Viridor Transforming waste™

The Environmental Permitting (England and Wales) Regulations 2010

Permit: EPR/LP3030XA
Cardiff Energy Recovery Facility

Annual Performance Report 2014

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.

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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 4.2.2, 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 produce an annual performance 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.

This report summarises the environmental and performance data collected at the site following first waste burn, which occurred on 9th October 2014, as agreed with Natural Resource Wales for 2014 and fulfil the reporting requirement of Chapter IV, Article 55 (2) of the Industrial Emissions Directive.

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
Section 5 – Performance Parameters

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.

Due to process interruptions spot sampling could not be achieved during this 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 was submitted 30 January 2015.

Viridor note that during the period schedule notifications were issued on a voluntary basis, as the contractor was operating the plant ahead of full completion of commissioning.

2.3 Schedule Notices Issued

21 October 2014 – Schedule 5 Notification Part A for CO ½ hourly average spike at sample point A1 (Part B was submitted 21/10/2014)

21 October 2014 – Schedule 5 Notification Part A for CO ½ hourly average spike at sample point A1 (Part B was submitted 21/10/2014)

19 November 2014 – Schedule 5 Notification Part C was raised due to failure of the Flue Gas Treatment (FGT) dosing system on line 1 (Part C was submitted 27/01/2015)

28 December 2014 – Three Schedule 5 Notifications Part A for HCl ½ hourly average exceedance at sample point A2 were submitted (Part B for each were submitted 30/12/2014)

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

30 December 2014 - Schedule 5 Notification Part A for HCl ½ hourly average exceedance at sample point A2 (Part B was submitted 30/12/2014)

31 December 2014 – Schedule 5 Notification Part A for TOC ½ 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**	**Uncertainty**
			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	
Polyaromatic hydrocarbons (PAH as BαP)	-		-	-	-	-	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 undertaken in November and December which have followed the criteria laid out in the ESA protocol. 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 3 are an average of the analysis undertaken in November and December.

Table 3: Residue Quality

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%	1.54	0.7						
Antimony (mg/kg)	---	82.3		541	771				
Cadmium (mg/kg)	---	11.3		170	173				
Thallium (mg/kg)	---	0.83		<1	<1				
Mercury (mg/kg)	---	<0.83		4.95	6.21				
Lead (mg/kg)	---	673		2175	3200				
Chromium (mg/kg)	---	104		19.1	19.9				
Copper (mg/kg)	---	2363		513	670				
Manganese (mg/kg)	---	1003		359	335				
Nickel (mg/kg)	---	136		9.39	12.5				
Arsenic (mg/kg)	---	7.27		27.8	36.8				

Cobalt (mg/kg)	---	40.1	4.71	4.36				
Vanadium (mg/kg)	---	35.0	5.93	6.01				
Zinc (mg/kg)	---	3071	12100	14600				
Dioxins/Furans ITEQ (ng/kg)	---	34.7	5575	2965				
PCB-81 Concentration (ng/kg)	---	3.95	584	578				
PCB-77 Concentration (ng/kg)	---	7.41	972	1062				
PCB-123 Concentration (ng/kg)	---	0.88	164	140				
PCB-118 Concentration (ng/kg)	---	5.8	542	616				
PCB-114 Concentration (ng/kg)	---	1.46	1333	1450				
PCB-105 Concentration (ng/kg)	---	4.68	542	616				
PCB-126 Concentration (ng/kg)	---	10.2	1336	1450				
PCB-167 Concentration (ng/kg)	---	2.28	285	298				
PCB-156 Concentration (ng/kg)	---	5.72	669	726				
PCB-157 Concentration (ng/kg)	---	4.21	518	561				
PCB-169 Concentration (ng/kg)	---	7.50	658	700				
PCB-189 Concentration (ng/kg)	---	8.25	745	734				
PCB (WHO-TEQ) Humans (ng/kg)	---	43	6586	3334				
PCB (WHO-TEQ) Birds (ng/kg)	---	53.3	8431	4589				
PCB (WHO-TEQ) Fish (ng/kg)	---	36.5	5749	3058				
Total soluble fraction (%)	---							
Metals only soluble fraction (%)	---							

*Note. Only line 1 was fully operational in November when the 1st sets of residue samples were taken.

5. Performance Parameters

5.1 Introduction

Condition 4.2.2 (b), (c), Table S4.2 and S4.3 of the Permit set out the reporting criteria for performance parameters.

5.2 Commentary on Data

The recorded performance data is set out in Tables 4; 5; 6 and 7.

Table 4: Energy 1

Parameter	Total (MWh)	Specific usage (MW / tonne incinerated)
Electricity generated	15277	0.45
Electricity exported to the National Grid	12723	0.37
Energy exported as heat (if any)	0	0
Energy usage	2504	0.07

Table 5: Performance 1

Parameter	Units	
Total municipal (domestic household) waste received on site	Tonnes	22,790
Total commercial and industrial waste received on site	Tonnes	21,711
Municipal waste incinerated	Tonnes	17,449
Commercial and industrial waste incinerated	Tonnes	16,654
Total waste incinerated	Tonnes	34,103
Unsuitable waste sent off-site for treatment	Tonnes	0
Rejected material sent for off-site disposal	Tonnes	0
Gas oil consumption	Tonnes	449
Dry Urea Reagent usage	kg/tonne waste incinerated	1.68
Hydrated Calcium Hydroxide Reagent usage	kg/tonne waste incinerated	25.9
Activated carbon used	kg/tonne waste incinerated	0.45

Table 6: Water Usage 1

Parameter	Units	
Mains water usage	m^3	34,824
Mains water usage	Litres/tonne waste incinerated	1021

Table 7: Residues

Parameter	Units	
Total Air Pollution Control residues disposed of	kg/tonne waste incinerated	36.4
Total bottom ash generated	kg/tonne waste incinerated	304
Total bottom ash recycled	kg/tonne waste incinerated	0
Total bottom ash disposed of	kg/tonne waste incinerated	272