Report for Periodic Monitoring of Emissions to Atmosphere

Part 1:	**Executive Summary**
Permit Number:	**PPC/193**
Operator:	**Covpress Ltd.**
Installation:	**Coventry**
Emission Point:	**Burn Off Oven Exhaust**
Monitoring Date:	**17th August 2016**

UKAS TESTING
1709

mCERTS

Contract Reference:	FTBS 45018
Operator:	Covpress Ltd
Address:	Burnsall Road Canley Coventry CV5 6RT
Monitoring Organisation:	RPS Consultants
Address:	Noble House, Capital Drive, Linford Wood, MK14 6QP
Report Date:	5th September 2016
Report Approved By:	Glyn Harrison
Position:	Operations Manager
MCERTS Registration No.:	MM 03 228
MCERTS Certification Level:	2
Technical Endorsements:	TE1, TE2, TE3, TE4

Signature: [redacted]

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Monitoring Objectives

At the request of Steve Cottom of Covpress Ltd, RPS Consultants conducted stack emission monitoring at the Coventry site in August 2016.

The monitoring programme at this installation was carried out to provide data on emissions to atmosphere for comparison with the limits specified in the air emission criteria for this site.

The following tables detail the parameters requested for monitoring at each emission point and the actual monitoring conducted.

Table 1.1

Parameters Requested to be Monitored	Emission Point
	Burn Off Oven Exhaust
Total Particulate Matter	✓
Volatile Organic Compounds	✓
Oxides of Nitrogen	✓
Carbon Monoxide	✓
Total Particulate Matter	✓
Specific Requirements	Long Cycle 'Burn Off' (~270 minutes)

Notes:
✓ *Represents pollutants sampled*

Monitoring Results

Table 2.1 Monitoring results for the Burn Off Oven Exhaust, Carried out on 17th August 2016.

Substance Monitored	Emission Limit Value	Periodic Monitoring Result	Units	Uncertainty (Expressed expanded k=2)	Reference Conditions	Sampling Date	Sampling Times	Monitoring Reference Method	Accreditation Status	Operating Status
Carbon Monoxide	No Limit	275	mg/m^3	+/- 17	273K, 101.3kPa, Dry, 11% Oxygen	17/08/16	10:04 – 14:30	BS EN 15058:2006	MCERTS	Normal
	No Limit	0.13	kg/hr	-						
Oxides of Nitrogen	No Limit	99	mg/m^3	+/- 5.8	273K, 101.3kPa, Dry, 11% Oxygen	17/08/16	10:04 – 14:30	BS EN 14792:2005	MCERTS	Normal
	No Limit	0.048	kg/hr	-						
Total Particulate Matter	20	**52**	mg/m^3	+/- 2.3	273K, 101.3kPa, Dry, 11% Oxygen	17/08/16	10:04 – 14:34	BS EN 13284-1:2002	MCERTS	Normal
	No Limit	0.024	kg/hr	-						
Volatile Organic Compounds (as Carbon)	20	8.0	mg/m^3	+/- 0.25	273K, 101.3kPa, Dry, 11% Oxygen	17/08/16	10:04 – 14:34	BS EN 12619:2013	MCERTS	Normal
	No Limit	0.0039	kg/hr	-						

Note :

- *Result in **bold type** is over the Emission Limit Value*
- *Tests were undertaken during a 'long cycle' burn off*

Operating Information

Table 3.1 Operating conditions during the monitoring of the Burn Off Oven Exhaust, carried out on 17th August 2016

Parameter	Result
Sample Date	17/08/16
Process Type	Batch
Process Duration	270 Minutes
If 'Batch', was monitoring carried out over the whole batch?	Yes
Abatement/Operational?	Not Installed
Load	Oven loaded with "UK" bars.

Comparison of Operator CEM and Periodic Monitoring Results		
Substance	**CEMs Results (mg/m^3)**	**Periodic Monitoring Results (mg/m^3)**
No CEMS Installed/Data Available		

Monitoring Deviations

Table 4.1 Monitoring Deviations for Burn Off Oven Exhaust Emission Point

Pollutant	Substance Deviations	Monitoring Deviations	Other Relevant Issues
Carbon Monoxide, Oxides of Nitrogen & Volatile Organic Compounds	None	None	None
Total Particulate Matter	None	Monitoring conducted from a single traverse line.	None

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Part 2:	**Supporting Information**
Permit Number:	**PPC/193**
Operator:	**Covpress Ltd.**
Installation:	**Coventry**
Emission Point:	**Burn Off Oven Exhaust**
Monitoring Date:	**17th August 2016**

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APPENDIX 1: General Information

Monitoring Organisation Staff Details

Table 5.1 Sampling Personnel

Sampling Personnel	Role	MCERTS Level	Technical Endorsements	MCERTS Registration Number
Carl Redgrove	Team Leader	Level 2	TE1, TE2, TE3, TE4	MM 03 173
Jack Richmond	Technician	-	-	MM 15 1361

Table 5.2 Report Author

Report Author	Position	MCERTS Level	Technical Endorsements	MCERTS Registration Number
Carl Redgrove	Senior Consultant	Level 2	TE1, TE2, TE3, TE4	MM 03 173

Table 5.3 Report Reviewer

Report Reviewer	Position	MCERTS Level	Technical Endorsements	MCERTS Registration Number
Glyn Harrison	Operations Manager	Level 2	TE1, TE2, TE3, TE4	MM 03 228

Monitoring Organisation Method Details

Table 6.1 Monitoring Methods

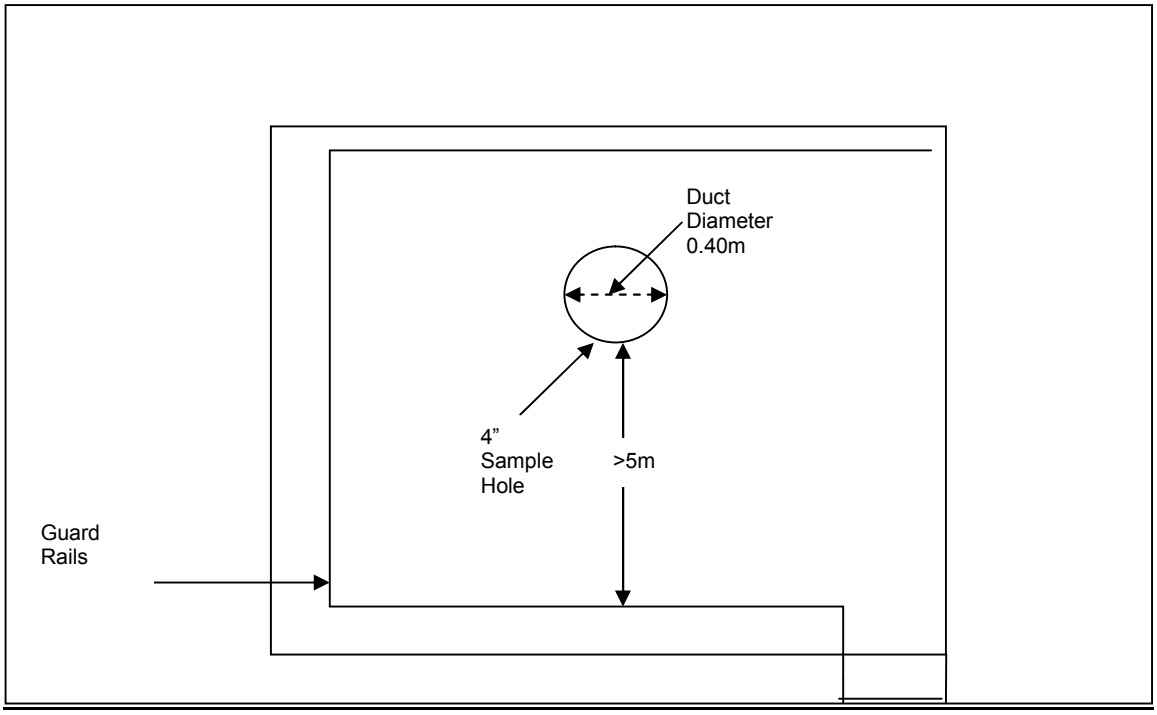
Emission Parameter	Standard Method	Monitoring Procedure No.	Monitoring Accreditation	Analysis	Analysis Procedure No.	Analytical Laboratory	Analysis Accreditation
Practical Considerations Prior to Monitoring	N/A	RPSCE/1/1	UKAS	N/A	N/A	N/A	N/A
Gas Flows	BS-EN 16911-1	RPSCE/1/2	MCERTS	N/A	N/A	N/A	N/A
Gas Temperatures	BS-EN 13284-1:2001	RPSCE/1/2	MCERTS	N/A	N/A	N/A	N/A
Carbon Monoxide	EN 15058:2006	RPSCE/1/21h	MCERTS	NDIR	N/A	N/A	N/A
Oxides of Nitrogen	EN 14792:2005	RPSCE/1/21f	MCERTS	Chemiluminescence	N/A	N/A	N/A
Low Concentration Total Particulate Matter	BS EN 13284-1:2002	RPSCE/1/7c	MCERTS	Gravimetric	D9	RPS Laboratories	UKAS
TOCs	BS EN 12619:2013	RPSCE/1/4b	MCERTS	Flame Ionisation Detector	N/A	N/A	N/A

Table 7.1 – Checklist Used

Equipment Checklist Used	File Location Address
FTBS 45018 Checklist	FTBS 45018 Electronic & Work File

APPENDIX 2:
Burn Off Oven Exhaust Sampling, Analysis & Uncertainty Data

Burn Off Oven Exhaust – Stack Diagram



Company Name: Covpress
Site Name: Coventry
Sampling Point Ref: Burn Off Oven
Project Reference: FTBS42088

Date: 17/08/16
Run: TPM

Mean Stack Temperature, oC	725.000
Traverse Stack Velocity, m/s	5.9
Stack Gas Volume Flow Rate, m3/s (scms wet)	0.232
Stack Gas Volume Flow Rate, m3/s (scms DRY) O2 Corrected	0.136

Δp Measurement units (Pa or mmH2O)	mmH2O
Pitot Coeficiant	0.847

Barometric	758	mmHg	**Leak Test**		
Static			Instrument range	250	mmH2O
Port A	1.2	mmH2O	Δp for leak test	187.5	mmH2O
Port B	1.2	mmH2O	Positive leakage rate	0.01	per 15secs
Mean	**1.2**	mmH2O	Negative leakage rate	0.01	per 15secs
			Pass/Fail	**Pass**	

Stagnation Test		
Static measurement		
Positive side	1.2	mmH2O
Negative side	1.2	mmH2O
Difference (Pa)	0	
Pass/Fail	**Pass**	

Stack Dimensions		
Circular diam A	0.40	m
Circular diam B	0.40	m
Circular Mean	0.40	m
Area	**0.1256636**	m^2

raverse Poir	Distance	Port A Δ p, 0				Swirl	Temp	Port B Δ p, 0				Swirl	Temp
	m	Reading 1	Reading 2	Reading 3	Average	Degrees	°C	Reading 1	Reading 2	Reading 3	Average	Degrees	°C
1	0.06	1	1	1	**1**		725	1	1	1	**1**		725
2	0.34	1	1	1	**1**		725	1	1	1	**1**		725

Gas Data	
Oxygen %	14.62
CO_2 %	3.46

Oxygen Correction	
Required Correction Value	11
Actual Oxygen Factor	1.58
Enter '0' if correction is not required	

BS EN 13284-1 & M1 Sample Point Requirements	Requirement Met?
Duct gas Flow: angle with regard to duct access <15°?	Y
Duct Gas Flow: No Negative Velocity: Not Permitted	Y
Duct Gas Flow: Ratio of max to min velocity <3:1?	Y
Working Area > $5m^2$?	Y
Handrails with removable chains / self closing gates across the top of the ladder?	Y
Handrails (approx 0,5 and 1,0 m high) and vertical baseboards (approx 0,25m high)?	Y
Scaffold Built to 'Heavy Duty' Scafftag Rating or at least 2.5kN/m2 loading	NA
Handrails not restricting access to ports?	Y
Room opposite sampling port equal or greater than the length of the sampling probe plus 1 metre?	Y
Sufficient Power (Waterproof 110V BS4343 Standard) close or on the platform?	Y

Company Name: Covpress
Site Ref: Coventry
Stack Ref: Burn Off Oven

Date: 17/08/16
Run: Gases

	O_2 %	CO_2 %	CO mg/m^3	CO kg/hr	NO_x mg/m^3	NO_x kg/hr		
Average	**14.62**	**3.46**	**275.0**	0.134	**98.83**	0.048		
Max	**16.04**	**6.16**	**1046.6**	0.512	**175.32**	0.09		
Min	**10.89**	**-0.10**	**7.7**	0.004	**1.73**	0.00		
Emission Limit			**N/A**		**N/A**			
Moisture, %	**7.7**		**Baromteric (mmHg) Start**			758		
Oxygen Reference, %	**11.0**		**Baromteric (mmHg) End**			758		

Stack Gas Volume Flow Rate, m3/s (scms DRY) O2 Corrected	0.135789

Calibrations	O_2 %	CO_2 %	CO ppm	NO ppm	
Analyser - Start Zero	0.00	0.00	0.6	0.0	
Analyser - Start Span	14.63	8.05	110.3	212.0	
Analyser - Zero Check	0.02	0	0.2	-0.2	
System - Zero Check	0.10	-0.03	1.0	0.5	
System - Span Check	14.72	8.05	111.5	211.0	
System - End Zero Check	0.08	0	1.3	1.0	
System - End Span Check	14.75	7.92	111.2	209.2	
Cylinder Number					
Span Value	14.63	8.05	110	210	
Analyser Range (0 - X)	25	20	5000	250	Not in Use

Equipment ID Nos	
Analyser	**278**

Uncertainty calculation for Gaseous Measurement of Carbon Monoxide EN 15058

Measured concentration - CO	334.6	**mg/m^3 (O_2 & H_2O uncorrected)**	**Analyser Make/Model**	Horiba PG250
Range (Max Value)	6250.0	**mg/m^3**	**ID Number**	**278**

Performance Characteristics		**Value**			**specification**
Response time			seconds		< 200 s
Logger sampling interval		60	seconds		
Measurement period		145	minutes		
Number of readings in measurement		145	Assuming 60 Second Readings over 2.41666666666667 hour period		
Repeatability at zero		0	% of Range		< 1% Range
Repeatability at span level		0	% of Range		< 2% of Range
Deviation from linearity		0	% of Range		< 2% of Range
Zero drift (during measurement period)		0.2727273	% of Range		< 2% of Range
Span drift (during measurement period)		-0.272727	% of Range		< 2% of Range
volume or pressure flow dependence		0	% of fs / 10l/h		< 1% range
atmospheric pressure dependence		0	% of Range/kPa		< 1.5 % range
ambient temperature dependence		-0.07	% of Range /K		<0.3 % range /K
CO_2 (% vol)	15		% by volume per		
CH4 (mg/m^3)	57		mg/m^3		
N_2O (mg/m^3)	42		mg/m^3		
	Total	0	% of Range		< 4% of Range (Total)
Dependence on voltage		0.1	% by volume /10V	+- 5%	< 2% of Range/10 volt
Losses in the line (leak)		2	% of value		< 2% of value
Uncertainty of calibration gas		2	% of value		

Performance characteristic			**Uncertainty**		**Value of uncertainty quantity**		**% vol**
Standard deviation of repeatability at zero			u_{r0}		for mean		Only use rep at span
Standard deviation of repeatability at span level			u_{rs}		for mean		0.000
Lack of fit			u_{fit}				0.000
Drift			u_{0dr}				0.000
volume or pressure flow dependence			u_{spres}				0.000
atmospheric pressure dependence			u_{apres}				0.000
ambient temperature dependence			u_{temp}				-0.008
CO_2							0.000
NO							0.000
NO_2							0.000
dependence on voltage			u_{volt}				0.000
losses in the line (leak)			u_{leak}				3.86
Uncertainty of calibration gas			u_{calib}				3.86

Measurement Concentration	**334.63**	**mg/m^3**	
Combined uncertainty	5.46	**mg/m^3**	
Coverage factor k = 2			
Expanded uncertainty (as measured)	10.93	mg/m^3	**(expressed with a level of confidence of 95%)**
Expanded uncertainty (Corrected to Ref Conditions)	**17.24**	mg/m^3	

Uncertainty calculation for Gaseous Measurement of Oxides of Nitrogen BS EN 14792

Measured concentration - NOx	107.7	**mg/m³ (O_2 & H_2O uncorrected)**	**Analyser Make/Model**	Horiba PG250
Range (Max Value)	513.4	**mg/m³**	**ID Number**	278

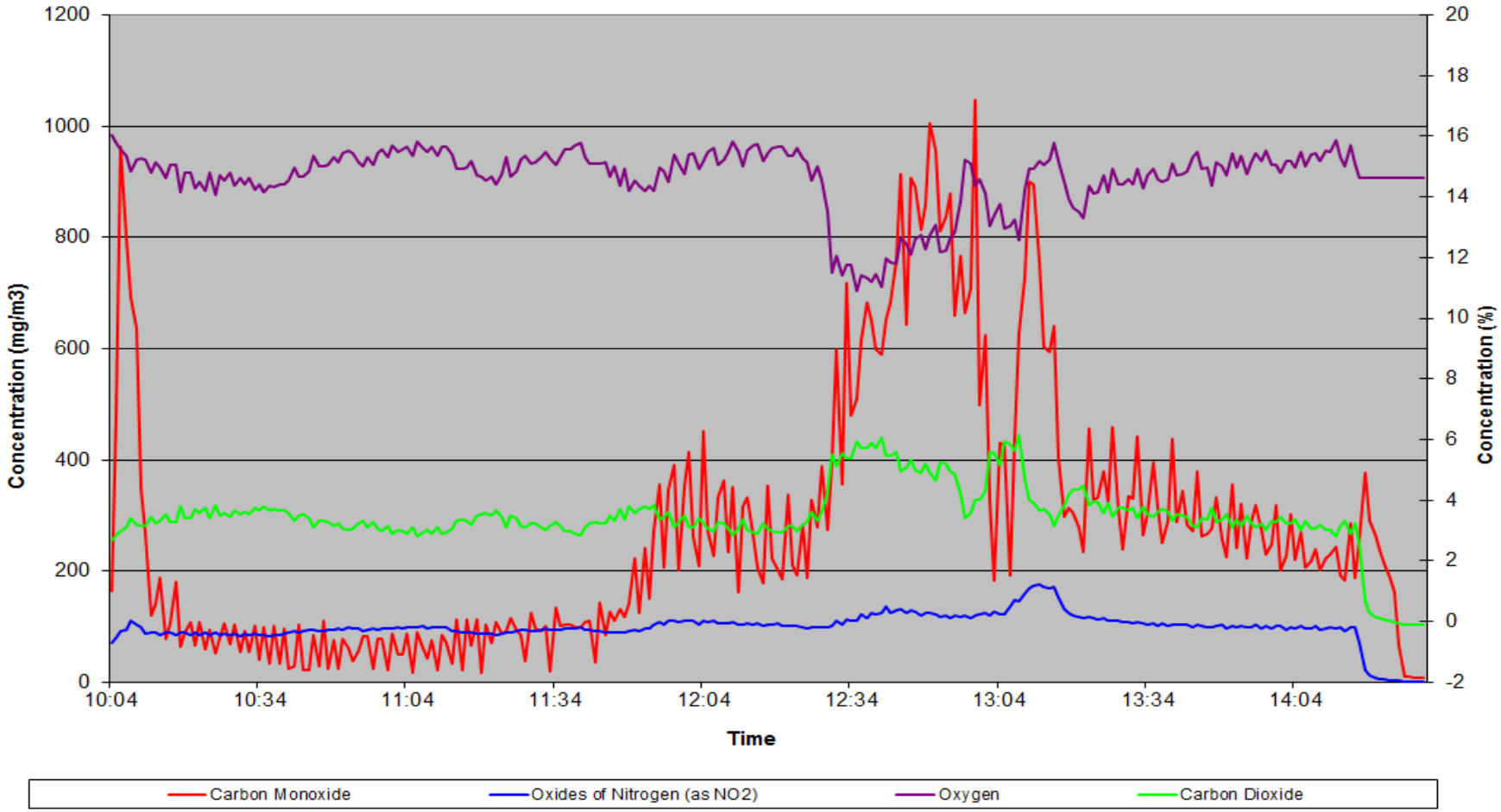
Performance Characteristics		Value			specification
Response time		13	seconds		< 180 s
Logger sampling interval		60	seconds		
Measurement period		145	minutes		
Number of readings in measurement		145	Assuming 60 Second Readings over 2.41666666666667 hour period		
Repeatability at zero		0.02	% full range		0.2
Repeatability at span level		0.02	% full range		2.0
Deviation from linearity		0.14	% of Value		2
Zero drift (during measurement period)		0.2380952	% full range		2
Span drift (during measurement period)		-0.857143	% full range		2
volume or pressure flow dependence		0	% of fs / kPa		0.033
atmospheric pressure dependence		0	% of fs/kPa		0.75
ambient temperature dependence		-0.07	% by volume /10K		0.3
CO_2 (% vol)	15		% by volume per		
CH_4 (mg/m³)	57		mg/m³		
NH_3 (mg/m³)	20		mg/m³		
Converter Efficiency		98.78	%		95%
Dependence on voltage		0.1	% by volume /10V		2% Full Scale /10 volt
Losses in the line (leak)		2	% of value		2% of value
Uncertainty of calibration gas		2	% of value		2% of value

Performance characteristic			Uncertainty	Value of uncertainty quantity			% vol
Standard deviation of repeatability at zero			u_{r0}		for mean		Only use rep at span
Standard deviation of repeatability at span level			u_{rs}		for mean		0.002
Lack of fit			u_{fit}				0.415
Drift			u_{0dr}				-0.385
volume or pressure flow dependence			u_{spres}				0.000
atmospheric pressure dependence			u_{apres}				0.000
ambient temperature dependence			u_{temp}				-0.008
CO_2							0.000
NO							0.000
NO_2							0.000
Converter Efficiency			u_{ceff}				0.01
dependence on voltage			u_{volt}				0.000
losses in the line (leak)			u_{leak}				1.24
Uncertainty of calibration gas			u_{calib}				1.24

Measurement Concentration (as measured)	**107.73**	**mg/m³**	
Combined uncertainty	1.85	mg/m³	
Coverage factor k = 2			
Expanded uncertainty (as measured)	3.70	mg/m³	**(expressed with a level of confidence of 95%)**
Expanded uncertainty (Corrected to Ref Conditions)	**5.83**	**mg/m³**	

Combustion Gas Emissions from the Burn Off Oven Exhaust at Covpress, Coventry on 17th August 2016

reference conditions expressed as 273K, 101.3 kPa, 11% O2 and dry gas



Company Name: Covpress
Site Name: Coventry
Project Reference: FTBS45018
Date: 17/08/16
Run: TPM
Sampling Point Ref: Burn Off Oven

In-stack Filter?	No	Bar. Press.mm H	758	K Factor	5.578583632	Ambient Temp.		Leak Rate (fin / %	0
Outstack Filter	Yes	Cp	0.847	Dn used	9.283	Start Time	10:04	Leak Rate (start /	0
Operators	CR JR	Bws%		Nozzle No.		Stop Time	14:34	Box/Probe setting	160 +/- 5 °C
				Meter Correction Yd	0.996				

Sample Filter Weights

	Sample ID	Laboratory	Increase, mg
Filter	135269	RPS	4.65
Probe Washings	30010682	RPS	59.02

Sample Filter Blank Weighings

	Sample ID	Laboratory	Increase, mg
Filter	135266	RPS	**0.23**
Probe Wash	30010681	RPS	**0.5**

Note: Results in Bold are reported at the L.O.D.

Impinger Weights

Weights	Initial	Final	Increase, g
Impinger 1	686.1	793.7	107.6
Impinger 2	699.1	718.7	19.6
Impinger 3	581.2	578.1	-3.1
Impinger 4			0.0
Impinger 5			0.0
Silica Gel	937	942.1	5.1
		Total	129.2

Sample Point	Clock Time min	Pitot Δ p, mm H_2O	Stack Temp, °C	Orifice Δ H, mm H_2O		Gas Meter Reading m^3	Temp at Gas Meter Outlet °C	Condenser Temp, °C	Filter Box Temp °C	Probe Temp °C	Pump Vacuum Inches Hg	Impinger Stem Temp. °C	Root Δ p,
				Desired	Actual								
	0	1	300	5.6	5.6	1561530	19		120		0	19	1.000
	10	1	700	5.6	5.6		18		120		0	18	1.000
	20	1	760	5.6	5.6		20		120		0	19	1.000
	30	1	736	5.6	5.6		22		120		0	19	1.000
	40	1	764	5.6	5.6		23		120		1	20	1.000
	50	1	757	5.6	5.6		24		120		2	20	1.000
	60	1	762	5.6	5.6		25		120		3	20	1.000
	70	1	765	5.6	5.6		25		120		4	20	1.000
	80	1	752	5.6	5.6		26		120		5	15	1.000
	90	1	750	5.6	5.6		27		120		6	17	1.000
	100	1	771	5.6	5.6		27		120		7	17	1.000
	110	1	784	5.6	5.6		28		120		8	17	1.000
	120	1	757	5.6	5.6		29		120		9	17	1.000
	130	1	763	5.6	5.6		31		120		10	17	1.000
	140	1	772	5.6	5.6		32		120		11	18	1.000
	150	1	770	5.6	5.6		32		120		12	18	1.000
	160	1	745	5.6	5.6		32		120		0	18	1.000
	170	1	765	5.6	5.6		33		120		0	18	1.000
	180	1	732	5.6	5.6		34		120		0	18	1.000
	190	1	738	5.6	5.6		34		120		0	18	1.000
	200	1	757	5.6	5.6		34		120		0	18	1.000
	210	1	722	5.6	5.6		34		120		0	18	1.000
	220	1	732	5.6	5.6		34		120		0	18	1.000
	230	1	704	5.6	5.6		34		120		0	17	1.000
	240	1	765	5.6	5.6		34		120		0	18	1.000
	250	1	735	5.6	5.6		34		120		0	18	1.000
	260	1	517	5.6	5.6		34		120		0	18	1.000
Endpoint	270					1563666							
	270.00	**1.000**	**725.0**	**5.6**	**5.6**	**2.136**	**28.9**	**#DIV/0!**	**120.0**	**#DIV/0!**	**2.9**	**18.1**	**1.0**

Company Name: Covpress
Site Name: Coventry
Project Reference: FTBS45018

Date: 17/08/16

Sampling Point Ref: Burn Off Oven	Run: TPM
Meter Volume Sampled, acm	2.136
Sample Run Start Time	10:04
Sample Run End Time	14:34
Total Actual Sampling Time, min	270.0
Barometric Pressure, mm Hg	758.00
Stack Pressure, mm Hg	758.09
Average Stack Temp, ^{o}C	725.0
Meter Volume at STP, scm	1.919
Stack Moisture Content, %	7.7
Average Stack Velocity, m/sec	6.389
Nozzle Diameter, mm	9.28
% Isokinetic Variation	**108.6**
Total Mass of Particulate, mg	63.7
Percentage of Total Particulate Collected on Filter	7.3
Stack Particulate Concentration, mg/m^3	**52.305**
Particulate Mass rate, kg/hour	0.0241
Emission Limit value	**20**

Sample Train Blank Results	
Sample Blank Particulate Concentration, mg/m^3	0.55
Total Weight Gain, mg (Sample Train Blank)	0.73
Blank Result Less than 10% of Limit Value	Y

Uncertainty Calculation for Total Particulate Matter to BS EN 13284-1

Determined Concentration	52.305	mg/m3 (at Reference Cond)

Measured Values

Sampled Volume	2.136	m^3
Sampled gas Temperature	301.8518519	k
Sampled gas Pressure	101.08	kPa
Sampled gas Humidity	0	% by volume
Oxygen content	14.62	% by volume
Mass	63.67	mg

Leak	0.00	%
Uncollected Mass	0	mg

Standard Uncertainties for Measured Values

Sampled Volume	0.001	m3
Sampled gas Temperature	2	k
Sampled gas Pressure	1	kPa
Sampled gas Humidity	1	% by volume
Oxygen content	0.1	% by volume
Mass	0.14152385	mg

Uncertainty Calculation for Volume Correction

Volume Correction Factor	0.902		
	Sensitivity Coefficient		**Uncertainty, Uv**
Sampled gas Temperature	0.0030		0.0060
Sampled gas Pressure	0.0089		0.0089
Sampled gas Humidity	0.0090		0.0090
		Sqrt (Uv)^2	0.0140
		Total Uv	**0.030**

Uncertainty Calculation for Oxygen Correction

Oxygen Correction Factor	1.5764		
	Sensitivity Coefficient		**Uncertainty, Uo**
Oxygen Measurement	0.2486		0.0249
		Total Uo	**0.0249**

Uncertainty Contributions (Itemised)

	Value		Sensitivity coefficient	Uncertainty Contribution			
				Concentration		%	
Volume Correction	1.919	m3	27.26	0.82	$mg.m^{-3}$	1.56	%
Mass (weighing)	63.67	mg	0.82	0.12	$mg.m^{-3}$	0.22	%
Oxygen Correction	1.5764		33.18	0.83	$mg.m^{-3}$	1.58	%
System Leak	0.00	$mg.m^{-3}$	1.00	0.00	$mg.m^{-3}$	0.00	%
Uncollected Mass	0.00	mg	0.82	0.00	$mg.m^{-3}$	0.00	%
			Total Uncertainty	**1.17**	**$mg.m^{-3}$**		

Uncertainty Result (Uncertainty has been expanded with a coveragefactor of 2 (K=2))

Expanded Uncertainty =	**2.3344**	**$mg.m^{-3}$**
=>	**4.46**	**% of Result**
=>	**11.67**	**% of ELV**

Company Name: Covpress
Site Name: Coventry
Sampling Point Ref:Burn Off Oven

Date: 17/08/16
Run: VOC

	VOC (as Carbon) ppm	VOC (as Carbon) mg/m3	VOC (as Carbon) kg/h			Oxygen %
Average	2.93	8.04	0.0039			14.62
Max	69.00	189.40	0.0926			16.04
Min	0.00	0.00	0.0000			10.89
Emission Limit		20.00				
Moisture, %	7.7					
Oxygen Reference, %	11.0					

Stack Gas Volume Flow Rate, m3/s (scms Dry) O2 Corrected	0.1359

Calibrations	ppm
Analyser - Start Zero	0.00
Analyser - Start Span	900.00
Analyser - Zero Check	-0.50
System - Zero Check	0.00
System - Span Check	900.00
System - End Zero Check	1.50
System - End Span Check	904.00
Span Value	900.00
Analyser Range (0 - X)	1000

Equipment ID	
FID	1575

ISO 14956 Calculation Sheet - TOC (BS EN 12619)

Studied Concentration (mg/m^3 as C)	8.036857063
Range of Instrument (mg/m^3 as C)	1607

Sampling Parameters to be met	Requirement Met?
Response Time < 60s	Yes
Operating temperature (5 - 45ºC)	Yes
Atmospheric pressure (700 - 1240 mbar)	Yes
Relative Humidity (10 - 90%, non condensing)	Yes
Altitude (< 2000 m)	Yes
Zero Drift 2% of FS	Yes
Span Drift 4% of FS	Yes

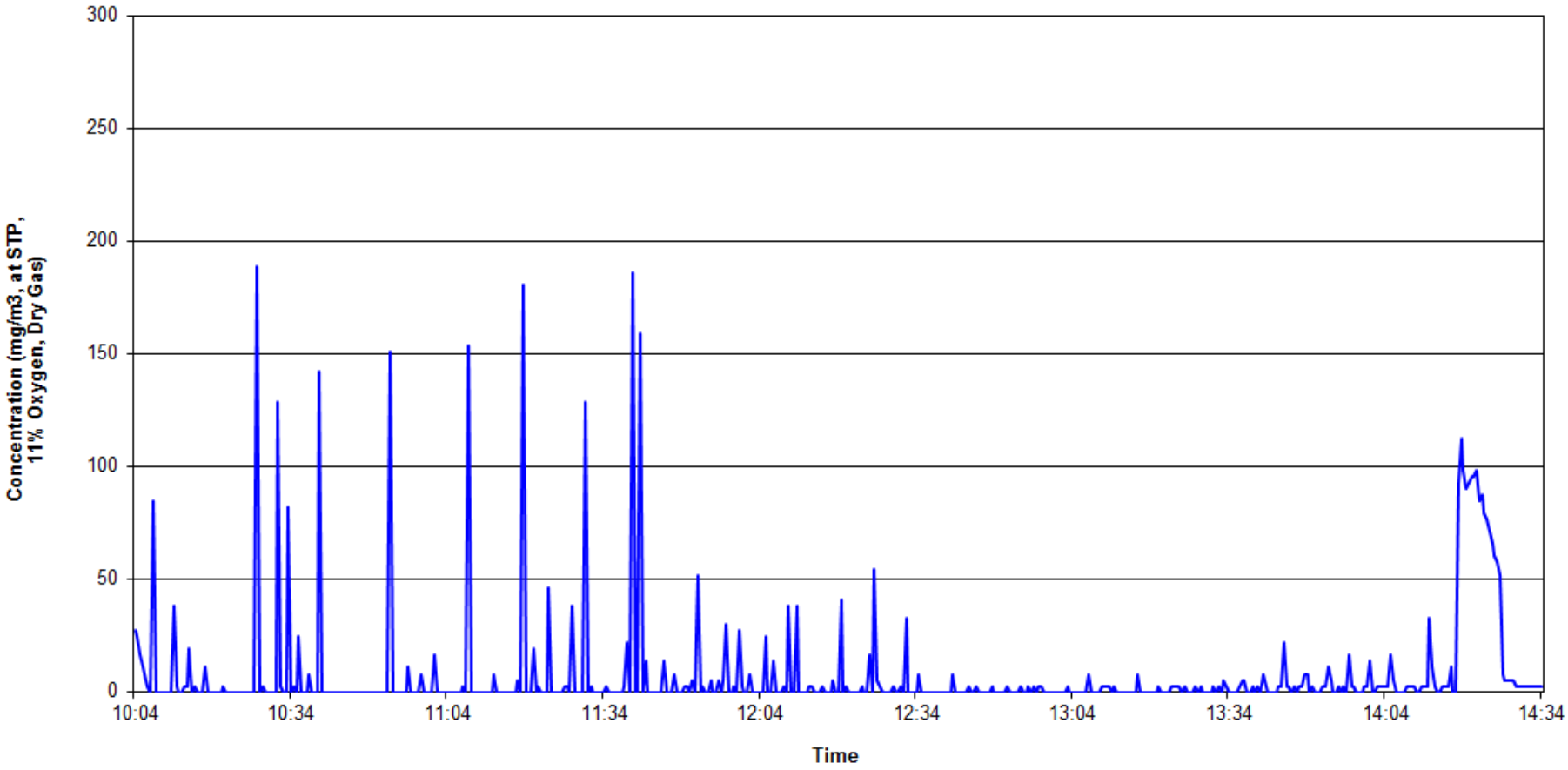
Selected Performance Characteristic	Value of Performance Characteristic			Operating Conditions compared to calibration condition		
	%	Numerical	Units	Required	Variable due to sampling conditions	Units
Deviation from Linearity	1	0.01	% FS	0.01	1	% FS
Repeatability Standard Deviation	1	0.01	% FS	0.01	1	% FS
8 Hour Drift	2	0.02	%	0.02	1	%
Atmospheric Pressure Dependence	0.1	0.001	% kPa	0.001	1	% kPa
Temperature Dependence	0.2	0.002	%K	0.002	1	%K
Sum Interference	2	0.02	%	0.02	2	%
Voltage Supply	0.1	0.001	%V	0.001	1	%V
Uncertainty of Calibration Gas	2	0.02	%	0.02	1	%
Moisture Effect	1	0.01	%Vol H2O Error	0.01	2	%Vol H2O Error
Loss in sample line (Leaks)	2	0.02	%	0.02	2	%

Measurement Performance related to stationary conditions								
			Value of Uncertainty Quantity					
			At Calibration Conditions			At Sampling Conditions		
Performance Characteristic	Uncertainty Quantity		Units	U	U^2	Units	U	U^2
Deviation form Linearity	U_{Fit}		% FS	16.07	258.245	% FS	0.0803686	0.006
Repeatability Standard Deviation	U_R		% FS	0.046	0.002	% FS	0.046	0.002
8 Hour Drift	U_{drift}		%	0.0928	0.009	%	0.093	0.009
Atmospheric Pressure Dependence	U_{Atmos}		% / kPa	0.005	0.000	% / kPa	0.005	0.000
Temperature Dependence	U_{Temp}		% / K	0.009	0.000	% / K	0.009	0.000
Sum Interference	$U_{Interference}$		%	0.093	0.009	%	0.005	0.000
Voltage Supply	$U_{Voltage}$		% / V	0.005	0.000	% / V	0.005	0.000
Uncertainty of Calibration Gas	$U_{Calibration\ gas}$		%	0.093	0.009	%	0.093	0.009
Loss in sample line (Leaks)	$U_{Losses,\ leak}$		%	0.093	0.009	%	0.186	0.034
			Sum	16.506	258.282	Sum	0.521	0.060

Measurement Uncertainty at	8.036857063	mg/m^3 C			
U_{tot}	0.246	mg/m^3 C			
$U_{tot}{}^{/c}$	3.059	%	U_{limit}	30	%

TOC Emissions Profile from the Burn off Oven Exhaust on 17th August 2016 at Covpress, Coventry

reference conditions expressed as 273K, 101.3 kPa,11 % O2 and dry gas



APPENDIX 3:
Laboratory Data

RPS

UKAS TESTING 0505

Test Certificate

Date 30/08/2016

Client	RPS Milton Keynes HSED Noble House Capital Drive Linford Wood Milton Keynes MK14 6QP	Order No.	FTBS 45018
		Certificate No.	WK16-5130
		Issue No.	1
Contact	Carl Redgrove	Date Received	19/08/2016
Description	2 filters & 2 washes for TPM	Technique	Gravimetric Stack

Sample No.	896544	135266	Method
Total particulate matter		0.23 mg	D9(U)
Sample No.	**896545**	**30010681**	**Method**
Total particulate matter		<0.5 mg	D9(U)
Sample No.	**896546**	**135269**	**Method**
Total particulate matter		4.65 mg	D9(U)
Sample No.	**896547**	**30010682**	**Method**
Total particulate matter		59.02 mg	D9(U)

RPS Laboratories Ltd. Unit 12. Waters Edge Business Park. Modwen Road. Salford. M5 3EZ
Tel: (0161) 872 2443 Fax: (0161) 877 3959

0505

Date 30/08/2016

Test Certificate

Client	RPS Milton Keynes HSED	Certificate No.	WK16-5130
		Issue No.	1

Tested By	Kirstie Davenport	Date	26/08/2016
Approved By	[redacted]	Date	30/08/2016

Joanne Dewhurst
Operational Manager

For and on authority of RPS Laboratories Ltd.

Method Symbols (U) Analysis is UKAS Accredited
(N) Analysis is not UKAS Accredited

Concentration values (mg/m3 and ppm) are calculated on the basis of information provided by the customer.
Results stated as ml are refering to the sample volume.

RPS Laboratories terms and conditions apply - a copy is available on request.
Analysis carried out on samples 'as received'

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