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**The Environmental Permitting (England
and Wales) Regulations 2010**

**Permit: EPR/LP3030XA
Cardiff Energy Recovery Facility**

**Environmental Monitoring Report
4th Quarter 2014: 1st October – 31st December 2014**

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Quality Assurance

This report has been prepared with all reasonable skill, care and diligence. Information reported herein is based on the interpretation of data collected and has been accepted in good faith as being accurate and valid.

Report Details

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1. Introduction

In accordance with the requirements of Condition 4.2.3, Schedule 4 and table S4.1 of Permit EPR/LP3030XA issued by National Resources Wales to Viridor Waste Management Limited (Viridor) on 4th November 2010, Viridor is required to submit a summary of the environmental monitoring works undertaken at the site on a quarterly basis. Such reports will form the basis of the annual environmental review report, which is to be submitted to the National Resources Wales by the 30th April as agreed in writing with the National Resources Wales of each year in accordance with Condition 4.2.2 of the Permit.

This report summarises the environmental data collected at the site during the fourth quarter calendar period of 2014, between 1st September and 31st December.

The report will cover the following areas of environmental monitoring:

- Section 2 – Point Source Emissions to Air
- Section 3 – Point Source Emissions to Water
- Section 4 – Residue Quality Monitoring Requirements

2. Point Source Emissions to Air

2.1. Introduction

Permit Condition 3.5.1 (a) and Tables S3.1 and S3.1(a) require Viridor to undertake performance monitoring of the point source emissions to air arising at sample points A1 and A2.

A summary of the point source emissions to air monitoring data at sample point A1 and A2 for the period is included as Table 1.

2.2 Commentary on Data

The recorded concentrations remained compliant with the limits set out in Permit Tables S3.1 and S3.1 (a) during the review period with the exception of those listed in 2.3 below.

Due to process interruptions spot sampling could not be achieved during the period. Line 1 was in operation for 66% of the quarter and Line 2 for 47%, however this was on a stop-start basis.

Where elevated results were briefly encountered above levels in Table S3.1 a Schedule 5 notification was issued as seen below.

The briefly elevated sulphur dioxide result occurred under abnormal conditions, and a Schedule 5 Part C will be submitted in due course.

Viridor note that schedule notifications are currently issued on a voluntary basis, as the contractor is operating the plant ahead of full completion of commissioning.

2.3 Schedule Notices Issued

21/10/2014 – Schedule 5 Notification Part A for CO $\frac{1}{2}$ hourly average spike at sample point A1 (Part B was submitted 21/10/2014)

21/10/2014 – Schedule 5 Notification Part A for CO $\frac{1}{2}$ hourly average spike at sample point A1 (Part B was submitted 21/10/2014)

19/11/2014 – Schedule 5 Notification Part C was submitted.

28/12/2014 – Three Schedule 5 Notifications Part A for HCl $\frac{1}{2}$ hourly average exceedance at sample point A2 were submitted (Part B for each were submitted 30/12/2014)

28/12/2014 - Schedule 5 Notification Part A for HCl daily average exceedance at sample point A2 (Part B was submitted 30/12/2014)

30/12/2014 - Schedule 5 Notification Part A for HCl $\frac{1}{2}$ hourly average exceedance at sample point A2 (Part B was submitted 30/12/2014)

31/12/2014 – Schedule 5 Notification Part A for TOC $\frac{1}{2}$ hourly average exceedance at sample point A1 and A2 (Part B was submitted 09/01/2015)

Table 1: Emissions to Air from A1 and A2 (CEMS)

Releases to Air from Incinerators – Continuous Monitoring – Air 2							
Parameter	Limit	Reference Period	A1		A2		Test Method
			Max	Avg	Max	Avg	
Oxides of nitrogen	200 mg/m ³	Daily mean	196	158	192	166	BS EN 15267-3
	400 mg/m ³	½ hourly mean	274	193	338	179	
Particulate Matter	10 mg/m ³	Daily mean	3	1	1	1	
	30 mg/m ³	½ hourly mean	5	2	2	1	
Total Organic Carbon (TOC)	10 mg/m ³	Daily mean	3	1	2	1	
	20 mg/m ³	½ hourly mean	84	2	68	1	
Hydrogen chloride	10 mg/m ³	Daily mean	10	7	18	4	
	60 mg/m ³	½ hourly mean	96	9	136	8	
Sulphur dioxide	50 mg/m ³	Daily mean	40	16	42	22	
	200 mg/m ³	½ hourly mean	108	29	218	32	
Carbon monoxide	50 mg/m ³	Daily mean	16	7	10	6	
	100 mg/m ³	½ hourly mean*					
Ammonia	No limit set	Daily mean	14	3	6	2	

*Note. ½ hourly monitoring for CO is no longer required in the latest version of the permit

Table 2: Emissions to Air from A1 and A2 Periodic

Substance / Parameter	Emission Limit Value	Reference Period	A1 Result ^[1]	Sample Date / Time ^[3]	A2 Result ^[1]	Sample Date / Time ^[3]	Test Method ^[2]	Uncertainty ^[4]
Oxides of nitrogen	200mg/m ³	Mean over period minimum 30 minutes, maximum 8 hours	-	-	-	-	BS EN 15267	
Particulate matter	30mg/m ³		-	-	-	-	BS EN 15267	
Total Organic Carbon (TOC)	20mg/m ³		-	-	-	-	BS EN 15267	
Hydrogen chloride	60mg/m ³		-	-	-	-	BS EN 15267	
Sulphur dioxide	200mg/m ³		-	-	-	-	BS EN 15267	
Carbon monoxide	100mg/m ³		-	-	-	-	BS EN 15267	
Ammonia	-		-	-	-	-	BS EN 15267	
Nitrous oxide	-		-	-	-	-	VDI 2469-1	
Hydrogen fluoride	2mg/m ³		-	-	-	-	ISO 15713	
Cd and Th and their compounds	0.05mg/m ³		-	-	-	-	BS EN 14385	
Hg and its compounds	0.05mg/m ³		-	-	-	-	BS EN 13211	
Sb, As, Pb, Cr, Co, Cu, Mn, Ni, V and their compounds	0.5mg/m ³		-	-	-	-	BS EN 14385	
Dioxins / furans (I-TEQ)	0.1ng/m ³	Mean over period minimum 6 hours, maximum 8 hours	-	-	-	-	BS EN 1948 1-3	
Polychlorinated biphenyls	-		-	-	-	-	BS EN 1948 1-3	
Polycyclic aromatic hydrocarbons (PAH as BaP)	-		-	-	-	-	BS ISO 11338-1 BS-ISO 11338-2	

3. Point Source Emissions to Water

3.1. Introduction

Permit Condition 3.5.1 (a) and Table S3.2 requires Viridor to ensure sample point W1 is free of oil, grease and visible solids

3.2 Commentary on Data

Due to construction works during the review period sample point W1 was inaccessible.

3.3 Schedule Notices Issued

No Permit limit exceedances were recorded during the review period for emissions to water.

4. Residue Quality Monitoring Requirements

4.1. Introduction

Permit Condition 3.5.1 (c) and Table S3.5 require Viridor to undertake residue quality monitoring at minimum monthly intervals for both bottom ash and air pollution control residues.

4.2 Commentary on Data

Incinerator Bottom Ash

Figures shown are an average of the analysis in November which has followed the criteria laid out in the ESA protocol. Viridor note that due to laboratory turn-around times December analysis has yet to be received, and therefore could not be included in this report, but will be included in the annual review. Additionally no ash sampling was undertaken in October because a minimal amount was produced as the plant was not in full operation.

Air Pollution Control Residues

Figures shown in Table 2 detail the analysis undertaken in November. However, as above, Viridor note December analysis could not be included in this report.

Residue quality									
Parameter	Limit	Normal Operation				Before use of a new disposal or recycling route			
		Bottom ash		APC Residues		Bottom ash (Soluble fractions)		APC Residues (Soluble fractions)	
		Line 1	Line 2	Line 1	Line 2	Line 1	Line 2	Line 1	Line 2
Total Organic Carbon	3%	2.14	*						
Antimony (mg/kg)	---	64.5		371					
Cadmium (mg/kg)	---	9.85		179					
Thallium (mg/kg)	---	0.84		<1					
Mercury (mg/kg)	---	<0.84		5.41					
Lead (mg/kg)	---	416		1,660					
Chromium (mg/kg)	---	89.5		17.4					
Copper (mg/kg)	---	2,477		371					
Manganese (mg/kg)	---	1,130		366					
Nickel (mg/kg)	---	79.3		7.77					

Arsenic (mg/kg)	---	5.98	19.7				
Cobalt (mg/kg)	---	34.7	4.22				
Vanadium (mg/kg)	---	31.8	5.07				
Zinc (mg/kg)	---	3,396	10,500				
Dioxins Concentration (ng/kg)	---	887	39,857				
Furans Concentration (ng/kg)	---	94.5	2,902				
PCB-81 Concentration (ng/kg)	---	0.0118	2.279				
PCB-77 Concentration (ng/kg)	---	0.0166	3.666				
PCB-123 Concentration (ng/kg)	---	<0.00167	0.57				
PCB-118 Concentration (ng/kg)	---	0.0247	1.787				
PCB-114 Concentration (ng/kg)	---	0.00477	0.880				
PCB-105 Concentration (ng/kg)	---	<0.00251	1.865				
PCB-126 Concentration (ng/kg)	---	0.02275	5.317				
PCB-167 Concentration (ng/kg)	---	<0.00251	0.964				
PCB-156 Concentration (ng/kg)	---	0.0383	2.361				
PCB-157 Concentration (ng/kg)	---	<0.00251	1.762				
PCB-169 Concentration (ng/kg)	---	<0.00251	2.792				
PCB-189 Concentration (ng/kg)	---	<0.00167	2.680				
Total soluble fraction (%)	---						
Metals only soluble fraction (%)	---						

*Note. Only line 1 was fully operational when the November IBA sample was taken.