

Leeds RERF Annual Report EPR/GP3334CX

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1. INTRODUCTION

This is the Annual Performance Report for the Leeds Recycling and Energy Recovery Facility (RERF) for 2016. This annual report is the facilities first complete annual report. This baseline year of 2016 will allow future comparisons and trends to be compared year on year to monitor the performance of the plant and its operation.

2. FACILITY INFORMATION

Plant Operator	Veolia ES Staffordshire Ltd
Name of Facility	Leeds Recycling and Energy Recovery Facility
EPR Permit Number	EPR/GP3334CX
Facility Address	Leeds Recycling and Energy Recovery Facility Newmarket Approach Cross Green Industrial Estate Leeds West Yorkshire LS9 0RJ
Telephone Number	02035678447

The RERF is operated by Veolia ES Leeds Ltd, a wholly owned subsidiary of Veolia. The plant is designed to firstly process through Mechanical Pre-treatment plant (MPT) maximum of 214,000 tonnes per annum and then burn maximum of 179,580 tonnes per annum of predominantly residual municipal solid waste. The facility has been built to serve Leeds City Council in order to divert the waste away from the landfill and to generate electricity.

The facility can generate approximately 13.8MW of electricity from waste. The facility uses 2.2MW and the reminding balance is exported to the national grid. In tangible terms the electricity generated is equivalent to 22,000 homes.

The facility is designed so that it can supply heat, when a client becomes available in the future.

Technical details of the plant:

- Constructions Industrielles de la Mediterranee (CNIM) - Design
- Maximum Permitted Refuse throughput – 179,580 tonnes per annum
- One Incineration line with a capacity of 20.5 tonnes per hour.
- Storage capacity 4,000 Tonnes – Approximately eight days full plant capacity
- Number of tipping bays – 6
- Steam output – 64 tonnes of steam per hour at 400°C at 58 BAR
- Flue gas treatment – dry Urea injection for the reduction of NOx, dry lime injection for the removal of acid gases, activated carbon injection for removal of metals and dioxins followed

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by high performance bag filters for removal of particulates, dispersal via 75m metre high stacks.

- Maximum energy generating capacity 52.4MW

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

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

The facility is permitted to accept the following waste types:

Permitted Waste types and quantities for Pre-treatment and then Incineration	
Maximum quantity 214,000 tonnes per year	
15 01 01	paper and cardboard packaging
15 01 06	mixed packaging
15 01 09	textile packaging
15 02 03	absorbents, filter materials, wiping clothes and protective clothing other than those mentioned in 15 02 02
16 03 06	organic wastes other than those mentioned in 16 03 05
19 12 01	paper and cardboard
19 12 07	wood other than that mentioned in 19 12 06
19 12 12	other wastes (including mixtures of materials) from mechanical treatment of wastes other than those mentioned 19 12 11
20 01 38	wood other than that mentioned in 20 01 37
20 03 01	mixed municipal waste
20 03 02	waste from markets
20 02 07	bulky waste
Permitted Waste Types and quantities for incineration plant	
Maximum quantity 175,580 tonnes per year. This includes waste from the above table after the pre-treatment.	
02 02 02	animal-tissue waste
02 02 03	materials unsuitable for consumption or processing
16 02 16	components removed from discarded equipment other than those mentioned in 16 02 15
16 03 06	organic wastes other than those mentioned in 16 03 05
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)
19 12 01	paper and cardboard
19 12 07	wood other than that mentioned in 19 12 06
19 12 08	textiles
19 12 10	combustible wastes (refuse derived fuel)

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19 12 12	other wastes (including mixtures of materials) from mechanical treatment of wastes other than those mentioned in 19 12 11
20 01 01	paper and cardboard
20 01 08	biodegradable kitchen and canteen waste
20 01 10	clothes
20 01 11	textiles
20 01 38	wood other than that mentioned in 20 01 37
20 01 39	plastics
20 01 99	other fractions not otherwise specified (comprising of non-clinical human and animal offensive/hygiene wastes (not arising from healthcare and/or related research i.e. not including waste from natal care, diagnosis, treatment or prevention of disease) which is not subject to special requirements in order to prevent infection
20 02 01	biodegradable waste
20 03 01	mixed municipal waste
20 03 02	waste from markets
20 03 03	street-cleaning residues
20 03 07	bulky waste

3. OPERATIONAL INFORMATION

3.1. Operational details

Operational Details		
Operational hours	8,077	Hours
Total Waste Incinerated	165,940	Tonnes
Incinerator Bottom Ash Produced	36,463	Tonnes
APC Residues	3,282.7	Tonnes

3.2. Reporting of Water and Other Raw Material Usage for the year 2016

Raw Material	Usage	Unit	Specific Usage	Unit
Mains water	27,972	m ³	168	kg/t
Total water usage	27,972	m ³	168	kg/t
Urea	137	Tonnes	0.83	kg/t
Activated carbon	83	Tonnes	0.50	kg/t
Lime/hydrated lime	1473	Tonnes	8.88	kg/t

(Specific Usage is measured in kg/tonne of waste incinerated)

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3.3. Reporting of Energy Usage/Export for the year 2016

Energy Source	Energy (MWh)	Specific energy	Units
Electricity produced	96,573	582	KWh/tonne of waste incinerated (dry basis)
Electricity imported	2,371	14.2	
Electricity Exported	79,775	480.7	
Fuel Oil	381,248	2.30	L/tonne of waste incinerated (dry basis)
Thermal Energy produced (Steam Production)	450,389	2.71	Tonnes/Tonne waste incinerated

3.4. Reporting of Waste Disposal and Recovery for the year 2016

Waste Description	Disposal Route	Annual Tonnes	Recovery Tonnes	Kg / Tonne Waste
1) Hazardous Wastes				
APC Residues	Empire /Minosus	3,283	0	9.7
IBA which is classified as hazardous waste		0	0	0
Total hazardous waste	Empire /Minosus	3,283	0	9.7
2) Non-Hazardous Wastes				
IBA	Ballast Phoenix	36,463	36,463	219.7
Other non-hazardous wastes	Metals LIM Recycled (Morris Metals)	2210	2210	13
	Scrap Metal Ferrous (Morris Metals)	865.96	865.96	5.2
	Scrap Metal Non-Ferrous (Morris Metals)	373.70	373.70	2.2
	Paper/card (Veolia Norwood)	254.94	254.94	1.5
	Plastics (Mid UK, Monoworld, Veolia Reinham)	468.88	468.88	2.8
Total non-hazardous waste		40636.48	40636.48	244.8
TOTAL WASTE		43919.48		

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3.5. Reporting of other performance indicators for the period 2016

Parameter	Result
Number of periods of IED abnormal operation	0
Cumulative hours of IED abnormal operation for 2016	0

4. EMISSIONS TO AIR

All gaseous emissions generated during the combustion process pass through an extensive flue gas cleaning process which starts in the boiler directly above the furnace with injected Urea to reduce the levels of oxides of nitrogen. After the boiler, super heater and economiser the gases are cooled to approximately 150 degrees centigrade. Activated carbon is added to remove metals and dioxins, and lime is added to remove acidic gases such as SO₂ and HCL. Most of this reaction occurs in the bag filters where particulates are removed and APCr is formed. There is a recirculation of APCr where the used lime and carbon is recirculated further to remove chlorinated gases via a recirculation silo. This secondary reactant is recirculated back to the original process via a lab loop. The cleaned gasses are finally released into the atmosphere through the chimney after the bag house.

In compliance with the IED 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).

4.1. The parameters measured and their frequency of monitoring are summarised

Measured Emissions					
Parameter	Frequency				
	Continuous	Quarter 1	Quarter 2	Quarter 3	Quarter 4
Particulate Matter	✓				
TOC	✓				
Hydrogen Chloride	✓				
Oxides of Nitrogen	✓				
Carbon Monoxide	✓				
Sulphur Dioxides	✓				
Ammonia	✓				

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Nitrous Oxide		✓	✓	✓	✓
Hydrogen Fluoride		✓	✓	✓	✓
Mercury		✓	✓	✓	✓
Arsenic		✓	✓	✓	✓
Cadmium		✓	✓	✓	✓
Chromium		✓	✓	✓	✓
Copper		✓	✓	✓	✓
Cobalt		✓	✓	✓	✓
Nickel		✓	✓	✓	✓
Manganese		✓	✓	✓	✓
Antimony		✓	✓	✓	✓
Lead		✓	✓	✓	✓
Thallium		✓	✓	✓	✓
Vanadium		✓	✓	✓	✓
Dioxins and Furans		✓	✓	✓	✓
Dioxin-like PCBs		✓	✓	✓	✓
PAHs		✓	✓	✓	✓

4.2. Continuous Emissions Monitoring

Through the process there is continuous emissions monitoring of six main pollutants with ELVs using MCERTS approved instruments. The pollutants measured in this way comprise: particulates, total organic carbon, carbon monoxide, sulphur dioxide and oxides of nitrogen.

Each pollutant has its own Emission Limit Value (ELV). A summary is shown below.

Pollutant	Chemical Symbol	ELV	Measurement	Monitoring Standard
Particulates		30mg/m3	half hour average	BS EN 14181 and BS EN 15267-3
		10mg/m3	daily average	BS EN 14181 and BS EN 15267-3
Total Organic Carbon	TOC	20mg/m3	half hour average	BS EN 14181 and BS EN 15267-3
		10mg/m3	daily average	BS EN 14181 and BS EN 15267-3
Hydrogen Chloride	HCL	60mg/m3	half hour average	BS EN 14181 and BS EN 15267-3
		10mg/m3	daily average	BS EN 14181 and BS EN 15267-3
Carbon Monoxide	CO	100mg/m3	half hour average	BS EN 14181 and BS EN 15267-3
		50mg/m3	daily average	BS EN 14181 and BS EN 15267-3
Sulphur Dioxide	SO2	200mg/m3	half hour average	BS EN 14181 and BS EN 15267-3
		50mg/m3	daily average	BS EN 14181 and BS EN 15267-3
Oxides of Nitrogen	NO and NO2 as NOX	400mg/m3	half hour average	BS EN 14181 and BS EN 15267-3
		200mg/m3	daily average	BS EN 14181 and BS EN 15267-3

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A summary of the continuous emissions can be seen below for 2016 for average daily figures per month (mg/Nm³):

	limit	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Dust	10	0.3	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2
Total Organic Carbon	10	0	0	0.4	0.8	0.6	0.5	0.5	0.5	0.6	0.6	0.7	0.3
Hydrogen Chloride	10	2.7	2.6	4.7	2.2	5.3	5.2	6.1	5.4	6.2	5.3	5.4	5.4
Carbon Monoxide	50	14.3	16.7	10.2	7.0	1.9	2.4	1.4	1.7	2.1	2.7	6.8	8.8
Sulphur Dioxide	50	29.7	38.4	21.4	38.3	33.3	23.6	26.5	20.9	20.7	19.6	18.6	16.7
Oxides of Nitrogen	200	143.5	144	146.8	146.9	146.3	159.8	159	154.8	157.6	154.5	150.1	151.2

The Monthly Mean results show that the emission levels are consistently stable from month to month. The emissions data is communicated monthly to the public via our Veolia website in terms of a percentage of each ELV. A more detailed report is sent to the Environment Agency showing emissions per pollutant, per month in terms of half hourly averages and daily averages.

4.3. Extractive Sampling

Extractive monitoring is carried out for those pollutants typically far harder to measure and which are only present in very low concentrations. The samples of flue gas are taken directly from the stack using appropriate methodologies and MCERT personnel.

Extractive testing data is shown in Appendix A.

The results show that the extractive samples are below the prescribed limits in the permit.

5. INCINERATOR BOTTOM ASH (IBA) AND AIR POLLUTION CONTROL (APC) RESIDUE

5.1 IBA

The plant has undergone rigorous sampling and testing of IBA to prove it is non-hazardous. The IBA is of a consistently high standard and there have been no failures in the last 24 samples. IBA is transported by Hargreaves Haulage to Ballast Phoenix in Sheffield, where it is reprocessed into a number of different graded aggregates. Metals are further extracted from the process and are also recycled.

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In order to comply with the Environmental Permit the IBA is monitored for the parameters as set out in the table below.

Parameter	Limit	Monitoring frequency
Total Organic Carbon (TOC)	<3%	Monthly in the First Year of operation. Then Quarterly.
Metals (Antimony, Cadmium, Thallium, Mercury, Lead, Chromium, Copper, Manganese, Nickel, Arsenic, Cobalt, Vanadium, Zinc) and their compounds, dioxins/furans and Dioxin-like PCBs	No limit set	Monthly in the First Year of operation. Then Quarterly.
Total Soluble fraction and Metals soluble fraction	No limit set	Before use of new disposal or recycling route

The results can be seen in the Appendix B.

5.2 APCr

APC residue is the fine particulate matter that is removed at the end of the gas cleansing process. It contains residues from the waste gas and the reactants used to treat the gas. APC is captured in the bag house filters in the plant before the gas is emitted and dispersed through the ERF's 75m stacks. The APC residue from ERF is sent to another Veolia facility for treatment, Empire Works or for permanent underground storage at Minosus.

The results can be seen in Appendix B.

An interpretation shows that the results are uniform and that the APCr quality does not vary.

6. ENVIRONMENTAL CONTROLS

Leeds RERF has an experienced Veolia management team from other existing plants. The plant has been designed using proven technology and experience and is operating very well. The plant supports our company ethos, as we operate 10 facilities in the UK. Reliable environmental controls and a robust management system ensure compliance with the Industrial Emissions Directive and EPR Permit.

Veolia staff are aware of the environmental impacts of their work and exercise a good standard of housekeeping. The Management System covers training, awareness and competence. The company identifies the training requirements of its employees and provides suitable resources to ensure they have the required knowledge, skills and expertise to carry out their duties.

Appendix A Reporting of periodically monitored emissions to air 2016.

January to March

Emission Point	Substance / Parameter	Emission Limit Value	Reference Period	Result ^[1]	Test Method	Result Date and Time ^[2]	Uncertainty ^[3]
A1	Hydrogen fluoride	2 mg/m ³	Periodic over minimum 1-hour period	0.04	BS ISO 15713	22/03/2016 07:41 - 08:41	0.003
A1	Cadmium & thallium and their compounds (total)	0.05 mg/m ³	over minimum 30 minute, maximum 8 hour period	0.0008	BS EN 14385	22/03/2016 12:40 - 13:10, 13:16 - 13:46	0.0001
A1	Mercury and its compounds	0.05 mg/m ³	over minimum 30 minute, maximum 8 hour period	0.002	BS EN 13211	22/03/2016 12:40 - 13:10, 13:16 - 13:46	0.0003
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	0.03	BS EN 14385	22/03/2016 12:40 - 13:10, 13:16 - 13:46	0.005
A1	Nitrous oxides (N ₂ O)	No limit applies	Periodic over minimum 1-hour period	Not tested during commissioning	BS EN ISO 21258	Not tested during commissioning	Not tested during commissioning
A1	Dioxins / Furans (I-TEQ)	0.1 ng/m ³	over minimum 6 hour period, maximum 8 hour period	0.00036 - 0.0018	BS EN 1948 Parts 1, 2 and 3	22/03/2016 07:05 - 10:05, 10:10 - 13:10	0.0004
A1	Dioxins / furans (WHO-TEQ Humans / Mammals)	No limit applies	over minimum 6 hour period, maximum 8 hour period	0.00028 - 0.0019	BS EN 1948 Parts 1, 2 and 3	22/03/2016 07:05 - 10:05, 10:10 - 13:10	0.0004
A1	Dioxins / furans (WHO-TEQ Fish)	No limit applies	over minimum 6 hour period, maximum 8 hour period	0.00004 - 0.0019	BS EN 1948 Parts 1, 2 and 3	22/03/2016 07:05 - 10:05, 10:10 - 13:10	0.0004

Appendix A Reporting of periodically monitored emissions to air 2016.

A1	Dioxins / furans (WHO-TEQ Birds)	No limit applies	over minimum 6 hour period, maximum 8 hour period	0.00004 - 0.0022	BS EN 1948 Parts 1, 2 and 3	22/03/2016 07:05 - 10:05, 10:10 - 13:10	0.0005
A1	Dioxin-like PCBs (WHO-TEQ Humans / Mammals)	No limit applies	over minimum 6 hour period, maximum 8 hour period	Not tested during commissioning	BS EN/TS 1948-4	Not tested during commissioning	n/a
A1	Dioxin-like PCBs (WHO-TEQ Fish)	No limit applies	over minimum 6 hour period, maximum 8 hour period	Not tested during commissioning	BS EN/TS 1948-4	Not tested during commissioning	n/a
A1	Dioxin-like PCBs (WHO-TEQ Birds)	No limit applies	over minimum 6 hour period, maximum 8 hour period	Not tested during commissioning	BS EN/TS 1948-4	Not tested during commissioning	n/a
<i>Poly-cyclic aromatic hydrocarbons (PAHs)</i>							
A1	Total	No limit applies	over minimum 6 hour period, maximum 8 hour period	Not tested during commissioning	BS EN 1948 Parts 1, 2 and 3	Not tested during commissioning	n/a
A1	Anthanthrene	No limit applies		Not tested during commissioning		Not tested during commissioning	n/a
A1	Benzo{a}anthracene	No limit applies		Not tested during commissioning		Not tested during commissioning	n/a
A1	Benzo[b]fluoranthene	No limit applies		Not tested during commissioning		Not tested during commissioning	n/a
A1	Benzo[k]fluoranthene	No limit applies		Not tested during commissioning		Not tested during commissioning	n/a
A1	Benzo[b]naph(2,1- d)thiophene	No limit applies		Not tested during commissioning		Not tested during commissioning	n/a
A1	Benzo[c]phenanthrene	No limit applies		Not tested during commissioning		Not tested during commissioning	n/a
A1	Benzo[ghi]perylene	No limit applies		Not tested during commissioning		Not tested during commissioning	n/a
A1	Benzo[a]pyrene	No limit applies		Not tested during commissioning		Not tested during commissioning	n/a
A1	Cholanthrene	No limit applies		Not tested during commissioning		Not tested during commissioning	n/a

Appendix A Reporting of periodically monitored emissions to air 2016.

A1	Chrysene	No limit applies		Not tested during commissioning		Not tested during commissioning	n/a
A1	Cyclopenta(c,d)pyrene	No limit applies		Not tested during commissioning		Not tested during commissioning	n/a
A1	Dibenzo[ah]anthracene	No limit applies		Not tested during commissioning		Not tested during commissioning	n/a
A1	Dibenzo[a,i]pyrene	No limit applies		Not tested during commissioning		Not tested during commissioning	n/a
A1	Fluoranthene	No limit applies		Not tested during commissioning		Not tested during commissioning	n/a
A1	Indo[1,2,3-cd]pyrene	No limit applies		Not tested during commissioning		Not tested during commissioning	n/a
A1	Naphthalene	No limit applies		Not tested during commissioning		Not tested during commissioning	n/a

April to June

Emission Point	Substance / Parameter	Emission Limit Value	Reference Period	Result ^[1]	Test Method	Result Date and Time ^[2]	Uncertainty ^[3]
A1	Hydrogen fluoride	2 mg/m ³	Periodic over minimum 1-hour period	0.32 mg/m ³	BS ISO 15713	20/04/2016 10:07 am – 11:07 am	0.02
A1	Cadmium & thallium and their compounds (total)	0.05 mg/m ³	over minimum 30 minute, maximum 8 hour period	0.001 mg/m ³	BS EN 14385	18/04/2016 15:25 – 15:55 16:05 – 16:35	0.0002
A1	Mercury and its compounds	0.05 mg/m ³	over minimum 30 minute, maximum 8 hour period	0.0007 mg/m ³	BS EN 13211	18/04/2016 15:25 – 15:55 16:05 – 16:35	0.0001
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	0.01 mg/m ³	BS EN 14385	18/04/2016 15:25 – 15:55 16:05 – 16:35	0.002

Appendix A Reporting of periodically monitored emissions to air 2016.

Emission Point	Substance / Parameter	Emission Limit Value	Reference Period	Result ^[1]	Test Method	Result Date and Time ^[2]	Uncertainty ^[3]
A1	Nitrous oxides (N ₂ O)	No limit applies	Periodic over minimum 1-hour period	30 mg/m ³	BS EN ISO 21258	19/04/2016 15:31 – 16:31	4.2
A1	Dioxins / Furans (I-TEQ)	0.1 ng/m ³	over minimum 6 hour period, maximum 8 hour period	0.005 ng/m ³ - 0.007 ng/m ³	BS EN 1948 Parts 1, 2 and 3	19/04/2016 09:56 – 12:56 13:09 – 16:09	0.001 – 0.002
A1	Dioxins / furans (WHO-TEQ Humans / Mammals)	No limit applies	over minimum 6 hour period, maximum 8 hour period	0.004 ng/m ³ – 0.007 ng/m ³	BS EN 1948 Parts 1, 2 and 3	19/04/2016 09:56 – 12:56 13:09 – 16:09	0.001 – 0.001
A1	Dioxins / furans (WHO-TEQ Fish)	No limit applies	over minimum 6 hour period, maximum 8 hour period	0.005 ng/m ³ – 0.008 ng/m ³	BS EN 1948 Parts 1, 2 and 3	19/04/2016 09:56 – 12:56 13:09 – 16:09	0.001 – 0.002
A1	Dioxins / furans (WHO-TEQ Birds)	No limit applies	over minimum 6 hour period, maximum 8 hour period	0.011 ng/m ³ – 0.013 ng/m ³	BS EN 1948 Parts 1, 2 and 3	19/04/2016 09:56 – 12:56 13:09 – 16:09	0.002 – 0.003
A1	Dioxin-like PCBs (WHO-TEQ Humans / Mammals)	No limit applies	over minimum 6 hour period, maximum 8 hour period	0.00000 ng/m ³ – 0.00046 ng/m ³	BS EN/TS 1948-4	19/04/2016 09:56 – 12:56 13:09 – 16:09	0.00000 – 0.000105
A1	Dioxin-like PCBs (WHO-TEQ Fish)	No limit applies	over minimum 6 hour period, maximum 8 hour period	0.00000 ng/m ³ – 0.00004 ng/m ³	BS EN/TS 1948-4	19/04/2016 09:56 – 12:56 13:09 – 16:09	0.00000 – 0.000009
A1	Dioxin-like PCBs (WHO-TEQ Birds)	No limit applies	over minimum 6 hour period, maximum 8 hour period	0.00000 ng/m ³ – 0.00504 ng/m ³	BS EN/TS 1948-4	19/04/2016 09:56 – 12:56 13:09 – 16:09	0.00000 - 0.001144
	<i>Poly-cyclic aromatic hydrocarbons (PAHs)</i>						
A1	Total	No limit applies	over minimum 6 hour period, maximum 8 hour	<6.4 µg/m ³		20/04/2016 09:20 – 12:20 12:25 – 15:25	1.4

Appendix A Reporting of periodically monitored emissions to air 2016.

Emission Point	Substance / Parameter	Emission Limit Value	Reference Period	Result ^[1]	Test Method	Result Date and Time ^[2]	Uncertainty ^[3]
A1	Anthanthrene	No limit applies	period	<0.01 µg/m ³	BS EN 1948 Parts 1, 2 and 3	20/04/2016 09:20 – 12:20 12:25 – 15:25	0.003
A1	Benzo(a)anthracene	No limit applies		0.03 µg/m ³		20/04/2016 09:20 – 12:20 12:25 – 15:25	0.007
A1	Benzo[b]fluoranthene	No limit applies		0.03 µg/m ³		20/04/2016 09:20 – 12:20 12:25 – 15:25	0.007
A1	Benzo[k]fluoranthene	No limit applies		0.01 µg/m ³		20/04/2016 09:20 – 12:20 12:25 – 15:25	0.003
A1	Benzo[b]naph(2,1-d)thiophene	No limit applies		<0.001 µg/m ³		20/04/2016 09:20 – 12:20 12:25 – 15:25	0.003
A1	Benzo[c]phenanthrene	No limit applies		<0.01 µg/m ³		20/04/2016 09:20 – 12:20 12:25 – 15:25	0.003
A1	Benzo[ghi]perylene	No limit applies		0.01 µg/m ³		20/04/2016 09:20 – 12:20 12:25 – 15:25	0.003
A1	Benzo[a]pyrene	No limit applies		0.01 µg/m ³		20/04/2016 09:20 – 12:20 12:25 – 15:25	0.003
A1	Cholanthrene	No limit applies		<0.01 µg/m ³		20/04/2016 09:20 – 12:20 12:25 – 15:25	0.003
A1	Chrysene	No limit applies		0.03 µg/m ³		20/04/2016 09:20 – 12:20 12:25 – 15:25	0.007
A1	Cyclopenta(c,d)pyrene	No limit applies		<0.01 µg/m ³		20/04/2016 09:20 – 12:20 12:25 – 15:25	0.003
A1	Dibenzo[ah]anthracene	No limit applies		<0.01 µg/m ³		20/04/2016 09:20 – 12:20 12:25 – 15:25	0.003

Appendix A Reporting of periodically monitored emissions to air 2016.

Emission Point	Substance / Parameter	Emission Limit Value	Reference Period	Result ^[1]	Test Method	Result Date and Time ^[2]	Uncertainty ^[3]
A1	Dibenzo[a,i]pyrene	No limit applies		<0.01 µg/m ³		20/04/2016 09:20 – 12:20 12:25 – 15:25	0.003
A1	Fluoranthene	No limit applies		0.22 µg/m ³		20/04/2016 09:20 – 12:20 12:25 – 15:25	0.050
A1	Indo[1,2,3-cd]pyrene	No limit applies		0.01 µg/m ³		20/04/2016 09:20 – 12:20 12:25 – 15:25	0.003
A1	Naphthalene	No limit applies		5.9 µg/m ³		20/04/2016 09:20 – 12:20 12:25 – 15:25	1.3

July to September

Emission Point	Substance / Parameter	Emission Limit Value	Reference Period	Result ^[1]	Test Method	Result Date and Time ^[2]	Uncertainty ^[3]
A1	Hydrogen fluoride	2 mg/m ³	Periodic over minimum 1-hour period	< 0.04	BS ISO 15713	07/07/2016 13:18 - 14:18	0.003
A1	Cadmium & thallium and their compounds (total)	0.05 mg/m ³	over minimum 30 minute, maximum 8 hour period	0.004	BS EN 14385	05/07/2016 12:58 - 13:30, 13:34 - 14:06	0.0006
A1	Mercury and its compounds	0.05 mg/m ³	over minimum 30 minute, maximum 8 hour period	0.0007	BS EN 13211	05/07/2016 12:58 - 13:30 13:34 - 14:06	0.00009
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	0.07	BS EN 14385	05/07/2016 12:58 - 13:30, 13:34 - 14:06	0.01

Appendix A Reporting of periodically monitored emissions to air 2016.

Emission Point	Substance / Parameter	Emission Limit Value	Reference Period	Result ^[1]	Test Method	Result Date and Time ^[2]	Uncertainty ^[3]
A1	Nitrous oxides (N ₂ O)	No limit applies	Periodic over minimum 1-hour period	26.4	BS EN ISO 21258	11/07/2016 20:00 - 21:00	1.8
A1	Dioxins / Furans (I-TEQ)	0.1 ng/m ³	over minimum 6 hour period, maximum 8 hour period	0.009 - 0.010	BS EN 1948 Parts 1, 2 and 3	06/07/2016 09:37 - 12:37, 12:43 - 15:43	0.002
A1	Dioxins / furans (WHO-TEQ Humans / Mammals)	No limit applies	over minimum 6 hour period, maximum 8 hour period	0.008 - 0.009	BS EN 1948 Parts 1, 2 and 3	06/07/2016 09:37 - 12:37, 12:43 - 15:43	0.002
A1	Dioxins / furans (WHO-TEQ Fish)	No limit applies	over minimum 6 hour period, maximum 8 hour period	0.009 - 0.010	BS EN 1948 Parts 1, 2 and 3	06/07/2016 09:37 - 12:37, 12:43 - 15:43	0.002
A1	Dioxins / furans (WHO-TEQ Birds)	No limit applies	over minimum 6 hour period, maximum 8 hour period	0.020 - 0.021	BS EN 1948 Parts 1, 2 and 3	06/07/2016 09:37 - 12:37, 12:43 - 15:43	0.002
A1	Dioxin-like PCBs (WHO-TEQ Humans / Mammals)	No limit applies	over minimum 6 hour period, maximum 8 hour period	0.000007 - 0.00067	BS EN/TS 1948-4	06/07/2016	0.000002 - 0.000153
A1	Dioxin-like PCBs (WHO-TEQ Fish)	No limit applies	over minimum 6 hour period, maximum 8 hour period	0.000003 - 0.00003	BS EN/TS 1948-4	06/07/2016	0.000001 - 0.000007
A1	Dioxin-like PCBs (WHO-TEQ Birds)	No limit applies	over minimum 6 hour period, maximum 8 hour period	0.000998 - 0.00215	BS EN/TS 1948-4	06/07/2016 09:37 - 12:37, 12:43 - 15:43	0.000228 - 0.000492
	Poly-cyclic aromatic hydrocarbons (PAHs)						
A1	Total	No limit applies	over minimum 6 hour period, maximum 8 hour	0.40		07/07/2016 08:38 - 11:38, 11:42 - 14:42	0.091

Appendix A Reporting of periodically monitored emissions to air 2016.

Emission Point	Substance / Parameter	Emission Limit Value	Reference Period	Result ^[1]	Test Method	Result Date and Time ^[2]	Uncertainty ^[3]
A1	Anthanthrene	No limit applies	period	<0.02	BS EN 1948 Parts 1, 2 and 3	07/07/2016 08:38 - 11:38, 11:42 -14:42	0.005
A1	Benzo{a}anthracene	No limit applies		<0.02		07/07/2016 08:38 - 11:38, 11:42 -14:42	0.005
A1	Benzo[b]fluoranthene	No limit applies		<0.02		07/07/2016 08:38 - 11:38, 11:42 -14:42	0.005
A1	Benzo[k]fluoranthene	No limit applies		<0.02		07/07/2016 08:38 - 11:38, 11:42 -14:42	0.005
A1	Benzo[b]naph(2,1-d)thiophene	No limit applies		<0.02		07/07/2016 08:38 - 11:38, 11:42 -14:42	0.005
A1	Benzo[c]phenanthrene	No limit applies		<0.02		07/07/2016 08:38 - 11:38, 11:42 -14:42	0.005
A1	Benzo[ghi]perylene	No limit applies		<0.02		07/07/2016 08:38 - 11:38, 11:42 -14:42	0.005
A1	Benzo[a]pyrene	No limit applies		<0.02		07/07/2016 08:38 - 11:38, 11:42 -14:42	0.005
A1	Cholanthrene	No limit applies		<0.02		07/07/2016 08:38 - 11:38, 11:42 -14:42	0.005
A1	Chrysene	No limit applies		<0.02		07/07/2016 08:38 - 11:38, 11:42 -14:42	0.005
A1	Cyclopenta(c,d)pyrene	No limit applies		<0.02		07/07/2016 08:38 - 11:38, 11:42 -14:42	0.005

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Emission Point	Substance / Parameter	Emission Limit Value	Reference Period	Result ^[1]	Test Method	Result Date and Time ^[2]	Uncertainty ^[3]
A1	Dibenzo[ah]anthracene	No limit applies		<0.02		07/07/2016 08:38 - 11:38, 11:42 -14:42	0.005
A1	Dibenzo[a,i]pyrene	No limit applies		<0.04		07/07/2016 08:38 - 11:38, 11:42 -14:42	0.009
A1	Fluoranthene	No limit applies		0.08		07/07/2016 08:38 - 11:38, 11:42 -14:42	0.018
A1	Indo[1,2,3-cd]pyrene	No limit applies		<0.02		07/07/2016 08:38 - 11:38, 11:42 -14:42	0.005
A1	Naphthalene	No limit applies		<0.02		07/07/2016 08:38 - 11:38, 11:42 -14:42	0.005

October to December

Emission Point	Substance / Parameter	Emission Limit Value	Reference Period	Result ^[1]	Test Method	Result Date and Time ^[2]	Uncertainty ^[3]
A1	Hydrogen fluoride	2 mg/m ³	Periodic over minimum 1-hour period	0.37	BS ISO 15713	08/11/2016 12:00 - 13:00	0.03
A1	Cadmium & thallium and their compounds (total)	0.05 mg/m ³	over minimum 30 minute, maximum 8 hour period	0.001	BS EN 14385	08/11/2016 13:30 - 14:00, 14:10 - 14:40	0.0001
A1	Mercury and its compounds	0.05 mg/m ³	over minimum 30 minute, maximum 8 hour period	0.001	BS EN 13211	08/11/2016 13:30 - 14:00, 14:10 - 14:40	0.0001

Appendix A Reporting of periodically monitored emissions to air 2016.

Emission Point	Substance / Parameter	Emission Limit Value	Reference Period	Result ^[1]	Test Method	Result Date and Time ^[2]	Uncertainty ^[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	0.02	BS EN 14385	08/11/2016 13:30 - 14:00, 14:10 - 14:40	0.002
A1	Nitrous oxides	No limit applies	Periodic over minimum 1-hour period	30.9	BS EN ISO 21258	09/11/2016 15:02 - 16:02	4.4
A1	Dioxins / Furans (I-TEQ)	0.1 ng/m ³	over minimum 6 hour period, maximum 8 hour period	0.0052 - 0.0055	BS EN 1948 Parts 1, 2 and 3	09/11/2016 09:37 - 12:37, 12:47 - 15:47	0.0011
A1	Dioxins / furans (WHO-TEQ Humans / Mammals)	No limit applies	over minimum 6 hour period, maximum 8 hour period	0.0050 - 0.0052	BS EN 1948 Parts 1, 2 and 3	09/11/2016 09:37 - 12:37, 12:47 - 15:47	0.0010 - 0.0011
A1	Dioxins / furans (WHO-TEQ Fish)	No limit applies	over minimum 6 hour period, maximum 8 hour period	0.0055 - 0.0058	BS EN 1948 Parts 1, 2 and 3	09/11/2016 09:37 - 12:37, 12:47 - 15:47	0.0011 - 0.0012
A1	Dioxins / furans (WHO-TEQ Birds)	No limit applies	over minimum 6 hour period, maximum 8 hour period	0.0088 - 0.0091	BS EN 1948 Parts 1, 2 and 3	09/11/2016 09:37 - 12:37, 12:47 - 15:47	0.0018 - 0.0019
A1	Dioxin-like PCBs (WHO-TEQ Humans / Mammals)	No limit applies	over minimum 6 hour period, maximum 8 hour period	0.0000 - 0.00039	BS EN/TS 1948-4	09/11/2016 09:37 - 12:37, 12:47 - 15:47	0.0000 - 0.000081
A1	Dioxin-like PCBs (WHO-TEQ Fish)	No limit applies	over minimum 6 hour period, maximum 8 hour period	0.0000 - 0.00002	BS EN/TS 1948-4	09/11/2016 09:37 - 12:37, 12:47 - 15:47	0.0000 - 0.000004
A1	Dioxin-like PCBs (WHO-TEQ Birds)	No limit applies	over minimum 6 hour period, maximum 8 hour period	0.0000 - 0.00137	BS EN/TS 1948-4	09/11/2016 09:37 - 12:37, 12:47 - 15:47	0.0000 - 0.000284

Appendix A Reporting of periodically monitored emissions to air 2016.

Emission Point	Substance / Parameter	Emission Limit Value	Reference Period	Result ^[1]	Test Method	Result Date and Time ^[2]	Uncertainty ^[3]
	<i>Poly-cyclic aromatic hydrocarbons (PAHs)</i>						
A1	Total	No limit applies	over minimum 6 hour period, maximum 8 hour period	0.20	BS EN 1948 Parts 1, 2 and 3	10/11/2016 09:43 - 12:43, 12:53 - 15:53	0.04
A1	Anthanthrene	No limit applies		< 0.011		10/11/2016 09:43 - 12:43, 12:53 - 15:53	0.002
A1	Benzo(a)anthracene	No limit applies		< 0.011		10/11/2016 09:43 - 12:43, 12:53 - 15:53	0.002
A1	Benzo(b)fluoranthene	No limit applies		0.011		10/11/2016 09:43 - 12:43, 12:53 - 15:53	0.002
A1	Benzo(k)fluoranthene	No limit applies		< 0.011		10/11/2016 09:43 - 12:43, 12:53 - 15:53	0.002
A1	Benzo(b)naph(2,1-d)thiophene	No limit applies		< 0.011		10/11/2016 09:43 - 12:43, 12:53 - 15:53	0.002
A1	Benzo(c)phenanthrene	No limit applies		0.011		10/11/2016 09:43 - 12:43, 12:53 - 15:53	0.002
A1	Benzo(ghi)perylene	No limit applies		0.011		10/11/2016 09:43 - 12:43, 12:53 - 15:53	0.002
A1	Benzo(a)pyrene	No limit applies		< 0.011		10/11/2016 09:43 - 12:43, 12:53 - 15:53	0.002
A1	Cholanthrene	No limit applies		< 0.011		10/11/2016 09:43 - 12:43, 12:53 - 15:53	0.002

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Emission Point	Substance / Parameter	Emission Limit Value	Reference Period	Result ^[1]	Test Method	Result Date and Time ^[2]	Uncertainty ^[3]
A1	Chrysene	No limit applies		< 0.011		10/11/2016 09:43 - 12:43, 12:53 - 15:53	0.002
A1	Cyclopenta(c,d)pyrene	No limit applies		< 0.011		10/11/2016 09:43 - 12:43, 12:53 - 15:53	0.002
A1	Dibenzo[ah]anthracene	No limit applies		< 0.011		10/11/2016 09:43 - 12:43, 12:53 - 15:53	0.002
A1	Dibenzo[a,i]pyrene	No limit applies		< 0.011		10/11/2016 09:43 - 12:43, 12:53 - 15:53	0.002
A1	Fluoranthene	No limit applies		0.011		10/11/2016 09:43 - 12:43, 12:53 - 15:53	0.002
A1	Indo[1,2,3-cd]pyrene	No limit applies		< 0.011		10/11/2016 09:43 - 12:43, 12:53 - 15:53	0.002
A1	Naphthalene	No limit applies		0.033		10/11/2016 09:43 - 12:43, 12:53 - 15:53	0.007

Appendix B Reporting of residue Quality for 2016.

January

Ash Composition (TOC/LOI)			
	LOI (%)	% Carbon (TOC) ^{w/w}	
Bottom Ash	*3.35	*0.92	

Ash Composition - Metals													
	Sb mg/kg	Cd mg/kg	Tl mg/kg	Hg mg/kg	Pb mg/kg	Cr mg/kg	Cu mg/kg	Mn mg/kg	Ni mg/kg	As mg/kg	Co mg/kg	V mg/kg	Zn mg/kg
Bottom ash	41	5.73	<1	<1	233	132	1633	1381	75.8	5.03	23.0	53.9	2051
APC residues	593	190	0.4	10.7	1352	57.7	460	549	32.8	39.9	9.30	48.3	11040

Ash composition dioxins and dioxin-like PCBs					
	DIOXIN I-TEQ ng/kg	DIOXIN WHO-TEQ ng/kg			DIOXIN-LIKE PCBs ng/kg
		Humans / mammals	Birds	Fish	
Bottom ash	4.63	5.09	7.54	4.46	34.9
APC residues	2552	2757	4480	2811	9245

Ash solubility – total soluble fractions	
	Total soluble fraction mg/kg
Bottom ash	12445

Appendix B Reporting of residue Quality for 2016.

February

Ash Composition (TOC/LOI)			
	LOI (%)	% Carbon (TOC) ^{w/w}	
Bottom Ash	*2.07	*0.85	

Ash Composition - Metals													
	Sb mg/kg	Cd mg/kg	Tl mg/kg	Hg mg/kg	Pb mg/kg	Cr mg/kg	Cu mg/kg	Mn mg/kg	Ni mg/kg	As mg/kg	Co mg/kg	V mg/kg	Zn mg/kg
Bottom ash	42.9	4.32	<1	<1	275	70.7	1330	1273	62.4	5.41	21.1	53.0	1494
APC residues	648	207	0.80	8.20	1604	42.3	383	248	19.5	45.4	6.60	28.6	11670

Ash composition dioxins and dioxin-like PCBs					
	DIOXIN I-TEQ ng/kg	DIOXIN WHO-TEQ ng/kg			DIOXIN-LIKE PCBs ng/kg
		Humans / mammals	Birds	Fish	
Bottom ash	2.13	2.26	4.54	2.27	15.3
APC residues	300	320	767	329	941

Appendix B Reporting of residue Quality for 2016.

March

Ash Composition (TOC/LOI)			
	LOI (%)	% Carbon (TOC) ^{w/w}	
Bottom Ash	2.59	0.92	

Ash Composition - Metals													
	Sb mg/kg	Cd mg/kg	Tl mg/kg	Hg mg/kg	Pb mg/kg	Cr mg/kg	Cu mg/kg	Mn mg/kg	Ni mg/kg	As mg/kg	Co mg/kg	V mg/kg	Zn mg/kg
Bottom ash	10.9	1.63	<1	<1	257	21.0	1331	146	66.9	1.80	6.46	14.9	1404
APC residues	711	221	1.00	8.00	1390	44.2	442	274	23.3	43.1	7.10	33.4	11600

Ash composition dioxins and dioxin-like PCBs					
	DIOXIN I-TEQ ng/kg	DIOXIN WHO-TEQ ng/kg			DIOXIN-LIKE PCBs ng/kg
		Humans / mammals	Birds	Fish	
Bottom ash	1.52	1.57	2.83	1.49	19.8
APC residues	336	352	885	380	783

Appendix B Reporting of residue Quality for 2016.

April

Ash Composition (TOC/LOI)			
	LOI (%)	% Carbon (TOC) ^{w/w}	
Bottom Ash	*1.52	*0.42	

Ash Composition - Metals													
	Sb mg/kg	Cd mg/kg	Tl mg/kg	Hg mg/kg	Pb mg/kg	Cr mg/kg	Cu mg/kg	Mn mg/kg	Ni mg/kg	As mg/kg	Co mg/kg	V mg/kg	Zn mg/kg
Bottom ash	19.8	1.80	0.08	0.51	300	51.6	930	314	31.1	3.70	16.7	21.0	788
APC residues	637	210	1.00	7.20	1635	46.5	454	296	20.8	43.5	7.40	31.1	10450

Ash composition dioxins and dioxin-like PCBs					
	DIOXIN I-TEQ ng/kg	DIOXIN WHO-TEQ ng/kg			DIOXIN-LIKE PCBs ng/kg
		Humans / mammals	Birds	Fish	
Bottom ash	1.16	1.16	2.41	1.29	16.8
APC residues	469	469	952	513	1013

Appendix B Reporting of residue Quality for 2016.

May

Ash Composition (TOC/LOI)			
	LOI (%)	% Carbon (TOC) ^{w/w}	
Bottom Ash	*1.73	*0.85	

Ash Composition - Metals													
	Sb mg/kg	Cd mg/kg	Tl mg/kg	Hg mg/kg	Pb mg/kg	Cr mg/kg	Cu mg/kg	Mn mg/kg	Ni mg/kg	As mg/kg	Co mg/kg	V mg/kg	Zn mg/kg
Bottom ash	56.6	6.78	0.09	0.43	473	70.1	1102	673	62.5	5.72	24.5	28.7	1105
APC residues	529	160	0.90	11.4	1553	36.4	369	239	15.9	36.7	5.90	17.7	7658

Ash composition dioxins and dioxin-like PCBs					
	DIOXIN I-TEQ ng/kg	DIOXIN WHO-TEQ ng/kg			DIOXIN-LIKE PCBs ng/kg
		Humans / mammals	Birds	Fish	
Bottom ash	1.94	4.02	8.75	3.90	24.4
APC residues	388	797	1694	847	1006

Appendix B Reporting of residue Quality for 2016.

June

Ash Composition (TOC/LOI)			
	LOI (%)	% Carbon (TOC) ^{w/w}	
Bottom Ash	*1.52	*0.67	

Ash Composition - Metals													
	Sb mg/kg	Cd mg/kg	Tl mg/kg	Hg mg/kg	Pb mg/kg	Cr mg/kg	Cu mg/kg	Mn mg/kg	Ni mg/kg	As mg/kg	Co mg/kg	V mg/kg	Zn mg/kg
Bottom ash	39.5	12.9	0.08	0.42	365	66.7	1239	660	64.8	4.75	24.1	22.2	1471
APC residues	524	222	1.00	7.90	1552	46.1	451	286	16.7	42.8	6.40	17.3	8910

Ash composition dioxins and dioxin-like PCBs					
	DIOXIN I-TEQ ng/kg	DIOXIN WHO-TEQ ng/kg			DIOXIN-LIKE PCBs ng/kg
		Humans / mammals	Birds	Fish	
Bottom ash	1.94	3.97	7.71	4.21	10.7
APC residues	777	1612	2963	1713	2677

Appendix B Reporting of residue Quality for 2016.

July

Ash Composition (TOC/LOI)			
	LOI (%)	% Carbon (TOC) ^{w/w}	
Bottom Ash	1.47	0.52	

Ash Composition - Metals													
	Sb mg/kg	Cd mg/kg	Tl mg/kg	Hg mg/kg	Pb mg/kg	Cr mg/kg	Cu mg/kg	Mn mg/kg	Ni mg/kg	As mg/kg	Co mg/kg	V mg/kg	Zn mg/kg
Bottom ash	38.8	34	0.09	0.43	483	76.3	1343	668	67.3	4.51	31.5	19.0	1365
APC residues	4.52	0.9	0.7	5.20	2011	64.1	782	283	39.5	35.7	8.90	27.5	11650

Ash composition dioxins and dioxin-like PCBs					
	DIOXIN I-TEQ ng/kg	DIOXIN WHO-TEQ ng/kg			DIOXIN-LIKE PCBs ng/kg
		Humans / mammals	Birds	Fish	
Bottom ash	2.12	4.35	8.26	4.45	12.0
APC residues	351	728	1454	774	1228

Appendix B Reporting of residue Quality for 2016.

August

Ash Composition (TOC/LOI)			
	LOI (%)	% Carbon (TOC) ^{w/w}	
Bottom Ash	1.44	0.42	

Ash Composition - Metals													
	Sb mg/kg	Cd mg/kg	Tl mg/kg	Hg mg/kg	Pb mg/kg	Cr mg/kg	Cu mg/kg	Mn mg/kg	Ni mg/kg	As mg/kg	Co mg/kg	V mg/kg	Zn mg/kg
Bottom ash	35.8	3.06	0.08	0.42	390	52.4	1194	597	56.8	4.27	35.1	16.9	1324
APC residues	687	223	0.90	8.10	1532	52.4	536	268	15.1	35.7	5.90	11.2	10730

Ash composition dioxins and dioxin-like PCBs					
	DIOXIN I-TEQ ng/kg	DIOXIN WHO-TEQ ng/kg			DIOXIN-LIKE PCBs ng/kg
		Humans / mammals	Birds	Fish	
Bottom ash	1.66	1.77	3.62	1.81	11.3
APC residues	316	338	681	354	1045

Appendix B Reporting of residue Quality for 2016.

September

Ash Composition (TOC/LOI)			
	LOI (%)	% Carbon (TOC) ^{w/w}	
Bottom Ash	1.81	0.60	

Ash Composition - Metals													
	Sb mg/kg	Cd mg/kg	Tl mg/kg	Hg mg/kg	Pb mg/kg	Cr mg/kg	Cu mg/kg	Mn mg/kg	Ni mg/kg	As mg/kg	Co mg/kg	V mg/kg	Zn mg/kg
Bottom ash	43.0	5.20	0.09	0.43	439	71.3	1494	500	52.8	5.17	16.4	16.5	1430
APC residues	473	183	0.80	7.30	916	37.2	355	248	11.4	22.6	4.70	11.7	8507

Ash composition dioxins and dioxin-like PCBs					
	DIOXIN I-TEQ ng/kg	DIOXIN WHO-TEQ ng/kg			DIOXIN-LIKE PCBs ng/kg
		Humans / mammals	Birds	Fish	
Bottom ash	2.65	2.80	5.77	3.05	17.2
APC residues	450	470	1055	514	971

Appendix B Reporting of residue Quality for 2016.

October

Ash Composition (TOC/LOI)			
	LOI (%)	% Carbon (TOC) ^{w/w}	
Bottom Ash	2.24	0.52	

Ash Composition - Metals													
	Sb mg/kg	Cd mg/kg	Tl mg/kg	Hg mg/kg	Pb mg/kg	Cr mg/kg	Cu mg/kg	Mn mg/kg	Ni mg/kg	As mg/kg	Co mg/kg	V mg/kg	Zn mg/kg
Bottom ash	41.5	15.2	0.17	0.43	309	68.1	1161	1103	43.5	5.76	24.0	33.1	1956
APC residues	485	192	0.90	6.40	1501	41.2	415	280	17.8	63.1	6.20	17.0	9470

Ash composition dioxins and dioxin-like PCBs					
	DIOXIN I-TEQ ng/kg	DIOXIN WHO-TEQ ng/kg			DIOXIN-LIKE PCBs ng/kg
		Humans / mammals	Birds	Fish	
Bottom ash	6.69	7.46	11.0	6.71	46.0
APC residues	390	404	932	443	793

Appendix B Reporting of residue Quality for 2016.

November

Ash Composition (TOC/LOI)			
	LOI (%)	% Carbon (TOC) ^{w/w}	
Bottom Ash	1.93	0.59	

Ash Composition - Metals													
	Sb mg/kg	Cd mg/kg	Tl mg/kg	Hg mg/kg	Pb mg/kg	Cr mg/kg	Cu mg/kg	Mn mg/kg	Ni mg/kg	As mg/kg	Co mg/kg	V mg/kg	Zn mg/kg
Bottom ash	49.8	4.08	0.08	0.42	315	72.2	1357	1121	56.5	5.00	22.8	43.9	1534
APC residues	464	148	0.80	6.80	1212	37.9	386	256	14.0	40.9	5.90	33.0	8310

Ash composition dioxins and dioxin-like PCBs					
	DIOXIN I-TEQ ng/kg	DIOXIN WHO-TEQ ng/kg			DIOXIN-LIKE PCBs ng/kg
		Humans / mammals	Birds	Fish	
Bottom ash	3.18	3.41	6.18	3.42	96.5
APC residues	458	479	1118	518	996

Appendix B Reporting of residue Quality for 2016.

December

Ash Composition (TOC/LOI)			
	LOI (%)	% Carbon (TOC) ^{w/w}	
Bottom Ash	1.93	0.54	

Ash Composition - Metals													
	Sb mg/kg	Cd mg/kg	Tl mg/kg	Hg mg/kg	Pb mg/kg	Cr mg/kg	Cu mg/kg	Mn mg/kg	Ni mg/kg	As mg/kg	Co mg/kg	V mg/kg	Zn mg/kg
Bottom ash	34.3	15.7	0.09	0.45	324	65.7	1517	1154	58.7	6.15	64.8	46.3	1400
APC residues	574	177	1.00	6.70	1448	40.6	442	290	20.9	41.0	5.90	35.8	10540

Ash compostion dioxins and dioxin-like PCBs					
	DIOXIN I-TEQ ng/kg	DIOXIN WHO-TEQ ng/kg			DIOXIN-LIKE PCBs ng/kg
		Humans / mammals	Birds	Fish	
Bottom ash	1.35	1.49	2.78	1.28	10.8
APC residues	1742	1849	3657	1953	5232