

Newhaven Energy Recovery Facility**EPR BV8067IL****Annual Performance Report 2016****1. Introduction**

This report is based on the requirements of Article 62, Chapter IV of Industrial Emissions Directive (IED) regarding the requirements on access to information and public participation, which requires the operator of an incineration or co-incineration plant to produce an annual report to the regulator on the functioning and monitoring of the plant and to make this available to the public.

Name of Company	Veolia ES South Downs Ltd.
Name of Plant	Newhaven Energy Recovery Facility
Permit Number	BV8067IL
Address	North Quay Road, Newhaven BN9 0AB
Phone number	01273 511310
Further information	Newhaven ERF (Energy Recovery Facility), Line 1 and 2, built on a new site situated at Newhaven (neighbouring Brighton). The site is located besides a river and approximately 2.0 km north of the south coast. Newhaven ERF provides a long term, sustainable solution for waste disposal in the area as part of an integrated approach to waste management. Municipal waste that is not recycled in East Sussex is incinerated at this ERF minimising disposal of waste to land fill.

The principal objective of the facility is the provision of an independent ERF with two separate lines burning acceptable mixed municipal solid waste at an average rate of 14.0 tons per hour, per line with a calorific value of 9.2 MJ/kg for producing 19MW of electrical power, of which 16.5MW goes for export.

2. Plant Description

The main purpose of the Facility is to incinerate Mixed Municipal Solid Waste (MMSW) as defined by European Waste Catalogue (EWC) Code 20 03 01, however up to 30% of the total throughput can be composed of a range of non-hazardous trade waste of a similar nature. Current energy recovery is exclusively in the form of steam and electricity for export to the National Grid, although potential does exist for the provision of community district heating that would also reduce local emissions. The permitted Facility covers the site and the entire incineration plant including all incineration lines, waste reception and storage, waste-fuel and air supply systems, boilers, facilities for the treatment of exhaust gases, on-site facilities for handling and storage of residues and operations, recording and monitoring conditions.

Waste Reception & Storage

Waste is delivered into the tipping hall in covered vehicles. The tipping hall is maintained under negative pressure to minimise the escape of odours, dust or litter. The vehicles tip into a waste storage bunker from where the grab cranes transfer waste as required to the feed hopper of the combustion plant.

Combustion Process:

Waste is gravity fed onto the incinerator grate. The grate is continually moving thus promoting continuous mixing of the waste with the combustion air, extracted from the tipping hall and introduced from beneath the grate into the heart of the fire

eliminating any odours. Further air is injected just above the fire to promote mixing and complete combustion of the gases.

Fuel oil burners are installed for start-up and to maintain the furnace temperature, if required. However, during normal operation no support fuel is required to maintain the minimum 850°C.

Ash from the grate is discharged into a water filled quench pit from where it is moved by conveyor to the enclosed ash storage bunkers prior to being transported off site. All incinerator bottom ash is sent to a local storage facility for onward transportation by rail to an aggregate production site.

Ferrous metals are removed from the ash by magnets and stored separately prior to being sent to a local Recycling Facility.

Energy Recovery:

Hot gases from the combustion of the waste pass through a heat recovery boiler. The temperature of the gases is reduced from over 850°C to around 150°C. The energy from the hot gases is transferred to the boiler to produce high pressure steam at 49bar. This steam is fed to the steam turbine driven generator capable of generating around 19.0 MW, which, after supplying the site electrical load, the residual is exported to the National Grid.

Gas Cleaning:

Whilst in the boiler combustion chamber a metered amount of ammonia solution is injected into the combustion gases to reduce the formation of oxides of nitrogen. Downstream of the boiler, lime is injected into the gas stream to neutralise acid gases produced in the process. A small quantity of activated carbon is injected to adsorb any residual organic material and heavy metals from the gases.

Prior to release into the air the gases pass through a fabric filter which removes the particulate matter, spent lime and carbon from the gas stream.

Once the gases have been cleaned they are discharged into the atmosphere via two separate 65 metre high stacks.

Water Usage:

The plant uses mains water for steam generation after passing through a water treatment plant. The steam is reused in the boiler after being cooled and condensed using air cooled condensers.

The facility also uses mains water in various ways for water injection into the abatement system reactor tower, internal wash downs, tipping hall floor cleaning, but mostly for human domestic use, cooking, showering and sanitation. Any water that is used within the facility other than for domestic washing and cleaning is captured in dedicated drains and directed into a waste water tank where heavy sediments are removed from the water.

The cleaned water is then re-used within the facility principally for ash quenching, thus limiting the amount of fresh water used and minimising water discharge from the site.

External uncontaminated rainwater runoff from the western side flows directly to a river outfall, whilst all other roof and external surface drains run into the full retention interceptor in accordance with BS EN858 and PPG3, then discharge into the river Ouse.

3. Summary of Plant Operation.

During 2016 the facility processed 233,013 tonnes of waste; of this 196,173 tonnes was municipal waste, and the remaining 36,840 tonnes came from other similar municipal & commercial waste sources. Section 8 lists the forms containing the reporting information required for permit compliance.

Summary of Waste Processed and Main Plant Outputs for 2016

Operating Hours	Line 1 – 8,233 Line 2 – 8,411	16,644 Hours
Waste Incinerated	233,013	Tonnes
Electricity Produced	150,227	MWh
Metals Recovered	4,296	Tonnes
Incinerator Bottom Ash	44,752	Tonnes
APC residues	6,796	Tonnes

The site generated 150,227 MWh of electricity during 2016. After subtracting on site power usage, 130,986 MWh of electricity was exported to the National Grid, providing enough electricity to power approximately 25,000 homes.

Incinerator Bottom Ash (IBA) is collected by an aggregate recycling company and placed into a storage facility, adjacent to the ERF, for onward transport via rail for further reprocessing.

Ferrous metal is removed from the IBA and collected by a local metal recycler for further processing.

Air Pollution Control residue (APCr), is removed from the flue gases by the fabric filter, collected in a storage silo and then sent in sealed tankers by road to a specialised Veolia treatment works (Empire). At this licensed site, the residue is used to treat spent acid wastes and then sent for safe disposal at a licensed land fill site.

4. Summary of Plant Emissions.

All emissions to air from the 65m high twin stacks are controlled to meet the emission limits included in the IED Permit. The flue gases released into the atmosphere are continuously monitored using Continuous Emissions Monitoring System (CEMS) for particulate matter, hydrogen chloride, oxides of nitrogen, carbon

monoxide, sulphur dioxide, total volatile organic compounds and ammonia. During 2016 the CEMS monitoring equipment was in service at all times and fully operational with the ERF remaining compliant within IED limits at all times.

An overview over the Emissions measured by the CEMS and released into the air in the year 2016 in comparison with the Emission limit can be seen in **Error! Reference source not found..**

A review of the extractive emission data regarding the limits sets by the IED can be seen in the following table (Table1).

Table 1 - Extractive emission data compared with emission limit value.

Emission Point	Substance / Parameter	Emission Limit Value	Result	
Quarter 1				
A1	Hydrogen fluoride	1 mg/m ³ over minimum 1 hour period	< 0.034 mg/m ³	
A1	Cadmium & thallium and their compounds (total)	0.05 mg/m ³ over minimum 30 minute, maximum 8 hour period	0.0016 mg/m ³	
A1	Mercury and its compounds	0.05 mg/m ³ over minimum 30 minute, maximum 8 hour period	0.0025 mg/m ³	
A1	Sb, As, Pb, Cr, Co, Cu, Mn, Ni and V and their compounds (total)	0.5 mg/m ³ over minimum 30 minute, maximum 8 hour period	0.055 mg/m ³	
A1	Particulate Matter	20 mg/m ³ over minimum 1 hour period	5.9 mg/m ³	
A1	VOC as Total Organic Carbon (TOC)	20 mg/m ³ over minimum 1 hour period	0.35 mg/m ³	
A1	Hydrogen chloride	30 mg/m ³ over minimum 1 hour period	3.0 mg/m ³	
A1	Carbon monoxide	100 mg/m ³ (average of ½-hour averages) over minimum 4 hour period	8.1 mg/m ³	
A1	Sulphur dioxide	200 mg/m ³ (average of ½-hour averages) over minimum 4 hour period	< 0.040 mg/m ³	
A1	Oxides of nitrogen (NO and NO ₂ expressed as NO ₂)	400 mg/m ³ (average of ½-hour averages) over minimum 4 hour period	223 mg/m ³	
A1	Dioxins / furans (I-TEQ) ⁶	0.1 ng/m ³ over minimum 6 hour, maximum 8 hour period	0.008 ng/m ³	0.0088 ng/m ³
A2	Hydrogen fluoride	1 mg/m ³ over minimum 1 hour period	<0.028 mg/m ³	
A2	Cadmium & thallium and their compounds (total)	0.05 mg/m ³ over minimum 30 minute, maximum 8 hour period	< 0.00079 mg/m ³	

A2	Mercury and its compounds	0.05 mg/m ³ over minimum 30 minute, maximum 8 hour period	0.0010 mg/m ³	
A2	Sb, As, Pb, Cr, Co, Cu, Mn, Ni and V and their compounds (total)	0.5 mg/m ³ over minimum 30 minute, maximum 8 hour period	0.13 mg/m ³	
A2	Particulate Matter	20 mg/m ³ over minimum 1 hour period	0.93 mg/m ³	
A2	VOC as Total Organic Carbon (TOC)	20 mg/m ³ over minimum 1 hour period	0.250 mg/m ³	
A2	Hydrogen chloride	30 mg/m ³ over minimum 1 hour period	4.1 mg/m ³	
A2	Carbon monoxide	100 mg/m ³ (average of ½-hour averages) over minimum 4 hour period	7.2 mg/m ³	
A2	Sulphur dioxide	200 mg/m ³ (average of ½-hour averages) over minimum 4 hour period	< 0.038 mg/m ³	
A2	Oxides of nitrogen (NO and NO ₂ expressed as NO ₂)	400 mg/m ³ (average of ½-hour averages) over minimum 4 hour period	220 mg/m ³	
A2	Dioxins / furans (I-TEQ) ⁶	0.1 ng/m ³ over minimum 6 hour, maximum 8 hour period	0.0057 ng/m ³	0.0067 ng/m ³
Quarter 2				
A1	Hydrogen fluoride	1 mg/m ³ over minimum 1 hour period	<0.034 mg/m ³	
A1	Cadmium & thallium and their compounds (total)	0.05 mg/m ³ over minimum 30 minute, maximum 8 hour period	0.0017 mg/m ³	
A1	Mercury and its compounds	0.05 mg/m ³ over minimum 30 minute, maximum 8 hour period	0.0019 mg/m ³	
A1	Sb, As, Pb, Cr, Co, Cu, Mn, Ni and V and their compounds (total)	0.5 mg/m ³ over minimum 30 minute, maximum 8 hour period	0.04 mg/m ³	
A2	Hydrogen fluoride	1 mg/m ³ over minimum 1 hour period	< 0.039 mg/m ³	
A2	Cadmium & thallium and their compounds (total)	0.05 mg/m ³ over minimum 30 minute, maximum 8 hour period	< 0.00074 mg/m ³	
A2	Mercury and its compounds	0.05 mg/m ³ over minimum 30 minute, maximum 8 hour period	0.0025 mg/m ³	
A2	Sb, As, Pb, Cr, Co, Cu, Mn, Ni and V and their compounds (total)	0.5 mg/m ³ over minimum 30 minute, maximum 8 hour period	0.032 mg/m ³	
Quarter 3				
A1	Hydrogen fluoride	1 mg/m ³ over minimum 1 hour period	< 0.031 mg/m ³	
A1	Cadmium & thallium and their compounds (total)	0.05 mg/m ³ over minimum 30 minute, maximum 8 hour period	0.00079 mg/m3	
A1	Mercury and its compounds	0.05 mg/m ³ over minimum 30 minute, maximum 8 hour period	0.0008 mg/m ³	
A1	Sb, As, Pb, Cr, Co, Cu, Mn, Ni and V and their compounds (total)	0.5 mg/m ³ over minimum 30 minute, maximum 8 hour period	0.064 mg/m ³	

A1	Particulate Matter	20 mg/m ³ over minimum 1 hour period	1.4 mg/m ³
A1	VOC as Total Organic Carbon (TOC)	20 mg/m ³ over minimum 1 hour period	0.45 mg/m ³
A1	Hydrogen chloride	30 mg/m ³ over minimum 1 hour period	3.9 mg/m ³
A1	Carbon monoxide	100 mg/m ³ (average of ½-hour averages) over minimum 4 hour period	9.5 mg/m ³
A1	Sulphur dioxide	200 mg/m ³ (average of ½-hour averages) over minimum 4 hour period	0.87 mg/m ³
A1	Oxides of nitrogen (NO and NO ₂ expressed as NO ₂)	400 mg/m ³ (average of ½-hour averages) over minimum 4 hour period	236 mg/m ³
A1	Dioxins / furans (I-TEQ) ⁶	0.1 ng/m ³ over minimum 6 hour, maximum 8 hour period	0.0021 ng/m ³ 0.0025 ng/m ³
A2	Hydrogen fluoride	1 mg/m ³ over minimum 1 hour period	< 0.027 mg/m ³
A2	Cadmium & thallium and their compounds (total)	0.05 mg/m ³ over minimum 30 minute, maximum 8 hour period	0.00074 mg/m ³
A2	Mercury and its compounds	0.05 mg/m ³ over minimum 30 minute, maximum 8 hour period	0.0038 mg/m ³
A2	Sb, As, Pb, Cr, Co, Cu, Mn, Ni and V and their compounds (total)	0.5 mg/m ³ over minimum 30 minute, maximum 8 hour period	0.025 mg/m ³
A2	Particulate Matter	20 mg/m ³ over minimum 1 hour period	2.1 mg/m ³
A2	VOC as Total Organic Carbon (TOC)	20 mg/m ³ over minimum 1 hour period	0.41 mg/m ³
A2	Hydrogen chloride	30 mg/m ³ over minimum 1 hour period	2.1 mg/m ³
A2	Carbon monoxide	100 mg/m ³ (average of ½-hour averages) over minimum 4 hour period	12.4 mg/m ³
A2	Sulphur dioxide	200 mg/m ³ (average of ½-hour averages) over minimum 4 hour period	36 mg/m ³
A2	Oxides of nitrogen (NO and NO ₂ expressed as NO ₂)	400 mg/m ³ (average of ½-hour averages) over minimum 4 hour period	206 mg/m ³
A2	Dioxins / furans (I-TEQ) ⁶	0.1 ng/m ³ over minimum 6 hour, maximum 8 hour period	0.0095 ng/m ³ 0.010 ng/m ³
Quarter 4			
A1	Hydrogen fluoride	1 mg/m ³ over minimum 1 hour period	0.04 mg/m ³
A1	Cadmium & thallium and their compounds (total)	0.05 mg/m ³ over minimum 30 minute, maximum 8 hour period	< 0.00072 mg/m ³
A1	Mercury and its compounds	0.05 mg/m ³ over minimum 30 minute, maximum 8 hour period	0.003 mg/m ³
A1	Sb, As, Pb, Cr, Co, Cu, Mn, Ni and V and their compounds (total)	0.5 mg/m ³ over minimum 30 minute, maximum 8 hour period	0.034 mg/m ³
A2	Hydrogen fluoride	1 mg/m ³ over minimum 1 hour	0.042 mg/m ³

		period	
A2	Cadmium & thallium and their compounds (total)	0.05 mg/m ³ over minimum 30 minute, maximum 8 hour period	< 0.0007 mg/m ³
A2	Mercury and its compounds	0.05 mg/m ³ over minimum 30 minute, maximum 8 hour period	0.0036 mg/m ³
A2	Sb, As, Pb, Cr, Co, Cu, Mn, Ni and V and their compounds (total)	0.5 mg/m ³ over minimum 30 minute, maximum 8 hour period	0.019 mg/m ³

The CEMS is stringently monitored to MCERTS standards with routine calibration checks, conforming to BS EN14181. Additionally, a full range of standby equipment is permanently in service should an unexpected failure occur.

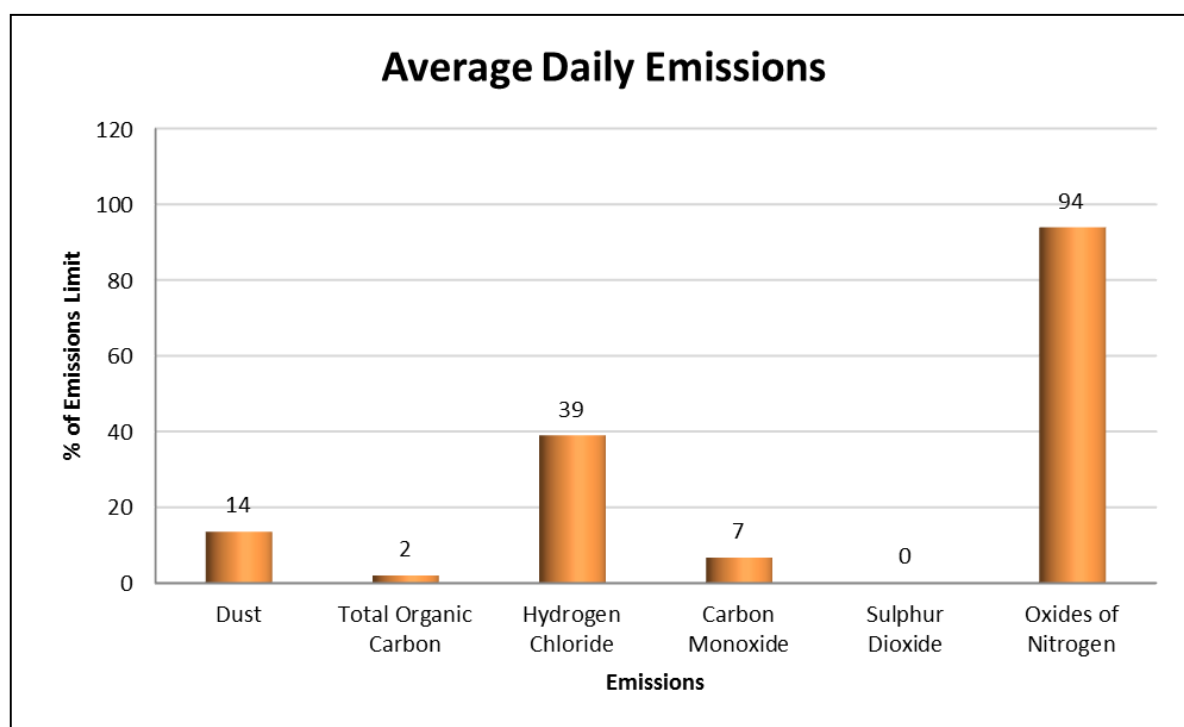


Figure 1 – Daily average emission 2016 as a percentage of the emission limit.

In addition to continuous monitoring, emissions are checked on a quarterly basis, being carried out by independent contractors using approved extractive methods to MCERTS standards.

Full details of continuously monitored and extractive emissions for 2016 are listed in forms A3 to A9, previously reported.

Newhaven ERF has not discharged to sewer in 2016.

5. Summary of Plant Compliance

Strict environmental controls and proven operating experience greatly assists in the facility remaining compliant within the conditions of its IED Permit at all times. This is achieved through constant monitoring of the incineration process during all of the stages, with detailed procedures in place to enable trained staff to carry out their work in an environmentally compliant manner.

During 2016 Newhaven ERF operated at all times within the limits of the IED.

Breach of Permit Conditions	0
Enforcement Notices	0
Abnormal Operation	0
ERF Substantiated Complaints	0

Any complaints received at the facility are recorded and thoroughly investigated by the Management team with a full report being kept detailing the outcome of the investigation. All complaints are reviewed monthly by the Veolia Senior Management team and at Director level.

6. Summary of information made available.

- A general process description can be found on the company website at <http://www.veolia.co.uk/southdowns/facilities/facilities/newhaven-energy-recovery-facility>
- This site also contains details of average emissions for the full year.
- Community liaison group meetings are planned annually and are expected to continue on a similar basis for the foreseeable future.
- As part of their regulatory responsibility the Environment Agency inspector visits the Facility on a regular basis.

- The Operating Permit is available on the Public Register from the Environment Agency's office at:

The Environment Agency

Solent and South Downs Area Office,
Guildbourne House, Chatsworth Road,
Worthing, Sussex, BN11 1LD

Useful web addresses:

<http://www.veolia.co.uk/>

www.environment-agency.gov.uk

Registered Office: Veolia,
8th Floor, 210 Pentonville Road,
London N1 9JY

7. Environmental reporting compliance

The following list of forms is submitted in compliance with Environmental Permit BV8067IL:

1. A1 emissions to air – quarterly
2. A2 emissions to air – biannually
3. A3 to A9 continuous emissions to air – quarterly
4. ASH1 APCr & IBA – quarterly
5. E1 energy usage – annual
6. WU water usage – annual
7. P1 performance indicators – annual
8. R1 waste disposal and recovery – annual