Exova Catalyst Ireland, Unit D8 North City Business Park, North Road, Finglas, Dublin 11

Site Specific Protocol (SSP) Commissioned by
Covanta

Installation Name & Address
Covanta
Dublin Waste-to-Energy Ltd
Shellybanks Road
Off Pigeon House Road
Dublin 4

Industrial Emissions Licence: W0232-01

Dates of the Proposed Monitoring Campaign
TBC

SSP Reference Number
CDU-SSP

Release Point References	
A2-1 - Line 1	A2-1 - Line 2

Report Written by	Version
Patrick O'Brien, MCERTS Level 2	Version 1

Report Date	Name of Client
4th April 2017	Kieran Mullins

Report Approved by	Date of Client Approval
Patrick O'Brien Deputy Regional Manager MCERTS Level 2 MM 08 922 TE1 TE2 TE3 TE4	

I confirm that I have read and understood the sampling protocol contained in this report and I am happy for the sampling to proceed

Signature of Report Approver (Catalyst)	Signature of Client (for SSP Approval)
	

SSP Part 1

CONTACT DETAILS, MONITORING DATES & PERSONNEL

This SSP (Site Specific Protocol) will be updated, if required to include feedback from each visit.

Operator Contact Details

Operator Name		Covanta
Site Location		Dublin 4
Full Installation Address		Dublin Waste-to-Energy Ltd Shellybanks Road Off Pigeon House Road Dublin 4
Industrial Emissions Licence		W0232-01

		Primary Site Contact	Alternative Site Contact
Contact Name		Kieran Mullins	N/A
Telephone Number			N/A
Fax Number			N/A
Mobile Phone Number			N/A
Email Address		kmullins@covanta.com	N/A

Monitoring Dates

Dates of Previous Campaign		N/A - Not Performed by Catalyst
Job No. of Previous Campaign		N/A - Not Performed by Catalyst
Planned Dates of Campaign		TBC

(If the Planned Dates of the Campaign change at late notice, the SSP will not be re-issued. The final test report will detail the actual monitoring dates.)

Analysis Laboratories (with short name reference as referenced in Part 2 of the SSP)

Exova Catalyst (CAT)	ISO17025 Accreditation Number: 4279
Scientific Analysis Laboratories Ltd (SAL)	ISO17025 Accreditation Number: 1549
RPS Laboratories Ltd (RPS)	ISO17025 Accreditation Number: 0605

Stack Emissions Monitoring Personnel

where SCM = Site Campaign Manager

	Position	Name	MCERTS Accreditation	MCERTS Number & Expiry Date	Technical Endorsements
SCM	Team Leader	Conor Cooney	MCERTS Level 2	MM 12 1194, April 2018	TE1 TE2 TE3 TE4
	Technician	Neil Kelly	MCERTS Level 1	MM 16 1390, August 2021	None

Exova Catalyst Site Campaign Manager Contact Details

Name		Email Address
Conor Cooney		conor.cooney@exova.com

Further Notes on Stack Emissions Monitoring Personnel

There may be, in exceptional circumstances, a need to change the personnel who will be performing the monitoring. If this was to occur, the sampling team sent to site will hold all the necessary MCERTS Technical Endorsements for the required tests. As this scenario would most likely happen at late notice, the SSP will not be re-issued. The names of the monitoring personnel will be available to the client on the day of sampling (or before if required for inductions / site security / permits to work). The names of the monitoring personnel along with their personal MCERTS accreditation details will also be detailed in the final test report.

DETAILS OF MONITORING: STACK AND LOCATION DETAILS

Release Point Reference		A2-1 Line 1

Sampling Location and Stack Photos

Operating & Process Information	Details
Type of Process	Waste Incineration
Batch or Continuous Process	Continuous
Feedstock / Fuel Type	Residual Municipal Waste
Load / Throughput / Continuous Rating of Plant	35 Tonnes / Hour
Expected Velocity, Temperature & Moisture	TBC m/s | 90 °C | 25 % v/v
Details of Abatement System	Selective non-catalytic reduction/semi-dry scrubber/bag filter/wet scrubber
Details of any CEMS Installed (including DCS)	SICK
Process Details Required	Operating conditions to be Provided by Site Contact
Reference Conditions 1	273K, 101.3kPa, dry gas, 11% oxygen.
Reference Conditions 2	N/A

Sampling Location Details	Value	Details
Stack Type / Shape	Square	
Diameter / Dimensions (m)	2 x 2	
Access	Stairs	mechanical hoist to lift equipment
Platform Type and Location	Permanent	Inside Plant building
Orientation of Duct	Horizontal	
Sample Port Size / Diameter	4" Flange	
Sample Port Depth (cm)	TBC	
Sample Ports Correctly Located?	Yes	
Number of Sampling Lines Available	4	
Number of Sampling Lines to be Used	4	
Number of Sample Points to be Used (per line)	4	
Total Number of Sample Points to be Used	16	
EN 15259 / Homogeneity Representative Point/s	-	To be determined at this visit

Availability of Utilities	Power	110V	Lighting	Yes	Water	No

Irish EPA Technical Guidance Note AG1 / EN 15259 Platform Requirements	Value
Sufficient working area to manipulate probe and operate the measuring instruments	Yes
Platform has 2 levels of handrails (approx. 0.5m & 1.0m high)	Yes
Platform has vertical base boards (approx. 0.25m high)	Yes
Platform has chains / self closing gates at top of ladders	Yes
There are no obstructions present which hamper insertion of sampling equipment	No
Safe Access Available	Yes
Easy Access Available	Yes

Sampling Plane Validation Criteria		
Requirement	**Value**	**Compliant**
Lowest Differential Pressure (Pa)	TBC	TBC
Ratio of Gas Velocities (:1)	TBC	TBC
Maximum Angle of Swirl (°)	TBC	TBC
No Local Negative Flow	TBC	

Sampling Platform / Improvement Recommendations:
The sampling location meets all the requirements specified in Irish EPA Guidance Note AG1 and EN 15259, and therefore there are no improvement recommendations.

DETAILS OF MONITORING: SAMPLING METHOD INFORMATION

Release Point Reference		A2-1 Line 1	(continued)

In the "Units" column, [1] = Reference Conditions 1, [2] = Reference Conditions 2

PERIODIC SAMPLING: MANUAL METHODS

Determinand	Number of Runs | Blanks		Units	Emission Limit	Expected Emission	Projected LOD	Standard Reference Method	Catalyst Technical Procedure	Absorption Media / Analysis Technique	Analysis Lab | ISO17025Status	Sample Duration (mins)	Sample Flowrate (ACTUAL) (l/min)	Sample Volume (REF) (m^3)	Projected MU (%)	Status of Testing
Particulate Matter	1	1	[1] mg/m^3	30	< 30	0.150	EN 13284-1	CAT-TP-01 / 03	Filter / Gravimetric	CAT 17025	60	15	0.839	30%	MCERTS
Cadmium & Thallium	1	1	[1] mg/m^3	0.05	< 0.05	0.0013	EN 14385	CAT-TP-06	HNO_3 & H_2O_2 / ICPMS	RPS 17025	60	15	0.839	15%	MCERTS
Heavy Metals	1	1	[1] mg/m^3	0.50	< 0.5	0.0067	EN 14385	CAT-TP-06	HNO_3 & H_2O_2 / ICPMS	RPS 17025	60	15	0.839	15%	MCERTS
Mercury (MID 14385)	1	1	[1] mg/m^3	0.05	< 0.05	0.0005	EN 13211	CAT-TP-06	$K_2Cr_2O_7$ / CVAFS	RPS 17025	60	15	0.839	15%	MCERTS
Dioxins & Furans	1	1	[1] ng/m^3	0.10	< 0.1	0.0030	EN 1948	CAT-TP-07	XAD-2 / GC-HRMS	SAL 17025	360	15	5.031	25%	MCERTS
Hydrogen Fluoride	1	1	[1] mg/m^3	4	< 4	0.089	ISO 15713	CAT-TP-10	NaOH / IC	CAT 17025	30	10	0.280	15%	MCERTS
PM_{10}	1	1	[1] mg/m^3	-	<10	0.286	EN ISO 23210	CAT-TP-18 / 03	Cascade Impactor	CAT 17025	60	25	1.398	30%	MCERTS
$PM_{2.5}$	1	1	[1] mg/m^3	-	< 10	0.215	EN ISO 23210	CAT-TP-18 / 03	Cascade Impactor	CAT 17025	60	25	1.398	30%	MCERTS
Water Vapour	5	-	[1] % v/v	-	25.00	0.100	EN 14790	CAT-TP-05	Gravimetric	CAT 17025	various	various	N/A	5%	MCERTS
Volume emitted (per hour)	1	-	[1] m^3/hr	275000	< 275000	-	EN ISO 16911-1	CAT-TP-41	Pressure & Temp	CAT 17025	N/A	N/A	N/A	10%	MCERTS
Velocity	1	-	[1] m/s	-	10.00	3.000	EN ISO 16911-1	CAT-TP-41	Pressure & Temp	CAT 17025	N/A	N/A	N/A	10%	MCERTS

PERIODIC SAMPLING: INSTRUMENTAL METHODS

Determinand	Number of Runs	Units	Emission Limit	Expected Emission	Projected LOD	Standard Reference Method	Catalyst Technical Procedure	Equipment Used	Measurement Technique	Sample Duration (mins) | Logging Interval (s)	Span / Check Gas Type & Conc.	Range During Testing	Projected MU (%)	Status of Testing
Nitrous Oxide	1	[1] mg/m^3	N/A	TBC	1.00	TGN M22	CAT-TP-22(b)	Gasmet DX4000	FTIR	30 | 60	400ppm NO	500 ppm	20%	MCERTS
Oxygen	1	[1] % v/v	N/A	11.0	0.10	EN 14789	CAT-TP-39	Horiba PG-350E	Paramagnetism	30 | 60	11% v/v	25% v/v	5%	MCERTS

The check gas that will be used for the reactivity test will be 100ppm SO_2

EN 14181 CEMS CALIBRATIONS: MANUAL METHODS

Determinand	QAL2 or AST	Number of Runs | Blanks		Units	ELVs (Daily | Short Term)		Expected Emission	Projected LOD	Standard Reference Method	Catalyst Technical Procedure	Absorption Media / Analysis Technique	Analysis Lab | ISO17025 Status	Sample Duration (mins)	Sample Flowrate (ACTUAL) (l/min)	Projected MU (%)	Status of Testing
Particulate Matter	QAL2	>15	3	[1] mg/m³	10	30	< 30	0.15	EN 13284-1	CAT-TP-01 / 03	Filter / Gravimetric	CAT 17025	60	15	30.00%	MCERTS
Hydrogen Chloride	QAL2	>15	1	[1] mg/m³	10	60	< 60	0.03	EN 1911	CAT-TP-11	H_2O / IC	CAT 17025	60	15	15.00%	MCERTS

EN 14181 CEMS CALIBRATIONS: INSTRUMENTAL METHODS

Determinand	QAL2 or AST	Number of Runs	Units	ELVs (Daily | Short Term)		Expected Emission	Projected LOD	Standard Reference Method	Catalyst Technical Procedure	Equipment Used	Measurement Technique	Averaging Times (mins) | Logging Interval (s)	Span / Check Gas Type & Conc.	Projected MU (%)	Status of Testing
Total VOCs	QAL2	> 15	[1] mg/m³	10	20	< 20	0.17	EN 12619:2013	CAT-TP-20	Sick 3006	FID	30 | 60	80 ppm	5%	MCERTS
Nitrogen Monoxide	QAL2	> 15	[1] mg/m³	-	-	< 400	0.50	TGN M22	CAT-TP-22(b)	Gasmet DX4000	FTIR	30 | 60	400ppm NO	10%	MCERTS
Nitrogen Dioxide	QAL2	> 15	[1] mg/m³	-	-	< 100	1.10	TGN M22	CAT-TP-22(b)	Gasmet DX4000	FTIR	30 | 60	400ppm NO	10%	MCERTS
Oxides of Nitrogen	QAL2	> 15	[1] mg/m³	200	400	<400	1.10	TGN M22	CAT-TP-22(b)	Gasmet DX4000	FTIR	30 | 60	400ppm NO	10%	MCERTS
Sulphur Dioxide	QAL2	> 15	[1] mg/m³	50	200	< 200	2.20	TGN M22	CAT-TP-22(b)	Gasmet DX4000	FTIR	30 | 60	100ppm SO_2	20%	MCERTS
Carbon Monoxide	QAL2	> 15	[1] mg/m³	150	100	< 100	0.70	TGN M22	CAT-TP-22(b)	Gasmet DX4000	FTIR	30 | 60	100ppm CO	5%	MCERTS

The check gas that will be used for the reactivity test will be 100ppm SO_2

EN 14181 CEMS CALIBRATIONS: EXISTING CALIBRATION FUNCTIONS

Parameter	Existing Calibration Function	Existing R^2
Total Particulate Matter	N/A	N/A
Total VOCs	N/A	N/A
Nitrogen Monoxide	N/A	N/A
Nitrogen Dioxide	N/A	N/A
Oxides of Nitrogen	N/A	N/A
Sulphur Dioxide	N/A	N/A
Carbon Monoxide	N/A	N/A
Hydrogen Chloride	N/A	N/A

EN 14181 CEMS CALIBRATIONS: FURTHER INFORMATION

Parameter	Details
Who will perform the Functional Checks?	TBC
When will Functional Checks be Performed?	TBC
Is Linearity Testing to be Performed	Yes
If Yes, which Parameters?	CO, NO, NO2, TOC, SO2 & HCl
How many days will the testing be performed over?	At least 3 days
Will any emissions be at or near Zero?	TBC
Is there easy and safe access to the CEMS?	Yes

EN 15259 ASSESSMENT OF HOMOGENEITY: SAMPLING POINTS INFORMATION						
Parameter	**Value**	**Details**		**Parameter**	**Value**	**Details**
No. of Sampling Lines Available	4			No. of Sample Points to be Used (per line)	4	
No. of Sampling Lines to be Used	4			Total No. of Sample Points to be Used	16	

INSTRUMENTAL METHODS

Determinand	Units	Emission Limit	Expected Emission	Standard Reference Method	Catalyst Technical Procedure	Equipment Used [FIXED]	Measurement Technique [FIXED]	Equipment Used [GRID]	Measurement Technique [GRID]	Span / Check Gas Type & Conc.	Range During Testing	Projected MU (%)	Status of Testing
Total VOCs	[1] mg/m^3	20	< 20	EN 12619:2013	CAT-TP-20	Sick 3006	FID	Sick 3006	FID	80 ppm	100 ppm	5%	MCERTS
Oxides of Nitrogen	[1] mg/m^3	400	<400	TGN M22	CAT-TP-22(b)	Gasmet DX4000	FTIR	Gasmet DX4000	FTIR	400ppm NO	500 ppm	10%	MCERTS
Carbon Monoxide	[1] mg/m^3	100	< 100	TGN M22	CAT-TP-22(b)	Gasmet DX4000	FTIR	Gasmet DX4000	FTIR	100ppm CO	250 ppm	5%	MCERTS
Oxygen	[1] % v/v	N/A	11.0	EN 14789	CAT-TP-39	Horiba PG-350E	Paramagnetism	Horiba PG-350E	Paramagnetism	11% v/v	25% v/v	5%	MCERTS
Sulphur Dioxide	[1] mg/m^3	200	< 200	TGN M22	CAT-TP-22(b)	Gasmet DX4000	FTIR	Gasmet DX4000	FTIR	100ppm SO_2	250 ppm	20%	MCERTS

The check gas that will be used for the reactivity test will be 100ppm SO_2

Is the CEMS Representative Point Homogeneity Test to be performed?	Yes

Velocity Profile - No Traverse Data Available

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where U stands for 'Unknown' due to there being no traverse data available

Monitoring Objectives / Unusual Occurrences / Comments / Health & Safety / Expected Deviations from Standard Reference Methods

1	Demonstrate compliance with a set of emission limit values (ELVs) as specified in the Site' s Permit
2	N/A
3	N/A
4	N/A

DETAILS OF MONITORING: STACK AND LOCATION DETAILS

Release Point Reference		A2-1 Line 2

Sampling Location and Stack Photos

Operating & Process Information	Details
Type of Process	Waste Incineration
Batch or Continuous Process	Continuous
Feedstock / Fuel Type	Residual Municipal Waste
Load / Throughput / Continuous Rating of Plant	35 Tonnes / Hour
Expected Velocity, Temperature & Moisture	TBC m/s | 90 °C | 25 % v/v
Details of Abatement System	Selective non-catalytic reduction/semi-dry scrubber/bag filter/wet scrubber
Details of any CEMS Installed (including DCS)	SICK
Process Details Required	Operating conditions to be Provided by Site Contact
Reference Conditions 1	273K, 101.3kPa, dry gas, 11% oxygen.
Reference Conditions 2	N/A

Sampling Location Details	Value	Details
Stack Type / Shape	Square	
Diameter / Dimensions (m)	2 x 2	
Access	Stairs	mechanical hoist to lift equipment
Platform Type and Location	Permanent	Inside Plant building
Orientation of Duct	Horizontal	
Sample Port Size / Diameter	4" Flange	
Sample Port Depth (cm)	TBC	
Sample Ports Correctly Located?	Yes	
Number of Sampling Lines Available	4	
Number of Sampling Lines to be Used	4	
Number of Sample Points to be Used (per line)	4	
Total Number of Sample Points to be Used	16	
EN 15259 / Homogeneity Representative Point/s	-	To be determined at this visit

Availability of Utilities	Power	110V	Lighting	Yes	Water	No

Irish EPA Technical Guidance Note AG1 / EN 15259 Platform Requirements	Value
Sufficient working area to manipulate probe and operate the measuring instruments	Yes
Platform has 2 levels of handrails (approx. 0.5m & 1.0m high)	Yes
Platform has vertical base boards (approx. 0.25m high)	Yes
Platform has chains / self closing gates at top of ladders	Yes
There are no obstructions present which hamper insertion of sampling equipment	No
Safe Access Available	Yes
Easy Access Available	Yes

Sampling Plane Validation Criteria		
Requirement	**Value**	**Compliant**
Lowest Differential Pressure (Pa)	TBC	TBC
Ratio of Gas Velocities (:1)	TBC	TBC
Maximum Angle of Swirl (°)	TBC	TBC
No Local Negative Flow	TBC	

Sampling Platform / Improvement Recommendations:
The sampling location meets all the requirements specified in Irish EPA Guidance Note AG1 and EN 15259, and therefore there are no improvement recommendations.

DETAILS OF MONITORING: SAMPLING METHOD INFORMATION

Release Point Reference		A2-1 Line 2	(continued)

In the "Units" column, [1] = Reference Conditions 1, [2] = Reference Conditions 2

PERIODIC SAMPLING: MANUAL METHODS

Determinand	Number of Runs | Blanks		Units	Emission Limit	Expected Emission	Projected LOD	Standard Reference Method	Catalyst Technical Procedure	Absorption Media / Analysis Technique	Analysis Lab | ISO17025Status	Sample Duration (mins)	Sample Flowrate (ACTUAL) (l/min)	Sample Volume (REF) (m^3)	Projected MU (%)	Status of Testing
Particulate Matter	1	1	[1] mg/m^3	30	< 30	0.150	EN 13284-1	CAT-TP-01 / 03	Filter / Gravimetric	CAT 17025	60	15	0.839	30%	MCERTS
Cadmium & Thallium	1	1	[1] mg/m^3	0.05	< 0.05	0.0013	EN 14385	CAT-TP-06	HNO_3 & H_2O_2 / ICPMS	RPS 17025	60	15	0.839	15%	MCERTS
Heavy Metals	1	1	[1] mg/m^3	0.50	< 0.5	0.0067	EN 14385	CAT-TP-06	HNO_3 & H_2O_2 / ICPMS	RPS 17025	60	15	0.839	15%	MCERTS
Mercury (MID 14385)	1	1	[1] mg/m^3	0.05	< 0.05	0.0005	EN 13211	CAT-TP-06	$K_2Cr_2O_7$ / CVAFS	RPS 17025	60	15	0.839	15%	MCERTS
Dioxins & Furans	1	1	[1] ng/m^3	0.10	< 0.1	0.0030	EN 1948	CAT-TP-07	XAD-2 / GC-HRMS	SAL 17025	360	15	5.031	25%	MCERTS
Hydrogen Fluoride	1	1	[1] mg/m^3	4.0	< 4	0.089	ISO 15713	CAT-TP-10	NaOH / IC	CAT 17025	30	10	0.280	15%	MCERTS
PM_{10}	1	1	[1] mg/m^3	-	<10	0.286	EN ISO 23210	CAT-TP-18 / 03	Cascade Impactor	CAT 17025	60	25	1.398	30%	MCERTS
$PM_{2.5}$	1	1	[1] mg/m^3	-	< 10	0.215	EN ISO 23210	CAT-TP-18 / 03	Cascade Impactor	CAT 17025	60	25	1.398	30%	MCERTS
Water Vapour	5	-	[1] % v/v	-	25.00	0.100	EN 14790	CAT-TP-05	Gravimetric	CAT 17025	various	various	N/A	5%	MCERTS
Volume emitted (per hour)	1	-	[1] m^3/hr	275000	< 275000	-	EN ISO 16911-1	CAT-TP-41	Pressure & Temp	CAT 17025	N/A	N/A	N/A	10%	MCERTS
Velocity	1	-	[1] m/s	-	10.00	3.000	EN ISO 16911-1	CAT-TP-41	Pressure & Temp	CAT 17025	N/A	N/A	N/A	10%	MCERTS

PERIODIC SAMPLING: INSTRUMENTAL METHODS

Determinand	Number of Runs	Units	Emission Limit	Expected Emission	Projected LOD	Standard Reference Method	Catalyst Technical Procedure	Equipment Used	Measurement Technique	Sample Duration (mins) | Logging Interval (s)	Span / Check Gas Type & Conc.	Range During Testing	Projected MU (%)	Status of Testing
Nitrous Oxide	1	[1] mg/m^3	N/A	TBC	1.00	TGN M22	CAT-TP-22(b)	Gasmet DX4000	FTIR	30 | 60	400ppm NO	500 ppm	20%	MCERTS
Oxygen	1	[1] % v/v	N/A	11.0	0.10	EN 14789	CAT-TP-39	Horiba PG-350E	Paramagnetism	continuous | 60	11% v/v	25% v/v	5%	MCERTS

The check gas that will be used for the reactivity test will be 100ppm SO_2

EN 14181 CEMS CALIBRATIONS: MANUAL METHODS

Determinand	QAL2 or AST	Number of Runs | Blanks		Units	ELVs (Daily | Short Term)		Expected Emission	Projected LOD	Standard Reference Method	Catalyst Technical Procedure	Absorption Media / Analysis Technique	Analysis Lab | ISO17025 Status	Sample Duration (mins)	Sample Flowrate (ACTUAL) (l/min)	Projected MU (%)	Status of Testing
Particulate Matter	QAL2	>15	3	[1] mg/m³	10	30	< 30	0.15	EN 13284-1	CAT-TP-01 / 03	Filter / Gravimetric	CAT 17025	60	15	30.00%	MCERTS
Hydrogen Chloride	QAL2	>15	1	[1] mg/m³	10	60	< 60	0.03	EN 1911	CAT-TP-11	H_2O / IC	CAT 17025	60	15	15.00%	MCERTS

EN 14181 CEMS CALIBRATIONS: INSTRUMENTAL METHODS

Determinand	QAL2 or AST	Number of Runs	Units	ELVs (Daily | Short Term)		Expected Emission	Projected LOD	Standard Reference Method	Catalyst Technical Procedure	Equipment Used	Measurement Technique	Averaging Times (mins) | Logging Interval (s)	Span / Check Gas Type & Conc.	Projected MU (%)	Status of Testing
Total VOCs	QAL2	> 15	[1] mg/m³	10	20	< 20	0.17	EN 12619:2013	CAT-TP-20	Sick 3006	FID	30 | 60	80 ppm	5%	MCERTS
Nitrogen Monoxide	QAL2	> 15	[1] mg/m³	-	-	< 400	0.50	TGN M22	CAT-TP-22(b)	Gasmet DX4000	FTIR	30 | 60	400ppm NO	10%	MCERTS
Nitrogen Dioxide	QAL2	> 15	[1] mg/m³	-	-	< 100	1.10	TGN M22	CAT-TP-22(b)	Gasmet DX4000	FTIR	30 | 60	400ppm NO	10%	MCERTS
Oxides of Nitrogen	QAL2	> 15	[1] mg/m³	200	400	<400	1.10	TGN M22	CAT-TP-22(b)	Gasmet DX4000	FTIR	30 | 60	400ppm NO	10%	MCERTS
Sulphur Dioxide	QAL2	> 15	[1] mg/m³	50	200	< 200	2.20	TGN M22	CAT-TP-22(b)	Gasmet DX4000	FTIR	30 | 60	100ppm SO_2	20%	MCERTS
Carbon Monoxide	QAL2	> 15	[1] mg/m³	150	100	< 100	0.70	TGN M22	CAT-TP-22(b)	Gasmet DX4000	FTIR	30 | 60	100ppm CO	5%	MCERTS

The check gas that will be used for the reactivity test will be 100ppm SO_2

EN 14181 CEMS CALIBRATIONS: EXISTING CALIBRATION FUNCTIONS

Parameter	Existing Calibration Function	Existing R^2
Total Particulate Matter	N/A	N/A
Total VOCs	N/A	N/A
Nitrogen Monoxide	N/A	N/A
Nitrogen Dioxide	N/A	N/A
Oxides of Nitrogen	N/A	N/A
Sulphur Dioxide	N/A	N/A
Carbon Monoxide	N/A	N/A
Hydrogen Chloride	N/A	N/A

EN 14181 CEMS CALIBRATIONS: FURTHER INFORMATION

Parameter	Details
Who will perform the Functional Checks?	TBC
When will Functional Checks be Performed?	TBC
Is Linearity Testing to be Performed	Yes
If Yes, which Parameters?	CO, NO, NO2, TOC, SO2 & HCl
How many days will the testing be performed over?	At least 3 days
Will any emissions be at or near Zero?	TBC
Is there easy and safe access to the CEMS?	Yes

EN 15259 ASSESSMENT OF HOMOGENEITY: SAMPLING POINTS INFORMATION						
Parameter	**Value**	**Details**		**Parameter**	**Value**	**Details**
No. of Sampling Lines Available	4			No. of Sample Points to be Used (per line)	4	
No. of Sampling Lines to be Used	4			Total No. of Sample Points to be Used	16	

INSTRUMENTAL METHODS

Determinand	Units	Emission Limit	Expected Emission	Standard Reference Method	Catalyst Technical Procedure	Equipment Used [FIXED]	Measurement Technique [FIXED]	Equipment Used [GRID]	Measurement Technique [GRID]	Span / Check Gas Type & Conc.	Range During Testing	Projected MU (%)	Status of Testing
Total VOCs	[1] mg/m³	20	< 20	EN 12619:2013	CAT-TP-20	Sick 3006	FID	Sick 3006	FID	80 ppm	100 ppm	5%	MCERTS
Oxides of Nitrogen	[1] mg/m³	400	<400	TGN M22	CAT-TP-22(b)	Gasmet DX4000	FTIR	Gasmet DX4000	FTIR	400ppm NO	500 ppm	10%	MCERTS
Carbon Monoxide	[1] mg/m³	100	< 100	TGN M22	CAT-TP-22(b)	Gasmet DX4000	FTIR	Gasmet DX4000	FTIR	100ppm CO	250 ppm	5%	MCERTS
Oxygen	[1] % v/v	N/A	11.0	EN 14789	CAT-TP-39	Horiba PG-350E	Paramagnetism	Horiba PG-350E	Paramagnetism	11% v/v	25% v/v	5%	MCERTS
Sulphur Dioxide	[1] mg/m³	200	< 200	TGN M22	CAT-TP-22(b)	Gasmet DX4000	FTIR	Gasmet DX4000	FTIR	100ppm SO_2	250 ppm	20%	MCERTS

The check gas that will be used for the reactivity test will be 100ppm SO_2

Is the CEMS Representative Point Homogeneity Test to be performed?	Yes

Velocity Profile - No Traverse Data Available

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where U stands for 'Unknown' due to there being no traverse data available

Monitoring Objectives / Unusual Occurrences / Comments / Health & Safety / Expected Deviations from Standard Reference Methods

1	Demonstrate compliance with a set of emission limit values (ELVs) as specified in the Site' s Permit
2	N/A
3	N/A
4	N/A

DEVIATIONS FROM THE SSP THAT MAY HAVE OCCURED ON SITE DURING THE SAMPLING CAMPAIGN

Make a note of any deviations from this SSP below:

(Deviations may include: modification to a sampling duration, removal of a test, change to the number of sampling runs etc.)

At the end of the sampling campaign, the Team Leader must select one of the statements below and complete the required boxes:

(1) I certify that all testing performed for this sampling campaign followed the testing programme as detailed in this SSP, and no deviations (unless specified in the original SSP and approved by the client) were required.

(tick)	Signature of Team Leader	Date of Signature

(2) It was necessary to deviate from the testing programme as detailed in this SSP. All deviations are listed above. The client was informed of the deviations and was happy for the testing to proceed / continue on this basis.

(A client signature MUST be obtained for Contract Review purposes)

(tick)	Signature of Team Leader	Date of Signature	Signature of Client	Date of Signature