Permit with introductory note

The Environmental Permitting (England & Wales) Regulations 2010

Helius Energy Gamma Limited

Avonmouth Biomass Power Plant
Avonmouth Docks
Bristol Port
Avonmouth

Permit number

EPR/RP3236CR

Avonmouth Biomass Power Plant
Permit number EPR/RP3236CR

Introductory note

This introductory note does not form a part of the permit

This permit controls the operation of a waste co-incineration plant. The relevant listed activity is S5.1A(1)(b): *The incineration of non-hazardous waste in a waste co-incineration plant with a capacity exceeding 3 tonnes per hour*. The permit implements the requirements of the EU Directives on Industrial Emissions.

The main features of the permit are as follows:

The Avonmouth Biomass Power plant consists of a biomass fuelled electricity generating station located adjacent to the Avonmouth Docks within the Port of Bristol.

The following operations are included within the scope of the permit:

- combustion of fuel in a boiler;
- reception, transfer and storage of virgin and recycled woodchips and pellets;
- steam turbine operation and the generation and export of electrical energy;
- cooling and condensing of the turbine exhaust steam in an air cooled condenser;
- water treatment to produce boiler quality make-up water;
- storage, pH control, and discharge of process effluent;
- storage and handling of process residues and scrap metal extracted from biomass fuel streams.

The plant consists of a single boiler which combusts biomass fuels to produce steam. The biomass fuel consists of virgin woodchips (about 10-20% of the total), recycled waste woodchips (30-35%) and virgin wood pellets (50-75%). The virgin biomass and non-hazardous waste wood to be combusted arrive on site having already met agreed pre-acceptance criteria. The plant can combust up to a maximum of 250,000 tonnes per annum of waste wood which occasionally may form 100% of the feed to the co-incinerator. In total, the plant can combust up to 850,000 tonnes per annum of wet fuel. In the fuel handling and storage areas, water mist systems and bag filtration units are used to prevent fugitive dust emissions.

The plant will use diesel fuel for start-up purposes and combustion stabilisation where required.

The steam produced in the boiler is used in a steam turbine generator set to generate up to 113 MWe. The majority of the electricity generated (99.9 MWe) is exported to the local network with the remainder used to power the plant.

Exhaust steam from the turbine is condensed in an air cooled condenser and recycled to the boiler. Steam extraction points are also included to enable the extraction of steam for a potential future external heat user such as a district heating network.

Flue gases will be treated prior to being released to the atmosphere using well established methods: selective non-catalytic reduction (SNCR) using ammonia, activated carbon injection, dry lime injection and fabric filters to remove particulate matter. The treated flue gases are vented to the atmosphere via a 100 metre high stack. Emissions from the stack are monitored in accordance with permit requirements and for process control purposes.

Main waste streams include the boiler blow down to sewer and ash residues from the boiler and flue gas cleaning. Ash is subject to testing to determine physical and chemical properties and pollution potential prior to determining the appropriate use. All wastes will be managed in a way which prevents their accidental release and enable recycling as much as practicable.

An Environmental Management System (EMS) compliant to ISO 14001 will be in place prior to commencement of commercial operation.

There are a number of ecologically sensitive sites within the distance criteria including the Severn Estuary SAC/SPA/Ramsar/SSSI and the Avon Gorge Woodland SAC/SSSI. The Severn Estuary is the closest internationally designated site to the proposal and is located approximately 150m west of the facility. It is designated for the passage, overwintering and assemblage of bird populations. The Avon Gorge Woodland SAC is cited for being representative of Tilio-Acerion Forest habitat.

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

Status Log of the permit		
Detail	**Date**	**Comments**
Application EPR/RP3236CR/A001	Duly made 19/07/13	Application for a waste co-incineration plant
Additional information received	21/08/13	Additional air quality modelling information
	24/10/13	Response to schedule 5 notice dated 26/09/13
Additional information received	07/08/14	Carbon assessment calculations
Additional information received	08/08/14	Clarification of design parameters
Additional information received	13/08/14	Validation for site baseline reference data
Permit determined	12/09/14	(Billing ref: RP3236CR)

End of Introductory Note

Permit

The Environmental Permitting (England and Wales) Regulations 2010

Permit number
EPR/RP3236CR

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

Helius Energy Gamma Limited ("the operator"),

whose registered office is

242 Marylebone Road
London
NW1 6JL

company registration number **06690364**

to operate an installation at

Avonmouth Biomass Power Plant
Avonmouth Docks
Bristol Port
Avonmouth

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

Name	Date
Thomas Ruffell	**12/09/2014**

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 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 Environment 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 disposal is necessary, this is undertaken in a manner which minimises its impact on the environment.

1.4.2 The operator shall 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 which identifies and minimises the risks of pollution relevant to that plan, 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 subsequently unsuitable for recovery by recycling.

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 fuel 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 is exceeded, other than under abnormal operating conditions; or

(c) 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 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", on a co-incineration line, any of the following situations arise, waste shall cease to be charged on that line 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 monitors 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 has reached 60 hours.

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 fuel 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

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.

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, S3.2 and S3.3 except in “abnormal operation”.

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 S3.5. 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.

3.2 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 which identifies and minimises the risks of pollution from emissions of substances not controlled by emission limits;

(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.

3.2.4 The operator shall carry out monitoring of groundwater at least once every 5 years; and of soil at least once every 10 years; to the protocol agreed in writing with the Environment Agency under PO7.

3.3 Odour

3.3.1 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.

3.3.2 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 which identifies and minimises the risks of pollution from odour;

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

3.4 Noise and vibration

3.4.1 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.

3.4.2 The operator shall:

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

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

3.5 Monitoring

3.5.1 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 S3.3;

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

(c) residue quality in table S3.5

3.5.2 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.

3.5.3 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.

3.5.4 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, S3.2, S3.3, S3.4 and S3.5 unless otherwise agreed in writing by the Environment Agency.

3.5.5 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 3.5.5(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.

3.6 Pests

3.6.1 The activities shall not give rise to the presence of pests which are likely to cause pollution, hazard or annoyance outside the boundary of the site. The operator shall not be taken to have breached this condition if appropriate measures, including, but not limited to, those specified in any approved pests management plan, have been taken to prevent or where that is not practicable, to minimise the presence of pests on the site.

3.6.2 The operator shall:

(a) if notified by the Environment Agency, submit to the Environment Agency for approval within the period specified, a pests management plan which identifies and minimises risks of pollution from pests;

(b) implement the pests 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 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 co-incineration plant in a format agreed with the Environment Agency. The report shall, as a minimum requirement (as required by Chapter IV of the Industrial Emissions 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 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 name or address; and

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

4.3.4 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.

4.3.5 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 A(1) (b)	The co-incineration of non hazardous waste and biomass fuels in a waste and biomass fuels co-incineration plant with a capacity exceeding 3 tonnes per hour.	From receipt of waste and virgin biomass fuels to emission of exhaust gas and disposal of waste arising. The co-incineration of non-hazardous waste and virgin biomass fuels including the operation of incineration line, boiler and auxiliary burners; facilities for the treatment of exhaust gases; on-site facilities for treatment and storage of residues, potable water, surface water and waste water; systems for controlling and monitoring incineration operations; and receipt, storage and handling of wastes and raw materials (including fuels). Waste types and quantities as specified in table S2.2 of this permit. Total input capacity 850,000 tonnes which includes up to 250,000 tonnes of waste.
Directly Associated Activities		
Electricity Generation	Electricity generation of up to 113 MWe electrical power using a steam turbine from energy recovered from the flue gases.	The generation of electricity for export to the grid and for on-site operations
Back up electrical generator	For providing emergency electrical power	The use of electricity for on-site plant and equipment operation in the event of supply interruption.
Firewater pumps	For providing emergency pumping of firewater	The use of firewater pumps and equipment operation in the event of a fire incident on site.

Table S1.2 Operating techniques		
Description	**Parts**	**Date Received**
Application EPR/RP3236CR/A001	Supporting Information Document AVON-R-009 in response to section 3a of application form B3 – technical standards, the installation, management systems and raw materials. Document includes a description of: ▪ plant capacity ▪ the waste feed cessation system ▪ start-up and shut-down ▪ energy recovery from the installation ▪ temperature, oxygen, water vapour and pressure at air release sampling points ▪ continuous measurement of flow and temperature at the discharge points to sewer ▪ Fugitive emission management Section entitled Environmental Risk Assessment including a description of: ▪ Odour management ▪ Noise management	19/07/13

Table S1.3 Improvement programme requirements		
Reference	**Requirement**	**Date**
IC1	The operator shall carry out a programme of tests, in accordance with a method to be agreed with the Environment Agency, 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} and $PM_{2.5}$ ranges. The programme shall conclude with the submission of a report on the results.	Within 6 months of the completion of commissioning.
IC2	The operator shall submit a written post-commissioning report to the Environment Agency which shall include: • a review of performance of the facility during the commissioning phase against the conditions of this permit. • details of optimisation of the NOx emission abatement system; how the Selective Non-Catalytic Reduction (SNCR) system and combustion settings are controlled to optimise NH_3, NOx and N_2O emissions. • details of procedures developed during commissioning for achieving and demonstrating satisfactory process control and covering the range of designed operating rates.	Within 6 months of the completion of commissioning.
IC3	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.
IC4	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 fuel is first burnt.
IC5	The operator shall carry out an assessment of the impact of emissions to air of NO_2, $PM_{2.5}$, TOC, Cd, As, Mn and Ni. The assessment shall predict the impact of the pollutants against the relevant EQS/EAL through the use of emissions monitoring data obtained during the first year of operation and air dispersion modelling. In the event that the assessment shows that an EQS/EAL can be exceeded, the report shall include proposals for further investigative work. A report of the assessment shall be made to the Environment Agency.	Within 15 months of the commencement of operations
IC6	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 complies with the requirements of BS EN 14181, specifically the requirements of QAL1, QAL2 and QAL3. • a full summary evidence compliance report	Within 4 months of the completion of commissioning. Within 18 months of the completion of commissioning

Table S1.3 Improvement programme requirements		
Reference	**Requirement**	**Date**
IC7	The operator shall carry out a programme of ambient monitoring of dust, over a period of at least one year, to verify whether or not dust emanating from the installation is a potential nuisance or a risk to human health. The programme shall have regard to Environment Agency Technical Guidance Note (Monitoring) M17 'Monitoring particulate matter in ambient air around waste facilities'. If at any time during the programme the operator measures levels that he believes could cause concern, he shall notify the Environment Agency in writing within 24 hours, and agree what remediation is required. The operator shall submit written reports to the Environment Agency as follows: • Interim summary reports at 3 month intervals • A full report within one month of concluding the programme	Within 15 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 submit 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". 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 co-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 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 for approval by the Agency. The plan shall include: • the expected emissions to the environment during the different stages of commissioning, • the expected durations of commissioning activities and estimated timeline for completion • the actions to be taken to protect the environment and report to the Agency in the event that actual emissions exceed expected emissions. Commissioning shall be carried out in accordance with the commissioning plan as approved.
PO5	After completion of furnace design and at least three calendar months before any furnace operation, the operator shall submit a written report to the Environment Agency of the details of the computational fluid dynamic (CFD) modelling or equivalent procedure to be agreed with the Environment Agency. The report shall demonstrate whether the design combustion conditions comply with the residence time and temperature requirements as defined by article 50(2) of the IED.
PO6	Prior to the commencement of commissioning, the operator shall submit a report on the baseline conditions of soil and groundwater at the installation. The report shall contain the information necessary to determine the state of soil and groundwater contamination so as to make a quantified comparison with the state upon definitive cessation of activities provided for in Article 22(3) of the IED. The report shall contain information, supplementary to that already provided in application Site Condition Report, needed to meet the information requirements of Article 22(2) of the IED.
PO7	Prior to the commencement of commissioning, the operator shall submit the written protocol referenced in condition 3.2.4 for the monitoring of soil and groundwater for approval by the Environment Agency. The protocol shall demonstrate how the Operator will meet the requirements of Articles 14(1)(b), 14(1)(e) and 16(2) of the IED. The procedure shall be implemented in accordance with the written approval from the Agency.

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 co-incineration plant	
Maximum quantity	250,000 tonnes waste wood per annum
Waste code	**Description**
02	**Wastes from agriculture, horticulture, aquaculture forestry hunting, fishing, food preparation and processing**
02 01	**Wastes from agriculture, horticulture, aquaculture forestry hunting and fishing**
02 01 03	plant-tissue waste
02 01 07	wastes from forestry
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
15	**Waste packaging, absorbents, wiping cloths, filter and materials and protective clothing no otherwise specified**
15 01	**Packaging (including separately collected municipal packaging waste)**
15 01 03	wooden packaging (where not suitable for recycling)
17	**Construction and demolition wastes (including excavated soil from contaminated sites)**
17 02	**Wood, glass and plastic**
17 02 01	wood
19	**Waste from waste management facilities, off-site waste-water treatment plants and preparation of water intended for human consumption/industrial use**
19 12	**Wastes from the mechanical treatment of waste (for example sorting, crushing, compacting, pelletising) not otherwise specified**
19 12 07	wood other than that mentioned in 19 12 06
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 38	wood other than that mentioned in 20 01 37

Schedule 3 – Emissions and monitoring

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

Emission point ref, source & location	Parameter	Limit	Reference period	Monitoring frequency	Monitoring standard(s) or method(s)
A1 – Boiler furnace: Stack as shown on drawing AVON-1035	Particulate matter	45 mg/m^3	½-hr average	Continuous measurement	BS EN 14181
	Particulate matter	15 mg/m^3	Daily average	Continuous measurement	BS EN 14181
	Total Organic Carbon (TOC)	30 mg/m^3	½-hr average	Continuous measurement	BS EN 14181
	Total Organic Carbon (TOC)	15 mg/m^3	Daily average	Continuous measurement	BS EN 14181
	Hydrogen chloride	90 mg/m^3	Periodic over minimum 1 hour period	Continuous measurement	BS EN 14181
	Hydrogen chloride	15 mg/m^3	Daily average	Continuous measurement	BS EN 14181
	Hydrogen fluoride	3 mg/m^3	Periodic over minimum 1 hour period	Quarterly in first year. Then Bi-annual	BS ISO 15713
	Hydrogen fluoride	1.5 mg/m^3	Daily average	Continuous measurement	BS EN 14181
	Carbon monoxide	150 mg/m^3	½-hr average	Continuous measurement	BS EN 14181
	Carbon monoxide	75 mg/m^3	Daily average	Continuous measurement	BS EN 14181
	Sulphur dioxide	300 mg/m^3	½-hr average	Continuous measurement	BS EN 14181
	Sulphur dioxide	75 mg/m^3	Daily average	Continuous measurement	BS EN 14181
	Oxides of nitrogen (NO and NO_2 expressed as NO_2)	600 mg/m^3	½-hr average	Continuous measurement	BS EN 14181
	Oxides of nitrogen (NO and NO_2 expressed as NO_2)	300 mg/m^3	Daily average	Continuous measurement	BS EN 14181
	Cadmium & thallium and their compounds (total)	0.05 mg/m^3	Periodic over minimum 30 minutes, maximum 8 hours	Quarterly in first year. Then Bi-annual	BS EN 14385
	Mercury and its compounds	0.05 mg/m^3	Periodic over minimum 30 minutes, maximum 8 hours	Quarterly in first year. Then Bi-annual	BS EN 13211
	Sb, As, Pb, Cr, Co, Cu, Mn, Ni, V and their compounds (total)	0.5 mg/m^3	Periodic over minimum 30 minutes, maximum 8 hours	Quarterly in first year. Then Bi-annual	BS EN 14385

Table S3.1 Point source emissions to air – emission limits and monitoring requirements					
Emission point ref, source & location	**Parameter**	**Limit**	**Reference period**	**Monitoring frequency**	**Monitoring standard(s) or method(s)**
	Ammonia (NH_3)	22.5 mg/m^3	Daily average	Continuous measurement	BS EN 14181
	Dioxins / furans (I-TEQ)	0.1 ng/m^3	Periodic over minimum 6 hours, maximum 8 hours	Quarterly in first year. Then Bi-annual	BS EN 1948 Parts 1, 2 and 3
	Dioxins / furans (WHO-TEQ Humans / Mammals)	No limit set	Periodic over minimum 6 hours, maximum 8 hours	Quarterly in first year. Then Bi-annual	BS EN 1948 Parts 1, 2 and 3
	Dioxins / furans (WHO-TEQ Fish)				
	Dioxins / furans (WHO-TEQ Birds)				
	Dioxin-like PCBs (WHO-TEQ Humans / Mammals)	No limit set	Periodic over minimum 6 hours, maximum 8 hours	Quarterly in first year. Then Bi-annual	BS EN 1948-4
	Dioxin-like PCBs (WHO-TEQ Fish)				
	Dioxin-like PCBs (WHO-TEQ Birds)				
	Specific individual poly-cyclic aromatic hydrocarbons (PAHs), as specified in Schedule 6.	No limit set	Periodic over minimum 6 hours, maximum 8 hours	Quarterly in first year. Then Bi-annual	BS ISO 11338 Parts 1 and 2.
A2 Backup diesel generator	No parameters set	No limit set	--	--	--
A3 Emergency firewater pumps	No parameters set	No limit set	--	--	--

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**
W1 – East site surface water discharge to existing surface water sewer to Kingsweston Rhine on drawing AVON-1035	No parameter set	Uncontaminated surface water via oil interceptor and RO reject water	No limit set	--	--	--
W2 – East site surface water discharge to existing surface water sewer to existing soakaway on drawing AVON-1035	No parameter set	Uncontaminated surface water via oil interceptor	No limit set	--	--	--
W3 – West site surface water discharge to Kingsweston Rhine on drawing AVON-1035	No parameter set	Uncontaminated surface water via oil interceptor	No limit 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**
Emission point to sewer as shown in the Application – Drawing No AVON-1035 dated 12/04/13	Flow rate	Effluent Treatment plant	No limit set	Daily m^3/day	Continuous	--
	Temperature		No limit set	--	Continuous	--

Table S3.4 Process monitoring requirements				
Location or description of point of measurement	**Parameter**	**Monitoring frequency**	**Monitoring standard or method**	**Other specifications**
Fluidised bed boiler.	Bed Temperature	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.
A1	Exhaust gas pressure	Continuous	Traceable to national standards	As agreed in writing with the Environment 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	--

Table S3.5 Residue quality				
Emission description	**Parameter**	**Limit**	**Monitoring frequency**	**Monitoring standard or method***
Bottom Ash	LOI	<5%	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.	None set	Monthly in the first year of operation. Then Quarterly	Sampling and analysis as per Environment Agency ash sampling protocol.
APC Residues				
Bottom Ash	Total soluble fraction and metals (Antimony, Cadmium, Thallium, Mercury, Lead, Chromium, Copper, Manganese, Nickel, Arsenic, Cobalt, Vanadium, Zinc) soluble fractions	None set	Before use of a new disposal or recycling route	Sampling and analysis as per Environment Agency ash sampling protocol.
APC Residues				

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, 1 Oct
LOI 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, 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 APC Residues	Quarterly (but monthly for the first year of operation)	1 Jan, 1 Apr, 1 Jul, 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 APC Residues	Before use of a new disposal or recycling route	--
Functioning and monitoring of the co-incineration plant as required by condition 4.2.2	--	Annually	1 Jan

Table S4.2 Annual production/treatment	
Parameter	**Units**
Total recycled wood waste co-incinerated	tonnes
Total virgin wood co-incinerated	tonnes
Electrical energy produced	MWh
Electrical energy exported	MWh
Electrical energy used on installation	MWh
Waste heat utilised by the installation	MWh
Total Bottom Ash produced	tonnes
Total APC produced	tonnes

Table S4.3 Performance parameters		
Parameter	**Frequency of assessment**	**Units**
Electrical energy exported, imported and used at the installation	Quarterly	MWh / tonne of total fuel co-incinerated
Fuel oil consumption	Quarterly	kg / tonne of total fuel co-incinerated
Mass of Bottom Ash produced	Quarterly	kg / tonne of total fuel co-incinerated
Mass of APC residues produced	Quarterly	kg / tonne of total fuel co-incinerated
Mass of Other solid residues produced	Quarterly	kg / tonne of total fuel co-incinerated
Ammonia consumption	Quarterly	kg / tonne of total fuel co-incinerated
Activated Carbon consumption	Quarterly	kg / tonne of total fuel co-incinerated
Lime consumption	Quarterly	kg / tonne of total fuel co-incinerated
Water consumption	Quarterly	kg / tonne of total fuel co-incinerated
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	Form **Air 1-9** or other form as agreed in writing by the Environment Agency	12/09/14
Residues	Form **Residues 1** or other form as agreed in writing by the Environment Agency	12/09/14
Energy usage and other performance indicators	Form **Performance 1** or other form as agreed in writing by the Environment Agency	12/09/14
Annual performance monitoring	Form **Annual Performance 1 and 2** or other form as agreed in writing by the Environment Agency	12/09/14

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 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 distributor

"*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 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 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.

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

"*Industrial Emissions Directive*", or "*IED*" means Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions.

"*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.

"*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.

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

"*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 or biomass fuel 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 or biomass fuel has been fed to the plant to initiate steady-state conditions.

"*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 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.

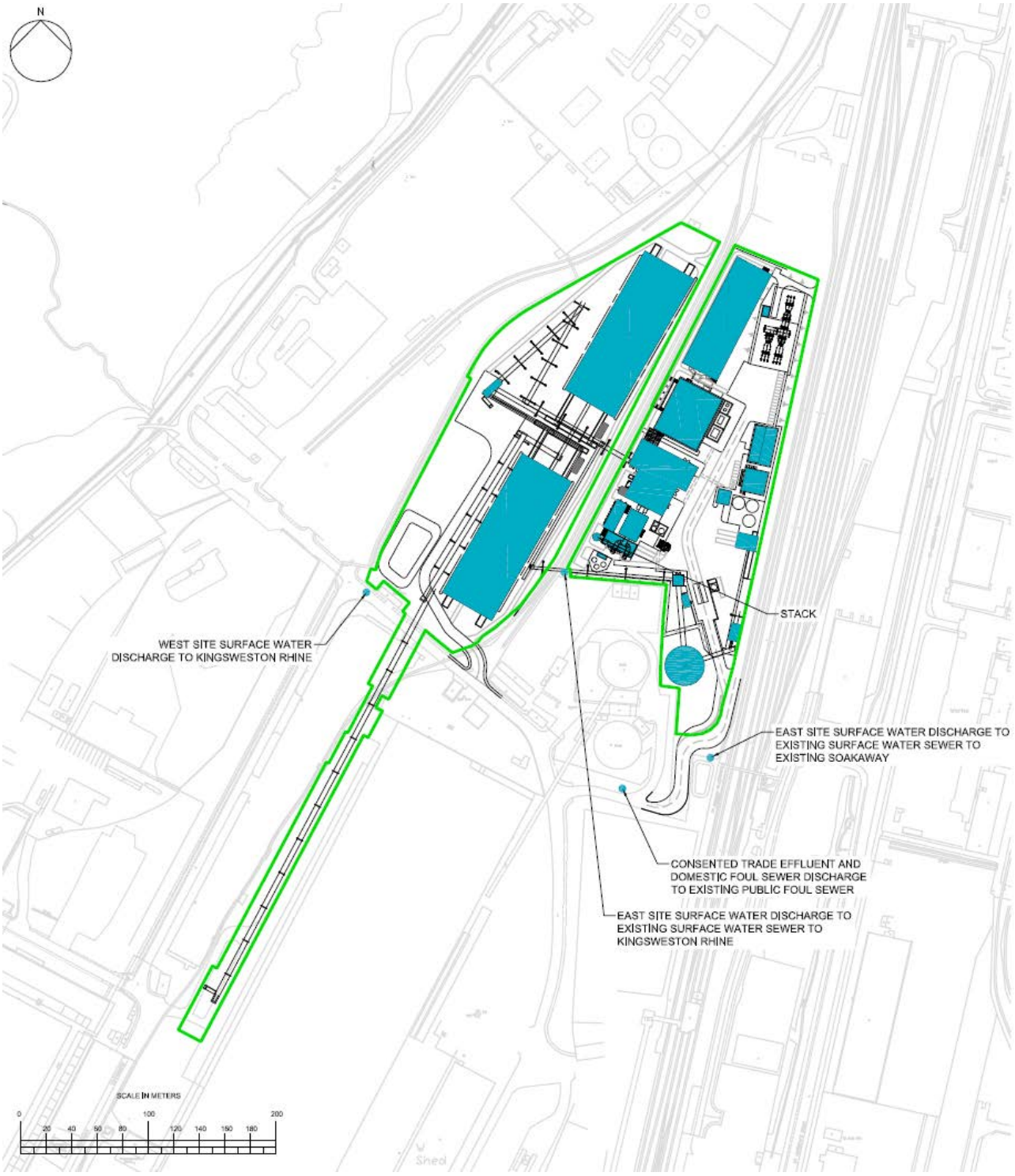
Unless otherwise stated, any references in this permit to concentrations of substances in emissions into air means in relation to gases from co-incineration plants the concentration in dry air at a temperature of 273K, at a pressure of 101.3 kPa and with an oxygen content of 6% dry.

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 then the detection limit assumed to be at the detection limit as a maximum. However the minimum value should be used when assessing compliance with the emission limit value in table S3.1.

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 plan



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