

# Viridor

**Transforming waste™**

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

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

**Environmental Monitoring Report  
Q4 2019**

**1 October – 31 December 2019**

Prepared by:  
Viridor Waste Management  
Cardiff ERF  
Trident Park  
Glass Avenue  
Cardiff  
CF24 5EN



## 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:	Gwyn Jones
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### **Reported Reviewed By**

Name:	Gwyn Jones
Position:	EHS Manager – Cardiff ERF

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## **1. Introduction**

Cardiff Energy Recovery Facility is located immediately north of Cardiff Docks. The facility has an annual throughput of up to 425,000 tonnes per year of residual municipal and C&I waste and has the capability of exporting approximately 30 MW of electrical power from the process.

In accordance with the requirements of Permit EPR/LP3030XA issued by Natural Resources Wales to Viridor Waste Management Limited (Viridor) on 4 May 2018, Viridor is required to submit an Environmental Monitoring Report on a quarterly basis.

This report summarises the environmental data collected at the site during the Q4 of 2019 (1 October – 31 December 2019).

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 were obtained by running a quarterly continuous emissions report on CDAS software report.

Line 1 was in operation for 2182 hours (98.8%) of the quarter and Line 2 was in operation 2100 hours (95.1%) of the quarter. (OND = 92 days = 2,208 hours)

### **2.3 Schedule Notices Issued**

Part C notification reported on	04 November 2019
Date of event	Started 4 November 2019 at 02:30H
Details	Abatement plant failed – Urea dosing ½ hour exceedance from 02:30H to 02:59H Recorded 402.1mg/m <sup>3</sup> ELV = 400mg/m <sup>3</sup>

**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/m³	Daily mean	191.8	184.7	193.6	185.3	BS EN 15267-3	
	400 mg/m³	½ hourly mean	402.1***		330.1			
Particulate Matter	10 mg/m³	Daily mean	0.6	0.6	0.5	0.4		
	30 mg/m³	½ hourly mean	1.1		0.6			
Total Organic Carbon (TOC)	10 mg/m³	Daily mean	0.4	0.1	0.6	0.0		
	20 mg/m³	½ hourly mean	8.5		3.9			
Hydrogen chloride	10 mg/m³	Daily mean	9.3	8.4	9.5	8.3		
	60 mg/m³	½ hourly mean	15.8		23.2			
Sulphur dioxide	50 mg/m³	Daily mean	38.3	27.8	19.0	11.1		
	200 mg/m³	½ hourly mean	87.2		67.1			
Carbon monoxide	50 mg/m³	Daily mean	21.8	8.6	16.5	8.6		
	100 mg/m³	½ hourly mean*						
Ammonia	No limit set	Daily mean	3.5	3.5	4.3	2.4		

\*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

\*\*\* Note 402.1mg/m3 occurred during the Schedule 5 PART C event. A notification was subsequently submitted to NRW 04 November 2019 to reflect this.

**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	None set mg/m <sup>3</sup>	Periodic over 30 minutes. Maximum 8 hours	14.9	1.2	8_10_2019 10:00 – 11:00H	11.7	1.2	8_10_2019 11:30H – 12:30H	EN 14792
Hydrogen fluoride	2 mg/m <sup>3</sup>		0.03	0.02	7_10_2019 12:05 – 13:05H	0.03	0.02	10_10_2019 15:02H – 16:02H	SRM - BS ISO 15713
Hg and its compounds	0.05 mg/m <sup>3</sup>		0.0036	0.0006	7_10_2019 13:25H – 15:29H	0.0011	0.0005	10_10_2019 15:04H – 17:08H	SRM - BS EN 13211 / MID 14385
Sb, As, Pb, Cr, Co, Cu, Mn, Ni, V and their compounds	0.5 mg/m <sup>3</sup>		0.0785	0.0085		0.0344	0.0044		EN 14385
Dioxins & Furans (I-TEQ)	0.1 ng/m <sup>3</sup>	Mean over period minimum 6 hours, maximum 8 hours	0.0223	0.0023	8_10_2019 08:47H – 14:53H	0.01084	0.00036	11_11_2019 09:02H – 15:12H	SRM - BS EN 1948-1
PCBs (WHO-TEQ Humans / Mammals)	None set ng/m <sup>3</sup>		0.000955	0.000106		0.00065	0.00003		SRM - BS EN 1948-1
PCBs (WHO-TEQ Fish)	None set ng/m <sup>3</sup>		0.000044	0.000005		0.00003	0.00000		SRM - BS EN 1948-1
PCBs (WHO-TEQ Birds)	None set ng/m <sup>3</sup>		0.002197	0.000244		0.00164	0.00007		SRM - BS EN 1948-1
Dioxins/Furans (WHO-TEQ Humans/Mammals)	None set ng/m <sup>3</sup>		0.0207	0.0022		0.1038	0.00034		SRM - BS EN 1948-1
Dioxins/Furans (WHO-TEQ Fish)	None set ng/m <sup>3</sup>		0.0223	0.0023		0.01130	0.00037		SRM - BS EN 1948-1
Dioxins/Furans (WHO-TEQ Birds)	None set ng/m <sup>3</sup>		0.0283	0.003		0.01445	0.00048		EN 1948 1-3

Anthanthrene	None set $\mu\text{g}/\text{m}^3$	Mean over period minimum 6 hours, maximum 8 hours	<0.003	201.1%	8_10_2019 08:57H – 14:53H	<0.0034	201.0%	11_10_2019 08:15H – 14:20H	SRM - BS ISO 11338 - 1
Benzo(a)anthracene	None set $\mu\text{g}/\text{m}^3$		<0.003	201.1		<0.0034			
Benzo(a)pyrene	None set $\mu\text{g}/\text{m}^3$		<0.003			<0.0034			
Benzo(b)fluoranthene	None set $\mu\text{g}/\text{m}^3$		<0.003			<0.0034			
Benzo(b)naphtho(2,1- d)thiophene	None set $\mu\text{g}/\text{m}^3$		<0.004			<0.0045			
Benzo(c)phenanthrene	None set $\mu\text{g}/\text{m}^3$		<0.004			<0.0045			
Benzo(ghi)perylene	None set $\mu\text{g}/\text{m}^3$		<0.003			<0.0034			
Benzo(k)fluoranthene	None set $\mu\text{g}/\text{m}^3$		<0.003			<0.0045			
Cholanthrene	None set $\mu\text{g}/\text{m}^3$		<0.004			<0.0045			
Chrysene	None set $\mu\text{g}/\text{m}^3$		<0.003			0.01	69.7		
Cyclopenta(cd)pyrene	None set $\mu\text{g}/\text{m}^3$		<0.004			<0.0045			
Dibenzo(ai)pyrene	None set $\mu\text{g}/\text{m}^3$		<0.005			<0.0057			
Dibenzo(ah)anthracene	None set $\mu\text{g}/\text{m}^3$		<0.003			0.0034			
Fluoranthene	None set $\mu\text{g}/\text{m}^3$		<0.003			0.01	88.1		
Indeno(123-cd)pyrene	None set $\mu\text{g}/\text{m}^3$		<0.003			<0.0034			
Naphthalene	None set $\mu\text{g}/\text{m}^3$		0.32	24.3		0.54	22.0%		

### **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
		Received at lab 22_11_2019 Reported to Viridor 27_11_2019	Received at lab 22_11_2019 Reported to Viridor 27_11_2019		
Total Organic Carbon	3%	2.1%	1.5%		
		Composite			
		Received at lab 22_11_2019 Reported to Viridor 04_12_2019		Received at lab 01_11_2019 Metals reported 07_11_2019 D+F reported 11_11_2019	Received at lab 01_11_2019 Metals reported 07_11_2019 D+F reported 11_11_2019
Antimony (mg/kg)	---	377		1241	1051
Cadmium (mg/kg)	---	28		283	260
Thallium (mg/kg)	---	<0.10		1.0	0.9
Mercury (mg/kg)	---	<0.5		7.24	7.79

Lead (mg/kg)	---	795.9	1727	1653
Chromium (mg/kg)	---	132	59.8	49.9
Copper (mg/kg)	---	1773.0	636	617
Manganese (mg/kg)	---	1210	389	357
Nickel (mg/kg)	---	78.2	18.7	16.7
Arsenic (mg/kg)	---	32.1	83.4	74.8
Cobalt (mg/kg)	---	29.2	6.2	4.6
Vanadium (mg/kg)	---	48.3	<10	<10
Zinc (mg/kg)	---	3434.9	13830	13570
Dioxins / Furans (WHO 2005 TEQ) (ng/kg)	---	Dioxins = 2.9375 Furans = 4.0947	Dioxins = 138.964 Furans = 278.595	Dioxins = 99.3972 Furans = 188.05
PCB (WHO 2005 TEQ) (ng/kg)	---	0.53195	9.31492	10.3709