

# Annual performance report for: Viridor Peterborough Limited

## Peterborough Energy Recovery Facility

Permit Number: EPR/NP3638ZS

Year: 2018

This report is required under the Industrial Emissions Directive's Article 55(2) requirements on reporting and public information on waste incineration plants and co-incineration plants, which require the operator to produce an annual report on the functioning and monitoring of the plant and make it available to the public.

### 1. Introduction

Name and address of plant	Peterborough Energy Recovery Facility Fourth Drove Fengate Peterborough PE1 5UR
Description of waste input	Residual domestic and commercial & industrial waste.
Operator contact details if members of the public have any questions	Kathryn Goldacre, EHS Manager Peterborough Energy Recovery Facility Fourth Drove Fengate Peterborough PE1 5UR  <a href="mailto:kgoldacre@viridor.co.uk">kgoldacre@viridor.co.uk</a> 01733 465284

### 2. Plant description

Peterborough Energy from Waste (EfW) facility is located on the eastern side of Peterborough and occupies an area of 4.5 hectares within the Fengate Industrial Estate, approximately 2.5km south-east of the city centre.

The facility has a capacity of 85,000 tonnes per year and generates electricity to be used internally and exported to the National Grid. The facility design and layout of the steam turbine allows for potential heat export to local users, a small district heating scheme was commissioned in March 2017 serving Dodson House (next door building owned by Peterborough City Council).

In accordance with the requirements of Condition 4.2.3 and Schedule 4 of Permit EPR/NP3638ZS issued by the Environment Agency to Viridor Peterborough Limited (Viridor) on 1 February 2013, Viridor is required to submit as summary of the environmental monitoring works undertaken at the site on a quarterly basis. Such reports will form the basis of the annual performance report which is to be submitted to the Environment Agency by 31 January of each year in accordance with Condition 4.2.2 of the Permit.

Viridor note, in line with Permit variation dated 1<sup>st</sup> November 2016; 30 minute carbon monoxide (CO) average monitoring was replaced with CO 10 minute average monitoring.

This report summarises the environmental and performance data collected at the site 1<sup>st</sup> January 2018 – 31<sup>st</sup> December 2018 and fulfils the requirement of Chapter IV, Article 55(2) of the Industrial Emissions Directive.

### 3. Summary of Plant Operation

Municipal waste received	55686.61 tonnes
Commercial and industrial waste received	27994.07 tonnes
Total waste received	83680.68 tonnes
Total plant operational hours	8020.8 hours
Total hours of “abnormal operation” (see permit for definition)	None
Total quantity of incinerator bottom ash (IBA) produced	17384.77 tonnes
Disposal or recovery route for IBA	All IBA reprocessed to IBAA (IBA Aggregate, with recovery of metal) by Johnsons Aggregates, Bunny, Nottingham.
Did any batches of IBA test as hazardous? If yes, state quantity	None
Total quantity of air pollution control (APC) residues produced	2139.04 tonnes
Disposal or recovery route for APC residues	Grundon Waste Management. Processed for recovery via carbonation to produce aggregates at Carbon 8 facility, Brandon, Suffolk Small quantities to Grundon hazardous waste landfill at Bishops Cleeve, Cheltenham due to operational reasons at disposal site.
Total electricity generated for export to the National Grid	62977.5 MWh generated. 54819.1 MWh exported
Total heat produced for export (e.g. to hospital or district heating scheme)	77.45 MWh

#### Energy 1

Parameter	Total (MWh)	Specific usage (MW / tonne incinerated)
Electricity generated	62977.5	0.78
Electricity exported to the National Grid	54819.1	0.68
Energy exported as heat (if any)	77.45	9.54 x 10 <sup>-4</sup>
Energy usage	8078.52	0.099

## Water 1

Parameter	Units	
Mains water usage	m <sup>3</sup>	53856
Mains water usage	Litres / tonne waste incinerated	0.66

## Performance 1

Parameter	Units	
Waste burnt	tonnes	81190.45
Water Usage	m <sup>3</sup> /tonne waste incinerated	0.66
Energy usage	Mwh/tonne waste incinerated	0.099 Mwh/tonne
Gas oil consumption	kg/tonne waste incinerated	2.58 kg / tonne of waste (used 246547.85L = 209565.67 kg)
Total Ammonia used	kg/tonne waste incinerated	4.13 kg ammonia/tonne of waste (used 369361L = 336118.5 kg)
Total acid gas abatement reagent used	kg/tonne waste incinerated	17.57 kg lime /tonne of waste (used 1426.91 tonnes)
Total Powdered Activated Carbon used	kg/tonne waste incinerated	042 kg carbon /tonne of waste (used 34.25 tonnes)
Total Air Pollution Control residues disposed of	tonnes	2139.04 tonnes
Total bottom ash generated	tonnes	17384.77 tonnes
Total bottom ash recycled	tonnes	17384.77 tonnes
Total bottom ash disposed of	tonnes	0 tonnes

## 4. Summary of Plant Emissions

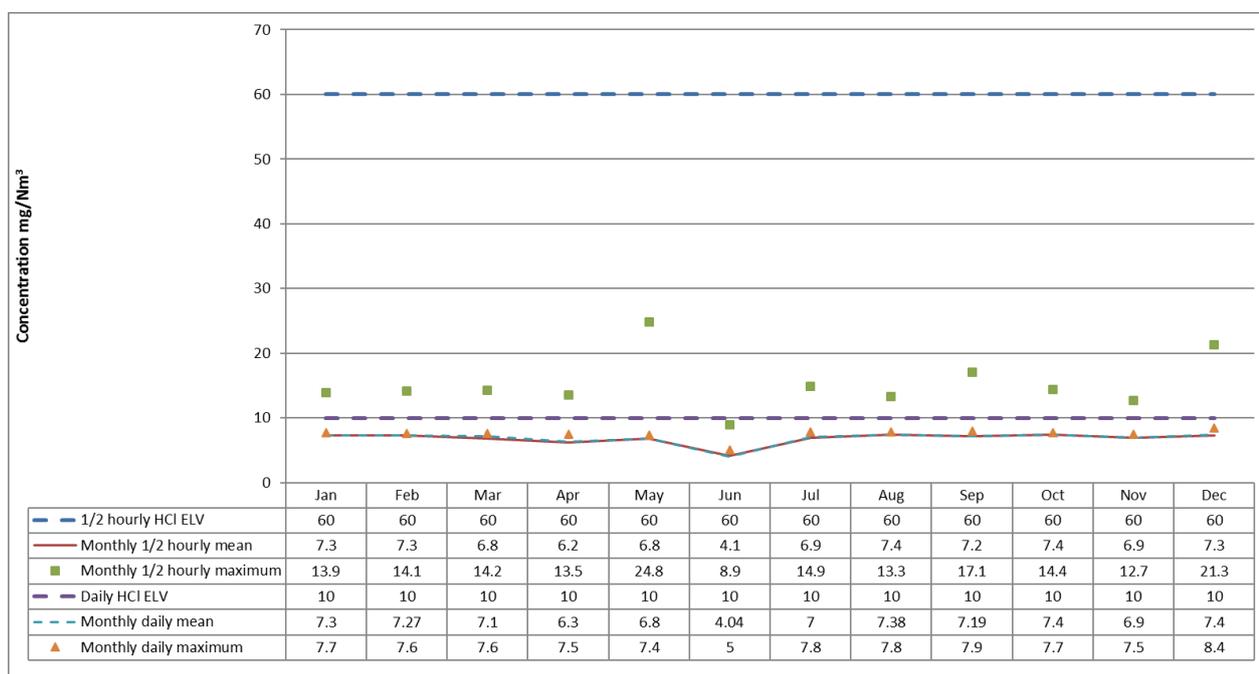
### 4.1 Summary of continuous emissions monitoring results for emissions to air

The following charts show the performance of the plant against its emission limit values (ELVs) for substances that are continuously monitored.

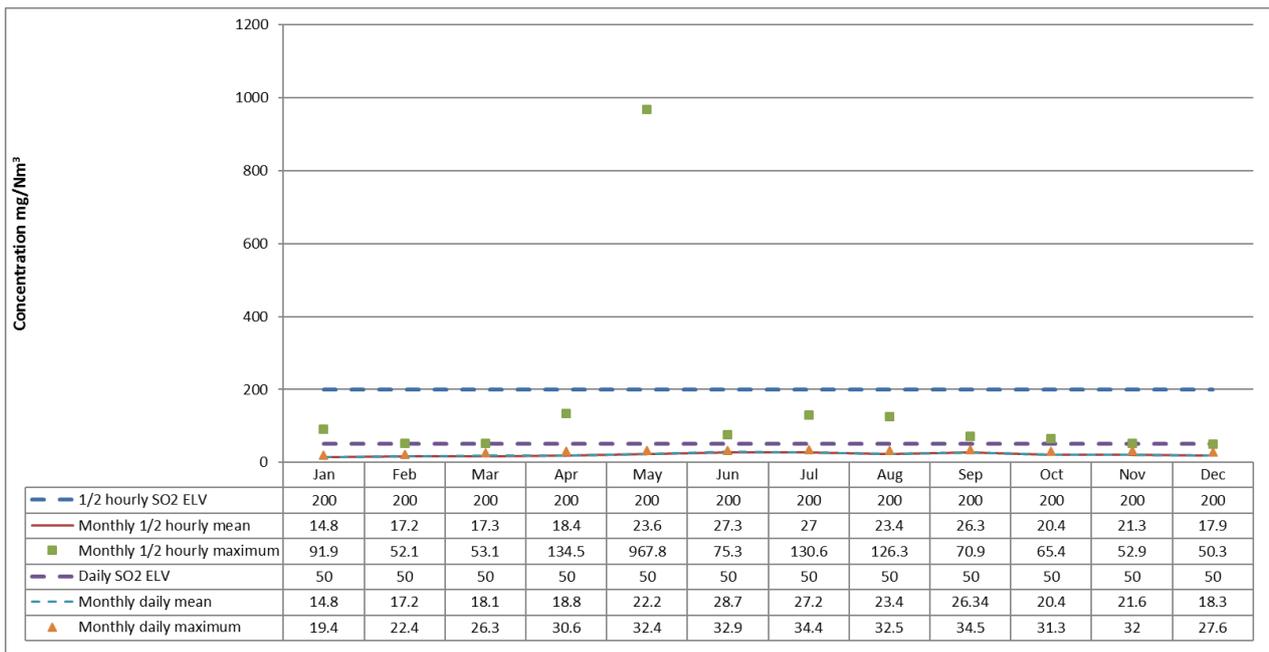


Monthly emissions summary incl half-ho

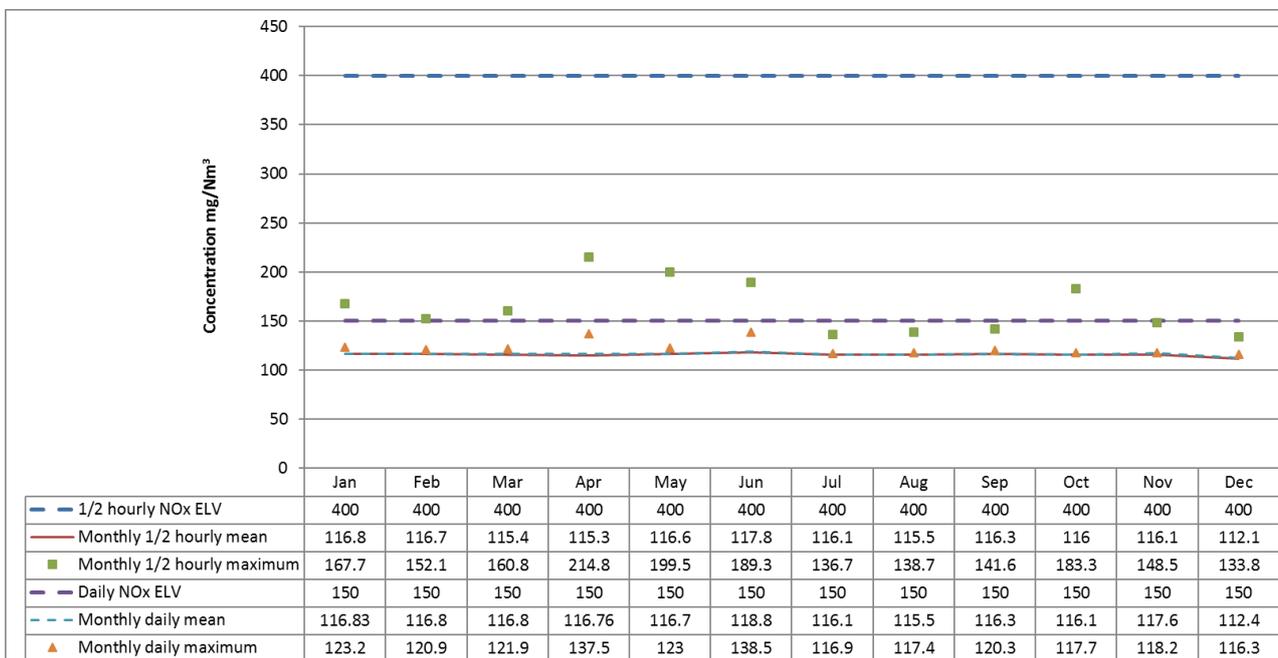
#### Line 1 - Hydrogen chloride



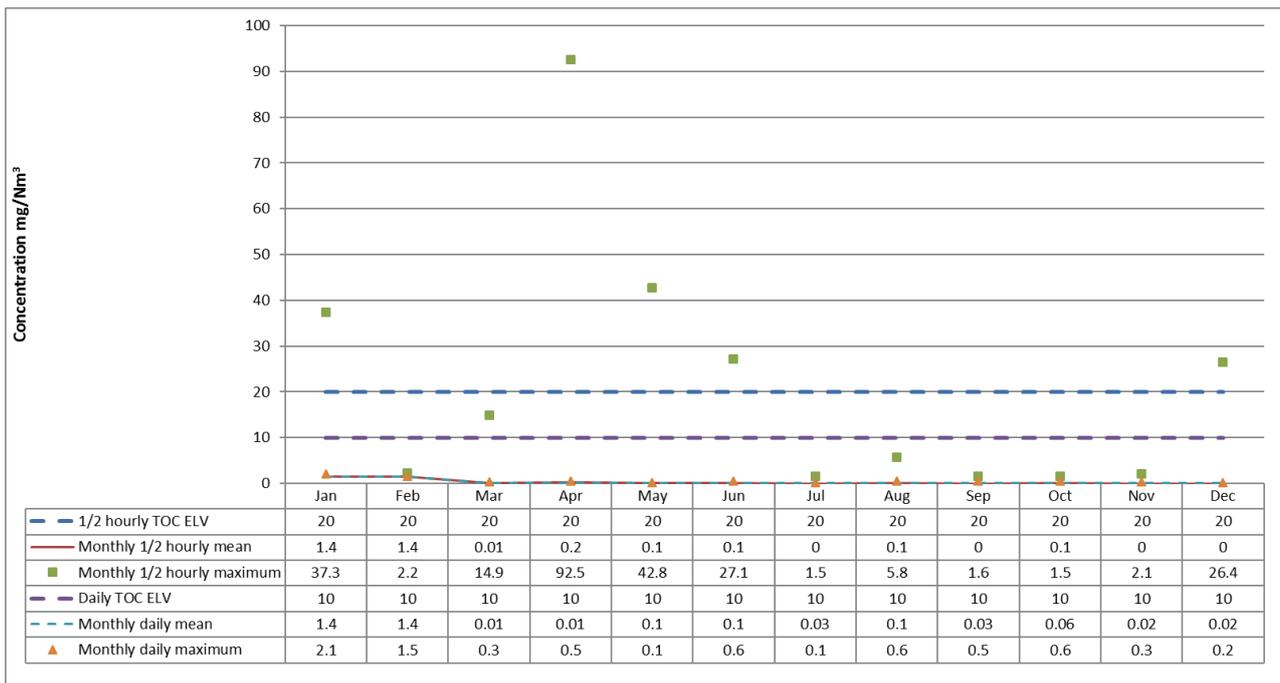
## Line 1 – Sulphur dioxide



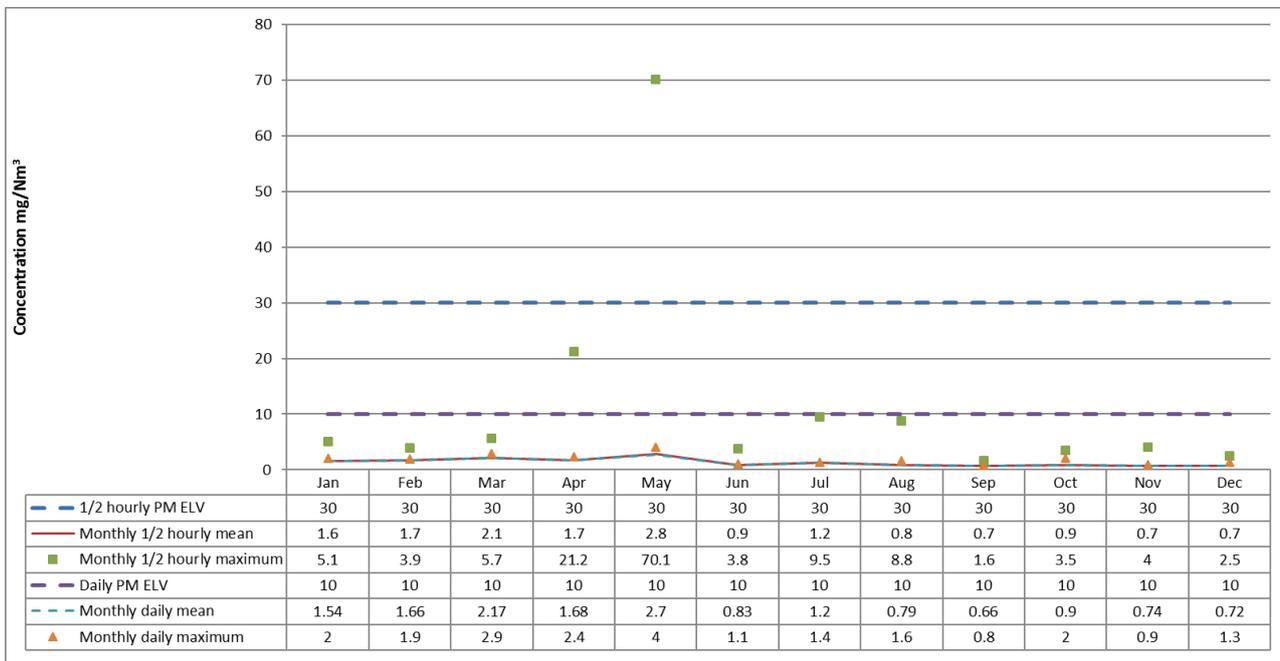
## Line 1 – Oxides of nitrogen



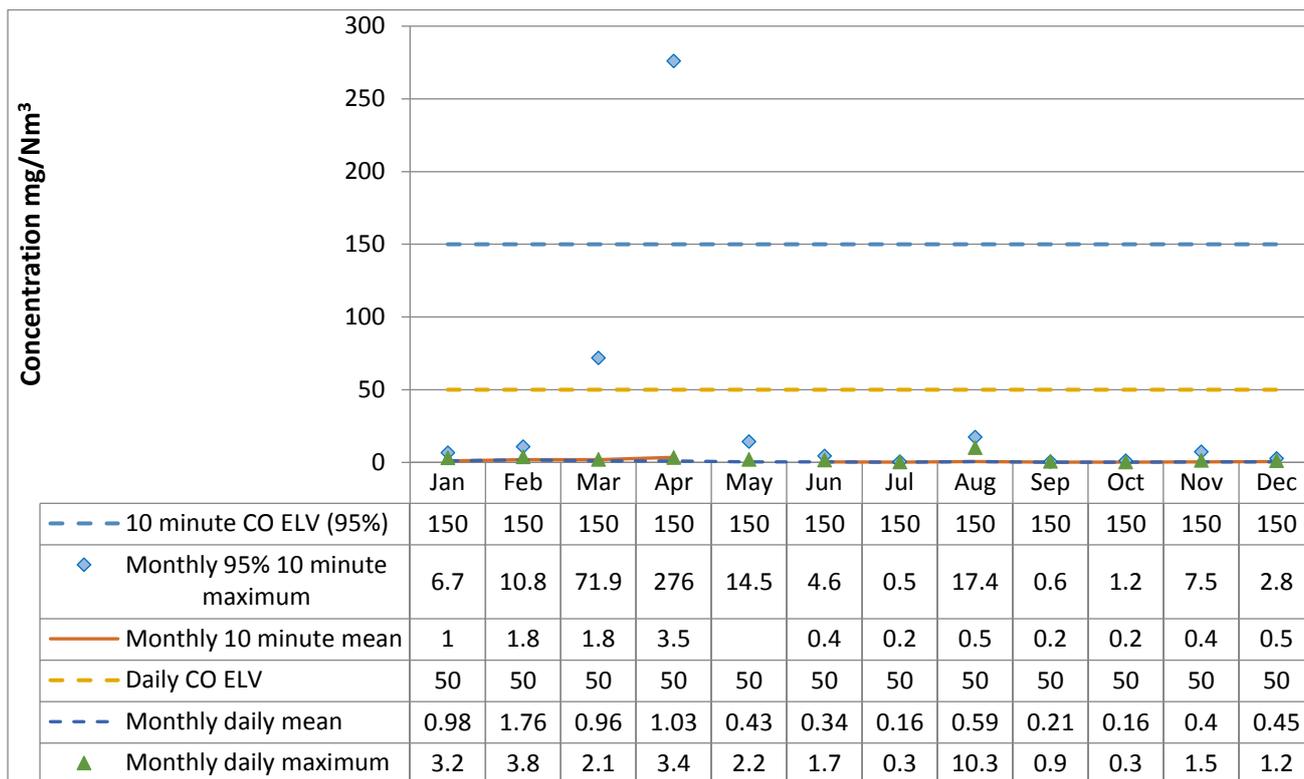
## Line 1 – Total organic carbon



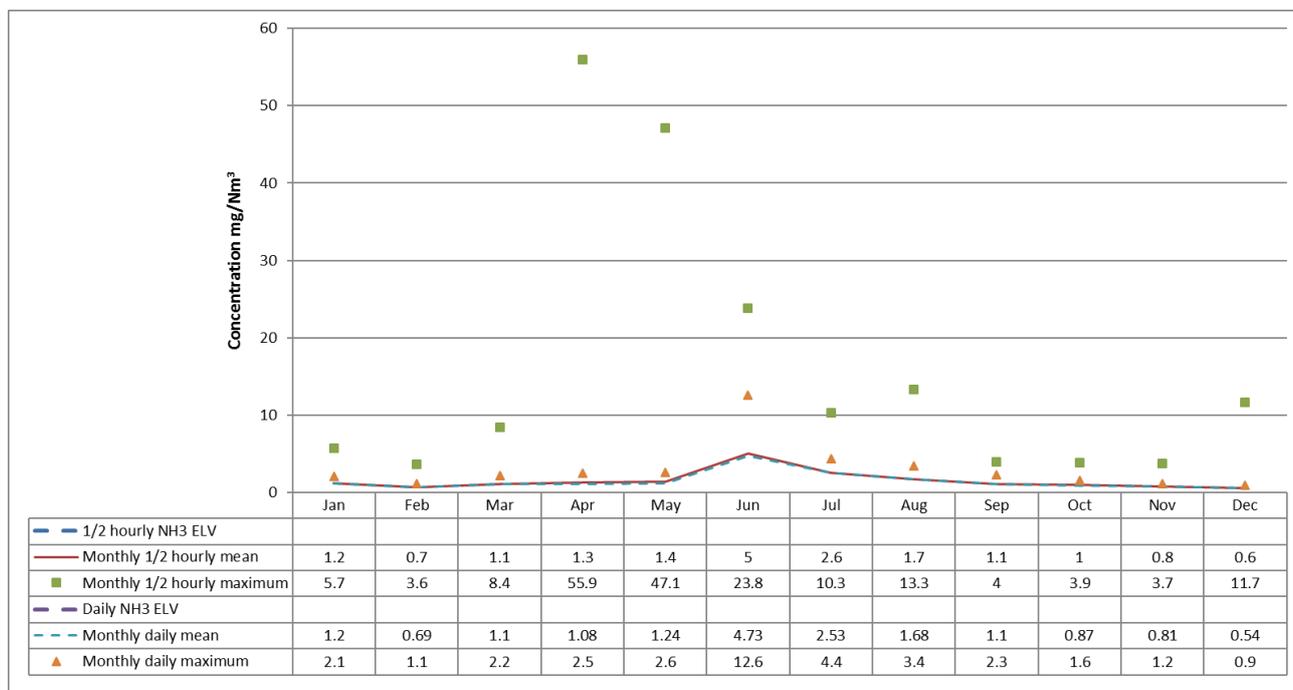
## Line 1 – Particulates



## Line 1 – Carbon monoxide



## Line 1 – Ammonia



## 4.2 Summary of periodic monitoring results for emissions to air

The table below shows the results of periodically monitored substances.

Substance	Emission limit value	Results	
		1/5/2018 – 3/5/2018 and 27/6/2018 – 28/6/2018	10/10/2018 - 11/10/2018
Mercury and its compounds	0.05 mg/m <sup>3</sup>	0.0008 mg/m <sup>3</sup>	0.002 mg/m <sup>3</sup>
Cadmium & thallium and their compounds (total)	0.05 mg/m <sup>3</sup>	0.0007 mg/m <sup>3</sup>	0.001 mg/m <sup>3</sup>
Sb, As, Pb, Cr, Co, Cu, Mn, Ni and V and their compounds (total)	0.5 mg/m <sup>3</sup>	0.04 mg/m <sup>3</sup>	0.013 mg/m <sup>3</sup>
Dioxins and furans (I-TEQ)	0.1 ng/m <sup>3</sup>	0.0117 ng/m <sup>3</sup>	0.017 ng/m <sup>3</sup>
Hydrogen Fluoride	2 mg/m <sup>3</sup>	0.105 mg/m <sup>3</sup>	0.10 mg/m <sup>3</sup>

## 4.3 Summary of monitoring results for emissions to water

Option 1: There are no emissions to water from the process [other than clean surface water].

## 5. Summary of Permit Compliance

### 5.1 Compliance with permit limits for continuously monitored pollutants

The plant met its emission limits as shown in the table below.

Substance	Percentage time compliant during operation	
	Half-hourly limit	Daily limit
Particulates	99.99 %	100 %
Oxides of nitrogen	100 %	100 %
Sulphur dioxide	99.98 %	100 %
Carbon monoxide	99.5 % for 95% of 10-min averages	100 %

<b>Total organic carbon</b>	99.96 %	100 %
<b>Hydrogen chloride</b>	100 %	100 %
<b>Hydrogen fluoride</b>	N/A monitored via stack test	N/A monitored via stack test

## 5.2 Summary of any notifications or non-compliances under the permit

<b>Date</b>	<b>Summary of notification or non-compliance</b>	<b>Reason</b>	<b>Measures taken to prevent reoccurrence</b>
18/01/2018	Notification for half-hourly TOC ELV exceedance	Explosion on grate	Continued and increased waste inspection with vigilance for gas cylinders and other similar waste. No recognisable residue to identify definite cause found.
17/04/2018	Notification for half-hourly TOC and SO <sub>2</sub> and 1 x1 10min CO ELV exceedance. SO <sub>2</sub> after waste feed ceased but before shutdown signal generated	Due to boiler fouling the ID fan was working towards its limit. Online cleaning mobilised to remove a suspected blockage within the horizontal pass of the boiler and the boiler reduced to minimum load but combustion issues occurred.	Plant shutdown, waste feed stopped, grate burned off. Online cleaning commenced to clear air flow restriction
21/05/2018	Notification for half-hourly TOC, Dust and SO <sub>2</sub> and 1 x1 10min CO ELV exceedance.	Online cleaning taking place around main furnace, peaks occurred in pattern with this. Based on analysis results this is believed to be linked to this process and a chemical reaction in the residues removed. Most ERFs (various companies) require more regular online clean due nature of their process. The Peterborough site runs very cleanly therefore requiring much less cleaning.	A schedule of online cleaning on a routine basis at initially approximately 3 month intervals to minimise residue - the exact interval dependant on a range of boiler performance measures reviewed by Viridor and an external expert will act as a control measure for this incident. Two of these more frequent cleans have been completed without causing environmental issue.

17/06/2018	Notification for half-hourly TOC ELV exceedance	Explosion on grate	Continued and increased waste inspection with vigilance for gas cylinders and other similar waste. No recognisable residue to identify definite cause found.
18/12/2018	Notification for half-hourly TOC ELV exceedance	Explosion on grate	Continued and increased waste inspection with vigilance for gas cylinders and other similar waste. No recognisable residue to identify definite cause found.

**5.3 Summary of any complaints received and actions to taken to resolve them.**

<b>Date of complaint</b>	<b>Summary of complaint</b>	<b>Reason for complaint including whether substantiated by the operator or the EA</b>	<b>If substantiated, measures to prevent reoccurrence</b>
-	NONE	-	-

**6. Summary of plant improvements**

<b>Summary of any permit improvement conditions that have been completed within the year and the resulting environmental benefits.</b>
None All completed between December 2015 and April 2017 within timeframes required by permit. All accepted by the Agency
<b>Summary of any changes to the plant or operating techniques which required a variation to the permit and a summary of the resulting environmental impact.</b>
None

**Summary of any other improvements made to the plant or planned to be made and a summary of the resulting environmental benefits.**

After some preliminary works the mounting levels of the ammonia (SNCR) nozzles in the boiler were adjusted in summer 2018.

As the plant matures the temperature profile of the boiler changes slightly, the SNCR reaction of NO<sub>x</sub> with ammonia has an optimum temperature range. The plant was designed with the ability to adjust the mounting levels of the nozzles to minimise ammonia usage whilst maximising NO<sub>x</sub> control.

The upper two levels of nozzles have been moved up one level to provide the best reaction profile across the operating range. The ammonia usage levels have reduced from an average 4.8L / tonne to average 4.5L / tonne to date looking over the last few months and 4.13 kg ammonia / tonne waste in 2018 compared to 4.40 kg/ tonne in 2017.