

**Report for the Monitoring of Emissions to Air from the stack Located at
Linx Printing Technologies, Fluids Plant, Unit 4, St Ives.**

Part 1: Executive Summary

Permit Number: B04/94 (*Variation Number: PPC13/14*)

Operator: Linx Printing Technologies Ltd

Installation: Fluids Plant, Unit 4



4251

Monitoring dates: 5th February 2020
Job Number: **R20134**
Version: 1
Address: **Linx Printing Technologies Ltd**
Linx House
8 Stocks Bridge Way
St Ives
Cambridgeshire, PE27 5JL

Monitoring Organisation: **EnviroDat Ltd**
Address: Cutbush Commercial
Cutbush Lane East
Reading, RG2 9AF

Date of Report: 6th March 2020
Report Approved By: Yu Shen
MCERTS Registration Number: MM 06 727 (Level II, TE1, 2, 3 & 4)
Function: Senior Project Manager (Team Leader)

Signed:



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Notes to Report.

- a). EnviroDat Ltd, Report Template V11.
- b). This report should not be reproduced except in full, without written approval of Envirodat Ltd.
- c). Opinions and Interpretations herein are outside the scope of UKAS/MCerts Accreditation.

PART 1: EXECUTIVE SUMMARY

1.1 Monitoring Objectives

EnviroDat Ltd. was commissioned by Mr. Darren Page-Mitchell, on behalf of Linx Printing Technologies Ltd to monitor the LEV stack located at Fluids Plant, Unit 4 for a suite of pollutants - as prescribed in the operational permit B04/94 - in order to establish the environmental compliance.

The Exhaust stack extracts the pollutants from the Ink and Solvent bottling process inside the plant and emits to the atmosphere directly.

The pollutants monitored are summarised below:

Substances to be monitored	Emission Point Identification
	Fluids Plant
Total Volatile Organic Compounds (VOCs)	✓
Velocity	✓
Total Particulate Matter (TPM)	✓
Moisture (for correction)	✓
Special requirements	None requested

1.2 Monitoring Results

Emission Point Reference	Substance to be Monitored	Emission Limit Value	Periodic Monitoring Result	Estimate of Uncertainty (2σ at 95% confidence)	Units	Reference Conditions	Date of Sampling	Start and End Times	Monitoring Method Reference	Accreditation for use of Method (see note below)	Operating Status
Fluids Plant - Unit 4	Total Particulate Matter (TPM)	20	0.68	±0.17	mg(N)m ⁻³	101.3kPa, 273K, dry gas, Stack% Oxygen	05/02/2020	10:15-18:15	BS EN 13284	B	At 100% MCR
	Volatile Organic Compounds (VOCs as carbon)	150	217.7	±23.7	mg(N)m ⁻³				BS EN 12619	A	
	Moisture	-	0.7	n/a	%	101.3kPa, 273K, dry gas			BS EN 14790	A	

NOTE:

- A. EnviroDat Ltd MCerts/UKAS Accredited for sampling and analysis.
- B. EnviroDat Ltd MCerts/UKAS Accredited for sampling only, UKAS Accredited analysis conducted by sub-contract laboratory.
- C. EnviroDat Ltd UKAS Accredited for sampling only (further clarification is given in section 1.4). Analysis of this component is not UKAS Accredited.
- D. The method for sampling and analysis is not UKAS or MCerts Accredited, method follows documented in-house procedure (further clarification is given in section 1.4).
- E. The method for sampling is not UKAS or MCerts Accredited, UKAS Accredited analysis conducted by sub-contract laboratory.

1.3 Operating Information

Emission Point Reference	Date	Process Type	Process Duration	Fuel	Feedstock	Abatement	Load	Comparison of Operator CEMS and Periodic Monitoring Results			
								Substance	CEMS Results	Periodic Monitoring Results	Units
Fluids Plant	05/02/2020	Extraction	Continuous	N/A	MEK, Acetone and Ethanol	N/A	Normal	N/A	N/A	N/A	N/A

1.4 Monitoring Deviations

Emission Point Reference	Substance Deviations	Monitoring Deviations	Other Relevant Issues
Fluids Plant	None	None	None

PART 2: SUPPORTING INFORMATION

2.1 Appendix I: General Information

2.1.1 Monitoring organisation staff details

Monitoring at Linx Printing Technologies Ltd, Fluids Plant, Unit 4 was conducted by the following EnviroDat Engineers:

Team Leader, Yu Shen – MCERTs Level II (TE1, 2, 3 & 4)	MM06 727
Technician, Niall Kester – MCERTs Trainee	MM19 1573

2.1.2 Monitoring method details

MONITORING SCHEDULE			
Parameter	Standard Reference Method/Alternative	EnviroDat Procedure	MCerts Accreditation
VOCs	BS EN 12619	SP12619	MCerts
Velocity	BS ISO 16911-1	SP16911	MCerts
Total Particulate Matter	BS EN 13284	SP13284	MCerts
Moisture (H ₂ O)	BS EN 14790	SP14790	MCerts

2.1.3 Monitoring organisation equipment and gas check list references

EQUIPMENT – LR68HDA			
Item	Reference	Calibration Due	PAT Due
Flame Ionisation Detector Analyser	FID#06	21-May-20	Oct-20
Data Logger	DL#03	08-Oct-20	-
Digital Barometer	DB#27	05-Jan-21	-

Heated Filter Head	HFH#01	05-Jan-21	Oct-20
Heated Line	HL#13	08-Oct-20	-
Heated Line Controller	HLC#13	08-Oct-20	Oct-20
Thermocouple (Stack Temperature)	TC#38	02-Apr-20	-
Timepiece	TP#24	05-Sep-20	-
Digital Manometer	DM#09	14-Jan-21	
Thermocouple Reader	TCR#24	04-Apr-20	
S-Type Pitot Tube	PT-04	10-Oct-20	
Tape Measure	TM#05	02-Oct-20	-
Balance	BAL#06	31-Mar-20	-
'Apex' Kit	APEX#06	See each item	Oct-20
Dry Gas Meter ('Apex')	DGM#02	04-Apr-20	-
Timepiece ('Apex')	TP#20	04-Apr-20	-
Thermocouple ('Apex')	TC#46	04-Apr-20	-
Thermocouple Reader ('Apex')	TCR#24	04-Apr-20	-
Thermocouple Reader ('Apex')	TCR#25	04-Apr-20	-
Thermocouple Reader ('Apex')	TCR#26	04-Apr-20	-
Manometer ('Apex' Orange)	MAN#12	04-Apr-20	-
Manometer ('Apex' Red)	MAN#13	04-Apr-20	-
Thermocouple ('Apex' Dogleg Exit)	TC#08	23-Oct-20	-
Nozzle	SS-1-5	14-May-20	
GAS CYLINDERS – LR68HDA			
	Certificate No.	Level (ppm)	Validity
VOC Span Gas	5702977	897	14-Aug-20

2.2 Appendix II: Emission Point Reference Data & Results

2.2.1 Photograph of Sampling Location on Stack



Sampling was taken from square Hole on vertical section of stack with the 0.5m diameter. Accessed via the mobile tower

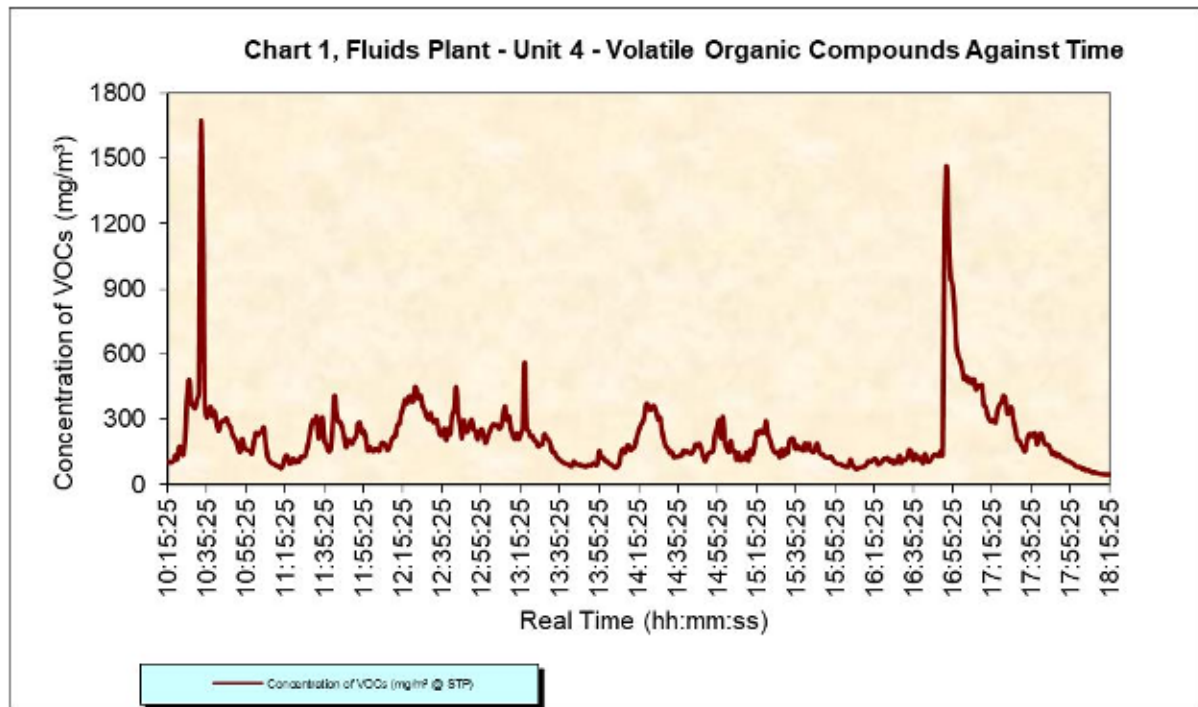
2.2.2 Homogeneity testing

BS EN 15259 stipulates that the exhaust gases emitted from combustion processes are tested to ensure homogeneity and that a representative sample is obtained during the monitoring, subject to a number of caveats as elucidated in Environment Agency guidance MID15259. The details of the testing at each emission point are summarised below:

Stack	Result of Homogeneity Testing
Exhaust Stack	N/A –homogeneity testing only required on stacks exceeding 1.13 m diameter, as specified in MID 15259. Homogeneity assumed and single point sampling acceptable.

2.2.3 Gas analyser site measurements and calibrations

The data in the following Chart 1 and Table 1 are expressed in mgm^{-3} @ STP and is uncorrected for O_2 . In Addition, VOC results are expressed as carbon equivalent. Calibration data is shown in Table 2.

**Table 1 – Stack, Raw Data**

Time	VOC (mgC/m³)	Comment
10:15:25	108.0	
10:16:25	101.9	
10:17:25	102.7	
10:18:25	109.6	
10:19:25	134.7	
10:20:25	116.8	
10:21:25	174.9	
10:22:25	162.8	
10:23:25	137.6	
10:24:25	221.6	
10:25:25	420.8	
10:26:25	481.2	
10:27:25	374.6	
10:28:25	362.4	
10:29:25	351.5	
10:30:25	392.9	
10:31:25	420.6	
10:32:25	1648.6	
10:33:25	1182.5	
10:34:25	368.5	

Time	VOC (mgC/m ³)	Comment
10:35:25	307.9	
10:36:25	340.9	
10:37:25	356.6	
10:38:25	312.3	
10:39:25	336.1	
10:40:25	279.8	
10:41:25	247.2	
10:42:25	282.5	
10:43:25	292.7	
10:44:25	293.3	
10:45:25	304.1	
10:46:25	279.3	
10:47:25	265.0	
10:48:25	232.9	
10:49:25	212.3	
10:50:25	200.9	
10:51:25	163.9	
10:52:25	151.9	
10:53:25	210.7	
10:54:25	172.6	
10:55:25	162.6	
10:56:25	157.5	
10:57:25	154.6	
10:58:25	142.2	
10:59:25	198.0	
11:00:25	238.5	
11:01:25	226.6	
11:02:25	238.7	
11:03:25	242.5	
11:04:25	261.0	
11:05:25	185.9	
11:06:25	126.0	
11:07:25	108.5	
11:08:25	98.8	
11:09:25	95.5	
11:10:25	88.7	
11:11:25	86.3	
11:12:25	80.0	
11:13:25	75.1	
11:14:25	95.5	

Time	VOC (mgC/m ³)	Comment
11:15:25	130.0	
11:16:25	131.9	
11:17:25	96.8	
11:18:25	100.3	
11:19:25	119.3	
11:20:25	101.6	
11:21:25	115.9	
11:22:25	104.5	
11:23:25	128.4	
11:24:25	126.3	
11:25:25	131.1	
11:26:25	162.0	
11:27:25	205.6	
11:28:25	258.8	
11:29:25	296.2	
11:30:25	284.6	
11:31:25	312.1	
11:32:25	212.3	
11:33:25	272.6	
11:34:25	305.8	
11:35:25	196.9	
11:36:25	181.6	
11:37:25	152.8	
11:38:25	158.5	
11:39:25	257.3	
11:40:25	406.9	
11:41:25	338.5	
11:42:25	288.3	
11:43:25	288.0	
11:44:25	259.9	
11:45:25	218.6	
11:46:25	170.8	
11:47:25	204.9	
11:48:25	200.9	
11:49:25	187.2	
11:50:25	207.6	
11:51:25	222.4	
11:52:25	278.4	
11:53:25	284.6	
11:54:25	236.9	

Time	VOC (mgC/m ³)	Comment
11:55:25	247.8	
11:56:25	210.2	
11:57:25	155.1	
11:58:25	174.5	
11:59:25	157.2	
12:00:25	153.5	
12:01:25	164.9	
12:02:25	159.4	
12:03:25	155.6	
12:04:25	189.6	
12:05:25	191.4	
12:06:25	182.1	
12:07:25	158.1	
12:08:25	171.6	
12:09:25	199.9	
12:10:25	220.0	
12:11:25	219.9	
12:12:25	272.6	
12:13:25	277.2	
12:14:25	322.6	
12:15:25	352.9	
12:16:25	390.2	
12:17:25	371.7	
12:18:25	404.0	
12:19:25	405.5	
12:20:25	381.7	
12:21:25	447.3	
12:22:25	436.2	
12:23:25	394.6	
12:24:25	409.8	
12:25:25	360.3	
12:26:25	343.0	
12:27:25	313.6	
12:28:25	300.5	
12:29:25	329.0	
12:30:25	294.4	
12:31:25	284.6	
12:32:25	298.6	
12:33:25	258.3	
12:34:25	227.6	

Time	VOC (mgC/m ³)	Comment
12:35:25	229.3	
12:36:25	258.1	
12:37:25	204.6	
12:38:25	257.5	
12:39:25	232.2	
12:40:25	314.5	
12:41:25	343.8	
12:42:25	447.9	
12:43:25	332.7	
12:44:25	280.4	
12:45:25	213.1	
12:46:25	294.8	
12:47:25	245.4	
12:48:25	243.8	
12:49:25	273.5	
12:50:25	298.6	
12:51:25	254.1	
12:52:25	244.9	
12:53:25	207.8	
12:54:25	237.1	
12:55:25	255.9	
12:56:25	229.7	
12:57:25	191.3	
12:58:25	215.2	
12:59:25	239.1	
13:00:25	264.1	
13:01:25	276.6	
13:02:25	271.6	
13:03:25	274.7	
13:04:25	257.0	
13:05:25	268.2	
13:06:25	317.9	
13:07:25	359.5	
13:08:25	294.9	
13:09:25	316.1	
13:10:25	253.4	
13:11:25	227.4	
13:12:25	209.3	
13:13:25	236.4	
13:14:25	208.8	

Time	VOC (mgC/m ³)	Comment
13:15:25	234.6	
13:16:25	264.7	
13:17:25	561.2	
13:18:25	258.9	
13:19:25	246.1	
13:20:25	221.3	
13:21:25	223.7	
13:22:25	201.5	
13:23:25	196.6	
13:24:25	174.4	
13:25:25	185.5	
13:26:25	185.6	
13:27:25	230.5	
13:28:25	216.0	
13:29:25	207.8	
13:30:25	189.0	
13:31:25	151.1	
13:32:25	151.1	
13:33:25	130.8	
13:34:25	121.0	
13:35:25	111.9	
13:36:25	105.1	
13:37:25	100.3	
13:38:25	95.3	
13:39:25	92.6	
13:40:25	89.0	
13:41:25	84.1	
13:42:25	105.6	
13:43:25	96.1	
13:44:25	91.4	
13:45:25	91.4	
13:46:25	86.8	
13:47:25	87.6	
13:48:25	81.0	
13:49:25	88.2	
13:50:25	87.6	
13:51:25	88.6	
13:52:25	98.4	
13:53:25	90.6	
13:54:25	91.8	

Time	VOC (mgC/m ³)	Comment
13:55:25	154.0	
13:56:25	123.8	
13:57:25	124.7	
13:58:25	107.8	
13:59:25	108.5	
14:00:25	96.8	
14:01:25	91.3	
14:02:25	87.1	
14:03:25	76.7	
14:04:25	80.2	
14:05:25	93.4	
14:06:25	140.1	
14:07:25	162.8	
14:08:25	145.8	
14:09:25	175.0	
14:10:25	180.2	
14:11:25	157.5	
14:12:25	168.4	
14:13:25	173.1	
14:14:25	212.9	
14:15:25	243.3	
14:16:25	270.0	
14:17:25	285.9	
14:18:25	314.0	
14:19:25	371.1	
14:20:25	362.9	
14:21:25	342.2	
14:22:25	358.9	
14:23:25	361.8	
14:24:25	334.3	
14:25:25	297.8	
14:26:25	308.1	
14:27:25	247.0	
14:28:25	200.9	
14:29:25	175.0	
14:30:25	166.3	
14:31:25	145.8	
14:32:25	150.1	
14:33:25	125.5	
14:34:25	129.2	

Time	VOC (mgC/m ³)	Comment
14:35:25	127.0	
14:36:25	134.4	
14:37:25	132.9	
14:38:25	156.2	
14:39:25	147.1	
14:40:25	152.2	
14:41:25	144.3	
14:42:25	141.4	
14:43:25	156.4	
14:44:25	184.2	
14:45:25	174.4	
14:46:25	188.4	
14:47:25	161.2	
14:48:25	130.7	
14:49:25	107.0	
14:50:25	133.2	
14:51:25	145.1	
14:52:25	149.1	
14:53:25	153.8	
14:54:25	231.4	
14:55:25	254.1	
14:56:25	296.5	
14:57:25	213.9	
14:58:25	311.6	
14:59:25	191.1	
15:00:25	166.8	
15:01:25	150.1	
15:02:25	200.1	
15:03:25	153.8	
15:04:25	152.4	
15:05:25	113.1	
15:06:25	145.9	
15:07:25	109.6	
15:08:25	125.2	
15:09:25	116.5	
15:10:25	147.9	
15:11:25	109.0	
15:12:25	160.7	
15:13:25	138.4	
15:14:25	171.6	

Time	VOC (mgC/m ³)	Comment
15:15:25	239.9	
15:16:25	230.6	
15:17:25	248.9	
15:18:25	237.9	
15:19:25	238.2	
15:20:25	292.3	
15:21:25	228.1	
15:22:25	207.5	
15:23:25	172.1	
15:24:25	154.1	
15:25:25	144.6	
15:26:25	149.1	
15:27:25	124.1	
15:28:25	162.2	
15:29:25	133.1	
15:30:25	163.3	
15:31:25	143.8	
15:32:25	203.9	
15:33:25	210.7	
15:34:25	209.6	
15:35:25	164.6	
15:36:25	179.7	
15:37:25	163.6	
15:38:25	169.7	
15:39:25	154.9	
15:40:25	190.6	
15:41:25	161.2	
15:42:25	188.2	
15:43:25	156.2	
15:44:25	150.3	
15:45:25	156.9	
15:46:25	189.5	
15:47:25	154.4	
15:48:25	139.8	
15:49:25	138.5	
15:50:25	126.3	
15:51:25	125.0	
15:52:25	122.6	
15:53:25	129.7	
15:54:25	114.3	

Time	VOC (mgC/m ³)	Comment
15:55:25	103.5	
15:56:25	96.6	
15:57:25	94.0	
15:58:25	94.2	
15:59:25	88.4	
16:00:25	85.2	
16:01:25	81.3	
16:02:25	82.8	
16:03:25	115.9	
16:04:25	91.8	
16:05:25	79.6	
16:06:25	71.2	
16:07:25	75.5	
16:08:25	77.6	
16:09:25	81.0	
16:10:25	82.9	
16:11:25	90.3	
16:12:25	106.7	
16:13:25	104.1	
16:14:25	107.4	
16:15:25	117.0	
16:16:25	116.5	
16:17:25	93.5	
16:18:25	97.4	
16:19:25	104.1	
16:20:25	118.1	
16:21:25	117.0	
16:22:25	121.8	
16:23:25	106.1	
16:24:25	114.6	
16:25:25	95.8	
16:26:25	110.3	
16:27:25	102.1	
16:28:25	133.2	
16:29:25	100.0	
16:30:25	114.9	
16:31:25	112.7	
16:32:25	128.1	
16:33:25	159.8	
16:34:25	146.7	

Time	VOC (mgC/m ³)	Comment
16:35:25	111.2	
16:36:25	140.1	
16:37:25	123.3	
16:38:25	115.2	
16:39:25	126.0	
16:40:25	97.7	
16:41:25	140.9	
16:42:25	110.7	
16:43:25	104.9	
16:44:25	114.6	
16:45:25	131.3	
16:46:25	136.8	
16:47:25	135.2	
16:48:25	131.6	
16:49:25	153.5	
16:50:25	135.8	
16:51:25	1188.0	
16:52:25	1465.9	
16:53:25	1190.4	
16:54:25	954.8	
16:55:25	922.2	
16:56:25	812.6	
16:57:25	642.5	
16:58:25	588.7	
16:59:25	569.4	
17:00:25	529.1	
17:01:25	483.6	
17:02:25	498.4	
17:03:25	471.9	
17:04:25	487.8	
17:05:25	463.2	
17:06:25	483.6	
17:07:25	436.3	
17:08:25	457.1	
17:09:25	446.8	
17:10:25	457.7	
17:11:25	365.3	
17:12:25	357.1	
17:13:25	314.5	
17:14:25	295.9	

Time	VOC (mgC/m ³)	Comment
17:15:25	290.3	
17:16:25	298.6	
17:17:25	284.8	
17:18:25	340.6	
17:19:25	367.4	
17:20:25	376.4	
17:21:25	408.9	
17:22:25	392.9	
17:23:25	326.6	
17:24:25	339.9	
17:25:25	354.7	
17:26:25	299.6	
17:27:25	256.5	
17:28:25	207.8	
17:29:25	203.5	
17:30:25	184.2	
17:31:25	166.8	
17:32:25	152.5	
17:33:25	198.0	
17:34:25	230.6	
17:35:25	229.7	
17:36:25	220.0	
17:37:25	236.7	
17:38:25	185.1	
17:39:25	207.3	
17:40:25	236.3	
17:41:25	216.3	
17:42:25	188.0	
17:43:25	184.2	
17:44:25	179.8	
17:45:25	160.2	
17:46:25	138.2	
17:47:25	149.0	
17:48:25	130.3	
17:49:25	140.3	
17:50:25	127.1	
17:51:25	123.3	
17:52:25	117.8	
17:53:25	109.8	
17:54:25	108.6	

Time	VOC (mgC/m ³)	Comment
17:55:25	103.0	
17:56:25	99.0	
17:57:25	91.9	
17:58:25	83.4	
17:59:25	80.7	
18:00:25	81.3	
18:01:25	72.2	
18:02:25	73.6	
18:03:25	63.5	
18:04:25	68.6	
18:05:25	61.4	
18:06:25	57.4	
18:07:25	55.3	
18:08:25	55.3	
18:09:25	52.6	
18:10:25	49.0	
18:11:25	48.2	
18:12:25	47.7	
18:13:25	45.5	
18:14:25	45.8	
18:15:25	46.1	

Table 2 –Analyser Calibration Data

ANALYSER CALIBRATION DATA					
Pre Sampling Check					
		NO (ppm)	CO (ppm)	O ₂ (%)	VOC's (ppm)
Range					1000
Zero Gas	Cylinder No.				AIR
Span Gas	Cylinder No.				5702977
	Certified Value				897
Zero Check	Value				1
<2 x repeatability (Yes/No)					YES
Down Line Zero & Span Check					
Zero Gas	Value				2
	<2% of span				YES
Span Gas	Value				898
	Within 2% of span				YES
Post Sampling Drift Check					
Zero Gas	Value				2
	Drift (%)				0.0
	Validation				No Correction Required
Span Gas	Value				895
	Drift (%)				0.3
	Validation				No Correction Required

2.3 Appendix III: Uncertainty Calculation

2.3.1 Stack, Uncertainty Calculations

VOC - Measurement performance related to stationary conditions		
Performance characteristic	Uncertainty	Value of uncertainty quantity
Standard deviation of repeatability at zero	U_{r0}	0.80
Standard deviation of repeatability at span level	U_{rs}	0.10
Lack of fit	U_{rl}	3.74
Drift	U_{dr}	10.61
volume or pressure flow dependence	U_{spres}	0.00
atmospheric pressure dependence	U_{apres}	0.75
ambient temperature dependence	U_{temp}	0.00
NH ₃ (20 mg/m ³)	U_{interf}	0.00
CO ₂ (15%)	-	0.00
H ₂ O (30%)	-	0.00
Error on Logger voltage	-	1.00
Dependence on voltage	U_{vgt}	0.03
losses in the line (leak)	U_{leak}	2.51
Uncertainty of calibration gas	U_{calib}	2.51

VOC Measurement uncertainty		Result	217.74	mg/m ³
Combined uncertainty			11.87	mg/m ³
Expanded uncertainty	k = 2		23.73	mg/m ³
Uncertainty corrected to std conds			23.73	mg.m-3 (corrected)
Expanded uncertainty expressed with a level of confidence of 95%			15.82 % ELV	
Expanded uncertainty expressed with a level of confidence of 95%			23.73 mg.m-3 of result	

Total Particulates						
Parameter		Value	Units	Sensitivity coeff	Uncertainty contribution	Uncertainty as %
Corrected Volume (standard conditi	V	6.23	m ³	0.11	0.01 mg.m ⁻³	1.18 %
Mass	m	4.23	mg	0.16	0.08 mg.m ⁻³	12.37 %
Factor for O2 Correction	fc	1.00		0.68	0.00 mg.m ⁻³	0.00 %
Leak	L	0.01	mg.m ⁻³	1.00	0.01 mg.m ⁻³	1.15 %
Combined uncertainty					0.08 mg.m ⁻³	

Expanded uncertainty as percentage of measured value % measured of value expressed with a level of confidence of 95%
(Using a coverage factor k=2)

Expanded uncertainty in units of measurement mg.m⁻³

Expanded uncertainty as percentage of limit value % ELV

2.4 Appendix IV: Moisture Calculations

Test No	T2
Date	5-2-20
pbar (mbar)	1036
pbar (mmHg)	777
Nozzle Diameter (mm)	n/a
Temp of Meter (in)/(out) °C	11
DH _{ave} (mmH ₂ O)	17.5
DGM Cal Factor (Y)	0.9865

Site	Linx Printing Technologies
	Fluids Plant - Unit 4
Stack	Fluids Plant - Unit 4
Job Number:	R20134
Site Team:	YS+ NCK
Data Entered By:	YS

Enter Data into coloured cells only

Start Volume Reading	153.1368	m ³
End Volume Reading	159.4730	m ³
Volume Sampled	6.2507	m ³

Start time	10:15	hr:min
End time	18:15	hr:min
Total time	08:00	hr:min

IMPINGER	1	2	3	4	Initials of Analyst
Absorber Solution (Type):	H ₂ O	H ₂ O	KO IMP	SILICA	
Sample No:	n/a	n/a	n/a	n/a	
Analysis Required:	n/a	n/a	n/a	n/a	
Initial Weight of Impingers plus absorber (g)	829.7	802.7	800.7	895.6	NCK
Final Weight of Impingers plus absorber (g)	796.0	823.9	800.6	943.0	NCK
Weight Gain (g)	-33.7	21.2	-0.1	47.4	

Total Weight Gain (1+2+3+4) (g)	34.8
---------------------------------	------

Gas Volume of water at 0°C and 101.3kPa (l)	43.33
Gas Meter volume at 0°C and 101.3kPa (l)	6153.42

Moisture content of Gases (%)	0.7
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2.5 Appendix V: Particulate Calculations

SUMMARY OF PARTICULATE SAMPLING DATA

Stack ID		Fluids Plant – Unit 4	
Stack Dimensions (m)		0.50	
Date of Test		05-Feb-20	05-Feb-20
TEST NUMBER		T1	T2
Standard Applied (3405, 9096 or 13284)		13284	13284
Start Time	(hh:mm)	Field Blank	10:15
Stop Time	(hh:mm)		18:15
Duration	(minutes)		480
Sampled Gas Volume	(m3)		6.3362
Mean Pitot Pressure	(mm H2O)		1.75
Mean Sample Pressure	(mm H2O)		17.50
Mean Temperature DGM	(oC)		11.08
Mean Stack Temperature	(oC)		18.01
Corrected Sampled Gas Vol.	(Sm3@20oC)		6.6066
Corrected Sampled Gas Vol.	(Nm3@STP)		6.1557
Percent Isokinetic	(%)		110.20
Nozzle Diameter	(mm)		7.51
Filter Number		197328	197329
Filter Weight	(mg)	0.04	3.73
Probe Wash Weight	(mg)	0.50	0.50
Total Particulate Mass	(mg)	0.54	4.23
TPM Concentration @ 20oC	(mg/m3)	0.08	0.64
TPM Concentration @ STP	(mg/m3)	0.09	0.69
Analysing Laboratory UKAS No.		0605	0605
Stack Moisture	(%)v/v	0.70	0.70
Moisture Correction	dim'less	1.01	1.01
Oxygen Correction Factor	dim'less	1.00	1.00
Net Correction Factor	dim'less	0.99	0.99
TPM Concentration @ Ref.	(mg/(N)m3)	0.09	0.68
Stack Velocity	(m/s)		4.59
Volumetric Flow Rate	((N)m3/hr)		3,046
Mass Emission of Particulate	(g/hr)		2.08
Field Blank Value < 10% ELV		Okay	
Filter & Wash Pre-Conditioning Temperature:	≥180oC	180	180
Filter & Wash Post-Conditioning Temperature:	≥160oC	160	160

2.6 Appendix VI: Velocity Profile Data

PRELIMINARY VELOCITY, TEMPERATURE AND ANGLE MEASUREMENTS										
Only enter data into GREEN COLOUR squares - Amend plain squares if needed										
Stack ID	Unit 4 - Fluids Plant									
Stack Dimensions (m)			Rectangular				Job Number:	R20134		
Stack Dimensions (m)	0.50		Circular				Date:	05/02/2020		
	Pitot Cal.=Cp		0.8703		AREA (m ²)		Standard:		16911	
Sampling Line A					0.196		Sampling Line B			
Sample Point No.	Distance along line (m)	Pitot Static Reading (mmH ₂ O)	Del.P @0°	Swirl Angle Deg.	Gas Temp. (°C)	Distance along line (m)	Pitot Static Reading (mmH ₂ O)	Del.P @0°	Swirl Angle Deg.	Gas Temp. (°C)
1	0.05	2.4	0.5	1	20	0.05				
2	0.25	2.2	0.6	1	20	0.25				
3	0.45	1.1	0.2	1	20	0.45				
4										
5										
6										
7										
8										
9										
10										
	Mean (1)	1.87			19.60	Mean (2)				
	Swirl Noted? (Y/N)		N			Swirl Noted? (Y/N)				
Static Pressure (mmH ₂ O)	-0.4		Barometric Pressure (Inch Hg)		30.64		Average Velocity	4.75		m/s
CONFORMITY TO THE REQUIREMENTS OF THE APPLIED STANDARD										
Mean Flue Gas Temp. Tm (K) = 0.5(Mean (1) + Mean (2)) + 273 =						292.6k		Okay		
Permitted Range of Gas Temp.						Permitted %k		5%		5.0 to 34.2
Highest Pitot-Static Reading (in sample line A or B) =						2.4		(mmH ₂ O)		
Lowest Pitot-Static Reading (in sample line A or B) =						1.1		(mmH ₂ O)		
Ratio: Highest/Lowest (maximum 9:1)						9.0:1		Okay		2.2:1
Required Number of Sample Lines						2		Total Points to meet Standard		Yes
Required Points Per Line						2		Sample plane meet Standard?		No
Total Points Available						3		Flow Parameters Meet Standard?		Yes

