Report for Periodic Monitoring of Emissions to Atmosphere

Part 1:	**Executive Summary**
Permit Number:	**N/A**
Operator:	**Dunlop Oil and Marine**
Installation:	**Grimsby**
Emission Point(s):	**Rubber Mix 4 Inch Mill And Extraction**
Monitoring Date(s):	**15th January 2016**

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Contract Reference:	FTBS 38567
Operator:	Dunlop Oil and Marine
Address:	Moody Lane, Pyewipe, Grimsby, North East Lincolnshire. DN312SY
Monitoring Organisation:	RPS Consultants
Address:	Noble House, Capital Drive, Linford Wood, Milton Keynes, MK14 6QP
Report Date:	16th February 2016
Report Approved By:	Waheed Rasul
Position:	Consultant
MCERTS Registration Number:	MM 07 851
MCERTS Certification Level:	Level 2
Technical Endorsements:	TE1, TE2, TE3, TE4
Signature:	

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Monitoring Objectives

At the request of Chris Allen of Dunlop Oil and Marine Ltd. RPS Consultants conducted stack emission monitoring at the Moody Lane site in Grimsby in January 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
	Rubber Mix 4 Inch Mill
Total Particulate Matter	✓
Specific Requirements	Normal

Note : ✓ *Represents pollutants sampled*

Table 1.2

Parameters Requested to be Monitored	Emission Point
	Extraction
Total Particulate Matter	✓
Specific Requirements	Normal

Note : ✓ *Represents pollutants sampled*

Monitoring Results

Table 2.1 Monitoring results for the Rubber Mix 4 Inch Mill, Carried out on 15/01/2016

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
Total Particulate Matter	None Set	2.5	mg/m^3	+/-0.25	273K, 101.3kPa, Wet	15/01/16	13:50 ï 14:55	BS EN 13284-1:2002	None	Normal
	None Set	0.0326	kg/hr							

Table 2.2 Monitoring results for the Extraction, Carried out on 15/01/2016

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
Total Particulate Matter	None Set	0.095	mg/m^3	+/- 0.020	273K, 101.3kPa, Wet	15/01/16	11:00 ï 14:45	None	None	Normal
	None Set	N/A	kg/hr							

Operating Information

Table 3.1 Operating conditions during the monitoring of the Rubber Mix 4 Inch Mill emission point, carried out on 15/01/2016

Parameter	Result
Sample Date	15/01/06
Process Type	Normal
Process Duration	Continuous
If 'Batch', was monitoring carried out over the whole batch?	NA
Abatement/Operational?	NA

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		

Table 3.2 Operating conditions during the monitoring of the Extraction emission point, carried out on 15/01/2016

Parameter	Result
Sample Date	15/01/06
Process Type	Normal
Process Duration	Continuous
If ôBatchõ was monitoring carried out over the whole batch?	NA
Abatement/Operational?	NA

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 the Rubber Mix 4 Inch Mill Emission Point

Pollutant	Substance Deviations	Monitoring Deviations	Other Relevant Issues
Total Particulate Matter	None	None	None

Table 4.2 Monitoring Deviations for the Extraction Emission Point

Pollutant	Substance Deviations	Monitoring Deviations	Other Relevant Issues
Total Particulate Matter	None	None Accredited	Sample location does not allow for accredited testing as detailed in the proposal. No traverse profile could be carried out.

Report for Periodic Monitoring of Emissions to Atmosphere

Part 2:	**Supporting Information**
Permit Number:	**N/A**
Operator:	**Dunlop Oil and Marine**
Installation:	**Grimsby**
Emission Point(s):	**Rubber Mix 4 Inch Mill and Extraction**
Monitoring Date(s):	**15th January 2016**

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Contract Reference:	FTBS 38567
Operator:	Dunlop Oil and Marine
Address:	Moody Lane, Pyewipe, Grimsby, North East Lincolnshire. DN312SY
Monitoring Organisation:	RPS Consultants
Address:	Noble House, Capital Drive, Linford Wood, Milton Keynes, MK14 6QP
Report Date:	16th February 2016
Report Approved By:	Waheed Rasul
Position:	Consultant
MCERTS Registration Number:	MM 07 851
MCERTS Certification Level:	Level 2
Technical Endorsements:	TE1, TE2, TE3, TE4
Signature:	

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APPENDIX 1: General Information

Monitoring Organisation Staff Details

Table 5.1 Sampling Personnel

Sampling Personnel	Position	MCERTS Level	Technical Endorsements	MCERTS Registration Number
Chris Davies	Consultant	Level 2	TE1, TE2, TE3, TE4	MM 03 252
James Beechey	Technician	Level 1	TE1, TE2	MM 11 1144

Table 5.2 Report Author

Report Author	Position	MCERTS Level	Technical Endorsements	MCERTS Registration Number
Chris Davies	Consultant	Level 2	TE1, TE2, TE3, TE4	MM 03 252

Table 5.3 Report Reviewer

Report Reviewer	Position	MCERTS Level	Technical Endorsements	MCERTS Registration Number
Waheed Rasul	Consultant	Level 2	TE1, TE2, TE3, TE4	MM 07 851

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 13284-1:2001	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
Low Concentration Total Particulate Matter	BS-EN 13284-1:2001	RPSCE/1/7c	MCERTS	Gravimetric	D9	RPS Laboratories	UKAS

Table 7.1 – Checklist Used

Equipment Checklist Used	File Location Address
FTBS38567 Checklist	FTBS38567 Electronic & Work File

APPENDIX 2:
Rubber Mix 4 Inch Mill Sampling, Analysis & Uncertainty Data

Stack Diagram

Company Name: Dunlop Oil and Marine
Site Name: Grimsby
Sampling Point Ref: 4 Inch Mill
Project Reference: FTBS38567

Date: 15/01/16
Run: TPM

Δp Measurement units (Pa or mmH2O)	mmH2O

Barometric	753	mmHg	Leak Test		
Static			Instrument range		mmH2O
Port A	2	mmH2O	Δp for leak test		mmH2O
Port B	2	mmH2O	Positive leakage rate		per 15secs
Mean	**2**	mmH2O	Negative leakage rate		per 15secs
			Pass/Fail	**Fail**	

Stagnation Test		
Static measurement		
Positive side	0.1	mmH2O
Negative side	0.1	mmH2O
Difference (Pa)	**0**	
Pass/Fail	**Pass**	

Stack Dimensions		
Rectangular A		m
Rectangular B		m
Circular diam A	0.6	m
Circular diam B	0.6	m
Circular Mean	0.6	m
Area	**0.2827431**	m^2

Traverse Point	Distance	Port A						Port B					
		Δ p, mmH2O				Swirl	Temp	Δ p, mmH2O				Swirl	Temp
	m	Reading 1	Reading 2	Reading 3	Average	Degrees	°C	Reading 1	Reading 2	Reading 3	Average		°C
1		16	16	16	**16.0**		12	15.5	16	16	**15.8**		12
2		17	17	17	**17.0**		12	16	16.5	16	**16.2**		12
3		17	17	16.5	**16.8**		12	16.5	17	16.5	**16.7**		12
4		16.5	16	16	**16.2**		12	17	17	16.5	**16.8**		12
5		17	16.5	16	**16.5**		12	17	17	16.5	**16.8**		12
6		16.5	17	16.5	**16.7**		12	17	17	17	**17.0**		12
7		16.5	16.5	16	**16.3**		12	16.5	16.5	17	**16.7**		12
8		16.5	16	16	**16.2**		12	16.5	17	16.5	**16.7**		12
9		16	16	15.5	**15.8**		12	16.5	17	16.5	**16.7**		12
10		16	16	16	**16.0**		12	16	16.5	16	**16.2**		12

Gas Data	
Oxygen %	20.9
CO_2 %	0.10
CO %	0.1

Oxygen Correction	
Required Correction Value	0
Actual Oxygen Factor	1.00
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°?	Yes
Duct Gas Flow Negative Velocity: Not Permitted	Yes
Duct Gas Flow: Ratio of max to min velocity <3:1?	Yes
Working Area > $5m^2$?	Yes
Handrails with removable chains / self closing gates across the top of the ladder?	Yes
Handrails (approx 0,5 and 1,0 m high) and vertical baseboards (approx 0,25m high)?	Yes
Scaffold Built to 'Heavy Duty' Scafftag rating or $2.5kN/m^2$ load rating minimum	NA
Handrails not restricting access to ports?	Yes
Room opposite sampling port equal or greater than the length of the sampling probe plus 1 metre?	Yes
Sufficient Power (Waterproof 110V BS4343 Standard) close or on the platform?	Yes

Company Name: Dunlop Oil and Marine		In-stack Filter?	Y	Bar. Press.mm Hg	753	K Factor	2.57	Ambient Temp.	12	Leak Rate (fin / %)	0.02
Site Name: Grimsby											
Project Reference: FTBS38567		Outstack Filter?	N	Cp	0.823	Dn used	5.8	Start Time	13:50	Leak Rate (start / %)	0.02
Date:	15/01/16										
Run:	TPM	Operators	CD - JB	Bws%	1	Nozzle No.	FYS367 -6	Stop Time	14:55	Box/Probe setting	160 +/- 5 °C
Sampling Point Ref: 4 Inch Mill											
						Meter Correction Yd	0.978				

Sample Filter Weights

	Sample ID	Laboratory	Increase, mg
Filter	128116	RPS	2.01
Probe Washings	20009734	RPS	1.04

Sample Filter Blank Weighings

	Sample ID	Laboratory	Increase, mg
Filter	125691	RPS	**0.04**
Probe Wash	20009733	RPS	**0.5**

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

Impinger Weights

Weights	Initial	Final	Increase, g
Impinger 1	798.8	793.8	-5.0
Impinger 2	592.8	592.4	-0.4
Impinger 3			0.0
Impinger 4			0.0
Impinger 5			0.0
Silica Gel	816.8	826.5	9.7
		Total	4.3

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	16	12	41.12	41.12	6966	10	-	-	-	-1	8	4.000
	5	16.5	12	42.405	42.405		10	-	-	-	-1	8	4.062
	10	17	12	43.69	43.69		11	-	-	-	-1	9	4.123
	15	17	12	43.69	43.69		11	-	-	-	-1	9	4.123
	20	16.5	12	42.405	42.405		12	-	-	-	-1	9	4.062
	25	16.5	12	42.405	42.405		12	-	-	-	-1	10	4.062
Endpoint	30												
	0	16	12	41.12	41.12		12	-	-	-	-1	10	4.000
	5	16.5	12	42.405	42.405		13	-	-	-	-1	10	4.062
	10	17	12	43.69	43.69		13	-	-	-	-1	10	4.123
	15	17	12	43.69	43.69		14	-	-	-	-1	11	4.123
	20	17	12	43.69	43.69		14	-	-	-	-1	11	4.123
	25	16.5	12	42.405	42.405		15	-	-	-	-1	12	4.062
Endpoint	30					8265							
	60.00	**16.625**	**12.0**	**42.7**	**42.7**	**1.299**	**12.3**				**-1.0**	**9.8**	**4.1**

Company Name: Dunlop Oil and Marine
Site Name: Grimsby
Project Reference: FTBS38567
Sampling Point Ref: 4 Inch Mill

Date: 15/01/16
Run: TPM

Meter Volume Sampled, (Actual m^3)	1.299
Sample Run Start Time	13:50
Sample Run End Time	14:55
Total Actual Sampling Time, min	60.0
Barometric Pressure, mm Hg	753.00
Stack Pressure, mm Hg	753.15
Average Stack Temp, ^oC	12.0
Meter Volume (Standardised m^3), Dry	1.209
Meter Volume (Standardised m^3) Wet	1.214
Stack Moisture Content, %	0.4
Oxygen Reference Value	0.0
Oxygen Correction Factor	1.0
Stack Gas Analysis $\%CO_2$	0.10
$\%O_2$	20.90
Average Stack Velocity, m/sec	13.446
Stack Area, m^2	0.28
Stack Flow Rate, (Actual m3/s)	3.802
Stack Flow Rate (Standardised m^3/s) wet	3.607
Stack Flow Rate, (Standardised m^3/s), dry	3.591
Nozzle Diameter, mm	5.80
% Isokinetic Variation	99.9
Mass of Particulate Collected on Filter, mg	2.0
Mass of Particulate collected in Probe, mg	1.0
Total Mass of Particulate, mg	3.1
Percentage of Total Particulate Collected on Filter	65.9
Stack Particulate Concentration, mg/m^3	**2.512**
Particulate Mass rate, kg/hour	0.033
Emission Limit value	**None Set**

Sample Train Blank Results	
Sample Blank Particulate Concentration, mg/m^3	0.44
Total Weight Gain, mg (Sample Train Blank)	0.54
Blank Result Less than 10% of Limit Value	N/A

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

Determined Concentration	2.512	mg/m3 (at Reference Cond)

Measured Values

Sampled Volume	1.299	m^3
Sampled gas Temperature	285.25	k
Sampled gas Pressure	100.42	kPa
Sampled gas Humidity	0	% by volume
Oxygen content	21	% by volume
Mass	3.05	mg

Leak	0.02	%
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	0.949		
	Sensitivity Coefficient		**Uncertainty, Uv**
Sampled gas Temperature	0.0033		0.0067
Sampled gas Pressure	0.0094		0.0094
Sampled gas Humidity	0.0095		0.0095
		Sqrt (Uv)^2	0.0150
		Total Uv	**0.019**

Uncertainty Calculation for Oxygen Correction

Oxygen Correction Factor	1.0000		
	Sensitivity Coefficient		**Uncertainty, Uo**
Oxygen Measurement	N/A		N/A
		Total Uo	**N/A**

Uncertainty Contributions (Itemised)

	Value		Sensitivity coefficient	Uncertainty Contribution			
				Concentration		%	
Volume Correction	1.209	m3	2.08	0.04	$mg.m^{-3}$	1.61	%
Mass (weighing)	3.05	mg	0.82	0.12	$mg.m^{-3}$	4.64	%
Oxygen Correction	N/A		0.00	0.00	$mg.m^{-3}$	0.00	%
System Leak	0.00	$mg.m^{-3}$	1.00	0.00	$mg.m^{-3}$	0.01	%
Uncollected Mass	0.00	mg	0.82	0.00	$mg.m^{-3}$	0.00	%
			Total Uncertainty	**0.12**	**$mg.m^{-3}$**		

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

Expanded Uncertainty =	**0.2467**	**$mg.m^{-3}$**
=>	**9.82**	**% of Result**
=>	**N/A**	**% of ELV**

APPENDIX 3:
Extraction Sampling, Analysis & Uncertainty Data

Stack Ref: Extraction			Personnel:	JB CD	
Company Name: Dunlop Oil and Marine			Date of Sampling:	15/01/2016	
Site Ref: Grimsby			**Sampling Comments**		
Ref Moisture	-	wet			
Ref Temp	K	273			
Ref Pressure	kPa	101.325			
Ref Oxygen	%	20.9			
	Start	End			
Sample Times	**11:00**	**14:45**			
Barometric	**kPa**	**101.3**	Measured Volume	m^3	0.450
Static Pressure	Pa	0.0	Volume at STP	m^3	0.419
Duct Diameter	m		**Area of Duct**	**m^2**	**0.000**
Average Stack Temperature	°C	20	Duct Pressure	kPa	101.300
Meter Correction Yd	-	1	Mean Sum SQRT Delta P	Pa	0.00
Meter Temp Average	°C	20	**Velocity**	**m/s**	**#DIV/0!**
Meter Volume (Start)	m^3	0	**Vol Flow (as Measured)**	**m^3/s**	**#DIV/0!**
Meter Volume (End)	m^3	0.45	**Vol Flow (corrected)**	**m^3/s**	**#DIV/0!**
Pitot Coefficient	-	1.00	Mass Emission	kg/hr	#VALUE!
Measured Oxygen	%	20.9	Moisture Content	%	0.00000
Laboratory Data			**Mass Concentration (at reference conditions)**		
Filter No:- 118395	mg	0.04		mg/m^3	0.095
Filter No:-106812	mg	0.04		mg/m^3	0.095
Mean	mg	0.04	Mean	mg/m^3	0.095

Uncertainty Calculation Sheet -

Studied Concentration (mg/m^3)	0.09542444

Selected Performance Characteristic	Value	Units	Variability due to sampling	Manual Method
Laboratory Analysis	20	%		
O2 Correction	0.2	%		
Gas Meter Volume, sampling rate	2	%		
Atmospheric Pressure Dependance	1	%/KPa	0.2	kPa
Temperature Dependance	0.4	% K	5	C
Desorption Efficiency	10	%		
Sample Handling (Handling)	1	%		
Losses in Sample Train (Leakage)	2	%		

Performance Characteristic	Uncertainty Quantity	At Calibration Conditions		At Sampling Conditions	
		U	U^2	U	U^2
Laboratory Analysis	$U_{analysis}$	0.019085	0.000364	0.019085	0.000364
O2 Correction	$U_{correction}$	0.001908	0.000004	0.001908	0.000004
Gas Meter Volume, sampling rate	U_{volume}	0.001102	0.000001	0.001102	0.000001
Atmospheric Pressure Dependance	U_{pres}	0.000551	0.000000	0.000110	0.000000
Temperature Dependance	U_{temp}	0.000220	0.000000	0.001102	0.000001
Desorption Efficiency	U_{des}	0.005509	0.000030	0.005509	0.000030
Sample Handling (transport etc)	$U_{handling}$	0.000551	0.000000	0.000551	0.000000
Losses in Sample Train (Leakage)	$U_{losses,\ leaks}$	0.001102	0.000001	0.001102	0.000001

Measurement Uncertainty at	0.09542444	mg/m3		
U_{tot}	0.0201	mg/m3		
$U_{tot}{}^{/C}$	21.0	%	U_{limit}	

APPENDIX 4:
Laboratory Data

RPS

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Test Certificate

Date 08/02/2016

Client	RPS Milton Keynes HSED Noble House Capital Drive Linford Wood Milton Keynes MK14 6QP	**Order No.**	FTBS 38561
		Certificate No.	WK16-0515
		Issue No.	1
Contact	Chris Davies	**Date Received**	02/02/2016
Description	2 Filters & Washes for TPM	**Technique**	Gravimetric

Sample No.	**867468**	**127293**	**Method**
Total particulate matter	<0.04 mg		D9(U)
Sample No.	**867469**	**20009476**	**Method**
Total particulate matter	<0.5 mg		D9(U)
Sample No.	**867470**	**128267**	**Method**
Total particulate matter	<0.04 mg		D9(U)
Sample No.	**867471**	**20009477**	**Method**
Total particulate matter	3.56 mg		D9(U)

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Tel: (0161) 872 2443 Fax: (0161) 877 3959

0905

Date 08/02/2016

Test Certificate

Client	RPS Milton Keynes HSED	Certificate No.	WK16-0515
		Issue No.	1

Tested By Simon Doodson Date 08/02/2016

Approved By Date 08/02/2016

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.

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Test Certificate

Date 03/02/2016

Client	RPS Milton Keynes HSED Noble House Capital Drive Linford Wood Milton Keynes MK14 6QP	**Order No.**	FTOM 38601
		Certificate No.	WK16-0298
		Issue No.	1
Contact	James Beechey	**Date Received**	21/01/2016
Description	5 filters for TID	**Technique**	Gravimetric

Sample No.	**866407**	**119944**		**Method**
Total inhalable dust	0.06 mg	0.11 mg/m³		D1(U)
Sample No.	**866408**	**120524**		**Method**
Total inhalable dust	0.16 mg	0.30 mg/m³		D1(U)
Sample No.	**866409**	**120523**		**Method**
Total inhalable dust	0.12 mg	0.22 mg/m³		D1(U)
Sample No.	**866412**	**118395**		**Method**
Total inhalable dust	<0.04 mg	<0.09 mg/m³		D1(U)
Sample No.	**866413**	**106812**		**Method**
Total inhalable dust	<0.04 mg	<0.09 mg/m³		D1(U)

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UKAS TESTING 0605

Date 03/02/2016

Test Certificate

Client	RPS Milton Keynes HSED	**Certificate No.**	WK16-0298
		Issue No.	1

Tested By Simon Doodson Date 03/02/2016

Approved By Date 03/02/2016

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.
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