
The Viridor logo, featuring the word "Viridor" in a large, white, serif font on a black background.

Transforming waste™

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

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

**Environmental Monitoring Report
Q4 2022**

1 October – 31 December 2022

Prepared by:
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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 up to 425,000 tonnes per year of residual municipal and C&I waste and has the capability of exporting approximately 33.5 MW of electrical power from the process.

In accordance with the requirements of Permit EPR/LP3030XA issued by Natural Resources Wales to Viridor Trident Park Limited (VTPL) on 21 December 2022, VTPL 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 2022 (1 October – 31 December 2022).

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 3.6.1(a) and Tables S3.1 and S3.1(a) require VTPL 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 2062.55 hours

As this quarter had 90 days (92 days x 24 hours = 2208 hours)

Line 1 was in operation 93.4%

Line 2 was in operation for 2,119.33 hours (95.9%).

This installation generated 79,580 MWh of electricity during the period.

2.3 Schedule Notices Issued

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

Table 1: Emissions to Air from A1 and A2 (CEMS) taken from A1- Cbiss reports.

See attached PDF Data Sheets as agreed with NRW

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					BS EN 15267-3
	400 mg/m ³	½ hourly mean					
Particulate Matter	10 mg/m ³	Daily mean					
	30 mg/m ³	½ hourly mean					
Total Organic Carbon (TOC)	10 mg/m ³	Daily mean					
	20 mg/m ³	½ hourly mean					
Hydrogen chloride	10 mg/m ³	Daily mean					
	60 mg/m ³	½ hourly mean					
Sulphur dioxide	50 mg/m ³	Daily mean					
	200 mg/m ³	½ hourly mean					
Carbon monoxide	50 mg/m ³	Daily mean					
	100 mg/m ³	½ hourly mean*					

* 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

*** Corrective factor determined by NPL during latest QAL 2 (inputted into CDAS on 22 February 2021).

*

Table 2: Emissions to Air from A1 and A2 Periodic (Reported by SOCOTEC on 2 November 2022)

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 ³	Periodic over 30 minutes. Maximum 8 hours	7.5	1.4	14 September 2022 12:00 – 13:00	8.6	1.7	7 September 2022 12:00 – 13:00	EN 14792
Hydrogen fluoride	2 mg/m ³		0.01	0.01	9 September 2022 09:00 – 12:00	0.00	0.02	6 September 2022 08:10 – 11:10	SRM - BS ISO 15713
Hg and its compounds	0.05 mg/m ³		0.0083	0.0011	13 September 2022 09:08 – 12:15	0.0044	0.0008	7 September 2022 09:00 – 12:30	SRM - BS EN 13211 / MID 14385
Cd and Tl and their compounds.	0.05 mg/m ³		0.0006	0.0007	13 September 2022 15:35 – 17:40	0.0005	0.0007	6 September 2022 10:30 – 12:40	SRM – BS EN 14385
Sb, As, Pb, Cr, Co, Cu, Mn, Ni, V and their compounds	0.5 mg/m ³		0.015	0.003		0.013	0.003		

Dioxins & Furans (I-TEQ)	0.1 ng/m ³	Mean over period minimum 6 hours, maximum 8 hours	0.0148	0.0045	12 September 2022 09:18 – 15:25	0.0023	0.0007	5 September 2022 12:00 – 18:07	SRM - BS EN 1948-1
PCBs (WHO-TEQ Humans / Mammals)	None set ng/m ³		0.0010	0.0001		0.0002	0.0000		SRM - BS EN 1948-1
PCBs (WHO-TEQ Fish)	None set ng/m ³		0.0001	0.0000		0.0000	0.0000		SRM - BS EN 1948-1
PCBs (WHO-TEQ Birds)	None set ng/m ³		0.0027	0.0004		0.0008	0.0001		SRM - BS EN 1948-1
Dioxins/Furans (WHO-TEQ Humans/Mammals)	None set ng/m ³		0.0136	0.0041		0.0021	0.0006		SRM - BS EN 1948-1
Dioxins/Furans (WHO-TEQ Fish)	None set ng/m ³		0.0159	0.0048		0.0023	0.0007		SRM - BS EN 1948-1
Dioxins/Furans (WHO-TEQ Birds)	None set ng/m ³		0.0318	0.0096		0.0045	0.0014		EN 1948 1-3
Anthanthrene	None set µg/m ³	Mean over period minimum 6 hours, maximum 8 hours	< 0.001	214.7	12 September 2022 09:18 – 15:25	< 0.001	212.9	6 September 2022 08:30 – 14:40	SRM - BS ISO 11338 - 1
Benzo(a)anthracene	None set µg/m ³		< 0.001	214.7		< 0.001	212.9		
Benzo(a)pyrene	None set µg/m ³		< 0.001	214.7		< 0.001	212.9		
Benzo(b)fluoranthene	None set µg/m ³		< 0.001	214.7		< 0.001	212.9		
Benzo(b)naptho(2,1-d)thiophene	None set µg/m ³		0.00	163.7		0.00	161.4		
Benzo(c)phenanthrene	None set µg/m ³		< 0.001	214.7		< 0.001	212.9		
Benzo(ghi)perylene	None set µg/m ³		< 0.001	214.7		< 0.001	212.9		
Benzo(k)fluoranthene	None set µg/m ³		< 0.001	214.7		< 0.001	212.9		

Cholanthrene	None set µg/m ³	< 0.001	214.7	< 0.001	212.9
Chrysene	None set µg/m ³	< 0.001	214.7	< 0.001	212.9
Cyclopenta(cd)pyrene	None set µg/m ³	< 0.001	214.7	< 0.001	212.9
Dibenzo(ai)pyrene	None set µg/m ³	< 0.001	214.7	< 0.001	212.9
Dibenzo(ah)anthracene	None set µg/m ³	< 0.001	214.7	< 0.001	212.9
Fluoranthene	None set µg/m ³	0.00	107.4	< 0.00	103.8
Indeno(123-cd)pyrene	None set µg/m ³	< 0.001	214.7	< 0.001	212.9
Naphthalene	None set µg/m ³	0.00	207.5	< 0.00	205.7

3. Point Source Emissions to Water

3.1. Introduction

Permit Condition 3.6.1(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 3.6.1(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 3_11_2022 Reported to Viridor 7_11_2022	Received at lab 3_11_2022 Reported to Viridor 7_11_2022		
Total Organic Carbon	3%	1.5%	0.8%		
		Composite			
		Received at lab 3_11_2022 Reported to Viridor 23_11_2022		Received at lab 3_11_2022 Metals reported to Viridor 10_11_2022 D, F + PCBs reported to Viridor 15_11_2022	Received at lab 3_11_2022 Metals reported to Viridor 10_11_2022 D, F + PCBs reported to Viridor 15_11_2022
Antimony (mg/kg)	---	344		699	701
Cadmium (mg/kg)	---	23.6		240	268
Thallium (mg/kg)	---	<0.1		0.7	0.8
Mercury (mg/kg)	---	<0.5		2.54	3.02

Lead (mg/kg)	---	438.5	1519	1557
Chromium (mg/kg)	---	133	25.5	23.4
Copper (mg/kg)	---	1848.8	486	537
Manganese (mg/kg)	---	1506	320	323
Nickel (mg/kg)	---	95.5	7.8	9.8
Arsenic (mg/kg)	---	30.1	79.3	57.6
Cobalt (mg/kg)	---	63.6	2.3	4
Vanadium (mg/kg)	---	30.8	<10	<10
Zinc (mg/kg)	---	5175.9	12110	13240
Dioxins / Furans (WHO 2005 TEQ) (ng/kg)	---	Dioxins = 2.4526 Furans = 4.76028	Dioxins = 75.1439 Furans = 131.165	Dioxins = 520.03 Furans = 663.632
PCB (WHO 2005 TEQ) (ng/kg)	---	0.2783	2.07724	56.7333