

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

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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 RUN 1	RESULT RUN 2	RESULT RUN 1	RESULT RUN 2
Particulate (mg/m ³)	121	513	1348	36.1
THC (mg/m ³)	113	247	53	48
Flowrate (m 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.

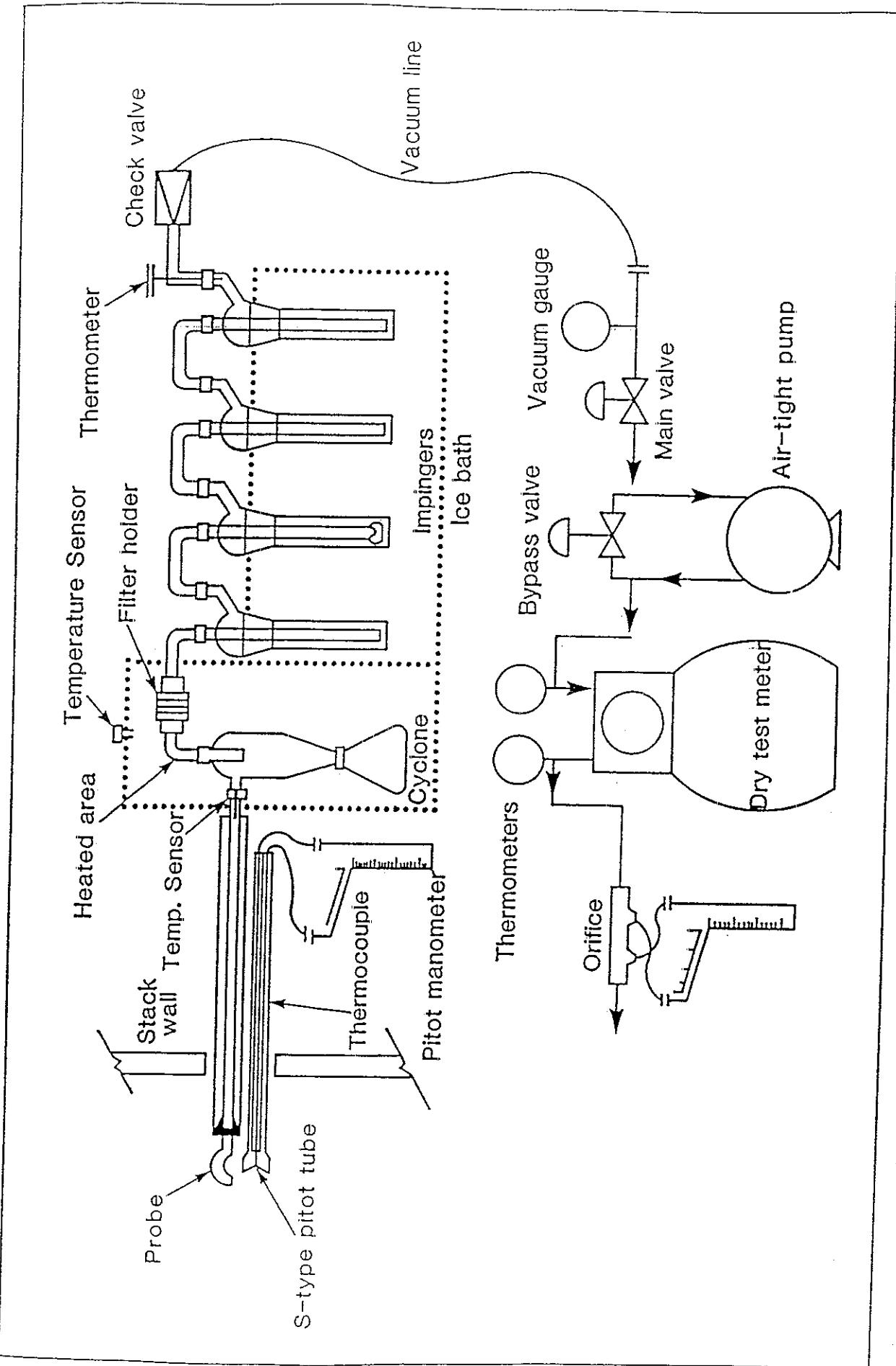


Figure 1 Particulate Sampling Train

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.

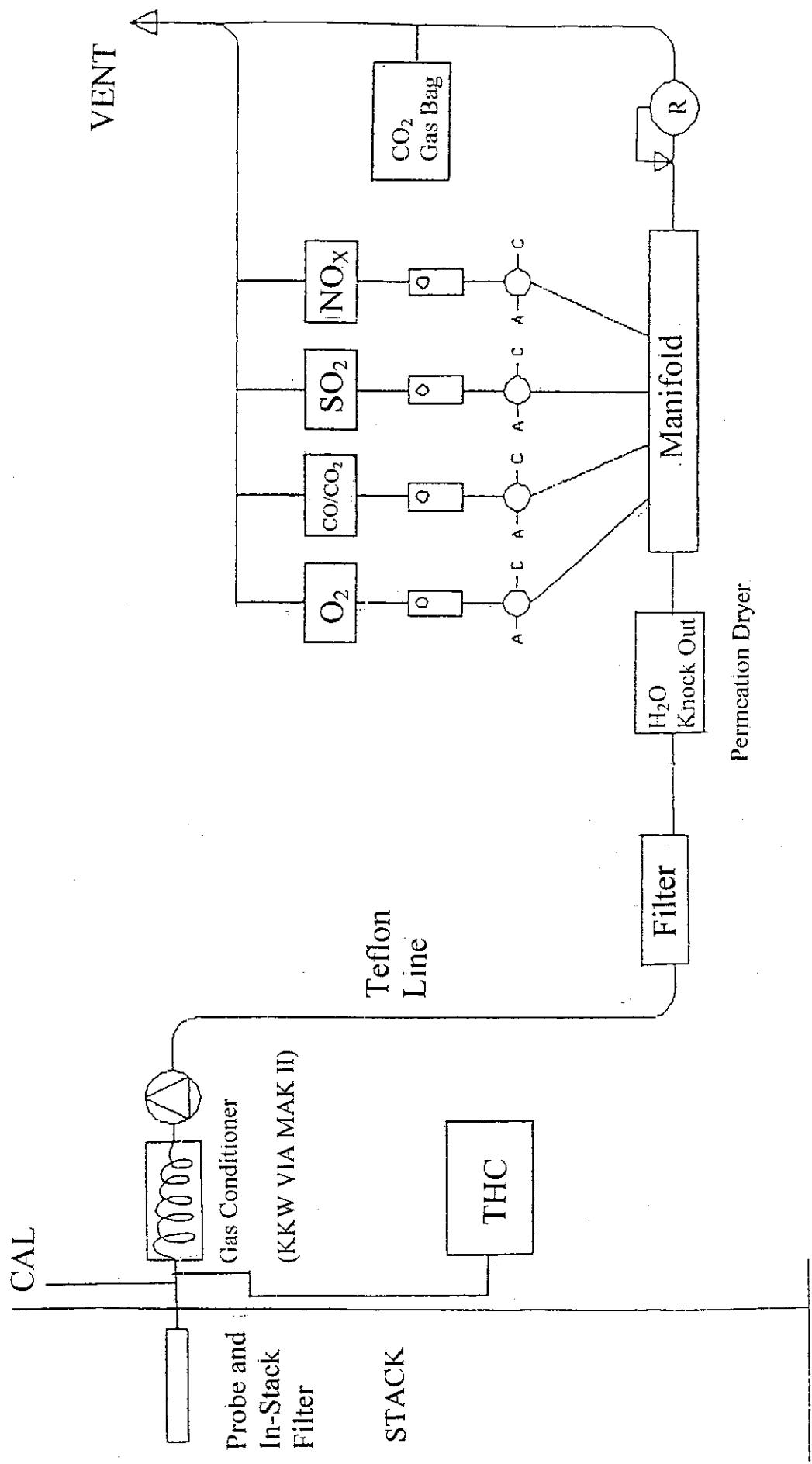
3.2 Analytical Techniques

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.



CONTINUOUS GAS SCHEMATIC
Figure 2

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/m ³)	121	513	317
Particulate (kg/hr)	0.1	0.6	0.4
Particulate(kg/day)	3.5	14.8	9.2
THC(mg/m ³)	113	247	180
Flowrate (m 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/m 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/m ³)	53	48	51
Flowrate (m 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/m³), but reduced to only about 36 mg/m³ 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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PARAMETER	DE-INKING SLUDGE RESULT	
	RUN 1	RUN 2
Particulate (mg/m ³)	1348	36.1
IHC (mg/m ³)	53	48
Flowrate (m ³ /min)	19.9	21.1
Temperature (°C)	76.3	58.3

IHC = total hydrocarbons

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

1.0 INTRODUCTION

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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.

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Cylinder No	THC (ppm)
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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)

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 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 (mgSm ³)	1348	36.1	692
Particulate (Kg/hr)	1.6	0.05	0.8
Particulate(Kg/day)	38.7	1.1	19.9
THC(mgSm 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)
Test 1	1060.5	29.3
Test 2	24.6	7.5

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
2	DeInk Sludge	734	46	501	18

5.0 DISCUSSION OF RESULTS

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. THC 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	Date:	March 30/09
Jobsite:	Abbotsford Plant	Run:	1 - DE:Inking Sludge
Source:	Exhaust Duct	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
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Sample Gas Volume:	0.8087 dscm	28.558 dscf
Total Sample Time:	30.0 minutes	

Average Isokineticity:	101.4 %
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Flue Gas Characteristics

Moisture:	12.81 %
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Temperature	76.3 oC	169.3 oF
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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
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Gas Analysis	21.00 % O ₂	0.00 % CO ₂
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28.840 Mol Wt (g/gmole) Dry	27.452 Mol. Wt (g/gmole) Wet
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* Standard Conditions:	Metric: 20 deg C, 101.325 kPa
	Imperial: 68 deg F, 29.92 in Hg

Client: FASC **Date:** March 30/09
Jobsite: Abbotsford Plant **Run:** 1 - DE:Inking Sludge
Source: Exhaust Duct **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
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			Wall Dist. (in.)	Isokin (%)
		0.0	279.200			Inlet (°F)	Outlet (°F)	Stack (°F)		
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	Date:	March 30/09
Jobsite:	Abbotsford Plant	Run:	2 - DE:Inking Sludge
Source:	Exhaust Duct	Run Time:	16:10 - 16:40

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

Emission Rate:	0.05 Kg/hr	0.101 lb/hr
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Sample Gas Volume:	0.8899 dscm	31.427 dscf
Total Sample Time:	30.0 minutes	

Average Isokineticity:	105.3 %
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Flue Gas Characteristics

Moisture:	14.22 %	
Temperature	58.3 oC	137.0 oF
Flow	21.1 dscm/min 0.35 dscm/sec 27.7 Acm/min	746 dscf/min 12.4 dscf/sec 980 Acf/min
Velocity	6.339 m/sec	20.80 f/sec
Gas Analysis	21.00 % O ₂	0.00 % CO ₂
	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 **Date:** March 30/09
Jobsite: Abbotsford Plant **Run:** 2 - DE:Inking Sludge
Source: Exhaust Duct **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. %):		
	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) 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)	<u>0.0246</u>
Washings (grams)	<u>0.0075</u>
Impinger (grams)	<u>0.0000</u>
Total (grams)	<u>0.0321</u>

Traverse	Point	Time (min.)	Dry Gas Meter (ft ³)	Pitot ^P (in. H ₂ O)	Orifice ^H (in. H ₂ O)	Dry Gas Temperature Inlet (°F)	Outlet (°F)	Stack (°F)	Wall Dist. (in.)	Isokin (%)
		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:	3225	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: Date	2009 Time	THC (ppm as CH ₄)
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

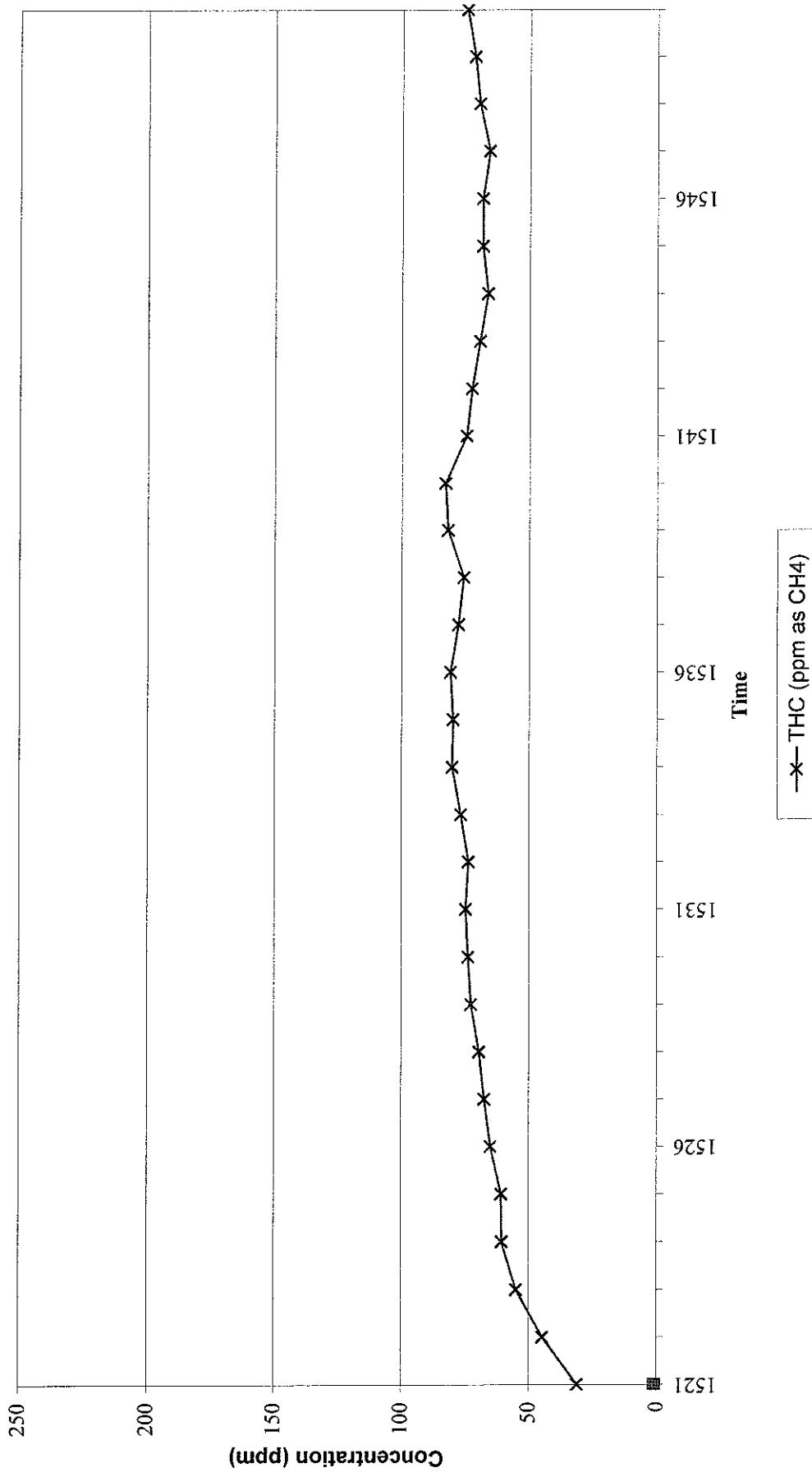
A. Lanfranco and Associates Inc.
METLab CEM Report

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

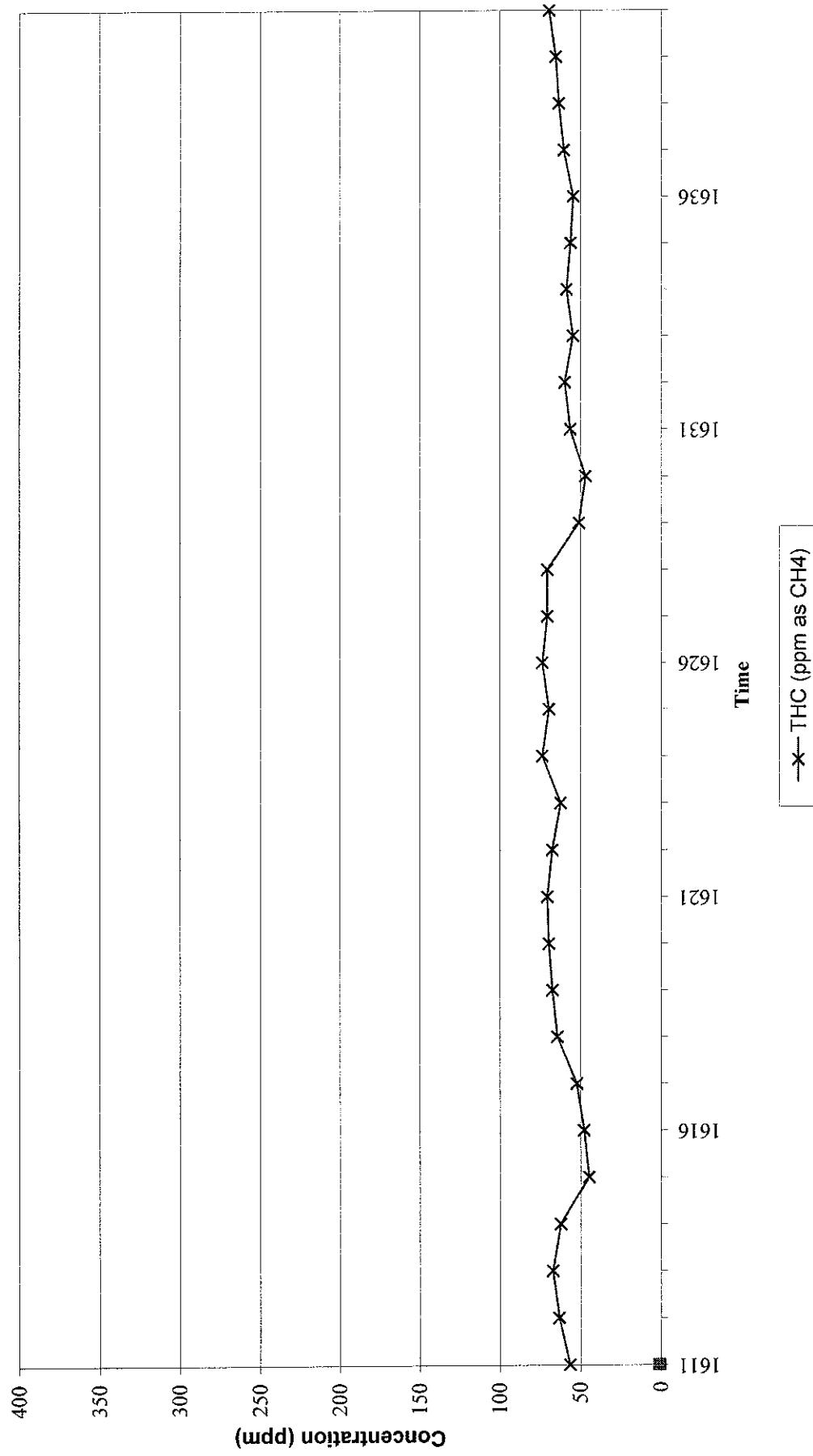
Year: Date	2009 Time	THC (ppm as CH ₄)
30-Mar	1611	56.4
30-Mar	1612	63.2
30-Mar	1613	67.0
30-Mar	1614	62.3
30-Mar	1615	44.8
30-Mar	1616	47.9
30-Mar	1617	52.1
30-Mar	1618	64.4
30-Mar	1619	67.4
30-Mar	1620	69.5
30-Mar	1621	70.5
30-Mar	1622	67.4
30-Mar	1623	62.3
30-Mar	1624	73.6
30-Mar	1625	69.5
30-Mar	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

$$1. \quad W_p = W_f + W_w$$

$$2. \quad P_m = P_b + \frac{\Delta H}{13.6}$$

$$3. \quad P_s = P_b + \frac{\Delta P_s}{13.6}$$

$$4. \quad V_{m_{std}} = \frac{V_m P_m}{T_m} * \frac{I_{std}}{P_{std}}$$

$$5. \quad \text{mg/dscm} = \frac{W_p}{V_{m_{std}}} / 35.315 \quad \text{mg/dscm @ 12% CO}_2 = \text{Mg/dscm} * \frac{12}{\% \text{CO}_2}$$

$$\text{mg/dscm @ 11% O}_2 = \text{Mg/dscm} * \frac{9.9}{(20.9 - \text{O}_2)}$$

$$6. \quad V_s = 85.49 * C_p (\text{avg } \Delta P) * \frac{I_s}{M_s * P_s}$$

$$7. \quad M_d = 0.44(\% \text{CO}_2) + 0.32(\% \text{O}_2) + 0.28(\text{CO} + \text{N}_2)$$

$$8. \quad M_s = M_d * \frac{100 - \% \text{H}_2\text{O}}{100} + 0.18(\% \text{H}_2\text{O})$$

$$9. \quad V_{tot} = V_{m_{std}} + V_{c_{std}}$$

$$10. \quad \% \text{H}_2\text{O} = \frac{V_{c_{std}} * 100}{V_{tot}}$$

$$11. \quad V_{c_{std}} = V_c * 0.0473$$

$$12. \quad Q_a = V_s * 60 * A_s$$

$$13. \quad Q_{std} = Q_a * \frac{I_{std}}{T_s} * \frac{P_s}{P_{std}} * \frac{1 - \% \text{H}_2\text{O}}{100}$$

$$14. \quad I = \frac{1.667 * I_s * (0.00267 * V_c + V_m P_m / T_m)}{\times * V_s * P_s * A_n}$$

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 _{m_{std}}	= gas meter sample volume @ standard conditions (ft ³)
P _b	= barometric pressure (mm Hg or inches of Hg)
ΔP _s	= stack static pressure (inches of H ₂ O)
P _m	= meter pressure (mm Hg or inches of Hg)
ΔH	= orifice differential pressure (inches of H ₂ O)
⊗	= sampling time total (min.)
T _m	= meter temperature (°R)
T _{std}	= 528 °R
P _{std}	= 760 mm Hg or 29.92 inches of Hg
V _s	= average stack gas velocity (ft / sec.)
C _p	= pitot correction factor (dimensionless)
(avg. ΔP)	= average velocity pressure (inches of H ₂ O)
M _d	= molecular weight dry (lb/lb mole)
M _w	= molecular weight wet (lb/lb mole)
% H ₂ O	= percent water vapour
V _c	= volume of condensate collected (mL)
V _{c_{std}}	= standard volume of moisture (ft ³)
I	= overall isokinetic variation (%)
Q _a	= volumetric flowrate at stack conditions (ft ³ / min.)
A _n	= sample nozzle area (ft ³)
Q _{std}	= volumetric flowrate at standard conditions (standard ft ³ / min.)

APPENDIX 3

FIELD DATA SHEETS and

PROCESS INFORMATION

JAN 10 1986

PLANT	FASC	PROBE TIP DIAMETER, IN.	0.4783	IMPINGER	INITIAL	FINAL	TOTAL GAIN
RUN No	1	PROBE LENGTH, FT / CP	3-C 0.8402	VOLUMES	(ml)	(ml)	(ml)
LOCATION	Stainless Duct.	FILTER NUMBER	H-8	Imp. # 1	100	162	62
DATE	March 30/86	STATIC PRESSURE, IN H ₂ O	+0.23	Imp. # 2	100	115	15
OPERATOR	MARK LANFRANCO +	STACK DIAMETER	12.0	Imp. # 3	0	2	2
CONTROL UNIT / Y	1.0033	STACK HEIGHT		Imp. # 4	200	-	-
BAROMETRIC PRESSURE, IN. Hg	30.00	INITIAL LEAK TEST	0.0000	13"			
ASSUMED MOISTURE, Bw	10 °F	FINAL LEAK TEST	0.0000	13"			

Point	Clock Time	Dry Gas Meter Fr ³	Pilot IN. H ₂ O ΔP	Orifice ΔH		Pump Vac.	Temperature °F	Temperature °F	Stack	Impinger Exit	Probe	Box	En. Hg Gauge	Inlet °F	Outlet °F	Furnaces	CO ₂ Vol. %	O ₂ Vol. %
				IN. H ₂ O	ΔP													
1	15:20	279.20	0.11	3.00	7.3	261	233	78	13.6	0.0	21.0							
2		384.00	0.11	3.00	7.3	262	250	98	13.6	0.0	21.0							
3		393.80	0.11	3.00	8.0	262	250	98	13.6	0.0	21.0							
4		393.50	0.11	3.00	8.2	262	250	98	13.6	0.0	21.0							
5		303.65	0.10	2.20	8.4	260	256	98	13.6	0.0	21.0							
6	15:30	307.60	0.10	2.20	8.5	260	256	98	13.6	0.0	21.0							

2.99^{5.0}
2720 160
28.15/60

PLANT	FASCI	PROBE TIP DIAMETER, IN.	9303	IMPINGER	INITIAL	FINAL	TOTAL GAIN
RUN No	2	PROBE LENGTH, FT / CP	3-C	VOLUMES	(mL)	(mL)	(mL)
LOCATION	Studg Duct	FILTER NUMBER	H-9	Imp. #1	100	126	26
DATE	March 30/09	STATIC PRESSURE, IN. H ₂ O	+ 0.23	Imp. #2	100	124	24
OPERATOR	MARK LANFRANCO + J-H. J.L.	STACK DIAMETER	12.0 "	Imp. #3	0	200	2
CONTROL UNIT / Y	1.0053	STACK HEIGHT		Imp. #4			
BAROMETRIC PRESSURE, IN. Hg	30.00	INITIAL LEAK TEST	0.010	Upstream Diameters			
ASSUMED MOISTURE, Bw	10%	FINAL LEAK TEST	0.008	15 "			
				Downstream Diameters			

Point	Clock Time	Dry Gas Meter Fr ³	Pitot IN. H ₂ O ΔP	Orifice ΔH IN. H ₂ O	Dry Gas Temp. °F	Pump Vac. In. Hg Gauge	Temperature °F Box Probe	Impinger Exit	Temperature °F Stack	CO ₂ Vol. %	Furnaces	O ₂ Vol. %
1	16:10	308.13	8.13	3.33	80	22	266 222	218	210	3.9	0.0	21.0
2			8.13	3.33	83	26						
3			8.12	3.35	85	27						
4			8.11	3.10	82	27						
5			8.11	3.10	82	27						
6			8.10	3.10	82	27						
7			8.09	3.10	82	27						
8			8.09	3.10	82	27						
9			8.09	3.10	82	27						
10			8.09	3.10	82	27						
11			8.09	3.10	82	27						
12			8.09	3.10	82	27						
13			8.09	3.10	82	27						
14			8.09	3.10	82	27						
15			8.09	3.10	82	27						
16			8.09	3.10	82	27						
17			8.09	3.10	82	27						
18			8.09	3.10	82	27						
19			8.09	3.10	82	27						
20			8.09	3.10	82	27						
21			8.09	3.10	82	27						
22			8.09	3.10	82	27						
23			8.09	3.10	82	27						
24			8.09	3.10	82	27						
25			8.09	3.10	82	27						
26			8.09	3.10	82	27						
27			8.09	3.10	82	27						
28			8.09	3.10	82	27						
29			8.09	3.10	82	27						
30			8.09	3.10	82	27						
31			8.09	3.10	82	27						
32			8.09	3.10	82	27						
33			8.09	3.10	82	27						
34			8.09	3.10	82	27						
35			8.09	3.10	82	27						
36			8.09	3.10	82	27						
37			8.09	3.10	82	27						
38			8.09	3.10	82	27						
39			8.09	3.10	82	27						
40			8.09	3.10	82	27						
41			8.09	3.10	82	27						
42			8.09	3.10	82	27						
43			8.09	3.10	82	27						
44			8.09	3.10	82	27						
45			8.09	3.10	82	27						
46			8.09	3.10	82	27						
47			8.09	3.10	82	27						
48			8.09	3.10	82	27						
49			8.09	3.10	82	27						
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55			8.09	3.10	82	27						
56			8.09	3.10	82	27						
57			8.09	3.10	82	27						
58			8.09	3.10	82	27						
59			8.09	3.10	82	27						
60			8.09	3.10	82	27						
61			8.09	3.10	82	27						
62			8.09	3.10	82	27						
63			8.09	3.10	82	27						
64			8.09	3.10	82	27						
65			8.09	3.10	82	27						
66			8.09	3.10	82	27						
67			8.09	3.10	82	27						
68			8.09	3.10	82	27						
69			8.09	3.10	82	27						
70			8.09	3.10	82	27						
71			8.09	3.10	82	27						
72			8.09	3.10	82	27						
73			8.09	3.10	82	27						
74			8.09	3.10	82	27						
75			8.09	3.10	82	27						
76			8.09	3.10	82	27						
77			8.09	3.10	82	27						
78			8.09	3.10	82	27						
79			8.09	3.10	82	27						
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81			8.09	3.10	82	27						
82			8.09	3.10	82	27						
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102			8.09	3.10	82	27						
103			8.09	3.10	82	27						
104			8.09	3.10	82	27						
105			8.09	3.10	82	27						
106			8.09	3.10	82	27						
107			8.09	3.10	82	27						
108			8.09	3.10	82	27						
109			8.09	3.10	82	27						
110			8.09	3.10	82	27						
111			8.09	3.10	82	27						
112			8.09	3.10	82	27						
113			8.09	3.10	82	27						
114			8.09	3.10	82	27						
115			8.09	3.10	82	27						
116			8.09	3.10	82	27						
117			8.09	3.10	82	27						
118			8.09	3.10	82	27						
119			8.09	3.10	82	27						
120			8.09	3.10	82	27						
121			8.09	3.10	82	27						
122			8.09	3.10	82	27						
123			8.09	3.10	82	27						
124			8.09	3.10	82	27						
125			8.09	3.10	82	27						
126			8.09	3.10	82	27						
127			8.09	3.10	82	27						
128			8.09	3.10	82	27						
129			8.09	3.10	82	27						
130			8.09	3.10								

CEM FIELD DATA SHEET

Plant : FASC - Abbotsford
 Source :
 Date : Mar 30/09

Technician : ML
 Ambient Temp °C :
 Bar Pressure in Hg :
 1

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				107			NO _x up
	92.1				94.1			NO _x dn
	40.3				41.5			O ₂ up
	N ₂				104			O ₂ dn
								CO up
*	Test 1	Station clock 1 hr behind						CO dn
	10:15 - 11:15							CO ₂ up
	(9:15 - 10:15)							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						
	N ₂				6.5			
	92.1				89			

CEM FIELD DATA SHEET

Plant : FASC - Abby
Source :
Date : Mar. 30/09

Technician : ML
Ambient Temp °C : _____
Bar Pressure in Hg : _____

Cylinder Gas Pressure (psi)

Certified Gas Value (ppm)

CEM Readings

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.	$\Delta P_{ref.}$	$C_{ref.} \sqrt{\Delta P_{ref.}}$	ΔP_s	$\sqrt{\Delta P_s}$
10.00	0.070	0.26193	0.100	0.31623
20.00	0.350	0.58569	0.500	0.70711
30.00	0.420	0.64159	0.720	0.84853
40.00	0.750	0.85737	1.010	1.00499

AVERAGE Cp = 0.8408

Calibration Equation: $C_p = C_{ref.} * \sqrt{(\Delta P_{ref.} / \Delta P_s)}$

$C_{ref.} = 0.99$

Where:

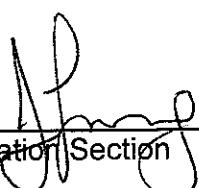
$\Delta P_{ref.}$ = velocity pressure measured by reference pitot

$C_{ref.}$ = coefficient of reference pitot

ΔP_s = velocity pressure measured by S - type pitot

C_p = coefficient of S - type pitot

AUTHORIZATION



Calibration Section

EPA Method 5

Meter Box Calibration
English Meter Box Units, English K' Factor

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.
 IMPOR TANT The Critical Orifice Coefficient, K', must be entered in English units, $(\bar{V}/3(\deg R)/0.5)(\text{in. Hg})^2(\text{min})$.
 !!!!!!!

DRY GAS METER READINGS							-CRITICAL ORIFICE READINGS-							
dh (in H ₂ O)	Time (min)	Volume Initial (cu ft)	Volume Final (cu ft)	Volume Total (cu ft)	Initial Temps. (deg F)	Outlet (deg F)	Inlet (deg F)	Final Temps. (deg F)	Orifice Serial# (number)	K' Orifice Coefficient (see above)	Actual Vacuum (in Hg)	Initial (deg F)	Final (deg F)	Average (deg F)
0.29	15.00	487.300	47.49	487.300	67.0	64.0	73.0	67.0	40	0.2408	21.0	59.0	60.0	59.5
0.61	15.00	475.495	482.300	6.805	63.0	61.0	70.0	63.0	48	0.3560	18.0	59.0	60.0	59.5
1.18	15.00	484.700	473.855	9.155	65.0	61.0	68.0	66.0	55	0.4606	16.0	54.0	60.0	57.0
1.92	15.00	487.049	498.638	11.589	75.0	68.0	80.0	70.0	63	0.5956	14.0	59.0	60.0	59.5

***** RESULTS *****

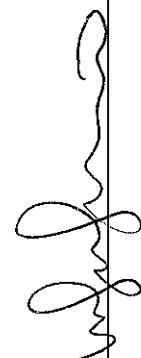
DRY GAS METER							- DRY GAS METER -						
VOLUME CORRECTED Vm(std) (cu ft)	VOLUME CORRECTED Vcr(std) (liters)	VOLUME CORRECTED Vcr (cu ft)	VOLUME CORRECTED Vcr (liters)	VOLUME NOMINAL Vcr (cu ft)	CALIBRATION FACTOR Y	CALIBRATION FACTOR Y	VOLUME CORRECTED Vcr (cu ft)	VOLUME NOMINAL Vcr (cu ft)	CALIBRATION FACTOR Y	VOLUME CORRECTED Vcr (cu ft)	VOLUME CORRECTED Vcr (cu ft)	CALIBRATION FACTOR Ko (value)	VARIATION dH@ (mm H ₂ O)
4.815	138.4	4.803	136.0	4.667	0.998	-0.008	1.619	41.13	-0.063	0.764	0.764	0.764	-0.02
6.951	196.8	7.101	201.1	6.900	1.022	0.016	1.569	39.85	-0.113	0.758	0.758	0.758	-0.02
9.350	264.8	9.210	260.8	8.906	0.985	-0.021	1.799	45.69	0.117	0.732	0.732	0.732	-0.02
11.674	330.6	11.881	336.5	11.544	1.018	0.012	1.741	44.21	0.059	0.724	0.724	0.724	-0.02

Average Y-----> 1.0055 Average dH@-----> 1.68 Average Ko----> 0.745

TEMPERATURE CALIBRATION

Calibration Standard ----->	Omega Model CL-23A S/N/T-218768	Temperature Device	Results	Percent of Absolute Value
Reference Temperature Set Point (deg F)		Reading (deg F)	Variation (deg F)	
32		29	-3	-0.61%
100		96	-4	-0.71%
500		492	-8	-0.83%
800		795	-5	-0.40%
1760		1685	-15	-0.69%

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 60° F and 29.92 inches of Hg, acceptable tolerance of individual values from the average is +/- 0.2.
 For Temperature Device, 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					

A. LANFRANCO and ASSOCIATES INC.
ENVIRONMENTAL CONSULTANTS

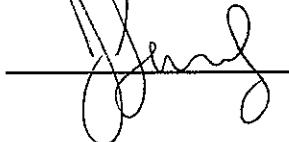
TEMPERATURE CALIBRATION FORM

Technician:

Date:

Signature:

J. Lang
DEC 14-08



TEMPERATURE DEVICE CALIBRATIONS

Reference Device Model CL23A Calibrator	Temperature Settings (degrees F)						
	32	100	200	300	500	800	1700
Device	Device Readout (degrees F)						
UEI DT150	33	100	199	300	499	799	
UEI DT150 #2							
UEI DT150 #3							
UEI DT200	32	99	200	300	500	800	1700
TPI 341 #1	32	100	200	300	500	800	1700
TPI 341 #2	32	100	200	300	500	800	1700
TPI 341 #3	32	100	200	300	500	800	1700
TPI 341 #4	32	100	200	300	500	800	1700
KM-450 (in deg C)	32	100		298	504	813	
KM-330 #1	31	98	199	299	496	796	1696
KM-330 #2	31	98	199	299	496	795	1694
HH11A1	32	99	200	300	498	798	1701
HH11A2	32	99	201	301	499	798	1700
HH11A3	33	99	200	301	498	798	1697
HH11A4	32	99	200	301	498	798	1699
Reference device is a NIST certified digital thermocouple calibrator							



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 LAN FRANCO

P.O NUMBER

REFERENCE STANDARD

COMPONENT	NIST SRM NO.	CYLINDER NO.	CONCENTRATION
SULFUR DIOXIDE GMIS	vs SRM#1693	CC 19018	10.4 ppm
MEIHANE GMIS	vs SRM#2750	SA 20162	40.05 ppm

ANALYZER READINGS

R=REFERENCE STANDARD

Z=ZERO GAS

C=GAS CANDIDATE

1. COMPONENT	SULFUR DIOXIDE GMIS	ANALYZER MAKE-MODEL-S/N	ROSEMOUNT 890129300000 10001E0	LAST CALIBRATION DATE	08/02/07
ANALYTICAL PRINCIPLE	ULTRAVIOLET ABSORPTION			SECOND ANALYSIS DATE	08/03/07
FIRST ANALYSIS DATE	07/26/07				
Z 0	R 86.1	C 84.9	CONC. 10.2	Z 0	R 75.1
R 86.3	Z 0	C 84.2	CONC. 10.1	R 76.3	Z 0
Z 0	C 84.0	R 86.2	CONC. 10.1	Z 0	C 74.6
U/M mV		MEAN TEST ASSAY	10.1	U/M mV	MEAN TEST ASSAY 10.1
2. COMPONENT	MEIHANE GMIS	ANALYZER MAKE-MODEL-S/N	HP 5890 SERIES II S/N 3310A48533	LAST CALIBRATION DATE	07/02/07
ANALYTICAL PRINCIPLE	GC/ FLAME IONIZATION			SECOND ANALYSIS DATE	
FIRST ANALYSIS DATE	07/26/07				
Z 0	R 1 9743	C 1 6557	CONC. 40.3	Z	R
R 1 9812	Z 0	C 1 6597	CONC. 40.2	R	Z
Z 0	C 1 6604	R 1 9793	CONC. 40.3	Z	C
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 ($\pm 2\%$)	10.1 ppm
OF TRACEABILITY PROTOCOL NO.	Rev 9/97		MEIHANE	40.3 ppm
PROCEDURE	G1		NITROGEN	BALANCE
CERTIFIED ACCURACY	± 1 % NIST 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

HK
HENRY KOUNG

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.



DocNumber: 00000005328

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

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

Customer & Order Information:

A LAN FRANCO

Praxair Order Number 06719932-00

Fill Date: NI MER2E-AS

Customer P O Number

Part Number: 109818303

Customer Reference Number PD999

Lot Number AS 350

Certified Concentration:

Cylinder Style & Outlet: 2000 psi 140 cu ft

Cylinder Pressure & Volume: 2000 psi 140 cu ft

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

Reference Standard Type: GMIS

Certified Concentration: 92.1 ppm

Ref Std Cylinder #: CC 115659

Instrument Used: HORIBA, FIA-510, 851135122

Ref Std Conc: 101 ppm

Analytical Method: Flame Ionization Detector

Ref Std Traceable to SRM #: vs. 2751

Last MultiPoint Calibration: 6/19/2008

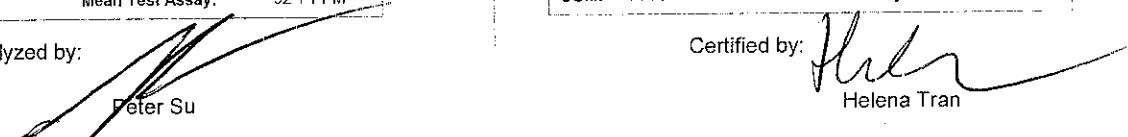
SRM Sample #: 212-09-AL

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		

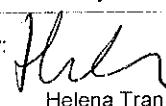
Second Analysis Data:				Date:
Z:	0	R:	0	C: 0 Conc: 0
R:	0	Z:	0	C: 0 Conc: 0
Z:	0	C:	0	R: 0 Conc: 0
UOM: PPM		Mean Test Assay: 0 PPM		

Analyzed by:



Peter Su

Certified by:



Helena Tran

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

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

CUSTOMER A LAN FRANCO

P.O. NUMBER

REFERENCE STANDARD

COMPONENT	NIST SRM NO.	CYLINDER NO.	CONCENTRATION
MEIHANE GMIS	vs. SRM#2751	SA 20217	96.7 ppm

ANALYZER READINGS

R=REFERENCE STANDARD

Z=ZERO GAS

C=GAS CANDIDATE

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

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		EPA-630/R97/121	MEIHANE	468 ppm
OF TRACEABILITY PROTOCOL NO.	REV 9/97		NITROGEN	BALANCE
PROCEDURE	G2 REV 08/25/99			
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

A1

S.H.

20.90 2.62 60°
20.90 1.45

PLANT	FAS C	PROBE TIP DIAMETER, IN.	0.0177	Woodwaste	IMPINGER	INITIAL	FINAL	TOTAL GAIN
RUN No	1	PROBE LENGTH, FT / CP	3	C-6	VOLUMES	(mL)	(mL)	(mL)
LOCATION	Woodwaste Part	FILTER NUMBER	H-C		Imp. # 1	100	102	2%
DATE	March 30/09	STATIC PRESSURE, IN. H ₂ O	0.25		Imp. # 2	100	126	26
OPERATOR		STACK DIAMETER	12.0		Imp. # 3	0	4	4
CONTROL UNIT / Y	7,0053	STACK HEIGHT	945-C		Imp. # 4	200		
BAROMETRIC PRESSURE, IN. HG	30.00	INITIAL LEAK TEST	8.010	15				
ASSUMED MOISTURE, Bw	12%	FINAL LEAK TEST	8.010	15				

Point	Clock Time	Dry Gas Meter ft ³	Pilot IN. H ₂ O AP	Orifice ΔH IN. H ₂ O	Dry Gas Temp. °F	Pump Vac. IN. Hg Gauge	Temperature °F	Impinger Ext	Stack	CO ₂ Vol. %	Furnaces	O ₂ Vol. %
1	10:10	137.00	0.10	0.10	97	90	268	220	93	12.3	21.0	21.0
2		185.22	0.11	0.30	51	41						
3		129.60	0.10	0.10	51	42						
4		123.23	0.09	0.10	64	54						
5		197.20	0.09	0.25	69	56						
6		201.40	0.08	1.62	52	32						
7	10:40	205.25	0.11	2.31	70	50	98	245	95	14.6	21.0	21.0
8		210.04	0.11	2.31	70	54						
9		214.44	0.11	2.31	72	55						
10		218.55	0.10	2.00	69	59						
11		222.66	0.10	2.10	67	67						
12	11:10	226.88	0.10	2.10	68	68						

2.73 90°
21.65 160°

PLANT	FASC	PROBE TIP DIAMETER, IN.	0.117	IMPINGER	INITIAL	FINAL	TOTAL GAIN
RUN No	1	PROBE LENGTH, FT / Cp	3.0, 840 ft	VOLUMES	(mL)	(mL)	(mL)
LOCATION	Wood Waste Port	FILTER NUMBER	H-7	Imp. # 1	100	210	110
DATE	March 30/09	STATIC PRESSURE, IN. H ₂ O	± 0.25	Imp. # 2	100	225	25
OPERATOR	MARK LANFRANCO + SH + S.L.	STACK DIAMETER	12.0	Imp. # 3	0	4	4
CONTROL UNIT / Y	1.0053	STACK HEIGHT	945 ft	Imp. # 4	200	-	-
BAROMETRIC PRESSURE, IN. Hg		INITIAL LEAK TEST	0.888	13"			
ASSUMED MOISTURE, Bw		FINAL LEAK TEST	0.888	16"			
				Upstream Diameters			
				Downstream Diameters			

Point	Clock Time	Dry Gas Meter Ft ³	Pilot	Orifice ΔH IN. H ₂ O	Dry Gas Temp. Inlet °F	Pump Vac. IN. Hg Gauge	Temperature °F Box	Probe	Temperature °F Impinger Exit	Stack	CO ₂ Vol. %	Furnace	O ₂ Vol. %
1	13:50	227.01		2.45	66	62	264	22.9	41	132			
2		231.56	8.11	2.45	70	64				145	0.6	21.0	
3		236.00	0.16	2.45	74	65	220	23.1	47	133			
4		240.28	0.10	2.45	78	66				136			
5		244.32	0.09	2.45	80	67	269	23.6	47	152	0.6	21.0	
6		248.36	0.09	2.00	80	67				158			
7		252.61	0.09	2.00	84	67							
8													
1		257.07	0.11	2.50	79	67	258	24.4	47	130			
2		261.56	9.11	2.50	88	70				161			
3		266.08	0.16	2.50	91	73	262	25.2	47	162	0.6	21.0	
4		270.41	0.10	2.33	93	73				162			
5		274.23	0.10	2.33	95	73	267	25.9	47	162			
6	14:50	279.06	0.10	2.25	96	73				162			

A. Lanfranco and Associates Inc.**METLab CEM Report**

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

Year: Date	2009 Time	THC (ppm as CH ₄)
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

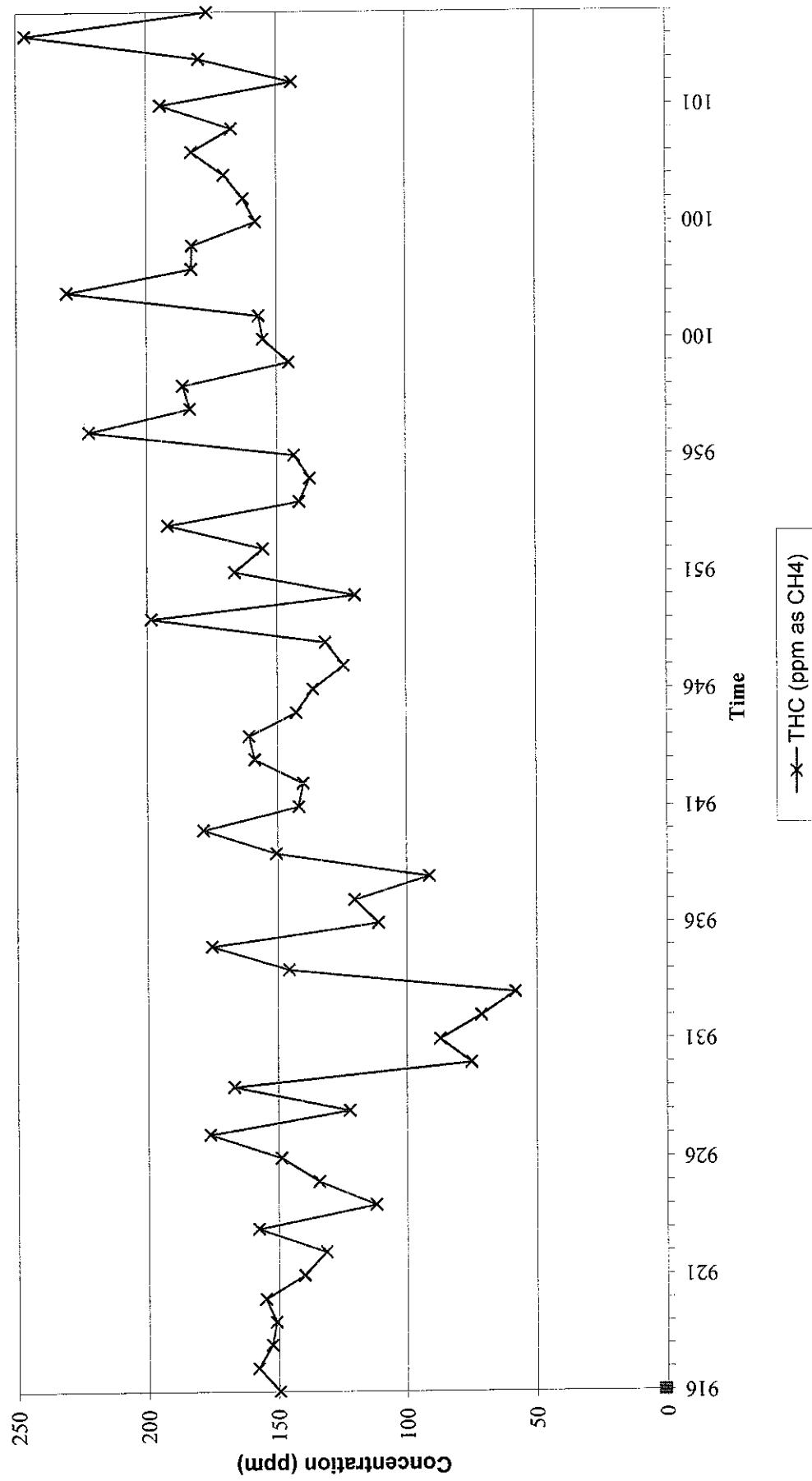
Year:	2009	Moisture % =
Date	Time	THC (ppm as CH ₄)
30-Mar	1351	323.0
30-Mar	1352	349.8
30-Mar	1353	392.8
30-Mar	1354	339.2
30-Mar	1355	330.0
30-Mar	1356	339.4
30-Mar	1357	354.9
30-Mar	1358	348.4
30-Mar	1359	373.0
30-Mar	1400	320.8
30-Mar	1401	365.9
30-Mar	1402	306.2
30-Mar	1403	299.5
30-Mar	1404	283.1
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

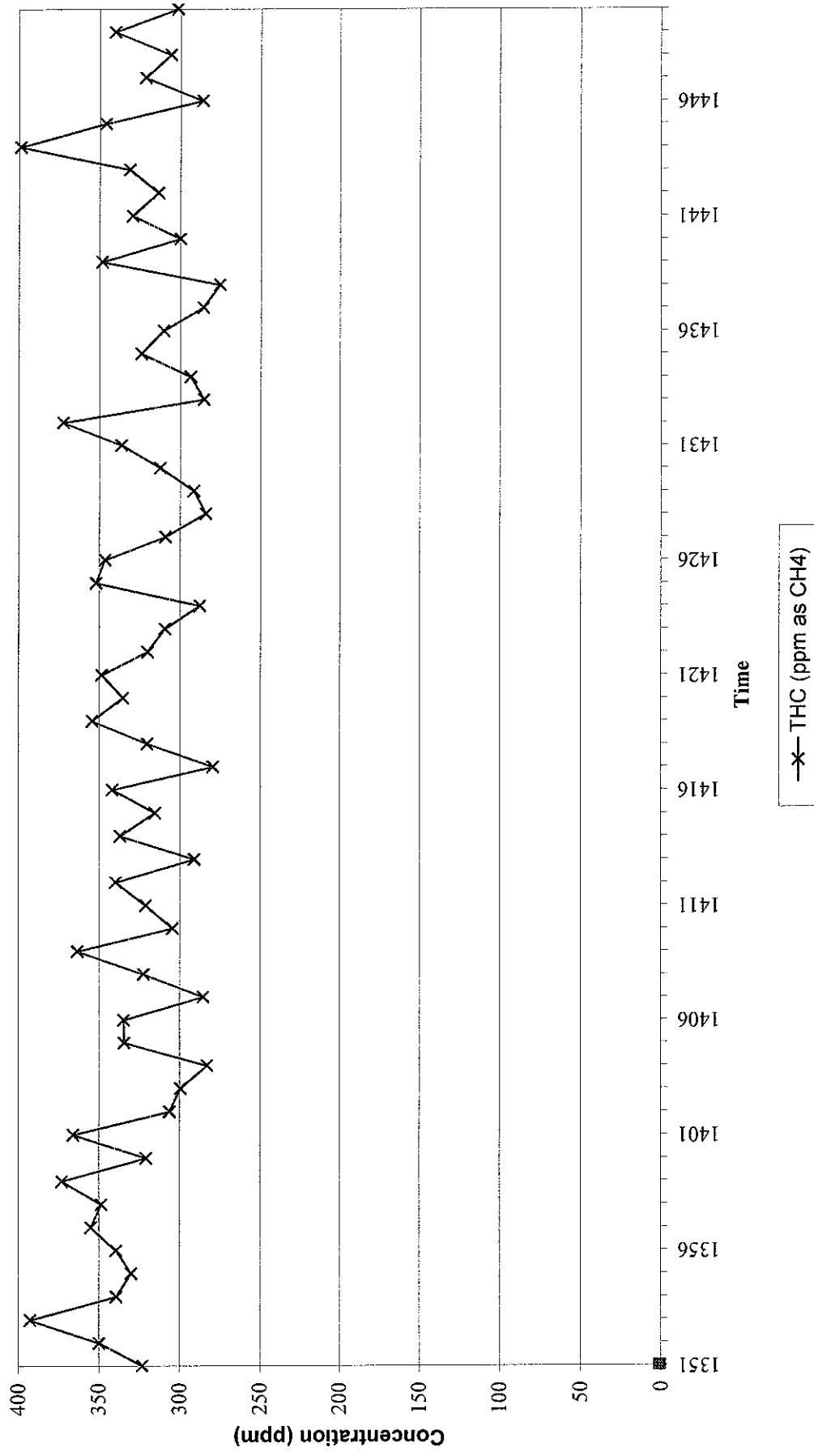
Exhaust Duct - Run 1 Woodwaste (March 30, 2009)

First American Scientific Corp.

METLab CEM Results



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



Client:	FASC	Date:	March 30/09
Jobsite:	Abbotsford Plant	Run:	1 - Woodwaste
Source:	Exhaust Duct	Run Time:	10:10 - 11:10

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

Emission Rate:	0.15 Kg/hr	0.326 lb/hr
-----------------------	------------	-------------

Sample Gas Volume:	1 4464 dscm	51.081 dscf
Total Sample Time:	60.0 minutes	

Average Isokineticity:	97.7 %
-------------------------------	--------

Flue Gas Characteristics

Moisture:	10.40 %	
Temperature	61.9 oC	143.4 oF
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 **Date:** March 30/09
Jobsite: Abbotsford Plant **Run:** 1 - Woodwaste
Source: Exhaust Duct **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. %):		
	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) 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)	<u>0.1661</u>
Washings (grams)	<u>0.0086</u>
Impinger (grams)	<u>0.0000</u>
Total (grams)	<u>0.1747</u>

Traverse	Point	Time (min.)	Dry Gas Meter (ft ³)	Pitot ^P (in. H ₂ O)	Orifice ^H (in. H ₂ O)	Dry Gas Temperature Inlet (°F)	Dry Gas Temperature Outlet (°F)	Stack (°F)	Wall Dist (in.)	Isokin (%)
1		0.0	177.000							
1	1	5.0	181.150	0.100	2.10	47	40	126	0.5	100.0
1	2	10.0	185.470	0.110	2.30	51	41	128	1.8	99.0
1	3	15.0	189.600	0.100	2.10	58	42	132	3.6	98.8
1	4	20.0	193.750	0.100	2.10	64	48	141	8.4	98.8
1	5	25.0	197.700	0.090	1.85	69	50	144	10.2	98.7
1	6	30.0	201.400	0.080	1.67	71	52	144	11.5	97.6
2		0.0	201.400							
2	1	5.0	205.750	0.110	2.31	70	50	146	0.5	98.5
2	2	10.0	210.090	0.110	2.31	78	54	142	1.8	96.8
2	3	15.0	214.440	0.110	2.31	79	55	144	3.6	97.0
2	4	20.0	218.550	0.100	2.10	86	65	156	8.4	95.5
2	5	25.0	222.660	0.100	2.10	87	67	159	10.5	95.4
2	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	Date:	March 30/09
Jobsite:	Abbotsford Plant	Run:	2 - Woodwaste
Source:	Exhaust Duct	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
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Sample Gas Volume:	1.4717 dscm	51.972 dscf
Total Sample Time:	60.0 minutes	

Average Isokineticity:	101.2 %
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Flue Gas Characteristics

Moisture:	12.18 %	
Temperature	68.8 oC	155.8 oF
Flow	20.0 dscm/min 0.33 dscm/sec 26.5 Acm/min	707 dscf/min 11.8 dscf/sec 935 Acf/min
Velocity	6.050 m/sec	19.85 f/sec
Gas Analysis	21.00 % O ₂	0.00 % CO ₂
	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. %):		
	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) 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)	0.7543

Traverse	Point	Time (min.)	Dry Gas Meter (ft ³)	Pitot ^P (in. H ₂ O)	Orifice ^H (in. H ₂ O)	Dry Gas Temperature Inlet (°F)	Dry Gas Temperature Outlet (°F)	Stack (°F)	Wall 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