

**Integra South West Energy Recovery Facility  
EPR BJ7093IY  
Annual Performance Report 2016**

## **1.0 INTRODUCTION**

This document represents the Annual Performance Report for Integra South West Energy Recovery Facility (Marchwood ERF) and has been submitted in compliance with Chapter IV Article 62 of the Industrial Emissions Directive (IED):

*'The operator shall supply the competent authority, on request, with data enabling the competent authority to verify compliance with the following: (a) give an account of the running of the process and the emissions into air and water compared with the emission standards in the IED.'*

This has also been submitted in compliance with Condition 4.2.2 (a) & (d) of Environmental Permit BJ7093IY:

*'A report or reports on the performance of the activities over the previous year shall be submitted to the Environment Agency by 31 January each year. The report shall include as a minimum:*

*A review of the results of the monitoring and assessment carried out in accordance with the permit including an interpretive review of that data;*

*The functioning and monitoring of the incineration plant in a format agreed with the Environment Agency. The report shall, as a minimum requirement, (as required by Chapter IV of the Industrial Emissions Directive) give an account of the running of the process and the emissions into air and water compared with the emission standards in the IED.'*

## **2.0 FACILITY INFORMATION**

<b>Plant Operator</b>	<b>Veolia Environmental Services Hampshire Limited</b>
<b>Name of Facility</b>	<b>Integra South West Energy Recovery Facility</b>
<b>EPR Permit Number</b>	<b>BJ7093IY</b>
<b>Facility Address</b>	<b>Oceanic Way Marchwood Industrial Park Hampshire SO40 4BD</b>
<b>Telephone Number</b>	<b>0203 567 6242</b>

Integra South West Energy Recovery Facility (ERF) was the second of its kind to be built in Hampshire and is leading example of best environmental practice for waste treatment. Waste produced by Southampton City and South West Hampshire Districts is processed at this ERF, providing a long term, sustainable solution for waste disposal. It recovers heat energy from the waste to produce steam, which is used to generate electricity supplied to the National Grid. Strict environmental controls and proven

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operating experience ensure the Integra South West ERF is a centre of excellence and a benchmark for the industry.

## 2.1 Technical details of the plant:

- Maximum Permitted Refuse throughput – 220,000 tonnes per annum, with approximately 13 tonnes per hour burning capacity per stream
- Storage capacity – four days full plant capacity
- Number of tipping bays – 10
- Steam output – 76 tonnes of steam per hour at 400°C and 45 bar
- Flue gas treatment – CNIM semi-dry lime scrubber followed by high performance bag filters, discharging into a 65 metre high chimney
- Energy produced – maximum generating capacity 17MW

The Integra South West ERF forms part of Veolia's Integrated Contracts, the most progressive integrated waste management system in Britain which provides sustainable waste management for all the domestic waste in the county.

The ERF is regulated by the Environment Agency and is certified in compliance with:

- ISO 9001 : 2008
- ISO 14001 : 2004,
- OHAS 18001 : 2007, and
- ISO 25999

**Table 2.1: Permitted Waste Types**

European Waste Catalogue Number	Description
<b>02</b>	<b>Wastes from agriculture, horticulture, aquaculture, forestry, hunting and fishing, food preparation and processing</b>
02 03 04	Materials unsuitable for consumption or processing
<b>15</b>	<b>Waste packaging, absorbents, wiping cloths, filter materials, and protective clothing not otherwise specified</b>
15 01 06	Mixed packaging
<b>18</b>	<b>Wastes from human natal care, diagnosis, treatment or prevention of disease in humans</b>
18 01 04	Wastes whose collection and disposal is not subject to special requirements in order to prevent infection (for example dressings, plaster casts, linen, disposable clothing, diapers)
<b>19</b>	<b>Wastes from Waste Management Facilities, Off-site Waste Water Treatment Plants and Preparation of Water Intended for Human Consumption and Water for Industrial Use.</b>
19 02	wastes from physico/chemical treatments of waste (including dechromataion, decyanidation, neutralisation)
19 02 10	combustible wastes other than those mentioned in 19 02 08 and

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	19 02 09
<b>19 08</b>	<b>Wastes from water treatment plants not otherwise specified</b>
19 08 01	Screenings
19 08 09	Grease and oil mixture from oil/water separation containing only edible oil and fats
<b>19 12</b>	<b>Wastes from mechanical treatment of waste (for example sorting, crushing, compacting, pelletising) not otherwise specified.</b>
19 12 01	paper and cardboard
19 12 08	textiles
19 12 10	combustible waste (refuse derived fuel)
19 12 12	other wastes from the mechanical treatment of wastes
<b>20</b>	<b>Municipal Waste (Household waste and similar commercial, industrial and institutional wastes) Including separately collected fractions.</b>
20 01	separately collected fractions (except 15 01)
20 01 01	paper and cardboard
20 01 08	biodegradable kitchen and canteen waste
20 01 10	clothes
20 01 11	textiles
20 01 39	plastics
20 01 99	Other fractions not otherwise specified (Hygiene waste collected from domestic facilities that is not classified as clinical waste)
<b>20 02</b>	<b>Garden and Park Wastes (Including Cemetery Waste).</b>
20 02 01	biodegradable waste
<b>20 03</b>	<b>Other Municipal Wastes.</b>
20 03 01	mixed municipal waste
20 03 02	market waste
20 03 03	street cleaning residues
20 03 07	bulky waste

### 3.0 OPERATIONAL INFORMATION

**Table 3.0 : Operational Details**

Operational hours (both lines)	16,616	Hours
Total Waste Incinerated	204,045	Tonnes
Electricity Exports to National Grid	118,972	MWHrs
Metals Recovered	3094	Tonnes
Incinerator Bottom Ash Produced	38,322	Tonnes
APC Residues	4,933	Tonnes

#### 3.1 Solid Residue Outputs

The Incinerator Bottom Ash (IBA) is transported by Veolia Haulage to Raymond Brown Minerals and Recycling Ltd Aggregate Processing Facility situated in Longparish, Hampshire. The IBA is reprocessed into a number of different graded aggregates, ferrous and non ferrous metal products, which are then utilised in the construction and metal industry.

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Ferrous metals removed during on site processing of IBA are forwarded to Light Brothers Waste and Metal Recycling Facility situated in Lewes, East Sussex. The metals are separated into individual fractions, and are sent on for utilisation in the metal industry.

The fine particulate matter, known as Air Pollution Control Residue (APCr), is removed from the process by a fabric filter. The APCr is sent to Empire, another Veolia site located in Aldridge, West Midlands where it is used to neutralise spent acid wastes before final disposal.

In line with Veolia's corporate responsibility, and as a Permit requirement, a Duty of Care Audit is conducted at least annually at these final disposal points.

### 3.2 Water Discharges from Site

The water required for plant operations is reused extensively within the process and therefore few, or no water discharges are released from the facility. When required, water discharges are released in batches from the plant in accordance with the Permit. Samples are taken and analysed for the parameters listed in the Trade Effluent Discharge Consent issued and regulated by Southern Water.

For the duration of 2016; 100% of water used for the running of the facility was recycled within the process, no discharges were made to sewer.

Seawater from the estuary is used to cool the boiler water before it is recycled back into the system. The following parameters are monitored on a continuous basis; Oil and Grease, Chlorine  $\mu\text{g/l}$  (Total Residual Oxidant), cooling water flow  $\text{M}^3/\text{hr}$ , cooling water temperature increment  $^{\circ}\text{C}$ . The monthly peaks are reported to the Environment Agency bi-annually.

The results compared with emission limits are summarised in Table 3.2.1

<b>Table 3.2.1 : Sea Water Monthly Peak 2016</b>													
<b>Parameter</b>	<b>Calendar Month</b>												<b>Limit</b>
	<b>Jan</b>	<b>Feb</b>	<b>Mar</b>	<b>Apr</b>	<b>May</b>	<b>Jun</b>	<b>Jul</b>	<b>Aug</b>	<b>Sep</b>	<b>Oct</b>	<b>Nov</b>	<b>Dec</b>	
Oil and Grease $\text{mg/l}$	None visible	None visible	None visible	None visible	None visible	None visible	None visible	None visible	None visible	None visible	None visible	None visible	None visible
Chlorine $\mu\text{g/l}$ (Total Residual Oxidant)	65	211	182	113	86	57	117	94	71	158	164	204	250
Flow Rate $\text{m}^3/\text{h}$	3264	3254	3246	3268	3267	3265	3269	3266	3266	3254	3239	3229	3300
Temperature $^{\circ}\text{C}$	9.5	9.4	9.3	9.2	9.8	9.8	9.7	9.9	9.9	9.6	10.6	9.9	11 $^{\circ}\text{C}$ above intake

### 3.3 Flue Gasses

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All gaseous emissions generated during the combustion process pass through an extensive flue gas cleaning process which begins in the boiler itself where good combustion conditions are maintained and Urea is added to treat oxides of nitrogen. Gasses exit the boiler and enter a gas scrubber where hydrated lime is injected to neutralise acid gasses, activated carbon is added to remove metals and dioxins, and finally gasses pass through the bag filter house to remove any remaining particulates. The cleaned gasses are finally released into the atmosphere through the chimney stacks.

In compliance with the IED and EPR Permit requirements, the flue gasses are continuously monitored using MCERTS accredited equipment. In addition to the continuous monitoring, an extractive sampling campaign is undertaken bi-annually by an approved service supplier. The organisation used for analysis and monitoring are accredited by the United Kingdom Accreditation Service (UKAS) and the Environment Agency's Monitoring Certification Scheme (Mcerts).

### 3.3.1 Continuous and Extractive Emissions Monitoring

The parameters measured and the frequency of monitoring are summarised in Table 3.3.1

<b>Table 3.3.1 : Measured Emissions</b>			
<b>Parameter</b>	<b>Frequency</b>		
	<b>Continuous</b>	<b>Jan - Jun</b>	<b>Jul - Dec</b>
Particulate Matter	✓		
TOC	✓		
Hydrogen Chloride	✓		
Oxides of Nitrogen	✓		
Carbon Monoxide	✓		
Sulphur Dioxides	✓		
Ammonia	✓		
Nitrous Oxide		✓	✓
Hydrogen Fluoride		✓	✓
Mercury		✓	✓
Arsenic		✓	✓
Cadmium		✓	✓
Chromium		✓	✓
Copper		✓	✓
Cobalt		✓	✓
Nickel		✓	✓
Manganese		✓	✓
Antimony		✓	✓
Lead		✓	✓
Thallium		✓	✓
Vanadium		✓	✓
Dioxins and Furans		✓	✓
Dioxin-like PCBs		✓	✓
PAHs		✓	✓

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The results of the bi-annual extractive campaign in comparison to IED and Permitted limits are summarised in Tables 3.3.2 through to and including Table 3.3.3

<b>Table 3.3.2 : Period 1 Extractive Results</b>			
<b>Parameter</b>	<b>Result mg/m<sup>3</sup></b>		<b>Emission Limit mg/m<sup>3</sup></b>
	<b>Stream 1</b>	<b>Stream 2</b>	
Nitrous Oxide	16.8	14.2	No Limit Applies
Hydrogen Fluoride	<0.043	<0.045	2
Mercury and its compounds	0.0025	0.00068	0.05
As, Sb, Pb, Cr, Cu, Mn, Ni, V and their compounds	0.026	0.019	0.5
Cadmium, Thallium and their compounds	0.0012	<0.00086	0.05
Dioxins and Furans (I -TEQ)	0.0039	0.0064	0.1
Dioxins and Furans (WHO – TEQ Humans and Mammals)	0.00069	0.00084	No Limit Applies
Dioxins and Furans (WHO – TEQ Fish)	0.000032	0.000038	No Limit Applies
Dioxins and Furans (WHO – TEQ Birds)	0.0022	0.0017	No Limit Applies
Dioxin-like PCBs (WHO – TEQ Humans and Mammals)	0.0038	0.0063	No Limit Applies
Dioxin-like PCBs (WHO – TEQ Fish)	0.0041	0.0068	No Limit Applies
Dioxin-like PCBs (WHO – TEQ Birds)	0.0070	0.011	No Limit Applies
PAHs Total	4.6	6.0	No Limit Applies

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**Table 3.3.3 : Period 2 Extractive Results**

Parameter	Result mg/m <sup>3</sup>		Emission Limit mg/m <sup>3</sup>
	Stream 1	Stream 2	
Nitrous Oxide	15.3	20.3	No Limit Applies
Hydrogen Fluoride	<0.032	0.030	2
Mercury and its compounds	0.0043	0.00064	0.05
As, Sb, Pb, Cr, Cu, Mn, Ni, V and their compounds	0.035	0.014	0.5
Cadmium, Thallium and their compounds	0.00087	0.00077	0.05
Dioxins and Furans (I -TEQ)	0.034	0.027	0.1
Dioxins and Furans (WHO – TEQ Humans and Mammals)	0.028	0.029	No Limit Applies
Dioxins and Furans (WHO – TEQ Fish)	0.032	0.032	No Limit Applies
Dioxins and Furans (WHO – TEQ Birds)	0.049	0.044	No Limit Applies
Dioxin-like PCBs (WHO – TEQ Humans and Mammals)	0.0022	0.0027	No Limit Applies
Dioxin-like PCBs (WHO – TEQ Fish)	0.00009	0.00014	No Limit Applies
Dioxin-like PCBs (WHO – TEQ Birds)	0.0037	0.0042	No Limit Applies
PAHs Total	1.4	1.1	No Limit Applies

### 3.3.2 Continuous Monitoring

The Continuous Monitoring Equipment (CEMS) for the period of 1<sup>st</sup> January 2016 through to 31<sup>st</sup> December 2016 was in service for 100% of the IED operational hours. The equipment is meticulously serviced, maintained, and calibration checks are routinely conducted.

The maximum half hourly average, and daily averages are reported to the Environment Agency on a bi-annual basis. The data is also uploaded on to the company website on a monthly basis and can be viewed at: [www.veoliaenvironmentalservices.co.uk](http://www.veoliaenvironmentalservices.co.uk)

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### 3.3.3 Annual Emissions

The annual mass emissions of the periodically monitored parameters are summarised in Table 3.3.6

<b>Table 3.3.6 : Annual Mass Emissions</b>		
<b>Parameter</b>	<b>Units</b>	<b>Annual Total</b>
Hydrogen Fluoride	Kg	40.17
Mercury	Kg	2.17
Arsenic	Kg	0.64
Cadmium	Kg	0.59
Copper	Kg	2.33
Nickel	Kg	1.50
Manganese	Kg	2.28
Antimony	Kg	1.66
Lead	Kg	8.01
Thallium	Kg	0.40
Dioxins and Furans	Kg	0.000017970
PAHs	Kg	3.508
PCBs	Kg	0.000001722

### 3.3.4 Review of Emissions

All recorded and reported emissions, including CEMS and Extractive have remained below the emission limit values throughout 2016, and are within acceptable ranges for the plant.

## 4.0 USE OF REJECTED HEAT

Every practicable opportunity to use the heat rejected at the steam condensers for beneficial local use is investigated. To date no cost effective or practicable options have become available. The site will continue to identify all possible opportunities, and investigate the practicalities of its installation. All viable developments will be implemented at the earliest opportunity.

## 5.0 ENVIRONMENTAL CONTROLS

The management and staff of Integra South West ERF are among the most highly qualified and experienced in the sector. Reliable environmental controls and a robust management system ensure that compliance with the Industrial Emissions Directive and EPR Permit is maintained.

VES staff are aware of the environmental impacts of their work and exercise an appropriate standard of good house keeping, proportionate to the impacts of any potential emissions. Training and competency of staff is controlled by the VES Business Management System. The company identifies training requirements of its employees and provides suitable resources to ensure they have the required knowledge, skills and expertise to carry out their duties.

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<b>Table 5.1 : Facility Compliance Summary</b>	
Exceedence of Emission Limit Values	None
Abnormal Operations	None
Enforcement Notices	None
Complaints	No Substantiated Complaints

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