Annual performance report for: SRCL, Bolton Clinical Waste Incinerator

Permit Number: EPR/ ZP3730XJ

Year: 2022

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	Stericycle Bolton Incinerator Building Royal Bolton Hospital Minerva Road BL40JR
Description of waste input	Clinical waste
Operator contact details if members of the public have any questions	Sarah Jones Plant Manager 0333 240 4000

2. Plant description

The plant consists of a single stream, rated at 750 kilograms per hour or 6570 tonnes per annum of solid wastes. The Primary Chamber utilises the rotary kiln design to provide good mixing of the waste coupled to sufficient retention time to burn the wastes to a high quality ash.

Waste is loaded mechanically into the Primary Chamber using a hydraulic lift and tip arrangement, to avoid any manual handling of the waste. The rotating action of the kiln provides good mixing of the waste, exposing fresh surfaces to combustion conditions. The combustion process is operated slightly in the sub-stoichiometric or starved air mode to produce volatile gases to fuel the Secondary Chamber while providing good burnout of the fixed carbon in the waste to produce bottom ash. The bottom ash is discharged from the end of the rotary kiln into an ash quench system to cool it rapidly, and from the ash quench pit it is discharged into storage skips. The skips of bottom ash are taken to a licensed Landfill Site for disposal as non-hazardous waste.

The combustion gases produced in the Primary Chamber then pass into the Secondary Chamber, which operates at a minimum temperature of 850ºC during start-up using non-hazardous wastes; and at a minimum temperature of 1000ºC when hazardous waste may be loaded. The Secondary Chamber provides a minimum of two seconds residence time under oxygen-rich conditions to combust any Carbon Monoxide and volatile organic compounds produced in the Primary Chamber.

The hot gases then pass through a boiler and dilution air system, which reduce the temperature from above 1000ºC to around 160ºC, before the gases pass on to the flue gas treatment (FGT) system.

In the FGT system, dry hydrated lime (Calcium Hydroxide) and powdered activated carbon are used to treat the flue gases. The lime neutralises the acid gases (Hydrogen Chloride, Hydrogen Fluoride and Sulphur Dioxide) in the flue gas, whereas the activated carbon absorbs heavy metals such as Mercury, and organic compounds such as dioxins and furans. The treated flue gases are then discharged to atmosphere via a 32 metre high stack.

3. Summary of Plant Operation

Municipal waste received	2.41 tonnes
Commercial and industrial waste received	56.19 tonnes
Hazardous waste received	4629.55 tonnes
Clinical waste received	5051.19 tonnes
Waste wood (biomass) received	N/A
Refuse-derived fuel received	N/A
Solid recovered fuel received	N/A
Other waste received Radioactive	0.76 tonnes
Total waste received	5109.79 tonnes
Total plant operational hours	7488 hours
Total hours of “abnormal operation” (see permit for definition)	5.5 hours (4 separate occurrences)
Total quantity of incinerator bottom ash (IBA) produced	843.21 tonnes
Disposal or recovery route for IBA	Disposal – Viridor Waste Management Ltd, Pilsworth Quarry, Pilsworth Road, Bury BL9 8QZ
Did any batches of IBA test as hazardous? If yes, state quantity	None
Total quantity of air pollution control (APC) residues produced	238.48 tonnes
Disposal or recovery route for APC residues	Recovery – Cleansing Service Group Ltd, Liverpool Road, Cadishead, Manchester M44 5DT
Total electricity generated for export to the National Grid	N/A
Total heat produced for export (e.g. to hospital or district heating scheme)	20,253 tonnes

4. Summary of Plant Emissions

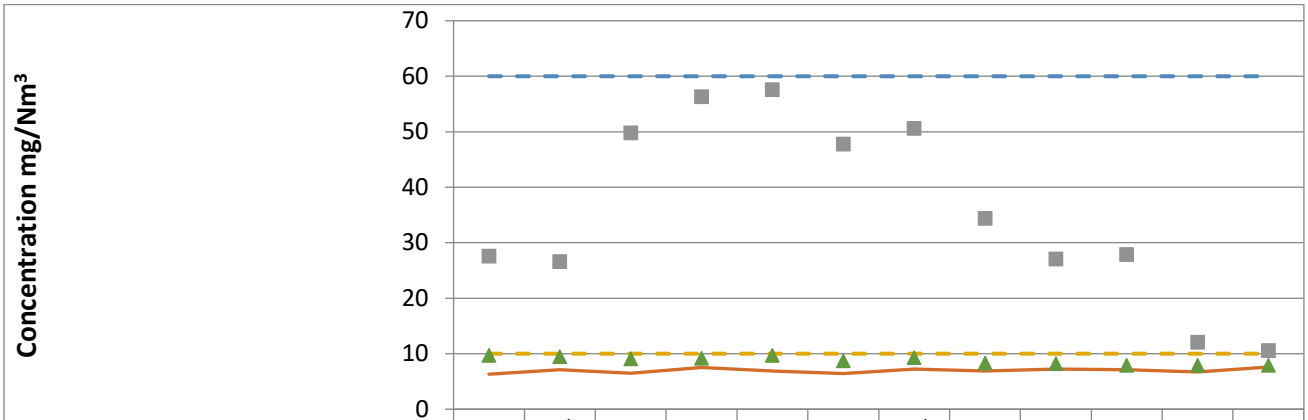
4.1 Summary of continuous emissions monitoring results for emissions to air

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

Monthly emissions summary daily ELVs o

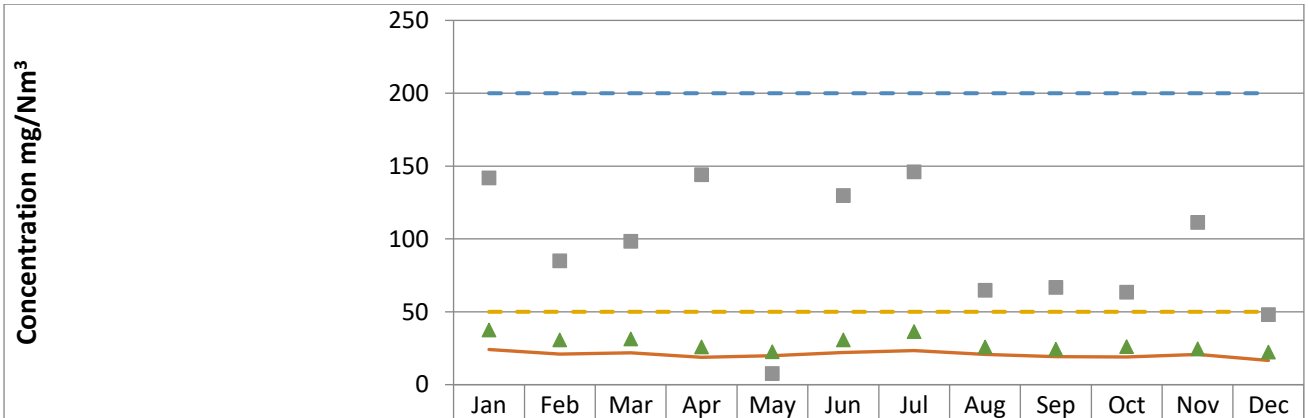
Monthly emissions summary incl half-hou

Line 1 - Hydrogen chloride



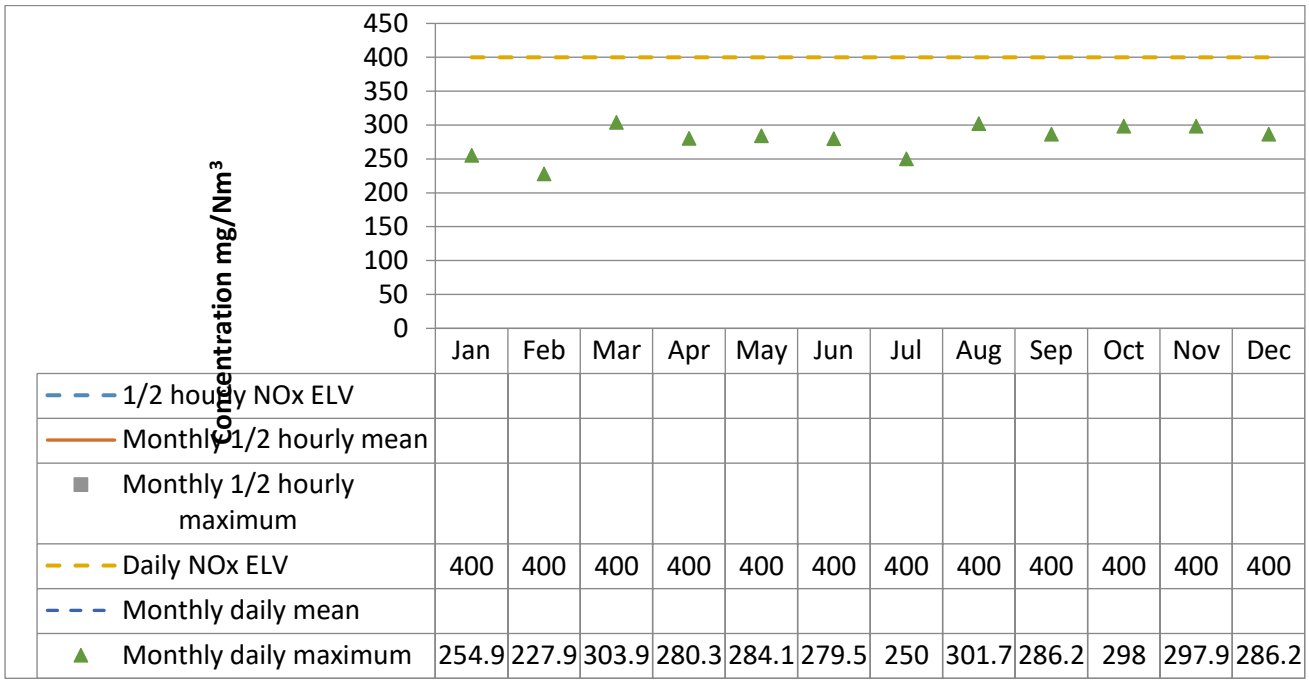
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1/2 hourly HCl ELV	60	60	60	60	60	60	60	60	60	60	60	60
Monthly 1/2 hourly mean	6.3	7.1	6.5	7.5	6.9	6.4	7.2	6.9	7.2	7.1	6.7	7.6
Monthly 1/2 hourly maximum	27.6	26.6	49.8	56.3	57.6	47.8	50.6	34.4	27.1	27.9	12.1	10.6
Daily HCl ELV	10	10	10	10	10	10	10	10	10	10	10	10
Monthly daily mean												
Monthly daily maximum	9.7	9.5	9.1	9.2	9.7	8.7	9.3	8.3	8.2	7.9	7.9	7.9

Line 1 – Sulphur dioxide



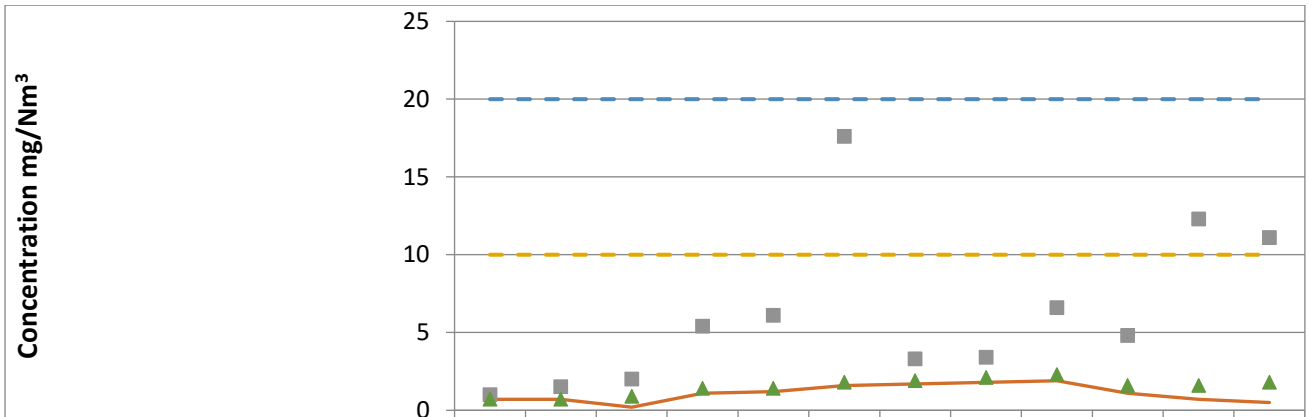
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1/2 hourly SO2 ELV	200	200	200	200	200	200	200	200	200	200	200	200
Monthly 1/2 hourly mean	24.1	21	21.8	18.8	19.8	22	23.4	20.7	19.3	19	20.7	16.6
Monthly 1/2 hourly maximum	141.8	85	98.3	143.9	7.6	129.7	146	64.6	66.6	63.3	111.2	48
Daily SO2 ELV	50	50	50	50	50	50	50	50	50	50	50	50
Monthly daily mean												
Monthly daily maximum	37.4	30.7	31.3	25.8	22.5	30.6	36.3	25.7	24.2	26	24.4	22.3

Line 1 – Oxides of nitrogen



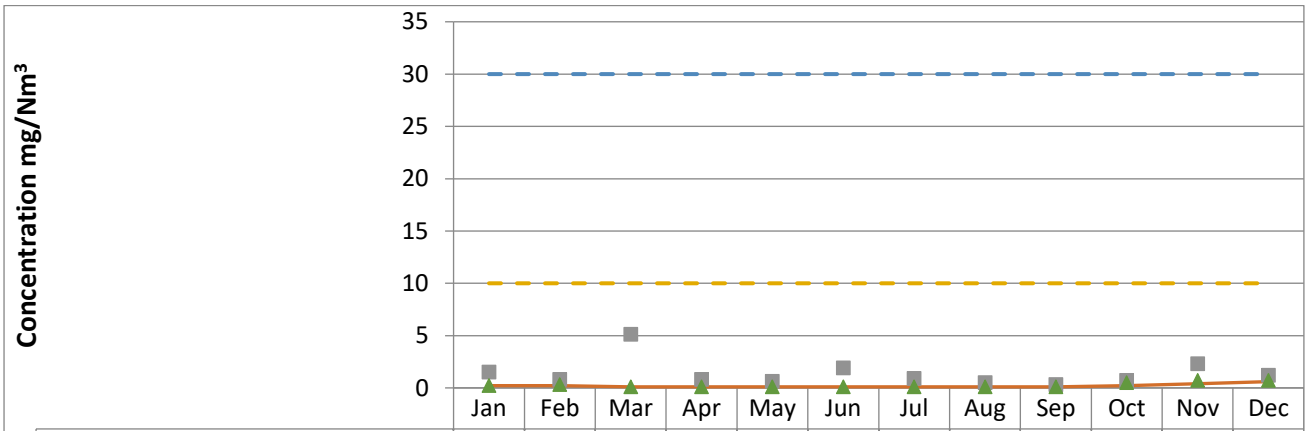
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1/2 hourly NOx ELV												
Monthly 1/2 hourly mean												
Monthly 1/2 hourly maximum												
Daily NOx ELV	400	400	400	400	400	400	400	400	400	400	400	400
Monthly daily mean												
Monthly daily maximum	254.9	227.9	303.9	280.3	284.1	279.5	250	301.7	286.2	298	297.9	286.2

Line 1 – Total organic carbon



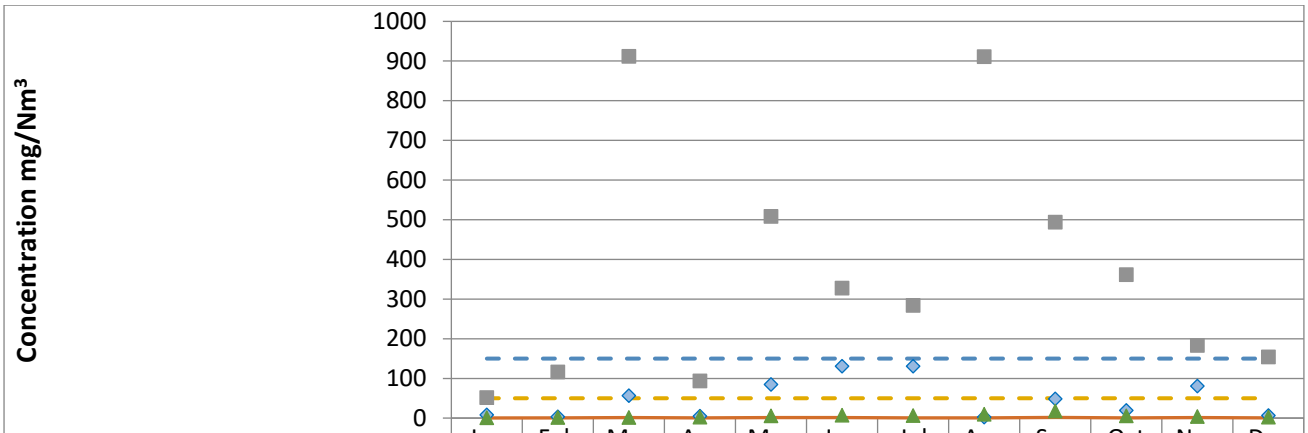
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1/2 hourly TOC ELV	20	20	20	20	20	20	20	20	20	20	20	20
Monthly 1/2 hourly mean	0.7	0.7	0.2	1.1	1.2	1.6	1.7	1.8	1.9	1.1	0.7	0.5
Monthly 1/2 hourly maximum	1	1.5	2	5.4	6.1	17.6	3.3	3.4	6.6	4.8	12.3	11.1
Daily TOC ELV	10	10	10	10	10	10	10	10	10	10	10	10
Monthly daily mean												
Monthly daily maximum	0.7	0.7	0.9	1.4	1.4	1.8	1.9	2.1	2.3	1.6	1.6	1.8

Line 1 – Particulates



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1/2 hourly PM ELV	30	30	30	30	30	30	30	30	30	30	30	30
Monthly 1/2 hourly mean	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.4	0.6
Monthly 1/2 hourly maximum	1.5	0.8	5.1	0.8	0.6	1.9	0.9	0.5	0.3	0.7	2.3	1.2
Daily PM ELV	10	10	10	10	10	10	10	10	10	10	10	10
Monthly daily mean												
Monthly daily maximum	0.2	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.5	0.7	0.7

Line 1 – Carbon monoxide



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
10 minute CO ELV (95%)	150	150	150	150	150	150	150	150	150	150	150	150
Monthly 95% 10 minute maximum	8.1	3.3	56	4.3	84.5	130.2	130.5	1.9	48.4	18.7	80.6	6
Monthly 10 minute mean	0.3	0.4	0.9	0.5	1.4	1.5	0.6	0.6	1.6	0.8	1.1	0.7
Monthly 10 minute maximum	51.7	115.8	911.9	92.9	508.3	327.2	283.4	911.1	493.2	360.9	182.8	153.9
Daily CO ELV	50	50	50	50	50	50	50	50	50	50	50	50
Monthly daily mean												
Monthly daily maximum	0.4	1	1.6	2.1	5.3	7	6.1	9.5	17.1	5.3	4.1	2.3

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	
		26/04-28/04/22	11-13/10/22
Mercury and its compounds	0.05 mg/m^3	0.0037 mg/m^3	0.0014 mg/m^3
Cadmium & thallium and their compounds (total)	0.05 mg/m^3	0.0020 mg/m^3	0.0016 mg/m^3
Sb, As, Pb, Cr, Co, Cu, Mn, Ni and V and their compounds (total)	0.5 mg/m^3	0.10 mg/m^3	0.055 mg/m^3
Dioxins and furans (I-TEQ)	0.1 ng/m^3	0.0586 ng/m^3	0.016 ng/m^3

4.3 Summary of monitoring results for emissions to water

No emissions to water are monitored from the process.

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	100 %	100 %
Oxides of nitrogen	N/A	100 %
Sulphur dioxide	100 %	100 %
Carbon monoxide	100 % 95% of 10-min averages	100 %
Total organic carbon	100 %	100 %
Hydrogen chloride	99.93 %	100 %
Hydrogen fluoride	N/A	N/A

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

Date	Summary of notification or non-compliance	Reason	Measures taken to prevent reoccurrence
15/03/2022	ERV Opening Part A/B – Fugitive Emission	Liquid waste leaked through incinerator seals and ignited. ERV initiated 3hrs 14minutes into controlled shut down.	Stop on third party waste until investigation complete. Full investigation into the third party whose waste was being processed during the incident. New pre-acceptance audit completed by Stericycle.
05/04/2022-10/04/2022	Abnormal Operations	5.5hours abnormal operations declared via Part C notifications. 4 separate occurrences. Lime blockages.	Blockage removed.
14/08/2022	ERV Opening	Compressor Failure The standby compressor did not initiate when required resulting in a loss of compressed air and tripping of the safety chain.	Idle mode removed to prevent a reoccurrence.
10/10/2022	ERV Opening	ID fan failure The ID failed to operate within its required parameters leading to a total loss of draft. This subsequently tripped the plants safety chain leading to an ERV opening. The ID fan belt failed.	Replacement fan belts quarterly.
11/11/2022	HF Emission Exceedance	HF Failure on Extractive Emissions Test Non-confirming waste in the form of inhalation anaesthetics	Identification and communication to customers who produce waste potentially containing HF sources when combusted.

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

Date of complaint	Summary of complaint	Reason for complaint including whether substantiated by the operator or the EA	If substantiated, measures to prevent reoccurrence
	None		

6. Summary of plant improvements

Summary of any permit improvement conditions that have been completed within the year and the resulting environmental benefits.

None
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.
None
Summary of any other improvements made to the plant or planned to be made and a summary of the resulting environmental benefits.
Planned 2023 • SNCR to abate NOx emissions to new BAT-AEL coming into force in Dec 23. • Upgrades to the lime dosing system motors to increase lime supply to the abatement plant to meet new BAT-AEL on HCL and SO2 coming into force in Dec 23. • UPS upgrades to boiler, MCC and PLC to improve resilience (potentially 2024).

7. Details of any public liaison planned for 2023

Date and time	Description	Location
	None	

8. Other Permit form Information

Below are a summary of the information contained within forms required by permit conditions 2.4.1, 2.8.1, 4.1.3, 4.1.5 and 4.1.6.

Performance 1	Operating hours for the year Number of periods of abnormal operations Cumulative hours of abnormal operations	See section 3
Performance indicators	Total waste incinerated Electrical energy imported to site/tonne incinerated Gas consumption/tonne incinerated IBA produced/tonne incinerated APC produced/tonne incinerated Lime consumption/tonne incinerated Carbon consumption/tonne incinerated Number of ERV operations	5109.79 tonne 16.86 kWh/tonne 98.92 kWh/tonne 165.02 kg/tonne 46.67 kg/tonne 36.47 kg/tonne 6.65 kg/tonne See section 5.2
Energy 1	Electricity (kWh, primary energy & CO2) Natural Gas (primary energy & CO2) Cumulative	86,142 kWh, 223.97 MWh 505.503MWh, 96.04 tonnes

	(primary energy, CO2 and CO2/tonne incinerated)	729.47 MWh, 133.01 tonnes, 0.026 tonnes/tonne
Water 1	Mains water (total & per tonne incinerated)	15,154 m3, 2.965 m3/tonne
Disposal and Recovery	Haz wate incinerated Clinical waste incinerated Cytotoxic/cytostatic waste incinerated Total waste incinerated Total waste per unit output (IBA)	See section 3 See section 3 191 tonnes See section 3 6.61 tonnes per tonne IBA
Progress against EMS targets	Progress against EMS targets (required annually)	Appendix 1
Fugitive emissions	Fugitive emissions (required annually)	Appendix 2
Waste Minimisation and Water Efficiency	Waste Minimisation and Water Efficiency Audit (required every four years)	Appendix 3
Accident Management	Accident Management Plan (required every four years)	Appendix 4

Comments:

Increased gas consumption is due to the use of gas burners for the drying of refractory during shutdowns.

Electrical efficiency improvements due to new MCC, new meters and new invertor equipment, new ID fan, secondary air fan (all completed Q4 2021).