Viridor Transforming waste™

The Environmental Permitting (England and Wales) Regulations 2010

Permit: EPR/LP3030XA
Cardiff Energy Recovery Facility

Environmental Monitoring Report
2nd Quarter 2017: 1st April – 30th June 2017

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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

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

In accordance with the requirements of Condition 4.2.3, Schedule 4 and table S4.1 of Permit EPR/LP3030XA issued by Natural 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 Natural Resources Wales by the 30th April as agreed in writing with Natural Resources Wales of each year in accordance with Condition 4.2.2 of the Permit.

Viridor took over the operation of the Plant on 31st January 2015; therefore 2017 is the third year of operations at the Facility.

This report summarises the environmental data collected at the site during the second quarter calendar period of 2017, 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 on a continuous and periodic basis.

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

The measurement frequency for periodic point source emissions to air monitoring data at sample point A1 and A2 is on a bi-annual basis, after 12 months of operation.

2.2 Commentary on Data

The concentrations recorded under normal operation during the review period remained compliant with the limits set out in the Permit, with the exception of a single event listed in 2.3.

Line 1 was in operation for 93.9% of the quarter and Line 2 for 94.6%.

2.3 Schedule Notices Issued

17/04/2017 – Schedule notification Part A and B were submitted due to an elevated CO daily average

22/04/2017 – Schedule notification Part A and B were submitted due to an elevated CO daily average

24/04/2017 – Schedule notification Part A and B were submitted due to an elevated CO daily average

02/05/2017 – Schedule notification Part A and B were submitted due to an elevated CO daily average

30/05/2017 – Schedule notification Part A and B were submitted due to an elevated CO daily average

01/06/2017 – Schedule notification Part A and C were submitted for an abnormal operation occurrence, which resulted in a disturbance in the abatement system.

06/06/2017 – Schedule notification Part A and C were submitted for an abnormal operation occurrence, which resulted in a disturbance in the abatement system.

09/06/2017 – Schedule notification Part A and B were submitted due to an elevated CO daily average

18/06/2017 – Schedule notification Part A and B were submitted due to an elevated CO daily average

19/06/2017 – Schedule notification Part A and B were submitted due to an elevated CO daily average

29/06/2017 – Schedule notification Part A and B were submitted due to three elevated CO daily averages

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	199	172	191	181	BS EN 15267-3	
	400 mg/m^3	½ hourly mean	266		289			
Particulate Matter	10 mg/m^3	Daily mean	0.7	0.6	0.6	0.4		
	30 mg/m^3	½ hourly mean	1		1			
Total Organic Carbon (TOC)	10 mg/m^3	Daily mean	0.7	0.4	1	0.4		
	20 mg/m^3	½ hourly mean	14		10			
Hydrogen chloride	10 mg/m^3	Daily mean	10	8.2	11	8.4		
	60 mg/m^3	½ hourly mean	30		77			
Sulphur dioxide	50 mg/m^3	Daily mean	23	10	24	7.5		
	200 mg/m^3	½ hourly mean	77		93			
Carbon monoxide	50 mg/m^3	Daily mean	215	17	220	15		
	100 mg/m^3	½ hourly mean*						
Ammonia	No limit set	Daily mean	2	0	2	0.7		

*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	Uncer-tainty	Sample Date / Time	A2 Result	Uncer-tainty	Sample Date / Time	Test Method
Nitrous oxide	None set mg/m^3	Periodic over 30 minutes. Maximum 8 hours	4.5	0.5	29/03/2017 08:32–09:32	5.6	0.69	03/04/2017 08:00-09:00	TGN M22
Hydrogen fluoride	2 mg/m^3		<0.02	0.002	20/03/2017 08:21-08:51; 08:53-09:23;	<0.03	0.002	05/04/2017 08:27-09:27	ISO 15713
Cd and Th and their compounds	0.05 mg/m^3		0.003	0.0005	30/03/2017 08:21–08:51; 08:53–09:23;	0.002	0.0004	05/04/2017 08:27-08:57; 08:59-09:29	EN 14385
Hg and its compounds	0.05 mg/m^3		0.005	0.001		0.006	0.001		MID 14385
Sb, As, Pb, Cr, Co, Cu, Mn, Ni, V and their compounds	0.5 mg/m^3		0.050	0.008		0.015	0.002		EN 14385
Dioxins & Furans (I-TEQ)	0.1 ng/m^3	Mean over period minimum 6 hours, maximum 8 hours	0.0283	0.0058	28/03/2017 08:50-11:50; 11:54-14:54	0.0089	0.0018	04/04/2017 08:21-11:21; 11:23-14:23	EN 1948 1-3
PCBs (WHO-TEQ Humans / Mammals)	None set ng/m^3		0.001486	0.000306		0.000734	0.000151		EN 1948 1-3
PCBs (WHO-TEQ Fish)	None set ng/m^3		0.000072	0.000015		0.000038	0.000008		EN 1948 1-3
PCBs (WHO-TEQ Birds)	None set ng/m^3		0.003250	0.000670		0.002315	0.000477		EN 1948 1-3
Dioxins/Furans (WHO-TEQ Humans/Mammals)	None set ng/m^3		0.0244	0.0050		0.0080	0.0016		EN 1948 1-3
Dioxins/Furans (WHO-TEQ Fish)	None set ng/m^3		0.0289	0.0060		0.0084	0.0017		EN 1948 1-3
Dioxins/Furans (WHO-TEQ Birds)	None set ng/m^3		0.0532	0.0110		0.0128	0.0026		EN 1948 1-3

Anthanthrene	None set µg/m^3	Mean over period minimum 6 hours, maximum 8 hours	<0.01	0.002	29/03/2017 08:32-11:32; 11:37-14:37	<0.01	0.002	03/04/2017 08:00-11:00; 11:04-14:04	ISO 11338
Benzo(a)anthracene	None set µg/m^3		<0.01	0.002		<0.01	0.002		
Benzo(a)pyrene	None set µg/m^3		0.02	0.004		<0.01	0.002		
Benzo(b)fluoranthene	None set µg/m^3		<0.01	0.002		<0.01	0.002		
Benzo(b)naptho(2,1-d)thiophene	None set µg/m^3		<0.01	0.002		<0.01	0.002		
Benzo(c)phenanthrene	None set µg/m^3		<0.01	0.002		<0.01	0.002		
Benzo(ghi)perylene	None set µg/m^3		<0.01	0.002		<0.01	0.002		
Benzo(k)fluoranthene	None set µg/m^3		<0.01	0.002		<0.01	0.002		
Cholanthrene	None set µg/m^3		<0.01	0.002		<0.01	0.002		
Chrysene	None set µg/m^3		<0.01	0.002		<0.01	0.002		
Cyclopenta(cd)pyrene	None set µg/m^3		<0.01	0.002		<0.01	0.002		
Dibenzo(ai)pyrene	None set µg/m^3		<0.01	0.002		<0.01	0.002		
Dibenzo(ah)anthracene	None set µg/m^3		<0.01	0.002		<0.01	0.002		
Fluoranthene	None set µg/m^3		0.1	0.013		0.1	0.014		
Indeno(123-cd)pyrene	None set µg/m^3		<0.01	0.002		<0.01	0.002		
Naphthalene	None set µg/m^3		1.1	0.3		1.1	0.2		

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

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

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 quarterly intervals following the first year of operation. This applies for both bottom ash and air pollution control residues.

4.2 Commentary on Data

Incinerator Bottom Ash

Figures shown in Table 3 detail the quarterly analysis undertaken in line with the criteria laid out in the ESA protocol.

Air Pollution Control Residues

Figures shown in Table 3 detail the analysis undertaken during the quarter.

Table 3: Residue Quality

Residue quality					
Parameter	**Limit**	**Normal Operation**			
		Bottom ash		**APC Residues**	
		Line 1	**Line 2**	**Line 1**	**Line 2**
		Quarter 1	Quarter 1		
Total Organic Carbon	3%	0.8	0.8		
		Composite			
Quarter		Quarter 2		Quarter 2	Quarter 2
Antimony (mg/kg)	---	96.1		1081	1118
Cadmium (mg/kg)	---	9.44		311	319
Thallium (mg/kg)	---	0.11		1.3	1.3
Mercury (mg/kg)	---	<0.5		5.04	5.27
Lead (mg/kg)	---	715.8		2678	2681
Chromium (mg/kg)	---	153		59.1	58.2
Copper (mg/kg)	---	1704.7		719	718
Manganese (mg/kg)	---	887		404	395
Nickel (mg/kg)	---	76.7		18.5	18.3
Arsenic (mg/kg)	---	11.7		95.7	100
Cobalt (mg/kg)	---	25.6		6.7	6.7

Vanadium (mg/kg)	---	23.5	11.7	11.1
Zinc (mg/kg)	---	2405.4	13780	13850
Dioxins / Furans (WHO 2005 TEQ) (ng/kg)	---	12.3407	35147.9	34866.6
PCB (WHO 2005 TEQ) (ng/kg)	---	0.95991	3164.21	2975.46