	3	270	231	47	153		
4		240.28	0.10	2.25	78	66	3				158		
5		244.52	0.09	2.00	80	67	3	269	236	47	158	0.0	21.0
6		248.56	0.09	2.00	84	68	3				158		
		252.61											
1		257.07	0.11	2.50	79	67	3	258	244	47	160		
2		261.56	0.11	2.50	88	70	3				161		
3		266.08	0.11	2.50	91	73	3	262	252	47	162	0.0	21.0
4		270.41	0.10	2.25	93	73	3				162		
5		274.73	0.10	2.25	95	77	3	267	259	47	162		
6	14:50	279.06	0.10	2.25	96	79	3				164		

A. Lanfranco and Associates Inc.
METLab CEM Report

Client: FASC Moisture % =
Source: Exhaust Duct 10.40
Run: Woodwaste - 1

Year:	2009	
Date	Time	THC (ppm as CH4)
30-Mar	916	149.7
30-Mar	917	157.9
30-Mar	918	152.6
30-Mar	919	151.0
30-Mar	920	155.1
30-Mar	921	139.9
30-Mar	922	131.5
30-Mar	923	157.7
30-Mar	924	112.0
30-Mar	925	134.1
30-Mar	926	148.8
30-Mar	927	176.2
30-Mar	928	122.2
30-Mar	929	166.9
30-Mar	930	75.0
30-Mar	931	87.2
30-Mar	932	71.3
30-Mar	933	58.1
30-Mar	934	145.6
30-Mar	935	175.3
30-Mar	936	110.9
30-Mar	937	120.3
30-Mar	938	91.3
30-Mar	939	150.5
30-Mar	940	178.6
30-Mar	941	141.7
30-Mar	942	140.0
30-Mar	943	158.8
30-Mar	944	160.9
30-Mar	945	142.7
30-Mar	946	136.2
30-Mar	947	124.2
30-Mar	948	131.3
30-Mar	949	198.4
30-Mar	950	119.7
30-Mar	951	166.3
30-Mar	952	155.4
30-Mar	953	192.1
30-Mar	954	141.2
30-Mar	955	137.2
30-Mar	956	143.3
30-Mar	957	222.2
30-Mar	958	183.4
30-Mar	959	186.1
30-Mar	1000	145.2
30-Mar	1001	155.3
30-Mar	1002	156.9
30-Mar	1003	230.5
30-Mar	1004	182.8
30-Mar	1005	182.6
30-Mar	1006	158.2
30-Mar	1007	162.9
30-Mar	1008	170.3
30-Mar	1009	182.7
30-Mar	1010	167.3
30-Mar	1011	194.6
30-Mar	1012	144.1
30-Mar	1013	179.9
30-Mar	1014	246.6
30-Mar	1015	176.7
Average		152.3
Minimum		58.1
Maximum		246.6

Mass Concentration (mg/m3 dry) 113.4

Calibration Summary	
Gas (Cert. Value)	92.1
Initial Gas Check	94.1
Final Gas Check	91.3
Initial Zero Drift	1.0
Final Zero Drift	1.8

A. Lanfranco and Associates Inc.
METLab CEM Report

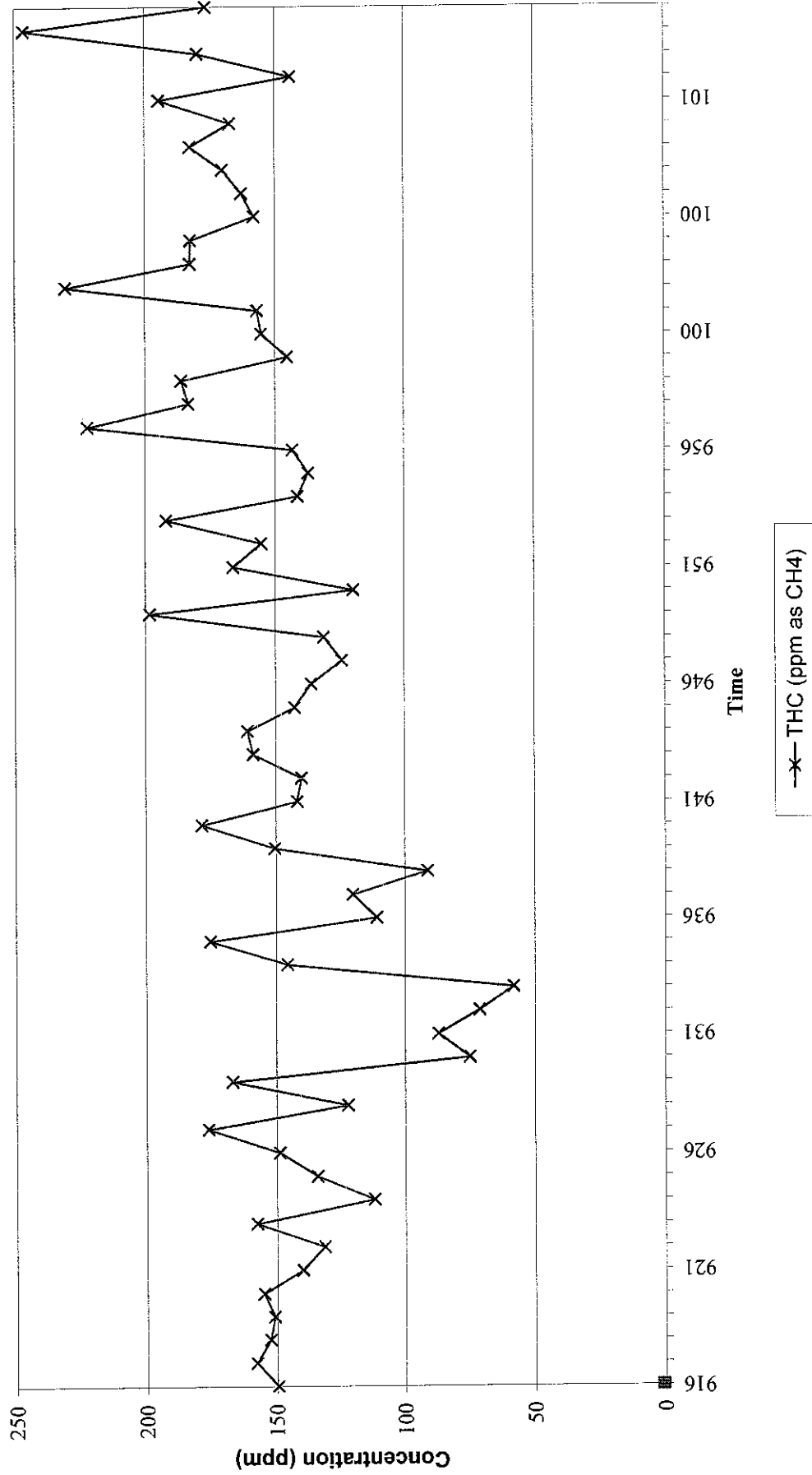
Client: FASC Moisture % =
Source: Exhaust Duct 12.18
Run: Woodwaste - 2

Year:	2009	
Date	Time	THC (ppm as CH4)
30-Mar	1351	323.0
30-Mar	1352	349.8
30-Mar	1353	392.8
30-Mar	1354	339.2
30-Mar	1355	330.0
30-Mar	1356	339.4
30-Mar	1357	354.9
30-Mar	1358	348.4
30-Mar	1359	373.0
30-Mar	1400	320.8
30-Mar	1401	365.9
30-Mar	1402	306.2
30-Mar	1403	299.5
30-Mar	1404	283.1
30-Mar	1405	334.3
30-Mar	1406	334.6
30-Mar	1407	285.5
30-Mar	1408	322.4
30-Mar	1409	363.3
30-Mar	1410	304.5
30-Mar	1411	321.0
30-Mar	1412	339.7
30-Mar	1413	291.0
30-Mar	1414	336.9
30-Mar	1415	315.3
30-Mar	1416	341.8
30-Mar	1417	279.6
30-Mar	1418	320.3
30-Mar	1419	354.3
30-Mar	1420	335.4
30-Mar	1421	348.2
30-Mar	1422	320.0
30-Mar	1423	309.4
30-Mar	1424	287.8
30-Mar	1425	351.9
30-Mar	1426	346.4
30-Mar	1427	309.0
30-Mar	1428	284.1
30-Mar	1429	291.6
30-Mar	1430	312.3
30-Mar	1431	336.2
30-Mar	1432	372.3
30-Mar	1433	285.4
30-Mar	1434	293.7
30-Mar	1435	323.9
30-Mar	1436	310.4
30-Mar	1437	285.8
30-Mar	1438	275.3
30-Mar	1439	348.2
30-Mar	1440	300.0
30-Mar	1441	329.5
30-Mar	1442	313.6
30-Mar	1443	331.3
30-Mar	1444	398.9
30-Mar	1445	346.1
30-Mar	1446	286.2
30-Mar	1447	321.6
30-Mar	1448	306.0
30-Mar	1449	340.4
30-Mar	1450	301.9
Average		324.6
Minimum		275.3
Maximum		398.9

Mass Concentration (mg/m3 dry) 246.6

Calibration Summary	
Gas (Cert. Value)	92.1
Initial Gas Check	91.3
Final Gas Check	89.0
Initial Zero Drift	1.8
Final Zero Drift	6.5

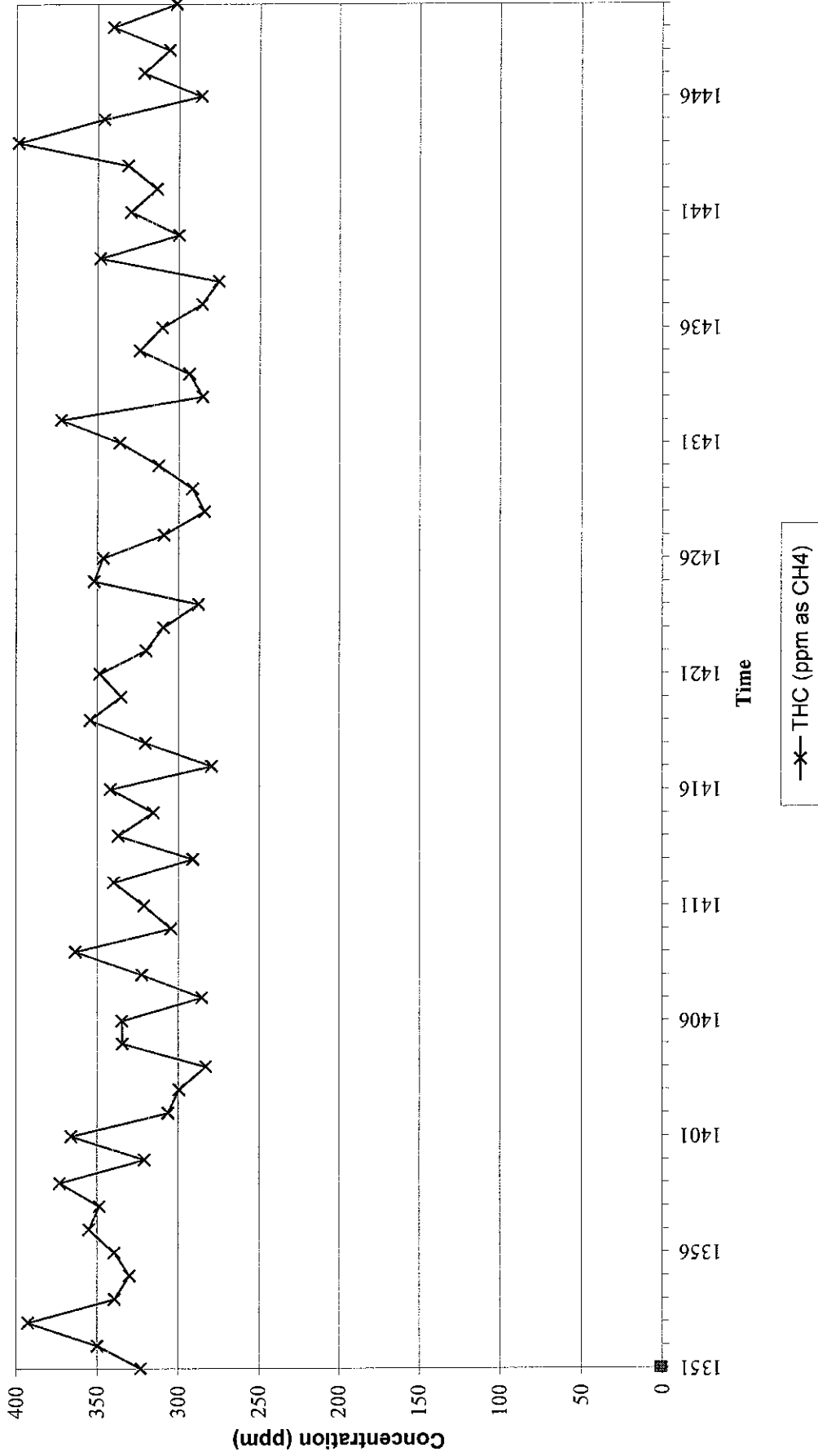
Exhaust Duct - Run 1 Woodwaste (March 30, 2009)
First American Scientific Corp.
METLab CEM Results



Exhaust Duct - Run 2 Woodwaste (March 30, 2009)

First American Scientific Corp.

METLab CEM Results



Client: FASC
Jobsite: Abbotsford Plant
Source: Exhaust Duct

Date: March 30/09
Run: 1 - Woodwaste
Run Time: 10:10 - 11:10

Particulate Concentration: 120.8 mg/dscm 0.0528 gr/dscf
 95.0 mg/Acm 0.0415 gr/Acf

Emission Rate: 0.15 Kg/hr 0.326 lb/hr

Sample Gas Volume: 14464 dscm 51.081 dscf
Total Sample Time: 60.0 minutes

Average Isokineticity: 97.7 %

Flue Gas Characteristics

Moisture:	10.40 %	
Temperature	61.9 °C	143.4 °F
Flow	20.4 dscm/min 0.34 dscm/sec 25.9 Acm/min	720 dscf/min 12.0 dscf/sec 915 Acf/min
Velocity	5.917 m/sec	19.41 f/sec
Gas Analysis	21.00 % O ₂	0.00 % CO ₂
	28.840 Mol Wt (g/gmole) Dry	27.712 Mol Wt (g/gmole) Wet

* **Standard Conditions:** Metric: 20 deg C, 101.325 kPa
 Imperial: 68 deg F, 29.92 in Hg

Client: FASC
Jobsite: Abbotsford Plant
Source: Exhaust Duct

Date: March 30/09
Run: 1 - Woodwaste
Run Time: 10:10 - 11:10

Control Unit (Y) 1 0055
Nozzle Diameter (in.) 0 4177
Pitot Factor 0 8408
Baro. Press. (in. Hg) 30.00
Static Press. (in. H2O) 0 25
Stack Height (ft) 5
Stack Diameter (in.) 12 0
Stack Area (sq.ft.) 0 785
Minutes Per Reading 5 0
Minutes Per Point 5 0

Gas Analysis (Vol. %):

	CO2	O2
	0.00	21.00
	0.00	21.00
	0.00	21.00
Average =	0.00	21.00

Condensate Collection:

Impinger 1 (grams)	82.0
Impinger 2 (grams)	26.0
Impinger 3 (grams)	4.0
Impinger 4 (grams)	14.0

Total Gain (grams) 126.0

Collection:

Filter (grams)	0.1661
Washings (grams)	0.0086
Impinger (grams)	0.0000
Total (grams)	0.1747

Traverse	Point	Time (min.)	Dry Gas Meter (ft3)	Pitot ^P (in. H2O)	Orifice ^H (in. H2O)	Dry Gas Temperature		Stack (oF)	Wall Dist (in.)	Isokin (%)
						Inlet (oF)	Outlet (oF)			
		0.0	177.000							
1	1	5.0	181.150	0.100	2.10	47	40	126	0.5	100.0
	2	10.0	185.470	0.110	2.30	51	41	128	1.8	99.0
	3	15.0	189.600	0.100	2.10	58	42	132	3.6	98.8
	4	20.0	193.750	0.100	2.10	64	48	141	8.4	98.8
	5	25.0	197.700	0.090	1.85	69	50	144	10.2	98.7
	6	30.0	201.400	0.080	1.67	71	52	144	11.5	97.6
		0.0	201.400							
2	1	5.0	205.750	0.110	2.31	70	50	146	0.5	98.5
	2	10.0	210.090	0.110	2.31	78	54	142	1.8	96.8
	3	15.0	214.440	0.110	2.31	79	55	144	3.6	97.0
	4	20.0	218.550	0.100	2.10	86	65	156	8.4	95.5
	5	25.0	222.660	0.100	2.10	87	67	159	10.5	95.4
	6	30.0	226.800	0.100	2.10	88	68	159	11.5	96.0
			Average:	0.101	2.113	70.7	52.7	143.4		97.7

Client: FASC
Jobsite: Abbotsford Plant
Source: Exhaust Duct

Date: March 30/09
Run: 2 - Woodwaste
Run Time: 13:50 - 14:50

Particulate Concentration: **512.5 mg/dscm** 0.2240 gr/dscf
 387.1 mg/Acm 0.1692 gr/Acf

Emission Rate: 0.62 Kg/hr 1.356 lb/hr

Sample Gas Volume: 1.4717 dscm 51.972 dscf
Total Sample Time: 60.0 minutes

Average Isokineticity: 101.2 %

Flue Gas Characteristics

Moisture: 12.18 %

Temperature 68.8 oC 155.8 oF

Flow 20.0 dscm/min 707 dscf/min
 0.33 dscm/sec 11.8 dscf/sec
 26.5 Acm/min 935 Acf/min

Velocity 6.050 m/sec 19.85 f/sec

Gas Analysis 21.00 % O2 0.00 % CO2

28.840 Mol. Wt (g/gmole) Dry 27.519 Mol. Wt (g/gmole) Wet

*** Standard Conditions:** Metric: 20 deg C, 101.325 kPa
 Imperial: 68 deg F, 29.92 in Hg

Client: FASC
Jobsite: Abbotsford Plant
Source: Exhaust Duct

Date: March 30/09
Run: 2 - Woodwaste
Run Time: 13:50 - 14:50

Control Unit (Y) 1 0055
 Nozzle Diameter (in.) 0 4177
 Pitot Factor 0 8408
 Baro. Press. (in. Hg) 30 00
 Static Press. (in. H2O) 0 25
 Stack Height (ft) 5
 Stack Diameter (in.) 12 0
 Stack Area (sq.ft.) 0 785
 Minutes Per Reading 5 0
 Minutes Per Point 5 0

Gas Analysis (Vol. %):

	CO2	O2
	0.00	21.00
	0.00	21.00
	0.00	21.00
Average =	0.00	21.00

Condensate Collection:

Impinger 1 (grams)	110.0
Impinger 2 (grams)	25.0
Impinger 3 (grams)	4.0
Impinger 4 (grams)	14.2

Total Gain (grams) 153.2

Collection:

Filter (grams)	0.7428
Washings (grams)	0.0115
Impinger (grams)	0.0000
Total (grams)	<u>0.7543</u>

Traverse	Point	Time (min.)	Dry Gas Meter (ft3)	Pitot ^P (in. H2O)	Orifice ^H (in. H2O)	Dry Gas Temperature		Stack (oF)	Wall	
						Inlet (oF)	Outlet (oF)		Dist (in.)	Isokin (%)
		0 0	227 010							
1	1	5.0	231.560	0.110	2.45	66	62	132	0.5	102.7
	2	10.0	236.000	0.110	2.45	70	64	145	1.8	100.8
	3	15.0	240.280	0.100	2.25	74	65	153	3.6	102.0
	4	20.0	244.520	0.100	2.25	78	66	156	8.4	100.8
	5	25.0	248.560	0.090	2.00	80	67	157	10.2	101.0
	6	30.0	252.610	0.090	2.00	84	68	158	11.5	100.9
		0 0	252 610							
2	1	5.0	257.080	0.110	2.50	79	67	160	0.5	101.6
	2	10.0	261.560	0.110	2.50	88	70	161	1.8	100.7
	3	15.0	266.080	0.110	2.50	91	73	162	3.6	101.2
	4	20.0	270.410	0.100	2.25	93	75	162	8.4	101.2
	5	25.0	274.730	0.100	2.25	95	77	162	10.5	100.6
	6	30.0	279.060	0.100	2.25	96	79	162	11.5	100.6
			Average:	0 103	2 304	82 8	69 4	155 8		101 2