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

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

**Environmental Monitoring Report
2nd Quarter 2015: 1st April – 30th June 2015**

Prepared by:
Viridor TES Team
South West Regional Office
Harrison House
Blackbrook Business Park
Taunton
Somerset
TA1 2PX

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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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Report Generated By

Name:	Ross Watson
Position:	Technical Projects Officer

Report Approved By

Name:	Fiona Bussell
Position:	EHS Manager

1. Introduction

Cardiff Energy Recovery Facility is located immediately north of Cardiff Docks. The facility has a design capacity to process 350,000 tonnes per year of residual municipal and C&I waste and has the capability of exporting approximately 30MW of electrical power.

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.

Viridor took over full operation of the Plant on 31st January 2015.

This report summarises the environmental data collected at the site during the second quarter calendar period of 2015, between 1st April and 30th June.

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 and 2.

2.2 Commentary on Data

Viridor note, due to challenges with plant process, the period in which the plant was operational during Q2 was significantly reduced. Due to this, periodic monitoring of A2 was unable to be undertaken during the quarter. Line 1 periodic monitoring was sampled; however as of the challenges with the process this was carried out in the latter stages of Q2. Therefore, due to laboratory turn-around, the results of the monitoring have not yet been received. The Q2 results for each A1 and A2 monitoring locations will be included in the next quarterly report.

2.3 Schedule Notices Issued

08/06/2015 – Schedule notification Part C was submitted for an abnormal operation occurrence, which resulted in a disturbance in the abatement system.

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	Uncertainty**
			Max	Avg	Max	Avg		
Oxides of nitrogen	200 mg/m ³	Daily mean	191	0	198	0	BS EN 15267-3	
	400 mg/m ³	½ hourly mean	294	0	336	0		
Particulate Matter	10 mg/m ³	Daily mean	2	0	0	0		
	30 mg/m ³	½ hourly mean	7	0	1	0		
Total Organic Carbon (TOC)	10 mg/m ³	Daily mean	1	0	0	0		
	20 mg/m ³	½ hourly mean	6	0	5	0		
Hydrogen chloride	10 mg/m ³	Daily mean	9	0	10	0		
	60 mg/m ³	½ hourly mean	52	0	57	0		
Sulphur dioxide	50 mg/m ³	Daily mean	21	0	8	0		
	200 mg/m ³	½ hourly mean	64	0	39	0		
Carbon monoxide	50 mg/m ³	Daily mean	25	0	26	0		
	100 mg/m ³	½ hourly mean*	-	-	-	-		
Ammonia	No limit set	Daily mean	0	0	4	0		

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

**Note. CEMS data figures are adjusted for the method uncertainty

Table 2: Emissions to Air from A1 and A2 (Periodic)

Substance / Parameter	Emission Limit Value	Reference Period	A1 Result	Uncertainty	Sample Date / Time	A2 Result	Uncertainty	Sample Date / Time	Test Method
Nitrous oxide	-	Periodic over 30 minutes. Maximum 8 hours							TGN M22
Hydrogen fluoride	2 mg/m ³								ISO 15713
Cd and Th and their compounds	0.05 mg/m ³								EN 14385
Hg and its compounds	0.05 mg/m ³								EN 13211
Sb, As, Pb, Cr, Co, Cu, Mn, Ni, V and their compounds	0.5 mg/m ³								EN 14385
Dioxins & Furans (I-TEQ)	0.1 ng/m ³	Mean over period minimum 6 hours, maximum 8 hours							EN 1948 1-3
PCBs (WHO-TEQ Humans / Mammals)	None set ng/m ³								EN 1948 1-3
PCBs (WHO-TEQ Fish)	None set ng/m ³								EN 1948 1-3
PCBs (WHO-TEQ Birds)	None set ng/m ³								EN 1948 1-3
Dioxins/Furans (WHO-TEQ Humans/Mammals)	None set ng/m ³								EN 1948 1-3
Dioxins/Furans (WHO-TEQ Fish)	None set ng/m ³								EN 1948 1-3
Dioxins/Furans (WHO-TEQ Birds)	None set ng/m ³								EN 1948 1-3

Anthanthrene	None set µg/m ³	Mean over period minimum 6 hours, maximum 8 hours						
Benzo(a)anthracene	None set µg/m ³							
Benzo(a)pyrene	None set µg/m ³							
Benzo(b)fluoranthene	None set µg/m ³							
Benzo(b)naphtho(2,1-d)thiophene	None set µg/m ³							
Benzo(c)phenanthrene	None set µg/m ³							
Benzo(ghi)perylene	None set µg/m ³							
Benzo(k)fluoranthene	None set µg/m ³							
Cholanthrene	None set µg/m ³							
Chrysene	None set µg/m ³							
Cyclopenta(cd)pyrene	None set µg/m ³							
Dibenzo(ai)pyrene	None set µg/m ³							
Dibenzo(ah)anthracene	None set µg/m ³							
Fluoranthene	None set µg/m ³							
Indeno(123-cd)pyrene	None set µg/m ³							
Naphthalene	None set µg/m ³							
ISO 11338								

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

During the quarter monitoring point W1 has remained free of oil grease and visible solids.

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 in Table 3 detail the monthly analysis undertaken in line with the criteria laid out in the ESA protocol.

Note. March analysis from Q1 is also included in Table 3, as the data wasn't available at time of previous report submission.

Air Pollution Control Residues

Figures shown in Table 3 detail the monthly analysis undertaken for each line during the quarter.

Note. March analysis from Q1 is also included in Table 3, as the data wasn't available at time of previous report submission.

Table 3 Residue Quality

Residue quality													
Parameter	Limit	Normal Operation											
		Bottom ash								APC Residues			
		Line 1				Line 2				Line 1			
		Mar	Apr	May	Jun	Mar	Apr	May	Jun				
Total Organic Carbon	3%	0.52	0.75	1.20	0.60	0.52	0.49	1.00	0.80				
		Composite											
		Mar	Apr	May	Jun	Mar	Apr	May	Jun	Mar	Apr	May	Jun
Antimony (mg/kg)	---	105	105	111	206	604	740	795	788	603	488	717	699
Cadmium (mg/kg)	---	11	39.8	9.67	28.5	190	282	328	307	203	238	226	256
Thallium (mg/kg)	---	0.86	0.85	0.83	0.17	<1	<1	<1	1.20	<1	<1	<1	1.10
Mercury (mg/kg)	---	<0.86	<0.85	<0.83	<0.42	5.78	4.91	5.86	6.30	4.84	6.33	5.07	5.90
Lead (mg/kg)	---	1043	1183	815	1458	2550	3160	3070	2719	2540	2800	2820	2625
Chromium (mg/kg)	---	104	107	96.9	111	19.9	18.8	37.9	33.8	16	17.9	36.5	36.2
Copper (mg/kg)	---	1960	1883	3197	1716	456	455	693	672	476	433	610	645
Manganese (mg/kg)	---	755	701	772	1078	341	309	382	367	330	331	354	381
Nickel (mg/kg)	---	74.3	79.5	73.9	84.7	10.5	8.75	23.8	12.8	7.71	8.00	18.0	14.2
Arsenic (mg/kg)	---	7.82	9.23	8.26	15.8	28.5	38.2	39.7	64.0	28.7	34.8	34.3	44.6
Cobalt (mg/kg)	---	28.6	50.5	27.2	30.7	4.48	4.20	7.33	4.50	3.32	4.18	6.25	4.50
Vanadium (mg/kg)	---	31.4	38.0	34.7	29.3	5.63	4.11	8.22	<10	4.11	3.96	7.36	<10

Zinc (mg/kg)	---	3131	3009	2789	3587	14400	15100	14000	13244	14200	13000	11400	12154
Dioxins / Furans I-TEQ (ng/kg)	---	5.05	4.63	7.37	37.2	512	147	5132	7672	514	163	2246	9090
PCB (WHO-TEQ) Humans (ng/kg)	---	5.74	5.43	8.51	46.8	574	166	5561	8794	558	185	2453	10128
PCB (WHO-TEQ) Birds (ng/kg)	---	8.47	7.73	12.3	72.9	994	308	9686	14755	928	345	4435	16753
PCB (WHO-TEQ) Fish (ng/kg)	---	5.14	4.82	7.63	37.3	546	157	5080	7640	506	175	2221	9048