VEOLIA

Appendix L (ii)

Reference facility assessment report

FICHTNER

4206E01-550-F

Woodlawn ARC Reference Facilities

Veolia Document number:

00288-R-06-K00-001

Woodlawn ARC

Veolia Environmental Services

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Document revision record

Rev.	Date	Details of revision	Fichtner Doc Ref.	Prepared by	Checked by
A	22-10-2021	For Client	4206E01-550-A	JRS	SMO
B	27-10-2021	Updated following Client comments	4206E01-550-B	JRS	SMO
C	03-11-2021	Updated following Client comments	4206E01-550-C	JRS	SMO
D	07-07-2022	Updated report with new Reference Facility	4206E01-550-D	OSK RO	DMJ
E	08-07-2022	Updated following Client comments	4206E01-550-E	OSK RO	DMJ
F	06-10-2022	Updated following Client comments	4206E01-550-F	OSK RO	DMJ

Veolia Document number: 00288-R-06-K00-001

Disclaimer

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1 Executive Summary

Veolia is currently seeking to develop an Energy Recovery Facility at the Woodlawn Eco Precinct Site near Tarago in NSW. As per the NSW Energy from Waste Policy Statement, the energy recovery facilities must use proven technologies and must be demonstrated by reference facilities.

Veolia has chosen a Reference Facility, the Staffordshire ERF (also known as Four Ashes ERF) and a comparable facility, the Greatmoor ERF and has requested Fichtner to provide a short report explaining the how the proposed facilities are similar to the Woodlawn ARC.

The table below provides a summary comparison of both the facilities to the Woodlawn ARC.

Table 1: Comparison of the Reference Facility with the comparable and the proposed facility

Sr. No.	Parameters	Staffordshire ERF	Greatmoor ERF	Woodlawn ARC
1	Annual capacity	340,000 tpa	345,000 tpa	380,000 tpa
2	Number of lines	2	1	1
3	Calorific value	9.2 MJ/kg	9.3 MJ/kg	9 MJ/kg
4	Waste type	Municipal and commercial waste	Municipal and commercial waste	Municipal and commercial waste

The combustion technology and the flue gas treatment technologies used in the Reference Facility and the comparable facility are used in most of the ERF facilities throughout Europe and the UK. As detailed within the Woodlawn ARC – BAT Assessment, the Woodlawn ARC will also use these technologies. These technologies include, but not limited to, an optimized combustion control system (CCS) to ensure the complete combustion of the volatile gases at the required 850°C for 2 seconds. This optimized combustion method controls Total Organic Carbon (TOC) and CO emissions.

As set out in the AQIA, analysis of monitoring data from the Staffordshire ERF has been undertaken, and subsequent comparison of the monitoring data with the emission limit values within the NSW EfW Policy. This demonstrates that nearly all emissions are consistently in accordance with the emission limit values stated within the NSW EfW Policy, noting that the Staffordshire ERF is operating in accordance with the requirements of its EP (Environmental Permit) as attached in Appendix 6.1. The monitoring data from the Staffordshire ERF does not consistently demonstrate compliance with the daily emission limit value for Ammonia; however, it is important to note that emissions of Ammonia from the Staffordshire ERF are not currently regulated.

It is understood that technology providers are currently implementing additional control measures within the design of their SNCR systems – referred to as 'Enhanced SNCR systems' – to optimize the performance of the systems, and further reduce emissions of Ammonia and NOx. Veolia proposes to install a similar system at the Woodlawn ARC.

In addition to the operational data from the Staffordshire ERF, the Greatmoor ERF and from the data available in the Waste Incineration BREF, it has been identified that there are a significant number of additional operational facilities in Europe and the UK which process the same/similar waste whilst utilizing the same abatement systems as proposed for the Woodlawn ARC.

2 Introduction

Veolia is currently seeking to develop an Energy Recovery Facility (ERF) at the Woodlawn Eco Precinct Site near Tarago in NSW (within this report it is referred to as the Woodlawn ARC or the Facility).

The NSW Energy from Waste Policy Statement, published in June 2021 (referred to as the NSW EfW Policy) by the NSW Environment Protection Authority (NSW EPA), states:

Energy recovery facilities must use technologies that are proven, well understood and capable of handling the expected variability and type of waste feedstock. This must be demonstrated through reference to fully operational plants using the same technologies and treating like waste streams in other similar jurisdictions.

As the NSW EfW policy has been developed by the NSW EPA and only applies to NSW, Australia it is not possible to provide operational data from a facility in the same 'jurisdiction'.

Veolia operates over 65 energy recovery facilities worldwide, mainly in Europe and the UK and the recent merger with SUEZ only enhances that capability. Therefore, Veolia is highly experienced in the design and operation of ERF's. Whilst Veolia's operations in Europe and the UK are not subject to the same regulatory requirements as the Facility, they are not directly comparable to the Facility. However, the facilities which Veolia operates in the UK are considered to be 'similar' to the Woodlawn ARC, as the UK utilizes a similar regulatory framework to that being applied in NSW by the NSW EPA and are operated in an English-speaking country meaning that all relevant operational records are written in English.

In accordance with the NSW EfW Policy, Veolia has requested that Fichtner provides a short report which explains why its proposed Plants are considered to be representatives of the Woodlawn ARC.

3 The Facilities

Veolia has chosen a reference facility and a comparable facility as representative of Woodlawn ARC, these are mentioned below.

1. Staffordshire Energy Recovery Facility as Reference Facility
2. Greatmoor Energy Recovery Facility as comparable facility

Below is a summary table that shows comparison of main parameters of the facilities with Woodlawn ARC.

Table 2: Comparison of main parameters of the Reference Facility with the comparable facility and the proposed facility

Sr. No.	Parameters	Staffordshire ERF	Greatmoor ERF	Woodlawn ARC
1	Annual capacity	340,000 tpa	345,000 tpa	380,000 tpa
2	Number of lines	2	1	1
3	Calorific value	9.2 MJ/kg	9.3 MJ/kg	9 MJ/kg
4	Waste type	Municipal and commercial waste	Municipal and commercial waste	Municipal and commercial waste
5	Grate type	Moving grate	Moving grate	Moving grate
6	Grate cooling	Air cooled	Air cooled	Air cooled
7	Boiler type	Five pass boiler, horizontal	Five pass boiler, horizontal	Five pass boiler, horizontal
8	Flue gas treatment			
	DeNOx	SNCR	SNCR	SNCR
	De-acidification	Dry	Semi Dry	Semi Dry
	DeDiox	Activated carbon	Activated carbon	Activated carbon
	Filtration	Fabric filter	Fabric filter	Fabric filter
9	Continuous emission monitoring - number of analyzers	2	1	1
10	Number of turbines	1	1	1
11	Gross power output	26 MW	29.3 MW	28.42 MW

3.1 Staffordshire Energy Recovery Facility

Veolia's chosen Reference Facility is the Staffordshire Energy Recovery Facility (also known as the Four Ashes ERF) which operates in Staffordshire, UK. Construction of the Staffordshire ERF commenced in June 2011, and commissioning of the Facility was completed in March 2014. The Staffordshire ERF incorporates conventional thermal treatment and abatement technologies which are widely adopted in Europe and the UK.

An indicative process schematic for the Staffordshire ERF is presented in Figure below.

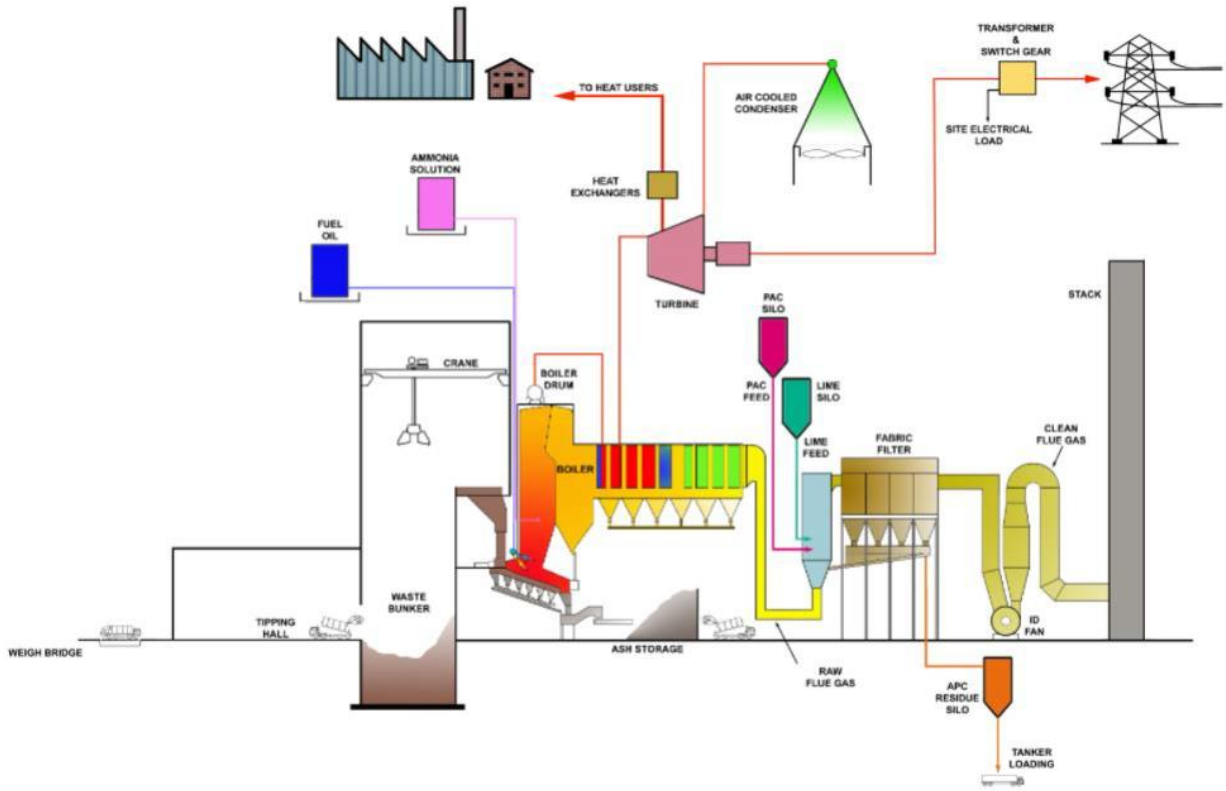


Figure 1: Indicative Schematic for the Staffordshire ERF

The design and operation of the Staffordshire ERF is subject to UK and European regulations and associated environmental constraints. The operation of the Staffordshire ERF is regulated in accordance with the requirements of an Environmental Permit which was granted by the Environment Agency in March 2012. The Environmental Permit (EP) for the Staffordshire ERF incorporates the requirements, including the prescribed emission limits, from the Industrial Emissions Directive (IED). The Staffordshire ERF is a twin-line facility that is permitted to process up to 340,000 tonnes per annum of waste with an assumed availability of 8,000 hours per annum.

3.1.1 Incoming Waste

The Staffordshire ERF primarily processes residual municipal waste (i.e., household waste which cannot be recycled or composted), with some commercial and industrial (C&I) waste also processed. The incoming waste is delivered to the Staffordshire ERF via road in waste delivery vehicles and deposited into a waste bunker for storage prior to combustion. The Net Calorific Value (NCV) of the waste received at the Staffordshire ERF is between 7 and 12.5 MJ/kg, and it is designed to process waste with an average NCV of approximately 9.2 MJ/kg.

Incoming waste is transferred from the waste bunker to the combustion system via an overhead crane which loads the waste into the feed hopper for the grate.

3.1.2 The Thermal Treatment Technology

3.1.2.1 The Combustion Technology

The combustion system utilizes a moving grate technology. The grate turns and mixes the waste along its surface to ensure that all waste is exposed to the combustion process. Moving grate is a well-established technology in Europe and the UK for the combustion of a range of non-hazardous wastes, such as residual municipal and C&I waste. Moving grates are typically capable of processing 1-50 tonnes per hour of waste[1].

The design and operation of the grate and the boiler is optimized to minimize emission of Oxides of Nitrogen (NOx), Carbon Monoxide and Total Organic Carbon (TOC) from the combustion process.

As detailed within the Woodlawn ARC – BAT Assessment, the Woodlawn ARC will use a moving grate technology.

3.1.2.2 The Flue Gas Treatment Technology

The Staffordshire ERF utilizes a number of different technologies to abate emissions including the following:

1. Selective Non-Catalytic Reduction (SNCR) system utilizing the injection of Ammonia into the boiler to abate emission of NOx.
2. Boiler cleaning techniques to minimize the reformation of Dioxins and Furans within the boiler.
3. Injection of hydrated lime into the flue gas stream within a reaction chamber to neutralize emissions of acid gases (including Sulphur Dioxide, Hydrogen Chloride and Hydrogen Fluoride) – this type of system is referred to as a 'dry scrubber'.
4. Injection of activated carbon into the flue gases stream to abate volatile organic compounds (VOC) and metals in the vapor phase; and
5. Bag filters to abate Particulate Matter, which will include metals which will be in the particulate phase, fly ash and any unreacted lime and/or activated carbon.

As detailed within the Woodlawn ARC – BAT Assessment, the Staffordshire ERF treated flue gases are subsequently released to atmosphere via two 80 m stacks.

The Woodlawn ARC will use the similar flue gas treatment technologies as the Staffordshire ERF.

3.1.2.3 Emissions Monitoring and Performance

In accordance with the requirements of the EP for the Staffordshire ERF, Veolia is required to undertake a combination of continuous and periodic monitoring, as follows:

- Continuous monitoring:
    - Particulate Matter
    - Sulphur Dioxide
    - Oxides of Nitrogen (expressed as Nitrogen Dioxide)
    - Carbon Monoxide
    - Hydrogen Chloride
    - Total Organic Carbon

[1] https://eippcb.jrc.ec.europa.eu/sites/default/files/2020-01/JRC118637_WI_Bref_2019_published_0.pdf

    - Ammonia
- Periodic monitoring:
    - Hydrogen Fluoride
    - Cadmium and Thallium
    - Mercury
    - Group 3 metals
    - Dioxins and Furans

In accordance with the requirements of the EP for the Staffordshire ERF, Veolia is required to report concentrations of those pollutants which are monitored on a continuous basis as half-hourly and daily averages.

As the reference periods for the monitoring data for the Staffordshire ERF are different to the emission limit values stated in NSW EfW Policy, Veolia has obtained the monitoring data from the Staffordshire ERF CEMS system for 2017.

Veolia's consultant has undertaken analysis of the raw data from the CEMS system to enable it to undertake analysis of the performance of the Staffordshire ERF against the emission limit values stated in NSW EfW Policy. Furthermore, EMM Consulting Pty Limited has analyzed the periodic emissions monitoring data for the same period. The analysis is presented in section 7.2 of the AQIA, and demonstrates that, for the Staffordshire ERF, the emissions for all pollutants monitored continuously and periodically are below the relevant emission standards from NSW EfW Policy with the following exceptions:

- one exceedance of the hourly emission limit for NOx
- one exceedance of the hourly emission limit for Sulphur Dioxide; and
- a number of days (approximately 30%) where there were exceedances of the daily emission limit for Ammonia.

It is important to mention that, currently, emissions of Ammonia are not regulated within the EP for the Staffordshire ERF; therefore, Veolia has not been required to implement measures to control/minimize emissions of Ammonia from the Staffordshire ERF. It is understood that the Ammonia concentrations are reflective of Ammonia-slip[2] associated with the installed SNCR technology for the abatement of NOx emissions which is designed and operated in accordance with the current regulatory regime. As explained in section 4.3, additional control measures for the abatement of NOx have been proposed for energy recovery facilities which are currently being developed in Europe and the UK which will ensure that the SNCR systems operate more efficiently than those installed at the Staffordshire ERF and will result in a lower Ammonia slip than experienced at the reference and comparable facilities.

Through the BREF review process, refer to section 4.1, Fichtner was informed that Veolia UK is currently upgrading the SNCR system at the Staffordshire ERF to further minimize emissions of NOx and Ammonia to align with the tighter controls required by the Waste Incineration BREF. The works will be completed by 2023.

[2] 'Ammonia slip' is the un-reacted ammonia within the flue gases when they exit the boiler.

3.2 Greatmoor Energy Recovery Facility

The Greatmoor Energy Recovery Facility (the Greatmoor ERF) located near Buckinghamshire, United Kingdom, is owned and operated by FCC Environment and was commissioned in 2016. The plant was designed by Hitachi Zosen Inova (HZI), and HZI was also the general contractor for the plant during the construction phase. The plant uses technologies which are widely used throughout Europe and the UK. A schematic of the main systems of the Greatmoor ERF is shown in the figure below.

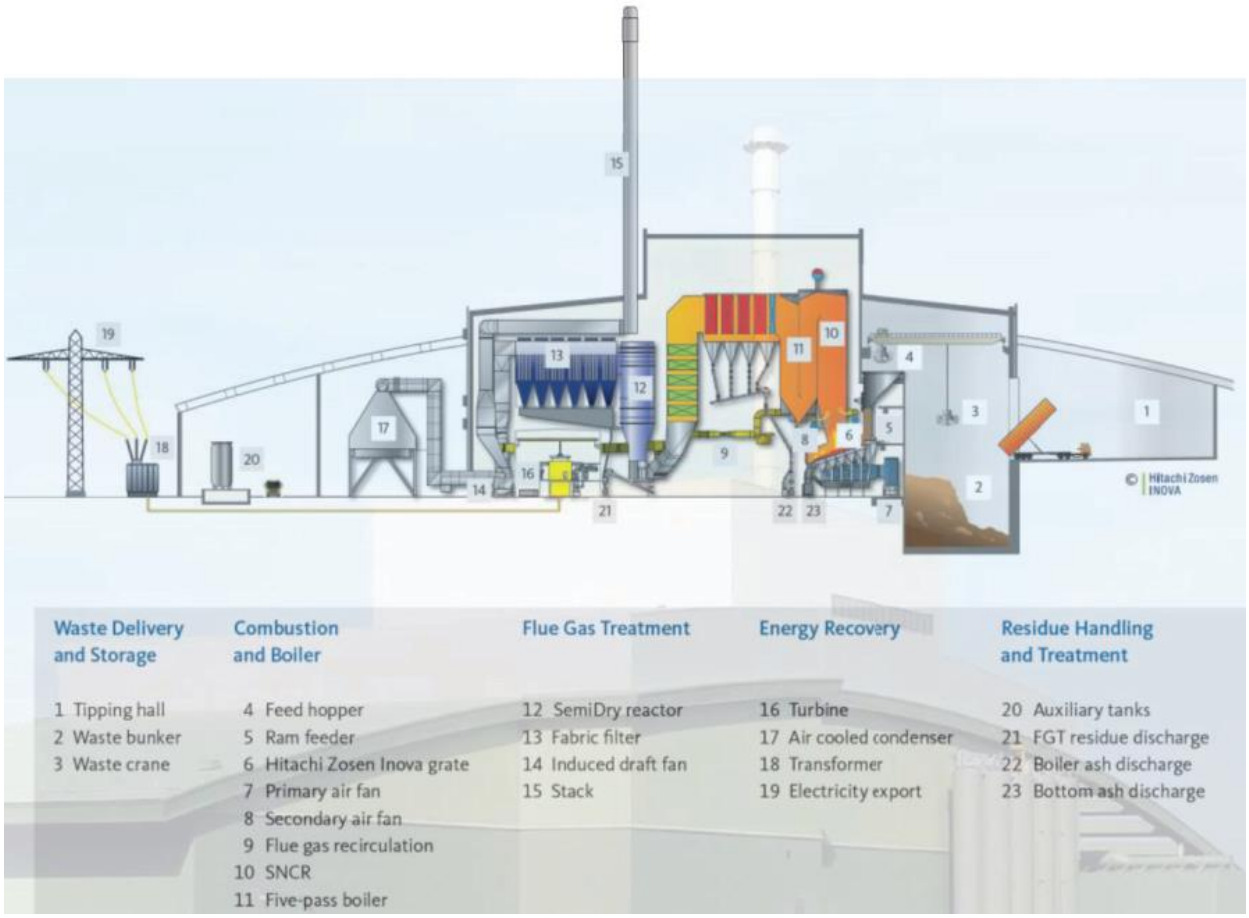


Figure 2: Schematic and main systems of the plant

Operations at the Greatmoor ERF are controlled by the requirements of the permit regulated by the Environment Agency, as attached in Appendix 6.2. The plant has been designed in accordance with the requirements of the Industrial Emissions Directive 2010 (IED) and employs the BAT (Best Available Techniques) Reference Document (BREF). The Greatmoor ERF is a single line facility that has a permitted waste processing capacity of 345,000 tonnes per annum and an assumed availability of 8,000 hours per annum.

3.2.1 Incoming Waste

The Greatmoor ERF processes residual municipal waste and commercial waste. The waste is transferred from High Heavens WTS which is located in High Wycombe, located in the south of the county. It is used as the local delivery point by the Southern kerbside Refuse Collection Vehicles (RCVs) and Household Recycling Centers (HRCs) to transfer residual waste to be processed at Greatmoor ERF. The Waste

Feedstock that Greatmoor ERF receives is predominantly residual MSW and with a proportion of residual C&I waste. It is to be noted that the waste characteristics are similar to the Woodlawn ARC.

The waste is deposited into a waste bunker for storage prior to combustion. The Net Calorific Value (NCV) of the waste received at the Facility is between 7.5 and 12.5 MJ/kg, and it is designed to process waste with an average NCV of approximately 9.3 MJ/kg.

3.2.2 The Thermal Treatment Technology

3.2.2.1 The Combustion Technology

The Greatmoor ERF comprises of a single line with a maximum waste processing capacity of 39.4 tonnes per hour utilizing conventional moving grate technology, firing municipal and commercial waste with a calorific value range of between 7.5 MJ/kg to 12.5 MJ/kg. The horizontal five-pass boiler producing steam to generate up to 29.4 MW of electricity through a single condensation turbine, with an air-cooled condenser as its cooling system.

3.2.2.2 The Flue Gas Treatment Technology

Several technologies and methods are used in the Greatmoor ERF to treat flue gas and to control emissions. Some of the technologies and methods are discussed below.

1. The exhaust gases are filtered through a bag filter, which traps fine particulate matter (dust).
2. An optimized combustion control system (CCS) in place to ensure the complete combustion of the volatile gases at the required 850°C for 2 seconds. This optimized combustion method controls Total Organic Carbon (TOC) and CO emissions.
3. Selective Non-Catalytic Reduction (SNCR) system utilizing the injection of Ammonia into the boiler for emission abatement of NOx.
4. Flue gas cleaning with a Semi Dry Reactor, this emissions abatement system uses hydrated lime and activated carbon to eliminate HCl, SO_2 and other substances.
5. Dioxins and furans are adsorbed in the surface area of the activated carbon which is added into the Semi Dry Reactor where the flue gas is cleaned. The reaction products are a dry solid material called Air Pollution Control Residue (APCR) which is then separated from the flue gas stream by means of the fabric filter and disposed off-site

The Woodlawn ARC will use similar flue gas treatment technologies as the Greatmoor ERF.

3.2.2.3 Emissions Monitoring and Performance

There are two types of substance emissions monitoring, continuous (all the time) and periodic (quarterly).

Continuously monitored emissions are measured using Continuous Emission Monitoring System (CEMS). Exhaust gas sample probes extract concentration samples that analyze and measure each emission parameter. This information automatically updates on the plant control system and is recorded in a dedicated read only data acquisition system.

Periodic extractive sampling is carried out twice a year. Extractive exhaust gas samples are removed independently from the CEMS and analyzed in laboratory conditions, as follows:

- Continuous monitoring:
    - Particulate Matter
    - Total Organic Carbon
    - Hydrogen Chloride
    - Carbon Monoxide
    - Sulphur Dioxide
    - Nitrogen Oxides
    - Ammonia
- Periodic monitoring:
    - Nitrous Oxide
    - Hydrogen Fluoride
    - Cadmium and Thallium
    - Mercury
    - Heavy metals
    - Dioxins and Furans

The plant emissions must not exceed defined limits to ensure Pollution Prevention and Control (PPC) compliance. In the event of plant abnormal operation affecting the emissions to atmosphere, the Environment Agency shall be formally notified.

Fichtner has reviewed the data[3] from the CEMS system from 2018 and 2019 to analyze the performance of the Greatmoor ERF against the emission limit values stated in NSW EfW Policy. Furthermore, Fichtner has received a sample of the periodic emissions monitoring data for the same period. The analysis demonstrates that, for the Greatmoor ERF, the emissions for all pollutants monitored continuously and periodically are below the relevant emission standards from NSW EfW Policy with the following exceptions:

- one exceedance of the half-hourly emission limit for NOx in Aug 2019
- one exceedance of the half-hourly emission limit for Particulate in Feb 2019; and
- CO[4] exceedance was observed on 10 min average both in 2018 and 2019.

The rarity of these exceedances demonstrates that overall, the plant is well fulfilling the required emission limits.

[3] It is to be noted that the averaging period specified in NSW EfW Policy for all emissions is 1-hour except NH_3 which has averaging period 24-hours. The emissions data provided for the Greatmoor ERF has half-hourly averaging period except NH_3 which has daily averaging period.

[4] CO data for Q4-2018 and Q1, Q3 & Q4 2019 is not available for review

4 Background Information & Additional Reference Data

As explained in section 3, the Staffordshire ERF and Greatmoor ERF incorporate the same combustion and flue gas treatment technologies which are proposed for the Woodlawn ARC. In addition, it is important to understand that there are many other facilities within Europe and the UK which utilize the same/similar abatement technologies to those proposed for the Woodlawn ARC, see further details below. Therefore, in addition to the data/information from the Staffordshire ERF and Greatmoor ERF, it is important to understand that there are other 'similar facilities' in Europe and the UK which operate to the same standards as the Staffordshire ERF and Greatmoor ERF.

4.1 European Legislation and Guidance

The IED, which was adopted on 7 January 2013, is the key European Directive which covers almost all regulation of industrial processes in Europe and the UK. The IED adopted the requirements of the Waste Incineration Directive, which have applied to thermal treatment facilities in Europe since December 2000. The EP for the Staffordshire ERF and Greatmoor ERF include emission limit values which are in accordance with the requirements of the IED.

The IED includes a requirement for sector specific BAT conclusions, developed as part of BAT Reference documents or BREF's, to become legally binding. The IED requires that when updated BAT conclusions are published, the Competent Authority in each Member State has up to four years to revise permits for facilities covered by that activity to comply with the requirements of the sector specific BREF.

The Waste Incineration BREF was published by the European IPPC Bureau in December 2019 and introduces tighter daily emissions limits (referred to as BATAELs) than those previously required under the IED - they will be lower for all pollutants, except TOC which remains unchanged. As the Competent Authorities have four years to implement the requirements of the Waste Incineration BREF, they will not apply to existing operational facilities, such as the Staffordshire ERF and Greatmoor ERF, until December 2023. The Competent Authority in England (the Environment Agency) has commenced the permit review process.

The requirements of the Waste Incineration BREF do apply to 'new' facilities; however, these are facilities which are currently under construction and there is no available operational reference data for these facilities. However, as there are a number of facilities currently under construction which will be required to comply with the BATAELs for a 'new' facility, this demonstrates that technology providers are able to offer performance guarantees against different and/or stricter requirements than those in the IED, such as those required by the NSW EfW Policy and the Waste Incineration BREF.

In addition to imposing stricter emission limits for those pollutants previously regulated under the IED, the Waste Incineration BREF has also introduced an emission limit for emissions of Ammonia.

4.2 BREF Data Review

In its development of the Waste Incineration BREF and the development of the BAT-AELs, the European IPPC Bureau collected data and information from operational thermal treatment facilities in Europe and the UK for the period 2016. This included information on the combustion and abatement technologies utilized and the environmental performance of the thermal treatment processing lines at each plant. The

data collated by the European IPPC Bureau has been reported for each waste processing line (here in referred to as 'lines') and is presented in the Annexes of the Waste Incineration BREF[5]. It includes data from a total of 355 waste processing lines (covering over 200 plants) which operate across the majority of Member States, including the UK. Member States were asked to provide information on a selection of the operating lines and the BREF states that there were 470 plants processing MSW across the EU in 2016, so the data collected covers a large proportion of the operational facilities in Europe.

Fichtner has undertaken analysis of the data and information presented in the Waste Incineration BREF to consider the following:

- the number of waste processing lines utilizing the proposed combustion technology, discussed in section 3.1.2.1 and section 3.2.2.1, as the Woodlawn ARC
- the number of waste processing lines utilizing the proposed flue gas treatment technologies, discussed in section 3.1.2.2 and section 3.2.2.2, as the Woodlawn ARC; and
- the number of waste processing lines which are of a similar capacity to the Woodlawn ARC.

To ensure that the plants are processing a 'similar' waste to that proposed for the Woodlawn ARC, only those facilities which predominantly process Municipal Solid Waste (MSW) have been considered, of which there are 222 waste processing lines within the dataset. Therefore, there are a significant number of plants, within Europe and the UK, which process 'similar' waste to the Woodlawn ARC (which considers 80% residual MSW and 20% C&I waste, these are typical figures).

4.2.1 Capacity

Whilst there are 222 waste processing lines in Europe which predominantly process MSW for which data was provided to the European Integrated Pollution Prevention Control Bureau (IPPCB), this includes facilities utilizing a range of different combustion and abatement technologies, with each facility being designed to process the quantities and types of waste which are required. The 222 lines includes single stream plants which process from 3 tph up to 50 tph. Of those facilities which are a 'similar' capacity to the Woodlawn ARC, there are 24 waste processing lines which are reported as having a thermal processing capacity of between 30 and 45 tonnes of waste per hour; and an additional 23 lines which thermally process between 300,000 and 421,000 tonnes of waste per annum.

4.2.2 Combustion Technology

As reported in section 2.3.1.2 of the Waste Incineration BREF, air cooled moving grates, such as that proposed for the Woodlawn ARC, are used for the thermal treatment of approximately 90% of waste thermally treated in Europe and the UK.

4.2.3 Flue Gas Treatment Systems

As explained in section 3.1.2.2 and section 3.2.2.2, the Staffordshire ERF and Greatmoor ERF utilizes (and the Woodlawn ARC is proposed to utilize) the following techniques for the treatment of flue gases:

- SNCR utilizing Ammonia injection for abatement of NOx
- Boiler cleaning to minimize the reformation of Dioxins and Furans within the boiler
- Injection of lime to neutralize emissions of acid gases

[5] https://eippcb.jrc.ec.europa.eu/sites/default/files/2020-01/JRC118637_WI_Bref_2019_published_0.pdf

- Injection of activated carbon into the flue gases stream to abate VOCs and metals in the vapor phase; and
- Bag filters to abate Particulate Matter.

From the data within Annex 8 of the BREF, it can be confirmed that of the 222 facilities which predominantly process MSW:

- 111 of the lines utilize an SNCR system for the abatement of NOx, and of these facilities 97 are required to operate in accordance with an emission limit value of 250 mg/Nm3 or lower, expressed as a daily average.
- 68 lines utilize a dry scrubber for the abatement of acid gases, and of these facilities 37 utilize lime as a reagent within the acid gas scrubber. All of the lines which utilize a dry scrubber with lime as a reagent are required to operate in accordance with an emission limit value of less than 100 mg/Nm3 of Sulphur Dioxide, expressed as a daily average. Sulphur Dioxide is considered to be representative of the suite of acid gas pollutants from a thermal treatment process.
- 78 lines utilize injection of activated carbon into the flue gas stream to abate volatiles and metals, and 21 of these lines are required to operate in accordance with the following emission limit values:
    - Dioxins and Furans (TEQ) - 0.1ng/Nm3
    - Group 3 Metals, referred to as Type 1 & 2 substances in the NSW EfW Policy - 0.3 mg/Nm3, and
    - Cadmium and Thallium – 0.02 mg/Nm3.
- 157 lines utilize bag filters for the abatement of pollutants in the particulate phase (i.e., dust particles), and 98 of these lines are required to operate in accordance with an emission limit value of less than 5 mg/Nm3, expressed as a daily average.

4.3 Enhancements to Abatement Systems

As explained in section 4.1, the EU has recently implemented tighter emission control requirements for new and existing thermal treatment plants and is currently implementing these controls on all facilities, including those which are under construction. As explained in section 3.1.2.3, Veolia has undertaken analysis of the emissions monitoring data for the Staffordshire ERF which has identified that nearly all emissions are consistently in accordance with the emission limit values stated within the NSW EfW Policy. Due to the proposed reductions in the BATAEL for NOx and the introduction of a BATAEL for Ammonia, technology providers are currently implementing additional control measures within the design of their SNCR systems – often referred to as 'Enhanced SNCR systems' – to optimize their performance.

Some suppliers of combustion systems may use an enhanced SNCR system which utilizes an acoustic gas measurement, using acoustic pyrometry, within the boiler/combustion system and multiple injection points within the boiler to identify the optimum temperature point for the SNCR reagent to be injected into the flue gases. It is understood that this type of system has been utilized in more than 90 thermal treatment plants worldwide[6].

In optimizing the location which the reagent is injected taking into consideration the temperature profile of the flue gases within the boiler, the Enhanced SNCR systems provide better process control which will

[6] Waste-to-Energy State-of-the-Art-Report Statistics 6th Edition August, 2012 ISWA

reduce the concentrations of NOx and Ammonia within the flue gases, as well as reducing the consumption of reagents.

Whilst an Enhanced SNCR system is not currently installed at the Staffordshire ERF or the Greatmoor ERF, Veolia proposes to install a similar system at the Woodlawn ARC to ensure compliance with the emission limit values within the NSW EfW Policy.

5 Conclusions

Veolia is currently seeking to develop an Energy Recovery Facility (ERF) at the Woodlawn Eco Precinct Site near Tarago in NSW. In accordance with the NSW EfW Policy, Veolia is required to demonstrate that the proposed abatement technologies "are proven, well understood and capable of handling the expected variability and type of waste feedstock … through reference to fully operational plants".

As identified within this Report, Veolia has presented details of the Staffordshire ERF, Staffordshire, UK as the proposed Reference Facility and Greatmoor ERF, Buckinghamshire, UK as a comparable facility. The Staffordshire ERF and the Greatmoor ERF utilize the same combustion and abatement technologies as those proposed for the Woodlawn ARC.

As set out in the AQIA, analysis of monitoring data from the Staffordshire ERF has been undertaken, and subsequent comparison of the monitoring data with the emission limit values within the NSW EfW Policy. This demonstrates that the nearly all emissions are consistently in accordance with the emission limit values stated within the NSW EfW Policy, noting that the Staffordshire ERF is operating in accordance with the requirements of its EP. The monitoring data from the Staffordshire ERF does not consistently demonstrate compliance with the daily emission limit value for Ammonia; however, it is important to note that emissions of Ammonia from the Staffordshire ERF are not currently regulated.

It is understood that technology providers are currently implementing additional control measures within the design of their SNCR systems – referred to as 'Enhanced SNCR systems' – to optimize the performance of the systems, and further reduce emissions of Ammonia and NOx. Veolia proposes to install a similar system at the Woodlawn ARC to ensure compliance with the emission limit values within the NSW EfW Policy.

Fichtner has reviewed the provided emissions data for the Greatmoor ERF for the year 2018 and 2019. The averaging period of the provided emissions data is not same as specified in the NSW EfW Policy. The operational data indicate a very high degree of compliance with the emission limits, as only very few exceedances were reported.

In addition to the operation data from the Staffordshire ERF, the Greatmoor ERF and from the data available in the Waste Incineration BREF, it has been identified that there are a significant number of additional operational facilities in Europe and the UK which process the same/similar waste whilst utilizing the same abatement systems as proposed for the Woodlawn ARC.

6 Appendices

6.1 Environmental Permit for the Staffordshire ERF

Notice of variation and consolidation with introductory note

The Environmental Permitting (England & Wales) Regulations 2010

Veolia ES Staffordshire Limited

Staffordshire Energy Recovery Facility
The Dell
Enterprise Park
Four Ashes
Wolverhampton
Staffordshire
WV10 7DF

Variation application number

EPR/HP3431HK/V003

Permit number

EPR/HP3431HK

Staffordshire Energy Recovery Facility
Permit number EPR/HP3431HK

Introductory note

This introductory note does not form a part of the notice.

Under the Environmental Permitting (England & Wales) Regulations 2010 (schedule 5, part 1, paragraph 19) a variation may comprise a consolidated permit reflecting the variations and a notice specifying the variations included in that consolidated permit.

Schedule 1 of the notice specifies the conditions that have been varied and schedule 2 comprises a consolidated permit which reflects the variations being made. Only the variations specified in schedule 1 are subject to a right of appeal.

Brief description of the changes introduced by this variation notice:

This variation is to increase the annual throughput of waste from 300,000 tonnes per annum (tpa) to 340,000 tpa. This increase is based on the plants realistic availability of 8,500 hours per year instead of the 7,500 hours which was assumed in the original application. The capacity of each line remains the same at 20 tonnes per hour.

The main features of this permit are as follows:

The Installation consists of two incineration lines, each with a capacity of 20 tonnes per hour. The Installation accepts mainly Municipal Solid Waste (MSW) and also some similar wastes from street cleaning, markets, commercial, bulky and non-recyclable wood.

Waste is delivered in covered vehicles or containers to a tipping hall, where it is tipped into the waste bunker. A shredder is available for shredding of any bulky items. The waste is mixed with a crane to prevent anaerobic conditions and hence odour.

Waste is loaded into the incinerator, using the crane, via the feed hopper. The waste feeds on the moving grate where it is burned. It is a reverse acting MARTIN grate, which is a proprietary system. Primary and secondary air supply is controlled to ensure good combustion conditions. A temperature of 850^{o}C for at least two seconds is achieved.

Good combustion minimises the amount of bottom ash to achieve <3% of total organic carbon (TOC) in the ash. The ash is quenched in water and ferrous metals magnetically removed. Ash is then transported by conveyor to an indoor storage area. The ash is treated off-site for recovery.

Combustion air is treated to reduce the level of pollutants emitted. Selective non catalytic reduction (SNCR), using ammonia injection, is used for oxides of nitrogen. Bag filters for particulate matter, dry lime injection for acid gases and activated carbon injection for metals and dioxins. After the clean-up, the gases are emitted to air through two 80m high stacks. The stacks are equipped with a Continuous Emissions Monitoring System (CEMS). The CEMS continuously monitor particulate matter, oxides of nitrogen (NO_x), sulphur dioxide (SO_2), carbon monoxide (CO), total organic carbon (TOC) in the form of volatile organic compounds (VOCs), hydrogen chloride (HCl) and ammonia (NH_3) in the combustion gases in order to ensure that the permit emission limits are complied with.

The bag filters collect residues from the air pollution control system (APC). These are transferred to a silo and then to a tanker for removal from site. Sealed bags are sometimes used instead of the tanker. APC resides go for off-site disposal or they are sent for use in waste neutralisation.

Steam is generated in a boiler. The steam is used to drive a turbine which generates up to 26MW of electricity. Approximately 3MW is required for internal use, with 23MW exported to the grid. The Installation is designed so that it can also supply heat, if a client for the heat comes available.

Process water and rainwater run-off from potentially contaminated areas are collected in a waste water pit and re-used in the process. During normal operations there are no emissions to sewer. During operation outside normal parameters, water from the waste water pit could be emitted to sewer after solids separation and pH adjustment. Boiler maintenance or shut-down could create large waste water flows and mean the need for discharge to sewer.

Clean rainwater run-off from the roadways, parking areas and hardstandings are passed through an oil separator and discharged through the Sustainable Urban Drainage (SUD) system to one of two attenuation ponds and then to Saredon Brook. There are no process emissions to water.

The schedules specify the changes made to the permit.

The status log of a permit sets out the permitting history, including any changes to the permit reference number.

Status log of the permit		
Description	**Date**	**Comments**
Application EPR/HP3431HK/A001	Duly made 21/07/11	
Response to Schedule 5 Notice dated 06/11/11	24/11/11	Various questions
Information request dated 01/08/11	Response received 30/08/11	Modelling Files
Information requests dated 12/10/11, 02/11/11 and 15/11/11	Received 29/11/11	Information on noise assessment
Information request dated 01/11/11	Received 19/12/11	Clarify modelling data
Information request dated 13/12/11	Received 19/12/11	Clarify noise information
Permit determined	22/03/12	
Variation determined EPR/HP3431HK/V002	05/09/13	Environment Agency initiated variation to implement the changes introduced by the Industrial Emissions Directive (IED)
Application EPR/HP3431HK/V003	Duly made 11/12/14	To increase throughput of waste from 300,000tpa to 340,000tpa (**Consolidation**)
Variation determined EPR/HP3431HK/V003	23/12/14	

End of introductory note

Notice of variation and consolidation

The Environmental Permitting (England and Wales) Regulations 2010

The Environment Agency in exercise of its powers under regulation 20 of the Environmental Permitting (England and Wales) Regulations 2010 varies and consolidates

Permit number

EPR/HP3431HK

Issued to

Veolia ES Staffordshire Limited ("the operator")

whose registered office is

210 Pentonville Road
London
N1 9JY

company registration number **7258863**

to operate a regulated facility at

Staffordshire Energy Recovery Facility
The Dell
Enterprise Park
Four Ashes
Wolverhampton
Staffordshire
WV10 7DF

to the extent set out in the schedules.

The notice shall take effect from 23/12/2014

Name	Date
Anne Nightingale	**23/12/2014**

Authorised on behalf of the Environment Agency

Schedule 1

The following conditions and tables were varied as a result of the application made by the operator:

Conditions

Condition 2.5.1 deleted, all pre-operational conditions have been completed.

Conditions 2.3.6, 2.3.8, 2.3.9, 2.3.10, 2.3.11, 3.1.1 and schedule 6 are amended to remove reference to the Waste Incineration Directive (WID) following implementation of the Industrial Emissions Directive (IED).

Condition 3.1.4 is added to the permit to implement the requirements of the Industrial Emissions Directive (IED).

Condition 4.2.2 is amended to remove reference to the Waste Incineration Directive (WID) following implementation of the Industrial Emissions Directive (IED).

Conditions 4.3.1 and 4.3.2 are amended in accordance with the requirements of the Industrial Emissions Directive (IED).

Condition 4.4.2 is amended in accordance with the requirements of the Industrial Emissions Directive (IED).

Tables

Deleted Table S1.4, all pre-operational conditions have been completed.

Amended Tables S1.1, S1.2, S1.3, S2.2 and S3.1(a)

Schedule 2 – consolidated permit

Consolidated permit issued as a separate document.

Permit

The Environmental Permitting (England and Wales) Regulations 2010

Permit number

EPR/HP3431HK

This is the consolidated permit referred to in the variation and consolidation notice for application EPR/HP3431HK/V003 authorising,

Veolia ES Staffordshire Limited ("the operator"),

whose registered office is

210 Pentonville Road
London
N1 9JY

company registration number **7258863**

to operate an installation at

Staffordshire Energy Recovery Facility
The Dell
Enterprise Park
Four Ashes
Wolverhampton
Staffordshire
WV10 7DF

to the extent authorised by and subject to the conditions of this permit.

Name	Date
Anne Nightingale	**23/12/12014**

Authorised on behalf of the Environment Agency

Conditions

1 Management

1.1 General management

1.1.1 The operator shall manage and operate the activities:

(a) in accordance with a written management system that identifies and minimises risks of pollution, including those arising from operations, maintenance, accidents, incidents, non-conformances, closure and those drawn to the attention of the operator as a result of complaints; and

(b) using sufficient competent persons and resources.

1.1.2 Records demonstrating compliance with condition 1.1.1 shall be maintained.

1.1.3 Any person having duties that are or may be affected by the matters set out in this permit shall have convenient access to a copy of it kept at or near the place where those duties are carried out.

1.2 Energy efficiency

1.2.1 The operator shall:

(a) take appropriate measures to ensure that energy is recovered with a high level of energy efficiency and energy is used efficiently in the activities;

(b) review and record at least every four years whether there are suitable opportunities to improve the energy recovery and efficiency of the activities; and

(c) take any further appropriate measures identified by a review.

1.2.2 The operator shall provide and maintain steam and/or hot water pass-outs such that opportunities for the further use of waste heat may be capitalised upon should they become practicable.

1.2.3 The operator shall review the practicability of Combined Heat and Power (CHP) implementation at least every 2 years. The results shall be reported to the Agency within 2 months of each review.

1.3 Efficient use of raw materials

1.3.1 The operator shall:

(a) take appropriate measures to ensure that raw materials and water are used efficiently in the activities;

(b) maintain records of raw materials and water used in the activities;

(c) review and record at least every four years whether there are suitable alternative materials that could reduce environmental impact or opportunities to improve the efficiency of raw material and water use; and

(d) take any further appropriate measures identified by a review.

1.4 Avoidance, recovery and disposal of wastes produced by the activities

1.4.1 The operator shall take appropriate measures to ensure that:

(a) the waste hierarchy referred to in Article 4 of the Waste Framework Directive is applied to the generation of waste by the activities; and

(b) any waste generated by the activities is treated in accordance with the waste hierarchy referred to in Article 4 or the Waste Framework Directive; and

(c) where waste disposal is necessary, this is undertaken in a manner which minimised its impact on the environment.

1.4.2 review and record at least every four years whether changes to those measures should be made; and take any further appropriate measures identified by a review.

2 Operations

2.1 Permitted activities

2.1.1 The operator is only authorised to carry out the activities specified in schedule 1 table S1.1 (the "activities").

2.1.2 Waste authorised by this permit in condition 2.3.3 shall be clearly distinguished from any other waste on the site.

2.2 The site

2.2.1 The activities shall not extend beyond the site, being the land shown edged in green on the site plan at schedule 7 to this permit.

2.3 Operating techniques

2.3.1 (a) The activities shall, subject to the conditions of this permit, be operated using the techniques and in the manner described in the documentation specified in schedule 1, table S1.2, unless otherwise agreed in writing by the Environment Agency.

(b) If notified by the Environment Agency that the activities are giving rise to pollution, the operator shall submit to the Environment Agency for approval within the period specified, a revision of any plan specified in schedule 1, table S1.2 or otherwise required under this permit, and shall implement the approved revised plan in place of the original from the date of approval, unless otherwise agreed in writing by the Environment Agency.

2.3.2 Any raw materials or fuels listed in schedule 2 table S2.1 shall conform to the specifications set out in that table.

2.3.3 Waste shall only be accepted if:

(a) it is of a type and quantity listed in schedule 2 table S2.2 ; and

(b) it conforms to the description in the documentation supplied by the producer or holder; and

(c) if having been separately collected for recycling, it is contaminated and otherwise destined for landfill.

2.3.4 The operator shall ensure that where waste produced by the activities is sent to a relevant waste operation, that operation is provided with the following information, prior to the receipt of the waste:

(a) the nature of the process producing the waste;

(b) the composition of the waste;

(c) the handling requirements of the waste;

(d) the hazardous property associated with the waste, if applicable; and

(e) the waste code of the waste.

2.3.5 The operator shall ensure that where waste produced by the activities is sent to a landfill site, it meets the waste acceptance criteria for that landfill.

2.3.6 Waste shall not be charged, or shall cease to be charged, if:

(a) the combustion chamber temperature is below, or falls below, 850^{o}C; or

(b) any continuous emission limit value in schedule 3 table S3.1(a) is exceeded; or

(c) any continuous emission limit value in schedule 3 table S3.1 is exceeded, other than under abnormal operating conditions ; or

(d) monitoring results required to demonstrate compliance with any continuous emission limit value in schedule 3 table S3.1 are unavailable other than under abnormal operating conditions.

2.3.7 The operator shall have at least one auxiliary burner in each line at start up or shut down or whenever the operating temperature falls below that specified in condition 2.3.6, as long as incompletely burned waste is present in the combustion chamber. Unless the temperature specified in condition 2.3.6 is maintained in the combustion chamber, such burner(s) may be fed only with fuels which result in emissions no higher than those arising from the use of gas oil, liquefied gas or natural gas.

2.3.8 The operator shall record the beginning and end of each period of “abnormal operation”.

2.3.9 During a period of “abnormal operation”, the operator shall restore normal operation of the failed equipment or replace the failed equipment as rapidly as possible.

2.3.10 Where, during “abnormal operation”, any of the following situations arise, the operator shall, as soon as is practicable, cease the burning of waste until normal operation can be restored:

(a) continuous measurement shows that an emission exceeds any emission limit value in schedule 3 table S3.1 due to disturbances or failures of the abatement systems, or continuous emission monitor(s) are out of service, as the case may be, for a total of 4 hours uninterrupted duration;

(b) the cumulative duration of “abnormal operation” periods over 1 calendar year exceeds 60 hours on an incineration line;

(c) continuous measurement shows that an emission exceeds any emission limit value in schedule 3 table S3.1 (a) due to disturbances or failures of the abatement systems;

2.3.11 The operator shall interpret the end of the period of “abnormal operation” as the earliest of the following:

(a) when the failed equipment is repaired and brought back into normal operation;

(b) when the operator initiates a shut down of the waste combustion activity, as described in the application or as agreed in writing with the Environment Agency;

(c) when a period of four hours has elapsed from the start of the “abnormal operation”;

(d) when, in any calendar year, an aggregated period of 60 hours “abnormal operation” has been reached for a given incineration line.

2.3.12 Bottom ash and APC residues shall not be mixed.

2.4 Improvement programme

2.4.1 The operator shall complete the improvements specified in schedule 1 table S1.3 by the date specified in that table unless otherwise agreed in writing by the Environment Agency.

2.4.2 Except in the case of an improvement which consists only of a submission to the Environment Agency, the operator shall notify the Environment Agency within 14 days of completion of each improvement.

3 Emissions and monitoring

3.1 Emissions to water, air or land

3.1.1 There shall be no point source emissions to water, air or land except from the sources and emission points listed in schedule 3 tables S3.1, S3.2 and S3.3 except in “abnormal operation”, when there shall be no point source emissions to water, air or land except from the sources and emission points listed in schedule 3 tables S3.1(a), S3.2 and S3.3.

3.1.2 The limits given in schedule 3 shall not be exceeded.

3.1.3 Wastes produced at the site shall, as a minimum, be sampled and analysed in accordance with schedule 3 table S 3.5. Additional samples shall be taken and tested and appropriate action taken, whenever:

(a) disposal or recovery routes change; or

(b) it is suspected that the nature or composition of the waste has changed such that the route currently selected may no longer be appropriate.

3.1.4 Periodic monitoring shall be carried out at least once every 5 years for groundwater and 10 years for soil, unless such monitoring is based on a systematic appraisal of the risk of contamination.

3.2 Emissions of substances not controlled by emission limits

3.2.1 Emissions of substances not controlled by emission limits (excluding odour) shall not cause pollution. The operator shall not be taken to have breached this condition if appropriate measures, including, but not limited to, those specified in any approved emissions management plan, have been taken to prevent or where that is not practicable, to minimise, those emissions.

3.2.2 The operator shall:

(a) if notified by the Environment Agency that the activities are giving rise to pollution, submit to the Environment Agency for approval within the period specified, an emissions management plan;

(b) implement the approved emissions management plan, from the date of approval, unless otherwise agreed in writing by the Environment Agency.

3.2.3 All liquids in containers, whose emission to water or land could cause pollution, shall be provided with secondary containment, unless the operator has used other appropriate measures to prevent or where that is not practicable, to minimise, leakage and spillage from the primary container.

3.3 Monitoring

3.3.1 The operator shall, unless otherwise agreed in writing by the Environment Agency, undertake the monitoring specified in the following tables in schedule 3 to this permit:

(a) point source emissions specified in tables S3.1, S3.1(a), S3.2 and S3.3;

(b) process monitoring specified in table S3.4;

(c) residue quality in table S3.5.

3.3.2 The operator shall maintain records of all monitoring required by this permit including records of the taking and analysis of samples, instrument measurements (periodic and continual), calibrations, examinations, tests and surveys and any assessment or evaluation made on the basis of such data.

3.3.3 Monitoring equipment, techniques, personnel and organisations employed for the emissions monitoring programme and the environmental or other monitoring specified in condition 3.5.1 shall have either MCERTS certification or MCERTS accreditation (as appropriate) unless otherwise agreed in writing by the Environment Agency. Newly installed CEMs, or CEMs replacing existing CEMs, shall have MCERTS certification and have an MCERTS certified range which is not greater than 1.5 times the daily emission limit value (ELV) specified in schedule 3 table S3.1. The CEM shall also be able to measure instantaneous values over the ranges which are to be expected during all operating conditions. If it is necessary to use more than one range setting of the CEM to achieve this requirement, the CEM shall be verified for monitoring supplementary, higher ranges.

3.3.4 The provisions for monitoring shall meet the requirements of BS EN 15259. Permanent means of access shall be provided to enable sampling/monitoring to be carried out in relation to the emission points specified in schedule 3 tables S3.1, S3.1(a), S3.2 and S3.3 unless otherwise agreed in writing by the Environment Agency.

3.3.5 Where Continuous Emission Monitors are installed to comply with the monitoring requirements in schedule 3 table S3.1; the Continuous Emission Monitors shall be used such that;

(a) the values of the 95% confidence intervals of a single measured result at the daily emission limit value shall not exceed the following percentages:

- Carbon monoxide 10%
- Sulphur dioxide 20%
- Oxides of nitrogen (NO & NO_2 expressed as NO_2) 20%
- Particulate matter 30%
- Total organic carbon (TOC) 30%
- Hydrogen chloride 40%

(b) valid half-hourly average values shall be determined within the effective operating time (excluding the start-up and shut-down periods) from the measured values after having subtracted the value of the confidence intervals in condition 3.3.5 (a);

(c) where it is necessary to calibrate or maintain the monitor and this means that data are not available for a complete half-hour period, the half-hourly average shall in any case be considered valid if measurements are available for a minimum of 20 minutes during the half-hour period. The number of half-hourly averages so validated shall not exceed 5 per day;

(d) daily average values shall be determined as the average of all the valid half-hourly average values within a calendar day. The daily average value shall be considered valid if no more than five half-hourly average values in any day have been determined not to be valid;

(e) no more than ten daily average values per year shall be determined not to be valid.

3.4 Odour

3.4.1 Emissions from the activities shall be free from odour at levels likely to cause pollution outside the site, as perceived by an authorised officer of the Environment Agency, unless the operator has used appropriate measures, including, but not limited to, those specified in any approved odour management plan, to prevent or where that is not practicable to minimise the odour.

3.4.2 The operator shall:

(a) if notified by the Environment Agency that the activities are giving rise to pollution outside the site due to odour, submit to the Environment Agency for approval within the period specified, an odour management plan;

(b) implement the approved odour management plan, from the date of approval, unless otherwise agreed in writing by the Environment Agency.

3.5 Noise and vibration

3.5.1 Emissions from the activities shall be free from noise and vibration at levels likely to cause pollution outside the site, as perceived by an authorised officer of the Environment Agency, unless the operator has used appropriate measures, including, but not limited to, those specified in any approved noise and vibration management plan to prevent or where that is not practicable to minimise the noise and vibration.

3.5.2 The operator shall:

(a) if notified by the Environment Agency that the activities are giving rise to pollution outside the site due to noise and vibration, submit to the Environment Agency for approval within the period specified, a noise and vibration management plan;

(b) implement the approved noise and vibration management plan, from the date of approval, unless otherwise agreed in writing by the Environment Agency.

4.1 Records

4.1.1 All records required to be made by this permit shall:

(a) be legible;

(b) be made as soon as reasonably practicable;

(c) if amended, be amended in such a way that the original and any subsequent amendments remain legible, or are capable of retrieval; and

(d) be retained, unless otherwise agreed in writing by the Environment Agency, for at least 6 years from the date when the records were made, or in the case of the following records until permit surrender:

(i) off-site environmental effects; and

(ii) matters which affect the condition of the land and groundwater.

4.1.2 The operator shall keep on site all records, plans and the management system required to be maintained by this permit, unless otherwise agreed in writing by the Environment Agency.

4.2 Reporting

4.2.1 The operator shall send all reports and notifications required by the permit to the Environment Agency using the contact details supplied in writing by the Environment Agency.

4.2.2 A report or reports on the performance of the activities over the previous year shall be submitted to the Environment Agency by 31 January (or other date agreed in writing by the Environment Agency) each year. The report(s) shall include as a minimum:

(a) a review of the results of the monitoring and assessment carried out in accordance with the permit including an interpretive review of that data;

(b) the annual production /treatment data set out in schedule 4 table S4.2; and

(c) the performance parameters set out in schedule 4 table S4.3 using the forms specified in table S4.4 of that schedule.

(d) the functioning and monitoring of the incineration plant in a format agreed with the Environment Agency. The report shall, as a minimum requirement (as required by Article 12(2) of the Waste Incineration Directive) give an account of the running of the process and the emissions into air and water compared with the emission standards in the IED.

4.2.3 Within 28 days of the end of the reporting period the operator shall, unless otherwise agreed in writing by the Environment Agency, submit reports of the monitoring and assessment carried out in accordance with the conditions of this permit, as follows:

(a) in respect of the parameters and emission points specified in schedule 4 table S4.1;

(b) for the reporting periods specified in schedule 4 table S4.1 and using the forms specified in schedule 4 table S4.4 ; and

(c) giving the information from such results and assessments as may be required by the forms specified in those tables.

4.2.4 The operator shall, unless notice under this condition has been served within the preceding four years, submit to the Environment Agency, within six months of receipt of a written notice, a report assessing whether there are other appropriate measures that could be taken to prevent, or where that is not practicable, to minimise pollution.

4.2.5 Within 1 month of the end of each quarter, the operator shall submit to the Environment Agency using the form made available for the purpose, the information specified on the form relating to the site and the waste accepted and removed from it during the previous quarter.

4.3 Notifications

4.3.1 The Operator shall

(a) in the event that the operation of the activities gives rise to an incident or accident which significantly affects or may significantly affect the environment, the operator must immediately—

(i) inform the Environment Agency,

(ii) take the measures necessary to limit the environmental consequences of such an incident or accident, and

(iii) take the measures necessary to prevent further possible incidents or accidents;

(b) in the event of a breach of any permit condition, the operator must immediately—

(i) inform the Environment Agency, and

(ii) take the measures necessary to ensure that compliance is restored within the shortest possible time;

(c) in the event of a breach of permit condition which poses an immediate danger to human health or threatens to cause an immediate significant adverse effect on the environment, the operator must immediately suspend the operation of the activities or the relevant part of it until compliance with the permit conditions has been restored.

4.3.2 Any information provided under condition 4.3.1(a)(i), or 4.3.1(b)(i) where the information relates to the breach of a limit specified in the permit, shall be confirmed by sending the information listed in schedule 5 to this permit within the time period specified in that schedule.

4.3.3 Where the Environment Agency has requested in writing that it shall be notified when the operator is to undertake monitoring and/or spot sampling, the operator shall inform the Environment Agency when the relevant monitoring and/or spot sampling is to take place. The operator shall provide this information to the Environment Agency at least 14 days before the date the monitoring is to be undertaken.

4.3.4 The Environment Agency shall be notified within 14 days of the occurrence of the following matters, except where such disclosure is prohibited by Stock Exchange rules:

Where the operator is a registered company:

(a) any change in the operator's trading name, registered name or registered office address; and

(b) any steps taken with a view to the operator going into administration, entering into a company voluntary arrangement or being wound up.

Where the operator is a corporate body other than a registered company:

(a) any change in the operator's name or address; and

(b) any steps taken with a view to the dissolution of the operator.

4.3.5 Where the operator proposes to make a change in the nature or functioning, or an extension of the activities, which may have consequences for the environment and the change is not otherwise the subject of an application for approval under the Regulations or this permit:

(a) the Environment Agency shall be notified at least 14 days before making the change; and

(b) the notification shall contain a description of the proposed change in operation.

4.3.6 The Environment Agency shall be given at least 14 days notice before implementation of any part of the site closure plan.

4.4 Interpretation

4.4.1 In this permit the expressions listed in schedule 6 shall have the meaning given in that schedule.

4.4.2 In this permit references to reports and notifications mean written reports and notifications, except where reference is made to notification being made "immediately", in which case it may be provided by telephone.

Schedule 1 – Operations

Table S1.1 activities		
Activity listed in Schedule 1 of the EP Regulations	**Description of specified activity**	**Limits of specified activity**
Section 5.1 Part A(1) (b)	The incineration of non-hazardous waste in a waste incineration plant with a capacity exceeding 3 tonnes per hour	From receipt of waste to emission of exhaust gas and disposal of waste arising. The incineration of non-hazardous waste on two incineration lines each with a capacity of 20 tonnes per hour and a total annual throughput of 340,000 tonnes per annum. Waste types and quantities as specified in Table S2.2 of this permit.
Directly Associated Activity		
Electricity Generation and/or supply of heat	Generation of electrical power using a steam turbine from energy recovered from the flue gases.	Supply of electricity to national grid and for use within the installation
Back up electrical generator	For providing emergency electrical power to the plant in the event of supply interruption.	-

Table S1.2 Operating techniques		
Description	**Parts**	**Date Received**
Application	Response to question 3 of application form B3; Sections 4, 6.7, 8.2.2, 8.3.2 and 13.5 of volume 2.	21/07/11
Response to Schedule 5 Notice dated 06/11/11	Response to questions 3, 5, 7, 8, 10 and 11	24/11/11
Variation Application (EPR/HP3431HK/V003)	The response to question 3 Operating techniques, given in Part C3 of the variation application form. Includes Table 3a – Technical Standards Non-Technical Summary	11/12/14

Table S1.3 Improvement programme requirements		
Reference	**Requirement**	**Date**
IC1	The Operator shall submit a written report to the Environment Agency on the implementation of its Environmental Management System and the progress made in the accreditation of the system by an external body or if appropriate submit a schedule by which the EMS will be subject to accreditation.	Complete
IC2	The Operator shall submit a written proposal to the Environment Agency to carry out tests to determine the size distribution of the particulate matter in the exhaust gas emissions to air from emission point A1, identifying the fractions within the PM_{10}, $PM_{2.5}$ and $PM_{1.0}$ ranges. The proposal shall include a timetable for approval by the Environment Agency to carry out	Complete

Table S1.3 Improvement programme requirements		
Reference	**Requirement**	**Date**
	such tests and produce a report on the results. On receipt of written agreement by the Environment Agency to the proposal and the timetable, the Operator shall carry out the tests and submit to the Environment Agency a report on the results.	
IC3	The Operator shall submit a written report to the Environment Agency on the commissioning of the installation. The report shall summarise the environmental performance of the plant as installed against the design parameters set out in the Application. The report shall also include a review of the performance of the facility against the conditions of this permit and details of procedures developed during commissioning for achieving and demonstrating compliance with permit conditions.	Complete
IC4	The Operator shall carry out checks to verify the residence time, minimum temperature and oxygen content of the exhaust gases in the furnace whilst operating under the anticipated most unfavourable operating conditions. The results shall be submitted in writing to the Environment Agency.	Complete
IC5	The Operator shall submit a written report to the Environment Agency describing the performance and optimisation of the Selective Non Catalytic Reduction (SNCR) system and combustion settings to minimise oxides of nitrogen (NO_x) emissions within the emission limit values described in this permit with the minimisation of nitrous oxide emissions. The report shall include an assessment of the level of NO_x and N_2O emissions that can be achieved under optimum operating conditions. The report shall also provide details of the optimisation (including dosing rates) for the control of acid gases and dioxins.	Complete
IC6	The Operator shall carry out an assessment of the impact of emissions to air of As and Cr(VI). A report on the assessment shall be made to the Environment Agency. Emissions monitoring data obtained during the first year of operation shall be used to compare the actual emissions with those assumed in the impact assessment submitted with the Application. An assessment shall be made of the impact of each metal against the relevant EQS/EAL. In the event that the assessment shows that an EQS/EAL can be exceeded, the report shall include proposals for further investigative work.	15 months from commencement of operations
IC7	The Operator shall submit a written summary report to the Agency to confirm by the results of calibration and verification testing that the performance of Continuous Emission Monitors for parameters as specified in Table S3.1 and Table S3.1(a) complies with the requirements of BS EN 14181, specifically the requirements of QAL1, QAL2 and QAL3.	Complete
IC8	The Operator shall bring forward the first review required by condition 1.4.2, by two years.	24 months from commencement of operations

Schedule 2 – Waste types, raw materials and fuels

Table S2.1 Raw materials and fuels	
Raw materials and fuel description	**Specification**
Fuel Oil	< 0.1% sulphur content

Table S2.2 Permitted waste types and quantities for incineration plant	
Maximum quantity	340,000 tonnes per year
Waste code	**Description**
02	**WASTES FROM AGRICULTURE, HORTICULTURE, AQUACULTURE, FORESTRY, HUNTING AND FISHING, FOOD PREPARATION AND PROCESSING**
02 02	**wastes from the preparation and processing of meat, fish and other foods of animal origin**
02 02 02	animal-tissue waste
02 02 03	materials unsuitable for consumption or processing
16	**WASTES NOT OTHERWISE SPECIFIED IN THE LIST**
16 03	**off-specification batches and unused products**
16 03 06	organicwastes other than those mentioned in 16 03 05
18	**WASTES FROM HUMAN OR ANIMAL HEALTH CARE AND/OR RELATED RESEARCH (except kitchen and restaurant wastes not arising from immediate health care)**
18 01	**wastes from natal care, diagnosis, treatment or prevention of disease in humans**
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	**WASTES FROM WASTE MANAGEMENT FACILITIES, OFF-SITE WASTE WATER TREATMENT PLANTS AND THE PREPARATION OF WATER INTENDED FOR HUMAN CONSUMPTION AND WATER FOR INDUSTRIAL USE**
19 12	**wastes from the mechanical treatment of waste (for example sorting, crushing, compacting, pelletising) not otherwise specified**
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 waste (refuse derived fuel)
19 12 12	other wastes (including mixtures of materials) from mechanical treatment of wastes other than those mentioned in 19 12 11
20	**MUNICIPAL WASTES (HOUSEHOLD WASTE AND SIMILAR COMMERCIAL, INDUSTRIAL AND INSTITUTIONAL WASTES) INCLUDING SEPARATELY COLLECTED FRACTIONS**

20 01	**separately collected fractions (except 15 01)**
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 (hygiene waste collected from domestic facilities that is not classified as clinical waste)
20 02	**garden and park wastes (including cemetery waste)**
20 02 01	biodegradable waste
20 03	**other municipal wastes**
20 03 01	mixed municipal waste
20 03 02	waste from markets
20 03 03	street-cleaning residues
20 03 07	bulky waste

Table S3.1 Point source emissions to air – emission limits and monitoring requirements						
Emission point ref. & location as shown in Fig. 2.3 in the Application	**Parameter**	**Source**	**Limit (including unit)**	**Reference period**	**Monitoring frequency**	**Monitoring standard or method**
A1	Particulate matter	Incineration exhaust gases	30 mg/m^3	½-hr average	Continuous measurement	BS EN 14181 and BS EN 15267-3
A2						
A1	Particulate matter		10 mg/m^3	daily average	Continuous measurement	BS EN 14181 and BS EN 15267-3
A2						
A1	Total Organic Carbon (TOC)		20 mg/m^3	½-hr average	Continuous measurement	BS EN 14181 and BS EN 15267-3
A2						
A1	Total Organic Carbon (TOC)		10 mg/m^3	daily average	Continuous measurement	BS EN 14181 and BS EN 15267-3
A2						
A1	Hydrogen chloride (HCl)		60 mg/m^3	½-hr average	Continuous measurement	BS EN 14181 and BS EN 15267-3
A2						
A1	Hydrogen chloride (HCl)		10 mg/m^3	daily average	Continuous measurement	BS EN 14181 and BS EN 15267-3
A2						
A1	Hydrogen fluoride (HF)		2 mg/m^3	periodic over minimum 1-hour period	Quarterly in first year, then bi-annual	BS ISO 15713
A2						
A1	Carbon monoxide (CO)		100 mg/m^3	½-hr average	Continuous measurement	BS EN 14181 and BS EN 15267-3
A2						
A1	Carbon monoxide (CO)		50 mg/m^3	daily average	Continuous measurement	BS EN 14181 and BS EN 15267-3
A2						

Table S3.1 Point source emissions to air – emission limits and monitoring requirements						
Emission point ref. & location as shown in Fig. 2.3 in the Application	**Parameter**	**Source**	**Limit (including unit)**	**Reference period**	**Monitoring frequency**	**Monitoring standard or method**
A1	Sulphur dioxide (SO_2)	Incineration exhaust gases	200 mg/m^3	½-hr average	Continuous measurement	BS EN 14181 and BS EN 15267-3
A2						
A1	Sulphur dioxide (SO_2)		50 mg/m^3	daily average	Continuous measurement	BS EN 14181 and BS EN 15267-3
A2						
A1	Oxides of nitrogen (NO and NO_2 expressed as NO_2)		400 mg/m^3	½-hr average	Continuous measurement	BS EN 14181 and BS EN 15267-3
A2						
A1	Oxides of nitrogen (NO and NO_2 expressed as NO_2)		200 mg/m^3	daily average	Continuous measurement	BS EN 14181 and BS EN 15267-3
A2						
A1	Cadmium (Cd) & thallium (Tl) and their compounds (total)		0.05 mg/m^3	periodic over minimum 30 minute, maximum 8 hour period	Quarterly in first year, then bi-annual	BS EN 14385
A2						
A1	Mercury and its compounds		0.05 mg/m^3	periodic over minimum 30 minute, maximum 8 hour period	Quarterly in first year, then bi-annual	BS EN 13211
A2						
A1	Sb, As, Pb, Cr, Co, Cu, Mn, Ni and V and their compounds (total)		0.5 mg/m^3	periodic over minimum 30 minute, maximum 8 hour period	Quarterly in first year, then bi-annual	BS EN 14385
A2						
A1	Dioxins / furans (I-TEQ)		0.1 ng/m^3	periodic over minimum 6 hours, maximum 8 hour period	Quarterly in first year, then bi-annual	BS EN 1948 Parts 1, 2 and 3
A2						

Table S3.1 Point source emissions to air – emission limits and monitoring requirements						
Emission point ref. & location as shown in Fig. 2.3 in the Application	**Parameter**	**Source**	**Limit (including unit)**	**Reference period**	**Monitoring frequency**	**Monitoring standard or method**
A1	Ammonia	Incineration exhaust gases	No limit set	½-hr average and daily average	Continuous	BS EN 14181 and BS EN 15267-3
A2						
A1	Nitrous oxide (N_2O)		No limit set	Periodic over minimum 1-hour period	Quarterly in the first year of operation, then bi-annual	BS EN ISO 21258
A2						
A1	Dioxin-like PCBs (WHO-TEQ Humans / Mammals)		No limit set	periodic over minimum 6 hours, maximum 8 hour period	Quarterly in first year, then bi-annual	BS EN/TS 1948-4
A2						
A1	Dioxin-like PCBs (WHO-TEQ Fish)		No limit set	periodic over minimum 6 hours, maximum 8 hour period	Quarterly in first year, then bi-annual	BS EN/TS 1948-4
A2						
A1	Dioxin-like PCBs (WHO-TEQ Birds)		No limit set	periodic over minimum 6 hours, maximum 8 hour period	Quarterly in first year, then bi-annual	BS EN/TS 1948-4
A2						

Table S3.1 Point source emissions to air – emission limits and monitoring requirements						
Emission point ref. & location as shown in Fig. 2.3 in the Application	**Parameter**	**Source**	**Limit (including unit)**	**Reference period**	**Monitoring frequency**	**Monitoring standard or method**
A1	Specific individual poly-cyclic aromatic hydrocarbons (PAHs), as specified in Schedule 6.	Incineration exhaust gases	No limit set	periodic over minimum 6 hours, maximum 8 hour period	Quarterly in first year, then bi-annual	Procedure shall use BS ISO 11338 Parts 1 and 2
A2						
A1	Dioxins / furans (WHO-TEQ Humans / Mammals)		No limit set	periodic over minimum 6 hours, maximum 8 hour period	Quarterly in first year, then bi-annual	BS EN/TS 1948 Parts 1, 2 and 3
A2						
A1	Dioxins / furans (WHO-TEQ Fish)		No limit set	periodic over minimum 6 hours, maximum 8 hour period	Quarterly in first year, then bi-annual	BS EN/TS 1948 Parts 1, 2 and 3
A2						
A1	Dioxins / furans (WHO-TEQ Birds)		No limit set	periodic over minimum 6 hours, maximum 8 hour period	Quarterly in first year, then bi-annual	BS EN/TS 1948 Parts 1, 2 and 3
A2						
A3 to **A9** and **A16**	No parameters set	Tank and silo vents	No limits set	-	-	-
A10 to **A13**	No parameters set	Boiler relief valves	No limits set	-	-	-
A14 and **A15**	No parameters set	Reserve/standby diesel generators	No limits set	-	-	-

Table S3.1(a) Point source emissions to air during abnormal operation of incineration plant – emission limits and monitoring requirements						
Emission point ref. & location as shown in Fig. 2.3 in the Application	**Parameter**	**Source**	**Limit (including unit)**	**Reference period**	**Monitoring frequency**	**Monitoring standard or method**
A1	Particulate matter		150 mg/m^3	½-hr average	Continuous measurement	BS EN 14181 and BS EN 15267-3 during abatement plant failure
A2						
A1	Total Organic Carbon (TOC)		20 mg/m^3	½-hr average	Continuous measurement	BS EN 14181 and BS EN 15267-3] during abatement plant failure
A2						
A1	Carbon monoxide (CO)		100 mg/m^3	½-hr average	Continuous measurement	BS EN 14181 and BS EN 15267-3 during abatement plant failure
A2						

Table S3.2 Point Source emissions to water (other than sewer) and land – emission limits and monitoring requirements						
Emission point ref. & location	**Parameter**	**Source**	**Limit (incl. unit)**	**Reference Period**	**Monitoring frequency**	**Monitoring standard or method**
W3 Emission to Saredon brook, as shown in Fig. 2.3 in the Application	No parameters set	Uncontaminated surface water	No limits set	-	-	-
W4 Emission to Saredon brook, as shown in Fig. 2.3 in the Application	No parameters set	Uncontaminated surface water	No limits set	-	-	-

Table S3.3 Point source emissions to sewer, effluent treatment plant or other transfers off-site– emission limits and monitoring requirements						
Emission point ref. & location	**Parameter**	**Source**	**Limit (incl. Unit)**	**Reference period**	**Monitoring frequency**	**Monitoring standard or method**
W2	No parameters set	Batch discharge of waste water via settlement and pH treatment equipment	No limits set	-	-	-

Table S3.4 Process monitoring requirements				
Emission point reference or source or description of point of measurement	**Parameter**	**Monitoring frequency**	**Monitoring standard or method**	**Other specifications**
As agreed in writing with the Environment Agency	Wind speed and direction	continuous	Anemometer	-
Location close to the combustion chamber inner wall	Temperature (°C)	continuous	Traceable to National Standards	As agreed in writing with the Environment Agency
A1	Exhaust gas temperature	continuous	Traceable to National Standards	As agreed in writing with the Environment Agency
A2				
A1	Exhaust gas pressure	continuous	Traceable to National Standards	As agreed in writing with the Environment Agency
A2				
A1	Exhaust gas oxygen content	continuous	BS EN 14181 and BS EN 15267-3	-
A2				
A1	Water vapour content	continuous	BS EN 14181 and BS EN 15267-3	Unless gas is dried before analysis of emissions
A2				

Table S3.5 Residue quality					
Emission point reference or source or description of point of measurement	**Parameter**	**Limit**	**Monitoring frequency**	**Monitoring standard or method ***	**Other specifications**
Bottom Ash	TOC	<3%	Monthly in the first year of operation then quarterly	Environment Agency ash sampling protocol.	
Bottom Ash	Metals (Antimony, Cadmium, Thallium, Mercury, Lead, Chromium, Copper, Manganese, Nickel, Arsenic, Cobalt, Vanadium, Zinc) and their compounds, dioxins/furans and dioxin-like PCBs.	No limits set	Monthly in the first year of operation then quarterly	Sampling and analysis as per Environment Agency ash sampling protocol.	
Bottom Ash	Total soluble fraction and metals (Antimony, Cadmium, Thallium, Mercury, Lead, Chromium, Copper, Manganese, Nickel, Arsenic, Cobalt, Vanadium, Zinc) soluble fractions	No limits set	Before use of a new disposal or recycling route	Sampling and analysis as per Environment Agency ash sampling protocol.	
APC Residues	Metals (Antimony, Cadmium, Thallium, Mercury, Lead, Chromium, Copper, Manganese, Nickel, Arsenic, Cobalt, Vanadium, Zinc) and their compounds, dioxins/furans and dioxin-like PCBs.	No limits set	Monthly in the first year of operation then quarterly	Sampling and analysis as per Environment Agency ash sampling protocol.	
APC Residues	Total soluble fraction and metals (Antimony, Cadmium, Thallium, Mercury, Lead, Chromium, Copper, Manganese, Nickel, Arsenic, Cobalt, Vanadium, Zinc) soluble fractions	No limits set	Before use of a new disposal or recycling route	Sampling and analysis as per Environment Agency ash sampling protocol.	

* Or other equivalent standard as agreed in writing with the Environment Agency

Schedule 4 – Reporting

Parameters, for which reports shall be made, in accordance with conditions of this permit, are listed below.

Table S4.1 Reporting of monitoring data			
Parameter	**Emission or monitoring point/reference**	**Reporting period**	**Period begins**
Emissions to air Parameters as required by condition 3.5.1	A1, A2	Quarterly	1 January, 1 April, 1 July, 1 October
TOC Parameters as required by condition 3.5.1	Bottom Ash	Quarterly (but monthly for the first year of operation)	1 January, 1 April, 1 July, 1 October
Metals (Antimony, Cadmium, Thallium, Mercury, Lead, Chromium, Copper, Manganese, Nickel, Arsenic, Cobalt, Vanadium, Zinc) and their compounds, dioxins/furans and dioxin-like PCBs Parameters as required by condition 3.5.1	Bottom Ash	Quarterly (but monthly for the first year of operation)	1 January, 1 April, 1 July, 1 October
Total soluble fraction and metals (Antimony, Cadmium, Thallium, Mercury, Lead, Chromium, Copper, Manganese, Nickel, Arsenic, Cobalt, Vanadium, Zinc) soluble fractions Parameters as required by condition 3.5.1	Bottom Ash	Before use of a new disposal or recycling route	-
Metals (Antimony, Cadmium, Thallium, Mercury, Lead, Chromium, Copper, Manganese, Nickel, Arsenic, Cobalt, Vanadium, Zinc) and their compounds, dioxins/furans and dioxin-like PCBs Parameters as required by condition 3.5.1	APC Residues	Quarterly (but monthly for the first year of operation)	1 January, 1 April, 1 July, 1 October
Total soluble fraction and metals (Antimony, Cadmium, Thallium, Mercury, Lead, Chromium, Copper, Manganese, Nickel, Arsenic, Cobalt, Vanadium, Zinc) soluble fractions Parameters as required by condition 3.5.1	APC Residues	Before use of a new disposal or recycling route	-
Functioning and monitoring of the incineration plant as required by condition 4.2.2		Annually	1 January

Table S4.2: Annual production/treatment	
Parameter	**Units**
Total Municipal Waste Incinerated	tonnes
Total Commercial Waste Incinerated	tonnes
Electrical energy produced	KWhrs
Thermal energy produced e.g. steam	KWhrs
Electrical energy exported	KWhrs
Electrical energy used on installation	KWhrs
Waste heat utilised by the installation	KWhrs

Table S4.3 Performance parameters		
Parameter	**Frequency of assessment**	**Units**
Electrical energy produced, exported, imported and used at the installation	Quarterly	KWhrs / tonne of waste incinerated (dry basis)
Fuel oil consumption	Quarterly	Kgs / tonne of waste incinerated (dry basis)
Mass of Bottom Ash produced	Quarterly	Kgs / tonne of waste incinerated (dry basis)
Mass of APC residues produced	Quarterly	Kgs / tonne of waste incinerated (dry basis)
Ammonia consumption	Quarterly	Kgrs / tonne of waste incinerated (dry basis)
Activated Carbon consumption	Quarterly	Kgs / tonne of waste incinerated (dry basis)
Lime consumption	Quarterly	Kgs / tonne of waste incinerated (dry basis)
Water consumption	Quarterly	m^3 / tonne of waste incinerated (dry basis)
Periods of abnormal operation	Quarterly	No of occasions and cumulative hours for current calendar year for each line

Table S4.4 Reporting forms		
Media/parameter	**Reporting format**	**Date of form**
Air	Forms air 1-7 or other form as agreed in writing by the Environment Agency	01/01/2012
Residues	Forms residues 1 and 2 or other form as agreed in writing by the Environment Agency	01/01/2012
Energy usage	Form energy 1 or other form as agreed in writing by the Environment Agency	01/01/2012
Raw material and water usage	Form WU/RM1 or other form as agreed in writing by the Environment Agency	01/01/2012
Waste disposal and recovery	Form R1 or other form as agreed in writing by the Environment Agency	01/01/2012
Other performance indicators	Form performance 1 or other form as agreed in writing by the Environment Agency	01/01/2012

Schedule 5 – Notification

These pages outline the information that the operator must provide.

Units of measurement used in information supplied under Part A and B requirements shall be appropriate to the circumstances of the emission. Where appropriate, a comparison should be made of actual emissions and authorised emission limits.

If any information is considered commercially confidential, it should be separated from non-confidential information, supplied on a separate sheet and accompanied by an application for commercial confidentiality under the provisions of the EP Regulations.

Part A

Permit Number	
Name of operator	
Location of Facility	
Time and date of the detection	

(a) Notification requirements for any malfunction, breakdown or failure of equipment or techniques, accident, or emission of a substance not controlled by an emission limit which has caused, is causing or may cause significant pollution	
To be notified within 24 hours of detection	
Date and time of the event	
Reference or description of the location of the event	
Description of where any release into the environment took place	
Substances(s) potentially released	
Best estimate of the quantity or rate of release of substances	
Measures taken, or intended to be taken, to stop any emission	
Description of the failure or accident.	

(b) Notification requirements for the breach of a limit	
To be notified within 24 hours of detection unless otherwise specified below	
Emission point reference/ source	
Parameter(s)	
Limit	
Measured value and uncertainty	
Date and time of monitoring	
Measures taken, or intended to be taken, to stop the emission	

Time periods for notification following detection of a breach of a limit	
Parameter	**Notification period**

(c) Notification requirements for the detection of any significant adverse environmental effect	
To be notified within 24 hours of detection	
Description of where the effect on the environment was detected	
Substances(s) detected	
Concentrations of substances detected	
Date of monitoring/sampling	

Part B – to be submitted as soon as practicable

Any more accurate information on the matters for notification under Part A.	
Measures taken, or intended to be taken, to prevent a recurrence of the incident	
Measures taken, or intended to be taken, to rectify, limit or prevent any pollution of the environment which has been or may be caused by the emission	
The dates of any unauthorised emissions from the facility in the preceding 24 months.	

Name*	
Post	
Signature	
Date	

* authorised to sign on behalf of the operator

Schedule 6 – Interpretation

“abatement equipment” means that equipment dedicated to the removal of polluting substances from releases from the installation to air or water media.

“abnormal operation” means any technically unavoidable stoppages, disturbances, or failures of the abatement plant or the measurement devices other than continuous emission monitors for releases to air of particulates, TOC and/or CO, during which the concentrations in the discharges into air and the purified waste water of the regulated substances may exceed the normal emission limit values.

“accident” means an accident that may result in pollution.

“APC residues” means air pollution control residues.

“application” means the application for this permit, together with any additional information supplied by the operator as part of the application and any response to a notice served under Schedule 5 to the EP Regulations.

“authorised officer” means any person authorised by the Environment Agency under section 108(1) of the Environmental Act 1995 to exercise, in accordance with the terms of any such authorisation, any power specified in section 108(4) of that Act.

“bi-annual” means twice per year with at least five months between tests.

“bottom ash” means ash falling through the grate and transported by the grate.

“CEM” Continuous emission monitor.

“CEN” means Commité Européen de Normalisation.

“daily average” for releases of substances to air means the average of valid half-hourly averages over [a calendar day during normal operation.

“dioxin and furans” means polychlorinated dibenzo-p-dioxins and polychlorinated dibenzofurans.

“disposal” means any of the operations provided for in Annex I to Directive 2008/98/EC of the European Parliament and of the Council on waste.

“emissions of substances not controlled by emission limits” means emissions of substances to air, water or land from the activities, either from the emissions points specified in schedule 3 or from other localised or diffuse sources, which are not controlled by an emission limit.

“EP Regulations” means The Environmental Permitting (England and Wales) Regulations SI 2010 No.675 and words and expressions used in this permit which are also used in the Regulations have the same meanings as in those Regulations.

“groundwater” means all water, which is below the surface of the ground in the saturation zone and in direct contact with the ground or subsoil.

“Industrial Emissions Directive” means DIRECTIVE 2010/75/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 24 November 2010 on industrial emissions.

“incineration line” means all of the incineration equipment related to a common discharge to air location.

“infectious clinical waste” means clinical waste incorporating substances containing viable micro-organisms or their toxins which are known or reliably believed to cause disease in man or other living organisms

“ISO” means International Standards Organisation.

“LOI” means loss on ignition a technique used to determine the combustible material by heating the ash residue to a high temperature.

“MCERTS” means the Environment Agency’s Monitoring Certification Scheme.

“PAH” means Poly-cyclic aromatic hydrocarbon, and comprises Anthanthrene, Benzo[a]anthracene, Benzo[b]fluoranthene, Benzo[k]fluoranthene, Benzo[b]naph(2,1-d)thiophene, Benzo[c]phenanthrene,

Benzo[ghi]perylene, Benzo[a]pyrene, Cholanthrene, Chrysene, Cyclopenta[c,d]pyrene, Dibenzo[ah]anthracene, Dibenzo[a,i]pyrene Fluoranthene, Indo[1,2,3-cd]pyrene, Naphthalene.

"PCB" means Polychlorinated Biphenyl. Dioxin-like PCBs are the non-ortho and mono-ortho PCBs listed in the table below.

"quarter" means a calendar year quarter commencing on 1 January, 1 April, 1 July or 1 October.

"quarterly" for reporting/sampling means after/during each 3 month period, January to March; April to June; July to September and October to December and, when sampling, with at least 2 months between each sampling date.

"recovery" means any of the operations provided for in Annex II to Directive 2008/98/EC of the European Parliament and of the Council on waste.

"shut down" is any period where the plant is being returned to a non-operational state and there is no waste being burned as described in the application or agreed in writing with the Environment Agency.

"start up" is any period, where the plant has been non-operational, after igniting the auxiliary burner until waste has been fed to the plant in sufficient quantity to cover the grate and to initiate steady-state conditions as described in the application or agreed in writing with the Environment Agency.

"TOC" means Total Organic Carbon. In respect of releases to air, this means the gaseous and vaporous organic substances, expressed as TOC. In respect of Bottom Ash, this means the total carbon content of all organic species present in the ash (excluding carbon in elemental form).

"Waste code" means the six digit code referable to a type of waste in accordance with the List of Wastes (England)Regulations 2005, or List of Wastes (Wales) Regulations 2005, as appropriate, and in relation to hazardous waste, includes the asterisk.

"Waste Incineration Directive" means Directive 2000/76/EC on the incineration of waste (O.J. L 332, 28.12.2000) (superseded by Industrial Emissions Directive, see above).

"Waste Framework Directive" or "WFD" means Waste Framework Directive 2008/98/EC of the European Parliament and of the Council on waste.

"year" means calendar year ending 31 December.

Where a minimum limit is set for any emission parameter, for example pH, reference to exceeding the limit shall mean that the parameter shall not be less than that limit.

Unless otherwise stated, any references in this permit to concentrations of substances in emissions into air means:

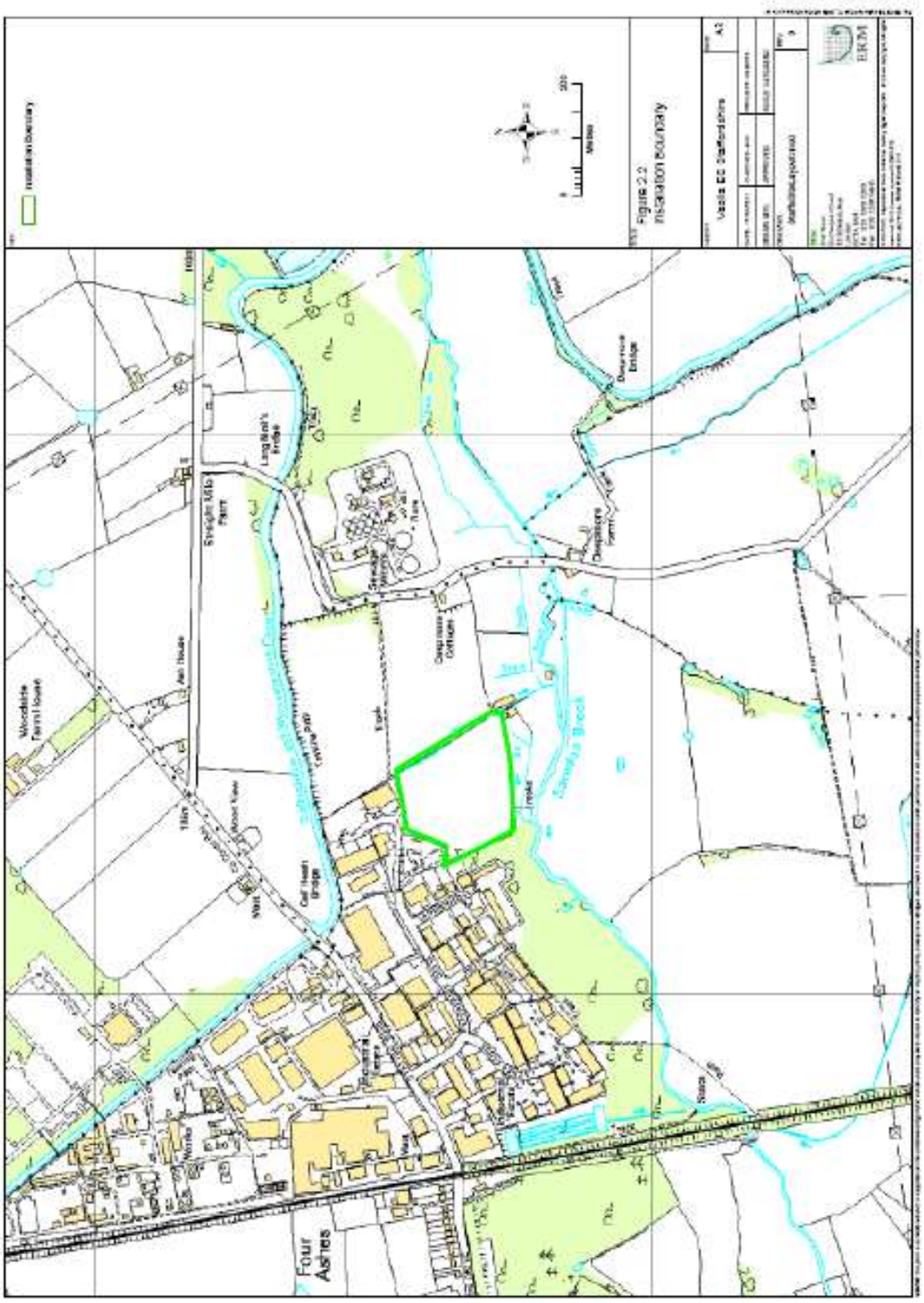
(a) in relation to gases from incineration and plants other than those burning waste oil, the concentration in dry air at a temperature of 273K, at a pressure of 101.3 kPa and with an oxygen content of 11% dry.

For dioxins/furans and dioxin-like PCBs the determination of the toxic equivalence concentration (I-TEQ, & WHO-TEQ for dioxins/furans, WHO-TEQ for dioxin-like PCBs) stated as a release limit and/ or reporting requirement, the mass concentrations of the following congeners have to be multiplied with their respective toxic equivalence factors before summing. When reporting on measurements of dioxins/furans and dioxin-like PCBs, the toxic equivalence concentrations should be reported as a range based on: all congeners less than the detection limit assumed to be zero as a minimum, and all congeners less than the detection limit assumed to be at the detection limit as a maximum.

TEF schemes for dioxins and furans				
Congener	**I-TEF(1990)**	**WHO-TEF (1997/8)**		
		Humans / Mammals	**Fish**	**Birds**
Dioxins				
2,3,7,8-TCDD	1	1	1	1
1,2,3,7,8-PeCDD	0.5	1	1	1
1,2,3,4,7,8-HxCDD	0.1	0.1	0.5	0.05
1,2,3,6,7,8-HxCDD	0.1	0.1	0.01	0.01
1,2,3,7,8,9-HxCDD	0.1	0.1	0.01	0.1
1,2,3,4,6,7,8-HpCDD	0.01	0.01	0.001	<0.001
OCDD	0.001	0.0001	-	-
Furans				
2,3,7,8-TCDF	0.1	0.1	0.05	1
1,2,3,7,8-PeCDF	0.05	0.05	0.05	0.1
2,3,4,7,8-PeCDF	0.5	0.5	0.5	1
1,2,3,4,7,8-HxCDF	0.1	0.1	0.1	0.1
1,2,3,7,8,9-HxCDF	0.1	0.1	0.1	0.1
1,2,3,6,7,8-HxCDF	0.1	0.1	0.1	0.1
2,3,4,6,7,8-HxCDF	0.1	0.1	0.1	0.1
1,2,3,4,6,7,8_HpCDF	0.01	0.01	0.01	0.01
1,2,3,4,7,8,9-HpCDF	0.01	0.01	0.01	0.01
OCDF	0.001	0.0001	0.0001	0.0001

TEF schemes for dioxin-like PCBs			
Congener	**WHO-TEF (1997/8)**		
	Humans / mammals	**Fish**	**Birds**
Non-ortho PCBs			
3,4,4',5-TCB (81)	0.0001	0.0005	0.1
3,3',4,4'-TCB (77)	0.0001	0.0001	0.05
3,3',4,4',5 - PeCB (126)	0.1	0.005	0.1
3,3',4,4',5,5'-HxCB(169)	0.01	0.00005	0.001
Mono-ortho PCBs			
2,3,3',4,4'-PeCB (105)	0.0001	<0.000005	0.0001
2,3,4,4',5-PeCB (114)	0.0005	<0.000005	0.0001
2,3',4,4',5-PeCB (118)	0.0001	<0.000005	0.00001
2',3,4,4',5-PeCB (123)	0.0001	<0.000005	0.00001
2,3,3',4,4',5-HxCB (156)	0.0005	<0.000005	0.0001
2,3,3',4,4',5'-HxCB (157)	0.0005	<0.000005	0.0001
2,3',4,4',5,5'-HxCB (167)	0.00001	<0.000005	0.00001
2,3,3',4,4',5,5'-HpCB (189)	0.0001	<0.000005	0.00001

Schedule 7 – Site plan



END OF PERMIT

6.2 Environmental Permit for the Greatmoor ERF

Permit with introductory note

The Environmental Permitting (England & Wales) Regulations 2010

Waste Recycling Limited

Greatmoor Energy from Waste Facility
Edgcott
Aylesbury
Bucks
HP18 0QN

Permit number

EPR/UP3734HT

Greatmoor Energy from Waste Facility
Permit Number EPR/UP3734HT

Introductory note

This introductory note does not form a part of the permit

This permit controls the operation of an Installation, whose purpose is the disposal of waste with energy recovery in an incineration plant. The relevant listed activity is Section 5.1 Part A(1)(c) – incineration of non-hazardous waste in an incineration plant with a capacity of 1 tonne or more per hour. The permit implements the requirement of the EU Directives, in particular, the Integrated Pollution Prevention and Control and Waste Incineration.

The main features of the permit are as follows:

The installation is designed to dispose of residual muncipal waste. The waste will be weighed when entering the site and incoming waste vehicles will discharge into the waste bunker.

Overhead grab crane(s) will be used to mix and break up the incoming materials, to ensure homogeneity of feed. Non-permitted wastes will be removed prior to the waste entering the combustion chambers and removed off-site. Waste will be loaded from the bunker into each combustion chamber via dedicated feed chutes and airlocks, using the grab cranes. The waste bunker is designed to provide up to seven days of waste storage capacity at the normal rate of throughput.

Air for combustion will be drawn from the tipping hall reducing the escape of dust and odours. The reception area will be enclosed, with rapid action access doors to manage traffic and louvered panels to control air movements.

Combustion will take place in two stages, with primary combustion undertaken on a moving mechanical grate to promote the mixing of burning/unburnt wastes. The combustion gas from the primary stage will be incinerated in the secondary combustion chamber to reach the specified minimum temperature of 850 degrees centigrade for a minimum of two seconds. The unburnt material remaining on the grate will be removed as an ash (IBA).

The heat from combustion will be recovered within a waste heat boiler to form high pressure steam, which is used to drive turbines to generate electricity. A proportion of this site generated energy will be used within the facility itself, but the majority will be exported to the National Grid.

The heat recovery boiler incorporates facilities to minimise dust carry-over and for online cleaning through rapping systems and soot blowers to minimise maintenance impacts. Dust collected from the boilers will be discharged as fly ash and collected with the flue gas treatment residues.

The air pollution control system will involve a process called "*Selective Non-Catalytic Reduction*" (SNCR) to control the release of nitrogen oxides (NOx) gases. Acid gases will be treated by a "semi - dry" system using lime injection. Activated carbon which adsorbs dioxins, furans and gaseous mercury is also injected into the gas stream. The exhaust gases will then be filtered through a bag filter, which traps fine particulate matter (dust) including the boiler ash (fly ash), reaction products and excess reagents. The bag filters also thereby remove heavy metals that are adsorbed onto particulate matter. These residues are known collectively as air pollution control (APC) residues. A metering system will deliver the reagents in the right quantity to insure low emissions, low reagent consumption and low residue levels.

The cleaned gases will pass to the atmosphere via the stack. The gases will be subject to extractive continuous sampling and monitoring, using certified Continuous Monitoring Equipment (CEMs). Feedback of monitoring data will allow action to be taken to adjust the process if necessary before emission limits are exceeded.

The principal waste streams the Installation will produce are incinerator bottom ash (IBA), air pollution control residues and recovered ferrous and non-ferrous metals. Air Pollution Control (APC) residues are treated as hazardous waste.

The site is located approximately 2km east of the village of Edgcott, 1.7 km from HM Prisons Grendon Springhill, 14km to the northwest of Aylesbury town centre and 11km south of Buckingham at National Grid Reference SP 703 224. The Listed Lower Greatmoor Farm farmhouse and outbuildings are located to the south of the proposed EfW facility site, and is the nearest residential receptor.

There are no Special Protection Areas (SPAs), Special Area of Conservation (SAC) or RAMSAR sites within a 2km radius of the proposed site. There are three Sites of Special Scientific Interest (SSSI) within 1km of the site; Sheephouse Wood from approximately 300m to the north, Grendon Wood from 750m to the south west and Finemere Wood from 550m to the south east.

The status log of the permit sets out the permitting history, including any changes to the permit reference number

Detail	Date	Comments
Application EPR/UP3734HT/A001	Duly made 05/06/11	
Issue of Notice seeking further information	16/11/11	
Additional Information Received	12/12/11 and 19/12/11	Response to question 9 sent under separate cover
Issue of Notice seeking further information	24/01/12	
Additional Information Received	01/02/12	
Permit determined	09/05/2012	

End of Introductory Note

Permit

The Environmental Permitting (England and Wales) Regulations 2010

Permit number
EPR/UP3734HT

The Environment Agency hereby authorises, under regulation 13 of the Environmental Permitting (England and Wales) Regulations 2010

Waste Recycling Limited ("the operator"),

whose registered office is

Waste Recycling Limited
Ground Floor West
900 Pavilion Drive
Northampton Business Park
Northhampton
NN4 7RG

company registration number 02674166

to operate an installation at

Greatmoor Energy from Waste Facility
Edgcott
Aylesbury
Bucks
HP18 0QN

to the extent authorised by and subject to the conditions of this permit.

Name	Date
Mrs F M Devine	**09 May 2012**

Authorised on behalf of the Environment Agency

Conditions

1 Management

1.1 General management

1.1.1 The operator shall manage and operate the activities:

(a) in accordance with a written management system that identifies and minimises risks of pollution, including those arising from operations, maintenance, accidents, incidents, non-conformances, closure and those drawn to the attention of the operator as a result of complaints; and

(b) using sufficient competent persons and resources.

1.1.2 Records demonstrating compliance with condition 1.1.1 shall be maintained.

1.1.3 Any person having duties that are or may be affected by the matters set out in this permit shall have convenient access to a copy of it kept at or near the place where those duties are carried out.

1.2 Energy efficiency

1.2.1 The operator shall:

(a) take appropriate measures to ensure that energy is recovered with a high level of energy efficiency and energy is used efficiently in the activities;

(b) review and record at least every four years whether there are suitable opportunities to improve the energy recovery and efficiency of the activities; and

(c) take any further appropriate measures identified by a review.

1.2.2 The operator shall provide and maintain steam and/or hot water pass-outs such that opportunities for the further use of waste heat may be capitalised upon should they become practicable.

1.2.3 The operator shall review the practicability of Combined Heat and Power (CHP) implementation at least every 2 years. The results shall be reported to the Agency within 2 months of each review.

1.3 Efficient use of raw materials

1.3.1 The operator shall:

(a) take appropriate measures to ensure that raw materials and water are used efficiently in the activities;

(b) maintain records of raw materials and water used in the activities;

(c) review and record at least every four years whether there are suitable alternative materials that could reduce environmental impact or opportunities to improve the efficiency of raw material and water use; and

(d) take any further appropriate measures identified by a review.

1.4 Avoidance, recovery and disposal of wastes produced by the activities

1.4.1 The operator shall take appropriate measures to ensure that:

(a) the waste hierarchy referred to in Article 4 of the Waste Framework Directive is applied to the generation of waste by the activities; and

(b) any waste generated by the activities is treated in accordance with the waste hierarchy referred to in Article 4 of the Waste Framework Directive; and

(c) where waste disposal is necessary, this is undertaken in a manner which minimised its impact on the environment.

1.4.2 review and record at least every four years whether changes to those measures should be made; and take any further appropriate measures identified by a review.

2 Operations

2.1 Permitted activities

2.1.1 The operator is only authorised to carry out the activities specified in schedule 1 table S1.1 (the "activities").

2.1.2 Waste authorised by this permit in condition 2.3.3 shall be clearly distinguished from any other waste on the site.

2.2 The site

2.2.1 The activities shall not extend beyond the site, being the land shown edged in green on the site plan at schedule 7 to this permit.

2.3 Operating techniques

2.3.1 (a) The activities shall, subject to the conditions of this permit, be operated using the techniques and in the manner described in the documentation specified in schedule 1, table S1.2, unless otherwise agreed in writing by the Environment Agency.

(b) If notified by the Environment Agency that the activities are giving rise to pollution, the operator shall submit to the Environment Agency for approval within the period specified, a revision of any plan specified in schedule 1, table S1.2 or otherwise required under this permit, and shall implement the approved revised plan in place of the original from the date of approval, unless otherwise agreed in writing by the Environment Agency.

2.3.2 Any raw materials or fuels listed in schedule 2 table S2.1 shall conform to the specifications set out in that table.

2.3.3 Waste shall only be accepted if:

(a) it is of a type and quantity listed in schedule 2 table S2.2 and

(b) it conforms to the description in the documentation supplied by the producer or holder; and

(c) having been separately collected for recycling, it is contaminated and otherwise destined for landfill.

2.3.4 The operator shall ensure that where waste produced by the activities is sent to a relevant waste operation, that operation is provided with the following information, prior to the receipt of the waste:

(a) the nature of the process producing the waste;

(b) the composition of the waste;

(c) the handling requirements of the waste;

(d) the hazardous property associated with the waste, if applicable; and

(e) the waste code of the waste.

2.3.5 The operator shall ensure that where waste produced by the activities is sent to a landfill site, it meets the waste acceptance criteria for that landfill.

2.3.6 Waste shall not be charged, or shall cease to be charged, if:

(a) the combustion chamber temperature is below, or falls below, 850^{o}C

(b) any continuous emission limit value in schedule 3 table S3.1(a) is exceeded; or

(c) any continuous emission limit value in schedule 3 table S3.1 is exceeded, other than under WID abnormal operating conditions ; or

(d) monitoring results required to demonstrate compliance with any continuous emission limit value in schedule 3 table S3.1 are unavailable other than under WID abnormal operating conditions.

2.3.7 The operator shall have at least one auxiliary burner in each line at start up or shut down or whenever the operating temperature falls below that specified in condition 2.3.6, as long as incompletely burned waste is present in the combustion chamber. Unless the temperature specified in condition 2.3.6 is maintained in the combustion chamber, such burner(s) may be fed only with fuels which result in emissions no higher than those arising from the use of gas oil, liquefied gas or natural gas.

2.3.8 The operator shall record the beginning and end of each period of “WID abnormal operation”.

2.3.9 During a period of “WID abnormal operation”, the operator shall restore normal operation of the failed equipment or replace the failed equipment as rapidly as possible.

2.3.10 Where, during “WID abnormal operation”, any of the following situations arise, the operator shall, as soon as is practicable, cease the burning of waste until normal operation can be restored:

(a) continuous measurement shows that an emission exceeds any emission limit value in schedule 3 table S3.1 due to disturbances or failures of the abatement systems, or continuous emission monitor(s) are out of service, as the case may be, for a total of 4 hours uninterrupted duration;

(b) the cumulative duration of “WID abnormal operation” periods over 1 calendar year exceeds 60 hours on an incineration line;

(c) continuous measurement shows that an emission exceeds any emission limit value in schedule 3 table S3.1 (a) due to disturbances or failures of the abatement systems.

2.3.11 The operator shall interpret the end of the period of “WID abnormal operation” as the earliest of the following:

(a) when the failed equipment is repaired and brought back into normal operation;

(b) when the operator initiates a shut down of the waste combustion activity, as described in the application or as agreed in writing with the Environment Agency;

(c) when a period of four hours has elapsed from the start of the “WID abnormal operation”;

(d) when, in any calendar year, an aggregated period of 60 hours “WID abnormal operation” has been reached for a given incineration line.

2.3.16 Bottom ash and APC residues shall not be mixed.

2.4 Improvement programme

2.4.1 The operator shall complete the improvements specified in schedule 1 table S1.3 by the date specified in that table unless otherwise agreed in writing by the Environment Agency.

2.4.2 Except in the case of an improvement which consists only of a submission to the Environment Agency, the operator shall notify the Environment Agency within 14 days of completion of each improvement.

2.5 Pre-operational conditions

2.5.1 The activities shall not be brought into operation until the measures specified in schedule 1 table S1.4 have been completed.

3 Emissions and monitoring

3.1 Emissions to water, air or land

3.1.1 There shall be no point source emissions to water, air or land except from the sources and emission points listed in schedule 3 tables S3.1, except in "WID abnormal operation", when there shall be no point source emissions to water, air or land except from the sources and emission points listed in schedule 3 tables S3.1 and S3.1(a).

3.1.2 The limits given in schedule 3 shall not be exceeded.

3.1.3 Wastes produced at the site shall, as a minimum, be sampled and analysed in accordance with schedule 3 table S 3.3. Additional samples shall be taken and tested and appropriate action taken, whenever:

(a) disposal or recovery routes change; or

(b) it is suspected that the nature or composition of the waste has changed such that the route currently selected may no longer be appropriate.

3.2 Emissions of substances not controlled by emission limits

3.2.1 Emissions of substances not controlled by emission limits (excluding odour) shall not cause pollution. The operator shall not be taken to have breached this condition if appropriate measures, including, but not limited to, those specified in any approved emissions management plan, have been taken to prevent or where that is not practicable, to minimise, those emissions.

3.2.2 The operator shall:

(a) if notified by the Environment Agency that the activities are giving rise to pollution, submit to the Environment Agency for approval within the period specified, an emissions management plan;

(b) implement the approved emissions management plan, from the date of approval, unless otherwise agreed in writing by the Environment Agency.

3.2.3 All liquids in containers, whose emission to water or land could cause pollution, shall be provided with secondary containment, unless the operator has used other appropriate measures to prevent or where that is not practicable, to minimise, leakage and spillage from the primary container.

3.3 Monitoring

3.3.1 The operator shall, unless otherwise agreed in writing by the Environment Agency, undertake the monitoring specified in the following tables in schedule 3 to this permit:

(a) point source emissions specified in tables S3.1, and S3.1(a);

(b) process monitoring specified in table S3.2;

(c) residue quality in table S3.3.

3.3.2 The operator shall maintain records of all monitoring required by this permit including records of the taking and analysis of samples, instrument measurements (periodic and continual), calibrations, examinations, tests and surveys and any assessment or evaluation made on the basis of such data.

3.3.3 Monitoring equipment, techniques, personnel and organisations employed for the emissions monitoring programme and the environmental or other monitoring specified in condition 3.5.1 shall have either MCERTS certification or MCERTS accreditation (as appropriate) unless otherwise agreed in writing by the Environment Agency. Newly installed CEMs, or CEMs replacing existing CEMs, shall have MCERTS certification and have an MCERTS certified range which is not greater than 1.5 times the daily emission limit value (ELV) specified in schedule 3 table S3.1. The CEM shall also be able to measure instantaneous values over the ranges which are to be expected during all operating conditions. If it is necessary to use more than one range setting of the CEM to achieve this requirement, the CEM shall be verified for monitoring supplementary, higher ranges.

3.3.4 Permanent means of access shall be provided to enable sampling/monitoring to be carried out in relation to the emission points specified in schedule 3 tables S3.1, S3.1(a), S3.2, and S3.3 unless otherwise agreed in writing by the Environment Agency.

3.3.5 Where Continuous Emission Monitors are installed to comply with the monitoring requirements in schedule 3 table S3.1; the Continuous Emission Monitors shall be used such that;

(a) the values of the 95% confidence intervals of a single measured result at the daily emission limit value shall not exceed the following percentages:

- Carbon monoxide 10%
- Sulphur dioxide 20%
- Oxides of nitrogen (NO & NO_2 expressed as NO_2) 20%
- Particulate matter 30%
- Total organic carbon (TOC) 30%
- Hydrogen chloride 40%

(b) valid half-hourly average values shall be determined within the effective operating time (excluding the start-up and shut-down periods) from the measured values after having subtracted the value of the confidence intervals in condition 3.3.5 (a);

(c) where it is necessary to calibrate or maintain the monitor and this means that data are not available for a complete half-hour period, the half-hourly average shall in any case be considered valid if measurements are available for a minimum of 20 minutes during the half-hour period. The number of half-hourly averages so validated shall not exceed 5 per day;

(d) daily average values shall be determined as the average of all the valid half-hourly average values within a calendar day. The daily average value shall be considered valid if no more than five half-hourly average values in any day have been determined not to be valid;

(e) no more than ten daily average values per year shall be determined not to be valid.

3.4 Odour

3.4.1 Emissions from the activities shall be free from odour at levels likely to cause pollution outside the site, as perceived by an authorised officer of the Environment Agency, unless the operator has used appropriate measures, including, but not limited to, those specified in any approved odour management plan, to prevent or where that is not practicable to minimise the odour.

3.4.3 The operator shall:

(a) if notified by the Environment Agency that the activities are giving rise to pollution outside the site due to odour, submit to the Environment Agency for approval within the period specified, an odour management plan;

(b) implement the approved odour management plan, from the date of approval, unless otherwise agreed in writing by the Environment Agency.

3.5 Noise and vibration

3.5.1 Emissions from the activities shall be free from noise and vibration at levels likely to cause pollution outside the site, as perceived by an authorised officer of the Environment Agency, unless the operator has used appropriate measures, including, but not limited to, those specified in any approved noise and vibration management plan to prevent or where that is not practicable to minimise the noise and vibration.

3.5.2 The operator shall:

(a) if notified by the Environment Agency that the activities are giving rise to pollution outside the site due to noise and vibration, submit to the Environment Agency for approval within the period specified, a noise and vibration management plan;

(b) implement the approved noise and vibration management plan, from the date of approval, unless otherwise agreed in writing by the Environment Agency.

4 Information

4.1 Records

4.1.1 All records required to be made by this permit shall:

(a) be legible;

(b) be made as soon as reasonably practicable;

(c) if amended, be amended in such a way that the original and any subsequent amendments remain legible, or are capable of retrieval; and

(d) be retained, unless otherwise agreed in writing by the Environment Agency, for at least 6 years from the date when the records were made, or in the case of the following records until permit surrender:

(i) off-site environmental effects; and

(ii) matters which affect the condition of the land and groundwater.

4.1.2 The operator shall keep on site all records, plans and the management system required to be maintained by this permit, unless otherwise agreed in writing by the Environment Agency.

4.2 Reporting

4.2.1 The operator shall send all reports and notifications required by the permit to the Environment Agency using the contact details supplied in writing by the Environment Agency.

4.2.2 report or reports on the performance of the activities over the previous year shall be submitted to the Environment Agency by 31 January (or other date agreed in writing by the Environment Agency) each year. The report(s) shall include as a minimum:

(a) a review of the results of the monitoring and assessment carried out in accordance with the permit including an interpretive review of that data;

(b) the annual production /treatment data set out in schedule 4 table S4.2; and

(c) the performance parameters set out in schedule 4 table S4.3 using the forms specified in table S4.4 of that schedule.

(d) the functioning and monitoring of the incineration plant in a format agreed with the Environment Agency. The report shall, as a minimum requirement (as required by Article 12(2) of the Waste Incineration Directive) give an account of the running of the process and the emissions into air and water compared with the emission standards in the WID.

4.2.3 Within 28 days of the end of the reporting period the operator shall, unless otherwise agreed in writing by the Environment Agency, submit reports of the monitoring and assessment carried out in accordance with the conditions of this permit, as follows:

(a) in respect of the parameters and emission points specified in schedule 4 table S4.1;

(b) for the reporting periods specified in schedule 4 table S4.1 and using the forms specified in schedule 4 table S4.4 ; and

(c) giving the information from such results and assessments as may be required by the forms specified in those tables.

4.2.4 The operator shall, unless notice under this condition has been served within the preceding four years, submit to the Environment Agency, within six months of receipt of a written notice, a report assessing whether there are other appropriate measures that could be taken to prevent, or where that is not practicable, to minimise pollution.

4.2.5 Within 1 month of the end of each quarter, the operator shall submit to the Environment Agency using the form made available for the purpose, the information specified on the form relating to the site and the waste accepted and removed from it during the previous quarter.

4.3 Notifications

4.3.1 The Environment Agency shall be notified without delay following the detection of:

(a) any malfunction, breakdown or failure of equipment or techniques, accident, or emission of a substance not controlled by an emission limit which has caused, is causing or may cause significant pollution;

(b) the breach of a limit specified in the permit; or

(c) any significant adverse environmental effects.

4.3.2 Any information provided under condition 4.3.1 shall be confirmed by sending the information listed in schedule 5 to this permit within the time period specified in that schedule.

4.3.3 Where the Environment Agency has requested in writing that it shall be notified when the operator is to undertake monitoring and/or spot sampling, the operator shall inform the Environment Agency when the relevant monitoring and/or spot sampling is to take place. The operator shall provide this information to the Environment Agency at least 14 days before the date the monitoring is to be undertaken.

4.3.4 The Environment Agency shall be notified within 14 days of the occurrence of the following matters, except where such disclosure is prohibited by Stock Exchange rules:

Where the operator is a registered company:

(a) any change in the operator's trading name, registered name or registered office address; and

(b) any steps taken with a view to the operator going into administration, entering into a company voluntary arrangement or being wound up.

Where the operator is a corporate body other than a registered company:

(a) any change in the operator's name or address; and

(b) any steps taken with a view to the dissolution of the operator.

4.3.5 Where the operator proposes to make a change in the nature or functioning, or an extension of the activities, which may have consequences for the environment and the change is not otherwise the subject of an application for approval under the Regulations or this permit:

(a) the Environment Agency shall be notified at least 14 days before making the change; and

(b) the notification shall contain a description of the proposed change in operation.

4.3.6 The Environment Agency shall be given at least 14 days notice before implementation of any part of the site closure plan.

4.4 Interpretation

4.4.1 In this permit the expressions listed in schedule 6 shall have the meaning given in that schedule.

4.4.2 In this permit references to reports and notifications mean written reports and notifications, except where reference is made to notification being made “without delay”, in which case it may be provided by telephone.

Schedule 1 - Operations

Table S1.1 activities		
Activity listed in Schedule 1 of the EP Regulations	**Description of specified activity**	**Limits of specified activity**
S5.1 A1 (c)	The incineration of non-hazardous waste in an incineration plant with a capacity of 1 tonne per hour or more.	From receipt of waste to emission of exhaust gas and disposal of waste arising.
Directly Associated Activities		
Electricity Generation	Generation of 22MWe electrical power using a steam turbine from energy recovered from the flue gases.	
Back up electrical generator	For providing emergency electrical power to the plant in the event of supply interruption.	

Table S1.2 Operating techniques		
Description	**Parts**	**Date Received**
Application	Best Available Techniques and operating techniques (all sections) BAT03 Questions in support of EPR 5.01 (all sections) Residue Management Plan (all sections)	Duly Made Date 05/06/11
Response to Schedule 5 Notice dated 12/12/11	Response to questions 3, 4, 5, 6 and 7	12/12/11

Table S1.3 Improvement programme requirements		
Reference	**Requirement**	**Date**
IC1	The Operator shall submit a written report to the Environment Agency on the implementation of its Environmental Management System and the progress made in the accreditation of the system by an external body or if appropriate submit a schedule by which the EMS will be subject to accreditation.	Within 12 months of the date on which waste is first burnt.
IC2	The Operator shall submit a written proposal to the Environment Agency to carry out tests to determine the size distribution of the particulate matter in the exhaust gas emissions to air from emission point A1, identifying the fractions within the PM_{10}, $PM_{2.5}$ and $PM_{1.0}$ ranges. The proposal shall include a timetable for approval by the Environment Agency to carry out such tests and produce a report on the results. On receipt of written agreement by the Environment Agency to the proposal and the timetable, the Operator shall carry out the tests and submit to the Environment Agency a report on the results.	Within 6 months of the completion of commissioning.

Table S1.3 Improvement programme requirements		
Reference	**Requirement**	**Date**
IC3	The Operator shall submit a written report to the Environment Agency on the commissioning of the installation. The report shall summarise the environmental performance of the plant as installed against the design parameters set out in the Application. The report shall also include a review of the performance of the facility against the conditions of this permit and details of procedures developed during commissioning for achieving and demonstrating compliance with permit conditions.	Within 4 months of the completion of commissioning.
IC4	The Operator shall carry out checks to verify the residence time, minimum temperature and oxygen content of the exhaust gases in the furnace whilst operating under the anticipated most unfavourable operating conditions. The results shall be submitted in writing to the Environment Agency.	Within 4 months of the completion of commissioning.
IC5	The Operator shall submit a written report to the Environment Agency describing the performance and optimisation of the Selective Non Catalytic Reduction (SNCR) system and combustion settings to minimise oxides of nitrogen (NO_x) emissions within the emission limit values described in this permit with the minimisation of nitrous oxide emissions. The report shall include an assessment of the level of NO_x and N_2O emissions that can be achieved under optimum operating conditions. The report shall also provide details of the optimisation (including dosing rates) for the control of acid gases and dioxins.	Within 4 months of the completion of commissioning.
IC6	The Operator shall carry out an assessment of the impact of emissions to air of the [following] component metals subject to emission limit values, Cd, and Cr. A report on the assessment shall be made to the Environment Agency. Emissions monitoring data obtained during the first year of operation shall be used to compare the actual emissions with those assumed in the impact assessment submitted with the Application. An assessment shall be made of the impact of each metal, that exceeds the original assumption, against the relevant EQS/EAL. In the event that the assessment shows that an EQS/EAL can be exceeded, the report shall include proposals for further investigative work.	15 months from commencement of operations
IC7	The Operator shall submit a written summary report to the Agency to confirm by the results of calibration and verification testing that the performance of Continuous Emission Monitors for parameters as specified in Table S3.1 and Table S3.1(a) complies with the requirements of BS EN 14181, specifically the requirements of QAL1, QAL2 and QAL3.	Initial calibration report to be submitted to the Agency within 3 months of completion of commissioning. Full summary evidence compliance report to be submitted within 18 months of commissioning.
IC8	The operator shall carry out a noise monitoring survey at Lower Great Moor Farm to quantify the noise impact during normal operation against the information supplied in the application and P07. The methodology and monitoring locations will be agreed in writing with the Environment Agency. The result of the survey together with the conclusions and recommendations for any abatement shall be provided to the Environment Agency.	Within 9 months of the completion of commissioning.

Table S1.4 Pre-operational measures	
Reference	**Pre-operational measures**
PO1	Prior to the commencement of commissioning, the Operator shall send a summary of the site Environment Management System (EMS) to the Environment Agency and make available for inspection all documents and procedures which form part of the EMS. The EMS shall be developed in line with the requirements set out in Section 1 of How to comply with your environmental permit – Getting the basics right. The documents and procedures set out in the EMS shall form the written management system referenced in condition 1.1.1 (a) of the permit.
PO2	Prior to the commencement of commissioning, the Operator shall send a report to the Environment Agency which will contain a comprehensive review of the options available for utilising the heat generated by the waste incineration process in order to ensure that it is recovered as far as practicable. The review shall detail any identified proposals for improving the recovery and utilisation of waste heat and shall provide a timetable for their implementation.
PO3	Prior to the commencement of commissioning, the Operator shall submit to the Environment Agency for approval a protocol for the sampling and testing of incinerator bottom ash for the purposes of assessing its hazard status. Sampling and testing shall be carried out in accordance with the protocol as approved.
PO4	Prior to the commencement of commissioning; the Operator shall provide a written commissioning plan, including timelines for completion, for approval by the Environment Agency. The commissioning plan shall include the expected emissions to the environment during the different stages of commissioning, the expected durations of commissioning activities and the actions to be taken to protect the environment and report to the Environment Agency in the event that actual emissions exceed expected emissions. Commissioning shall be carried out in accordance with the commissioning plan as approved.
PO5	Prior to the commencement of commissioning, the Operator shall submit a written report to the Agency detailing the waste acceptance procedure to be used at the site. The waste acceptance procedure shall include the process and systems by which wastes unsuitable for incineration at the site will be controlled. The procedure shall be implemented in accordance with the written approval from the Agency.
PO6	After completion of furnace design and at least three calendar months before any furnace operation; the operator shall submit a written report to the Agency of the details of the computational fluid dynamic (CFD) modelling. The report shall demonstrate whether the design combustion conditions comply with the residence time and temperature requirements as defined by the Waste Incineration Directive.
PO7	As part of the final design process the Operator shall assess opportunities to reduce noise emissions. On completion of the final design and prior to commencement of installation of plant and associated buildings , the operator shall submit a revised noise assessment report to the Environment Agency detailing the design options considered (including building dimensions, what the walls and roofs will be made of) and those proposed relating to noise reduction of the new plant and buildings to achieve the levels of protection identified in BS:4142.

Schedule 2 - Waste types, raw materials and fuels

Table S2.1 Raw materials and fuels	
Raw materials and fuel description	**Specification**
Fuel Oil	< 0.1% sulphur content

Table S2.2 Permitted waste types and quantities for incineration plant	
Maximum quantity	Maximum total throughput 300,000 tonnes per year
Waste code	**Description**
02	**Wastes from Agriculture, Horticulture, Aquaculture, Forestry, Hunting and Fishing, Food Preparation and Processing**
02 01	**wastes from agriculture, horticulture, aquaculture, forestry, hunting and fishing**
02 01 04	waste plastics (except packaging)
02 01 07	wastes from forestry
02 01 09	agrochemical wastes other than those mentioned in 02 01 08
02 02	**Wastes from the preparation and processing of meat, fish and other foods of animal origin**
02 02 02	animal-tissue waste
02 02 03	materials unsuitable for consumption or processing
02 02 04	sludges from on-site effluent treatment
02 06	**Wastes from the baking and confectionary industry**
02 06 01	materials unsuitable for consumption or processing
03	**Wastes from Wood Processing and the Production of Panels and Furniture, Pulp, Paper and Cardboard**
03 01	**Wastes from wood processing and the production of panels and furniture**
03 01 01	waste bark and cork
03 01 05	sawdust, shavings, cuttings, wood, particle board and veneer other than those mentioned in 03 01 04
03 03	**Wastes from pulp, paper and cardboard production and processing**
03 03 01	waste bark and wood
03 03 07	mechanically separated rejects from pulping of waste paper and cardboard
03 03 08	wastes from sorting of paper and cardboard destined for recycling
04	**Wastes from the Leather, Fur and Textile Industries**
04 02	**Wastes from the textile industry**
04 02 09	wastes from composite materials (impregnated textile, elastomer, plastomer)
04 02 10	organic matter from natural products (e.g. grease, wax)
04 02 21	wastes from unprocessed textile fibres
04 02 22	wastes from processed textile fibres
09	**Wastes from the Photographic Industry**
09 01	**Wastes from the photographic industry**
09 01 07	photographic film and paper containing silver or silver compounds
09 01 08	photographic film and paper free of silver or silver compounds
15	**Waste Packaging, Absorbents, Wiping Cloths, Filter Materials and Protective Clothing Not Otherwise Specified**
15 01	**Packaging (including separately collected municipal packaging waste)**

Table S2.2 Permitted waste types and quantities for incineration plant	
Maximum quantity	Maximum total throughput 300,000 tonnes per year
Waste code	**Description**
15	**Waste Packaging, Absorbents, Wiping Cloths, Filter Materials and Protective Clothing Not Otherwise Specified**
15 01	**Packaging (including separately collected municipal packaging waste)**
15 01 01	paper and cardboard packaging
15 01 02	plastic packaging
15 01 03	wooden packaging
15 01 05	composite packaging
15 01 06	mixed packaging
15 01 09	textile packaging
15 02	**Absorbents, filter materials, wiping cloths and protective clothing**
15 02 03	absorbents, filter materials, wiping cloths and protective clothing other than those mentioned in 15 02 02
17	**Construction and Demolition Wastes (including Excavated Soil from Contaminated Sites)**
17 02	**wood, glass and plastic**
17 02 01	wood
17 02 03	plastic
17 06	**Insulation materials and asbestos-containing construction materials**
17 06 04	insulating materials other than those mentioned in 17 06 01 and 17 06 03
17 09	**Other construction and demolition wastes**
17 09 04	mixed construction and demolition wastes other than those mentioned in 17 09 01, 17 09 02 and 17 09 03
18	**Wastes From Human or Animal Health Care and/or Related Research (except kitchen wastes not arising from immediate health care)**
18 01	**Wastes from natal care, diagnosis, treatment or prevention of disease in humans**
18 01 04	wastes whose collection and disposal is not subject to special requirements in order to prevent infection
18 01 07	chemicals other than those mentioned in 18 01 06
18 01 09	medicines other than those mentioned in 18 01 08
18 02	**wastes from research, diagnosis, treatment or prevention of disease involving animals**
18 02 03	wastes whose collection and disposal is not subject to special requirements in order to prevent infection
18 02 06	chemicals other than those mentioned in 18 02 05
18 02 08	medicines other than those mentioned in 18 02 07
19	**Wastes from Waste Management Facilities, Off-Site Waste Water Treatment Plants and the Preparation of Water for**
	Human Consumption and Water for Industrial Use
19 05	**Wastes from aerobic treatment of solid wastes**
19 05 01	non-composted fraction of municipal and similar wastes
19 05 02	non-composted fraction of animal and vegetable wastes
19 05 03	off-specification compost
19 06	**Wastes from anaerobic treatment of waste**
19 06 04	digestate from anaerobic treatment of municipal waste
19 06 06	digestate from anaerobic treatment of animal and vegetable waste
19 08	**Wastes from waste water treatment plants not otherwise specified**
19 08 01	screenings
19 08 05	sludges from treatment of urban waste water
19 12	**Wastes from the mechanical treatment of waste (e.g. sorting, crushing,**

Table S2.2 Permitted waste types and quantities for incineration plant	
Maximum quantity	Maximum total throughput 300,000 tonnes per year
Waste code	**Description**
	compacting, pelletising) not otherwise specified
19 12 01	paper and cardboard
19 12 04	plastic and rubber
19 12 07	wood other than that mentioned in 19 12 06
19 12 08	textiles
19 12 10	combustible waste (refuse derived fuel)
19 12 12	other wastes (including mixtures of materials) from mechanical treatment of waste other than those mentioned in 19 12 11
20	**Municipal Wastes (Household Waste and Similar Commercial, Industrial and Institutional Wastes) Including Separately Colected Fractions**
20 01	**Separately collected fraction (except 15 01)**
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 on 20 01 37
20 01 39	plastics
20 02	**Garden and park wastes (including cemetery waste)**
20 02 01	biodegradable waste
20 03	**Other municipal wastes**
20 03 01	mixed municpal waste
20 03 02	waste from markets
20 03 03	street-cleaning residues
20 03 06	waste from sewage cleaning
20 03 07	bulky waste

Schedule 3 – Emissions and monitoring

Table S3.1 Point source emissions to air – emission limits and monitoring requirements

Emission point ref. & location	Parameter	Source	Limit (including unit)	Reference period	Monitoring frequency	Monitoring standard(s) or method(s)
A1	Particulate matter		30 mg/m^3	½-hr average	Continuous measurement	BS EN 14181
A1	Particulate matter		10 mg/m^3	daily average	Continuous measurement	BS EN 14181
A1	Total Organic Carbon (TOC)		20 mg/m^3	½-hr average	Continuous measurement	BS EN 14181
A1	Total Organic Carbon (TOC)		10 mg/m^3	daily average	Continuous measurement	BS EN 14181
A1	Hydrogen chloride		60 mg/m^3	½-hr average	Continuous measurement	BS EN 14181
A1	Hydrogen chloride		10 mg/m^3	daily average	Continuous measurement	BS EN 14181
A1	Hydrogen fluoride		2 mg/m^3	periodic over minimum 1-hour period	Quarterly in first year. Then Bi-annual	BS ISO 15713
A1	Carbon monoxide		150 mg/m^3	95% of all 10-minute averages in any 24-hour period	Continuous measurement	BS EN 14181
A1	Carbon monoxide		50 mg/m^3	daily average	Continuous measurement	BS EN 14181
A1	Sulphur dioxide		200 mg/m^3	½-hr average	Continuous measurement	BS EN 14181
A1	Sulphur dioxide		50 mg/m^3	daily average	Continuous measurement	BS EN 14181
A1	Oxides of nitrogen (NO and NO_2 expressed as NO_2)		400 mg/m^3	½-hr average	Continuous measurement	BS EN 14181
A1	Oxides of nitrogen (NO and NO_2 expressed as NO_2)		200 mg/m^3	daily average	Continuous measurement	BS EN 14181

Table S3.1 Point source emissions to air – emission limits and monitoring requirements						
Emission point ref. & location	**Parameter**	**Source**	**Limit (including unit)**	**Reference period**	**Monitoring frequency**	**Monitoring standard(s) or method(s)**
A1	Cadmium & thallium and their compounds (total)		0.05 mg/m^3	periodic over minimum 30 minute, maximum 8 hour period	Quarterly in first year. Then Bi-annual	BS EN 14385
A1	Mercury and its compounds		0.05 mg/m^3	periodic over minimum 30 minute, maximum 8 hour period	Quarterly in first year. Then Bi-annual	BS EN 13211
A1	Sb, As, Pb, Cr, Co, Cu, Mn, Ni and V and their compounds (total)		0.5 mg/m^3	periodic over minimum 30 minute, maximum 8 hour period	Quarterly in first year. Then Bi-annual	BS EN 14385
A1	water vapour content Unless gas is dried before analysis of emissions			continuous		BS EN 14181
A1	Ammonia (NH_3)			½-hr average and / or daily average	Continuous where CEM installed.	BS EN 14181
A1	Nitrous oxide (N_2O)			½-hr average and / or daily average	Continuous where CEM installed.	BS EN 14181
A1	Dioxins / furans (I-TEQ)		0.1 ng/m^3	periodic over minimum 6 hours, maximum 8 hour period	Quarterly in first year. Then Bi-annual	BS EN 1948 Parts 1, 2 and 3
A1	Dioxins / furans (WHO-TEQ Humans / Mammals)			periodic over minimum 6 hours, maximum 8 hour period	Quarterly in first year. Then Bi-annual	BS EN 1948 Parts 1, 2 and 3
A1	Dioxins / furans (WHO-TEQ Fish)			periodic over minimum 6 hours, maximum 8 hour period	Quarterly in first year. Then Bi-annual	BS EN 1948 Parts 1, 2 and 3
A1	Dioxins / furans (WHO-TEQ Birds)			periodic over minimum 6 hours, maximum 8 hour period	Quarterly in first year. Then Bi-annual	BS EN 1948 Parts 1, 2 and 3

Table S3.1 Point source emissions to air – emission limits and monitoring requirements						
Emission point ref. & location	**Parameter**	**Source**	**Limit (including unit)**	**Reference period**	**Monitoring frequency**	**Monitoring standard(s) or method(s)**
A1	Dioxin-like PCBs (WHO-TEQ Humans / Mammals)			periodic over minimum 6 hours, maximum 8 hour period	Quarterly in first year. Then Bi-annual	BS EN 1948-4
A1	Dioxin-like PCBs (WHO-TEQ Fish)			periodic over minimum 6 hours, maximum 8 hour period	Quarterly in first year. Then Bi-annual	BS EN 1948-4
A1	Dioxin-like PCBs (WHO-TEQ Birds)			periodic over minimum 6 hours, maximum 8 hour period	Quarterly in first year. Then Bi-annual	BS EN 1948-4
A1	Specific individual poly-cyclic aromatic hydrocarbons (PAHs), as specified in Schedule 6.			periodic over minimum 6 hours, maximum 8 hour period	Quarterly in first year. Then Bi-annual	BS ISO 11338 Parts 1 and 2.

Table S3.1(a) Point source emissions to air during abnormal operation of incineration plant – emission limits and monitoring requirements						
Emission point ref. & location	**Parameter**	**Source**	**Limit (including unit)**	**Reference period**	**Monitoring frequency**	**Monitoring standard or method**
A1	Particulate matter		150 mg/m^3	½-hr average	Continuous measurement	BS EN 15267-3 during abatement plant failure
A1	Total Organic Carbon (TOC)		20 mg/m^3	½-hr average	Continuous measurement	BS EN 15267-3 during abatement plant failure
A1	Carbon monoxide		100 mg/m^3	½-hr average	Continuous measurement	BS EN 15267-3 during abatement plant failure]

Table S3.2 Process monitoring requirements				
Location or description of point of measurement	**Parameter**	**Monitoring frequency**	**Monitoring standard or method**	**Other specifications**
As identified in the Application	Wind Speed and Direction	Continuous	Anemometer	
Location close to the Combustion Chamber inner wall.	Temperature (° C)	Continuous	Traceable to national standards	As agreed in writing with the Agency.
A1	Exhaust gas temperature	Continuous	Traceable to national standards	As agreed in writing with the Agency.
A1	Exhaust gas pressure	Continuous	Traceable to national standards	As agreed in writing with the Agency.
A1	Exhaust gas oxygen content	Continuous	BS EN 15267-3 BS EN 14181	
A1	Exhaust gas water vapour content	Continuous	BS EN 15267-3 BS EN 14181	Unless gas is dried before analysis of emissions.

Table S3.3 Residue quality					
Emission point reference or source or description of point of measurement	**Parameter**	**Limit**	**Monitoring frequency**	**Monitoring standard or method ***	**Other specifications**
Bottom Ash	TOC	3%	Monthly in the first year of operation. Then Quarterly	Environment Agency ash sampling protocol.	
Bottom Ash	Metals (Antimony, Cadmium, Thallium, Mercury, Lead, Chromium, Copper, Manganese, Nickel, Arsenic, Cobalt, Vanadium, Zinc) and their compounds, dioxins/furans and dioxin-like PCBs.		Monthly in the first year of operation. Then Quarterly	Sampling and analysis as per Environment Agency ash sampling protocol.	
Bottom Ash	Total soluble fraction and metals (Antimony, Cadmium, Thallium, Mercury, Lead, Chromium, Copper, Manganese, Nickel, Arsenic, Cobalt, Vanadium, Zinc) soluble fractions		Before use of a new disposal or recycling route	Sampling and analysis as per Environment Agency ash sampling protocol.	
APC Residues	Metals (Antimony, Cadmium, Thallium, Mercury, Lead, Chromium, Copper, Manganese, Nickel, Arsenic, Cobalt, Vanadium, Zinc) and their compounds, dioxins/furans and dioxin-like PCBs.		Monthly in the first year of operation. Then Quarterly	Sampling and analysis as per Environment Agency ash sampling protocol.	
APC Residues	Total soluble fraction and metals (Antimony, Cadmium, Thallium, Mercury, Lead, Chromium, Copper, Manganese, Nickel, Arsenic, Cobalt, Vanadium, Zinc) soluble fractions		Before use of a new disposal or recycling route	Sampling and analysis as per Environment Agency ash sampling protocol.	

* Or other equivalent standard as agreed in writing with the Environment Agency.

Schedule 4 - Reporting

Parameters, for which reports shall be made, in accordance with conditions of this permit, are listed below.

Table S4.1 Reporting of monitoring data

Parameter	Emission or monitoring point/reference	Reporting period	Period begins
Emissions to air Parameters as required by condition 3.5.1	A1	Quarterly	1 Jan, 1 Apr, 1 Jul and 1 Oct
TOC Parameters as required by condition 3.5.1	Bottom Ash	Quarterly (but monthly for the first year of operation)	1 Jan, 1 Apr, 1 Jul and 1 Oct
Metals (Antimony, Cadmium, Thallium, Mercury, Lead, Chromium, Copper, Manganese, Nickel, Arsenic, Cobalt, Vanadium, Zinc) and their compounds, dioxins/furans and dioxin-like PCBs Parameters as required by condition 3.5.1	Bottom Ash	Quarterly (but monthly for the first year of operation)	1 Jan, 1 Apr, 1 Jul and 1 Oct
Total soluble fraction and metals (Antimony, Cadmium, Thallium, Mercury, Lead, Chromium, Copper, Manganese, Nickel, Arsenic, Cobalt, Vanadium, Zinc) soluble fractions Parameters as required by condition 3.5.1	Bottom Ash	Before use of a new disposal or recycling route	
Metals (Antimony, Cadmium, Thallium, Mercury, Lead, Chromium, Copper, Manganese, Nickel, Arsenic, Cobalt, Vanadium, Zinc) and their compounds, dioxins/furans and dioxin-like PCBs Parameters as required by condition 3.5.1	APC Residues	Quarterly (but monthly for the first year of operation)	1 Jan, 1 Apr, 1 Jul and 1 Oct
Total soluble fraction and metals (Antimony, Cadmium, Thallium, Mercury, Lead, Chromium, Copper, Manganese, Nickel, Arsenic, Cobalt, Vanadium, Zinc) soluble fractions Parameters as required by condition 3.5.1	APC Residues	Before use of a new disposal or recycling route	
Functioning and monitoring of the incineration plant as required by condition 4.2.2		Annually	1 Jan

Table S4.2: Annual production/treatment

Parameter	Units
Total Municipal Waste Incinerated	tonnes
Total Commercial Waste Incinerated	tonnes
Electrical energy produced	KWhrs
Thermal energy produced e.g. steam	KWhrs

Table S4.2: Annual production/treatment	
Parameter	**Units**
Electrical energy exported	KWhrs
Electrical energy used on installation	KWhrs
Waste heat utilised by the installation	KWhrs

Table S4.3 Performance parameters		
Parameter	**Frequency of assessment**	**Units**
Electrical energy exported, imported and used at the installation	Quarterly	KWhrs / tonne of waste incinerated
Fuel oil consumption	Quarterly	Kgs / tonne of waste incinerated
Mass of Bottom Ash produced	Quarterly	Kgs / tonne of waste incinerated
Mass of APC residues produced	Quarterly	Kgs / tonne of waste incinerated
Mass of Other solid residues produced	Quarterly	Kgs / tonne of waste incinerated
Ammonia consumption	Quarterly	Kgs / tonne of waste incinerated
Activated Carbon consumption	Quarterly	Kgs / tonne of waste incinerated
Lime consumption	Quarterly	Kgs / tonne of waste incinerated
Water consumption	Quarterly	Kgs / tonne of waste incinerated
Periods of WID abnormal operation	Quarterly	No of occasions and cumulative hours for current calendar year for each line.

Table S4.4 Reporting forms		
Media/parameter	**Reporting format**	**Date of form**
Air	Form air 1-7 or other form as agreed in writing by the Environment Agency	09/05/12
Residues	Form R1/residues1-2 or other form as agreed in writing by the Environment Agency	09/05/12
Energy usage	Form energy 1 or other form as agreed in writing by the Environment Agency	09/05/12
Other performance indicators	Form WU/RM1 or other form as agreed in writing by the Environment Agency	09/05/12

Schedule 5 - Notification

These pages outline the information that the operator must provide.

Units of measurement used in information supplied under Part A and B requirements shall be appropriate to the circumstances of the emission. Where appropriate, a comparison should be made of actual emissions and authorised emission limits.

If any information is considered commercially confidential, it should be separated from non-confidential information, supplied on a separate sheet and accompanied by an application for commercial confidentiality under the provisions of the EP Regulations.

Part A

Permit Number	
Name of operator	
Location of Facility	
Time and date of the detection	

(a) Notification requirements for any malfunction, breakdown or failure of equipment or techniques, accident, or emission of a substance not controlled by an emission limit which has caused, is causing or may cause significant pollution	
To be notified within 24 hours of detection	
Date and time of the event	
Reference or description of the location of the event	
Description of where any release into the environment took place	
Substances(s) potentially released	
Best estimate of the quantity or rate of release of substances	
Measures taken, or intended to be taken, to stop any emission	
Description of the failure or accident.	

(b) Notification requirements for the breach of a limit	
To be notified within 24 hours of detection unless otherwise specified below	
Emission point reference/ source	
Parameter(s)	
Limit	
Measured value and uncertainty	
Date and time of monitoring	
Measures taken, or intended to be taken, to stop the emission	

Time periods for notification following detection of a breach of a limit	
Parameter	**Notification period**

(c) Notification requirements for the detection of any significant adverse environmental effect	
To be notified within 24 hours of detection	
Description of where the effect on the environment was detected	
Substances(s) detected	
Concentrations of substances detected	
Date of monitoring/sampling	

Part B - to be submitted as soon as practicable

Any more accurate information on the matters for notification under Part A.	
Measures taken, or intended to be taken, to prevent a recurrence of the incident	
Measures taken, or intended to be taken, to rectify, limit or prevent any pollution of the environment which has been or may be caused by the emission	
The dates of any unauthorised emissions from the facility in the preceding 24 months.	

Name*	
Post	
Signature	
Date	

* authorised to sign on behalf of the operator

Schedule 6 - Interpretation

"abatement equipment" means that equipment dedicated to the removal of polluting substances from releases from the installation to air or water media.

"accident" means an accident that may result in pollution.

"APC residues" means air pollution control residues

"application" means the application for this permit, together with any additional information supplied by the operator as part of the application and any response to a notice served under Schedule 5 to the EP Regulations.

"authorised officer" means any person authorised by the Environment Agency under section 108(1) of The Environment Act 1995 to exercise, in accordance with the terms of any such authorisation, any power specified in section 108(4) of that Act.

"bi-annual" means twice per year with at least five months between tests;

"bottom ash" means ash falling through the grate or transported by the grate

"CEM" Continuous emission monitor

"CEN" means Commité Européen de Normalisation

"daily average" for releases of substances to air means the average of valid half-hourly averages over [a calendar day] during normal operation.

"*dioxin and furans*" means polychlorinated dibenzo-p-dioxins and polychlorinated dibenzofurans.

"disposal" means any of the operations provided for in Annex IIA to Directive 2008/98/EC of the Waste Frameword Directive.

"emissions to land" includes emissions to groundwater.

"EP Regulations" means The Environmental Permitting (England and Wales) Regulations SI 2010 No.675 and words and expressions used in this permit which are also used in the Regulations have the same meanings as in those Regulations.

"emissions of substances not controlled by emission limits" means emissions of substances to air, water or land from the activities, either from the emission points specified in schedule 3 or from other localised or diffuse sources, which are not controlled by an emission or background concentration limit..

"groundwater" means all water, which is below the surface of the ground in the saturation zone and in direct contact with the ground or subsoil.

"incineration line" means all of the incineration equipment related to a common discharge to air location.

"ISO" means International Standards Organisation.

"LOI" means loss on ignition a technique used to determine the combustible material by heating the ash residue to a high temperature

"MCERTS" means the Environment Agency's Monitoring Certification Scheme.

"PAH" means Poly-cyclic aromatic hydrocarbon, and comprises Anthanthrene, Benzo[a]anthracene, Benzo[b]fluoranthene, Benzo[k]fluoranthene, Benzo[b]naph(2,1-d)thiophene, Benzo[c]phenanthrene, Benzo[ghi]perylene, Benzo[a]pyrene, Cholanthrene, Chrysene, Cyclopenta[c,d]pyrene, Dibenzo[ah]anthracene, Dibenzo[a,i]pyrene Fluoranthene, Indo[1,2,3-cd]pyrene, Naphthalene

"PCB" means *Polychlorinated Biphenyl. Dioxin-like PCBs are the non-ortho and mono-ortho PCBs listed in the table below.*

"quarter" means a calendar year quarter commencing on 1 January, 1 April, 1 July or 1 October.

"quarterly" for reporting/sampling means after/during each 3 month period, January to March; April to June; July to September and October to December and, when sampling, with at least 2 months between each sampling date.

"recovery" means any of the operations provided for in Annex IIB to Directive 2008/98/EC of the Waste Framework Directive.

"*shut down"* is any period where the plant is being returned to a non-operational state.

"start up" is any period, where the plant has been non-operational, after igniting the auxiliary burner until waste has been fed to the plant[in sufficient quantity to cover the grate and to initiate steady-state conditions as described in the application.

"TOC" means *Total Organic Carbon.* In respect of releases to air, this means the gaseous and vaporous organic substances, expressed as TOC. In respect of Bottom Ash, this means the total carbon content of all organic species present in the ash (excluding carbon in elemental form).

"Waste code" means the six digit code referable to a type of waste in accordance with the List of Wastes (England)Regulations 2005, or List of Wastes (Wales) Regulations 2005, as appropriate, and in relation to hazardous waste, includes the asterisk.

"Waste Incineration Directive" means Directive 2000/76/EC on the incineration of waste (O.J. L 332, 28.12.2000)

"WFD" means Waste Framework Directive (Directive 2008/98/EC of the European Parliament and Council).

"WID abnormal operation" means any technically unavoidable stoppages, disturbances, or failures of the abatement plant or the measurement devices, during which the concentrations in the discharges into air and the purified waste water of the regulated substances may exceed the normal emission limit values.

"year" means calendar year ending 31 December.

Where a minimum limit is set for any emission parameter, for example pH, reference to exceeding the limit shall mean that the parameter shall not be less than that limit.

Unless otherwise stated, any references in this permit to concentrations of substances in emissions into air means:

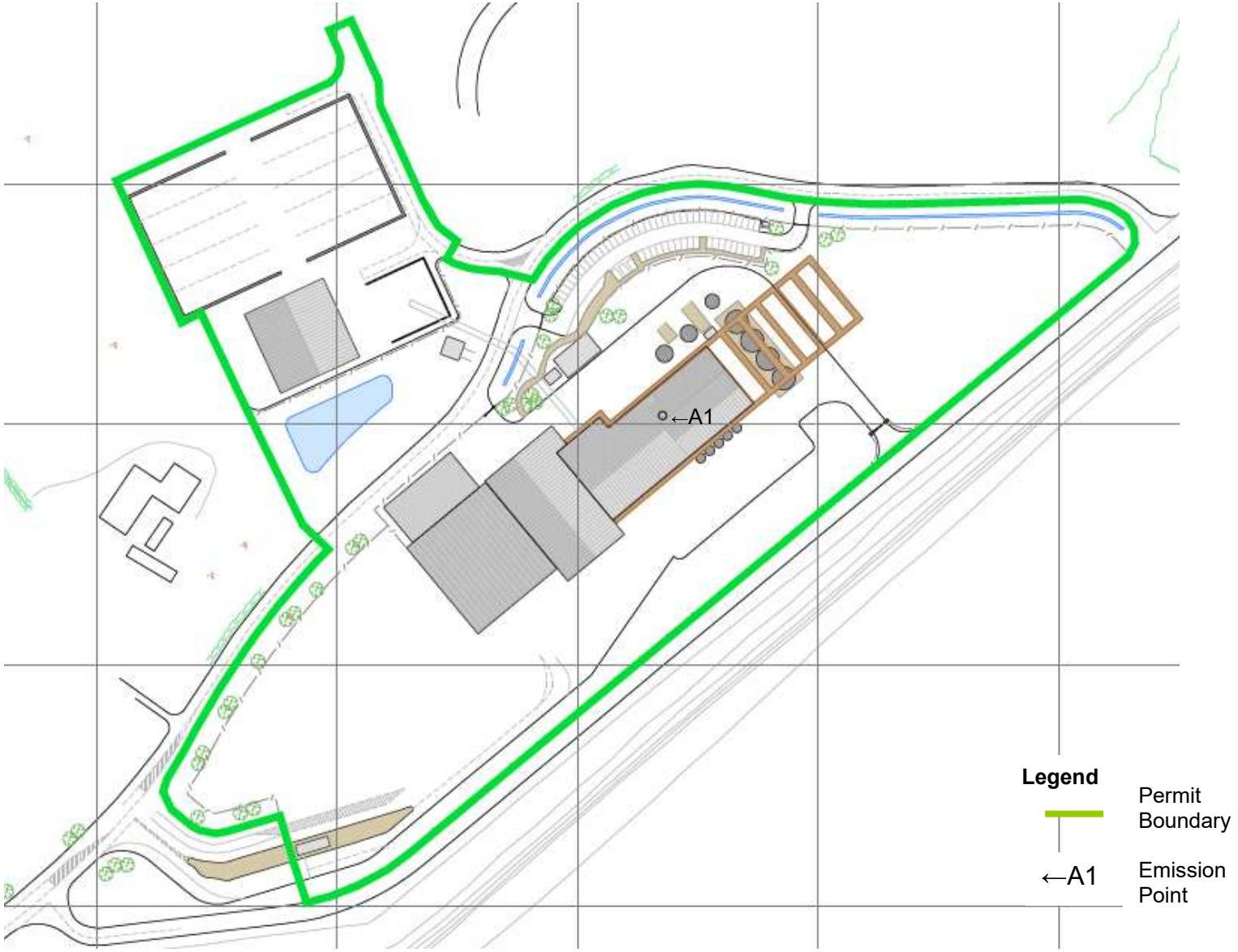
(a) in relation to gases from incineration and co-incineration plants other than those burning waste oil, the concentration in dry air at a temperature of 273K, at a pressure of 101.3 kPa and with an oxygen content of 11% dry.

For dioxins/furans and dioxin-like PCBs the determination of the toxic equivalence concentration (I-TEQ, & WHO-TEQ for dioxins/furans, WHO-TEQ for dioxin-like PCBs) stated as a release limit and/ or reporting requirement, the mass concentrations of the following congeners have to be multiplied with their respective toxic equivalence factors before summing. When reporting on measurements of dioxins/furans and dioxin-like PCBs, the toxic equivalence concentrations should be reported as a range based on: all congeners less than the detection limit assumed to be zero as a minimum, and all congeners less than the detection limit assumed to be at the detection limit as a maximum.

TEF schemes for dioxins and furans				
Congener	***I-TEF***	***WHO-TEF***		
	1990	**2005**	**1997/8**	
		Humans / Mammals	***Fish***	***Birds***
Dioxins				
2,3,7,8-TCDD	*1*	*1*	*1*	*1*
1,2,3,7,8-PeCDD	*0.5*	*1*	*1*	*1*
1,2,3,4,7,8-HxCDD	*0.1*	*0.1*	*0.5*	*0.05*
1,2,3,6,7,8-HxCDD	*0.1*	*0.1*	*0.01*	*0.01*
1,2,3,7,8,9-HxCDD	*0.1*	*0.1*	*0.01*	*0.1*
1,2,3,4,6,7,8-HpCDD	*0.01*	*0.01*	*0.001*	*<0.001*
OCDD	*0.001*	*0.0003*	*-*	*-*
Furans				
2,3,7,8-TCDF	*0.1*	*0.1*	*0.05*	*1*
1,2,3,7,8-PeCDF	*0.05*	*0.03*	*0.05*	*0.1*
2,3,4,7,8-PeCDF	*0.5*	*0.3*	*0.5*	*1*
1,2,3,4,7,8-HxCDF	*0.1*	*0.1*	*0.1*	*0.1*
1,2,3,7,8,9-HxCDF	*0.1*	*0.1*	*0.1*	*0.1*
1,2,3,6,7,8-HxCDF	*0.1*	*0.1*	*0.1*	*0.1*
2,3,4,6,7,8-HxCDF	*0.1*	*0.1*	*0.1*	*0.1*
1,2,3,4,6,7,8_HpCDF	*0.01*	*0.01*	*0.01*	*0.01*
1,2,3,4,7,8,9-HpCDF	*0.01*	*0.01*	*0.01*	*0.01*
OCDF	*0.001*	*0.0003*	*0.0001*	*0.0001*

TEF schemes for dioxin-like PCBs			
Congener	***WHO-TEF***		
	2005	**1997/8**	
	Humans / mammals	***Fish***	***Birds***
Non-ortho PCBs			
3,4,4',5-TCB (81)	*0.0001*	*0.0005*	*0.1*
3,3',4,4'-TCB (77)	*0.0003*	*0.0001*	*0.05*
3,3',4,4',5 - PeCB (126)	*0.1*	*0.005*	*0.1*
3,3',4,4',5,5'-HxCB(169)	*0.03*	*0.00005*	*0.001*
Mono-ortho PCBs			
2,3,3',4,4'-PeCB (105)	*0.00003*	*<0.000005*	*0.0001*
2,3,4,4',5-PeCB (114)	*0.00003*	*<0.000005*	*0.0001*
2,3',4,4',5-PeCB (118)	*0.00003*	*<0.000005*	*0.00001*
2',3,4,4',5-PeCB (123)	*0.00003*	*<0.000005*	*0.00001*
2,3,3',4,4',5-HxCB (156)	*0.00003*	*<0.000005*	*0.0001*
2,3,3',4,4',5'-HxCB (157)	*0.00003*	*<0.000005*	*0.0001*
2,3',4,4',5,5'-HxCB (167)	*0.00003*	*<0.000005*	*0.00001*
2,3,3',4,4',5,5'-HpCB (189)	*0.00003*	*<0.000005*	*0.00001*

Schedule 7 - Site plans



END OF PERMIT