

**Integra South West Energy Recovery Facility  
 EPR BJ7093IY  
 Annual Performance Report 2011**

## 1.0 INTRODUCTION

This document represents the Annual Performance Report for Integra South West Energy Recovery Facility (Marchwood ERF) and has been written to conform with Article 12 (2) of the Waste Incineration Directive (WID):

*'For incineration or co-incineration plants with a nominal capacity of two tonnes or more per hour and notwithstanding Article 15(2) of Directive 96/61/EC, an annual report to be provided by the operator to the competent authority on the functioning and monitoring of the plant shall be made available to the public. This report shall, as a minimum requirement, give an account of the running of the process and the emissions into air and water compared with the emission standards in this Directive.'*

This report has also been written in order to comply with Condition 4.1.10 of Environmental Permit BJ7093IY:

*'The Operator shall submit an annual performance report on the functioning and monitoring of the incineration plant in a format agreed with the Environment Agency by the 31<sup>st</sup> January each year. The report shall, as a minimum requirement, give an account of the running of the process and the emissions into air and water compared with the emission standards in the Waste Incineration Directive, as required by Article 12(2) of the Waste Incineration Directive.'*

## 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>023 80 875500</b>
<b>Fax Number</b>	<b>023 80 875501</b>

Integra South West Energy Recovery Facility (ERF) is the second of its kind to be built in Hampshire and is leading example of best environmental practise for waste treatment. The waste produced by Southampton City and South West Hampshire Districts is dealt with at this ERF, providing a long term, sustainable solution for waste disposal. It recovers heat energy from the waste to produce steam, which

**Integra South West Energy Recovery Facility**  
**EPR BJ7093IY**  
**Annual Performance Report 2011**

is used to generate electricity supplied to the National Grid. Strict environmental controls and proven 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 – 210,000 tonnes per annum, with approximately 12 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 14MW

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, and
- OHAS 18001 : 2007

**Table 2.1: Permitted Waste Types**

Description	European Waste Catalogue Number	Maximum Throughput
Other Wastes from mechanical treatment of waste	19 12 12	Note 1
Confidential Waste	20 01 01 20 01 39	Note 1
Catering Waste	20 01 08	Note 1
Mixed Municipal Waste	20 03 01	Note 1
Market Waste	20 03 03	Note 1
Street Cleaning Residues	20 03 03	Note 1
Bulky Waste	20 03 07	Note 1

**Integra South West Energy Recovery Facility  
 EPR BJ7093IY  
 Annual Performance Report 2011**

Note 1: The total annual throughput of all waste types shall not exceed 210,000te and the maximum hourly throughput (at average calorific value 9200j/kg) shall not exceed 24 te/hr.

### 3.0 OPERATIONAL INFORMATION

<b>Table 2.2 : Operational Details</b>		
Operational hours (both lines)	16,390	Hours
Total Waste Incinerated	201,031	Tonnes
Electricity Exports to National Grid	119,998	MWHrs
Metals Recovered	3468	Tonnes
Incinerator Bottom Ash Produced	45,693	Tonnes
APC Residues	5984	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 Verwood, 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.

Ferrous metals removed during on site processing of IBA are forwarded to M.J.D 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 Minosus, another Veolia site located in Bostock, Cheshire, 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 the above mentioned locations.

#### 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 2011; 100% of water used for the running of the plant was recycled within the

**Integra South West Energy Recovery Facility  
EPR BJ7093IY  
Annual Performance Report 2011**

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 µg/l (Total Residual Oxidant), cooling water flow M<sup>3</sup>/hr, cooling water temperature increment °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 2011</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 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 µg/l (Total Residual Oxidant)	168.15	116.02	82.97	144.86	80.36	57.6	143	50	511	606	331	411	250
Flow Rate M <sup>3</sup> /h	3246.2	3197.04	3207.95	3247.58	3246.07	3246.35	3252	3245	3246	3286	3229	3241	330
Temperature °C	10.23	10.24	10.01	10.34	10.18	10.13	10.3	9.6	10.1	10.8	10.6	10.0	11°C above intake

### 3.3 Flue Gasses

All gaseous emissions generated during the combustion process pass through an extensive flue gas cleaning process which starts with a gas scrubber where hydrated lime is injected to neutralise acid gasses. Activated carbon is added to remove dioxins, urea is added to treat oxides of nitrogen and finally the bag filter takes away remaining particulates. The cleaned gasses are finally released into the atmosphere through the chimney.

In compliance with the WID and EPR Permit, the flue gasses are continuously monitored using MCERTS accredited equipment. In addition to the continuous monitoring, an extractive sampling campaign is undertaken on a quarterly basis 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).

**Integra South West Energy Recovery Facility  
 EPR BJ7093IY  
 Annual Performance Report 2011**

3.3.1 Extractive Monitoring

The parameters measured and their 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>Quarter 1</b>	<b>Quarter 2</b>	<b>Quarter 3</b>	<b>Quarter 4</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		✓		✓	

**Integra South West Energy Recovery Facility  
EPR BJ7093IY  
Annual Performance Report 2011**

The results of the quarterly extractive campaign in comparison to WID and Permitted limits are summarised in Tables 3.3.2 through to and including Table 3.3.5

<b>Table 3.3.2 : Quarter 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>	
Particulate Matter	37.8*	0.8	20
TOC	0.1	Non detectable	20
Hydrogen Chloride	15.7	6.0	30
Oxides of Nitrogen	257.3	228.0	400
Carbon Monoxide	18.5	13.4	100
Sulphur Dioxide	13.3	36.6	200
Ammonia	7.36	2.4	No Limit Applies
Nitrous Oxide	19.0	12.6	No Limit Applies
Hydrogen Fluoride	0.1	Non detectable	2
Mercury and its compounds	0	0.0048	0.05
As, Sb, Pb, Cr, Cu, Mn, Ni, V and their compounds	0.2	0.011	0.5
Cadmium, Thallium and their compounds	0	0.0004	0.05
Dioxins and Furans (I -TEQ)	0.0261	0.0287	0.1
Dioxins and Furans (WHO – TEQ Humans and Mammals)	0.0030	0.0028	No Limit Applies
Dioxins and Furans (WHO – TEQ Fish)	0.0034	0.0031	No Limit Applies
Dioxins and Furans (WHO – TEQ Birds)	0.0065	0.0048	No Limit Applies
Dioxin-like PCBs (WHO – TEQ Humans and Mammals)	0.0015	0.0015	No Limit Applies
Dioxin-like PCBs (WHO – TEQ Fish)	0.0034	0.0001	No Limit Applies
Dioxin-like PCBs (WHO – TEQ Birds)	0.0065	0.0035	No Limit Applies
PAHs Total	0.362	0.499	No Limit Applies

\*Note 1: An extractive monitoring particulate exceedence on Boiler 1 of 37.8 mg/m<sup>3</sup> against the permitted limit of 20 mg/m<sup>3</sup> was recorded during the quarter 1 extractive sampling campaign 16<sup>th</sup> – 23<sup>rd</sup> February 2011. The particulate matter was found within the probe washings rather than on the analytical filter

**Integra South West Energy Recovery Facility  
EPR BJ7093IY  
Annual Performance Report 2011**

paper, and the continuous monitor recorded a level of 3.78 mg/m<sup>3</sup> during the test period which is compliant with the permit. Nonetheless, an exceedance was reported to the Environment Agency. The plant was shut down on 24<sup>th</sup> February and approximately 40 bags within the filter bag house on line 1 were replaced. The particulate levels were retested during the quarter 2 extractive sampling campaign, a compliant result of 1.29 mg/m<sup>3</sup> was obtained.

<b>Table 3.3.3 : Quarter 2 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>	
Particulate Matter	1.29 <sup>†</sup>	N/A	20
Hydrogen Fluoride	0.07	0.13	2
Mercury and its compounds	Non detectable	0.0010	0.05
As, Sb, Pb, Cr, Cu, Mn, Ni, V and their compounds	0.014	0.014	0.5
Cadmium, Thallium and their compounds	Non detectable	0.0005	0.05

<sup>†</sup>Note 2: Particulate analysis repeated due to previous Quarter 1 exceedance

<b>Table 3.3.4 : Quarter 3 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>	
Particulate Matter	1.25	3.52	20
TOC	Non detectable	0.4	20
Hydrogen Chloride	19.0	7.71	30
Oxides of Nitrogen	202	199	400
Carbon Monoxide	33.9	10	100
Sulphur Dioxide	7.79	7.36	200
Ammonia	3.7	4.96	No Limit Applies
Nitrous Oxide	14.9	14.0	No Limit Applies
Hydrogen Fluoride	0.29	2	2
Mercury and its compounds	0.001	0.001	0.05
As, Sb, Pb, Cr, Cu, Mn, Ni, V and their compounds	0.004	0.022	0.5
Cadmium, Thallium and their compounds	Non detectable	0.0003	0.05
Dioxins and Furans (I -TEQ)	0.001	0.011	0.1
Dioxins and Furans (WHO – TEQ Humans and Mammals)	0.001	0.009	No Limit Applies
Dioxins and Furans (WHO – TEQ Fish)	0.001	0.009	No Limit Applies
Dioxins and Furans (WHO –	0.002	0.013	No Limit Applies

**Author:** Naomi Chillcott

**Reference:**

**Date:**

**Page:**

**Owner:** Michael Campbell

M.ERF/APR/2011

01 /12

7 of 10

**Integra South West Energy Recovery Facility  
 EPR BJ7093IY  
 Annual Performance Report 2011**

TEQ Birds)			
Dioxin-like PCBs (WHO – TEQ Humans and Mammals)	0.0008	0.0015	No Limit Applies
Dioxin-like PCBs (WHO – TEQ Fish)	0.00004	0.00007	No Limit Applies
Dioxin-like PCBs (WHO – TEQ Birds)	0.0015	0.0034	No Limit Applies
PAHs Total	2.124	0.581	No Limit Applies

**Table 3.3.5 : Quarter 4 Extractive Results**

Parameter	Result mg/m <sup>3</sup>		Emission Limit mg/m <sup>3</sup>
	Stream 1	Stream 2	
Hydrogen Fluoride	0.07	0.13	2
Mercury and its compounds	Non detectable	0.0010	0.05
As, Sb, Pb, Cr, Cu, Mn, Ni, V and their compounds	0.014	0.014	0.5
Cadmium, Thallium and their compounds	Non detectable	0.0005	0.05

### 3.3.2 Continuous Monitoring

The Continuous Monitoring Equipment (CEMS) for the period of 1<sup>st</sup> January 2011 through to 31<sup>st</sup> December 2011 was in service for 100% of the WID 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 companies' website on a monthly basis and can be viewed at: [www.veoliaenvironmentalservices.co.uk](http://www.veoliaenvironmentalservices.co.uk)

A half hourly CO exceedence of 116.15 mg/m<sup>3</sup> against the permitted half hourly maximum of 100 mg/m<sup>3</sup>, was recorded 20<sup>th</sup> May 2011 21:00 – 21:30 Boiler 2 due to an abnormal operation. The Environment Agency was notified of the abnormal operation 21<sup>st</sup> May 2011. The auxiliary burner cut in on low combustion chamber temperature as is required to maintain a boiler temperature of 850°C. The auxiliary burner tripped due to a Diesel Oil valve fault, and attempts to re-set the burner were unsuccessful. Following the failed attempts the feed chute door was shut, and the boiler was taken off waste. Once the burner had been re-established, the grate was cleared and normal operations recommenced. The Diesel Oil valve fault was rectified, and adjustments were made to prevent a reoccurrence.

**Author:** Naomi Chillcott

**Reference:**

**Date:**

**Page:**

**Owner:** Michael Campbell

M.ERF/APR/2011

01 /12

8 of 10



**Integra South West Energy Recovery Facility  
EPR BJ7093IY  
Annual Performance Report 2011**

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	124.01
Mercury	Kg	0.33
Arsenic	Kg	0.10
Cadmium	Kg	0.15
Copper	Kg	1.16
Nickel	Kg	1.29
Manganese	Kg	5.37
Antimony	Kg	0.07
Lead	Kg	1.69
Thallium	Kg	0
Dioxins and Furans	Kg	0.000017
PAHs	Kg	0.941
PCBs	Kg	0.000133

**3.0 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 Waste Incineration Directive and EPR Permit is achieved.

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 Management System covers training, awareness and competence. 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.

<b>Table 4.1 : Facility Compliance Summary</b>	
Exceedence of Permitted Limits	Two <sup>* Note 1</sup>

**Integra South West Energy Recovery Facility  
EPR BJ7093IY  
Annual Performance Report 2011**

Abnormal Operations	One <sup>†</sup> Note 2
Enforcement Notices	None
Complaints	None

\* Note 1: Particulate exceedence 2<sup>nd</sup> March 2011 (for explanation refer to section 3.3.1)

CO Half Hourly Average exceedence 20<sup>th</sup> May 2011 (for explanation refer to section 3.3.2)

<sup>†</sup> Note 2: Auxiliary burner failure (for explanation refer to section 3.3.2)