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

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

**Environmental Monitoring Report
Q3 2019**

1 July – 30 September 2019

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

Report Title:	Cardiff Energy Recovery Facility – Environmental Report
Report Date:	30 October 2019
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Report Generated By

Name:	Pip Crabb Gwyn Jones
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Report Approved By

Name:	Gwyn Jones
Position:	EHS Manager

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 Commercial and Industrial (C&I) waste and has the capability of exporting approximately 30 MW of electrical power from the process.

This report is produced and submitted 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).

This report summarises the environmental data collected at the site during the third quarter calendar period of 2019, between 1st July and 30th September.

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. Periodic monitoring data is not included in this report but will be included in the next quarterly report.

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, except for the events listed in 2.3. Line 1 was in operation for 1,663 hours (75.3%) of the quarter and Line 2 for 1,973 hours (89.3%).

Cardiff ERF generated 60,637MWh of electricity during the period.

2.3 Schedule Notices Issued

Two Schedule 5 Notices were submitted to NRW during this quarter.

CO exceedance via Stream 2

Exceeding the permissible 95thile 10-minute average during any 24 hour period.

The exceedance above the Emission Limit Value (ELV) occurred between 03:10H and 03:19H on 22 July 2019.

SO₂ exceedance via Stream 1

Exceeding the permissible ELV 1/2hourly average.

The exceedance above the ELV occurred on 19 August 2019 between 08:30H and 08:59H.

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		Uncertainty**
			Max	Avg	Max	Avg	
Oxides of nitrogen	200 mg/m ³	Daily mean	190.3	183.6	232.4***	185.6	
	400 mg/m ³	½ hourly mean	316.3		336.6		
Particulate Matter	10 mg/m ³	Daily mean	0.7	0.6	0.5	0.4	
	30 mg/m ³	½ hourly mean	1.5		0.9		
Total Organic Carbon (TOC)	10 mg/m ³	Daily mean	0.2	0.1	1.2	0.2	
	20 mg/m ³	½ hourly mean	3.1		15.5		
Hydrogen chloride	10 mg/m ³	Daily mean	9.4	8.3	9.7	8.7	
	60 mg/m ³	½ hourly mean	41.3		52.3		
Sulphur dioxide	50 mg/m ³	Daily mean	43.4	27.1	33.2	14.9	
	200 mg/m ³	½ hourly mean	211.7		116.9		
Carbon monoxide	50 mg/m ³	Daily mean	27.0	7.8	55.3	8.0	
	100 mg/m ³	½ hourly mean*	See	note	below	---	
Ammonia	No limit set	Daily mean	2.7	2.7	5.2	2.8	

*Note. ½ hourly monitoring for CO is no longer required in the current version of the permit. Permit now states "95%ile 10 minute average in any 24 hour period".

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

*** Note NOx data point of 232.4mg/m³ occurred on an invalid day when Line 2 was returning to work on 10 JULY 2019 after the outage. Daily Average based on only 15 thirty-minute averages. Data collection started from 16:30H. No Schedule 5 submitted as invalid day. Evidence provided within Appendix 1 below.

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 (i.e. 24 samples per year).

Air Pollution Control Residues

Figures shown in Table 3 detail the analysis of samples collected on 30 September 2019.

Table 3: Residue Quality

Residue quality		Normal Operation			
Parameter	Limit	Bottom ash		APC Residues	
		Quarter 3		Quarter 3	Quarter 3
				Line 1 Sample taken on 30/09/2019	Line 2 Sample taken on 30/09/2019
Total Organic Carbon	3%	Line 1 Sample taken on 30/09/2019 0.3%	Line 2 Sample taken on 18/07/2019 1.0%		
		Composite Sample Sample taken on 29/07/19			
Antimony (mg/kg)	***	183		980	653
Cadmium (mg/kg)	***	24.9		302	227
Thallium (mg/kg)	***	<0.1		1.0	0.7
Mercury (mg/kg)	***	<0.5		6.98	11.2
Lead (mg/kg)	***	449.9		1767	1315
Chromium (mg/kg)	***	121		36.7	24.1

Copper (mg/kg)		1726.2	565	381
Manganese (mg/kg)		1226	332	344
Nickel (mg/kg)		63.0	12.6	11.1
Arsenic (mg/kg)		23.3	54.5	44.0
Cobalt (mg/kg)		28.6	3.7	2.6
Vanadium (mg/kg)		24.8	17.8	17.2
Zinc (mg/kg)		3304.8	13,440	9950
Dioxins / Furans (WHO 2005 TEQ) (ng/kg)		Dioxins = 1.47062 Furans = 2.02646	Dioxins = 81.9237 Furans = 133.963	Dioxins = 84.0351 Furans = 126.246
PCB (WHO 2005 TEQ) (ng/kg)		0.09818	3.80438	4.74049

APPENDIX 1

Stream 2 for the 10 July 2019

Report for Stream 2 for the 10 July 2019

	NOx mg/m3
00:00 to 00:29	Off
00:30 to 00:59	Off
01:00 to 01:29	Off
01:30 to 01:59	Off
02:00 to 02:29	Off
02:30 to 02:59	Off
03:00 to 03:29	Off
03:30 to 03:59	Off
04:00 to 04:29	Off
04:30 to 04:59	Off
05:00 to 05:29	Off
05:30 to 05:59	Off
06:00 to 06:29	Off
06:30 to 06:59	Off
07:00 to 07:29	Off
07:30 to 07:59	Off
08:00 to 08:29	Off
08:30 to 08:59	Off
09:00 to 09:29	Off
09:30 to 09:59	Off
10:00 to 10:29	Off
10:30 to 10:59	Off
11:00 to 11:29	Off
11:30 to 11:59	Off
12:00 to 12:29	Off
12:30 to 12:59	Off
13:00 to 13:29	Off
13:30 to 13:59	Off
14:00 to 14:29	Off
14:30 to 14:59	Off
15:00 to 15:29	Off
15:30 to 15:59	Off
16:00 to 16:29	Off
16:30 to 16:59	169.47
17:00 to 17:29	271.16
17:30 to 17:59	336.65
18:00 to 18:29	316.23
18:30 to 18:59	305.99
19:00 to 19:29	308.05
19:30 to 19:59	303.00
20:00 to 20:29	275.14
20:30 to 20:59	179.04
21:00 to 21:29	168.80
21:30 to 21:59	175.39
22:00 to 22:29	163.24
22:30 to 22:59	170.69
23:00 to 23:29	172.83
23:30 to 23:59	170.35
Period Alarm Limit	400.00
No Exceedances	0
Daily Limit	200.00
Daily Average	232.40
Average Below Limit	No

