

**LEEDS CLINICAL WASTE INCINERATOR**

**Environmental Permit Reference Number EPR/CP3930XL/V004**

**ANNUAL PERFORMANCE REPORT FOR 2018**

SRCL Limited  
Knothrop Treatment Works  
Knowsthorpe Lane  
Leeds  
LS9 0PJ

January 2019

## **Introduction**

Leeds Clinical Waste Incinerator is a clinical waste incinerator situated on the Knostrop Wastewater Treatment Plant at Knowsthorpe Lane, Leeds, LS9 0PJ. The incinerator has been operated by SRCL Limited (previously called White Rose Environmental Limited) on this site since it was first commissioned in 1994. The plant was originally regulated by the Environment Agency under Authorisation Number AM6293, but in 2005 came under the Pollution Prevention and Control Regulations, and the original PPC permit reference number XP3838ST was issued in December 2005. Therefore this Annual Performance Report for 2018 represents the 13th Annual Performance Report for a full year under the PPC (now Environmental Permitting) Regulations.

The plant came under the Environmental Permitting Regulations in April 2008, but this resulted in no significant changes to the operation and regulation of the plant; the permit conditions remained the same, and the plant continues to be regulated by the Environment Agency. There was a change of company name in 2008, from White Rose Environmental Limited to SRCL Limited, a change that resulted in a change of PPC permit number from XP3838ST to CP3930XL which came into full effect on the 8<sup>th</sup> January 2008.

A further variation to the permit was issued in November 2011, the purpose of the variation being to consolidate the waste operation for a sharps container washing system and transfer operation back into the main site permit as a directly associated activity. The varied permit (CP3930XL/V004) was also re-issued as a new modern style Environmental Permit.

A further, separate permit was issued in June 2014 (Permit number EPR/BB3409HF), for the thermal treatment (autoclave) of waste metals arising from healthcare activities.

Details of the management of the plant are shown below:

**General Manager: Mrs. Jenny Firth**  
**Plant Manager: Mr. Mark Mitchinson**  
**Address: (for both)**

Leeds Clinical Waste Incinerator.  
SRCL Limited  
Knostrop Treatment Works  
Knowsthorpe Lane  
Leeds  
LS9 0PJ                      **Phone: 0333 240 4208**

## **General Description of the Process**

The Leeds plant incinerates clinical waste, including clinical wastes classed as hazardous under the Hazardous Waste Regulations 2005. The bulk of the waste is produced at hospitals, but also includes smaller quantities from doctors' surgeries, dentists, health clinics, residential and nursing homes, and from medical research facilities. The hazardous wastes incinerated include infectious waste and waste containing cytotoxic or cytostatic medicines.

The plant also incinerates small amounts of specialised wastes where it is recognised that high temperature incineration represents the best disposal option. These waste types include drugs confiscated by the Police or Customs and Excise, animal by-product wastes, genetically modified wastes, and certain confidential materials.

## **Plant Description**

The Leeds incinerator consists of two streams, known as the East and West streams, each with a nominal throughput of one tonne of clinical waste per hour. The permit sets an annual throughput limit of 8500 tonnes on each stream, with lower limits on specific waste types. The two streams are independent of each other, so that one stream can still be operated while the other stream is shut down for maintenance.

The two incinerators are of stepped hearth design, with three main combustion hearths and an ash box. Clinical waste is loaded mechanically direct from the wheeled bins used to deliver the waste, onto the first hearth, and the combustion process commences. Hydraulic rams operate at intervals to push the waste along the first hearth, until it falls off the end onto the second hearth where the waste burns vigorously at a temperature of between 1000 and 1100 degrees Centigrade. The waste is then pushed from the second hearth onto the third hearth, where it burns out to produce an ash. This bottom ash is then pushed into an ash box, where the fixed carbon in the ash is further burned out. The retention time on the hearths is approximately 12 hours, with the bottom ash being retained in the ash box for up to 8 hours before being dropped into a skip. Ram movements are programmed in relation to the number of bins fed.

The flue gases from the incineration process then pass through a secondary chamber, or afterburner, where any gaseous products of combustion are burned out under oxygen rich conditions. This stage is designed to destroy any Carbon Monoxide, Volatile Organic Compounds, and dioxins and furans produced by the combustion process.

The flue gases are then cooled by passing through a waste-heat boiler and economiser, before passing into the final, abatement section of the process. Powdered lime (Calcium Hydroxide) and powdered activated carbon are added to the flue gases entering the abatement process to remove acid gases, heavy metals and residual dioxins and furans before discharge to atmosphere from the stack. The flue gases being discharged from the stack are continuously monitored for Hydrogen Chloride, Sulphur Dioxide, Carbon Monoxide, Oxides of Nitrogen, particulate matter (dust), Volatile Organic Compounds, oxygen and moisture content.

The incineration process produces two residues; bottom ash and spent lime. The bottom ash is sent to a recycling transfer station for reprocessing, the bulk of the material ultimately ending up as a landfill cover material. The spent lime, which is the residue from the flue gas abatement process, went to a site in Leeds where it is used to neutralise acidic wastes.

## **Summary of Plant Operation**

During 2018, the plant processed 13937 tonnes of waste, this figure being a slight decrease on the quantity processed in 2017 (14111 tonnes). The majority of this waste was classified as infectious waste (EWC code 180103), with smaller quantities of the other permitted waste types. A summary of the waste types processed is shown in Table A below, which shows the waste type both by a description and by its classification by the appropriate code from the European Waste Catalogue (EWC).

**Table A**

<b>Waste Type</b>	<b>EWC Code</b>	<b>Tonnes burned</b>
<b>Total clinical waste incinerated</b>	<b>All codes</b>	<b>13936.5</b>
<b>Hazardous waste incinerated</b>	<b>180103 &amp; 180108 (and others in small quantities)</b>	<b>12859.7</b>
<b>Cytotoxic &amp; cytostatic wastes incinerated</b>	<b>180108</b>	<b>888.67</b>

During the year, 3,136.56 tonnes of bottom ash were disposed of as a landfill cover material after re-processing at the LSS Waste Management materials recycling facility. The spent lime was sent for disposal to the Cleansing Services Group site in Manchester, where use of this waste is for the neutralisation of acidic wastes.

### **Summary of Plant Improvements**

A number of changes have been made to the plant operations to improve efficiency

- New Bomb Doors fitted to both Incinerators
- Major Refractory work to East Incinerator
- Overhaul of Hopper on East Incinerator
- Bag House filter Change to East and West.

### **Overall reductions**

<b>Year</b>	<b>Gas usage (MWh)</b>	<b>Electricity (MWh)</b>	<b>Water (m3)</b>	<b>Lime (tonnes)</b>
2008	10903.4	2654.2	30733	771
2009	5264.6	2151.6	30000	624
2010	3664.7	2146.7	29796	630
2011	3238.1	2172.1	36511	653
2012	2328.5	1663.6	36042	764
2013	2087.08	1693.85	30622	675
2014	1320.12	1547.0	34284	578.2
2015	719	1622.6	41746	589.72
2016	1021.46	1102.2	44836	625.88
2017	770.28	870.89	46595	620.25
2018	2597.84	1136.57	49864	667.6

Overall the facility has continued to make energy saving improvements in line with Company policy and the downward trend in the carbon footprint of the facility continues. The increase in water is linked to the installation (in 2013) of a sharps container washing plant which has continued to grow year on year, likely to peak in 2019 when this facility is planned to run 24/7.

Unfortunately as in 2018 the Heliex steam screw has had a year of technical faults, although after a redesign of a seal it has become much more reliable. It is intended that the heliex technology will continue to be implemented at Knostrop as the most feasible technology for energy recovery. An alternative CHP installation would not be practical. This update is SRCL's submission of permit requirement 1.2.3, a review of the practicability of CHP implementation.

## **Summary of Plant Monitoring**

The Leeds plant has two sets of identical monitors, one set for each stream, situated within a CEMs room on the ground floor of the Process Building. Each set of monitors comprises three continuous monitors; an Erwin Sick MCS multi-gas analyser, a flame ionisation detector to monitor Volatile Organic Compounds, and a dust monitor. All the monitors are linked to a computerised reporting system, with software to correct the measured values to standard reference conditions and to produce daily and monthly printouts of the corrected emissions from the process. Any breaches of the emission limits set by the permit are reported immediately to the Environment Agency.

As well as the continuous monitoring systems, the plant is tested twice a year by an independent laboratory for those parameters that cannot be monitored continuously. A summary of which pollutants are monitored continuously, and which are monitored periodically, is shown in Table B below;

**Table B**

<b>Pollutant</b>	<b>Continuously</b>	<b>Periodically</b>	<b>Operating time (%)</b>
Particulates	Yes		100
Oxides of Nitrogen	Yes		> 99
Sulphur Dioxide	Yes		> 99
Carbon Monoxide	Yes		> 99
Total Organic Carbon	Yes		> 99
Hydrogen Chloride	Yes		> 99
Cadmium and Thallium		Yes	
Mercury		Yes	
Other Heavy Metals		Yes	
Dioxins and Furans		Yes	
Hydrogen Fluoride		Yes	

It should be noted that all the instruments used for continuous monitoring have received MCERTS accreditation, and are subject to a number of quality assurance procedures known as QAL1, QAL2, QAL3 and the Annual Surveillance test (AST)

## **Summary of Plant Compliance**

Independent half annual tests were carried out on both incinerators as per permit requirements and all results submitted.

There have been emissions non-compliances on the West stream throughout 2018 however there are action plans in place to address the root causes of said emission non-compliances which have been submitted to the EA. The Leeds site is certified to the Environmental Management Systems Standards ISO 14001 and ISO9001, and the site procedures and records are audited on a regular basis by the British Standards Institute.

## **Summary of Information made Available**

This report has been supplied to the Environment Agency, who have placed in on the Public Register at their Leeds Office, at the address shown below:

Environment Agency  
Lateral  
8 City Walk  
Leeds  
LS11 9AT