



talking about what would happen after the Permit is granted we call Veolia ES Hertfordshire Limited “the **Operator**”.

Veolia ES Hertfordshire Limited’s proposed facility is located at Rye House Energy Recovery Facility. We refer to this as “the **Installation**” in this document.

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## Glossary of acronyms used in this document

(Please note that this glossary is standard for our decision documents and therefore not all these acronyms are necessarily used in this document.)

AAD	Ambient Air Directive (2008/50/EC)
APC	Air Pollution Control
AQS	Air Quality Strategy
BAT	Best Available Technique(s)
BAT-AEL	BAT Associated Emission Level
BREF	BAT Reference Note
CEM	Continuous emissions monitor
CFD	Computerised fluid dynamics
CHP	Combined heat and power
COMEAP	Committee on the Medical Effects of Air Pollutants
CROW	Countryside and rights of way Act 2000
CV	Calorific value
CW	Clinical waste
CWI	Clinical waste incinerator
DAA	Directly associated activity – Additional activities necessary to be carried out to allow the principal activity to be carried out
DD	Decision document
EAL	Environmental assessment level
EIAD	Environmental Impact Assessment Directive (85/337/EEC)
ELV	Emission limit value
EMAS	EU Eco Management and Audit Scheme
EMS	Environmental Management System
EPR	Environmental Permitting (England and Wales) Regulations 2016 (SI 2016 No. 1154) as amended
ES	Environmental standard
EWC	European waste catalogue
FSA	Food Standards Agency
GWP	Global Warming Potential
HHRAP	Human Health Risk Assessment Protocol
HPA	Health Protection Agency (now PHE – Public Health England)
HRA	Human Rights Act 1998

HW	Hazardous waste
HWI	Hazardous waste incinerator
IBA	Incinerator Bottom Ash
IED	Industrial Emissions Directive (2010/75/EU)
IPPCD	Integrated Pollution Prevention and Control Directive (2008/1/EC) – now superseded by IED
I-TEF	Toxic Equivalent Factors set out in Annex VI Part 2 of IED
I-TEQ	Toxic Equivalent Quotient calculated using I-TEF
LCPD	Large Combustion Plant Directive (2001/80/EC) – now superseded by IED
LCV	Lower calorific value – also termed net calorific value
LfD	Landfill Directive (1999/31/EC)
LADPH	Local Authority Director(s) of Public Health
LOI	Loss on Ignition
MBT	Mechanical biological treatment
MSW	Municipal Solid Waste
MWI	Municipal waste incinerator
NOx	Oxides of nitrogen (NO plus NO <sub>2</sub> expressed as NO <sub>2</sub> )
Opra	Operator Performance Risk Appraisal
PAH	Polycyclic aromatic hydrocarbons
PC	Process Contribution
PCB	Polychlorinated biphenyls
PEC	Predicted Environmental Concentration
PHE	Public Health England
POP(s)	Persistent organic pollutant(s)
PPP	Plan/Project/Permission
PPS	Public participation statement
PR	Public register
PXDD	Poly-halogenated di-benzo-p-dioxins
PXB	Poly-halogenated biphenyls
PXDF	Poly-halogenated di-benzo furans
RDF	Refuse derived fuel
RGS	Regulatory Guidance Series
SAC	Special Area of Conservation
SCR	Selective catalytic reduction

SGN	Sector guidance note
SHPI(s)	Site(s) of High Public Interest
SNCR	Selective non-catalytic reduction
SPA(s)	Special Protection Area(s)
SS	Sewage sludge
SSSI(s)	Site(s) of Special Scientific Interest
SWMA	Specified waste management activity
TDI	Tolerable daily intake
TEF	Toxic Equivalent Factors
TGN	Technical guidance note
TOC	Total Organic Carbon
UHV	Upper heating value –also termed gross calorific value
UN_ECE	United Nations Environmental Commission for Europe
US EPA	United States Environmental Protection Agency
WFD	Waste Framework Directive (2008/98/EC)
WHO	World Health Organisation
WID	Waste Incineration Directive (2000/76/EC) – now superseded by IED

# 1 Our decision

We have decided to grant the Permit to the Applicant. This will allow it to operate the Installation, subject to the conditions in the Permit.

We consider that, in reaching that decision, we have taken into account all relevant considerations and legal requirements and that the permit will ensure that a high level of protection is provided for the environment and human health.

This Application is to operate an installation which is subject principally to the Industrial Emissions Directive (IED).

The Permit contains many conditions taken from our standard Environmental Permit template including the relevant Annexes. We developed these conditions in consultation with industry, having regard to the legal requirements of the Environmental Permitting Regulations and other relevant legislation. This document does not therefore include an explanation for these standard conditions. Where they are included in the permit, we have considered the Application and accepted the details are sufficient and satisfactory to make the standard condition appropriate. This document does, however, provide an explanation of our use of “tailor-made” or installation-specific conditions, or where our Permit template provides two or more options.

# 2 How we reached our decision

## 2.1 Receipt of Application

The Application was duly made on 04/06/2017. This means we considered it was in the correct form and contained sufficient information for us to begin our determination but not that it necessarily contained all the information we would need to complete that determination: see below.

The Applicant made no claim for commercial confidentiality. We have not received any information in relation to the Application that appears to be confidential in relation to any party.

## 2.2 Consultation on the Application

We carried out consultation on the Application in accordance with the EPR, our statutory PPS and our own internal guidance RGS Note 6 for Determinations involving Sites of High Public Interest. We consider that this process satisfies, and frequently goes beyond the requirements of the Aarhus Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters, which are directly incorporated into the IED, which applies to the Installation and the Application. We have also taken into account our obligations under the Local Democracy,

Economic Development and Construction Act 2009 (particularly Section 23). This requires us, where we consider it appropriate, to take such steps as we consider appropriate to secure the involvement of representatives of interested persons in the exercise of our functions, by providing them with information, consulting them or involving them in any other way. In this case, our consultation already satisfies the Act's requirements.

We advertised the Application by a notice placed on our website, which contained all the information required by the IED, including telling people where and when they could see a copy of the Application. We also placed an advertisement in the Hertfordshire Mercury and the Harlow Star on 13<sup>th</sup> July 2017. A drop in event was held in Hoddesdon Baptist Church hall, Burford Street, EN11 8HX on 27<sup>th</sup> July 2017.

We made a copy of the Application and all other documents relevant to our determination (see below) available to view on our Public Register at the Environment Agency office located at Apollo Court, 2 Bishop Square Business Park, St Albans Road West, Hatfield, Hertfordshire AL10 9EX. Anyone wishing to see these documents could do so and arrange for copies to be made. We also made a copy of the application available to view at Hoddesdon Library

We sent copies of the Application to the following bodies, which includes those with whom we have "Working Together Agreements":

- Health and Safety Executive
- Food Standards Agency
- Public Health England
- Local Fire Service
- Local Authority Environmental Protection Department – Epping Forest District Council, East Herts District Council and Borough of Broxbourne.
- Planning Authority – Hertfordshire County Council
- Director of Public Health – Hertfordshire

Note that we have also consulted with Thames Water and the Canal and River Trust, specifically with regard to the proposed discharge to the River Lee.

These are bodies whose expertise, democratic accountability and/or local knowledge make it appropriate for us to seek their views directly. Note under our Working Together Agreement with Natural England, we only inform Natural England of the results of our assessment of the impact of the installation on designated Habitats sites.

In addition to our advertising the Application, we undertook a programme of extended public consultation. A Public surgery was held at Hoddesdon Baptist Church Hall, Burford Street, EN11 8HX, written comments were also accepted by the Environment Agency beyond the formal consultation period. Further



details along with a summary of consultation comments and our response to the representations we received can be found in Annex 4. We have taken all relevant representations into consideration in reaching our determination. In addition to consulting on the Application we also conducted a consultation on our draft decision. This was conducted between 02/08/2018 and 24/09/2018. The draft permit and decision document were made available to view on the .gov.uk website. Adverts were also placed in the local newspapers (Hertfordshire Mercury and Harlow Star) providing details of how the public and other interested parties could access the documents and comment on the draft documents. Further details along with a summary of consultation comments and our response to the representations we received can be found in Annex 4.

### 2.3 Requests for Further Information

Although we were able to consider the Application duly made, we did in fact need more information in order to determine it, and issued an information notice on 18<sup>th</sup> August 2017. A copy of the information notice and the responses (received 13/10/2017 & 23/05/2018) were placed on our public register.

In addition to our information notice, we received additional information during the determination from the Applicant in response to a request made via email dated 20<sup>th</sup> October 2017 (Response received 30/11/2017). We also received additional information relating to the sewage discharge on 04/07/2018 and updated site drawings on 17/07/2018. We also received an updated version of the Flood Risk Assessment. We have made a copy of this information available to the public in the same way as the response to our information notice.

Following the consultation on our draft decision we requested further information from the Applicant. Whilst we were already satisfied with the Applicant's proposals the further information was requested to provide further clarification in response to some of the comments raised during the consultation. The information was received on 06/12/2018 (Further detail and clarification of proposals for managing the risk of fugitive emissions from storage and transfer of IBA); 09/11/2018 (information on relevance of plans/projects/proposals in relation to the in-combination assessments in the Habitats Assessment); 03/12/2018 (information on Phosphorous at Rye Meads); 31/10/2018 (Confirmation of stack diameter); and 06/02/2019 (further details and clarification on techniques for managing discharge to River Lee). The information requested was not considered extensive and/or significant enough as to require any specific consultation beyond making it available to view on our public register.

## 3 The legal framework

The Permit is granted under Regulation 13 of the EPR. The Environmental Permitting regime is a legal vehicle which delivers most of the relevant legal

requirements for activities falling within its scope. In particular, the regulated facility is:

- an *installation* and a *waste incineration plant* as described by the IED;
- an *operation* covered by the WFD, and
- subject to aspects of other relevant legislation which also have to be addressed.

We address some of the major legal requirements directly where relevant in the body of this document. Other requirements are covered in a section towards the end of this document.

We consider that, in granting the Permit, it will ensure that the operation of the Installation complies with all relevant legal requirements and that a high level of protection will be delivered for the environment and human health.

We explain how we have addressed specific statutory requirements more fully in the rest of this document.

## 4 The Installation

### 4.1 Description of the Installation and related issues

#### 4.1.1 The permitted activities

The Installation is subject to the EPR because it carries out an activity listed in Part 1 of Schedule 1 to the EPR:

- Section 5.1 Part A(1)(b) – incineration of non-hazardous waste in a waste incineration plant or waste co-incineration plant with a capacity of 3 tonnes or more per hour.

The IED definition of “waste incineration plants” and “waste co-incineration plants” says that it includes:

*“all incineration lines or co-incineration lines, waste reception, storage, on-site pre-treatment facilities, waste, fuel and air supply systems, boilers, facilities for the treatment of waste gases, on-site facilities for treatment or storage of residues and waste water, stacks, devices for controlling incineration or co-incineration operations, recording and monitoring incineration or co-incineration conditions.”*

Many activities which would normally be categorised as “directly associated activities” for EPR purposes (see below), such as air pollution control plant, and the ash storage bunker, are therefore included in the listed activity description.

An installation may also comprise “directly associated activities”, which at this Installation includes the generation of electricity using a steam turbine and a back up electricity generator for emergencies. These activities comprise one installation, because the incineration plant and the steam turbine are successive steps in an integrated activity.

Together, these listed and directly associated activities comprise the Installation.

The Applicant has applied for a waste transfer activity for clinical waste. This is considered a separate activity to the incineration process and is not directly associated to and so not part of the installation. It is covered by a standard rules permit (SR2008 No24 75kte – Clinical Waste Healthcare Waste Transfer Station) which has been included in the permit. The waste types accepted under the standard rules permit are not permitted for incineration under this permit with the exception of waste code 18 01 04.

The Applicant also applied for another Standard Rules activity for the discharge of domestic sewage (SR2010 No.3 Discharge of surface water: secondary treated domestic sewage with a maximum daily volume between 5 and 20 cubic metres per day). The application did not meet the standard rules criteria due the presence of protected species within the screening distance criteria, therefore we have treated this as a bespoke application and included it in the permit as a standalone water quality discharge activity.

#### 4.1.2 The Site

The proposed Energy Recovery Facility is located off Ratty’s Lane in Hoddesdon, Hertfordshire. Grid reference 538944, 209199. The site is located in an industrial area and is adjacent to the existing gas fired Rye House Power Station, the site covers an area of approximately 5.0ha. The closest residential receptor is Lock Keepers Cottage at a distance of approximately 20 meters from the installation boundary. There are a number of ecological receptors close to the installation including the Lee Valley Special Protection Area (SPA) and Ramsar Site; the Rye Meads Site of Special Scientific Interest (SSSI) and RSPB reserve; Ancient Woodland at Totwellhill Bushes; Rye House Power Station Local Wildlife Site; and Lee Valley North Local Wildlife Site. The River Lee and River Stort also run close to the installation.

The Applicant submitted a plan which we consider is satisfactory, showing the site of the Installation and its extent. A plan is included in Schedule 7 to the Permit, and the Operator is required to carry on the permitted activities within the site boundary.

Further information on the site is addressed below at 4.3.

#### 4.1.3 What the Installation does

The Applicant has described the facility as an Energy Recovery Facility. Our view is that for the purposes of IED (in particular Chapter IV) and EPR, the installation is a waste incineration plant because:

Notwithstanding the fact that energy will be recovered from the process; the process is never the less 'incineration' because it is considered that its main purpose is the thermal treatment of waste.

The key features of the Installation can be summarised in the table below.

Waste throughput, Tonnes/line	350,000/annum	40 t/hour
Waste processed	MSW and mixed commercial and industrial wastes.	
Number of lines	2	
Furnace technology	Grate	
Auxiliary Fuel	Gas Oil	
Acid gas abatement	Dry	Lime
NOx abatement	SNCR	Ammonia
Reagent consumption	Auxiliary Fuel 260 t/annum Ammonia: 740 t/annum Lime: 6070 t/annum Activated carbon: 115 t/annum Process water: 64,649 t/annum	
Flue gas recirculation	No	
Dioxin abatement	Activated carbon	
Stack	Location: NGR 538927.3, 209146.3 (Line 1). 538933.5, 209152.1 (Line 2)	
	Height, 86.75 m	Diameter, 1.70 m
Flue gas	Flow, 42.97Nm <sup>3</sup> /s	Velocity, 18.9m/s
	Temperature 138°C	
Electricity generated	33.5MWe	268000MWh
Electricity exported	30.2MWe	241600MWh

#### 4.1.4 Key Issues in the Determination

The key issues arising during this determination were the impact from Emissions to Air and Noise on nearby sensitive human and ecological receptors we therefore describe how we determined these issues in most detail in this document.

#### 4.2 The site and its protection

##### 4.2.1 Site setting, layout and history

The site lies within an industrial estate approximately east of Hoddesdon in Hertfordshire and approximately 4km west of Harlow in Essex. The site area is approximately 5 ha (including rail sidings), currently covered with concrete and/or asphalt hardstanding and compacted aggregate. The main development area is predominantly level with elevations ranging from approximately 27.3m Above Ordnance Datum (AOD) at the lowest point along the western boundary with the adjacent power station, to approximately 28.2 m AOD on the north eastern boundary of the Application Site. A thin strip of land measuring some 500m by 30m extends westwards from the northwest corner. The long northern boundary is formed by a railway line. The Site, which is adjacent to the existing gas-fired Rye House Power Station, is currently operated by Tarmac as a plant for the processing, storage and distribution of stone aggregates. Aggregates are primarily brought into and out of the Site via a rail siding which runs within the north-western site boundary. The aggregate is unloaded to various stockpiles via an overhead conveyor.

Review of historical maps and the Landmark report 3.5.1. identifies the following:

- The earliest mapping (1880) shows the Site as undeveloped greenfield land with no development shown prior to the 1960 map.
- Maps between 1960 and 1980 show the Site as part of a 'works' with the presence of railway sidings running across the northern and western sections of the site and a well is located close to the eastern boundary. The Site was historically (around 1980) occupied by the coal yard and coal handling facilities of the adjacent power station.
- Maps between 1999 and 2011 show the Site as a 'depot' with a structure located along the south eastern boundary, labelled as a conveyor from 2006, associated with the adjacent power station.

##### 4.2.2 Proposed site design: potentially polluting substances and prevention measures

The Applicant proposes a number of techniques for the prevention of pollution to ground and groundwater, these include:

- All tanks will be new, and therefore, will be in good condition.
- Bulk storage of liquids will comply with the requirements of the appropriate Pollution Prevention Guidance.
- Secondary containment, where required will comprise suitably lined bunds with 110% capacity of the largest tank within it.

- All filling points, vents and sight glasses will be located within the bund and there will be no drain through the bund floor or walls.
- All facilities required for the storage of liquids including hydrocarbons and process chemicals will be sited on impervious bases and surrounded by impervious bund walls as required.
- Drip trays and spill kits will be located at strategic points around the site.

We satisfied, based on the measures proposed in the Application that the risk of pollution of the ground and groundwater due to fugitive release from the site is low.

Under Article 22(2) of the IED the Applicant is required to provide a baseline report containing at least the information set out in paragraphs (a) and (b) of the Article before starting operation.

The Applicant has submitted a site condition report which includes a report on the baseline conditions as required by Article 22. We have reviewed that report and consider that it adequately describes the condition of the soil and groundwater prior to the start of operations.

The baseline report is an important reference document in the assessment of contamination that might arise during the operational lifetime of the installation and at cessation of activities at the installation

#### 4.2.3 Closure and decommissioning

Having considered the information submitted in the Application, we are satisfied that the appropriate measures will be in place for the closure and decommissioning of the Installation, as referred to in the Closure Report submitted with the Application. Pre-operational condition PO1 requires the Operator to have an Environmental Management System in place before the Installation is operational, and this will include a site closure plan.

At the definitive cessation of activities, the Operator has to satisfy us that the necessary measures have been taken so that the site ceases to pose a risk to soil or groundwater, taking into accounts both the baseline conditions and the site's current or approved future use. To do this, the Operator will apply to us for surrender of the permit, which we will not grant unless and until we are satisfied that these requirements have been met.

### 4.3 Operation of the Installation – general issues

#### 4.3.1 Administrative issues

The Applicant is the sole Operator of the Installation.

We are satisfied that the Applicant is the person who will have control over the operation of the Installation after the granting of the Permit; and that the

Applicant will be able to operate the Installation so as to comply with the conditions included in the Permit.

The incineration of waste is not a specified waste management activity (SWMA). The Environment Agency has considered whether any of the other activities taking place at the Installation are SWMAs and considers that the following SWMAs are taking place – Clinical waste Transfer Activity. This activity has no technical connection with the Installation and is a standalone activity which is permitted under standard rules SR2008 No24 75kte – Clinical Waste Healthcare Waste Transfer Station. The Operator will be required to comply with the conditions set in the relevant standard rules, which will form part of this permit. The relevant standard rules are referenced in the permit and can be viewed on-line at:

<https://www.gov.uk/government/publications/sr2008-no24-75kte-clinical-waste-and-healthcare-waste-transfer-station>

#### 4.3.2 Management

The Applicant has stated in the Application that they will implement an Environmental Management System (EMS) that will be certified under ISO14001. A pre-operational condition (PO1) is included requiring the Operator to provide a summary of the EMS prior to commissioning of the plant and to make available for inspection all EMS documentation. The Environment Agency recognises that certification of the EMS cannot take place until the Installation is operational. An improvement condition (IC1) is included requiring the Operator to report progress towards gaining accreditation of its EMS.

We are satisfied that appropriate management systems and management structures will be in place for this Installation, and that sufficient resources are available to the Operator to ensure compliance with all the Permit conditions.

A requirement for the Standard Rules waste activity, is that the Applicant must demonstrate they comply with the requirements of an approved competence scheme. The Applicant has done this and provided evidence of a technically competent manager for the site who holds an appropriate certificate of technical competence (awarded by WAMITAB) including a continuing competence certificate.

#### 4.3.3 Site security

Having considered the information submitted in the Application, we are satisfied that appropriate infrastructure and procedures will be in place to ensure that the site remains secure.

#### 4.3.4 Accident management

The Applicant has submitted an Accident Management Plan. Having considered the Plan and other information submitted in the Application, we are satisfied that appropriate measures will be in place to ensure that

accidents that may cause pollution are prevented but that, if they should occur, their consequences are minimised. An Accident Management Plan will form part of the Environmental Management System and must be in place prior to commissioning as required by a pre-operational condition (PO1).

The Applicant submitted a Fire Prevention Plan. We have approved this plan and incorporated this within operating techniques table S1.2 meaning that the site has to follow such requirements. Condition 3.7.1 in the permit requires that the Operator must follow the operating techniques in the approved Fire Prevention Plan.

We are satisfied that appropriate measures will be in place to prevent fires and to minimise the impact from a fire if it was to occur.

4.3.5 Off-site conditions

We do not consider that any off-site conditions are necessary.

4.3.6 Operating techniques

We have specified that the Applicant must operate the Installation in accordance with the following documents contained in the Application:

Description	Parts Included	Justification
The Application	The response to questions 3, 4 and Appendix 6 of the application form Part B3. Supporting information including Impact Assessment Report (dated Feb 2017); Energy Management Plan (dated Feb 2017); Emission Management Plan (dated Feb 2017); Resource Management Plan (dated Feb 2017); Accident Management Plan (dated Feb 2017); Technical Arrangements (dated Feb 2017) and Management Plan (dated Feb 2017).	
Response to Schedule 5 Notice (issued 18/08/2017)	Response to questions 1 to 36 and 38 to 40. Including Fire Prevention Plan (dated Oct 2017).	



Additional information received in response to email (dated 20 <sup>th</sup> October 2017)	Responses to questions 1 to 7.	
Response to Schedule 5 Notice (issued 18/08/2017)	Response to question 37.	
Additional information received in response to email (dated 15 <sup>th</sup> June 2018) - Additional information relating to sewage discharge	Response to question 1, 2, and 3	
Updated drawings - these supersede the corresponding plans and drawings submitted in the application.	All - Drawings showing installation boundary, site layout, monitoring point locations, locations of emissions, site drainage and building design.	
Additional information received in response to information request (dated 19/10/2018) – Techniques for managing fugitive emissions from storage and transfer of IBA.	Response to questions 1, 2, 3 and 4.	Further clarification on the Applicant's Operating techniques.
Additional information received in response to information request (dated 01/02/2019) – Techniques for managing discharge to River Lee.	Response to questions 1 & 2.	Further clarification on the Applicant's Operating techniques.

The details set out above describe the techniques that will be used for the operation of the Installation that have been assessed by the Environment Agency as BAT; they form part of the Permit through Permit condition 2.3.1 and Table S1.2 in the Permit Schedules.

We have also specified the following limits and controls on the use of raw materials and fuels:

<b>Raw Material or Fuel</b>	<b>Specifications</b>	<b>Justification</b>
Gas Oil	< 0.1% sulphur content	As required by Sulphur Content of Liquid Fuels Regulations.

Article 45(1) of the IED requires that the Permit must include a list of all types of waste which may be treated using at least the types of waste set out in the European Waste List established by Decision 2005/532/EC, EC, if possible, and containing information on the quantity of each type of waste, where appropriate. The Application contains a list of those wastes coded by the European Waste Catalogue (EWC) number, which the Applicant will accept in the waste streams entering the plant and which the plant is capable of burning in an environmentally acceptable way. We have specified the permitted waste types, descriptions and where appropriate quantities which can be accepted at the installation in Table S2.2.

We are satisfied that the Applicant can accept the wastes contained in Table S2.2 of the Permit because: -

- (i) these wastes are categorised as municipal waste in the European Waste Catalogue or are non-hazardous wastes similar in character to municipal waste;
- (ii) the wastes are all categorised as non-hazardous in the European Waste Catalogue and are capable of being safely burnt at the installation.
- (iii) these wastes are likely to be within the design calorific value (CV) range for the plant;
- (iv) these wastes are unlikely to contain harmful components that cannot be safely processed at the Installation.

The incineration plant will take municipal waste, which has not been source-segregated or separately collected or otherwise recovered, recycled or composted. Waste codes for separately collected fractions of waste (with the exception of waste wood classified under EWC code 20 01 38) are not included in the list of permitted wastes, except that separately collected fractions which prove to be unsuitable for recovery may be included.

The waste categories accepted as clinical waste in the waste transfer facility are set out in Standard Rules (SR2008 No.24 75kte – Clinical Waste Healthcare Waste transfer Station) these codes have been deemed suitable for this activity.

We have limited the capacity of the Installation to 350,000 tonnes per annum. This is based on the installation operating 8760 hours per year at a nominal capacity of 40 tonnes per hour (2 lines at 20 tonnes per hour).

The Installation will be designed, constructed and operated using BAT for the incineration of the permitted wastes. We are satisfied that the operating and abatement techniques are BAT for incinerating these types of waste. Our assessment of BAT is set out later in this document.

We are also satisfied that the clinical waste transfer station will comply with the requirements of the standard rules.

#### 4.3.7 Energy efficiency

(i) Consideration of energy efficiency

We have considered the issue of energy efficiency in the following ways:

1. The use of energy within, and generated by, the Installation which are normal aspects of all EPR permit determinations. This issue is dealt with in this section.
2. The extent to which the Installation meets the requirements of Article 50(5) of the IED, which requires “*the heat generated during the incineration and co-incineration process is recovered as far as practicable through the generation of heat, steam or power*”. This issue is covered in this section.
3. The combustion efficiency and energy utilisation of different design options for the Installation are relevant considerations in the determination of BAT for the Installation, including the Global Warming Potential of the different options. This aspect is covered in the BAT assessment in section 6 of this Decision Document.
4. The extent to which the Installation meets the requirement of Article 14(5) of the Energy Efficiency Directive which requires new thermal electricity generation installations with a total thermal input exceeding 20 MW to carry out a cost-benefit assessment to “*assess the cost and benefits of providing for the operation of the installation as a high-efficiency cogeneration installation*”.

**Cogeneration** means the simultaneous generation in one process of thermal energy and electrical or mechanical energy and is also known as combined heat and power (CHP)

**High-efficiency co-generation** is cogeneration which achieves at least 10% savings in primary energy usage compared to the separate generation of heat and power – see Annex II of the Energy Efficiency Directive for detail on how to calculate this.

(ii) Use of energy within the Installation

Having considered the information submitted in the Application, we are satisfied that appropriate measures will be in place to ensure that energy is used efficiently within the Installation.

The Application details a number of measures that will be implemented at the Installation in order to increase its energy efficiency, these include:

- Various areas of the Facility will be fully insulated to minimise heat losses
- The boilers will be regularly cleaned on line using steam and/or water sprays and vibrating rappers to maximise the heat transfer
- Regular maintenance of equipment such as air conditioning, condensers, refrigeration units and air compressors
- Use of Variable speed motors for larger equipment (draught fan and air cooled condenser fan drives) that are subject to extended periods of operation. Operation at reduced load with variable speed drives would result in parasitic load saving.
- Soft starters on other motor drivers to limit the start-up current.

The Application states that the specific energy consumption, a measure of total energy consumed per unit of waste processed, will be approximately 86 kWh/tonne. The installation capacity is 350,000 t/year.

Data from the BREF for Municipal Waste Incinerators shows that the range of specific energy consumptions is as in the table below.

MSWI plant size range (t/yr)	Process energy demand (kWh/t waste input)
Up to 150,000	300 – 700
150,000 – 250,000	150 – 500
More than 250,000	60 – 200

The BREF says that it is BAT to reduce the average installation electrical demand to generally below 150 kWh/tonne of waste with an LCV of 10.4 MJ/kg. The LCV in this case is expected to be 9.5 MJ/kg. Taking account of the difference in LCV, the specific energy consumption in the Application is in line with that set out above.

(iii) Generation of energy within the Installation - Compliance with Article 50(5) of the IED

Article 50(5) of the IED requires that *“the heat generated during the incineration and co-incineration process is recovered as far as practicable”*.

Our CHP Ready Guidance - February 2013 considers that BAT for energy efficiency for Energy from Waste (EfW) plant is the use of CHP in circumstances where there are technically and economically viable opportunities for the supply of heat from the outset.

The term CHP in this context represents a plant which also provides a supply of heat from the electrical power generation process to either a district heating network or to an industrial / commercial building or process. However, it is recognised that opportunities for the supply of heat do not always exist from the outset (i.e. when a plant is first consented, constructed and commissioned).

In cases where there are no immediate opportunities for the supply of heat from the outset, the Environment Agency considers that BAT is to build the plant to be CHP Ready (CHP-R) to a degree which is dictated by the likely future opportunities which are technically viable and which may, in time, also become economically viable.

The BREF says that where a plant generates electricity only, it is BAT to recover 0.4 – 0.65 MWh/ tonne of waste (based on LCV of 10.4 MJ/kg) for raw waste inputs or 0.6 – 1.0 MWh/tonne of waste (based on LCV of 15.2 MJ/kg) for pre-treated wastes. Our technical guidance note, SGN EPR S5.01, states that where electricity only is generated, 5-9 MW of electricity should be recoverable per 100,000 tonnes/annum of waste (which equates to 0.4 – 0.72 MWh/tonne of waste).

The Installation will generate electricity only and has been specified to maximise electrical output with little or no use of waste heat. The Sankey diagram in Energy Management Plan of the Application shows 33.5MW of electricity produced for an annual burn of 350,000 tonnes, which represents 9.6 MW per 100,000 tonnes/yr of waste burned (0.84 MWh/tonne of waste). The Installation is therefore above the indicative BAT range.

The SGN and Chapter IV of the IED both require that, as well as maximising the primary use of heat to generate electricity; waste heat should be recovered as far as practicable.

The location of the Installation largely determines the extent to which waste heat can be utilised, and this is a matter for the planning authority. The Applicant carried out a feasibility study and provided a CHP-R assessment as part of their application, which showed there was potential to provide district heating to local businesses; suitable opportunities are being explored, though there are no firm commitments at this stage. There is provision within the design of the steam turbine to extract low-grade steam for a district heating scheme.

We consider that, within the constraints of the location of the Installation explained above, the Installation will recover heat as far as practicable, and therefore that the requirements of Article 50(5) are met.

Compliance with Article 14(5) of the Energy Efficiency Directive and CHP ready

The operator has submitted a cost-benefit assessment of opportunities for high efficiency co-generation within 15 km of the installation in which they calculated net present value. The Applicant's assessment is considered a high level assessment that uses provisional costs which do not include land purchase costs and which cannot be established until further investigation of potential pipeline routes, existing utility provisions and landownership is completed.

If the NPV is positive (i.e. any number more than zero) it means that the investors will make a rate of return that makes the scheme commercially viable. A negative NPV means that the project will not be commercially viable. The Applicant's assessment showed a positive net present value which demonstrates that operating as a high-efficiency cogeneration installation could be financially viable. The Applicant has explained that while this CBA shows that over the long term (33 years) a district heating scheme has the potential to be viable, it should be noted that viability relies on:

- securing long term agreements (in excess of 15 years) with potential heat off takers;
- negotiating land access across a range of areas including addressing complex issues associated with access across industrial land; and
- being able to secure the relevant land rights at a price to enable the various elements of the district heating scheme to remain financially viable.

We accept that at this stage it is not possible to fully determine whether the district heating system is going to be viable and the Applicant has further work to do to establish whether this is case. We have therefore included the following pre-operational condition in the permit:

<b>PO10</b>	<p>Prior to the commencement of commissioning the operator shall submit to the Environment Agency for approval a plan for further investigation and if appropriate implementation of the district heating scheme identified in the cost benefit analysis (submitted on 13<sup>th</sup> October 2017).</p> <p>The plan shall include as a minimum:</p> <ul style="list-style-type: none"> <li>● A timetable for further investigation and if appropriate implementation</li> <li>● A description of any dependencies or further approvals required</li> <li>● A description of any changes that will need to be made to the plant</li> <li>● Whether there will be any operational changes which could affect the environmental impact of the installation [such as a reduction in stack temperature.</li> <li>● Consideration of whether a permit variation will be required</li> </ul> <p>If required to do so by the Environment Agency they shall implement the plan in accordance with the Environment Agency's written approval.</p>	
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(iv) R1 Calculation

The R1 calculation does not form part of the matters relevant to our determination. It is however a general indicator that the installation is achieving a high level of energy recovery.

The Applicant has presented a calculation of the R1 factor (as defined under the WFD 2008). The R1 formula is a measure of the extent to which energy is recovered from incineration plant. The formula is:

$$R1 = (E_p - (E_f + E_i)) / (0.97 \times (E_w + E_f))$$

Where:

- $E_p$  means annual energy produced as heat or electricity. It is calculated in the form of electricity being multiplied by 2.6 and heat for commercial use being multiplied by 1.1 (GJ/yr).
- $E_f$  means annual energy input to the system from fuels contributing to the production of steam (GJ/yr).
- $E_w$  means annual energy contained in the treated waste calculated using the net calorific value of the waste (GJ/yr).
- $E_i$  means annual energy imported excluding  $E_w$  and  $E_f$  (GJ/yr)
- 0.97 is a factor accounting for energy losses due to bottom ash and radiation.

Where municipal waste incinerators can achieve an R1 factor of 0.65 or above, the plant will be considered to be a 'recovery activity' for the purposes of the Waste Framework Directive. Again whether or not an installation achieves an R1 score of >0.65 is not a matter directly relevant to this determination. However by being classified as a 'recovery activity' rather than as a 'disposal activity', the Operator could draw financial and other benefits.

The R1 factor can only be determined from operational data over a full year. At application stage it is only possible to make a provisional assessment.  $E_p$  measures the energy recovered for use from the incinerator. This energy will have been recovered not just from the combustion of waste ( $E_w$ ), but also from the combustion of the support fuel at start up and shut down and where required to maintain the 850 °C combustion temperature ( $E_f$ ).  $E_i$  is additional energy imported, which will primarily be electricity from the grid. These parameters will depend on the way in which the plant is operated, e.g. number of start ups and shut downs.

Note that the availability or non-availability of financial incentives for renewable energy such as the ROC and RHI schemes is not a consideration in determining this application.

The Applicant has completed the R1 spreadsheet and submitted it with the application. Based on the design data we have concluded that the plant is capable of having an R1 energy efficiency factor equal to or above 0.65.

(v) Choice of Steam Turbine

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The proposed steam conditions are 440°C and 0.65 Bar. These are at the higher end of the range seen for similar plants, which will maximise energy recovery.

(vi) Choice of Cooling System

An Air Cooled Condenser (ACC) will be used to condense the steam output from the turbine with return of the condensate to the boiler. The Applicant justified this choice as follows:

The two main alternatives to an ACC are a water cooled condenser (WCC) or an evaporative condenser (EC). All are considered in Sector Guidance Note EPR 5.01 as potential BAT options. The WCC uses a recirculating water supply to condense the steam and the EC uses water which is evaporated directly from the condenser surface and lost to the atmosphere to provide the required cooling.

The main advantage of both of these water based systems is that they provide improved cooling and are not susceptible to condenser efficiency fluctuation with changing air temperature. Air cooled condensers operating in high summer air temperatures can result in insufficient condensing power and subsequently reduce the efficiency of the generating turbine. Water cooled condensing system generate less noise in comparison to the noise generated by the fans in an air cooled condenser system.

However, water cooled condensers require significant volumes of make-up water. Chemical additives are also required. Waste water is also generated which requires disposal. In addition, during winter months there is a risk of freezing and maintenance costs are high due to the wet nature of the technology. Evaporative condensers have significant potential for the release of water vapour plumes.

The ACC has been designed with enough additional capacity to maintain turbine efficiency during the summer. The noise generated by the ACC has been considered in the noise assessment and there will be no significant impacts.

We are satisfied that the use of ACC is BAT for this site.

(vii) Permit conditions concerning energy efficiency

Conditions 1.2.2 and 1.2.3 have also been included in the Permit, which require the Operator to review the options available for heat recovery on an ongoing basis, and to provide and maintain the proposed steam/hot water pass-outs.

The Operator is required to report energy usage and energy generated under condition 4.2 and Schedule 4. The following parameters are required to be



reported: total electrical energy generated; electrical energy exported; total energy usage and energy exported as heat (if any). Together with the total waste burned per year, this will enable the Environment Agency to monitor energy recovery efficiency at the Installation and take action if at any stage the energy recovery efficiency is less than proposed.

There are no site-specific considerations that require the imposition of standards beyond indicative BAT, and so the Environment Agency accepts that the Applicant's proposals represent BAT for this Installation.

#### 4.3.8 Efficient use of raw materials

Having considered the information submitted in the Application, we are satisfied that the appropriate measures will be in place to ensure the efficient use of raw materials and water.

The Operator is required to report with respect to raw material usage under condition 4.2 and Schedule 4, including consumption of lime, activated carbon and ammonia used per tonne of waste burned. This will enable the Environment Agency to assess whether there have been any changes in the efficiency of the air pollution control plant, and the operation of the SNCR to abate NO<sub>x</sub>. These are the most significant raw materials that will be used at the Installation, other than the waste feed itself (addressed elsewhere). The efficiency of the use of auxiliary fuel will be tracked separately as part of the energy reporting requirement under condition 4.2.1. Optimising reagent dosage for air abatement systems and minimising the use of auxiliary fuels is further considered in the section on BAT.

#### 4.3.9 Avoidance, recovery or disposal with minimal environmental impact of wastes produced by the activities

This requirement addresses wastes produced at the Installation and does not apply to the waste being treated there. The principal waste streams the Installation will produce are bottom ash, air pollution control residues and recovered metals.

The first objective is to avoid producing waste at all. Waste production will be avoided by achieving a high degree of burnout of the ash in the furnace, which results in a material that is both reduced in volume and in chemical reactivity. Condition 3.1.5 and associated Table S3.5 specify limits for total organic carbon (TOC) of <3% in bottom ash. Compliance with this limit will demonstrate that good combustion control and waste burnout is being achieved in the furnaces and waste generation is being avoided where practicable.

Incinerator bottom ash (IBA) will normally be classified as non-hazardous waste. However, IBA is classified on the European List of Wastes as a "mirror entry", which means IBA is a hazardous waste if it possesses a hazardous property relating to the content of dangerous substances. Monitoring of

incinerator ash will be carried out in accordance with the requirements of Article 53(3) of IED. Classification of IBA for its subsequent use or disposal is controlled by other legislation and so is not duplicated within the permit.

Air pollution control (APC) residues from flue gas treatment are hazardous waste and therefore must be sent for disposal to a landfill site permitted to accept hazardous waste, or to an appropriately permitted facility for hazardous waste treatment. The amount of APC residues is minimised through optimising the performance of the air emissions abatement plant.

In order to ensure that the IBA residues are adequately characterised, pre-operational condition PO2 requires the Operator to provide a written plan for approval detailing the ash sampling protocols. Table S3.5 requires the Operator to carry out an ongoing programme of monitoring.

The Application states that metal fractions will be recovered from the bottom ash by the use of a magnetic separator and sent for recycling. The Application also proposes that, where possible, bottom ash will be transported to a suitable recycling facility, from where it could be re-used in the construction industry as an aggregate.

Having considered the information submitted in the Application, we are satisfied that the waste hierarchy referred to in Article 4 of the WFD will be applied to the generation of waste and that any waste generated will be treated in accordance with this Article.

We are satisfied that waste from the Installation that cannot be recovered will be disposed of using a method that minimises any impact on the environment. Standard condition 1.4.1 will ensure that this position is maintained.

## **5. Minimising the Installation's environmental impact**

Regulated activities can present different types of risk to the environment, these include odour, noise and vibration; accidents, fugitive emissions to air and water; as well as point source releases to air, discharges to ground or groundwater, global warming potential and generation of waste and other environmental impacts. Consideration may also have to be given to the effect of emissions being subsequently deposited onto land (where there are ecological receptors). All these factors are discussed in this and other sections of this document.

For an installation of this kind, the principal emissions are those to air, although we also consider those to land and water.

The next sections of this document explain how we have approached the critical issue of assessing the likely impact of the emissions to air from the Installation on human health and the environment and what measures we are requiring to ensure a high level of protection.

## 5.1 Assessment Methodology

### 5.1.1 Application of Environment Agency guidance 'risk assessments for your environmental permit'

A methodology for risk assessment of point source emissions to air, which we use to assess the risk of applications we receive for permits, is set out in our guidance 'Air emissions risk assessment for your environmental permit' and has the following steps:

- Describe emissions and receptors
- Calculate process contributions
- Screen out insignificant emissions that do not warrant further investigation
- Decide if detailed air modelling is needed
- Assess emissions against relevant standards
- Summarise the effects of emissions

The methodology uses a concept of “process contribution (PC)”, which is the estimated concentration of emitted substances after dispersion into the receiving environmental media at the point where the magnitude of the concentration is greatest. The methodology provides a simple method of calculating PC primarily for screening purposes and for estimating process contributions where environmental consequences are relatively low. It is based on using dispersion factors. These factors assume worst case dispersion conditions with no allowance made for thermal or momentum plume rise and so the process contributions calculated are likely to be an overestimate of the actual maximum concentrations. More accurate calculation of process contributions can be achieved by mathematical dispersion models, which take into account relevant parameters of the release and surrounding conditions, including local meteorology – these techniques are expensive but normally lead to a lower prediction of PC.

### 5.1.2 Use of Air Dispersion Modelling

For incineration applications, we normally require the Applicant to submit a full air dispersion model as part of their application. Air dispersion modelling enables the process contribution to be predicted at any environmental receptor that might be impacted by the plant.

Once short-term and long-term PCs have been calculated in this way, they are compared with Environmental Standards (ES).

Where an Ambient Air Directive (AAD) Limit Value exists, the relevant standard is the AAD Limit Value. Where an AAD Limit Value does not exist, AAD target values, UK Air Quality Strategy (AQS) Objectives or Environmental Assessment Levels (EALs) are used. Our web guide sets out EALs which have been derived to provide a similar level of protection to Human Health and the Environment as the AAD limit values, AAD target and AQS objectives. In a very small number of cases, e.g. for emissions of lead,

the AQS objective is more stringent than the AAD value. In such cases, we use the AQS objective for our assessment.

AAD target values, AQS objectives and EALs do not have the same legal status as AAD limit values, and there is no explicit requirement to impose stricter conditions than BAT in order to comply with them. However, they are a standard for harm and any significant contribution to a breach is likely to be unacceptable.

PCs are considered **Insignificant** if:

- the **long-term** process contribution is less than **1%** of the relevant ES; and
- the **short-term** process contribution is less than **10%** of the relevant ES.

The **long term** 1% process contribution insignificance threshold is based on the judgements that:

- It is unlikely that an emission at this level will make a significant contribution to air quality;
- The threshold provides a substantial safety margin to protect health and the environment.

The **short term** 10% process contribution insignificance threshold is based on the judgements that:

- spatial and temporal conditions mean that short term process contributions are transient and limited in comparison with long term process contributions;
- the threshold provides a substantial safety margin to protect health and the environment.

Where an emission is screened out in this way, we would normally consider that the Applicant's proposals for the prevention and control of the emission to be BAT. That is because if the impact of the emission is already insignificant, it follows that any further reduction in this emission will also be insignificant.

**However, where an emission cannot be screened out as insignificant, it does not mean it will necessarily be significant.**

For those pollutants which do not screen out as insignificant, we determine whether exceedences of the relevant ES are likely. This is done through detailed audit and review of the Applicant's air dispersion modelling taking background concentrations and modelling uncertainties into account. Where an exceedance of an AAD limit value is identified, we may require the Applicant to go beyond what would normally be considered BAT for the Installation or we may refuse the application if the applicant is unable to provide suitable proposals. Whether or not exceedences are considered likely, the application is subject to the requirement to operate in accordance with BAT.

This is not the end of the risk assessment, because we also take into account local factors (for example, particularly sensitive receptors nearby such as a SSSIs, SACs or SPAs). These additional factors may also lead us to include more stringent conditions than BAT.

If, as a result of reviewing of the risk assessment and taking account of any additional techniques that could be applied to limit emissions, we consider that emissions **would cause significant pollution**, we would refuse the Application.

## **5.2 Assessment of Impact on Air Quality**

The Applicant's assessment of the impact of air quality is set out in the Impact Assessment Report submitted with the Application. The assessment comprises:

- Dispersion modelling of emissions to air from the operation of the incinerator.
- A study of the impact of emissions on nearby sensitive habitat and conservation sites.

This section of the decision document deals primarily with the dispersion modelling of emissions to air from the incinerator chimney and its impact on local air quality. The impact on conservation sites is considered in section 5.4.

The Applicant has assessed the Installation's potential emissions to air against the relevant air quality standards, and the potential impact upon local conservation and habitat sites and human health. These assessments predict the potential effects on local air quality from the Installation's stack emissions (including emissions from the 2 standby diesel generators) using the ADMS (V5.1.2) dispersion model, which is a commonly used computer model for regulatory dispersion modelling. The model used 5 years of meteorological data collected from the weather station at Stansted between 2011 and 2015. The impact of the terrain surrounding the site upon plume dispersion was considered in the dispersion modelling. The Applicant also carried out a cumulative assessment which considered the impact from nearby consented activities, see section 5.2.4 below for details of this assessment.

The air quality impact assessment (including the cumulative assessment) and the dispersion modelling upon which they were based, employed the following assumptions.

- First, they assumed that the ELVs in the Permit would be the maximum permitted by Article 46(2) and Annex VI of the IED. These substances are:
  - Oxides of nitrogen (NO<sub>x</sub>), expressed as NO<sub>2</sub>
  - Total dust
  - Carbon monoxide (CO)
  - Sulphur dioxide (SO<sub>2</sub>)
  - Hydrogen chloride (HCl)

- Hydrogen fluoride (HF)
- Metals (Cadmium, Thallium, Mercury, Antimony, Arsenic, Lead, Chromium, Cobalt, Copper, Manganese, Nickel and Vanadium)
- Polychlorinated dibenzo-para-dioxins and polychlorinated dibenzo furans (referred to as dioxins and furans)
- Gaseous and vaporous organic substances, expressed as Total Organic Carbon (TOC)
- Second, they assumed that the Installation operates continuously at the relevant long-term or short-term ELVs, i.e. the maximum permitted emission rate
- Third, the model also considered emissions of pollutants not covered by Annex VI of IED, specifically ammonia (NH<sub>3</sub>), polycyclic aromatic hydrocarbons (PAH) and Polychlorinated biphenyls (PCBs). Emission rates used in the modelling have been drawn from data in the Waste Incineration BREF and are considered further in section 5.2.5.

We are in agreement with this approach. The assumptions underpinning the model have been checked and are precautionary.

The Applicant has used background pollutant concentrations from a variety of data sources including: Project specific monitoring, local continuous monitoring, DEFRA modelled background maps; and the UK heavy metals and polycyclic aromatics, acid gas and aerosol network and the toxic organic micro pollutants network. Our view is that the background data used by the applicant is likely to be reasonably conservative.

As well as calculating the peak ground level concentration, the Applicant has modelled the concentration of key pollutants at a number of specified locations within the surrounding area.

The way in which the Applicant used dispersion models, its selection of input data, use of background data and the assumptions it made have been reviewed by the Environment Agency's modelling specialists to establish the robustness of the Applicant's air impact assessment. The output from the model has then been used to inform further assessment of health impacts and impact on habitats and conservation sites.

Our review of the Applicant's assessment leads us to agree with the Applicant's conclusions. We have also audited the air quality and human health impact assessment and similarly agree that the conclusions drawn in the reports were acceptable.

The Applicant's modelling predictions are summarised in the following sections.

### 5.2.1 Assessment of Air Dispersion Modelling Outputs

The Applicant's modelling predictions are summarised in the tables below.

The Applicant's modelling predicted peak ground level exposure to pollutants in ambient air. We have conservatively assumed that the maximum concentrations occur at the location of receptors.

Whilst we have used the Applicant's modelling predictions in the table below, we have made our own simple verification calculation of the percentage process contribution and predicted environmental concentration. These are the numbers shown in the tables below and so may be very slightly different to those shown in the Application. Any such minor discrepancies do not materially impact on our conclusions.

Pollutant	Environmental Standard		Back-ground µg/m <sup>3</sup>	Process Contribution (PC)		Predicted Environmental Concentration (PEC)	
	µg/m <sup>3</sup>			µg/m <sup>3</sup>	% of EAL	µg/m <sup>3</sup>	% of EAL
NO <sub>2</sub>	40	1	23.5	2.67	6.68	26.2	65.4
	200	2	39.5	48.1	24.1	87.6	43.8
PM <sub>10</sub>	40	1	25	0.182	0.46	25.2	63.0
	50	3	40.2	0.66	1.32	40.86	81.7
PM <sub>2.5</sub>	25	1	11.7	0.182	0.73	11.88	47.5
SO <sub>2</sub>	50	1	4.6	0.904	1.81	5.50	11.0
	266	4	7.6	13.7	5.2	21.3	8.0
	350	5	7.6	11.6	3.31	19.2	5.5
	125	6	7.6	5.56	4.4	13.16	10.5
HCl	750	7	1.4	6.07	0.8093333	7.5	1.00
HF	16	8	0.003	0.607	3.79	0.610	3.81
	160	7	0.006	0.607	0.379375	0.61	0.4
CO	10000	9	66.4	16.2	0.16	83	0.8
	30000	10	66.4	46.7	0.16	113	0.4
TOC	5	1	0.5	0.181	3.62	0.681	13.62
PAH	0.00025	1	0.00017	0.000181	72.40	0.000351	140.4
NH <sub>3</sub>	180	1	1.66	0.181	0.10	1.84	1.02
	2500	10	3.32	6.07	0.24	9.39	0.4
PCBs	0.2	1	0.00001	0.0000904	0.05	0.00010	0.05
	6	10	0.00002	0.00304	0.05	0.00306	0.1
Dioxins			2.88E-08	1.81E-09		3.06E-08	

TOC as Benzene

PAH as benzo[a]pyrene

1 = Annual Mean; 2 = 99.79th %ile of 1-hour means; 3 = 90.41st %ile of 24-hour means; 4 = 99.9th ile of 15-min means; 5 = 99.73rd %ile of 1-hour means; 6 = 99.18th %ile of 24-hour means; 7 = 1-hour average; 8 = Monthly average; 9 = Maximum daily running 8-hour mean; 10 = 1-hour maximum

**(Important – Please note that whilst the table shows PAH exceeding 100% of the EAL. Further assessment shows that process contributions are in fact less than 100% - see section 5.2.2 below for more details of the further assessment).**

Pollutant	Environmental Standard		Back-ground	Process Contribution		Predicted Environmental Concentration	
	$\mu\text{g}/\text{m}^3$			$\mu\text{g}/\text{m}^3$	% of EAL	$\mu\text{g}/\text{m}^3$	% of EAL
Cd	0.005	1	0.0002	0.000904	18.1	0.001	22.1
Tl				0.000904		0.001	
Hg	0.25	1	4.4E-06	0.000904	0.36	0.001	0.36
	7.5	2	8.8E-06	0.0304	0.41	0.030	0.405
Sb	5	1	0.0016	0.00904	0.18	0.011	0.21
	150	2	0.0032	0.304	0.20	0.307	0.205
Pb	0.25	1	0.0089	0.0009	0.36	0.010	3.92
Cu	10	1	0.016	0.00904	0.09	0.025	0.250
	200	2	0.032	0.304	0.15	0.336	0.168
Mn	0.15	1	0.0062	0.00904	6.03	0.015	10.16
	1500	2	0.012	0.304	0.02	0.316	0.0211
V	5	1	0.0013	0.00904	0.18	0.010	0.21
	1	3	0.0026	0.304	30.40	0.307	30.66
As	0.003	1	0.00056	0.00904	301.33	0.010	320.0
Cr (II)(III)	5	1	0.0016	0.00904	0.18	0.011	0.213
	150	2	0.0032	0.304	0.20	0.307	0.2048
Cr (VI)	0.0002	1	0.00032	0.00904	4520.00	0.009	4680.0
Ni	0.02	1	0.0034	0.0090	45.20	0.012	62.2

1 = Annual Mean  
 2 = 1-hr Maximum  
 3 = 24-hr Maximum

**(Important – Please note that whilst the table shows Cr (VI) and As significantly exceed 100% of the EAL. Further assessment shows that process contributions are in fact less than 100% - see section 5.2.3 below for more details of the further assessment).**

(i) Screening out emissions which are insignificant  
 From the tables above the following emissions can be screened out as insignificant in that the process contribution is < 1% of the long term ES and <10% of the short term ES. These are:

- $PM_{10}$ ,  $PM_{2.5}$ , HCl, CO,  $NH_3$ , PCB, Hg, Sb, Pb, Cu, Cr (II)(III)

Therefore we consider the Applicant's proposals for preventing and minimising the emissions of these substances to be BAT for the Installation subject to the detailed audit referred to below.

(ii) Emissions unlikely to give rise to significant pollution



Also from the tables above the following emissions (which were not screened out as insignificant) have been assessed as being unlikely to give rise to significant pollution in that the predicted environmental concentration is less than 100% (taking expected modelling uncertainties into account) of both the long term and short term ES.

- *NO<sub>2</sub>, SO<sub>2</sub>, HF, TOC, Cd/Tl, Mn, V, Ni.*

For these emissions, we have carefully scrutinised the Applicant's proposals to ensure that they are applying the Best Available Techniques to prevent and minimise emissions of these substances. This is reported in section 6 of this document.

(iii) Emissions requiring further assessment

Finally from the tables above the following emissions are considered to have the potential to give rise to pollution in that the Predicted Environmental Concentration exceeds 100% of the long term or short term ES.

- PAH (as benzo[a]pyrene), As and Cr(VI)

These pollutants required further assessment. Section 5.2.3 considers As and Cr (VI). PAH is discussed below in section 5.2.2.

5.2.2 Consideration of key pollutants

(i) Nitrogen dioxide (NO<sub>2</sub>)

The impact on air quality from NO<sub>2</sub> emissions has been assessed against the ES of 40 µg/m<sup>3</sup> as a long term annual average and a short term hourly average of 200 µg/m<sup>3</sup>. The model assumes a 70% NO<sub>x</sub> to NO<sub>2</sub> conversion for the long term and 35% for the short term assessment in line with Environment Agency guidance on the use of air dispersion modelling.

The above tables show that the peak long term PC is greater than 1% of the ES and therefore cannot be screened out as insignificant. Even so, from the table above, the emission is not expected to result in the ES being exceeded. The peak short term PC is above the level that would screen out as insignificant (>10% of the ES). However it is not expected to result in the ES being exceeded.

(ii) Particulate matter PM<sub>10</sub> and PM<sub>2.5</sub>

The impact on air quality from particulate emissions has been assessed against the ES for PM<sub>10</sub> (particles of 10 microns and smaller) and PM<sub>2.5</sub> (particles of 2.5 microns and smaller). For PM<sub>10</sub>, the ES are a long term annual average of 40 µg/m<sup>3</sup> and a short term daily average of 50 µg/m<sup>3</sup>. For PM<sub>2.5</sub> the ES of 25 µg/m<sup>3</sup> as a long-term annual average to be achieved by 2010 as a Target Value and by 2015 as a Limit Value has been used.

The Applicant's predicted impact of the Installation against these ESs is shown in the tables above. The assessment assumes that **all** particulate

emissions are present as PM<sub>10</sub> for the PM<sub>10</sub> assessment and that **all** particulate emissions are present as PM<sub>2.5</sub> for the PM<sub>2.5</sub> assessment.

The above assessment is considered to represent a worst case assessment in that: -

- It assumes that the plant emits particulates continuously at the IED Annex VI limit for total dust, whereas actual emissions from similar plant are normally lower.
- It assumes all particulates emitted are below either 10 microns (PM<sub>10</sub>) or 2.5 microns (PM<sub>2.5</sub>), when some are expected to be larger.

We have reviewed the Applicant's particulate matter impact assessment and are satisfied in the robustness of the Applicant's conclusions.

The above assessment shows that the predicted process contribution for emissions of PM<sub>10</sub> is below 1% of the long term ES and below 10% of the short term ES and so can be screened out as insignificant. Therefore we consider the Applicant's proposals for preventing and minimising the emissions of particulates to be BAT for the Installation.

The above assessment also shows that the predicted process contribution for emissions of PM<sub>2.5</sub> is also below 1% of the ES. Therefore the Environment Agency concludes that particulate emissions from the installation, including emissions of PM<sub>10</sub> or PM<sub>2.5</sub>, will not give rise to significant pollution.

There is currently no emission limit prescribed nor any continuous emissions monitor for particulate matter specifically in the PM<sub>10</sub> or PM<sub>2.5</sub> fraction. Whilst the Environment Agency is confident that current monitoring techniques will capture the fine particle fraction (PM<sub>2.5</sub>) for inclusion in the measurement of total particulate matter, an improvement condition (IC2) has been included that will require a full analysis of particle size distribution in the flue gas, and hence determine the ratio of fine to coarse particles. In the light of current knowledge and available data however the Environment Agency is satisfied that the health of the public would not be put at risk by such emissions, as explained in section 5.3.3.

(iii) Acid gases, SO<sub>2</sub>, HCl and HF

From the tables above, emissions of HCl can be screened out as insignificant in that the process contribution is <10% of the short term ES. There is no long term ES for HCl. HF has 2 assessment criteria – a 1-hr ES and a monthly ES – for short term emissions are <10% of the EQS and are considered insignificant. For long term emissions the process contribution is marginally above the 1% insignificance threshold of the monthly ES, however the PEC is significantly less than the ES and therefore we can conclude that it is unlikely to give rise to significant pollution, provided the Applicant is using BAT, this is considered further in Section 6.

There is no long term EAL for SO<sub>2</sub> for the protection of human health. Protection of ecological receptors from SO<sub>2</sub> for which there is a long term ES is considered in section 5.4.

Emissions of SO<sub>2</sub> can also be screened out as insignificant in that the short term process contribution is also <10% of each of the three short term ES values. Therefore we consider the Applicant's proposals for preventing and minimising the emissions of SO<sub>2</sub> to be BAT for the Installation.

(iv) Emissions to Air of CO, VOCs, PAHs, PCBs, Dioxins and NH<sub>3</sub>

The above tables show that for CO emissions, the peak long term PC is less than 1% of the ES and the peak short term PC is less than 10% of the ES and so can be screened out as insignificant. Therefore we consider the Applicant's proposals for preventing and minimising the emissions of these substances to be BAT for the Installation.

The above tables show that for VOC, the peak long term PC is greater than 1% of the ES and therefore cannot be screened out as insignificant. Even so, from the table above, the emission is not expected to result in the ES being exceeded.

The above tables show that for PCB emissions, the peak long term PC is less than 1% of the ES and the peak short term PC is less than 10% of the ES for PCBs and so can be screened out as insignificant. Therefore we consider the Applicant's proposals for preventing and minimising the emissions of these substances to be BAT for the Installation.

With regards to PAH, the above table shows that for PAH emissions the process contribution is significantly greater than 1% and the PEC exceeds the relevant ES. Due to this the Applicant has provided further assessment. The initial assessment was based on a highly conservative emission rate, so in order to predict what actual emission rates are likely the Applicant used actual PAH (as benzo[a]pyrene) emission monitoring data from the Veolia Sheffield Energy Recovery Facility, which is a similar process and has a similar feedstock to that proposed for this application. Using an emission rate of PAH based on this monitoring, the Applicant's modelled process contribution was predicted to be 0.07% and therefore < 1% of the long term ES. The Applicant concluded that the emissions are likely to be insignificant.

Note that the Applicant used the ES for benzo[a]pyrene (BaP) for their assessment of the impact of PAH. We agree that the use of the BaP ES is sufficiently precautionary.

There is no ES for dioxins and furans as the principal exposure route for these substances is by ingestion and the risk to human health is through the accumulation of these substances in the body over an extended period of time. This issue is considered in more detail in section 5.3

From the tables above NH<sub>3</sub> can be screened out as insignificant in that the process contribution is < 1% of the long term ES and <10% of the short term ES.

The ammonia emission is based on a release concentration of 10 mg/m<sup>3</sup>. We are satisfied that this level of emission is consistent with the operation of a well controlled SNCR NO<sub>x</sub> abatement system.

Whilst all emissions cannot be screened out as insignificant, the Applicant's modelling shows that the installation is unlikely to result in a breach of the ES. The Applicant is required to prevent, minimise and control PAH and VOC emissions using BAT, this is considered further in Section 6. We are satisfied that PAH and VOC emissions will not result in significant pollution.

#### (V) Summary

For the above emissions to air, for those emissions that do not screen out, we have carefully scrutinised the Applicant's proposals to ensure that they are applying the BAT to prevent and minimise emissions of these substances. This is reported in section 6 of this document. We consider the Applicant's proposals for preventing and minimising emissions to be BAT for the Installation and we are satisfied that the above emissions to air will not result in significant pollution. Dioxins and furans are considered further in section 5.3.2.

#### 5.2.3 Assessment of Emission of Metals

The Applicant has assessed the impact of metal emissions to air, as previously described.

Annex VI of IED sets three limits for metal emissions:

- An emission limit value of 0.05 mg/m<sup>3</sup> for mercury and its compounds (formerly WID group 1 metals).
- An aggregate emission limit value of 0.05 mg/m<sup>3</sup> for cadmium and thallium and their compounds (formerly WID group 2 metals).
- An aggregate emission limit of 0.5 mg/m<sup>3</sup> for antimony, arsenic, lead, chromium, cobalt, copper, manganese, nickel and vanadium and their compounds (formerly WID group 3 metals).

In addition the UK is a Party to the Heavy Metals Protocol within the framework of the UN-ECE Convention on long-range trans-boundary air pollution. Compliance with the IED Annex VI emission limits for metals along with the Application of BAT also ensures that these requirements are met.

In section 5.2.1 above, the following emissions of metals were screened out as insignificant:

- Hg, Pb, Cu & Cr(II)(III)

Also in section 5.2.1, the following emissions of metals whilst not screened out as insignificant were assessed as being unlikely to give rise to significant pollution:

- Cd, Tl, Ni and Mn

This left emissions of Cr (VI) & As requiring further assessment. For all other metals, the Applicant has concluded that exceedences of the EAL for all metals are not likely to occur.

Where Annex VI of the IED sets an aggregate limit, the Applicant's assessment assumes that each metal is emitted individually at the relevant aggregate emission limit value. This is something which can never actually occur in practice as it would inevitably result in a breach of the limit, and so represents a very much worst case scenario.

For As the Applicant's further assessment (instead of assuming the very worst case scenario as detailed above) used representative emissions data from other municipal waste incinerators using our guidance note. Please refer to "Guidance to Applicants on Impact Assessment for Group 3 Metals Stack Releases – version 4" for further details.

Based on the above, emissions of AS were screened out as insignificant:

Cr(VI) also required further assessment. The 2009 report of the Expert Panel on Air Quality Standards (EPAQS) – "Guidelines for Metal and Metalloids in Ambient Air for the Protection of Human Health", sets non statutory ambient air quality guidelines for Arsenic, Nickel and Chromium (VI). These guidelines have been incorporated as ESs in our guidance 'Air emissions risk assessment for your environmental permit'

Cr (VI) is not specifically referenced in Annex VI of IED, which includes only total Chromium as one of the nine Group 3 metals, the impact of which has been assessed above. The EPAQS guidelines refer only to that portion of the metal emissions contained within PM<sub>10</sub> in ambient air. The guideline for Cr (VI) is 0.2 ng/m<sup>3</sup>.

Measurement of Cr (VI) at the levels anticipated at the stack emission points is expected to be difficult, with the likely levels being below the level of detection by the most advanced methods. The Applicant derived a Cr (VI) emission rate from a measured total chromium concentration from Veolia's Sheffield Energy recovery Facility, of 0.00062 mg/Nm<sup>3</sup>. The Applicant stated that this is towards the lower end of the range quoted within Environment Agency guidance on assessing group 3 metal emission. This result was then factored to obtain a Cr (VI) emission concentration using the highest ratio of total chromium to Cr (VI) in Table A1 of the Environment Agency guidance note (1.2%), giving a chromium (VI) emission rate of 7.4 x 10<sup>-6</sup>mg/Nm<sup>3</sup>, or a mass emission rate of 2x10<sup>-7</sup> g/s per stack.

There is little data available on the background levels of Cr(VI). Taking a precautionary approach. We have assumed that the background level already exceeds the ES.

The Applicant has used the above data to model the predicted Cr(VI) impact. The PC is predicted as 0.07% of the EAL.

This assessment shows that emissions of Cr (VI) screen out as insignificant and therefore any increase to the background will be negligible. We agree with the Applicant's conclusions. The installation has been assessed as meeting BAT for control of metal emissions to air. See section 6 of this document.

IC6 has been set to confirm this assessment for Cr(VI) and As based on 12 months of monitoring data.

#### 5.2.4 Consideration of Local Factors

##### (i) Impact on Air Quality Management Areas (AQMA)

The Applicant has identified a number of Air Quality Management Areas (AQMA) within 10km of the installation. These include Hertford AQMA, Epping Forest AQMA, Broxbourne AQMA, Enfield AQMA, Enfield Whole Borough AQMA and Sawbridgeworth AQMA.

From the Applicants model, the process contribution at all points within each of the AQMA is predicted to be below 1% of the ES for NO<sub>2</sub> and PM<sub>10</sub> (where applicable) and can be considered insignificant – note that the process contribution will be significantly less than the process contributions shown in the tables above and unlikely to be discernable at the AQMA. Therefore even though the background is already above the ES, the contribution from the Installation is negligible. This approach is in accordance with Defra's IED EPR Guidance on Part A installations.

##### (ii) Cumulative Assessment

It was recognised by the Applicant that potential emissions from the nearby consented, by not yet operational Trent Developments Sustainable Energy Facility (Anaerobic Digestion and Advanced Thermal Treatment Plant) would not be captured in the baseline air quality data used in the Application. Also emissions from the nearby Rye House Power Station, which is operational but not operating at full capacity would also not be captured in the background air quality data. Therefore in order to assess the significance of the potential contributions on background air quality the Applicant produced a 'cumulative assessment'. The cumulative assessment was based on the maximum combined process contributions from the across the model domain. This would represent a worst case approach.

The Applicant's assessment showed that the modelled PECs are all within the environmental standards for the protection of human health, with the exception of Cr(VI). The annual mean PEC for Cr(VI) was predicted to be 161% of the environmental standard, due almost entirely to the estimated background concentration (derived from project specific monitoring). The predicted combined contribution from the Installation and other facilities listed above at the point of maximum impact was 1.1% of the environmental standard. The predicted value is comprised almost entirely of the PC from the Trent Developments Sustainable Energy Facility, which is assumed to be emitting Cr(VI) at the maximum concentration in the range reported within the EA metals assessment guidance. The predicted PC at the same location for Rye House ERF is less than 0.1% of the environmental standard. Therefore the contribution from the proposed ERF will be insignificant.

As part of our audit of the Applicant's Air Quality Assessment we also carried out our own assessment of the potential impact from other consented operations. In considering emissions from the other consented plants we audited and analysed the key emissions on a risk basis and included any contributions, from other plant into the background. These included Trent Developments Sustainable Energy Facility (Hoddesdon Anaerobic Digestion Facility and Hoddesdon Energy from Waste Plant (also known as Advanced Thermal Treatment (ATT) Plant)), Rye House Power Station (RHPS) and road vehicle contribution associated with the ERF. The contributions from these additional sources have been checked against previous assessment modelling work carried out by us for the Trent Developments Sustainable Energy Facility and Rye House Power Station. Based on this, and following the permit guidance, our audit and check modelling agree with the Applicant's conclusions.

It should also be noted that the Applicant's assessment of Rye House ERF takes account of changes in traffic flow associated with the installation and other operational installations in the area (Rye House Power Station and Trent Developments Sustainable Energy Facility). It also takes account of predicted changes to traffic flow and composition in the future (year 2021). This includes predicted future changes to baseline traffic, traffic associated with the Rye ERF development and cumulative development traffic. For the purposes of our audit and assessment we included the traffic related impacts in our background concentrations.

### **5.3 Human health risk assessment**

#### **5.3.1 Our role in preventing harm to human health**

The Environment Agency has a statutory role to protect the environment and human health from all processes and activities it regulates. We assessed the effects on human health for this application in the following ways:

##### **i) Applying Statutory Controls**

The plant will be regulated under EPR. These regulations include the requirements of relevant EU Directives, notably, the industrial emissions directive (IED), the waste framework directive (WFD), and ambient air directive (AAD).

The main conditions in an EfW permit are based on the requirements of the IED. Specific conditions have been introduced to specifically ensure compliance with the requirements of Chapter IV. The aim of the IED is to prevent or, where that is not practicable, to reduce emissions to air, water and land and prevent the generation of waste, in order to achieve a high level of protection of the environment taken as a whole. IED achieves this aim by setting operational conditions, technical requirements and emission limit values to meet the requirements set out in Articles 11 and 18 of the IED. These requirements include the application of BAT, which may in some circumstances dictate tighter emission limits and controls than those set out in Chapter IV of IED on waste incineration and co-incineration plants. The assessment of BAT for this installation is detailed in section 6 of this document.



## ii) Environmental Impact Assessment

Industrial activities can give rise to odour, noise and vibration, accidents, fugitive emissions to air and water, releases to air (including the impact on Photochemical Ozone Creation Potential (POCP)), discharges to ground or groundwater, global warming potential and generation of waste. For an installation of this kind, the principal environmental effects are through emissions to air, although we also consider all of the other impacts listed. Section 5.1 and 5.2 above explain how we have approached the critical issue of assessing the likely impact of the emissions to air from the Installation on human health and the environment and any measures we are requiring to ensure a high level of protection.

## iii) Expert Scientific Opinion

We take account of the views of national and international expert bodies. The gathering of evidence is a continuing process. Although gathering evidence is not our role we keep the available evidence under review. The following is a summary of some of the publications which we have considered (in no particular order).

An independent review of evidence on the health effects of municipal waste incinerators was published by **DEFRA** in 2004. It concluded that there was no convincing link between the emissions from MSW incinerators and adverse effects on public health in terms of cancer, respiratory disease or birth defects. On air quality effects, the report concluded “Waste incinerators contribute to local air pollution. This contribution, however, is usually a small proportion of existing background levels which is not detectable through environmental monitoring (for example, by comparing upwind and downwind levels of airborne pollutants or substances deposited to land). In some cases, waste incinerator facilities may make a more detectable contribution to air pollution. Because current MSW incinerators are located predominantly in urban areas, effects on air quality are likely to be so small as to be undetectable in practice.”

The European Integrated Pollution Prevention and Control Bureau stated in the Reference Document on the Best Available Techniques for Waste Incineration August 2006 “European health impact assessment studies, on the basis of current evidence and modern emission performance, suggest that the local impacts of incinerator emissions to air are either negligible or not detectable.”

**HPA** (now **PHE**) in 2009 stated that “The Health Protection Agency has reviewed research undertaken to examine the suggested links between emissions from municipal waste incinerators and effects on health. While it is not possible to rule out adverse health effects from modern, well regulated municipal waste incinerators with complete certainty, any potential damage to the health of those living close-by is likely to be very small, if detectable”. In January 2012 **PHE** confirmed they would be undertaking a study to look for

evidence of any link between municipal waste incinerators and health outcomes including low birth weight, still births and infant deaths.

The first part of the study was published on 31<sup>st</sup> October (*Fetal growth, stillbirth, infant mortality and other birth outcomes near UK municipal waste incinerators; retrospective population based cohort and case-control study. Ghosh, R.E. Environment International, 31/10/2018*). The study found that living near an incinerator and being exposed to emissions from an incinerator were not associated with an additional risk of any of the birth outcomes investigated. These were multiple births, sex ratio, low birth weight, still birth, preterm delivery, neonatal mortality (deaths in the first month of life) and post-neonatal mortality (deaths from the second month of life up to the end of the 12<sup>th</sup> month of life).

PHE's position remains that modern, well run municipal waste incinerators are not a significant risk to public health.

**Policy Advice from Government** also points out that the minimal risk from modern incinerators. Paragraph 22 (Chapter 5) of WS2007 says that "research carried out to date has revealed no credible evidence of adverse health outcomes for those living near incinerators." It points out that "the relevant health effects, mainly cancers, have long incubation times. But the research that is available shows an absence of symptoms relating to exposures twenty or more years ago when emissions from incinerators were much greater than is now the case." **Paragraph 30 of PPS10** explains that "modern, appropriately located, well run and well regulated waste management facilities should pose little risk to public health."

The **Committee on Carcinogenicity of Chemicals in Food, Consumer Products and the Environment (CoC)** issued a statement in 2000 which said that "any potential risk of cancer due to residency (for periods in excess of 10 years) near to municipal solid waste incinerators was exceedingly low and probably not measurable by the most modern epidemiological techniques." In 2009, CoC considered six further relevant epidemiological papers that had been published since the 2000 statement, and concluded that "there is no need to change the advice given in the previous statement in 2000 but that the situation should be kept under review".

**Republic of Ireland Health Research Board** report stated that "It is hard to separate the influences of other sources of pollutants, and other causes of cancer and, as a result, the evidence for a link between cancer and proximity to an incinerator is not conclusive".

The **Food Safety Authority of Ireland (FSAI) (2003)** investigated possible implications on health associated with food contamination from waste incineration and concluded: "In relation to the possible impact of introduction of waste incineration in Ireland, as part of a national waste management strategy, on this currently largely satisfactory situation, the FSAI considers that such incineration facilities, if properly managed, will not contribute to dioxin levels in the food supply to any significant extent. The risks to health

and sustainable development presented by the continued dependency on landfill as a method of waste disposal far outweigh any possible effects on food safety and quality.”

**Health Protection Scotland (2009)** considered scientific studies on health effects associated with the incineration of waste particularly those published after the Defra review discussed earlier. The main conclusions of this report were: “(a) For waste incineration as a whole topic, the body of evidence for an association with (non-occupational) adverse health effects is both inconsistent and inconclusive. However, more recent work suggests, more strongly, that there may have been an association between emissions (particularly dioxins) in the past from industrial, clinical and municipal waste incinerators and some forms of cancer, before more stringent regulatory requirements were implemented. (b) For individual waste streams, the evidence for an association with (non-occupational) adverse health effects is inconclusive. (c) The magnitude of any past health effects on residential populations living near incinerators that did occur is likely to have been small. (d) Levels of airborne emissions from individual incinerators should be lower now than in the past, due to stricter legislative controls and improved technology. Hence, any risk to the health of a local population living near an incinerator, associated with its emissions, should also now be lower.”

The **US National Research Council Committee on Health Effects of Waste Incineration (NRC) (NRC 2000)** reviewed evidence as part of a wide ranging report. The Committee view of the published evidence was summarised in a key conclusion: “Few epidemiological studies have attempted to assess whether adverse health effects have actually occurred near individual incinerators, and most of them have been unable to detect any effects. The studies of which the committee is aware that did report finding health effects had shortcomings and failed to provide convincing evidence. That result is not surprising given the small populations typically available for study and the fact that such effects, if any, might occur only infrequently or take many years to appear. Also, factors such as emissions from other pollution sources and variations in human activity patterns often decrease the likelihood of determining a relationship between small contributions of pollutants from incinerators and observed health effects. Lack of evidence of such relationships might mean that adverse health effects did not occur, but it could mean that such relationships might not be detectable using available methods and sources.”

The **British Society for Ecological Medicine (BSEM) published a report in 2005** on the health effects associated with incineration and concluded that “Large studies have shown higher rates of adult and childhood cancer and also birth defects around municipal waste incinerators: the results are consistent with the associations being causal. A number of smaller epidemiological studies support this interpretation and suggest that the range of illnesses produced by incinerators may be much wider. Incinerator emissions are a major source of fine particulates, of toxic metals and of more than 200 organic chemicals, including known carcinogens, mutagens, and hormone disrupters. Emissions also contain other unidentified compounds

whose potential for harm is as yet unknown, as was once the case with dioxins. Abatement equipment in modern incinerators merely transfers the toxic load, notably that of dioxins and heavy metals, from airborne emissions to the fly ash. This fly ash is light, readily windborne and mostly of low particle size. It represents a considerable and poorly understood health hazard.”

The BSEM report was reviewed by the HPA and they concluded that “Having considered the BSEM report the HPA maintains its position that contemporary and effectively managed and regulated waste incineration processes contribute little to the concentrations of monitored pollutants in ambient air and that the emissions from such plants have little effect on health.” The BSEM report was also commented on by the consultants who produced the Defra 2004 report referred to above. They said that “It fails to consider the significance of incineration as a source of the substances of concern. It does not consider the possible significance of the dose of pollutants that could result from incinerators. It does not fairly consider the adverse effects that could be associated with alternatives to incineration. It relies on inaccurate and outdated material. In view of these shortcomings, the report’s conclusions with regard to the health effects of incineration are not reliable.”

A **Greenpeace** review on incineration and human health concluded that a broad range of health effects have been associated with living near to incinerators as well as with working at these installations. Such effects include cancer (among both children and adults), adverse impacts on the respiratory system, heart disease, immune system effects, increased allergies and congenital abnormalities. Some studies, particularly those on cancer, relate to old rather than modern incinerators. However, modern incinerators operating in the last few years have also been associated with adverse health effects.”

The Health Protection Scotland report referred to above says that “the authors of the Greenpeace review do not explain the basis for their conclusion that there is an association between incineration and adverse effects in terms of criteria used to assess the strength of evidence. The weighting factors used to derive the assessment are not detailed. The objectivity of the conclusion cannot therefore be easily tested.”

From this published body of scientific opinion, we take the view stated by the HPA that “While it is not possible to rule out adverse health effects from modern, well regulated municipal waste incinerators with complete certainty, any potential damage to the health of those living close-by is likely to be very small, if detectable”. We therefore ensure that permits contain conditions which require the installation to be well-run and regulate the installation to ensure compliance with such permit conditions.

#### **iv) Health Risk Models**

Comparing the results of air dispersion modelling as part of the Environmental Impact assessment against European and national air quality standards effectively makes a health risk assessment for those pollutants for which a standard has been derived. These air quality standards have been developed

primarily in order to protect human health via known intake mechanisms, such as inhalation and ingestion. Some pollutants, such as dioxins, furans and dioxin like PCBs, have human health impacts at lower ingestion levels than lend themselves to setting an air quality standard to control against. For these pollutants, a different human health risk model is required which better reflects the level of dioxin intake.

Models are available to predict the dioxin, furan and dioxin like PCBs intake for comparison with the Tolerable Daily Intake (TDI) recommended by the Committee on Toxicity of Chemicals in Food, Consumer Products and the Environment, known as COT. These include the HHRAP model.

HHRAP has been developed by the US EPA to calculate the human body intake of a range of carcinogenic pollutants and to determine the mathematic quantitative risk in probabilistic terms. In the UK, in common with other European Countries, we consider a threshold dose below which the likelihood of an adverse effect is regarded as being very low or effectively zero.

The TDI is the amount of a substance that can be ingested daily over a lifetime without appreciable health risk. It is expressed in relation to bodyweight in order to allow for different body size, such as for children of different ages. In the UK, the COT has set a TDI for dioxins, furans and dioxin like PCB's of 2 picograms I-TEQ/Kg-body weight/day (N.B. a picogram is a million millionths (10-12) of a gram).

In addition to an assessment of risk from dioxins, furans and dioxin like PCB's, the HHRAP model enables a risk assessment from human intake of a range of heavy metals. In principle, the respective ES for these metals are protective of human health. It is not therefore necessary to model the human body intake.

COMEAP developed a methodology based on the results of time series epidemiological studies which allows calculation of the public health impact of exposure to the classical air pollutants (NO<sub>2</sub>, SO<sub>2</sub> and particulates) in terms of the numbers of "deaths brought forward" and the "number of hospital admissions for respiratory disease brought forward or additional". COMEAP has issued a statement expressing some reservations about the applicability of applying its methodology to small affected areas. Those concerns generally relate to the fact that the exposure-response coefficients used in the COMEAP report derive from studies of whole urban populations where the air pollution climate may differ from that around a new industrial installation. COMEAP identified a number of factors and assumptions that would contribute to the uncertainty of the estimates. These were summarised in the Defra review as below:

- Assumption that the spatial distribution of the air pollutants considered is the same in the area under study as in those areas, usually cities or large towns, in which the studies which generated the coefficients were undertaken.

- Assumption that the temporal pattern of pollutant concentrations in the area under study is similar to that in the areas in which the studies which generated the coefficients were undertaken (i.e. urban areas).
- It should be recognised that a difference in the pattern of socio-economic conditions between the areas to be studied and the reference areas could lead to inaccuracy in the predicted level of effects.
- In the same way, a difference in the pattern of personal exposures between the areas to be studied and the reference areas will affect the accuracy of the predictions of effects.

The use of the COMEAP methodology is not generally recommended for modelling the human health impacts of individual installations. However it may have limited applicability where emissions of NO<sub>x</sub>, SO<sub>2</sub> and particulates cannot be screened out as insignificant in the Environmental Impact assessment, there are high ambient background levels of these pollutants and we are advised that its use was appropriate by our public health consultees.

Our recommended approach is therefore the use of the methodology set out in our guidance for comparison for most pollutants (including metals) and dioxin intake model using the HHRAP model as described above for dioxins, furans and dioxin like PCBs. Where an alternative approach is adopted for dioxins, we check the predictions ourselves.

**v) Consultations**

As part of our normal procedures for the determination of a permit application, we consult with Local Authorities, Local Authority Directors of Public Health, FSA and PHE. We also consult the local communities who may raise health related issues. All issues raised by these consultations are considered in determining the application as described in Annex 4 of this document.

**5.3.2 Assessment of Intake of Dioxins, Furans and Dioxin like PCBs**

For dioxins, furans and dioxin like PCBs, the principal exposure route is through ingestion, usually through the food chain, and the main risk to health is through accumulation in the body over a period of time.

The human health risk assessment calculates the dose of dioxins and furans that would be received by local receptors if their food and water were sourced from the locality where the deposition of dioxins, furans and dioxin like PCBs is predicted to be the highest. This is then assessed against the Tolerable Daily Intake (TDI) levels established by the COT of 2 picograms I-TEQ / Kg bodyweight/ day.

The results of the Applicant’s assessment of dioxin intake are detailed in the table below. (worst – case results for each category are shown).

Receptor	Intake as % of TDI	
	Adult	Child
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Point of maximum impact (agricultural receptor)	15%	25%
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Calculated maximum daily intake of dioxins by local receptors resulting from the operation of the proposed facility (I-TEQ/ kg-BW/day)

The above assessment was based on highly conservative and unrealistic assumptions, including that all dietary intake is sourced locally from the peak predicted location within Hoddesdon and therefore actual intake is likely to be much lower than predicted in the Applicant's assessments. As a check we have we have conducted our own screening using a methodology based on USEPA HHRAP incorporating emissions of dioxins, furans and dioxin like PCBs. The conclusion from our screening assessment was that the doses are likely to be well below 10% intake (% of TDI) for both adults and children as a worst case and therefore significantly less than that predicted by the Applicant.

The FSA has reported that dietary studies have shown that estimated total dietary intakes of dioxins and dioxin-like PCBs from all sources by all age groups fell by around 50% between 1997 and 2001, and are expected to continue to fall. A report in 2012 showed that Dioxin and PCB levels in food have fallen slightly since 2001. In 2001, the average daily intake by adults in the UK from diet was 0.9 pg WHO-TEQ/kg bodyweight. The additional daily intake predicted by the modelling is substantially below this figure.

In 2010, FSA studied the levels of chlorinated, brominated and mixed (chlorinated-brominated) dioxins and dioxin-like PCBs in fish, shellfish, meat and eggs consumed in UK. It asked COT to consider the results and to advise on whether the measured levels of these PXDDs, PXDFs and PXBs indicated a health concern ('X' means a halogen). COT issued a statement in December 2010 and concluded that "The major contribution to the total dioxin toxic activity in the foods measured came from chlorinated compounds. Brominated compounds made a much smaller contribution, and mixed halogenated compounds contributed even less (1% or less of TDI). Measured levels of PXDDs, PXDFs and dioxin-like PXBs do not indicate a health concern". COT recognised the lack of quantified TEFs for these compounds but said that "even if the TEFs for PXDDs, PXDFs and dioxin-like PXBs were up to four fold higher than assumed, their contribution to the total TEQ in the diet would still be small. Thus, further research on PXDDs, PXDFs and dioxin-like PXBs is not considered a priority."

In the light of this statement, we assess the impact of chlorinated compounds as representing the impact of all chlorinated, brominated and mixed dioxins / furans and dioxin like PCBs.

### 5.3.3 Particulates smaller than 2.5 microns

The Operator will be required to monitor particulate emissions using the method set out in Table S3.1 of Schedule 3 of the Permit. This method requires that the filter efficiency must be at least 99.5 % on a test aerosol with a mean particle diameter of 0.3 µm, at the maximum flow rate anticipated.

The filter efficiency for larger particles will be at least as high as this. This means that particulate monitoring data effectively captures everything above 0.3 µm and much of what is smaller. It is not expected that particles smaller than 0.3 µm will contribute significantly to the mass release rate / concentration of particulates because of their very small mass, even if present. This means that emissions monitoring data can be relied upon to measure the true mass emission rate of particulates.

Nano-particles are considered to refer to those particulates less than 0.1 µm in diameter (PM<sub>0.1</sub>). Questions are often raised about the effect of nano-particles on human health, in particular on children's health, because of their high surface to volume ratio, making them more reactive, and their very small size, giving them the potential to penetrate cell walls of living organisms. The small size also means there will be a larger number of small particles for a given mass concentration. However the HPA statement (referenced below) says that due to the small effects of incinerators on local concentration of particles, it is highly unlikely that there will be detectable effects of any particular incinerator on local infant mortality.

The HPA (now PHE) addresses the issue of the health effects of particulates in their September 2009 statement 'The Impact on Health of Emissions to Air from Municipal Incinerators'. It refers to the coefficients linking PM<sub>10</sub> and PM<sub>2.5</sub> with effects on health derived by COMEAP and goes on to say that if these coefficients are applied to small increases in concentrations produced, locally, by incinerators; the estimated effects on health are likely to be small. PHE note that the coefficients that allow the use of number concentrations in impact calculations have not yet been defined because the national experts have not judged that the evidence is sufficient to do so. This is an area being kept under review by COMEAP.

In December 2010, COMEAP published a report on The Mortality Effects of Long-Term Exposure to Particulate Air Pollution in the United Kingdom. It says that "a policy which aims to reduce the annual average concentration of PM<sub>2.5</sub> by 1 µg/m<sup>3</sup> would result in an increase in life expectancy of 20 days for people born in 2008." However, "The Committee stresses the need for careful interpretation of these metrics to avoid incorrect inferences being drawn – they are valid representations of population aggregate or average effects, but they can be misleading when interpreted as reflecting the experience of individuals."

PHE also point out that in 2007 incinerators contributed 0.02% to ambient ground level PM<sub>10</sub> levels compared with 18% for road traffic and 22% for industry in general. PHE noted that in a sample collected in a day at a typical urban area the proportion of PM<sub>0.1</sub> is around 5-10% of PM<sub>10</sub>. It goes on to say that PM<sub>10</sub> includes and exceeds PM<sub>2.5</sub> which in turn includes and exceeds PM<sub>0.1</sub>.

This is consistent with the assessment of this application which shows emissions of PM<sub>10</sub> to air to be insignificant.



We take the view, based on the foregoing evidence, that techniques which control the release of particulates to levels which will not cause harm to human health will also control the release of fine particulate matter to a level which will not cause harm to human health.

#### 5.3.4 Assessment of Health Effects from the Installation

We have assessed the health effects from the operation of this installation in relation to the above (sections 5.3.1 to 5.3.3). We have applied the relevant requirements of the national and European legislation in imposing the permit conditions. We are satisfied that compliance with these conditions will ensure protection of the environment and human health.

Taking into account all of the expert opinion available, we agree with the conclusion reached by PHE that “While it is not possible to rule out adverse health effects from modern, well regulated municipal waste incinerators with complete certainty, any potential damage to the health of those living close-by is likely to be very small, if detectable.”

In carrying out air dispersion modelling as part of the Environmental Impact assessment and comparing the predicted environmental concentrations with European and national air quality standards, the Applicant has effectively made a health risk assessment for many pollutants. These air quality standards have been developed primarily in order to protect human health.

The Applicant’s assessment of the impact from *PM<sub>10</sub>, PM<sub>2.5</sub>, HCl, CO, NH<sub>3</sub>, PCB, Hg, Sb, Pb, Cu, Cr (II)(III), Cr(VI), PAH and As* have all indicated that the Installation emissions screen out as insignificant; where the impact of emissions of *NO<sub>2</sub>, SO<sub>2</sub>, HF, TOC, Cd/Tl, Mn, V and Ni* have not been screened out as insignificant, the assessment still shows that the predicted environmental concentrations are well within air quality standards or environmental action levels.

The Environment Agency has reviewed the methodology employed by the Applicant to carry out the health impact assessment. The assessment methodology has deliberately used assumptions to generate scenarios that will lead to overestimations of the risk to human health. We also agree that the Applicant has used an appropriate and conservative approach, however we have conducted our own HHRA screening using the US EPA HHRAP. We carried out a HHRA based on our check modelling and using a methodology based on the USEPA HHRAP and incorporating emissions of dioxins, furans and dioxin-like PCBs. We found that the doses predicted by the Applicant are unlikely to be exceeded and are likely to be significantly lower than predicted.

Overall, taking into account the conservative nature of the impact assessment (i.e. that it is based upon an individual exposed for a life-time to the effects of the highest predicted relevant airborne concentrations and consuming mostly locally grown food), it was concluded that the operation of the proposed facility will not pose a significant carcinogenic or non-carcinogenic risk to human health.

Public Health England and the Local Authority Director of Public Health were consulted on the Application, a response was received from Public Health England and concluded that they had no significant concerns regarding the risk to the health of humans from the installation. The Food Standards Agency was also consulted during the permit determination process, however they made no comment on the application. Details of the response provided by Public Health England to the consultation on this Application can be found in Annex 4.

The Environment Agency is therefore satisfied that the Applicant's conclusions presented above are soundly based and we conclude that the potential emissions of pollutants including dioxins, furans and metals from the proposed facility are unlikely to have an impact upon human health.

#### **5.4 Impact on Habitats sites, SSSIs, non-statutory conservation sites etc.**

##### **5.4.1 Sites Considered**

The following Habitats (i.e. Special Areas of Conservation, Special Protection Areas and Ramsar) sites are located within 10Km of the Installation:

- Epping Forest Special Area of Conservation (SAC)
- Wormley Hoddesdonpark Woods Special Area of Conservation (SAC)
- Lee Valley Special Protection Area (SPA) & Ramsar

The following Sites of Special Scientific Interest (SSSI) are located within 2Km of the Installation:

- Rye Meads SSSI

The following local wildlife site (LWS) and other conservation sites are located within 2Km of the Installation:

- Paddley LWS
- Rye House Power Station LWS
- Admiral Walks Lake LWS
- Carthegena Estate Lakes, Broxbourne Gravel Pit LWS
- Senior's Lake LWS
- Stanstead Abbots Gravel Pit LWS
- Lea Valley North LWS
- Rye Meads Gravel Pit LWS
- Totwellhill Bushes LWS
- Lea Valley Central LWS
- Knowle Thicket by Cock Lane Ford LWS
- Totwellhill Bushes Ancient Woodland

#### 5.4.2 Habitats Assessment

We have assessed the impact from the proposed ERF on the three Habitats sites that are within the relevant screening distance:

- Epping Forest Special Area of Conservation (SAC)
- Wormley Hoddesdonpark Woods Special Area of Conservation (SAC)
- Lee Valley Special Protection Area (SPA) & Ramsar

As required under the Habitats Regulations we have completed a Habitats Regulation Assessment. We completed a Stage 1 Habitats Regulation Assessment, as detailed in the draft decision document which we previously consulted on. The assessment concluded 'no likely significant effect'. Due to additional information received in comments from the consultation on our draft decision on potential plans/project/permissions (PPP) that could act in combination with the Rye House ERF, which we were not aware of at the time of the previous assessment, we decided to repeat the Habitats Assessment.

We originally agreed with Natural England to only complete a Stage 1 Habitats Regulation Assessment, however for the repeated assessment we decided it was appropriate to complete a Stage 2 Habitats Regulation Assessment known as an 'Appropriate Assessment'. The air quality assessment data used in the Stage 2 assessment was the same as that presented in the previous Stage 1 assessment and the overall conclusion remained unchanged. The conclusion from the Stage 2 Habitats Assessment is that the proposed Rye House ERF will not have a significant adverse effect alone or in combination on the integrity of the Lee Valley SPA Ramsar. The following is a summary of the assessment.

The assessment concentrated on the impacts from emissions to air on the habitat sites from the proposed Rye House ERF. The installation will have an aqueous discharge to the River Lee, which will consist of uncontaminated surface water runoff and secondary treated domestic sewage. Whilst the discharge point is located downstream of the nearest area of the Lee Valley SPA and Ramsar to the installation, there is an area of the Lee Valley SPA and Ramsar located downstream (approx. 4.5km). We have assessed the impact of the discharge and we are satisfied that it will not cause significant pollution in the River Lee. We have therefore concluded no likely significant effect on any of the Habitat sites within the relevant screening distance.

With regards to emissions to air we assessed against critical levels and critical loads, these are set to protect the most vulnerable habitat types. Thresholds change in accordance with the levels of protection afforded by the legislation. Therefore the thresholds for SAC, SPA and SSSI features are more stringent than those for other nature conservation sites.

In completing our assessment the Applicant's Habitats Assessment, which was submitted as part of the Application, was reviewed by the Environment Agency's technical specialists for modelling, air quality, conservation and ecology technical services.

The Applicant provided an assessment of the impact of relevant pollutants from the ERF and using air dispersion modelling predicted the process contribution (PC) of each pollutant on each relevant habitat site. The assessment also calculated the predicted environment concentration (PEC), this is the sum of the process contribution and the background pollution levels.

In accordance with our habitats assessment process if the process contribution is less than 1% of the relevant long-term critical level or load or less than 10% of the short-term critical level or load we consider the impact to be insignificant and we can conclude no likely significant effect on the interest features of the habitat site. And if the process contribution is above the insignificance threshold but the PEC is below 70% we can also conclude no likely significant effect on the integrity of the habitat site.

Where the process contribution is above the insignificance threshold and the PEC exceeds 70% then a detailed assessment including an in-combination assessment is required. The detailed assessment which is referred to as an 'Appropriate Assessment' is completed as a Stage 2 Habitats Assessment and includes consultation with Natural England. The in-combination assessment means an assessment of whether another plan/project/permission (PPP) could make the effects of the plan or project that we are assessing more likely, more significant or both. The Stage 2 assessment determines whether there will be significant adverse effect on the integrity of the Site either alone or in combination with another PPP.

The result of the Applicant's modelling assessment is as follows:

Lee Valley SPA & Ramsar

Pollutant	Critical level (µg/m³)	Back-ground (µg/m³)	Process Contribution (PC) (µg/m³)	PC as % of ES	Predicted Environmental Concentration (PEC) (µg/m³)	PEC as % ES
<b>Direct Impacts<sup>1</sup></b>						
NO <sub>x</sub> Annual	30	23.5	0.98	3.3	24.5	82
NO <sub>x</sub> Daily Mean	75	35.25	13.05	17.4	48.3	64
SO <sub>2</sub>	20	2.05	0.23	1.2	2.3	12
Ammonia	3	1.66	0.047	1.6	1.71	57
HF Weekly Mean	0.5	0.01	0.021	<10%	-	-
HF Daily Mean	5	0.01	0.06	<10%	-	-
<b>Deposition Impacts<sup>1</sup></b>						
N Deposition (kg N/ha/yr)	15 – 30 (critical load)	18.48	0.23	1.5 – 0.8	18.7	125 - 62
Acidification (Keq/ha/yr)	Not Sensitive to Acid Deposition					

(1) Direct impact units are  $\mu\text{g}/\text{m}^3$  and deposition impact units are  $\text{kg N}/\text{ha}/\text{yr}$  or  $\text{Keq}/\text{ha}/\text{yr}$ .

(2) The lichen and bryophyte sensitivity standards for ammonia and sulphur dioxide have been assigned for this assessment as the presence of these features has been recorded in the site Management Plan for at least one of the sections of the site.

### Epping Forest Special Area of Conservation

Pollutant	Critical level ( $\mu\text{g}/\text{m}^3$ )	Back-ground ( $\mu\text{g}/\text{m}^3$ )	Process Contribution (PC) ( $\mu\text{g}/\text{m}^3$ )	PC as % of ES	Predicted Environmental Concentration (PEC) ( $\mu\text{g}/\text{m}^3$ )	PEC as % ES
<b>Direct Impacts<sup>1</sup></b>						
NO <sub>x</sub> Annual	30	47.8	0.11	<1	-	-
NO <sub>x</sub> Daily Mean	75	71.7	1.35	<10	-	-
SO <sub>2</sub>	10	1.57	0.03	<1	-	-
Ammonia	1	3.07	0.006	<1	-	-
HF Weekly Mean	0.5	0.01	0.004	<10	-	-
HF Daily Mean	5	0.01	0.01	<10	-	-
<b>Deposition Impacts<sup>1</sup></b>						
N Deposition ( $\text{kg N}/\text{ha}/\text{yr}$ )	10-20 (critical Load)	27.02	0.05	<1	-	-
Acidification ( $\text{Keq}/\text{ha}/\text{yr}$ )	CLmaxN 2.374, CLminN 0.892, CLMaxS 1.660 (critical Load)	N 1.15, S 0.25	0.01	<1	-	-

(1) Direct impact units are  $\mu\text{g}/\text{m}^3$  and deposition impact units are  $\text{kg N}/\text{ha}/\text{yr}$  or  $\text{Keq}/\text{ha}/\text{yr}$ .

(2) The lichen and bryophyte sensitivity standards for ammonia and sulphur dioxide have been assigned for this assessment as the presence of these features has been recorded in the site Management Plan for at least one of the sections of the site.

### Wormley Hoddesdonpark Woods SAC

Pollutant	Critical level ( $\mu\text{g}/\text{m}^3$ )	Back-ground ( $\mu\text{g}/\text{m}^3$ )	Process Contribution (PC) ( $\mu\text{g}/\text{m}^3$ )	PC as % of ES	Predicted Environmental Concentration (PEC) ( $\mu\text{g}/\text{m}^3$ )	PEC as % ES
<b>Direct Impacts<sup>2</sup></b>						
NO <sub>x</sub> Annual	30	27.51	0.12	<1	-	-
NO <sub>x</sub> Daily Mean	75	41.3	2.44	<10	-	-
SO <sub>2</sub>	10	1.93	0.03	<1	-	-
Ammonia	1	1.66	0.006	<1	-	-

Pollutant	Critical level ( $\mu\text{g}/\text{m}^3$ )	Back-ground ( $\mu\text{g}/\text{m}^3$ )	Process Contribution (PC) ( $\mu\text{g}/\text{m}^3$ )	PC as % of ES	Predicted Environmental Concentration (PEC) ( $\mu\text{g}/\text{m}^3$ )	PEC as % ES
HF Weekly Mean	0.5	0.01	0.005	<10	-	-
HF Daily Mean	5	0.01	0.01	<10	-	-
Deposition Impacts <sup>1</sup>						
N Deposition (kg N/ha/yr)	15-20 (critical load)	24.78	0.05	<1	-	-
Acidification (Keq/ha/yr)	CLmaxN 8.752, CLminN 0.357, CLMaxS 8.395 (critical load)	N 1.77, S 0.30	0.02	<1	-	-

(1) Direct impact units are  $\mu\text{g}/\text{m}^3$  and deposition impact units are kg N/ha/yr or Keq/ha/yr.

(2) The lichen and bryophyte sensitivity standards for ammonia and sulphur dioxide have been assigned for this assessment as the presence of these features has been recorded in the site Management Plan for at least one of the sections of the site.

The results show that the process contributions for all pollutants assessed at the Wormely Hoddesdonpark Woods SAC and Epping Forest SAC are below the relevant insignificance thresholds, therefore the proposed ERF will have no likely significant effect on either site. Note that because the predicted impacts are below the insignificance threshold an in-combination assessment is not required.

With regards to the Lee Valley SPA and Ramsar process contributions for  $\text{NO}_x$ , Nutrient Nitrogen Deposition,  $\text{SO}_2$ , and ammonia are above the relevant insignificance threshold, however with the exception of  $\text{NO}_x$  and nutrient nitrogen deposition the PEC is below 70% so we can therefore conclude no likely significant effect with regards to  $\text{SO}_2$  and ammonia.

As we could not conclude no likely significant effect for  $\text{NO}_x$  and nutrient nitrogen deposition we completed a detailed Stage 2 Habitats Regulation Assessment known as an 'Appropriate Assessment'

The Stage 2 Assessment included an in-combination assessment. The Applicant provided a cumulative assessment as part of their assessment. This assessment identified Trent Developments Sustainable Energy Facility which includes Hoddesdon Anaerobic Digestion Facility and Hoddesdon Energy from Waste Plant (also known as Advanced Thermal Treatment (ATT) Plant); and Rye House Power Station as PPPs that could act in combination with the Rye House ERF. The Rye House Power station is currently operational, however it was recognised in the assessment that the plant is currently not at full utilisation so for this reason predicted emissions have been included to

reflect the highest annual utilisation from the last 10 years of operation. This is considered a conservative approach as the background pollution data used in the assessment will already include contribution from the Rye House Power Station.

In order to ensure that we have identified all relevant PPPs that could act in combination with the proposed Rye House ERF we consulted with planning departments at Epping Forest District Council, Broxbourne Council, Harlow Council, East Herts Council and Hertfordshire County Council. These authorities were contacted and asked to provide details of any PPPs they considered relevant.

We received a response from Epping Forest District Council and Herts County Council. However their response did not highlight any relevant PPPs that are not already considered in the assessment.

We also carried out our own search which included consideration of any consented but not yet operational permissions known to the Environment Agency, we also checked the planning portal. We did not find any relevant PPPs that are not already considered in the assessment.

Potentially relevant PPPs had been identified following our draft decision consultation. These were Pharmaron UK Limited, High Leigh Village, Harlow and Gilston Garden Town, Gravel Extraction at Briggens and Woollensbrook Crematorium. We have assessed the relevance of these and have concluded that none of them are relevant PPPs for this in-combination assessment. The reasons why are as follows:

Pharmaron UK Limited	The facility is located approximately 2.3 km from the Lee Valley SPA/Ramsar. As it stands there is an Environmental Permit Application currently being determined for this facility. Emissions from the facility will include NOx. We have assessed the proposal and whether the emissions of NOx could contribute significantly to background NOx concentration at the Lee Valley SPA/Ramsar. We have concluded that due to relatively small scale of the combustion activities on site and the distance from the Lee Valley SPA/Ramsar any increase to background NOx levels is likely to be negligible.
High Leigh Garden Village	This is a proposed new development of approximately 500 new homes, located approximately 2.5km from the Lee Valley SPA/Ramsar. Planning permission has been granted. Increased traffic associated with this development could increase NOx levels locally. However we are satisfied that given the distance from the Lee Valley SPA/Ramsar, we would expect the additional contributions at the habitat site from road traffic emissions to be negligible compared to the existing background.
Woollensbrook Crematorium	The facility is located approximately 2.5km from the Lee Valley SPA/Ramsar. The combustion activity is relatively small scale and due to the distance from the site any increase to background NOx levels is likely to be negligible. Also the facility opened in 2017 so emissions of NOx will already be accounted for in the background NOx concentrations that we have used in our air quality

	assessment checks.
Harlow and Gilston Garden Town	<p>According to information on the relevant local authority websites the proposed housing development is located around the towns of Harlow and Gilston (approximately 4 -5 km from the Lee Valley SPA/Ramsar). The scheme includes a plan to build 16,000 new homes in the area up to 2033 and a further 7,000 new homes beyond 2033. It is likely that the potential impact on background NOx emissions would predominantly be as a result of the increased traffic associated with this development.</p> <p>We have consulted with the relevant local authorities requesting details of any plans, projects or permissions including this one, we have received no response in relation to this development. We have therefore looked at the local planning portal and there is no evidence of a planning application being submitted.</p> <p>As planning permission is not currently being sought we cannot consider this in our assessment. However, the planning application for this development should include an Environmental Statement which would assess impact on the Lee Valley SPA/Ramsar and it will be for the developer to consider cumulative impacts with the Rye House ERF development, should they decide to proceed with an application.</p>
Gravel extraction at Briggens	<p>This is a proposal that was included in a consultation draft of the Hertfordshire Minerals Local Plan. We have consulted with the relevant local authorities requesting details of any plans, projects or permissions including this one. We received a response from Herts County Council who commented on this proposal. They commented that any future mineral extraction at the site is 'purely hypothetical at this time'.</p> <p>As planning permission is not currently being sought we cannot consider this in our assessment. However, the planning application for this development will include an Environmental Statement which would assess impact on the Lee Valley SPA/Ramsar and it will be for the developer to consider cumulative impacts with the Rye House ERF development, should they decide to proceed with an application.</p>

Of the potentially relevant PPPs identified we concluded in the Stage 2 Assessment that the relevant PPPs are the Trent Developments Sustainable Energy Facility – which includes Hoddesdon Anaerobic Digestion Facility and Hoddesdon Energy from Waste Plant (also known as Advanced Thermal Treatment (ATT) Plant); and Rye House Power Station.

The in-combination assessment concluded, with regards to annual mean NOx (long term) that even with the contribution to the background from the relevant PPPs included, the PEC would not exceed the 100% threshold. The PEC is predicted to be 87% of the critical level. With regards to 24-hour mean NOx (short-term) the additional contribution from the relevant PPPs does not lead to the exceedance of the critical level (note that in line with the assessment process guidance there is no requirement to consider short-term effects in-combination with background (PEC)). The assessment concentrated on the impact on the most sensitive part of the habitat site so we have concluded that with respect to NO<sub>x</sub> the proposed Rye House ERF will not have a



significant adverse effect alone or in-combination on the integrity of the Lee Valley SPA and Ramsar.

With regards to nutrient nitrogen deposition, the background deposition at the Lee Valley SPA and Ramsar already exceeds the relevant critical load. The in-combination assessment showed that there would be a small increase to the PEC from 125% to 127%. The Applicant recognised this and provided a detailed assessment of the potential effect of nutrient nitrogen deposition on the habitat site. The assessment established that the influence of nutrient nitrogen deposition on the condition of this habitat is limited. Therefore a negligible increase in nutrient nitrogen deposition when set against the existing background deposition, which is already exceeding the critical load, is unlikely to result in a measurable adverse impact on the integrity of the site.

As discussed above we completed a Stage 2 Habitats Assessment and this was sent to Natural England for consultation. Natural England agreed with our conclusion that the proposed Rye House ERF will not have a significant adverse effect alone or in-combination on the integrity of the Lee Valley SPA and Ramsar. The Stage 2 Habitats Assessment and Natural England's response is available to view on public register.

It is noted that Natural England's response included a recommendation for the permit to include a requirement for the Operator to carry out regular monitoring of NO<sub>x</sub> emissions to validate the dispersion modelling predicted effects on Lee Valley SPA and Ramsar. The recommended monitoring included monitoring of air quality (i.e. continuous monitoring station and data collection from diffusion tubes) at the point of emission and at varied distances within the habitat site relevant to the listed sensitive habitats.

The permit contains a requirement to monitor NO<sub>x</sub> and ammonia continuously at the stack, however it was our view that Natural England's recommendation for air quality monitoring at locations within the Lee Valley SPA and Ramsar to validate the modelling assessment is unnecessary. We are satisfied that the models used in our check modelling (ADMS and AERMOD) have both been extensively validated. The model validation documents for ADMS and model evaluation documents for AEMROD provide us with evidence of the performance of these models giving us an understanding of confidence in their performance. Model developers complete this validation using standard data suites available from the USEPA containing known emission rates that correspond to ambient monitoring at the same time. The models have then been tested against actual measurements. Model performance against reality is therefore known indicating a typical uncertainty of approximately 0.7 to 1.3 (for example annual mean predictions). We use this knowledge to help interpret our check modelling predictions for each incinerator application.

Our modelling takes account of the upper end of the uncertainty ranges using conservative worst-case assumptions. It is also based on the site operating at the ELV for 365 days of the year which is highly conservative. We can therefore be confident that the predictions are reliable within the known uncertainties.

We wrote to Natural England to inform them of our reasons why we considered the recommended monitoring unnecessary. Natural England subsequently accepted our reasons and no longer consider the additional monitoring is necessary. Therefore no additional monitoring has been included in the permit.

#### 5.4.3 SSSI Assessment

The Applicant's assessment of SSSIs was reviewed by the Environment Agency's technical specialists for modelling, air quality, conservation and ecology technical services, who agreed with the assessment's conclusions, that the proposal does not damage the special features of the SSSI.

Rye meads SSSI – Please note that the geographical area that this site covers is also designated as the Lee Valley SPA and Ramsar. Therefore the assessment and our conclusions are the same as those detailed above that detailed above. As per the requirements of Countryside and Rights of Way Act (CRoW) 2000 we have completed an Appendix 4 notice which details our assessment and conclusions and have sent this to Natural England for consultation. Natural England's response was to agree with our conclusions. Note that there is no requirement to carry out an in-combination assessment for SSSIs.

#### 5.4.4 Assessment of other conservation sites

Conservation sites are protected in law by legislation. The Habitats Directive provides the highest level of protection for SACs and SPAs, domestic legislation provides a lower but important level of protection for SSSIs. Finally the Environment Act provides more generalised protection for flora and fauna rather than for specifically named conservation designations. It is under the Environment Act that we assess other sites (such as local wildlife sites) which prevents us from permitting something that will result in significant pollution; and which offers levels of protection proportionate with other European and national legislation. However, it should not be assumed that because levels of protection are less stringent for these other sites that they are not of considerable importance. Local sites link and support EU and national nature conservation sites together and hence help to maintain the UK's biodiversity resilience.

For SACs, SPAs, Ramsars and SSSIs we consider the contribution PC and the background levels in making an assessment of impact. In assessing these other sites under the Environment Act we look at the impact from the Installation alone in order to determine whether it would cause significant pollution. This is a proportionate approach, in line with the levels of protection offered by the conservation legislation to protect these other sites (which are generally more numerous than Natura 2000 or SSSIs) whilst ensuring that we do not restrict development.

Critical levels and loads are set to protect the most vulnerable habitat types. Thresholds change in accordance with the levels of protection afforded by the

legislation. Therefore the thresholds for SAC SPA and SSSI features are more stringent than those for other nature conservation sites.

Therefore we would generally conclude that the Installation is not causing significant pollution at these other sites if the PC is less than the relevant critical level or critical load, provided that the Applicant is using BAT to control emissions.

The Applicant has assessed the impact on a number of non-statutory sites, the assessment showed that process contributions will be below the relevant critical level and loads at the sites assessed. The threshold for significance for these sites is 100%. Even using the maximum predictions and worst case sensitivities from all the wildlife sites presented by the Applicant the PCs are significant below the 100% threshold. The maximum PC for all relevant pollutants is 36.7% for 24-hour NO<sub>x</sub> at Lee Valley North LWS. This is directly adjacent to the proposed installation and is likely to represent the worst-case. It can therefore be assumed that the PCs at all the other non-statutory sites will be equal to or less than the modelled maximum PCs at Lee Valley North LWS.

We have audited the Applicant's assessment and carried out our own check modelling. Taking uncertainties in to account our predictions at this site and the other sites agree with the Applicant's conclusions.

#### 5.4.5 Assessment of other habitats and Species

As part of our assessment we check on protected sites, habitats and species which have the potential to be impacted by the activity being proposed. This is done using our own internal screening tools to generate a list of sites and species. We also had a large number of consultation responses expressing concern over impacts on nearby sites and species.

According to our records there are protected species present close to the facility. The areas where these species are located are covered by the Rye Power Station LWS, Lee Valley LWS and Lee Valley SPA & Ramsar. We have assessed the impact from emissions to air on these habitats, which is detailed above. We have concluded that there will be no significant adverse effect on the integrity of the Lee Valley SPA and Ramsar; and process contributions at the LWSs will be less than 100% of the relevant critical load and levels. Also we are satisfied that any impact from aqueous discharges to controlled water from the Installation will not result in a significant adverse impact on the habitat sites or the protected species with in them, see section 6.5.1 for our assessment of emissions to water.

There are also lichen and bryophytes present in areas south of the installation. Our records show that the closest populations are found within Lee Valley LWS. Lichen and Bryophytes are sensitive to air pollution, in particular ammonia. As detailed in section 5.4.4 the Applicant has assessed the impact on nearby local wildlife sites, including the Lee Valley North LWS and process contributions for all relevant sites are below the relevant critical

loads or critical levels and there will be no significant pollution. The assessment included impacts from ammonia.

As well as the species discussed above, comments received from the public consultation for this application (as detailed in Annex 4) also identified populations of Bats, Badgers, Great Crested Newts, Breeding Birds and protected plant species that are present close to the Installation. As discussed above the Applicant has assessed the impacts on both statutory and non-statutory habitat sites and we are satisfied that any impacts on these sites will not be significant. We believe that the nearby local wildlife sites and wider protected habitats are likely to be the main areas frequented by such species even though the species are not recorded as being integral to them. These sites and habitats are protected during our determination (see section 5.4.2 above) as part of our general duties to protect the wider environment and to not allow any significant pollution, and as such we believe that protecting these supporting habitats will inherently protect the associated species noted within the public consultation.

We are also aware that the Applicant has provided a detailed Habitat Risk Assessment (HRA) as part of their Environmental Statement that forms part of the planning application for this facility. This HRA includes assessment of the presence and possible impacts on relevant wildlife and plant species located outside of the habitat sites assessed as part of the Environmental Permit Application. The report considers impact from construction and operation of the installation. This report has been assessed as part of the planning application process.

As well as impacts from emissions to air and emissions to controlled waters we are aware that wildlife species can be impacted on by noise. The Applicant has carried out a noise assessment, this assessment included noise from HGVs on site, see section 6.5.5. The assessment concentrates on human receptors and it concludes that impacts will be low and unlikely to cause significant pollution. Of the human receptors considered, the closest was Lock Keepers Cottage which is located only 20m from the installation boundary to the east of the site close to Lee Valley LWS and Rye House Power Station LWS. We are satisfied that at these LWS and at habitat sites located further away from Lock Keepers Cottage, the impact from noise on wildlife species located within these habitats is unlikely to be significant and therefore any disturbance of wildlife due to noise is unlikely to be significant. Also with specific focus on birds which are key features of nearby habitat sites the main type of noise impact to consider is sudden loud noises, however noises of this type are unlikely from this installation when it is operational. Concern about the impact on birds from noise from acceleration of HGVs climbing the ramp to tipping hall was raised in consultation responses received during the draft permit consultation (see Annex 4). As discussed above the noise assessment submitted by the Applicant considered noise from HGV movements on site. Also during the night time period (23:00 to 05:00) no HGV movements are proposed; and there will be a noise barrier along the eastern edge of the HGV access route, from the site entrance to the top of the ramp to the tipping hall that will reduce the impact of HGV noise at receptors outside the installation.

Based on the assessment provided we do not consider that noise from HGVs will cause significant disturbance of birds at nearby habitat sites.

There were many public comments received about light on nearby ecological sites and species. Light is primarily a planning issue and a concern for visual impacts. In any event light is not likely to have a significant impact, the Applicant has stated that Operational lighting of the facility will be directed into the body of the site to minimise unnecessary illumination of the wider environment.

## **5.5 Impact of abnormal operations**

Article 50(4)(c) of IED requires that waste incineration and co-incineration plants shall operate an automatic system to prevent waste feed whenever any of the continuous emission monitors show that an emission limit value (ELV) is exceeded due to disturbances or failures of the purification devices. Notwithstanding this, Article 46(6) allows for the continued incineration and co-incineration of waste under such conditions provided that this period does not (in any circumstances) exceed 4 hours uninterrupted continuous operation or the cumulative period of operation does not exceed 60 hours in a calendar year. This is a recognition that the emissions during transient states (e.g. start-up and shut-down) are higher than during steady-state operation, and the overall environmental impact of continued operation with a limited exceedance of an ELV may be less than that of a partial shut-down and re-start.

For incineration plant, IED sets backstop limits for particulates, CO and TOC which must continue to be met at all times. The CO and TOC limits are the same as for normal operation, and are intended to ensure that good combustion conditions are maintained. The backstop limit for particulates is 150 mg/m<sup>3</sup> (as a half hourly average) which is five times the limit in normal operation.

Article 45(1)(f) requires that the permit shall specify the maximum permissible period of any technically unavoidable stoppages, disturbances, or failures of the purification devices or the measurement devices, during which the concentrations in the discharges into the air may exceed the prescribed emission limit values. In this case we have decided to set the time limit at 4 hours, which is the maximum period prescribed by Article 46(6) of the IED.

These abnormal operations are limited to no more than a period of 4 hours continuous operation and no more than 60 hour aggregated operation in any calendar year. This is less than 1% of total operating hours and so abnormal operating conditions are not expected to have any significant long term environmental impact unless the background conditions were already close to, or exceeding, an ES. For the most part therefore consideration of abnormal operations is limited to consideration of its impact on short term ESs.

Assessment of emissions during abnormal operation was provided by the applicant. The Applicant used emissions that they consider to be a worst case scenario in that these abnormal conditions include a number of different equipment failures not all of which will necessarily result in an adverse impact on the environment (e.g. a failure of a monitoring instrument does not necessarily mean that the incinerator or abatement plant is malfunctioning). This analysis assumed that any failure of any equipment results in all the negative impacts set out in the application occurring simultaneously. The Applicant's assessment was calculated by multiplying the maximum short term average modelling result (based on daily limit values) by the ratio of the maximum abnormal half-hour emission concentration to the normal daily emission concentration.

The Applicant reported maximum short term PCs and PECs for the ERF operating under abnormal conditions. The Applicant predicted that in the event that such increased emission was coincident with the very worst hour in the year for dispersion, then the short term air quality criteria would not be exceeded during periods where emissions are at the half hourly emission levels indicated. It was noted that the Applicant did not include the diesel generator emissions in calculating the short term impacts. During abnormal operating events the applicant predicted the impact can be considered insignificant on the basis that the:

- PC's for the short-term impact were below the 10% PC significance criteria could be screened as insignificant, with the exception of the NO<sub>x</sub>, SO<sub>2</sub>, and particulates.
- Further consideration NO<sub>x</sub>, SO<sub>2</sub> and particulates, showed that all of the PECs are predicated to be below environmental standards.

We have audited the Applicant's assessment and in our view the assessment was not a precautionary approach as alternative data indicated the potential for higher emissions. Also the assessment did not consider short term emissions from the diesel generators. We therefore used alternative more precautionary data to complete our own check modelling assessment of abnormal emissions, which factored in the emissions from the diesel generators in the unlikely event that the generators were in use at the same time – this would ensure a conservative worst case assessment. Also the Applicant's assessment did not specify unabated emissions from PCBs, metals or dioxins, we therefore considered these in our assessment as well. Our check modelling assessment indicated that the proposed ERF is unlikely to lead to any short term breaches of the environmental standards at sensitive receptors.

We are therefore satisfied that it is not necessary to further constrain the conditions and duration of the periods of abnormal operation beyond those permitted under Chapter IV of the IED.

We have not assessed the impact of abnormal operations against long term ESs for the reasons set out above. Except that if dioxin emissions were at 10 ng/m<sup>3</sup> for the maximum period of abnormal operation, this would result in an increase of approximately 70% in the TDI reported in section 5.3.3. Despite the increase under abnormal operations the dioxin intake is predicted to remain well below the health standard. Which will still not pose a risk to human health.

## 6. Application of Best Available Techniques

### 6.1 Scope of Consideration

In this section, we explain how we have determined whether the Applicant's proposals are the Best Available Techniques for this Installation.

- The first issue we address is the fundamental choice of incineration technology. There are a number of alternatives, and the Applicant has explained why it has chosen one particular kind for this Installation.
- We then consider in particular control measures for the emissions which were not screened out as insignificant in the previous section on minimising the installation's environmental impact. They are: oxides of nitrogen, VOCs and some metals.
- We also have to consider the combustion efficiency and energy utilisation of different design options for the Installation, which are relevant considerations in the determination of BAT for the Installation, including the Global Warming Potential of the different options.
- Finally, the prevention and minimisation of Persistent Organic Pollutants (POPs) must be considered, as we explain below.

Chapter IV of the IED specifies a set of maximum emission limit values. Although these limits are designed to be stringent, and to provide a high level of environmental protection, they do not necessarily reflect what can be achieved by new plant. Article 14(3) of the IED says that BAT Conclusions shall be the reference for setting the permit conditions, so it may be possible and desirable to achieve emissions below the limits referenced in Chapter IV. A final draft of the BAT conclusions was published in December 2018, however it is not expected that the BAT conclusions will be published (and come into force) until second half of 2019.

However BAT Conclusions and a revised BREF for Incineration have not yet been published, so the existing BREF and Chapter IV of the IED remain relevant. When BAT conclusions are published we will vary permit as required.

Even if the Chapter IV limits are appropriate, operational controls complement the emission limits and should generally result in emissions below the

maximum allowed; whilst the limits themselves provide headroom to allow for unavoidable process fluctuations. Actual emissions are therefore almost certain to be below emission limits in practice, because any Operator who sought to operate its installation continually at the maximum permitted level would almost inevitably breach those limits regularly, simply by virtue of normal fluctuations in plant performance, resulting in enforcement action (including potentially prosecution) being taken. Assessments based on, say, Chapter IV limits are therefore “worst-case” scenarios.

Should the Installation, once in operation, emit at rates significantly below the limits included in the Permit, we will consider tightening ELVs appropriately. We are, however, satisfied that emissions at the permitted limits would ensure a high level of protection for human health and the environment in any event.

#### 6.1.1 Consideration of Furnace Type

The prime function of the furnace is to achieve maximum combustion of the waste. Chapter IV of the IED requires that the plant (furnace in this context) should be designed to deliver its requirements. The main requirements of Chapter IV in relation to the choice of a furnace are compliance with air emission limits for CO and TOC and achieving a low TOC/LOI level in the bottom ash.

The Waste Incineration BREF elaborates the furnace selection criteria as:

- the use of a furnace (including secondary combustion chamber) dimensions that are large enough to provide for an effective combination of gas residence time and temperature such that combustion reactions may approach completion and result in low and stable CO and TOC emissions to air and low TOC in residues.
- use of a combination of furnace design, operation and waste throughput rate that provides sufficient agitation and residence time of the waste in the furnace at sufficiently high temperatures.
- The use of furnace design that, as far as possible, physically retain the waste within the combustion chamber (e.g. grate bar spacing) to allow its complete combustion.

The BREF also provides a comparison of combustion and thermal treatment technologies and factors affecting their applicability and operational suitability used in EU and for all types of wastes. There is also some information on the comparative costs. The table below has been extracted from the BREF tables. This table is also in line with the Guidance Note “The Incineration of Waste (EPR 5.01)). However, it should not be taken as an exhaustive list nor that all technologies listed have found equal application across Europe.

Overall, any of the furnace technologies listed below would be considered as BAT provided the Applicant has justified it in terms of:

- nature/physical state of the waste and its variability
- proposed plant throughput which may affect the number of incineration lines



- preference and experience of chosen technology including plant availability
- nature and quantity/quality of residues produced.
- emissions to air – usually NOx as the furnace choice could have an effect on the amount of unabated NOx produced
- energy consumption – whole plant, waste preparation, effect on GWP
- Need, if any, for further processing of residues to comply with TOC
- Costs

**Summary comparison of thermal treatment technologies (reproduced from the Waste Incineration BREF)**

<b>Technique</b>	<b>Key waste characteristics and suitability</b>	<b>Throughput per line</b>	<b>Advantages</b>	<b>Disadvantages / Limitations of use</b>	<b>Bottom Ash Quality</b>	<b>Cost</b>
Moving grate (air-cooled)	<p>Low to medium heat values (LCV 5 – 16.5 GJ/t)</p> <p>Municipal and other heterogeneous solid wastes</p> <p>Can accept a proportion of sewage sludge and/or medical waste with municipal waste</p> <p>Applied at most modern MSW installations</p>	<p>1 to 50 t/h with most projects 5 to 30 t/h.</p> <p>Most industrial applications not below 2.5 or 3 t/h.</p>	<p>Widely proven at large scales.</p> <p>Robust</p> <p>Low maintenance cost</p> <p>Long operational history</p> <p>Can take heterogeneous wastes without special preparation</p>	<p>generally not suited to powders, liquids or materials that melt through the grate</p>	<p>TOC 0.5 % to 3 %</p>	<p>High capacity reduces specific cost per tonne of waste</p>
Moving grate (liquid Cooled)	<p>Same as air-cooled grates except:</p> <p>LCV 10 – 20 GJ/t</p>	<p>Same as air-cooled grates</p>	<p>As air-cooled grates but:</p> <p>higher heat value waste is treatable</p> <p>better Combustion control possible.</p>	<p>As air-cooled grates but:</p> <p>risk of grate damage/ leaks</p> <p>higher complexity</p>	<p>TOC 0.5 % to 3 %</p>	<p>Slightly higher capital cost than air-cooled</p>

Technique	Key waste characteristics and suitability	Throughput per line	Advantages	Disadvantages / Limitations of use	Bottom Ash Quality	Cost
Rotary Kiln	Can accept liquids and pastes  solid feeds more limited than grate (owing to refractory damage)  often applied to hazardous Wastes	<10 t/h	Very well proven with broad range of wastes and good burn out even of HW	Throughputs lower than grates	TOC <3 %	Higher specific cost due to reduced capacity
Fluid bed - bubbling	Only finely divided consistent wastes.  Limited use for raw MSW □ often applied to sludges	1 to 10 t/h	Good mixing  Fly ashes of good leaching quality	Careful operation required to avoid clogging bed.  Higher fly ash quantities.	TOC <3 %	FGT cost may be lower.  Costs of waste preparation
Fluid bed - circulating	Only finely divided consistent wastes.  Limited use for raw MSW, often applied to sludges / RDF.	1 to 20 t/h most used above 10 t/h	Greater fuel flexibility than BFB  Fly ashes of good leaching quality	Cyclone required to conserve bed material  Higher fly ash quantities	TOC <3 %	FGT cost may be lower.  Costs of preparation.
Oscillating furnace	MSW / □ heterogeneous wastes	1 – 10 t/h	Robust Low maintenance Long history	-higher thermal loss than with grate furnace - LCV under 15 GJ/t	TOC 0.5 – 3 %	Similar to other technologies

			Low NOX level Low LOI of bottom ash			
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Technique	Key waste characteristics and suitability	Throughput per line	Advantages	Disadvantages / Limitations of use	Bottom Ash Quality	Cost
Pulsed hearth	Only higher CV waste (LCV >20 GJ/t) □ mainly used for clinical wastes	<7 t/h	can deal with liquids and powders	bed agitation may be lower	Dependent on waste type	Higher specific cost due to reduced capacity
Stepped and static hearths	Only higher CV waste (LCV >20 GJ/t)  Mainly used for clinical wastes	No information	Can deal with liquids and powders	Bed agitation may be lower	Dependent on waste type	Higher specific cost due to reduced capacity
Spreader - stoker combustor	- RDF and other particle feeds - poultry manure - wood wastes	No information	- simple grate construction - less sensitive to particle size than FB	only for well defined mono-streams	No information	No information
Gasification - fixed bed	- mixed plastic wastes - other similar consistent streams - gasification less widely used/proven than incineration	1 to 20 t/h	-low leaching residue -good burnout if oxygen blown - syngas available - Reduced oxidation of recyclable metals	- limited waste feed - not full combustion - high skill level - tar in raw gas - less widely proven	-Low leaching bottom ash -good burnout with oxygen	High operation/ maintenance costs

<b>Technique</b>	<b>Key waste characteristics and suitability</b>	<b>Throughput per line</b>	<b>Advantages</b>	<b>Disadvantages / Limitations of use</b>	<b>Bottom Ash Quality</b>	<b>Cost</b>
Gasification - entrained flow	- mixed plastic wastes - other similar consistent streams - not suited to untreated MSW - gasification less widely used/proven than incineration	To 10 t/h	- low leaching slag - reduced oxidation of recyclable metals	- limited waste feed - not full combustion - high skill level - less widely proven	low leaching slag	High operation/ maintenance costs pre-treatment costs high
Gasification - fluid bed	- mixed plastic wastes - shredded MSW - shredder residues - sludges - metal rich wastes - other similar consistent streams - less widely used/proven than incineration	5 – 20 t/h	-temperatures e.g. for Al recovery - separation of non-combustibles -can be combined with ash melting - reduced oxidation of recyclable metals	-limited waste size (<30cm) - tar in raw gas - higher UHV raw gas - less widely proven	If Combined with ash melting chamber ash is vitrified	Lower than other gasifiers
Pyrolysis	- pre-treated MSW - high metal inert streams - shredder residues/plastics - pyrolysis is less widely used/proven than incineration	~ 5 t/h (short drum) 5 – 10 t/h (medium drum)	- no oxidation of metals - no combustion energy for metals/inert - in reactor acid neutralisation possible - syngas available	- limited wastes - process control and engineering critical - high skill req. - not widely proven - need market for syngas	- dependent on process temperature - residue produced requires further processing e.g. combustion	High pre-treatment, operation and capital costs

The Applicant has carried out a review of the following candidate furnace types:

- Moving Grate Furnace
- Rotary Kiln
- Fluidised Bed
- Pyrolysis
- Gasification
- Plasma Applications

The review considered the advantages and disadvantages of each furnace type comparing them against each other in a number of different assessment criteria including emissions, global warming potential, odour, noise, residue generation, energy efficiency, costs and application. They have concluded:

- Although there is some difference in pollutant levels in raw gas (e.g. lower NOx but higher particulate with fluidised bed), each of the options performs in accordance with IED emission limits with the use of appropriate secondary abatement technologies;
- The GWP signature for plasma systems indicates that this is lower than the other technologies, however, it is not proven technology in the UK for a large scale MSW facility;
- The GWP signature for the remaining technologies is broadly similar, however consideration of the relative energy generation efficiency of the process, the need for supplementary combustion fuel to support the thermal treatment process and parasitic load requirements to drive supporting plant and equipment shows that moving grate systems have similar or improved performance to the other technologies; and
- Moving-grate has a similar or improved level of performance to other technologies in respect of electrical efficiency, residue generation, raw materials and noise impact.

Taking all the above into consideration, along with the proven performance at the proposed scale, the Applicant have selected moving grate technology which is identified in the tables above as being considered BAT in the BREF or TGN for this type of waste feed

The Applicant proposes to use gasoil as support fuel for start-up, shut down and for the auxiliary burners. The choice of support fuel is based on safety considerations in that as gas oil is already available on site as a fuel for site vehicles and the gas oil is only needed in low quantities by the burners, it was decided to utilise the available gas oil fuel rather than introduce a second fuel source. We accept that this is BAT in this case.

### Boiler Design

In accordance with our Technical Guidance Note, EPR 5.01, the Applicant has confirmed that the boiler design will include the following features to minimise the potential for reformation of dioxins within the de-novo synthesis range:

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- Reduction of the surface temperature and therefore reduced deposits formation;
- The design of boiler with reduced stagnant and low gas velocity areas;
- Short residence time of the flue gas in the low surface temperature section of the boiler;
- The boiler cross sectional area is progressively reduced in order to ensure that the flue gas velocities are maintained and do not cause deposits to collect;
- Reduction in the deposits on boiler tubes by use of efficient cleaning devices (online rappers and sootblower water cleaning systems).

Any of the options listed in the BREF and summarised in the table above can be BAT. The Applicant has chosen a furnace technique that is listed in the BREF and we are satisfied that the Applicant has provided sufficient justification to show that their technique is BAT. This is not to say that the other techniques could not also be BAT, but that the Applicant has shown that their chosen technique is at least comparable with the other BAT options. We believe that, based on the information gathered by the BREF process, the chosen technology will achieve the requirements of Chapter IV of the IED for the air emission of TOC/CO and the TOC on bottom ash.

## 6.2 BAT and emissions control

The prime function of flue gas treatment is to reduce the concentration of pollutants in the exhaust gas as far as practicable. The techniques which are described as BAT individually are targeted to remove specific pollutants, but the BREF notes that there is benefit from considering the FGT system as a whole unit. Individual units often interact, providing a primary abatement for some pollutants and an additional effect on others.

The BREF lists the general factors requiring consideration when selecting flue-gas treatment (FGT) systems as:

- type of waste, its composition and variation
- type of combustion process, and its size
- flue-gas flow and temperature
- flue-gas content, size and rate of fluctuations in composition
- target emission limit values
- restrictions on discharge of aqueous effluents
- plume visibility requirements
- land and space availability
- availability and cost of outlets for residues accumulated/recovered
- compatibility with any existing process components (existing plants)
- availability and cost of water and other reagents
- energy supply possibilities (e.g. supply of heat from condensing scrubbers)
- reduction of emissions by primary methods
- release of noise.

Taking these factors into account the Technical Guidance Note points to a range of technologies being BAT subject to circumstances of the Installation.

### 6.2.1 Particulate Matter

<b>Particulate matter</b>				
<b>Technique</b>	<b>Advantages</b>	<b>Disadvantages</b>	<b>Optimisation</b>	<b>Defined as BAT in BREF or TGN for:</b>
<b>Bag / Fabric filters (BF)</b>	Reliable abatement of particulate matter to below 5mg/m <sup>3</sup>	Max temp 250°C	Multiple compartments  Bag burst detectors	Most plants
<b>Wet scrubbing</b>	May reduce acid gases simultaneously.	Not normally BAT.  Liquid effluent produced	Require reheat to prevent visible plume and dew point problems.	Where scrubbing required for other pollutants
<b>Ceramic filters</b>	High temperature	May be "blind"	more than	Small plant.



	applications Smaller plant.	fabric filters		High temperature gas cleaning required.
<b>Electrostatic precipitators</b>	Low pressure gradient. Use with BF may reduce the energy consumption of the induced draft fan.	Not normally BAT.		When used with other particulate abatement plant

The Applicant proposes to use fabric filters for the abatement of particulate matter. Fabric filters provide reliable abatement of particulate matter to below 5 mg/m<sup>3</sup> and are BAT for most installations. The Applicant proposes to use multiple compartment filters with burst bag detection to minimise the risk of increased particulate emissions in the event of bag rupture.

Emissions of particulate matter have been previously screened out as insignificant, and so the Environment Agency agrees that the Applicant's proposed technique is BAT for the installation.

## 6.2.2 Oxides of Nitrogen

<b>Oxides of Nitrogen : Primary Measures</b>				
<b>Technique</b>	<b>Advantages</b>	<b>Disadvantages</b>	<b>Optimisation</b>	<b>Defined as BAT in BREF or TGN for:</b>
<b>Low NOx burners</b>	Reduces NOx at source		Start-up, supplementary firing.	Where auxiliary burners required.
<b>Starved air systems</b>	Reduce CO simultaneously.			Pyrolysis, Gasification systems.
<b>Optimise primary and secondary air injection</b>				All plant.
<b>Flue Gas Recirculation (FGR)</b>	Reduces the consumption of reagents used for secondary NOx control.  May increase overall energy recovery	Some applications experience corrosion problems.		All plant unless impractical in design (needs to be demonstrated)

<b>Oxides of Nitrogen : Secondary Measures (BAT is to apply Primary Measures first)</b>				
<b>Technique</b>	<b>Advantages</b>	<b>Disadvantages</b>	<b>Optimisation</b>	<b>Defined as BAT in BREF or TGN for:</b>
<b>Selective catalytic reduction (SCR)</b>	NOx emissions < 70mg/ m <sup>3</sup>  Reduces CO, VOC, dioxins	Expensive.  Re-heat required – reduces plant efficiency		All plant
<b>Selective non-catalytic reduction (SNCR)</b>	NOx emissions typically 150 - 180mg/m <sup>3</sup>	Relies on an optimum temperature around 900 °C, and sufficient retention time for reduction  May lead to Ammonia slip	Port injection location	All plant unless lower NOx release required for local environmental protection.
<b>Reagent Type: Ammonia</b>	Likely to be BAT  Lower nitrous oxide formation	More difficult to handle  Narrower temperature window		All plant

<b>Reagent Type: Urea</b>	Likely to be BAT			All plant
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The Applicant proposes to implement the following primary measures:

- Low NO<sub>x</sub> burners – this technique reduces NO<sub>x</sub> at source and is defined as BAT where auxiliary burners are required.
- Optimise primary and secondary air injection – this technique is BAT for all plant.

There are two recognised techniques for secondary measures to reduce NO<sub>x</sub>. These are Selective Catalytic Reduction (SCR) and Selective Non-Catalytic Reduction (SNCR). For each technique, there is a choice of urea or ammonia reagent.

SCR can reduce NO<sub>x</sub> levels to below 70 mg/m<sup>3</sup> and can be applied to all plant, it is generally more expensive than SNCR and requires reheating of the waste gas stream which reduces energy efficiency, periodic replacement of the catalysts also produces a hazardous waste. SNCR can typically reduce NO<sub>x</sub> levels to between 150 and 180 mg/m<sup>3</sup>, it relies on an optimum temperature of around 900 deg C and sufficient retention time for reduction. SNCR is more likely to have higher levels of ammonia slip. The technique can be applied to all plant unless lower NO<sub>x</sub> releases are required for local environmental protection. Urea or ammonia can be used as the reagent with either technique, urea is somewhat easier to handle than ammonia and has a wider operating temperature window, but tends to result in higher emissions of N<sub>2</sub>O. Either reagent is BAT, and the use of one over the other is not normally significant in environmental terms.

The Applicant proposes to use SNCR with ammonia as the reagent.

Emissions of NO<sub>x</sub> cannot be screened out as insignificant. Therefore the Applicant has carried out a cost / benefit study of the alternative techniques. The cost per tonne of NO<sub>x</sub> abated over the projected life of the plant has been calculated and compared with the environmental impact as shown in the table below.

	Cost of NO <sub>x</sub> removal £/tonne	PC (long term)*	PEC (long term)
SCR	1723	0.76	24.3
SNCR	667	2.67	26.2

\* Note that this assessment assumes 100% of the NO<sub>x</sub> is converted to NO<sub>2</sub>.

Based on the figures above the Applicant considers that the additional cost of SCR over SNCR is not justified by the reduction in environmental impact. Thus SCR is not BAT in this case, and SNCR is BAT for the Installation. The Applicant has justified the use of ammonia as the reagent on the basis of

- The annualised costs of using SNCR with ammonia are almost 30% lower than those of SNCR with urea for a comparable level of performance; and
- It offers a 50% reduction in unabated NO<sub>x</sub> emissions, which is comparable to SNCR using urea.

The Environment Agency agrees with this assessment.

The amount of ammonia used for NO<sub>x</sub> abatement will need to be optimised to maximise NO<sub>x</sub> reduction and minimise NH<sub>3</sub> slip. Improvement condition IC5 requires the Operator to report to the Environment Agency on optimising the performance of the NO<sub>x</sub> abatement system. The Operator is also required to monitor and report on NH<sub>3</sub> (continuously) and N<sub>2</sub>O emissions every 6 months.

### 6.2.3 Acid Gases, SO<sub>x</sub>, HCl and HF

<b>Acid gases and halogens : Primary Measures</b>				
<b>Technique</b>	<b>Advantages</b>	<b>Disadvantages</b>	<b>Optimisation</b>	<b>Defined as BAT in BREF or TGN for:</b>
<b>Low sulphur fuel, (&lt; 0.1%S gasoil or natural gas)</b>	Reduces SO <sub>x</sub> at source		Start-up, supplementary firing.	Where auxiliary fuel required.
<b>Management of waste streams</b>	Disperses sources of acid gases (e.g. PVC) through feed.	Requires closer control of waste management		All plant with heterogeneous waste feed

<b>Acid gases and halogens : Secondary Measures (BAT is to apply Primary Measures first)</b>				
<b>Technique</b>	<b>Advantages</b>	<b>Disadvantages</b>	<b>Optimisation</b>	<b>Defined as BAT in BREF or TGN for:</b>
<b>Wet</b>	High reaction rates  Low solid residues production  Reagent delivery may be optimised by concentration and flow rate	Large effluent disposal and water consumption if not fully treated for re-cycle  Effluent treatment plant required  May result in		Plants with high acid gas and metal components in exhaust gas – HWIs
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		wet plume  Energy required for effluent treatment and plume reheat		
<b>Dry</b>	Low water use  Reagent consumption may be reduced by recycling in plant  Lower energy use  Higher reliability	Higher solid residue production  Reagent consumption controlled only by input rate		All plant
<b>Semi-dry</b>	Medium reaction rates  Reagent delivery may be varied by concentration and input rate	Higher solid waste residues		All plant
<b>Reagent Type: Sodium Hydroxide</b>	Highest removal rates  Low solid waste production	Corrosive material  ETP sludge for disposal		HWIs
<b>Reagent Type: Lime</b>	Very good removal rates  Low leaching solid residue  Temperature of reaction well suited to use with bag filters	Corrosive material  May give greater residue volume if no in-plant recycle	Wide range of uses	MWIs, CWIs
<b>Reagent</b>	Good	Efficient	Not proven at	CWIs

<b>Type:</b> <b>Sodium Bicarbonate</b>	removal rates  Easiest to handle  Dry recycle systems proven	temperature range may be at upper end for use with bag filters – Leachable solid residues  Bicarbonate more expensive	large plant	
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The Applicant proposes to implement the following primary measures:

- Use of low sulphur fuels for start up and auxiliary burners – gas should be used if available, where fuel oil is used, this will be low sulphur (i.e. <0.1%), this will reduce SO<sub>x</sub> at source. The Applicant has justified its choice of gasoil as the support fuel is based on safety considerations in that as gas oil is already available on site as a fuel for site vehicles and the gas oil is only needed in low quantities by the burners, it was decided to utilise the available gas oil fuel rather than introduce a second fuel source and we agree with that assessment.
- Management of heterogeneous wastes – this will disperse problem wastes such as PVC by ensuring a homogeneous waste feed.

There are three recognised techniques for secondary measures to reduce acid gases. These are wet, dry and semi-dry. Wet scrubbing produces an effluent for treatment and disposal in compliance with Article 46(3) of IED. It will also require reheat of the exhaust to avoid a visible plume. Wet scrubbing is unlikely to be BAT except where there are high acid gas and metal components in the exhaust gas as may be the case for some hazardous waste incinerators. In this case, the Applicant does not propose using wet scrubbing, and the Environment Agency agrees that wet scrubbing is not appropriate in this case.

The Applicant has therefore considered dry and semi-dry methods of secondary measures for acid gas abatement. Either can be BAT for this type of facility.

Both dry and semi-dry methods rely on the dosing of powdered materials into the exhaust gas stream. Semi-dry systems (i.e. hydrated reagent) offer reduced material consumption through faster reaction rates, but reagent recycling in dry systems can offset this.

In both dry and semi-dry systems, the injected powdered reagent reacts with the acid gases and is removed from the gas stream by the bag filter system. The powdered materials are either lime or sodium bicarbonate. Both are effective at reducing acid gases, and dosing rates can be controlled from

continuously monitoring acid gas emissions. The decision on which reagent to use is normally economic. Lime produces a lower leaching solid residue in the APC residues than sodium bicarbonate and the reaction temperature is well suited to bag filters, it tends to be lower cost, but it is a corrosive material and can generate a greater volume of solid waste residues than sodium bicarbonate. Either reagent is BAT, and the use of one over the other is not significant in environmental terms in this case.

In this case, the Applicant proposes to use dry scrubbing using lime. The Environment Agency is satisfied that this is BAT

#### 6.2.4 Carbon monoxide and volatile organic compounds (VOCs)

The prevention and minimisation of emissions of carbon monoxide and volatile organic compounds is through the optimisation of combustion controls, where all measures will increase the oxidation of these species.

<b>Carbon monoxide and volatile organic compounds (VOCs)</b>				
<b>Technique</b>	<b>Advantages</b>	<b>Disadvantages</b>	<b>Optimisation</b>	<b>Defined as BAT in BREF or TGN for:</b>
<b>Optimise combustion control</b>	All measures will increase oxidation of these species.		Covered in section on furnace selection	All plants

#### 6.2.5 Dioxins and furans (and Other POPs)

<b>Dioxins and furans</b>				
<b>Technique</b>	<b>Advantages</b>	<b>Disadvantages</b>	<b>Optimisation</b>	<b>Defined as BAT in BREF or TGN for:</b>
<b>Optimise combustion control</b>	All measures will increase oxidation of these species.		Covered in section on furnace selection	All plants
<b>Avoid <i>de novo</i> synthesis</b>			Covered in boiler design	All plant
<b>Effective Particulate matter removal</b>			Covered in section on particulate matter	All plant
<b>Activated Carbon injection</b>	Can be combined with acid gas absorber or fed separately.	Combined feed rate usually controlled by acid gas content.		All plant.  Separate feed normally BAT unless feed is constant and acid gas control also controls dioxin

				release.
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The prevention and minimisation of emissions of dioxins and furans is achieved through:

- optimisation of combustion control including the maintenance of permit conditions on combustion temperature and residence time, which has been considered in 6.1.1 above;
- avoidance of de novo synthesis, which has been covered in the consideration of boiler design;
- the effective removal of particulate matter, which has been considered in 6.2.1 above;
- injection of activated carbon. This can be combined with the acid gas reagent or dosed separately. Where the feed is combined, the combined feed rate will be controlled by the acid gas concentration in the exhaust. Therefore, separate feed of activated carbon would normally be considered BAT unless the feed was relatively constant. Effective control of acid gas emissions also assists in the control of dioxin releases.

In this case the Applicant proposes separate feed and we are satisfied their proposals are BAT.

#### 6.2.6 Metals

<b>Metals</b>				
<b>Technique</b>	<b>Advantages</b>	<b>Disadvantages</b>	<b>Optimisation</b>	<b>Defined as BAT in BREF or TGN for:</b>
<b>Effective Particulate matter removal</b>			Covered in section on particulate matter	All plant
<b>Activated Carbon injection for mercury recovery</b>	Can be combined with acid gas absorber or fed separately.	Combined feed rate usually controlled by acid gas content.		All plant.  Separate feed normally BAT unless feed is constant and acid gas control also controls dioxin release.

The prevention and minimisation of metal emissions is achieved through the effective removal of particulate matter, and this has been considered in 6.2.1 above.

Unlike other metals however, mercury if present will be in the vapour phase. BAT for mercury removal is also dosing of activated carbon into the exhaust gas stream. This can be combined with the acid gas reagent or dosed



separately. Where the feed is combined, the combined feed rate will be controlled by the acid gas concentration in the exhaust. Therefore, separate feed of activated carbon would normally be considered BAT unless the feed was relatively constant.

In this case the Applicant proposes separate feed and we are satisfied their proposals are BAT.

### 6.3 BAT and global warming potential

This section summarises the assessment of greenhouse gas impacts which has been made in the determination of this Permit. Emissions of carbon dioxide (CO<sub>2</sub>) and other greenhouse gases differ from those of other pollutants in that, except at gross levels, they have no localised environmental impact. Their impact is at a global level and in terms of climate change. Nonetheless, CO<sub>2</sub> is clearly a pollutant for IED purposes.

The principal greenhouse gas emitted is CO<sub>2</sub>, but the plant also emits small amounts of N<sub>2</sub>O arising from the operation of secondary NO<sub>x</sub> abatement. N<sub>2</sub>O has a global warming potential 310 times that of CO<sub>2</sub>. The Applicant will therefore be required to optimise the performance of the secondary NO<sub>x</sub> abatement system to ensure its GWP impact is minimised.

The major source of greenhouse gas emissions from the installation is however CO<sub>2</sub> from the combustion of waste. There will also be CO<sub>2</sub> emissions from the burning of support fuels at start up, shut down and should it be necessary to maintain combustion temperatures. BAT for greenhouse gas emissions is to maximise energy recovery and efficiency.

The electricity that is generated by the Installation will displace emissions of CO<sub>2</sub> elsewhere in the UK, as virgin fossil fuels will not be burnt to create the same electricity.

The Installation is not subject to the Greenhouse Gas Emissions Trading Scheme Regulations 2012 therefore it is a requirement of IED to investigate how emissions of greenhouse gases emitted from the installation might be prevented or minimised.

Factors influencing GWP and CO<sub>2</sub> emissions from the Installation are:

On the debit side

- CO<sub>2</sub> emissions from the burning of the waste;
- CO<sub>2</sub> emissions from burning auxiliary or supplementary fuels;
- CO<sub>2</sub> emissions associated with electrical energy used;
- N<sub>2</sub>O from the de-NO<sub>x</sub> process.

On the credit side

- CO<sub>2</sub> saved from the export of electricity to the public supply by displacement of burning of virgin fuels;

The GWP of the plant will be dominated by the emissions of carbon dioxide that are released as a result of waste combustion. This will be constant for all options considered in the BAT assessment. Any differences in the GWP of the options in the BAT appraisal will therefore arise from small differences in energy recovery and in the amount of N<sub>2</sub>O emitted.

The Applicant considered energy efficiency and compared SCR to SNCR in its BAT assessment.

The Applicant's comparison of SNCR to SCR showed that SNCR was favourable in terms of global warming potential, with SNCR using ammonia as a reagent favourable when compared with SNCR with urea due to reduced N<sub>2</sub>O formation.

Note: avoidance of methane which would be formed if the waste was landfilled has not been included in this assessment. If it were included due to its avoidance it would be included on the credit side. Ammonia has no direct GWP effect.

Taking all these factors into account, the Operator's assessment shows their preferred options are best in terms of GWP.

The Environment Agency agrees with this assessment and that the chosen option is BAT for the installation.

#### 6.4 BAT and POPs

International action on Persistent Organic pollutants (POPs) is required under the UN's Stockholm Convention, which entered into force in 2004. The EU implemented the Convention through the POPs Regulation (850/2004), which is directly applicable in UK law. The Environment Agency is required by national POPs Regulations (SI 2007 No 3106) to give effect to Article 6(3) of the EC POPs Regulation when determining applications for environmental Permits.

However, it needs to be borne in mind that this application is for a particular type of installation, namely a waste incinerator. The Stockholm Convention distinguishes between intentionally-produced and unintentionally-produced POPs. Intentionally-produced POPs are those used deliberately (mainly in the past) in agriculture (primarily as pesticides) and industry. Those intentionally-produced POPs are not relevant where waste incineration is concerned, as in fact high-temperature incineration is one of the prescribed methods for destroying POPs.

The unintentionally-produced POPs addressed by the Convention are:

- dioxins and furans;
- HCB (hexachlorobenzene)
- PCBs (polychlorobiphenyls) and
- PeCB (pentachlorobenzene)

The UK's national implementation plan for the Stockholm Convention, published in 2007, makes explicit that the relevant controls for unintentionally-produced POPs, such as might be produced by waste incineration, are delivered through the requirements of IED. That would include an examination of BAT, including potential alternative techniques, with a view to preventing or minimising harmful emissions. These have been applied as explained in this document, which explicitly addresses alternative techniques and BAT for the minimisation of emissions of dioxins.

Our legal obligation, under regulation 4(b) of the POPs Regulations, is, when considering an application for an environmental permit, to comply with article 6(3) of the POPs Regulation:

“Member States shall, when considering proposals to construct new facilities or significantly to modify existing facilities using processes that release chemicals listed in Annex III, without prejudice to Council Directive 1996/61/EC, give priority consideration to alternative processes, techniques or practices that have similar usefulness but which avoid the formation and release of substances listed in Annex III.”

The 1998 Protocol to the Convention recommended that unintentionally produced should be controlled by imposing emission limits (e.g 0.1 ng/m<sup>3</sup> for MWIs) and using BAT for incineration. UN Economic Commission for Europe (Executive Body for the Convention) (ECE-EB) produced BAT guidance for the parties to the Convention in 2009. This document considers various control techniques and concludes that primary measures involving management of feed material by reducing halogenated substances are not technically effective. This is not surprising because halogenated wastes still need to be disposed of and because POPs can be generated from relatively low concentrations of halogens. In summary, the successful control techniques for waste incinerators listed in the ECE-EB BAT are:

- maintaining furnace temperature of 850°C and a combustion gas residence time of at least 2 seconds
- rapid cooling of flue gases to avoid the *de novo* reformation temperature range of 250-450°C
- use of bag filters and the injection of activated carbon or coke to adsorb residual POPs components.

Using the methods listed above, the UN-ECE BAT document concludes that incinerators can achieve an emission concentration of 0.1 ng TEQ/m<sup>3</sup>.

We believe that the Permit ensures that the formation and release of POPs will be prevented or minimised. As we explain above, high-temperature incineration is one of the prescribed methods for destroying POPs. Permit conditions are based on the use of BAT and Chapter IV of IED and incorporate all the above requirements of the UN-ECE BAT guidance and deliver the requirements of the Stockholm Convention in relation to unintentionally produced POPs.

The release of **dioxins and furans** to air is required by the IED to be assessed against the I-TEQ (International Toxic Equivalence) limit of 0.1 ng/m<sup>3</sup>. Further development of the understanding of the harm caused by dioxins has resulted in the World Health Organisation (WHO) producing updated factors to calculate the WHO-TEQ value. Certain **PCBs** have structures which make them behave like dioxins (dioxin-like PCBs), and these also have toxic equivalence factors defined by WHO to make them capable of being considered together with dioxins. The UK's independent health advisory committee, the Committee on Toxicity of Chemicals in Food, Consumer Products and the Environment (COT) has adopted WHO-TEQ values for both dioxins and dioxin-like PCBs in their review of Tolerable Daily Intake (TDI) criteria. The Permit requires that, in addition to the requirements of the IED, the WHO-TEQ values for both dioxins and dioxin-like PCBs should be monitored for reporting purposes, to enable evaluation of exposure to dioxins and dioxin-like PCBs to be made using the revised TDI recommended by COT. The release of dioxin-like PCBs and PAHs is expected to be low where measures have been taken to control dioxin releases. The Permit also requires monitoring of a range of PAHs and dioxin-like PCBs at the same frequency as dioxins are monitored. We have included a requirement to monitor and report against these WHO-TEQ values for dioxins and dioxin-like PCBs and the range of PAHs as listed in the Permit. We are confident that the measures taken to control the release of dioxins will also control the releases of dioxin-like PCBs and PAHs. Section 5.2.1 of this document details the assessment of emissions to air, which includes dioxins and concludes that there will be no adverse effect on human health from either normal or abnormal operation.

**Hexachlorobenzene (HCB)** is released into the atmosphere as an accidental product from the combustion of coal, waste incineration and certain metal processes. It has also been used as a fungicide, especially for seed treatment although this use has been banned in the UK since 1975. Natural fires and volcanoes may serve as natural sources. Releases of (HCB) are addressed by the European Environment Agency (EEA), which advises that:

*"due to comparatively low levels in emissions from most (combustion) processes special measures for HCB control are usually not proposed. HCB emissions can be controlled generally like other chlorinated organic compounds in emissions, for instance dioxins/furans and PCBs: regulation of time of combustion, combustion temperature, temperature in cleaning devices, sorbents application for waste gases cleaning etc."* [reference [http://www.eea.europa.eu/publications/EMEPCORINAIR4/sources\\_of\\_HCB.pdf](http://www.eea.europa.eu/publications/EMEPCORINAIR4/sources_of_HCB.pdf)]

Pentachlorobenzene (PeCB) is another of the POPs list to be considered under incineration. PeCB has been used as a fungicide or flame retardant, there is no data available however on production, recent or past, outside the

UN-ECE region. PeCBs can be emitted from the same sources as for PCDD/F: waste incineration, thermal metallurgic processes and combustion plants providing energy. As discussed above, the control techniques described in the UN-ECE BAT guidance and included in the permit, are effective in controlling the emissions of all relevant POPs including PeCB.

We have assessed the control techniques proposed for dioxins by the Applicant and have concluded that they are appropriate for dioxin control. We are confident that these controls are in line with the UN-ECE BAT guidance and will minimise the release of HCB, PCB and PeCB.

We are therefore satisfied that the substantive requirements of the Convention and the POPs Regulation have been addressed and complied with.

## 6.5 Other Emissions to the Environment

### 6.5.1 Emissions to water

The Applicant has stated that only surface water runoff collected from access roads and parking will be discharged to controlled waters. The surface water will be collected within the site drainage system which is equipped with a full retention oil separator, it will be passed into an underground cellular site attenuation storage system before being discharged into the River Lee via a new outfall pipe through the existing quay wall. The runoff is derived from areas of the site that are not subject to point sources emissions and the Operator is required by the permit to restrict this discharge to uncontaminated surface water only. Whilst there is a risk that the runoff could become contaminated due to fugitive emissions of potentially polluting substances we are satisfied that the various pollution prevention measures proposed in the Application as a whole will prevent pollution occurring. See section 6.5.3 below for details of our assessment of fugitive emissions.

The site will also have a discharge to the River Lee of secondary treated domestic effluent, up to 9m<sup>3</sup> per day. The effluent will originate from the visitor centre and admin building which are not considered part of the installation, and will be discharged via a package treatment plant. A standard rules permit application (SR2010 No.3) was made for this discharge however the application did not meet the standard rules criteria due to the proximity of protected species. For this reason we have treated the application as a bespoke application and have carried out a full assessment of the discharge. The assessment showed that the discharge would not result in a significant adverse impact on water quality in the River Lee. The discharge has been incorporated in to the permit. We have included limits on the discharge for visual appearance, flow, oil and grease, BOD, Ammonia and suspended solids. Note that this stretch of the River Lee is an asset of the Canal and River Trust, therefore the Applicant will need their permission to discharge. Thames Water and the Canal and River Trust have been consulted on the proposed discharge. Thames Water did not comment. The Canal and River Trust made several comments, see Annex 4 for a summary of the comments and how we have addressed these.

Based upon the information in the application we are satisfied that appropriate measures will be in place to prevent and /or minimise emissions to water.

#### 6.5.2 Emissions to sewer

The Applicant has stated that there will be no discharges to sewer. However they have stated that the option will be explored in the future. Any future discharge to sewer will be subject to a variation application.

#### 6.5.3 Fugitive emissions

The IED specifies that Operators must be able to demonstrate that the plant is designed in such a way as to prevent the unauthorised and accidental release of polluting substances into soil, surface water and groundwater. In addition storage requirements for waste and for contaminated water of Article 46(5) must be arranged. We are satisfied both requirements are satisfied.

The Application proposes that chemical and gas oil bulk storage tanks will be constructed to an appropriate standard, bunded and will incorporate high level alarms to avoid overflowing. Activated carbon and hydrated lime will be stored within silos that have local dust filters and also incorporate high level alarms to avoid over filling. Lubricants and oils will be stored in containers within a bund. The Applicant has stated that spill kits will be available on site. Waste storage and IBA storage area will have sealed drainage. Runoff from these areas will be collected and re used where possible or if necessary tankered off site. We are satisfied there is adequate storage capacity.

All waste will be stored within a building this will minimise fugitive emissions of litter and dust. Also any contaminated run-off from the waste or IBA stored on site will be prevented from entering nearby watercourses due to it being contained in a sealed drainage area.

We received a number of comments on the storage and handling of IBA from the public consultation on the draft decision. Although we were already satisfied with the Applicant's proposals we decided to ask the Applicant to provide further details of their proposed techniques to address the concerns raised in the public consultation (see Annex 4 for further details). The following is a summary of the techniques proposed:

- IBA is deposited in to roofed buildings, which are enclosed on 3 sides. The IBA will be routinely sprayed with water to ensure it does not give rise to dust.
- As necessary ashes will be sprayed with water prior to and during the loading activity. Hourly reports from the onsite weather station will be used to assess weather conditions. The duty manager will stop loading IBA in high winds or when adverse meteorological conditions necessitate.
- Operating procedures will be employed to routinely monitor ash to ensure that it is dampened and does not dry out.

- Regular cleaning of the loading area and access roadways will take place to maintain a clean environment and minimise fugitive dust emissions from spillage
- Drainage is provided for surface water run-off from the open northwest side of the IBA handling area and from the IBA storage sheds – this is sealed and any runoff will be collected and ultimately discharged to the process water sedimentation tank. Any excess water that cannot be re-used in the process will be tankered away off-site. The drainage system is separate from the surface water drainage system for the site roads and other external areas and as such contaminated water cannot enter the surface water management system.
- Any vehicles leaving the IBA storage area will be visually inspected and if necessary jet washed or washed down prior to leaving to minimise the risk of IBA being deposited on roadways outside the IBA area.
- In the unlikely event that IBA is spilled on to road ways outside the sealed drainage area, this will be treated as an accident /incident under the site Emergency plan and the site spillage control arrangements will be implemented. Surface water drains will be protected using drain covers and booms as appropriate. Spills will be cleaned up immediately and if necessary a road sweeper can be deployed. Discharge of surface water to the River Lee will be permitted once the surface water drains and attenuation tank are inspected. If necessary cleaning and monitoring of affected drains and/or attenuation tanks will be arranged before pumped discharge to the River Lee is resumed.
- Daily inspections of areas outside the sealed drainage will be carried out. Any accumulations found will be removed promptly.

Written procedures for the techniques described above will form part of the Operator’s written management system, which is a requirement under condition 1.1.1 of the permit. A copy of the Environmental Management Systems (EMS) documents and procedures shall be made available for inspection prior to commencement of operations under pre-operational condition PO1.

The permit contains condition 3.2.1 require that emissions of substances not controlled by emission limits (excluding odour) shall not cause pollution. We are satisfied that the various pollution prevention measure proposed in the Application as a whole will prevent any significant pollution of the environment or harm to human health.

#### 6.5.4 Odour

Based upon the information in the Application we are satisfied that the appropriate measures will be in place to prevent or where that is not practicable to minimise odour and to prevent pollution from odour.

Waste accepted at the installation will be delivered in covered vehicles or within containers and bulk storage of waste will only occur in the installation’s waste bunker. A roller shutter door will be used to close the entrance to the tipping hall outside of the waste delivery periods and combustion air will be

drawn from above the waste storage bunker in order to prevent odours and airborne particulates from leaving the facility building. We have set pre-operational condition (PO8) so that the air flows through the building are checked at the commissioning stage.

The Applicant proposes that planned shutdowns will occur annually however only one incineration line will be shutdown at a time so as to ensure the air is still drawn through the incinerator to maintain odour control. There will be a shutdown of both lines simultaneously once every 2 years for 1-2 days. During this period the following techniques will be employed:

- odour monitoring as part of the shift walkdown with completion of an odour log;
- all facility doors will remain closed except when vehicles enter and depart;
- utilisation of odour control additives applied with the misting system in the tipping building.
- For extended shutdowns of both lines simultaneously, waste deliveries will be diverted during the shutdown and if necessary waste can be back-loaded out of the bunker using the refuse crane and removed to a suitably permitted waste treatment facility.
- Ammonia will be stored in a sealed tank which incorporates control measures to minimise the risk of fugitive release.

With regards to IBA the Applicant has stated that it has a relatively low potential for odour when stored at ambient temperature. We agree with this and our experience of regulating similar sites in a similar setting to this site is that significant odour issues from IBA are unlikely to occur.

The Applicant has stated that IBA will be stored in a roofed building enclosed on 3 sides and that daily odour monitoring will be carried out around the IBA storage area. In the unlikely event that issues are identified they will consider other appropriate measures to mitigate any odour, such as odour neutralisers in the liquid being used for dust suppression and curtain windbreaks installed along the open side of the IBA sheds.

We are satisfied that the risk of odour pollution from the storage and handling of IBA is likely to be low. The permit requires the Operator to control odour through condition 3.3.1 and the permit also includes condition 3.3.2 which could be used to require the Operator to submit an odour management plan in the unlikely event that odour was to be an issue.

Pre-operational condition PO3 requires a commissioning plan to be submitted, we expect odour control to be an important consideration in the plan and that if deemed necessary further controls can be implemented prior to full operation of the facility.

#### 6.5.5 Noise and vibration



Based upon the information in the application we are satisfied that the appropriate measures will be in place to prevent or where that is not practicable to minimise noise and vibration and to prevent pollution from noise and vibration outside the site.

The application contained a noise impact assessment and noise modelling (using SoundPLAN 7.4) which identified local noise-sensitive receptors, potential sources of noise at the proposed plant (including noise from facility buildings, external plant and activities, and noise from HGVs) and noise attenuation measures. Measurements were taken of the prevailing ambient noise levels to produce a baseline noise survey and an assessment was carried out in accordance with BS 4142:2014 to compare the predicted plant rating noise levels with the established background levels.

We audited the Applicant's Noise assessment and modelling and we were not satisfied that that the background data used in the assessment was representative of the current soundscape as it was gathered between 2011 – 2012. For this reason we requested via a Schedule 5 Notice that the Applicant submit a revised background assessment and conduct a re-assessment of the predicted impacts at the key receptor locations. The key receptors include Lock Keepers Cottage which is located close to the proposed facility.

The Applicant did carry out a revised background assessment which used background noise measurements taken in 2018, and they carried out a re-assessment of the impacts at key receptors. We have audited the re-assessment, and also carried out our own check calculations and modelling. Our findings agree with the Applicant's conclusion that the impacts will be low at all receptors. Our predictions and conclusions are based on the sound power levels and mitigation found within the Applicant's noise modelling. Therefore, the assessment depends on the operator incorporating the mitigation and achieving the same level of sound powers as modelled. We have included a pre-operational condition (PO3) in the permit that includes a requirement for the Operator to validate the noise assessment.

## 6.6 Setting ELVs and other Permit conditions

### 6.6.1 Translating BAT into Permit conditions

Article 14(3) of IED states that BAT conclusions shall be the reference for permit conditions. Article 15(3) further requires that under normal operating conditions; emissions do not exceed the emission levels associated with the best available techniques as laid down in the decisions on BAT conclusions.

At the time of writing of this document, no BAT conclusions have been published for waste incineration or co-incineration. The BAT conclusions are expected in 2019 and permits will be reviewed accordingly.

The use of IED Chapter IV emission limits for air dispersion modelling sets the worst case scenario. If this shows emissions are insignificant then we have accepted that the Applicant's proposals are BAT, and that there is no justification to reduce ELVs below the Chapter IV limits in these circumstances.

Below we consider whether, for those emission not screened out as insignificant, different conditions are required as a result of consideration of local or other factors, so that no significant pollution is caused (Article 11(c)) or to comply with environmental quality standards (Article 18).

(i) Local factors

We have considered the following information as set out in the sections above:

- The location of human receptors
- The location of ecological receptors and wildlife

Permit conditions will ensure that the Installation is unlikely to have a significant effect on any local receptor.

(ii) National and European ESs

Emission limits have been set that will ensure the Installation is unlikely to contribute to an exceedance of these standards.

(iii) Global Warming

CO<sub>2</sub> is an inevitable product of the combustion of waste. The amount of CO<sub>2</sub> emitted will be essentially determined by the quantity and characteristics of waste being incinerated, which are already subject to conditions in the Permit. It is therefore inappropriate to set an emission limit value for CO<sub>2</sub>, which could do no more than recognise what is going to be emitted. The gas is not therefore targeted as a key pollutant under Annex II of IED, which lists the main polluting substances that are to be considered when setting emission limit values (ELVs) in Permits.

We have therefore considered setting equivalent parameters or technical measures for CO<sub>2</sub>. However, provided energy is recovered efficiently (see section 4.3.7 above), there are no additional equivalent technical measures (beyond those relating to the quantity and characteristics of the waste) that can be imposed that do not run counter to the primary purpose of the plant, which is the destruction of waste. Controls in the form of restrictions on the volume and type of waste that can be accepted at the Installation and permit conditions relating to energy efficiency effectively apply equivalent technical measures to limit CO<sub>2</sub> emissions.

(iv) Commissioning

Before the plant can become fully operational it will be necessary for it to be commissioned. IED and the Permit cover operations once the plant is fully operational. Before it can be commissioned the Operator is required (by pre-operational condition PO3) to submit its proposals for commissioning to the Agency for approval. Commissioning will be carried out in accordance with the approved proposals.

## 6.7 Monitoring

### 6.7.1 Monitoring during normal operations

We have decided that monitoring should be carried out for the parameters listed in Schedule 3 using the methods and to the frequencies specified in those tables. These monitoring requirements have been imposed in order to demonstrate compliance with emission limit values and to enable correction of measured concentration of substances to the appropriate reference conditions; to gather information about the performance of the SNCR system; to establish data on the release of dioxin-like PCBs and PAHs from the incineration process and to deliver the requirements of Chapter IV of IED for monitoring of residues and temperature in the combustion chamber.

For emissions to air, the methods for continuous and periodic monitoring are in accordance with the Environment Agency's Guidance M2 for monitoring of stack emissions to air.

Based on the information in the Application and the requirements set in the conditions of the permit we are satisfied that the Operator's techniques, personnel and equipment will have either MCERTS certification or MCERTS accreditation as appropriate.

### 6.7.2 Monitoring under abnormal operations arising from the failure of the installed CEMs

The Operator has stated that they will provide back-up CEMS working in parallel to the operating CEMS. These will be switched into full operation immediately in the event that there is any failure in the regular monitoring equipment. The back-up CEMS measure the same parameters as the operating CEMS. In the unlikely event that the back-up CEMS also fail Condition 2.3.10 of the permit requires that the abnormal operating conditions apply.

### 6.7.3 Continuous emissions monitoring for dioxins and heavy metals

Chapter IV of IED specifies manual extractive sampling for heavy metals and dioxin monitoring. However, Article 48(5) of the IED enables The Commission to act through delegated, authority to set the date from which continuous measurements of the air emission limit values for heavy metals, dioxins and furans shall be carried out, as soon as appropriate measurement techniques are available within the Community. No such decision has yet been made by the Commission.

The Environment Agency has reviewed the applicability of continuous sampling and monitoring techniques to the installation.

Recent advances in mercury monitoring techniques have allowed standards to be developed for continuous mercury monitoring, including both vapour-phase and particulate mercury. There is a standard which can apply to CEMs which measure mercury (EN 15267-3) and standards to certify CEMs for mercury, which are EN 15267-1 and EN 15267-3. Furthermore, there is an MCERTS-certified CEM which has been used in trials in the UK and which has been verified on-site using many parallel reference tests as specified using the steps outlined in EN 14181.

In the case of dioxins, equipment is available for taking a sample for an extended period (several weeks), but the sample must then be analysed in the conventional way. A CEN committee has agreed Technical Specifications (EN TS 1948-5) for continuous sampling of dioxins. This specification will lead to a CEN standard following a validation exercise which is currently underway. According to IED Article 48(5), "As soon as appropriate measurement techniques are available within the Union, the Commission shall, by means of delegated acts in accordance with Article 76 and subject to the conditions laid down in Articles 77 and 78, set the date from which continuous measurements of emissions into the air of heavy metals and dioxins and furans are to be carried out. This is yet to happen. However, our extant 'dioxin enforcement policy' recommends continuous sampling of dioxins where multiple emission exceedances occur and no clear root cause can be identified. Therefore should continuous sampling be required at a later date during the operation of the installation, then sampling and analysis shall comply with the requirements of EN TS 1948

For either continuous monitoring of mercury or continuous sampling of dioxins to be used for regulatory purposes, an emission limit value would need to be devised which is applicable to continuous monitoring. Such limits for mercury and dioxins have not been set by the European Commission. Use of a manual sample train is the only technique which fulfils the requirements of the IED. At the present time, it is considered that in view of the predicted low levels of mercury and dioxin emission it is not justifiable to require the Operator to install additionally continuous monitoring or sampling devices for these substances.

In accordance with its legal requirement to do so, the Environment Agency reviews the development of new methods and standards and their performance in industrial applications. In particular the Environment Agency considers continuous sampling systems for dioxins to have promise as a potential means of improving process control and obtaining more accurate mass emission estimates.

## 6.8 Reporting

We have specified the reporting requirements in Schedule 5 of the Permit either to meet the reporting requirements set out in the IED, or to ensure data is reported to enable timely review by the Environment Agency to ensure compliance with permit conditions and to monitor the efficiency of material use and energy recovery at the installation.

## 7 Other legal requirements

In this section we explain how we have addressed other relevant legal requirements, to the extent that we have not addressed them elsewhere in this document.

### 7.1 The EPR 2016 and related Directives

The EPR delivers the requirements of a number of European and national laws.

#### 7.1.1 Schedules 1 and 7 to the EPR 2016 – IED Directive

We address the requirements of the IED in the body of this document above and the specific requirements of Chapter IV in Annex 1 of this document.

There is one requirement not addressed above, which is that contained in Article 5(3) IED. Article 5(3) requires that “In the case of a new installation or a substantial change where Article 4 of Directive 85/337/EC (now Directive 2011/92/EU) (the EIA Directive) applies, any relevant information obtained or conclusion arrived at pursuant to articles 5, 6 and 7 of that Directive shall be examined and used for the purposes of granting the permit.”

- Article 5 of EIA Directive relates to the obligation on developers to supply the information set out in Annex IV of the Directive when making an application for development consent.
- Article 6(1) requires Member States to ensure that the authorities likely to be concerned by a development by reason of their specific environmental responsibilities are consulted on the Environmental Statement and the request for development consent.
- Article 6(2)-6(6) makes provision for public consultation on applications for development consent.
- Article 7 relates to projects with transboundary effects and consequential obligations to consult with affected Member States.

The grant or refusal of development consent is a matter for the relevant local planning authority. The Environment Agency’s obligation is therefore to examine and use any relevant information obtained or conclusion arrived at by the local planning authorities pursuant to those EIA Directive articles.

In determining the Application we have considered the following documents: -

- The Environmental Statement submitted with the planning application (which also formed part of the Environmental Permit Application).
- The response of the Environment Agency to the local planning authority in its role as consultee to the planning process.

We have complied with our obligation under Article 9(2) so far as we are able in that no conclusion has yet been arrived at. From consideration of the Environmental Statement and our response as consultee to the planning

process we are satisfied that no additional or different permit conditions are necessary.

The Environment Agency has also carried out its own consultation on the Environmental Permitting Application which includes the Environmental Statement submitted to the local planning authority. The results of our consultation are described elsewhere in this decision document.

#### 7.1.2 Schedule 9 to the EPR 2016 – Waste Framework Directive

As the Installation involves the treatment of waste, it is carrying out a *waste operation* for the purposes of the EPR 2016, and the requirements of Schedule 9 therefore apply. This means that we must exercise our functions so as to ensure implementation of certain articles of the WFD.

We must exercise our relevant functions for the purposes of ensuring that the waste hierarchy referred to in Article 4 of the Waste Framework Directive is applied to the generation of waste and that any waste generated is treated in accordance with Article 4 of the Waste Framework Directive. (See also section 4.3.9)

The conditions of the permit ensure that waste generation from the facility is minimised. Where the production of waste cannot be prevented it will be recovered wherever possible or otherwise disposed of in a manner that minimises its impact on the environment. This is in accordance with Article 4.

We must also exercise our relevant functions for the purposes of implementing Article 13 of the Waste Framework Directive; ensuring that the requirements in the second paragraph of Article 23(1) of the Waste Framework Directive are met; and ensuring compliance with Articles 18(2)(b), 18(2)(c), 23(3), 23(4) and 35(1) of the Waste Framework Directive.

Article 13 relates to the protection of human health and the environment. These objectives are addressed elsewhere in this document.

Article 23(1) requires the permit to specify:

- (a) the types and quantities of waste that may be treated;
- (b) for each type of operation permitted, the technical and any other requirements relevant to the site concerned;
- (c) the safety and precautionary measures to be taken;
- (d) the method to be used for each type of operation;
- (e) such monitoring and control operations as may be necessary;
- (f) such closure and after-care provisions as may be necessary.

These are all covered by permit conditions.

We consider that the intended method of waste treatment is acceptable from the point of view of environmental protection so Article 23(3) does not apply.

Energy efficiency is dealt with elsewhere in this document but we consider the conditions of the permit ensure that the recovery of energy take place with a high level of energy efficiency in accordance with Article 23(4).

Article 35(1) relates to record keeping and its requirements are delivered through permit conditions.

### 7.1.3 Schedule 22 to the EPR 2016 – Water Framework and Groundwater Directives

To the extent that it might lead to a discharge of pollutants to groundwater (a “groundwater activity” under the EPR 2016), the Permit is subject to the requirements of Schedule 22, which delivers the requirements of EU Directives relating to pollution of groundwater. The Permit will require the taking of all necessary measures to prevent the input of any hazardous substances to groundwater, and to limit the input of non-hazardous pollutants into groundwater so as to ensure such pollutants do not cause pollution, and satisfies the requirements of Schedule 22.

No releases to groundwater from the Installation are permitted. The Permit also requires material storage areas to be designed and maintained to a high standard to prevent accidental releases.

### 7.1.4 Directive 2003/35/EC – The Public Participation Directive

Regulation 60 of the EPR 2016 requires the Environment Agency to prepare and publish a statement of its policies for complying with its public participation duties. We have published our public participation statement.

This Application is being consulted upon in line with this statement, as well as with our guidance RGS6 on Sites of High Public Interest, which addresses specifically extended consultation arrangements for determinations where public interest is particularly high. This satisfies the requirements of the Public Participation Directive.

Our decision in this case has been reached following a programme of extended public consultation, both on the original application and later, separately, on the permit and a decision document. The way in which this has been done is set out in Section 2. A summary of the responses received to our consultations and our consideration of them is set out in Annex 2.

## 7.2 National primary legislation

### 7.2.1 **Environment Act 1995**

#### (i) Section 4 (Pursuit of Sustainable Development)

We are required to contribute towards achieving sustainable development, as considered appropriate by Ministers and set out in guidance issued to us. The Secretary of State for Environment, Food and Rural Affairs has issued *The*



*Environment Agency's Objectives and Contribution to Sustainable Development: Statutory Guidance (December 2002)*. This document:

*"provides guidance to the Agency on such matters as the formulation of approaches that the Agency should take to its work, decisions about priorities for the Agency and the allocation of resources. It is not directly applicable to individual regulatory decisions of the Agency".*

Paragraph 4.2 of this Guidance provides the objectives we are to pursue when discharging our main operational functions. As far as determining applications for water discharge permits is concerned, this states that we are:

*'To protect, enhance and restore the environmental quality of inland and coastal surface water and groundwater, and in particular: to address both point source and diffuse pollution; to implement the EC Water Framework Directive; and to ensure that all relevant quality standards are met.'*

The Environment Agency considers that it has pursued the objectives set out in the Government's guidance, where relevant, and that there are no additional conditions that should be included in this Permit to take account of the Section 4 duty

In respect of regulation of industrial pollution through the EPR, the Guidance refers in particular to the objective of setting permit conditions *"in a consistent and proportionate fashion based on Best Available Techniques and taking into account all relevant matters..."*. The Environment Agency considers that it has pursued the objectives set out in the Government's guidance, where relevant, and that there are no additional conditions that should be included in this Permit to take account of the Section 4 duty.

For waste the guidance refers to ensuring waste is recovered or disposed of in ways which protect the environment and human health. The Environment Agency considers that it has pursued the objectives set out in the Government's guidance, where relevant, and that there are no additional conditions that should be included in this Permit to take account of the Section 4 duty.

(ii) Section 5 (Preventing or Minimising Effects of Pollution of the Environment)

We are satisfied that our pollution control powers have been exercised for the purpose of preventing or minimising, remedying or mitigating the effects of pollution.

(iii) Section 6(1) (Conservation Duties with Regard to Water)

We have a duty to the extent we consider it desirable generally to promote the conservation and enhancement of the natural beauty and amenity of inland and coastal waters and the land associated with such waters, and the

conservation of flora and fauna which are dependent on an aquatic environment. We consider that no additional or different conditions are appropriate for this Permit.

(iv) Section 6(6) (Fisheries)

We have a duty to maintain, improve and develop fisheries of salmon, trout, eels, lampreys, smelt and freshwater fish. We consider that no additional or different conditions are appropriate for this Permit.

(v) Section 7 (Pursuit of Conservation Objectives)

This places a duty on us, when considering any proposal relating to our functions, to have regard amongst other things to any effect which the proposals would have on sites of archaeological, architectural, or historic interest; the economic and social well-being of local communities in rural areas; and to take into account any effect which the proposals would have on the beauty or amenity of any rural area.

We considered whether we should impose any additional or different requirements in terms of our duty to have regard to the various conservation objectives set out in Section 7, but concluded that we should not.

(vi) Section 39 (Costs and Benefits)

We have a duty to take into account the likely costs and benefits of our decisions on the applications ('costs' being defined as including costs to the environment as well as any person). This duty, however, does not affect our obligation to discharge any duties imposed upon us in other legislative provisions.

In so far as relevant we consider that the costs that the permit may impose on the applicant are reasonable and proportionate in terms of the benefits it provides.

(vii) Section 108 Deregulation Act 2015 – Growth duty

We have considered our duty to have regard to the desirability of promoting economic growth set out in section 108(1) of the Deregulation Act 2015 and the guidance issued under section 110 of that Act in deciding whether to grant this permit.

Paragraph 1.3 of the guidance says:

"The primary role of regulators, in delivering regulation, is to achieve the regulatory outcomes for which they are responsible. For a number of regulators, these regulatory outcomes include an explicit reference to

development or growth. The growth duty establishes economic growth as a factor that all specified regulators should have regard to, alongside the delivery of the protections set out in the relevant legislation.”

We have addressed the legislative requirements and environmental standards to be set for this operation in the body of the decision document above. The guidance is clear at paragraph 1.5 that the growth duty does not legitimise non-compliance and its purpose is not to achieve or pursue economic growth at the expense of necessary protections.

We consider the requirements and standards we have set in this permit are reasonable and necessary to avoid a risk of an unacceptable level of pollution. This also promotes growth amongst legitimate operators because the standards applied to the operator are consistent across businesses in this sector and have been set to achieve the required legislative standards.

(viii) Section 81 (National Air Quality Strategy)

We have had regard to the National Air Quality Strategy and consider that our decision complies with the Strategy, and that no additional or different conditions are appropriate for this Permit.

#### **7.2.2 Human Rights Act 1998**

We have considered potential interference with rights addressed by the European Convention on Human Rights in reaching our decision and consider that our decision is compatible with our duties under the Human Rights Act 1998. In particular, we have considered the right to life (Article 2), the right to a fair trial (Article 6), the right to respect for private and family life (Article 8) and the right to protection of property (Article 1, First Protocol). We do not believe that Convention rights are engaged in relation to this determination.

#### **7.2.3 Countryside and Rights of Way Act 2000 (CROW 2000)**

Section 85 of this Act imposes a duty on Environment Agency to have regard to the purpose of conserving and enhancing the natural beauty of the area of outstanding natural beauty (AONB). There is no AONB which could be affected by the Installation.

#### **7.2.4 Wildlife and Countryside Act 1981**

Under section 28G of the Wildlife and Countryside Act 1981 the Environment Agency has a duty to take reasonable steps to further the conservation and enhancement of the flora, fauna or geological or physiographical features by reason of which a site is of special scientific interest. Under section 28I the Environment Agency has a duty to consult Natural England in relation to any permit that is likely to damage SSSIs.

We assessed the Application and concluded that the Installation will not damage the special features of any SSSI. This was recorded on a CROW Appendix 4 form.

The CROW assessment is summarised in greater detail in section 5.4 of this document. A copy of the full Appendix 4 Assessment can be found on the public register.

#### **7.2.5 Natural Environment and Rural Communities Act 2006**

Section 40 of this Act requires us to have regard, so far as is consistent with the proper exercise of our functions, to the purpose of conserving biodiversity. We have done so and consider that no different or additional conditions in the Permit are required.

### **7.3 National secondary legislation**

#### **7.3.1 Conservation of Habitats and Species Regulations 2017**

We have assessed the Application in accordance with guidance agreed jointly with Natural England and concluded that there will be no significant adverse effect alone or in-combination on the integrity of any European Site.

We consulted Natural England by means of a Stage 2 Habitats Assessment, and they agreed with our conclusions.

The habitat assessment is summarised in greater detail in section 5.4 of this document. A copy of the full stage 2 Habitats Assessment can be found on the public register.

#### **7.3.2 Water Environment (Water Framework Directive) Regulations 2017**

Consideration has been given to whether any additional requirements should be imposed in terms of the Environment Agency's duty under regulation 3 to secure compliance with the requirements of the Water Framework Directive and the EQS Directive through (inter alia) environmental permits, and its obligation in regulation 33 to have regard to the river basin management plan (RBMP) approved under regulation 314 and any supplementary plans prepared under regulation 32. However, it is felt that existing conditions are sufficient in this regard and no other appropriate requirements have been identified.

We are satisfied that granting this application with the conditions proposed would not cause the current status of the water body to deteriorate.

#### **7.3.3 The Persistent Organic Pollutants Regulations 2007**

We have explained our approach to these Regulations, which give effect to the Stockholm Convention on POPs and the EU's POPs Regulation, above.

### **7.4 Other relevant legal requirements**

#### **7.4.1 Duty to Involve**

S23 of the Local Democracy, Economic Development and Construction Act 2009 require us where we consider it appropriate to take such steps as we consider appropriate to secure the involvement of interested persons in the exercise of our functions by providing them with information, consulting them or involving them in any other way. S24 requires us to have regard to any Secretary of State guidance as to how we should do that.

The way in which the Environment Agency has consulted with the public and other interested parties is set out in section 2.2 of this document. The way in which we have taken account of the representations we have received is set out in Annex 4. Our public consultation duties are also set out in the EP Regulations, and our statutory Public Participation Statement, which implement the requirements of the Public Participation Directive. In addition to meeting our consultation responsibilities, we have also taken account of our guidance in Environment Agency Guidance Note RGS6 and the Environment Agency's Building Trust with Communities toolkit.

**ANNEX 1: APPLICATION OF CHAPTER IV OF THE INDUSTRIAL EMISSIONS DIRECTIVE**

<b>IED Article</b>	<b>Requirement</b>	<b>Delivered by</b>
45(1)(a)	The permit shall include a list of all types of waste which may be treated using at least the types of waste set out in the European Waste List established by Decision 2000/532/EC, if possible, and containing information on the quantity of each type of waste, where appropriate.	Condition 2.3.4(a) and Table S2.2 in Schedule 2 of the Permit.
45(1)(b)	The permit shall include the total waste incinerating or co-incinerating capacity of the plant.	Condition 2.3.4(a) and Table S2.2 in Schedule 2 of the Permit.
45(1)(c)	The permit shall include the limit values for emissions into air and water.	Conditions 3.1.1 and 3.1.2 and Tables S3.1 and S3.1(a) in Schedule 3 of the Permit.
45(1)(d)	The permit shall include the requirements for pH, temperature and flow of waste water discharges.	Not Applicable
45(1)(e)	The permit shall include the sampling and measurement procedures and frequencies to be used to comply with the conditions set for emissions monitoring.	Conditions 3.5.1 to 3.5.5 and Tables S3.1, S3.1(a), S3.2 and S3.4 in Schedule 3 of the Permit.
45(1)(f)	The permit shall include the maximum permissible period of unavoidable stoppages, disturbances or failures of the purification devices or the measurement devices, during which the emissions into the air and the discharges of waste water may exceed the prescribed emission limit values.	Conditions 2.3.10 and 2.3.11.
46(1)	Waste gases shall be discharged in a controlled way by means of a stack the height of which is calculated in such a way as to safeguard human health and the environment.	Condition 2.3.1(a) and Table S1.2 of Schedule 1 of the Permit.
46(2)	Emission into air shall not exceed the emission limit values set out in part of Annex VI.	Conditions 3.1.1 and 3.1.2 and Tables S3.1 and S3.1a.

<b>IED Article</b>	<b>Requirement</b>	<b>Delivered by</b>
46(2)	Emission into air shall not exceed the emission limit values set out in parts 4 or determined in accordance with part 4 of Annex VI.	Conditions 3.1.1 and 3.1.2 and Tables S3.1 and S3.1a.
46(3)	Relates to conditions for water discharges from the cleaning of exhaust gases.	There are no such discharges as condition 3.1.1 prohibits this.
46(4)	Relates to conditions for water discharges from the cleaning of exhaust gases.	There are no such discharges as condition 3.1.1 prohibits this.
46(5)	Prevention of unauthorised and accidental release of any polluting substances into soil, surface water or groundwater. Adequate storage capacity for contaminated rainwater run-off from the site or for contaminated water from spillage or fire-fighting.	The application explains the measures to be in place for achieving the directive requirements
46(6)	Limits the maximum period of operation when an ELV is exceeded to 4 hours uninterrupted duration in any one instance, and with a maximum cumulative limit of 60 hours per year. Limits on dust (150 mg/m <sup>3</sup> ), CO and TOC not to be exceeded during this period.	Conditions 2.3.11 and 2.3.12
47	In the event of breakdown, reduce or close down operations as soon as practicable. Limits on dust (150 mg/m <sup>3</sup> ), CO and TOC not to be exceeded during this period.	Condition 2.3.11
48(1)	Monitoring of emissions is carried out in accordance with Parts 6 and 7 of Annex VI.	Conditions 3.5.1 to 3.5.5. Reference conditions are defined in Schedule 6 of the Permit.
48(2)	Installation and functioning of the automated measurement systems shall be subject to control and to annual surveillance tests as set out in point 1 of Part 6 of Annex VI.	condition 3.5.3, and tables S3.1, S3.1(a), and S3.4
48(3)	The competent authority shall determine the location of sampling or measurement points to be used	conditions 3.5.3 and 3.5.4

IED Article	Requirement	Delivered by
	for monitoring of emissions.	
48(4)	All monitoring results shall be recorded, processed and presented in such a way as to enable the competent authority to verify compliance with the operating conditions and emission limit values which are included in the permit.	Conditions 4.1.1 and 4.1.2, and Tables S4.1 and S4.4
49	The emission limit values for air and water shall be regarded as being complied with if the conditions described in Part 8 of Annex VI are fulfilled.	conditions 3.1.1 and 3.1.2 and 3.5.5
50(1)	Slag and bottom ash to have Total Organic Carbon (TOC) < 3% or loss on ignition (LOI) < 5%.	Conditions 3.5.1 and Table S3.5
50(2)	Flue gas to be raised to a temperature of 850°C for two seconds, as measured at representative point of the combustion chamber.	Condition 2.3.7, Pre-operational condition PO5 and Improvement condition IC4 and Table S3.4
50(3)	At least one auxiliary burner which must not be fed with fuels which can cause higher emissions than those resulting from the burning of gas oil liquefied gas or natural gas.	Condition 2.3.8
50(4)(a)	Automatic shut to prevent waste feed if at start up until the specified temperature has been reached.	Condition 2.3.7
50(4)(b)	Automatic shut to prevent waste feed if the combustion temperature is not maintained.	Condition 2.3.7
50(4)(c)	Automatic shut to prevent waste feed if the CEMs show that ELVs are exceeded due to disturbances or failure of waste cleaning devices.	Condition 2.3.7
50(5)	Any heat generated from the process shall be recovered as far as practicable.	(a) The plant will generate electricity (b) Operator to review the available heat recovery options prior to commissioning (Condition PO10) and then every 2 years (Conditions 1.2.1 to 1.2.3)



<b>IED Article</b>	<b>Requirement</b>	<b>Delivered by</b>
50(6)	Relates to the feeding of infectious clinical waste into the furnace.	No infectious clinical waste will be burnt
50(7)	Management of the Installation to be in the hands of a natural person who is competent to manage it.	Conditions 1.1.1 to 1.1.3 and 2.3.1 of the Permit.
51(1)	Different conditions than those laid down in Article 50(1), (2) and (3) and, as regards the temperature Article 50(4) may be authorised, provided the other requirements of this chapter are met.	No such conditions Have been allowed
51(2)	Changes in operating conditions do not cause more residues or residues with a higher content of organic polluting substances compared to those residues which could be expected under the conditions laid down in Articles 50(1), (2) and (3).	No such conditions Have been allowed
51(3)	Changes in operating conditions shall include emission limit values for CO and TOC set out in Part 3 of Annex VI.	No such conditions Have been allowed
52(1)	Take all necessary precautions concerning delivery and reception of Wastes, to prevent or minimise pollution.	Conditions 2.3.1, 2.3.2, 2.3.4, 2.3.5, 3.2.1, 3.3.1 and 3.6.1.
52(2)	Determine the mass of each category of wastes, if possible according to the EWC, prior to accepting the waste.	Condition 2.3.4(a) and Table S2.2 in Schedule 3 of the Permit.
52(3)	Prior to accepting hazardous waste, the operator shall collect available information about the waste for the purpose of compliance with the permit requirements specified in Article 45(2).	Not applicable
52(4)	Prior to accepting hazardous waste, the operator shall carry out the procedures set out in Article 52(4).	Not applicable
52(5)	Granting of exemptions from Article 52(2), (3) and (4).	Not applicable
53(1)	Residues to be minimised in their amount and harmfulness, and recycled where appropriate.	Conditions 1.4.1, 1.4.2 and 3.5.1 with Table S3.5.
53(2)	Prevent dispersal of dry residues and dust during transport and storage.	Conditions 1.4.1 2.3.1, 2.3.2 and 3.2.1.
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<b>IED Article</b>	<b>Requirement</b>	<b>Delivered by</b>
53(3)	Test residues for their physical and chemical characteristics and polluting potential including heavy metal content (soluble fraction).	Condition 3.5.1 and Table S3.5 and pre-operational condition PO2.
55(1)	Application, decision and permit to be publicly available.	All documents are accessible from the Environment Agency Public Register.
55(2)	An annual report on plant operation and monitoring for all plants burning more than 2 tonne/hour waste.	Condition 4.2.2 and 4.2.3.

## ANNEX 2: Pre-Operational Conditions

Based on the information on the Application, we consider that we do need to impose pre-operational conditions. These conditions are set out below and referred to, where applicable, in the text of the decision document. We are using these conditions to require the Operator to confirm that the details and measures proposed in the Application have been adopted or implemented prior to the operation of the Installation.

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 Environment Agency web guide on developing a management system for environmental permits (found on <a href="http://www.gov.uk">www.gov.uk</a> ). 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 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. The protocol shall be in line with Environment Agency guidance M4 (Guidelines for Ash Sampling and Analysis).	
PO3	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. The plan shall include proposals for the validation of the noise assessment that was submitted with the application. Commissioning shall be carried out in accordance with the commissioning plan as approved.	
PO4	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.	
PO5	After completion of furnace design and at least three calendar months before commencement of commissioning; 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 Chapter IV and Annex VI of the IED.	
PO6	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.	
PO7	At least three months before the commencement of commissioning, the Operator shall	
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	<p>submit a written report to the Environment Agency specifying arrangements for continuous and periodic monitoring of emissions to air to comply with Environment Agency guidance notes M1 and M2. The report shall include the following:</p> <ul style="list-style-type: none"> <li>• Plant and equipment details, including accreditation to MCERTS</li> <li>• Methods and standards for sampling and analysis</li> <li>• Details of monitoring locations, access and working platforms</li> </ul>
<b>PO8</b>	<p>During commissioning, the operator shall carry out tests to demonstrate whether the furnace combustion air will provide the required air flows to ensure that negative pressure is achieved throughout the reception hall. The tests shall demonstrate whether air is pulled through the reception hall and bunker area into the furnace with dead spots minimised. The operator shall submit a report to the Environment Agency for approval, and obtain the Environment Agency's written approval to it, summarising the findings along with any proposed improvements if required.</p>
<b>PO9</b>	<p>Prior to the commencement of commissioning the operator shall confirm if any changes are required to the fire prevention plan after the detailed design stage of the installation. The operator shall submit a revised version of the plan that was submitted with the application (if required) to the Environment Agency for approval. The revised plan shall include details of the fire water supply and confirm that it complies with fire service requirements regarding the flow and pressure. The plan shall be in line with current Environment Agency guidance on fire prevention plans.</p>
<b>PO10</b>	<p>Prior to the commencement of commissioning the operator shall submit to the Environment Agency for approval a plan for further investigation and if appropriate implementation of the district heating scheme identified in the cost benefit analysis (submitted on 13<sup>th</sup> October 2017).</p> <p>The plan shall include as a minimum:</p> <ul style="list-style-type: none"> <li>• A timetable for further investigation and if appropriate implementation</li> <li>• A description of any dependencies or further approvals required</li> <li>• A description of any changes that will need to be made to the plant</li> <li>• Whether there will be any operational changes which could affect the environmental impact of the installation [such as a reduction in stack temperature].</li> <li>• Consideration of whether a permit variation will be required</li> </ul> <p>If required to do so by the Environment Agency they shall implement the plan in accordance with the Environment Agency's written approval</p>

### ANNEX 3: Improvement Conditions

Based in the information in the Application we consider that we need to set improvement conditions. These conditions are set out below - justifications for these is provided at the relevant section of the decision document. We are using these conditions to require the Operator to provide the Environment Agency with details that need to be established or confirmed during and/or after commissioning.

Reference	Improvement measure	Completion date
IC1	The Operator shall submit a written report to the Environment Agency on the implementation of its Environmental Management System (EMS) and the progress made in the certification of the system by an external body or if appropriate submit a schedule by which the EMS will be certified.	Within 12 months of the completion of commissioning.
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 & A2, identifying the fractions within the PM <sub>10</sub> , and PM <sub>2.5</sub> ranges. On receipt of written approval from 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.
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, this includes validation of the noise assessment that was provided 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 and confirm that the Environmental Management System (EMS) has been updated accordingly.	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 and include a comparison with the CFD modelling submitted with PO5.	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: <ul style="list-style-type: none"> <li>The Selective Non Catalytic Reduction (SNCR) system and combustion settings to minimise oxides of nitrogen (NOx).The report shall include an assessment of the level of NOx, N<sub>2</sub>O and NH<sub>3</sub> emissions that can be</li> </ul>	Within 4 months of the completion of commissioning.
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	<p>achieved under optimum operating conditions.</p> <ul style="list-style-type: none"> <li>• The lime injection system for minimisation of acid gas emissions</li> <li>• The carbon injection system for minimisation of dioxin and heavy metal emissions.</li> </ul>	
<b>IC6</b>	<p>The Operator shall carry out an assessment of the impact of emissions to air (in order to validate the assessment provided in the application) of the following component metals subject to emission limit values:</p> <ul style="list-style-type: none"> <li>• Cr and As</li> </ul> <p>A report on the assessment shall be made to the Environment Agency.</p> <p>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 environmental standard (ES). In the event that the assessment shows that an ES can be exceeded, the report shall include proposals for further investigative work. The Operator shall implement the proposed investigative work in accordance with the scope and timescales agreed with the Environment Agency.</p>	15 months from the completion of commissioning
<b>IC7</b>	<p>The Operator shall submit a written summary report to the Environment 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.</p>	<p>Initial calibration report to be submitted to the Agency within 3 months of completion of commissioning.</p> <p>Full summary evidence compliance report to be submitted within 18 months of completion of commissioning.</p>

## ANNEX 4: Consultation Responses

### A) Advertising and Consultation on the Application

The Application has been advertised and consulted upon in accordance with the Environment Agency's Public Participation Statement. The way in which this has been carried out along with the results of our consultation and how we have taken consultation responses into account in reaching our decision is summarised in this Annex. Copies of all consultation responses have been placed on the Environment Agency public register.

The Application was advertised on the Environment Agency website from 13<sup>th</sup> July 2017 to 17<sup>th</sup> August 2017 and in the Hertfordshire Mercury and Hertfordshire on 13<sup>th</sup> July 2017. The Application was made available to view at the Environment Public Register at located at Apollo Court, 2 Bishop Square Business Park, St Albans Road West, Hatfield, Hertfordshire AL10 9EX. We also made a copy of the application available to view at Hoddesdon Library.

The following statutory and non-statutory bodies were consulted: -

- Health and Safety Executive
- Food Standards Agency
- Public Health England
- Local Fire Service
- Local Authority Environmental Protection Department – Epping Forest District Council, East Herts District Council and Borough of Broxbourne.
- Planning Authority – Hertfordshire County Council
- Director of Public Health - Hertfordshire

### 1) Consultation Responses from Statutory and Non-Statutory Bodies

Response Received from Borough of Broxbourne	
Brief summary of issues raised:	Summary of action taken / how this has been covered
Concern that the Applicant's controls are unlikely to be robust enough to ensure that hazardous materials are not present within the waste accepted at the facility.	The Applicant will have pre-acceptance procedures to ensure that only those wastes that the plant is permitted to receive will be received. Waste acceptance procedures will then be used to check waste as received. It is BAT to have procedures to deal with unacceptable wastes (such as hazardous wastes) should they be received. Pre operational condition PO4 has been included for the Operator to provide a report detailing the waste acceptance procedures for Environment Agency's approval.
Concern that how the chimney height is derived is not clear and local topography has not been taken into account in the dispersion modelling. Also concern that dispersion modelling does not provide a true representation of the impact on surrounding	The following is an extract from the application explaining how the chosen stack height has been calculated:  <i>'Emissions from the main two stacks have been modelled at heights between 50 m and</i>
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<p>receptors.</p>	<p><i>120 m. The assessment demonstrated that the optimum release height for the proposed facility is 86.75m, after which additional stack height gives diminishing environmental benefits. The modelling results predicted that, with two 86.75 m stacks and a 49 m diesel generator flue release height, adequate dispersion of pollutants would be achieved. The height of the two main stacks and the diesel generator flues selected for the Proposed Development are 86.75m and 49m above local ground level respectively'.</i></p> <p>We audited the Applicant's dispersion modelling and we are satisfied that the stack will provide sufficient dispersion to avoid any significant impacts.</p> <p>Local topography has been accounted for in the modelling assessment and our check modelling.</p> <p>The methodology used for the air dispersion modelling assessment are generally conservative and based on worst case scenarios.</p>	
<p>Concern that gas oil will be used as the support fuel for the auxiliary burners and not natural gas, as natural gas contains less sulphur and does not require a fuel store.</p>	<p>The Operator has justified the use of gas oil over natural gas, this is discussed in section 6.1.1. The permit contains a condition requiring the gas oil to be low sulphur.</p>	
<p>Concern raised that there is no reference in the application to a secondary combustion chamber that will ensure that the 2 second residence time can be ensured. Also if hazardous waste were to be incinerated, and if the waste contained 1% halogenated organic substances a secondary combustion chamber reaching 1100°C would be required.</p>	<p>We are satisfied that the proposed combustion technology can achieve the requirements set out in IED of 850°C for 2 seconds.</p> <p>The permit does not permit the incineration of hazardous waste.</p>	
<p>Concern about the storage and handling of ammonia. It is not clear where it will be stored and the odour potential has not been considered.</p>	<p>We are satisfied that ammonia will be stored and handled appropriately so as to minimise the risk of fugitive emissions, including odour. The application states that storage of ammonia will be in a bunded (more than 110% capacity of the tank) storage tank. Tanks will be designed in accordance with appropriate design, and fabrication and safety standards. Tanks will have high level alarm to prevent overfilling. Routine inspection of the tanks and bund integrity will be carried out. Loading and discharging will be in accordance with written procedures.</p> <p>We are satisfied that we have sufficient information to be satisfied that ammonia will be stored and handled appropriately so as not to cause significant pollution.</p>	
<p>Concern that there will be an adverse impact from noise, dust and odour on receptors at Lock Keepers Cottage and residentially moored canal boats.</p>	<p>We are satisfied that proposals to minimise fugitive emissions of dust and odour from the facility are appropriate and will not lead to significant pollution at Lock Keepers Cottage or residentially moored canal boats.</p> <p>The noise assessment considers impacts at</p>	
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	Lock Keepers Cottage and residentially moored canal boats. We are satisfied that noise pollution will not be significant at these receptors. See section 6.5.5 for further details of our assessment.
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Response Received from Public Health England (PHE)	
Brief summary of issues raised:	Summary of action taken / how this has been covered
PHE recommends that the Environment Agency liaises with the local planning department to ensure that the Applicant's measures are sufficient to prevent off-site nuisance impacts associated with fugitive dust, noise and odour, particularly at the single residential property located near to the site boundary.	We are satisfied that proposals to minimise fugitive emissions of dust and odour from the facility are appropriate and will not lead to significant pollution at Lock Keepers Cottage. The noise assessment considers impacts at Lock Keepers Cottage. We are satisfied that noise pollution will not be significant at these receptors. See section 6.5.5 for further details of our assessment.
Based on the information contained in the application supplied to us and aside from the point above concerning mitigation of fugitive dust impacts at the nearest residential receptors during construction, Public Health England has no significant concerns regarding the risk to the health of the local population from the installation. This consultation response is based on the assumption that the permit holder shall take all appropriate measures to prevent or control pollution, in accordance with the relevant sector guidance and industry best practice.	As discussed in this document we have assessed the Applicant's proposals and we are satisfied that the installation will use BAT and will not have a significant adverse impact on human health or the environment.

Response Received from Epping Forest District Council	
Brief summary of issues raised:	Summary of action taken / how this has been covered
Concern over fugitive emissions of particulates and associate odour from deliveries.	As discussed in sections 6.5.3 and 6.5.4 we are satisfied fugitive emissions of odour and dust will not have a significant adverse impact on human health or the environment.
Concern over fugitive emissions from storage and handling of ash.	We are satisfied that storage proposals for bottom ash are appropriate and will not result in significant pollution. See section 6.5.3 of the decision document for further details.
Vehicles leaving the site should be fully enclosed or covered to prevent wastes materials being deposited on local roads. A wheel wash should be used.	The Applicant has stated that incoming waste loads will be sheeted. Vehicles (rail wagons & Road vehicles) transporting IBA away from the facility will not be routinely covered instead the Applicant has stated that they will ensure the IBA is kept damp to ensure dust emissions are minimised. Areas where IBA storage handling occurs will have sealed drainage. Internal roads, storage and processing areas will be hard surfaced with concrete or tarmac and swept regularly. A wheel wash is not proposed and we do not consider one to be necessary based on our experience at other similar sites. We are satisfied that these control measures are appropriate and fugitive emissions will be

	<p>minimised.</p> <p>Note that the movement of waste/materials outside the installation boundary is outside the scope of the permit but is subject to other legislative controls.</p>
Vehicles entering and leaving the site should be via agreed roads that are suitable for such traffic.	Transport routes outside the installation boundary are not a consideration for the Environmental Permit determination.
Vehicles waiting to enter the site should turn their engines off to minimise emissions.	Control of vehicles outside the installation boundary are not a consideration for the Environmental Permit determination. This is a matter for the planning process.
A robust plan should be put in place to ensure appropriate control measures are adopted in the event that stack emissions exceed permitted limits.	The emission limit is the maximum permitted limit that we would allow the site to operate to. If emission limits are exceeded the plant will have to stop feeding waste. Any breaches would be subject to the Environment Agency's enforcement and sanctions policy.
The Operator should keep sufficient spares and consumables on site to ensure simple repairs can be attended to immediately, thereby reducing the likelihood of elevated emissions.	The EMS whilst not finalised will require the Operator have access to suitable spares in order to minimise the risk to the environment due to mechanical breakdown.
We note that monitoring of stack emissions will be undertaken and trust that concentrations of pollutants will be maintained below the limits set in the permit.	If any Permit condition or limit is not met we will take action under our enforcement and sanctions statement.
Based the information provided, Epping Forest District Council has no significant concerns regarding the risk to the health of its population from this activity, providing that the applicant takes all appropriate measures to prevent pollution in accordance with the relevant sector technical guidance and industry best practice.	As discussed in this document we have assessed the Applicant's proposals and we are satisfied that the installation will use BAT and will not have a significant adverse impact on human health or the environment

Response Received from Hertfordshire Fire and Rescue Service	
Brief summary of issues raised:	Summary of action taken / how this has been covered
The response provide a number of requirements for access and water supplies and provided these are met they have no further comment.	<p>We forwarded the consultation response listing the requirements for access, facilities and water supplies to the Applicant to inform their final plant design. Some of these requirements are matters for building control not EPR.</p> <p>As part of the determination process the Applicant submitted a Fire Prevention Plan (FPP). We are satisfied that the Installation will meet the relevant standards set out in our guidance however we recognise that some of the finer detail (such as the exact location of hydrants for example) may change after the detailed design stage. We have set pre-operational condition PO9 for the Operator to submit a revised FPP after the detailed design stage.</p>

2) **Consultation Responses from Members of the Public and Community Organisations**

The consultation responses received were wide ranging and a number of the issues raised were outside the Environment Agency's remit in reaching its permitting decisions. Specifically questions were raised which fall within the jurisdiction of the planning system, both on the development of planning policy and the grant of planning permission.

Guidance on the interaction between planning and pollution control is given in the National Planning Policy Framework. It says that the planning and pollution control systems are separate but complementary. We are only able to take into account those issues, which fall within the scope of the Environmental Permitting Regulations.

a) **Representations from Parish Councils**

Representations were received from Nazeing Parish Council and Roydon Parish Council, who raised the following issues.

Brief summary of issues raised:	Summary of action taken / how this has been covered
<b>Comments about air emissions and air risk assessment</b>	
Concern raised over impact on air quality from emissions causing harm to environment and human health	We are satisfied that emissions to air will not cause significant harm to human health or the environment. See section 5.2 and 5.3 of this decision document for further details.
Concern raised that because the facility is located in a valley that this will adversely affect dispersion of pollutants.	ADMS and AERMOD takes account of local topography. Therefore we are satisfied that any effect on dispersion due to local topography has been taken into account in the air quality assessment.
Concern that not all PM <sub>10</sub> and PM <sub>2.5</sub> emissions are not captured by bag filters. Citing an incident at another incineration facility that led to a release of dust to atmosphere following a filter bag bursting.	Although bag filters are highly efficient they are not 100% efficient and some particulate matter will be emitted. The impact assessment was based on emissions at the ELV. Even based on this worst case assessment impacts were predicted to be insignificant for both PM <sub>10</sub> and PM <sub>2.5</sub> .  The Applicant has proposed a multi compartment bag filter, this allows individual bags to be isolated in case of an individual failure. Complete failure of the filters is therefore highly unlikely. In the vent that the ELV is exceeded the plant will have to stop feeding waste.
Concern raised about the health risks associated with functioning incinerators. Concern about emission of dioxins and furans and heavy metals.	We are satisfied that potential emissions of dioxins, furans and heavy metals from the proposed facility are unlikely to have a significant impact on human health or the environment. See section 5 of this decision document for further details.
A request made that pollution monitoring	We are satisfied that the monitoring

<p>equipment is located in the village of Roydon – it is operated and maintained by Veolia but independently monitored.</p>	<p>requirements set in the permit are appropriate.</p> <p>The Permit does not require the Operator to carry out ambient air quality monitoring. Ambient air monitoring around operating incinerators is not a reliable method of establishing the impact as it identifies what pollution is present but not where it comes from. Our preferred approach is to use air dispersion modelling to predict the impact based on the highest allowed emissions (emission limit values) and then require monitoring to ensure those limits are not exceeded. We have audited the modelling and we are satisfied that it is suitable for assessing the impact from the Installation.</p> <p>The local authority carry out air quality monitoring in the local area.</p>	
<b>Comments about health impacts</b>		
<p>Concern raised about studies that report that there is a statistically significant increase in the risk of dying from cancer in towns near incinerators.</p>	<p>PHE’s position is “While it is not possible to rule out adverse health effects from modern, well regulated municipal waste incinerators with complete certainty, any potential damage to the health of those living close-by is likely to be very small, if detectable. This view is based on detailed assessments of the effects of air pollutants on health and on the fact that modern and well managed municipal waste incinerators make only a very small contribution to local concentrations of air pollutants.”</p> <p>PHE is not aware of any evidence that requires a change in their position statement.</p> <p>PHE also stated on 25/05/17 that they are not aware of any evidence that requires a change in their position statement this is after the date the paper was published.</p> <p>Our view is that there will not be a significant effect on health. This is in line with Public Health England’s position statement as discussed in section 5.3 of this decision document.</p>	
<b>Comments about impacts at ecological sites</b>		
<p>Concern raised about the impact from pollution on sensitive local wildlife and human receptors.</p>	<p>Sections 5.1 to 5.4 of this document details our assessment of impacts on human and ecological receptors. We are satisfied that there will not be a significant impact.</p>	
<b>Comments about impacts from increased traffic</b>		
<p>Concern raised about the increased traffic causing increased disruption and pollution in the local area during construction and post construction.</p>	<p>The effects of road traffic pollution are the responsibility of the local authorities concerned. However, in terms of the EPR process, the effect of traffic is taken into account in the background concentrations.</p>	
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	The Applicant's assessment of the Installation takes account of changes in traffic flow associated with the installation and other operational installations in the area (Rye House Power Station, ATT and AD plant). It also takes account of predicted changes to traffic flow and composition in the future (year 2021). This includes predicted future changes to baseline traffic, traffic associated with the Rye House ERF development and cumulative development traffic.
<b>Comments about other impacts and issues</b>	
Concern raised over light pollution caused by the proposed facility.	Pollution from light is primarily a concern for considering visual impacts and as such is covered by the planning process. In any event light pollution is not likely to have a significant effect on the environment. The Applicant has stated that Operational lighting of the facility will be directed into the body of the site to minimise unnecessary illumination of the wider environment.
Concern raised that the process for identifying waste that should not be incinerated is not adequate.	The permit does not allow waste unsuitable for incineration to be burned. Waste pre-acceptance and acceptance procedures will be used to prevent hazardous waste and other non-permitted wastes being received. We are satisfied appropriate measures will be in place to prevent non permitted wastes being accepted on site.
Concern that location of the facility is unsuitable. Why is the site considered suitable now when it was considered unsuitable in 2015.	Location is primarily a land use planning issue. We have a legal duty to determine any application made to us for an environmental permit. Our role is to determine whether appropriate measures are used to prevent and minimise emissions and whether any impacts on the environment and human health are acceptable. We have considered the location of receptors in making our decision.
Concern that waste will be imported from outside Hertfordshire leading to increased traffic.	The permit includes conditions restricting the waste types that can be accepted at the installation, however the decision of where waste is imported from is not a consideration for the Environmental Permitting process.
Concern raised that we should be recycling, reusing or reducing waste instead of incineration.	This is outside the scope of the determination which is to assess the impact of emissions from the proposed activity. Recycling initiatives are a matter for the local authority. However the permit does restrict the Operator from burning separately collected waste unless contaminated.
Concern raised about the amount CO <sub>2</sub> produced by incineration and its contribution to climate change.	BAT and global warming potential are discussed in section 6.3 of the decision document.

b) Representations from Community and Other Organisations

Representations were received from Broxbourne's Not For Burning, Lee Valley Growers Association, Hoddesdon Society, United Kingdom Without Incineration, Herts WithOut Waste and Ratty's Lane Action Group.

The key issues raised are shown below. Where an issue has already been covered it is not necessarily repeated below.

<b>Brief summary of issues raised:</b>	<b>Summary of action taken / how this has been covered</b>	
<b>Comments about air emissions and air risk assessment</b>		
Concern raised that the impact of emissions from the chimneys, dust and water pollutants have not been properly assessed.	We are satisfied that emissions to air and controlled water will not result in significant pollution. See sections 5 & 6 of this decision document for further details.	
Concern raised that a local phenomena of 'temperature inversion' or that the installation is within a valley has not been considered in the Applicant's air dispersion modelling.	ADMS and AERMOD models the effect of local inversion layers, by taking account of topography and hourly meteorological conditions such as wind speeds and temperatures. Although the specific weather conditions in the valley may not be reproduced exactly in the modelling, sensitivity checks to the most conservative meteorological conditions over five years from three different sites take account of variations in the data. Also, site specific meteorological data has been taken into account in the models. There are specific models available that consider temperature inversions such as in valleys. USEPA suggests using the Calpuff model which claims to model local inversion effects and fumigation effects. We have conducted multiple studies comparing the Calpuff model to the more commonly used models (ADMS, AERMOD). Our check modelling indicates that the predictions can indeed be higher using this alternative modelling software and met data with short-term impacts showing the greatest sensitivity. However, we found that any differences in the results are within the modelling uncertainties and generally do not affect the conclusions.	
Concern raised that the applicant has not identified Lea Valley Glasshouse & agricultural Industry as agricultural receptors and therefore the impact on these receptors has not been assessed.	We have audited the Applicant's air quality and human health risk assessment and we are satisfied that emissions to air will not result in significant harm to the environment and human health. Whilst the Lea Valley Glasshouse & agricultural Industry were not identified as receptors we are satisfied that impacts at this location will also not result in significant harm to the environment and human health, this is because the Assessment was based on the worst case and any impact at other receptors would be less. The Human Health Risk assessment (HHRA) that considered the impacts of dioxins and furans and dioxin like PCBs through the food chain. We audited the assessment and are satisfied that health impacts are likely to be insignificant compared to the tolerable daily intake (TDI). Further details are in section 5 of this decision document.	
Concern raised that meteorological data used to predict hourly mean process contributions are unacceptably out of date.	We are satisfied that the meteorological data used in air dispersion modelling is valid, however as part of our audit of the air dispersion modelling we have conducted sensitivity analysis of the model using alternative meteorological data and this did not change the conclusions of the assessment.	
Concern raised that data shown	We are satisfied that there will be no exceedance of an	
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on Table 7.9 on page 7-33 that the ES for NO <sub>x</sub> will be exceeded at some receptors.	EAL at any receptor. See section 5.	
The EA should consider whether SCR should be BAT for NO <sub>x</sub> abatement rather than SNCR.	We are satisfied that SNCR is BAT for this installation. Our reasoning for this is discussed in section 6 of this decision document.	
Concern raised that in Table 5.2, Emissions Levels from Point Sources page 15 (first line) – it states that an emission concentration of 100 mg/m <sup>3</sup> was used in H1 risk assessment for short term NO <sub>x</sub> and this should be 400 mg/m <sup>3</sup> . Also it is not clear where the figures in tonnes per year column are derived.	Environment Agency air quality specialists identified this typographical error and have checked that the emission concentration that the Applicant used in modelling assessment was 400mg/m <sup>3</sup> . We can confirm the concentration used in the modelling assessment was appropriate. The tonnes per year figure is calculated by converting g/sec into g/hour then multiplying this figure by the proposed number of operating hours (8760 hours)	
Concern that meteorological data used for the wind rose diagrams uses out-of date measurements taken at Stanstead Airport during 2011 and 2015. It is unclear whether this data was just used for the accident prevention and management or the air dispersion modelling as well.	We are satisfied that the meteorological data used in air dispersion modelling is valid, however as part of our audit of the air dispersion modelling we have conducted sensitivity analysis of the model using alternative meteorological data and this did not change the conclusions of the assessment.	
Concern at the cumulative effects on pollution from emissions from predicted traffic movements associated with the newly opened ATT plant and AD plant.	The effects of road traffic pollution are the responsibility of the local authorities concerned. However, in terms of the EPR process, the effect of traffic associated with the proposed installation is taken into account in the background concentrations. In considering emissions from other consented plants (including ATT & AD plant) we have audited and analysed the key emissions on a risk basis and considered any contributions from the other plants in the background pollution levels used in the assessment to ensure they are suitably precautionary.	
Concern raised that emissions from the stack at the ATT plant will be effected by the proposed facility. The ATT stack is 40m and the proposed facility located 100 meters away could cause emission downwash.	We have looked at the effect of building downwash due to the installation on the emissions from both the 'Hoddesdon Energy from Waste Plant' and 'Rye House Power Station' (at 350m, the Hoddesdon AD is over the distance at which building downwash effects are considered). We found that the impact would be negligible with any changes being well within modelling uncertainties.	
Concern of the effect of pollution from small particles that arise from tyres and breaking.	Traffic emissions do not form part of the Environmental Permitting decision process except to the extent that they could affect the prevailing background levels. We do not consider emissions arising from vehicles breaking and their tyres will be significant.	
Concern raised of how PM2.5 will be monitored.	The emission limit in the permit is for total particulates and the method for monitoring particulates will capture smaller particles. See Schedule 3 of the permit for details of the monitoring requirements and emission limits.	
Concern that quarterly monitoring of heavy metals is inadequate.	The monitoring frequencies in the permit reflect those in IED. We are satisfied that the proposed abatement techniques are BAT and will minimise emissions of heavy metals. See our assessment of emissions to air (section 5.2), which includes metals.	
Concern raised about emissions to air during start-up and shut-	The emissions limits set by IED chapter IV do not apply at	
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down.	start-up and shut-down. The combustion units will be fired on a support fuel (gas oil) during start up and shut down, to ensure that the temperature meets the required levels before waste is permitted to be fed for incineration. This support fuel is automatically fed if the temperature of the furnace falls below a permitted level. The impact at start-up and shut down, when emission limits do not apply, is not likely to be significant.	
<b>Comments about impacts at ecological sites</b>		
Concern that emissions of pollutants could disrupt food chains for avian, land and aquatic species including insects, amphibians, reptiles and fish both directly and via their habitats.	We are satisfied that emissions to air will not affect ecological sites or species and therefore food chains. Section 5.4 of this decision document has further details.  There are no emissions to water other than rainwater run-off and a relatively small volume of secondary treated domestic sewage. Measures will be in place to prevent pollution in the event of spillages. We are satisfied this will have significant impact on water quality in receiving water and therefore will not adversely impact on nearby habitats and species. Further details are in section 6.5.1 to 6.5.3 of this decision document.	
Concern about impact on a Badger Sett located at the proposed site.	The Applicant has acknowledged the presence of a Badger Sett in their Environmental Statement. Section 10 - Ecology and Nature Conservation of this document has identified that there was a disused badger ( <i>Meles meles</i> ) sett within the Application Site, with three entrances visible. In May 2016, fox ( <i>Vulpes vulpes</i> ) hairs were found at one entrance, with a strong smell of fox indicating recent presence. Although this sett was thought to be an active outlier in 2012, badgers are now assumed absent from the Application Site. In any event emissions from the installation are unlikely to affect badgers.	
Concern raised over impacts from emissions (NO <sub>x</sub> and NH <sub>3</sub> ) on nearby habitat sites from emissions to air and water.	Emissions to air will not have a significant impact on ecological sites or species. Section 5.4 of this decision document has further details. There are no emissions to water other than uncontaminated rainwater run-off and secondary treated domestic sewage. Measures will be in place to prevent pollution in the event of spillages. Further details are in section 4.2.2 of this decision document.	
Concern raised about impacts from noise, odour and air quality on people using Lee Valley Park.	Given we do not consider that the emissions from the installation will cause significant pollution or harm to human health there should be no adverse impact on the area.	
Concern raised about the impact on Hunsdon Mead SSSI from airborne NO <sub>x</sub> emissions.	This SSSI is located outside the 2km screening distance for assessment. As per the requirements of Countryside and Rights of Way Act (CRoW) 2000.	
<b>Comments about impacts from increased traffic</b>		
Concern raised about Veolia's traffic assessments and impact of pollution from vehicles transporting waste to and from the facility.	The effects of road traffic pollution are the responsibility of the local authorities concerned. However, in terms of the EPR process, the effect of traffic associated with the proposed installation is taken into account in the background concentrations that are used in the air quality assessments.	
Concern raised that local infrastructure is not designed for and will not cope with an increase in HGV traffic.	Highways issues forms part of the consideration for the planning process and is not a consideration for Environment Permitting process.	
Concern raised about pollution	Vehicle movements within the Installation boundary are	
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from emissions from vehicle movements within the facility.	considered within the remit of the Environmental Permit. However the emissions from this limited area will not be significant and will not affect the conclusions of the air quality impact assessment.
<b>Comments about Noise impacts</b>	
It is highlighted that the noise survey has used baseline noise measurements made in 2011 and 2012 and therefore should not be assumed to apply. Specific noise measurements should be carried out.	We requested additional current background measurements to ensure baseline noise levels used in the assessment are were representative. See section 6.5.5 for details of the noise assessment.
Concern that noise from the facility will be intermittent due to vehicles climbing a ramp to reach the tipping hall and the single track access via Ratty's Lane and this has not been considered in the noise assessment.	We are satisfied that this is accounted for in the noise assessment.
<b>Comments about odour impacts</b>	
Concern raised that the risk of odour has not been properly considered particularly as the site is located within a basin.	Measures to prevent odour emissions are set out in section 6.5.4 of this decision document. We are satisfied odour will not cause significant pollution, even if the site is located within a basin. Also the nearby AD plant and ATT also have odour control measures and conditions in there permits controlling odour, so any risks of cumulative impacts are not considered significant.  We are satisfied that odour impacts are unlikely to occur and Permit conditions will control this.
Concern raised about risk from odour and the cumulative odours from other nearby facilities including the AD plant and ATT.	
Concerns about inadequate storage of incinerator bottom ash causing odour.	We are satisfied that fugitive emissions of odour resulting from the storage and handling of IBA is unlikely to cause significant pollution. See section 6.5.4 for details of our assessment.
<b>Comments about flood risk</b>	

<p>Concern at the risk of pollution if the site is flooded.</p>	<p>The Environment Agency provides advice and guidance to the local planning authority on flood risk in our consultation response to the local planning authority. Our advice on these matters is normally accepted by both the Applicant and Planning Authority. When making permitting decisions, flood risk is still a relevant consideration, but generally only in so far as appropriate measures are in place to prevent pollution in the event of a credible flooding incident. We are satisfied that appropriate measures are in place.</p> <p>The Environment Agency have recommended to the local planning authority that a number of conditions with regard to flood risk management are applied to the grant of any planning permission for the site, including the design as stated in the Applicant's Flood Risk Assessment Final Report (August 2017) that the finished floor levels for the ERF building to be set no lower than 29.04m AOD, which ensures a 300mm freeboard above the modelled 1 in 1000 year 25% flood level to protect the development from flooding.</p>	
<p><b>Comments about global warming potential and R1</b></p>		
<p>Concern raised that the applicant has disregarded the impact from greenhouse emissions from the production of lime which is being used to remove hazardous components from emissions.</p>	<p>The use of lime for the abatement of acid gases is considered BAT. See section 6 of this document for further details.</p> <p>Consideration on any impacts during the manufacture of reagents is outside the scope of the permit determination.</p>	
<p>Concern over whether the carbon dioxide figures used in the global warming assessment are correct.</p>	<p>We are satisfied with the way the Applicant's BAT assessment considered carbon dioxide and global warming. Any changes in the way the offset is considered would be the same for each option and so will not affect the conclusions of the BAT assessment. Further details are in section, 6.3 of this decision document.</p>	
<p>Various concerns were raised over the R1 calculation that was included in Appendix C is not correct.</p>	<p>Although as explained in section 4.3.7 that this is not part of this determination we are satisfied the R1 calculation is appropriate. The Applicant has presented a calculation of the R1 factor (as defined under the WFD 2008). The R1 formula is a measure of the extent to which energy is recovered from incineration plant. The formula is:</p> $R1 = (E_p - (E_f + E_i)) / (0.97 \times (E_w + E_f))$ <p>Where:</p> <ul style="list-style-type: none"> <li>• <math>E_p</math> means annual energy produced as heat or electricity. It is calculated in the form of electricity being multiplied by 2.6 and heat for commercial use being multiplied by 1.1 (GJ/yr).</li> <li>• <math>E_f</math> means annual energy input to the system from fuels contributing to the production of steam (GJ/yr).</li> <li>• <math>E_w</math> means annual energy contained in the treated waste calculated using the net calorific value of the waste (GJ/yr).</li> <li>• <math>E_i</math> means annual energy imported excluding <math>E_w</math></li> </ul>	
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	<p>and Ef (GJ/yr)</p> <ul style="list-style-type: none"> <li>0.97 is a factor accounting for energy losses due to bottom ash and radiation.</li> </ul>	
Concern that the carbon impact has been compared against burning coal rather than renewable sources.	Any changes in the way the offset is considered would be the same for each option and so does not affect the conclusions of the BAT assessment. Further details are in section, 6.3 of this decision document.	
Concern raised that the application concentrates on impacts around the facility and does not consider the wider impacts in terms of climate change, and overall CO <sub>2</sub> emissions.	See section 6.3 of this decision document for our assessment of global warming.	
The electricity generated from the process would not be renewable as it involves burning material derived from fossil fuels.	Whether or not the process is a renewable energy source is not a consideration for the Environment Permit determination.	
Request made to examine the R1 calculation critically and consider instances of ongoing failures that have happened at the Arc/Babcock & Wilcox Volund installation in Copenhagen.	<p>Although as explained in section 4.3.7 that this is not part of this determination the R1 factor can only be determined from operational data over a full year. At application stage it is only possible to make a provisional assessment. Ep measures the energy recovered for use from the incinerator. This energy will have been recovered not just from the combustion of waste (Ew), but also from the combustion of the support fuel at start up and shut down and where required to maintain the 850 °C combustion temperature (Ef). Ei is additional energy imported, which will primarily be electricity from the grid. These parameters will depend on the way in which the plant is operated, e.g. number of start-ups and shut downs.</p> <p>Should the Applicant be unable to demonstrate after a year of operation that they can achieve the R1 factor then R1 status will be revoked.</p>	
<b>Comments about other impacts and issues</b>		
Concern raised that the correct process and technology has not been proposed.	The technology proposed by the Applicant is listed in the BREF as a BAT option. We are satisfied that the Applicant's proposals are BAT, this is discussed in more detail in Section 6 of this decision document.	
Concern raised that the Environmental regulatory requirement and technical standards will not be met.	The Operator is required to comply with the conditions of the permit and we consider they will do so. This includes Operating the installation in line with the proposals set out in the Application and incorporated into the permit which have been assessed as representing BAT.	
Concern raised that information provided by the Applicant regarding the local population and sensitive sites is inaccurate.	We are satisfied that the information provided by the Applicant is representative.	
Concern raised that lack of control over waste received will lead to a lack of control over emissions.	<p>Waste acceptance procedures will be used so that unsuitable wastes are not received. In addition, emission limit values set in the Permit will have to be complied with at all times.</p> <p>We will carry out inspection and audits on the Installation and the EMS (including waste acceptance procedures) to ensure that Permit conditions are complied with. Any non-compliances will be subject to our enforcement and sanctions statement.</p>	
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<p>Concern raised that the Applicant's proposals do not separate waste streams prior to incineration.</p>	<p>This is outside the scope of the determination which is to assess the impact of emissions from the proposed activity. This proposal is for dealing with residual waste and recycling should occur further up the waste management process through separate collections etc. Separately collected waste can only be burnt if contaminated and not suitable for recovery. Recycling initiatives are a matter for the local authority.</p>	
<p>Concern raised that the manufacturers of the proposed boiler Babcock and Wilcox Volund has been associated with problems at the Copenhagen Incinerator. Veolia should provide details of the problems and should explain how these problems would not occur at the proposed facility.</p>	<p>The applicant was asked to respond to this comment, their response was as follows:</p> <p><i>'The Copenhagen Facility is currently in operation at full load and generating electricity. Commissioning activities are always complex and it is not uncommon to have M&amp;E related delays in starting operation. There have been reports of baled waste being delivered to the site and stored, and this waste not being burnt as promptly as would have been expected. This will not occur at the Rye House ERF, as Hertfordshire's waste will continue to be sent to the current disposal points until the ERF is operational.'</i></p> <p>We are satisfied that the controls in place for commissioning and subsequent operation will protect people and the environment and prevent or minimise issues.</p>	
<p>Concern raised about the risk of pollution from a fire on site, particularly as the site is cramped.</p>	<p>The Applicant submitted a fire prevention plan (FPP). We are satisfied that the Applicant's proposed techniques will minimise the risk of fire occurring and also minimise any impacts if a fire was to occur. However we recognise that some of the finer detail (such as the exact location of hydrants for example) may change after the detailed design stage. We have set pre-operational condition PO9 for the Operator to submit a revised FPP after the detailed design stage.</p>	
<p>Concerns raised about the risk from emissions and adequacy of mitigation measures. Request that a precautionary approach is taken in assessment of the risks and that the sustainability of the proposals is considered.</p>	<p>This document described how we have assessed the risk from the installation. We are satisfied that there will not be a significant impact on the environment or human health.</p> <p>With regards to sustainability, it is argued that incineration is not an environmentally sustainable technology and therefore cannot be considered to be the Best Available Technique (BAT). The Environment Agency is aware that a number of proposals are coming forward for other ways of dealing with waste streams such as pyrolysis and mechanical biological treatment. At this time however, mass burn incineration at this scale can still be considered BAT subject to the appropriate assessment being made.</p> <p>The United Kingdom Interdepartmental Liaison Group on Risk Assessment (UK-ILGRA) state in their paper "The Precautionary Principle: Policy and Application" that the precautionary principle should be invoked when there is good reason to believe that harmful effects may occur and the level of scientific uncertainty about the consequences or likelihood of the risk is such that the best available scientific advice cannot assess the risk with sufficient confidence to inform decision making. The Health Protection Agency, (Response to British Society</p>	
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	for Ecological Medicine Report, “The Health Effects of Waste Incinerators) say that “as there is a body of scientific evidence strongly indicating that contemporary waste management practices, including incineration, have at most a minor effect on human health and the environment, there are no grounds for adopting the ‘precautionary principle’ to restrict the introduction of new incinerators. Nevertheless we have adopted a conservative approach to assessing the impacts.	
Concern that the purpose of the plant is to divert residual material from landfill rather than protecting the environment as a whole.	This document described how we have assessed the risk from the installation. We are satisfied that there will not be a significant impact on the environment or human health and that the environment as a whole will be protected.	
Concern about the competence of the Applicant. And also Veolia ES.	We have no reason to believe that the Applicant will not be competent. We have an Enforcement and Sanctions policy which we follow. <a href="https://www.gov.uk/government/publications/environment-agency-enforcement-and-sanctions-policy/environment-agency-enforcement-and-sanctions-policy">https://www.gov.uk/government/publications/environment-agency-enforcement-and-sanctions-policy/environment-agency-enforcement-and-sanctions-policy</a>  We have checked our National Enforcement Database and Case Management System and no relevant offences have been found for either Veolia ES Hertfordshire Limited or Veolia ES (UK) Limited.	
Concern over discharges of treated domestic sewage to the River Lee and potential disturbance to the public sewer.	We are satisfied the discharge of domestic sewage will not cause significant pollution. There are no discharges to public sewer proposed.	
Concern over pollution from emissions to air, land and water including groundwater in the underlying aquifer.	This document describes how we have assessed the risk from the installation, including emissions to air, land, water and groundwater. We are satisfied that there will not be a significant impact on the environment or human health.	
Concern that other waste treatment/ disposal technologies are more sustainable than incineration	It is argued that Incineration is not an environmentally sustainable technology and therefore cannot be considered to be the Best Available Technique (BAT). The Environment Agency is aware that a number of proposals are coming forward for other ways of dealing with waste streams such as pyrolysis and mechanical / biological treatment. At this time however, mass burn incineration at this scale can still be considered BAT, subject to the appropriate assessments being made. Anaerobic digestion is most suitable for high moisture content biodegradable wastes such as food and agricultural wastes, and can be applied where there is separate collection of these waste streams. Anaerobic digestion is not however appropriate for mixed municipal waste. Some technologies such as plasma arc gasification are currently considered not to meet the definition of ‘availability’ due to their very limited application worldwide.  It is important to draw a distinction between Sustainability Appraisal and Best Practicable Environmental Option (BPEO) and BAT. Sustainability Appraisal forms part of the decision making process which should be applied so as to shape planning strategies that support the	
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	Government's planning objectives for waste management. Thus Sustainability Appraisal is an important part of plan formation and planning decisions are made by reference to planning policies. BPEO forms a similar function in Wales. BAT assessment is a technical appraisal that the proposed technique is the best available for the protection of the environment as a whole.	
Pre-treatment to remove recyclates is considered BAT. Concern raised that no pre-treatment is proposed at the installation – plastics in the feedstock will lead to an increase in the amount reagent required for acid gas abatement.	This proposal is for dealing with residual waste and recycling should occur further up the waste management process through separate collections etc. Separately collected waste can only be burnt if contaminated and not suitable for recovery. The permit does not allow wastes that have been separately collected for recycling to be burned, unless they are subsequently found to be unsuitable for recovery by recycling. Condition 2.3.4 secures this position. We requested further information from the Applicant on some wastes types that appeared to be recyclable materials. The Applicant confirmed that these materials would be contaminated materials not suitable for recycling such as contaminated packaging. The National Planning Policy for waste recognises that adequate provision must be made for waste disposal. The waste hierarchy still includes disposal where no other option is appropriate. Recycling initiatives are a matter for the local authority. Large amounts of plastics will not be burned.	
Concern over the impact on people's amenity and use of the local area.	We do not consider that the emissions from the installation will cause significant pollution or harm to human health and we are therefore satisfied that there will not be an adverse impact on the local area.	
Concern that the removal of contaminated soils that could be hazardous may cause pollution if an accident happens when storing, handling or producing the soil.	The construction phase of development is controlled by the planning regime and is not relevant to Environmental Permit determination.	
Concern that siting of the facility fails to take account of local characteristics.	Location is primarily a land use planning issue. We have a legal duty to determine any application made to us for an environmental permit. Our role is to determine whether appropriate measures are used to prevent and minimise emissions and whether any impacts on the environment and human health are acceptable. We have considered the location of local characteristics (e.g. receptors and topography) in making our decision.	
Concern raised that whether transporting Hertfordshire's residual waste to the proposed facility is ecologically acceptable. Rail or waterways should be used.	Off-site traffic and transport considerations forms part of the consideration for the planning process and is not a consideration for Environment Permitting process.	
Concern over the size of the site and scope for future expansion.	Consideration of the size of the site or potential for future expansion is not a consideration for Environmental Permit determination we have to determine the application currently before us. In the event that the Operator proposes an expansion of the site in the future then a variation to the Environmental Permit will be required.	
Concern that the site will attract	Pests are not usually an issue at incineration plants	
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vermin and flies.	because the waste is only stored for a short period of time. The Applicant confirmed that bunker management would be used to mix the waste and that storage time would be 4-5 days which we consider is appropriate.  Conditions 3.6.1 and 3.6.2 will provide controls to prevent pests becoming an issue.
Concern that there is no evidence that an agreement has been made with Network rail to remove IBA by rail.	This is a not for consideration under the Environmental Permit determination.
Concern that there is inadequate access for emergency services - the only access to the site is via a single track road in the event of an emergency this could become blocked.	Highways issues are matters for planning we have assessed the measures to prevent accidents on site and minimise their consequences and are satisfied with the measures proposed.
Using the proximity principle this site should not be considered – Hertfordshire is surrounded by incinerators.	This is not a matter for consideration as part of the environmental permit determination. We do however take in to consideration background pollution when assessing the impact from the facility.
Concern raised about the risk of burning clinical or radioactive waste.	The permit will not allow radioactive material or hazardous clinical waste to be accepted as a specific waste. It is possible that smoke alarms (containing small radioactive sources) could be placed in household bins and received at the incinerator under the municipal waste code. However they are likely to be small in number and have low level of radioactivity so we do not consider there is any significant risk if they were burned.
Concern raised of the risk of noise pollution and groundwater pollution, and impacts from dewatering activities when the site is being constructed.	Impacts during construction are a consideration for the planning process. We have assessed the impacts during operation and we are satisfied that the impacts will not cause significant pollution. See section 6.5.5 of this document for further details.
Concern raised about maintenance of the package treatment plant.	Condition 1.1 of the permit requires the Operator to implement an Environmental Management System. This will include appropriate preventative maintenance procedures for abatement plant.
Concern raised about whether the Operator has permission to pipe across land to the River Lee.	This is a matter for the planning application.
Concern raised that the discharge will not comply with the Water Framework Directive (WFD).	We have carried out a full assessment of the discharge and we are satisfied it complies with the WFD.
Concern raised about the validity of the human health risk assessment.	See section 5.3 of this document for details of how carried out our assessment of impacts on human health.
Concern raised about the risk of fugitive emissions of dust and odour of IBA from the storage area.	We are satisfied that fugitive emissions of dust and odour resulting from the storage and handling of IBA is unlikely to cause significant pollution. See section 6.5.3 and 6.5.4 for details of our assessment.

c) Representations from Individual Members of the Public

A total of 288 responses were received from individual members of the public. A drop-in event was attended by approximately 400 persons, who were a mixture of local residents and business community potentially impacted by the proposed facility. A number of these responses came from people attending the drop-in event.

The key issues raised are shown below. Where an issue has already been covered above it is not necessarily repeated below.

Brief summary of issues raised:	Summary of action taken / how this has been covered
<b>Comments about air emissions and air risk assessment</b>	
Concern over cumulative impact of dioxin pollution from Edmonton Incinerator.	Our assessment of dioxins is discussed in section 5.3 of this document. Dioxins were also assessed as part of the determination process for the Environmental Permit for Edmonton Eco Park (which includes an incinerator). Both assessment concluded no significant risk to human health due to dioxins. Also as the site is located approximately 17km from the proposed facility any in-combination would not be discernible at this distance.
Concern raised that risk assessments do not take into account the adjacent 'advanced thermal treatment (ATT)' and anaerobic digester plant (AD). The ATT has a stack height of 40m whereas the Veolia building is 48m tall – this will create downdraft affecting dispersion from the stack from the ATT plant which has not been modelled.	We have looked at the effect of the ERF building downwash on the emissions from both the Hoddesdon Energy from Waste Plant (ATT and AD plant). Having modelled sensitivity to the ERF building downwash effects we found that the impact would be negligible with any changes being well within modelling uncertainties.
Concern raised over emissions that could cause acid rain, particularly bio-persistent trifluoroacetic acid (TFA).	Acid rain can be caused by the emission of acidic gases from large combustion plants such as coal fired power stations. The abatement system includes the addition of lime which is effective at reducing acid gases and the dosing rates can be controlled from continuously monitoring acid gas emissions. This is consider BAT for acid gas control. Wet deposition is a long range effect and we consider that the amount of acid gases emitted from the installation will not be significant enough to contribute towards acid rain.
Concern over the impact of air pollutants on edible crops and ornamental crops grown locally.	The HHRA included impacts from dioxin intake from locally grown food. The HHRA is based on very conservative criteria and impacts were shown to be insignificant. Further details are in section 5.3 of this decision document.
Concern that smoke from the stack will cause shading of greenhouses causing reduced crop yields. And may also impact on outdoor crops.	There will not be emissions of smoke from the installation. Smoke is made up of high concentrations of particulates. Particulate emissions will be controlled to low levels by the bag filter system.
Concern raised over cumulative impact from	The air quality impact assessment has



<p>pollution due to other nearby combustion facilities.</p>	<p>considered the existing background air quality and has also considered potential impacts from the nearby Hoddesdon Anaerobic Digestion Facility EPR-KP3138EV; Hoddesdon Energy from Waste Plant EPR-UP3038WA; and Rye House Power Station EPRRP3632SF. We are satisfied that the cumulative impacts have been considered in the assessment.</p>	
<p>Concern raised about the health risk from ultra-fine particles that will be released from the plant. They cannot be fully captured by incineration filtration systems.</p>	<p>The impact from particulate emissions was shown to be insignificant. Section 5.2.1 of this decision document has more details on particulate impacts. The emissions limit in the permit is for total particulates and the method for monitoring particulates will capture smaller particles. Section 5.3.3 of this document has further details.</p>	
<p>Concern raised of how PM2.5 will be monitored. Is there ground level monitoring and how many chemicals will be monitored and how many emitted to air.</p>	<p>The emission limit in the permit is for total particulates and the method for monitoring particulates will capture smaller particles. There is no ground level monitoring required in the permit. See Schedule 3 of the permit for details of the monitoring requirements and emission limits.</p>	
<p>Concern over what are the safe limits for pollutants such as lead, cadmium and dioxins.</p>	<p>The monitoring requirements and emission limits (including metals &amp; dioxins) are set in the permit and reflect the requirements set out in IED. We have assessed the predicted emissions of metals and dioxins against the relevant environmental standards.</p>	
<p>Concern raised that the level of NO<sub>x</sub> in Hoddesdon's Borough of Broxbourne currently exceeds the legal level set by the Government and any increase should not be allowed.</p>	<p>We are satisfied that emissions of NO<sub>x</sub> will not be significant. The assessment includes consideration of nearby AQMAs, including Broxbourne. See section 5 of this decision document for further details of our assessment.</p>	
<p>Concern raised over fugitive emissions to air from transporting IBA by rail</p>	<p>Impacts from off-site rail movements is outside the scope of the Environmental Permitting process. The Applicant has considered fugitive emissions from storage and loading of IBA and we are satisfied that fugitive emission will be minimised as set out in section 6.5.3 of the decision document.</p>	
<p>Concern raised that prevailing winds will carry pollutants to Roydon Village.</p>	<p>The weather data used in the dispersion modelling has ensured that wind direction has been taken into account in assessing impacts off site.</p>	
<p>Concern raised that the permit application does not show graphs of dispersal from the stacks in the presence of different wind and weather patterns.</p>	<p>The weather data used in the dispersion modelling has ensured that local meteorological conditions have been taken into account in assessing impacts off site.</p>	
<p>Concern that metal, dioxins and other substances will only be monitored on a quarterly and bi annual basis, so pollutants could be emitted into the atmosphere without anyone knowing.</p>	<p>We are satisfied that the monitoring frequency we have set in the permit is appropriate and is in line with the requirements set out in IED. Also the operating techniques imposed by the permit will ensure emissions are minimised at all times.</p>	
<p>Concern raised that toxic heavy metals will</p>	<p>We have assessed the impact from</p>	
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<p>be emitted from the facility.</p>	<p>emissions of toxic metals from the installation and we are satisfied that emissions will not cause significant harm to human health or the environment. See section 5.2 for further details. Also the Applicant's proposals include measures to minimise emissions of toxic metals, these include bag filters and activated carbon injection, see section 6.2 for further details. We consider these measures to be BAT. The permit contains emission limits and monitoring requirements for particulates and metals.</p>
<p>Concern raised about impacts from particulate releases following an emergency shutdown.</p>	<p>The abnormal operation impact assessment considered the impacts from particulate emissions at 150mg/m<sup>3</sup> for the short time period allowed under abnormal operation. We agreed with the Applicant's proposals that they would not cause significant harm to the environment or human health. Any emissions above this would be a permit breach and we would take appropriate enforcement action under our enforcement and sanctions statement.</p>
<p>Concern that pollution from the diesel generators has not been assessed.</p>	<p>Diesel generators have been taken into consideration in our assessment of the emissions from the installation. See section 5.2 for further details.</p>
<p>Concern raised about emissions to air during start-up and shut-down.</p>	<p>The emissions limits set by IED chapter IV do not apply at start-up and shut-down. The combustion units will be fired on a support fuel (gas oil) during start up and shut down, to ensure that the temperature meets the required levels before waste is permitted to be fed for incineration. This support fuel is automatically fed if the temperature of the furnace falls below a permitted level. The impact at start-up and shut down, when emission limits do not apply, is not likely to be significant.</p>
<p>Concern that impact from air emissions at a nearby campsite (located 400m away) have not been considered.</p>	<p>The air quality assessment has considered receptor location close to the campsite and we are satisfied that there will be no significant impacts at the campsite. The Applicant has reported maximum concentrations in the modelled grid, these represent 'worst case' predictions and do not necessarily represent public exposure. However, the predicted PCs and PECs are predicted to be either insignificant or not significant enough to risk exceeding the environmental standards for air.</p>
<p>Concern about the safety of the permitted levels of toxic pollutants including cadmium, lead and dioxins.</p>	<p>The permit imposes emission limits which are derived from IED, these limits are designed to be stringent and to provide a high level of environmental protection. The Applicant's air dispersion modelling used emissions at these limits. We are satisfied that impacts will not be significant as set out in section 5.2 of this document.</p>

<p>Concern over the accuracy of background monitoring data gathered by DEFRA and therefore validation of emission modelling is not possible.</p>	<p>We are satisfied that background pollution levels used in the Application are appropriate.</p> <p>We have audited the Applicant's dispersion modelling, our audit included checking the background pollution levels that were used. We are satisfied that the modelling is suitable for assessing the impact from the Installation.</p>
<p>Concern raised that air quality monitoring used by Veolia between Nov 2014 and Sep 2015 is not representative of the norm due to Rye House Gas Fired power Station being dormant under a Supplementary Balancing Reserve contract directly with the National Grid. The site has since returned to operation.</p>	<p>The air quality monitoring has considered the Operation of the Rye House Power Station in the background air quality used in the modelling assessment. They have acknowledged the fact that the Power station is currently not operating to full capacity and have accounted for this in the calculation of the background for this modelling assessment. See section 5.2 of this decision document for further details.</p>
<p>Concern raised that emissions will be increased at night to minimise visual awareness.</p>	<p>The Operator will be required to comply the conditions and emission limits set in the permit at all times. Emission will be monitored (some continuously – see Schedule 3 of the permit) in line with permit conditions. The operator must inform us within 24 hours of any breach of the emissions limits, followed by a fuller report of the size of the release, its impact and how they propose to avoid this happening in the future;</p> <p>The operators' monitoring results are placed on the public registers;</p> <p>Depending on the seriousness of any breach, we will take appropriate enforcement action and/or prosecute.</p>
<p><b>Comments about abatement systems &amp; best available techniques</b></p>	
<p>Concern raised that bag filters have limited use in this application and should be supported by Electrostatic precipitators</p>	<p>We are satisfied that the Applicant's proposals for abatement of particulate matter combustion gases is BAT for this installation. The use of bag filters like those proposed for the application is widespread at energy from waste facilities and we are satisfied they will be effective for this application. See section 6.2.1.</p>
<p>Concern raised that incineration is an obsolete technology and not BAT and other mechanical biological heat treatment should be used instead.</p>	<p>The technology proposed by the Applicant is listed in the BREF as a BAT option. We are satisfied that the Applicant's proposals are BAT, this is discussed in more detail in Section 6 of this decision document.</p>
<p>Concern raised that it does not promote innovation in the waste management and energy sectors and undermines the principle of reduce, reuse and recycle as waste will be need to fuel the site 24/7. The plant is not sustainable.</p>	<p>This outside the scope of this determination which to assess the impact of emissions from the proposed facility.</p> <p>It is argued that as the quantity of residual waste reduces over the lifetime of the installation, the need to maximise efficiency by maintaining the incinerator at full capacity will suppress waste recovery and recycling initiatives, which are higher up the waste</p>

	<p>hierarchy. The capacity of the incinerator is primarily a matter for the Applicant designed to meet the waste disposal needs of the local authority. The proposed facility forms part of an integrated waste management strategy; any material arriving at the facility will be residual waste arising following upstream waste segregation, recovery and recycling initiatives. The shape and content of this strategy is a matter for the local authority. The incinerator is one element in that strategy, and the Permit will ensure that it can be operated without giving rise to significant pollution or harm to human health. In any event Permit conditions will prohibit the burning of any separately collected or recovered waste streams, unless contaminated and recovery is not practicable.</p>
<p>Concern raised that the start fuel proposed – Diesel -is not environmentally sound.</p>	<p>The Applicant has chosen to use fuel oil based on safety reasons. See section 6.2.3. There is a requirement in the permit that the fuel oil must be low sulphur.</p>
<p>Concern over risk of legionnaires' disease contaminating the aqueous releases.</p>	<p>Aqueous discharges are limited to surface water runoff and secondary treated domestic sewage, therefore the risk of legionella bacteria (which causes legionnaires' disease) is insignificant as this is generally associated with large cooling towers which are not proposed for this installation.</p>
<p>Concern that the technology proposed will soon become outdated and superseded by cleaner more efficient technologies. Therefore the proposed 30 year lifespan of the facility is too long. For example Anaerobic digestion is a cleaner technology.</p>	<p>The technology proposed by the Applicant is listed in the BREF as a BAT option. We can only base our assessment and what is currently considered BAT therefore we are satisfied that the Applicant's proposals at this time is BAT, this is discussed in more detail in Section 6 of this decision document. Also at this time current Anaerobic Digestion technologies has only limited application and would not be suitable for all the wastes proposed.</p>
<p>Concern over the combined effect of emissions from increased aeroplanes landing at Stansted Airport and emissions from the proposed facility.</p>	<p>Existing background pollution concentrations have been considered in the air quality assessment. Increases in background pollution due to increased aeroplane traffic are not expected to significantly increase the background pollution levels to the extent that it will affect the conclusions of the air quality assessment.</p>
<p><b>Comments about health impacts</b></p>	
<p>Concern over health risk (including long term health) from the installation including increased risk of asthma, Pulmonary problems, cancer (including non Hodgkins Lymphoma and Sarcoma), birth defects and link between air quality and dementia.</p>	<p>PHE's position is "While it is not possible to rule out adverse health effects from modern, well regulated municipal waste incinerators with complete certainty, any potential damage to the health of those living close-by is likely to be very small, if detectable. This view is based on detailed assessments of the effects of air pollutants on health and on the fact that modern and well managed municipal waste incinerators make only a very small</p>

	<p>contribution to local concentrations of air pollutants.” PHE is not aware of any evidence that requires a change in their position statement.</p> <p>Our view is that there will not be a significant effect on health. This is in line with Public Health England’s position statement as discussed in section 5.3 of this decision document.</p>	
Concern raised of the impact from particulates on health.	There is evidence that particulates can cause harm to human health however the impact from particulate emissions for this application was shown to be insignificant. See section 5.2.1 of this decision document for further details of our assessment of particulates.	
Concern raised about the potentially dangerous products of combustion including those products covered by the Stockholm Convention Persistent Organic Pollutants (POPs), dioxins and furans.	We are satisfied that the Permit ensures that the formation and releases of POPs and dioxins and furans will be prevented or minimised. See section 6.4 of this decision document has more details.	
Concern raised that under the Stockholm Convention incinerators are not a preferred technique due there potential to emit POPs.	High-temperature incineration is one of the prescribed methods for destroying POPs. See section 6.4 for further details.	
Concern raised that rainwater harvested for use in the local salad growing industry will be contaminated with air borne pollutants from the plant. Also risk of groundwater pollution as local farmers also use wells.	The impact of the ERF on the food chain has been assessed in the HHRA and we have checked sensitivity to uncertainties in assessment. The HHRA takes account of a range of pollutant pathways including rain water and predicts the worst case impacts to different receptor types. Further details are in section 5.3 of this decision document.	
Concern raised over the adequacy of monitoring of toxic waste removed from site and the risk to health of the public.	APC residues will contain heavy metals, dioxins and also unreacted lime, it is considered hazardous waste and will be handled and disposed of appropriately as hazardous waste in an appropriately licensed facility.	
Concern about who will pay for the treatment due to ill health to the residents of Hoddesdon that will be caused by the plant.	We are satisfied that the proposal will not have a significant impact on human health.	
Pre-treatment should be used to improve energy recovery potential of the waste.	This proposals is for dealing with residual waste, no on site pre-treatment is proposed. The permit requires that separately collected wastes can only be burnt if contaminated and not suitable for recovery. We are satisfied that in terms of energy recovery and efficiency the proposed techniques are BAT.	
Concern raised that PM <sub>2.5</sub> are not separately regulated in the Waste Incineration Directive even though it is repeatedly correlated spatially to infant mortality in the UK.	Even though the permit contains limits for total Particulate matter, as per IED. We assess the impacts from both PM <sub>2.5</sub> and PM <sub>10</sub> in our assessment of air quality – see section 5.2 for further details. We are satisfied that particulate emissions from the installation, including emissions of PM <sub>10</sub> and PM <sub>2.5</sub> will not give rise to significant pollution	
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	<p>or harm to human health. We take advice from PHE on health matters and their current position is that modern, well run municipal waste incinerators are not a significant risk to public health remains valid.</p>	
<p>Concern raised about European Doctors associations in June 2008 representing 33,000 doctors statement to the European Parliament citing widespread concerns on incinerator particle emissions and absence of specific fine and ultrafine size particle monitoring or in-depth industry/government epidemiological studies.</p>	<p>Particulate emissions have been shown to be insignificant, section 5.2 of this decision document has further details.</p> <p>We take advice from PHE on health matters. Their advice is more recent than the report referred to and takes account of a range of related research studies and data to examine links between emissions from municipal waste incinerators and effects on health. The PHE's position is "While it is not possible to rule out adverse health effects from modern, well regulated municipal waste incinerators with complete certainty, any potential damage to the health of those living close-by is likely to be very small, if detectable. This view is based on detailed assessments of the effects of air pollutants on health and on the fact that modern and well managed municipal waste incinerators make only a very small contribution to local concentrations of air pollutants." PHE is not aware of any evidence that requires a change in their position statement.</p> <p>Our view is that there will not be a significant effect on health. This is in line with Public Health England's position statement as discussed in section 5.3 of this decision document.</p>	
<p>Greenpeace report has been cited that highlights environmental and health impacts of waste incineration.</p>	<p>The Environment Agency takes advice from PHE on the health implications of incinerators generally and specifically of each application for a permit. In January 2012 they confirmed they would be undertaking a study to look for evidence of any link between municipal waste incinerators and health outcomes. The results of the health study have not been released yet. However the first part of the study showing levels of pollutants in the air around incineration plants due to emissions from the incinerator has been published. The report shows that the levels are low.</p> <p>Their current position that modern, well run municipal waste incinerators are not a significant risk to public health remains valid. See section 5.3 for further information.</p>	
<p>Concerns raised about adverse health effects and risk of fires from waste management facilities including waste incineration. Direct reference has been made to sections from the ' Annual Report of the Chief Medical</p>	<p>The Environment Agency takes advice from PHE on the health implications of incinerators generally and specifically on each application for a permit. In January 2012 they confirmed they would be undertaking a study to look for</p>	
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<p>Officer 2017, Health Impacts of All Air Pollution – What do we know’.</p>	<p>evidence of any link between municipal waste incinerators and health outcomes. The results of the health study have not been released yet. However the first part of the study showing levels of pollutants in the air around incineration plants due to emissions from the incinerator has been published. The report shows that the levels are low.</p> <p>Their current position that modern, well run municipal waste incinerators are not a significant risk to public health remains valid. The study has been undertaken to extend the evidence base and provide the public with further information; as such it does not justify a delay in our decision.</p> <p>With regards to the risk of pollution from fires. The Applicant has submitted a Fire Prevention Plan as part of the Application. We have assessed this plan against our own Fire Prevention Plan guidance. We are satisfied that it minimises the risk of fire occurring and the consequences of any fire if one does occur. Permit conditions requiring the operator to operate in accordance with an EMS and FPP that minimises risks of pollution are included in the permit.</p>
<p>Concern raised about the risk of adverse health effects on people living close to waste incineration plants discussed in a report written by Michael Ryan - Incinerators &amp; the Environment Agency.</p>	<p>We are aware of and take account of a range of views of national and international expert bodies with regards to the health effects of incinerators, see section 5.3 for further details. And we take advice from PHE on health matters. Their advice takes account of a range of related research studies and data to examine links between emissions from municipal waste incinerators and effects on health. The PHE’s position is “While it is not possible to rule out adverse health effects from modern, well regulated municipal waste incinerators with complete certainty, any potential damage to the health of those living close-by is likely to be very small, if detectable. This view is based on detailed assessments of the effects of air pollutants on health and on the fact that modern and well managed municipal waste incinerators make only a very small contribution to local concentrations of air pollutants.”</p> <p>In January 2012 they confirmed they would be undertaking a study to look for evidence of any link between municipal waste incinerators and health outcomes. The results of the health study have not been released yet. However the first part of the study showing levels of pollutants in the air around incineration plants due to emissions from the incinerator has been published. The report shows that the levels are low.</p>

	<p>Their current position that modern, well run municipal waste incinerators are not a significant risk to public health remains valid. The study has been undertaken to extend the evidence base and provide the public with further information; as such it does not justify a delay in our decision. The details contained in the report referred in the consultation response do not lead us to change our view that there will not be a significant effect on health. This is in line with Public Health England's position statement as discussed in section 5.3 of this decision document.</p>
<b>Comments about impacts at ecological sites</b>	
Concern over risk of pollution of local waterways impacting on fish and wildlife	The only emissions permitted for emission to water will be uncontaminated surface water runoff and a relatively small volume of secondary treated domestic sewage. We are satisfied that these releases will not have a significant adverse impact on water quality in the receiving waters.
Concern over impact from increased noise on impact on local bird population at the RSPB nature reserve.	Our view is that expected noise levels are not likely to have a significant effect on species. The main type of noise impact to consider for species like birds is sudden loud noises which are unlikely from this installation.
Concern over impact on air quality causing adverse impact at the Lea Valley Ramsar, Rye Meadows Nature Reserve, a SSSI and a SPA.	We have assessed the impact at these sites. See section 5.4 of this document for details of the assessment.
Concern raised that the site encroaches on Lee Valley Regional Park, Green belt, the River Lee and other key wildlife environments.	We are satisfied that there will not be a significant impact on ecological sites or species due to emissions from the site. Section 5.4 of this decision document has further details.
Concern raised of the effect of nitrogen deposition at Rye Meads, nearby Ramsar site, Broxbourne Woods NNR and grassland at Hudson Meads.	We are satisfied that there will not be a significant impact on ecological sites or species. Section 5.4 of this decision document has further details.
Concern over impact on nearby protected Bats and Newts and other protected species.	We are satisfied that there will not be a significant impact on species in the nearby area. See section 5.4 for further details of our assessment.
<b>Comments about impacts from increased traffic</b>	
Concern raised over impact of traffic including on air quality particularly on cyclists and pedestrians.	<p>Movement of traffic to and from the installation is a relevant consideration for the grant of planning permission, but does not form part of the Environmental permit decision making process.</p> <p>Also emissions from off-site traffic do not form part of the Environmental permitting decision process except to the extent that they could affect the prevailing background levels. This has been accounted for in the Air quality assessment. The predicted background emissions used for assessment</p>
Concern raised over danger to pedestrians and cyclists from pollution and road accidents.	
How much additional traffic pollution can we expect from the estimated 287 lorry movement per day? What will the effect on air quality in the district?	



	<p>considered “cumulative impact” from other nearby consented operations (Hoddesdon Anaerobic Digestion Facility, Hoddesdon Energy from Waste Plant (known as ATT) &amp; Rye House Power Station), and the road vehicle contribution associated with the installation.</p> <p>Vehicle movements within the Installation boundary are considered within the remit of the Environmental Permit. However the emissions from this limited area will not be significant and will not affect the conclusions of the air quality impact assessment.</p>
If the site has excess capacity will Veolia be able to increase waste inputs in the future leading to more pollution and traffic congestion?	The Operator would need to apply for a variation to the Environmental Permit to increase the waste throughput limit in the permit. We would make an assessment of impact on the environment and human health from the increase in tonnage before making a decision on whether or not to issue the variation. Consideration of traffic congestion outside the installation boundary does not form part of the Environmental Permitting decision process.
<b>Comments about Noise impacts</b>	
Concern about noise caused by increased traffic due to lorries delivering waste to the proposed facility.	On site traffic movements were considered in the Applicant’s noise assessment and we are satisfied that there will be not be a significant impact due to noise, see section 6.5.5 of this document. Off-site movements form part of the consideration for the planning process.
Concern raised of the risk of noise pollution when the site is being constructed and operated.	Impacts during construction are a consideration for the planning process. We have assessed the impacts during operation and we are satisfied that the impacts will not cause significant pollution. See section 6.5.5 of this document for further details.
Concern raised about noise pollution at night.	The Applicant has completed a noise assessment as part of the application. The assessment concluded, which we agree with, that the impacts will be low at all sensitive receptors, this includes during the night. See section 6.5.5 for further details.
Concern over noise impacts from reversing alarms on vehicles.	The Applicant has stated that vehicles accessing the reception building/tipping hall will enter and exit in forward gear. With regards to external movements the facility is designed with anticlockwise vehicle circulation to minimise reversing manoeuvres. External to the reception building and ramp, reversing activities are minimal and limited to short periods for: <ul style="list-style-type: none"> <li>• operations adjacent to the IBA storage area to facilitate the rail loading operations. This is expected to be once per week as a daytime activity. Mobile plant involved in this operation will be equipped with white noise reversing alarms.</li> </ul>

	<ul style="list-style-type: none"> <li>• Broxbourne Borough Council refuse collection vehicles reversing into overnight parking bays at the end of shift in afternoon.</li> <li>• reagent deliveries on occasion.</li> </ul> <p>All above vehicles will be fitted with white noise reversing alarms which are quieter and less disturbing than reversing alarms.</p>	
<b>Comments about odour impacts</b>		
Concern over odour from vehicles delivering waste to the site.	Odour from onsite vehicles was included in the Applicant's odour assessment. As we only regulate odour emissions from the installation any odour from vehicles off site is outside our remit.	
Concern raised that in the event of a breakdown on site waste will be allowed to build up resulting in odour pollution.	The Operator's proposals consider this scenario and we are satisfied that their contingency plan in the event of a breakdown will not lead to significant odour pollution. Please see section 6.5.4 of this document for further details.	
Concern about odour when vehicles carrying waste are unloaded.	Waste will be unloaded with in a building under negative pressure this will minimise odour emissions. See section 6.5.4 of this decision document for further details on odour.	
Concern raised that shutter doors on the waste reception hall will not be closed at all times due to frequent traffic movements and that this will lead to odour issues.	The permit contains conditions (3.3.1 and 3.3.2) to control odour, to comply with this shutter doors should only be opened when vehicles enter or exit the building. The use of combustion air to generate negative pressure within the reception hall is standard practice at most incineration plants and is a reliable way of controlling odour without the need for continuous pressure testing. We have set pre-operational condition PO8 to ensure that air flows will be sufficient during normal operation. See section 6.5.4 of this decision document for further details.	
Concern raised over risk of odour from vehicles that are not adequately covered in high winds.	The application states that all vehicles carrying waste to the facility will be covered. We expect this to be the case in all weather conditions.	
<b>Comments about global warming</b>		
Has climate change been considered when predicting emissions from the facility?	For dispersion modelling we expect 5 years of met data to be used that is generally less than 10 years old. Climate change is assumed to be less than the inter year variation in the data so is not expected to affect predictions significantly.	
<b>Comments about Operator competence</b>		
Concern raised over Veolia's safety record at similar site and the Environment Agency's inspection regime. Are the results of the inspections available in the public domain?	We have no reason to believe that the Applicant will not operate the installation safely and it is in their interests to do so. The Environment Agency will regulate the site carrying out a continual assessment of the plant's operations and its environmental performance. This will be achieved in the following ways:	
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	<ul style="list-style-type: none"> <li>• The Operator must monitor emissions and report the results to us;</li> <li>• We will regularly inspect the installations, review monitoring techniques and assess monitoring results to measure the performance of the plant;</li> <li>• We will carry out on-site audits of operator monitoring;</li> <li>• The operator must inform us within 24 hours of any breach of the emission limits, followed by a fuller report of the size of the release. Its impact and how they propose to avoid this happening in the future;</li> <li>• The operators monitoring results are placed on the public register;</li> <li>• Depending on the seriousness of any breach , we will take appropriate enforcement action and/or prosecute</li> </ul> <p>Copies of inspections reports and monitoring results are available to view by the public.</p>	
<b>Comments about other impacts and issues</b>		
Concern that the application was previously turned down in 2011.	We assume this comment refers to the Planning Application for an energy from waste installation in Hatfield. The Environment Agency are not responsible for planning decisions.	
Concern that waste will be imported from outside the local area.	The decision of where waste is imported from is not a consideration for the Environmental permitting process.	
Concern raised of an adverse impact on property prices.	Impact on house prices is not a consideration for the Environmental Permitting process.	
Concern raised of an adverse impact on tourism to Hoddesdon.	Based on our assessment of the impact on the environment and human health there is no reason why emissions from the installation will have an adverse impact on tourism.	
Concern raised that effluent from the site will contaminate crops that are grown only a few miles away from site.	Discharges to controlled water are restricted to surface water runoff and secondary treated domestic sewage – which will be subject to the limits set in the permit. We are satisfied that there will be no significant adverse impact on water quality in receiving waters. See section 6 for further details.	
Concern raised that the facility will not be treating waste and that recyclates such as paper and plastic will be required to be burned.	The permit does not allow wastes that have been separately collected for recycling to be burned, unless they are subsequently found to be unsuitable for recovery by recycling. Condition 2.3.4 secures this position. We requested further information from the Applicant on some wastes types that appeared to be recyclable materials. The Applicant confirmed that these materials would be contaminated materials not suitable for recycling such as contaminated packaging.	
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	The National Planning Policy for waste recognises that adequate provision must be made for waste disposal. The waste hierarchy still includes disposal where no other option is appropriate.	
Concern raised over of a conflict of interest in the approval of the planning application.	This application was for an Environment Permit and not a planning application which is matter for the local planning authority.	
Concern raised that the site was not put forward as a possible location for any type of facility in the Hertfordshire Waste site Allocations document 2014.	This is a matter for consideration by the local planning authority.	
Concern raised that the change of land use from aggregates to incineration appears to be in contradiction to the Minerals and Waste Plan.	This is a matter for consideration by the local planning authority.	
Concern raised that the proposed site was considered unsuitable in the planning application for the New Barnfield Incinerator.	Location is primarily a land use planning issue. We have a legal duty to determine any application made to us for an environmental permit. Our role is to determine whether appropriate measures are used to prevent and minimise emissions and whether any impacts on the environment and human health are acceptable. Location is relevant so far as it has the potential to have an adverse impact on sensitive receptors. We have considered the location of receptors in making our decision.	
Concerns raised over why two large incinerators are needed so close to each other – Edmonton Incinerator is located approximately 11.8 miles away and whether other sites may be more suitable.	Location is primarily a land use planning issue. We have a legal duty to determine any application made to us for an environmental permit. Our role is to determine whether appropriate measures are used to prevent and minimise emissions and whether any impacts on the environment and human health are acceptable.	
Concern about impacts from vermin and flies.	Pest are not usually an issue at incineration plants because the waste is only stored for a short period of time the applicant confirmed that bunker management would be used to mix the wastes and that storage time would be 4-5 days which we consider is appropriate. Conditions 3.6.1 and 3.6.2 will provide controls.	
Concern raised about self-reporting for monitoring. Monitoring should be carried out by a third party and spot checks should be made.	The Operator's monitoring will have either MCERTS certification or MCERTS accreditation as appropriate. This still applies when carried out by external third party assessors. MCERTS is the Environment Agency's Monitoring Certification Scheme. If monitoring complies with MCERTS we can have confidence in the monitoring of emissions. In addition we will carry out audits of the Operator's monitoring. If we find a problem we will take action to put this right. The Environment Agency may carry out its own monitoring as part of its regulation of the site.	
Concern raised that there may not be enough waste in the future so the incinerator is not	Availability of waste is a matter for the Operator and not a consideration for the	
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needed.	Environmental permitting process. The permit will ensure that for so long as the installation is operated the environmental impacts from it will be acceptable
Concerns raised over fugitive releases from the facility due to contaminated runoff, litter, leaks from tankers, leaks from containers, spillages of waste, spillages of fuel and overflows from storage containers.	An assessment of fugitive emissions has been carried out. See section 6.5.3 of this decision document for further details.
Concern raised that if there is breakdown the plant would take approximately 30 mins to shutdown in which time it would produce excessive amounts of pollution.	We are satisfied that emission during shutdown will not be significant. See our assessment of the impact on emissions from abnormal operations – section 5.5.
Concern over impact on people who live on their boats in the canal and at Roydon Marina.	We have considered the canal boats moored close to the site in our assessment, we are satisfied that impacts will not be significant.
Concern raised that impacts at Dobbs weir have not been considered.	Dobbs Weir Road has been considered as a receptor in the relevant risk assessments completed by the Applicant.
Concern over the risk of contamination of the New River which provides drinking water for the Lee Valley area and parts of London	The only emissions to controlled water will be of uncontaminated surface water runoff and secondary treated domestic sewage to the River Lee. We are satisfied that there will be no significant adverse impact on water quality in receiving waters.
The time and location of the drop in event was totally inadequate. Also concerns at the lack of notification.	The way in which we consulted is described in section 2 of this decision document. We consider we took appropriate steps to inform people of the Application and how they could provide comments.
Concern raised that worst case scenarios have not been considered in the application.	We are satisfied that the modelling assessments submitted by the Applicant adequately consider worst case conditions.
Concern raised that the application states that the information in the application is based largely on 'estimates' or 'assessment' and there are no guarantees or assurances about the performance of the proposed facility and its impact on the environment.	The methodology use for the assessment of impact are generally conservative and based on worst case scenarios. To ensure the installations performance the permit imposes emission limits which are derived from IED, these limits are designed to be stringent and to provide a high level of environmental protection. These limits will need to be met and we will regulate activities to ensure that they are.
Concern raised about whether the cladding on the incinerator will be flammable.	We asked the Applicant to respond to this comment and they provided details of construction which they state the insulation is fire-proof and non-combustible to EN13501-1 standards.
Question raised about how many jobs will be created and whether they will be zero hour contracts.	Creation of jobs does not form part of the Environmental permit decision making process.
Can the Environment Agency confirm or deny the allegations that HCC has signed a 30 year contract worth £1 billion.	No we cannot the Environment Agency have no involvement in waste contracts between HCC and the Applicant.
Concern raised that the facility will burn commercial waste as well as municipal waste.	The Application has proposed a number of waste codes and states that the wastes will consist of mixed municipal solid waste (MSW) and commercial and industrial waste.

	We are satisfied that the waste types proposed by the Applicant are suitable for combustion in a moving grate incineration plant and that the Installation will be able to comply with the permit conditions (including emission limit values) whilst burning these wastes.
Concern raised about what will happen to the runoff from the cooling system.	The Applicant has proposed the use of Air cooled condensers (ACC) therefore water use will be low. The only permitted discharges from the site to controlled waters are surface water runoff and secondary treated domestic sewage. The small volume of effluent produced by the process will either be re-used within the process or tankered off site for disposal.
Concern raised about a New Scientist report that states that the carbon footprint of electricity generated by waste incineration is more than from most coal-fired power plants based on CO <sub>2</sub> emissions per kWh of electricity generated.	See section 6.3 for further information on our assessment of global warming potential. We are assessing a waste disposal activity and our assessment of global warming impact is made within that context comparing various alternative waste techniques.
Concern raised about security on site.	We are satisfied that appropriate infrastructure and procedures will be in place to ensure the site remains secure.
Concern that hospital waste will be burned at the facility.	The Application proposes to take waste under waste code 18 01 04. This classed as wastes whose collection and disposal is not subject to special requirements in order to prevent infection (for example dressings, plaster casts, linen, disposable clothing, nappies). We are satisfied that this waste is suitable for burning in the installation. Hazardous clinical waste cannot be accepted for incineration.
Concern over the storage of ammonia hydrated lime and APC residues and risk of release to the environment.	We are satisfied that the proposals for the storage of ammonia, hydrated lime and APC residues are appropriate. See section 6.5.3 of this document for further details.
Concern that Operators are given 2 weeks' notice before inspections by the Environment Agency	This is not correct. Also we can carry out both announced and un-announced inspections if required.
Concern that the incinerator building will not have capacity to contain the waste delivered to site and that it will have to be stored outside.	We are satisfied that the Applicant will control waste inputs in a way that will not cause significant pollution. There are no proposals to store waste outside the building and to do so would be a breach of the permit.
What assurances has the council received from Veolia that the disposal cost won't rise in the future?	Consideration of rising costs for the council does not form part of our Environmental permitting decision.
Will emissions monitoring data be available to view?	The monitoring reports submitted in line with permit conditions will be available to view on public register.
How often will emissions be monitored? Who decides what is safe?	Monitoring requirements and frequencies are detailed in schedule 3 of the Environmental permit. Limits are also detailed, these limits are set in accordance with the Industrial Emissions Directive.

Concern raised that Environment Agency have said that the emission limits are based on what is technically achievable and not on what is safe for human health.	We are not aware of the source of this statement but we are satisfied that there is no significant risk to human health from the proposed installation. This was done by comparing impacts to appropriate environmental and health standards as set out in section 5 of this document. To ensure the installations performance the permit imposes emission limits which are derived from IED, these limits are designed to be stringent and to provide a high level of environmental protection.	
Concern raised that recent reports say there are too many incinerators in the UK already for the amount of waste produced.	This is not a relevant consideration for the Environmental permitting process. Our concern is whether if the plant operates the environment will be protected which we consider will be the case	
Concern raised that Brexit will mean a relaxation in environmental regulations.	It is not possible to predict any future changes in regulation.	
Concern that toxic IBA will be used as road covering causing pollution of groundwater and water ways.	The permit does not control how the IBA is used once it leaves the site although the transport and subsequent treatment or use will be covered by duty of care legislation and the EPR. IBA is used for a variety of purposes (for example as aggregate) without incident.	
Concern that there is too much emphasis on risk based approach to reducing cost of monitoring compliance, with not enough weight being given to the precautionary principle.	The monitoring is in accordance with the requirements of IED and we consider that appropriate. Also the resource we put into compliance assessment concentrates on those activities or sites we consider present the greatest risks but we aim to regulate all sites effectively and ensure they comply with their permits.	
Concern about incinerators being a target for terrorist attacks.	We are satisfied that appropriate infrastructure and procedures will be in place to ensure the site remains secure. The risk of a terror attack is continually assessed by the government and included in a national risk register. The Environment Agency will comply with any government instruction on the prevention of terrorism. In the meantime we need to continue to determine applications as normal.	
Concern raised that the plant will be controlled by a computer system and there is a risk of power failure or hacking.	A back-up electricity generator is proposed for emergencies in the event of power failure. The operator will have measures in place to limit the risk of cyber-attacks.	
Concern raised over storage of diesel and potential for explosion on site	We are satisfied the storage proposals for diesel are appropriate. An accident management plan will form part of the Environment Management System required under pre-operational condition P01.	
Concern over the validity of the Applicant's emissions calculations if a permit or emissions limits have been agreed.	We are satisfied that the assumptions and calculations underpinning the risk assessment, including the predicted emissions, are valid and precautionary. We explain in this document how we have assessed the Applicants proposals.	
Concern over the impact of emissions of	We are satisfied that emissions of cadmium	
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cadmium and nickel and cumulative impact with the ATT plant.	and nickel are unlikely to give rise to significant pollution or harm to human health. See section 5.2.3 for further details of our assessment. The cumulative impacts from nearby consented plants including those from the proposed ATT have been considered in the assessment.
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## **B) Advertising and Consultation on the Draft Decision**

This section reports on the outcome of the public consultation on our draft decision carried out between 02/08/2018 and 24/09/2018.

Also some of the consultation responses received were on matters which are outside the scope of the Environment Agency's powers under the Environmental Permitting Regulations. Our position on these matters is as described previously.

### **a) Consultation Responses from Statutory and Non-Statutory Bodies**

Response Received from Epping Forest District Council		
Brief summary of issues raised:	Summary of action taken / how this has been covered	
Concern raised that charging of waste can continue during abnormal operations, as allowed under condition 2.3.7.	Article 50(4)(c) of IED requires that waste incineration and co-incineration plants shall operate an automatic system to prevent waste feed whenever any of the continuous emission monitors show that an emission limit value (ELV) is exceeded due to disturbances or failures of the purification devices. Notwithstanding this, Article 46(6) allows for the continued incineration and co-incineration of waste under such conditions provided that this period does not (in any circumstances) exceed 4 hours uninterrupted continuous operation or the cumulative period of operation does not exceed 60 hours in a calendar year. This is a recognition that the emissions during transient states (e.g. start-up and shut-down) are higher than during steady-state operation, and the overall environmental impact of continued operation with a limited exceedance of an ELV may be less than that of a partial shut-down and re-start. See section 5.5 of this document for further details of our assessment of impacts during abnormal operations.	
With reference to condition 2.3.11 (a) and (b) in the draft permit concern raised that the permit allows waste to be charged for up to 4 hours during abnormal operations as it will lead to unnecessary air pollution.	Air quality impacts during abnormal operations have been considered, see section 5.5. We are satisfied that emissions during the 4 hour period will not result in significant pollution or harm to human health.	
With reference to condition 2.3.12 (d) in the draft permit. Request that consideration is	This is a standard condition in all permits for this type of facility. We are satisfied the	
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given to the wording of this condition as it may be more appropriate to use the "preceding 12 months" as the time frame. Concern that if a calendar year is used in this condition, there would be a concentration of pollution events starting in January each year.	wording of the condition is appropriate.
With reference to condition 2.3.12. Concern raised that in (d) this condition suggests that once 60 hours of abnormal conditions have been recorded for any calendar year, no further abnormal conditions are of concern. It is assumed that there is an intention to shut down operations in this event, however the permit does not make that clear. Also, in (c) it states that the abnormal operations cease after 4 hours. Request made that this condition be amended to require the shut-down of the plant concerned if the problem has not been rectified after this time.	This is a standard condition in all permits for this type of facility. We are satisfied the wording of the condition is appropriate and should be read with condition 2.3.7. The part (d) of the condition limits them to 60 hours of abnormal operations for any calendar year after which they will be required to shut down. Also part (c) means that after 4 hours of continuous abnormal operations they will be required to shut down.
With reference to conditions 3.4 and 3.5 in draft permit concern that pollution is not defined.	It is defined in the EPR, which is referred to in the permit. Expressions used in the permit that are used in the regulations have the same meaning. The condition allows us to take action if we consider that pollution has been caused.
In table S1.2 Operating Techniques, there is reference to other documentation that is not included in the permit. This makes interpretation and understanding of the permit difficult.	Table S1.2 contains reference to the Operating techniques described in the Operator's Application, which is available to view on public register. As per condition 2.3.1 the activities shall be operated using these techniques. This is a standard condition in all permits for this type of facility. We are satisfied the condition is appropriate.
With reference to table S3.2 in the permit. Concern that no monitoring frequency has been set for visual monitoring requirement.	Monitoring frequency for visual appearance has been set at weekly. The other parameters will be monitored by the Environment Agency as it considers necessary. Note the Applicant has committed in the application to monitoring for BOD (monthly) they will be expected to do this.
With reference to table S3.5 in the permit concern that a number of parameters listed do not have limits set for them.	The requirement set out in table S3.5 is a direct requirement from IED. The setting of limits is not required and nor is it considered necessary in this case.
Concern raised about pollution from road traffic travelling to and from this site, and that the local roads are not appropriate for HGVs.	This issue was raised in the consultation on the Application and is covered in Annex 4, part A.

Response Received from Borough of Broxbourne	
Brief summary of issues raised:	Summary of action taken / how this has been covered
Concern that the timing of the draft consultation was not appropriate and request to extend the consultation period.	The consultation period on the draft decision was extended from a deadline of 30 <sup>th</sup> August 2018 until 24 <sup>th</sup> September 2018. We are satisfied that the consultation period was appropriate.
Concern that meteorological data from	We are satisfied that the meteorological data

Stansted Airport used in the air dispersion modelling was not appropriate.	used in air dispersion modelling is valid. As part of our audit of the air dispersion modelling we have conducted sensitivity analysis of the model using alternative meteorological data and this did not change the conclusions of the assessment.
Concern that the cumulative assessment of emissions to air failed to take account of the Trent Advanced Thermal treatment facility on Ratty's Lane which is in the process of being commissioned.	The Applicant assessed the "cumulative impact" from Trent Developments Sustainable Energy Facility (which includes Hoddesdon Anaerobic Digestion Facility and Hoddesdon Energy from Waste Plant also known as Advanced Thermal Treatment (ATT) Plant) and Rye House Power Station. Their results are based the maximum combined PC's across the model domain which represents a worst-case impact approach. See sections 5.2.4 and 5.4.2 for further details.
Concern raised that the internal diameter of the 2 chimneys is believed to be larger than 1.7m and as a result predicted emission volumes will be more than stated in the permit application.	The Applicant has confirmed that the internal stack diameter will be 1.7m. This diameter is stated in the Operating technique which are listed in table S1.2 of the permit therefore if the Operator wishes to deviate from this a variation application will have to be made.

Response Received from Canal and River Trust	
Brief summary of issues raised:	Summary of action taken / how this has been covered
Concern about containment of firewater generated in external areas of the site and is there sufficient capacity to contain firewater that may arise.	We are satisfied with the proposed firewater containment. The Applicant has described their fire water containment proposals in the Fire Prevention Plan which was submitted with the Application. We have assessed the plan and we are satisfied that there is sufficient capacity.
Request for inclusion of a requirement for a control shut-off valve or other appropriate emergency measure that would prevent/minimise the discharge of oil/other liquid contaminants/firewater into the Lee Navigation in the event of an incident.	The Applicant's proposals include a penstock valve that can be activated to prevent discharge in to the River Lee.
Concern that there is no agreement between the Canal and River Trust and the Applicant to discharge treated sewage.	This is not a matter for this determination. We are satisfied that the discharges proposed in the Application to the River Lee will not result in significant pollution. The Applicant is aware that they will need to seek permission from the Canal and River Trust to discharge into the River Lee. They have stated that if the permission is not granted they will adopt an alternative disposal route.
Concern that current monitoring of the treated sewage discharge is inadequate as there is no monitoring requirement in the permit for BOD, ammonia and phosphorus.	Monitoring will be carried by the Environment Agency as it considers necessary, with the exception of visual appearance which the Applicant must check weekly. BOD and Ammonia have been included in the monitoring suite. Due to the nature of the discharge and the relatively small discharge volume a requirement for phosphorus is not deemed necessary. The Applicant has

	committed in the Application to monitor for BOD (monthly) to monitor the performance of the sewage treatment plant.
Request made for relevant discharge limits for BOD, ammonia and phosphorus on the discharge of treated sewage.	We have included discharge limits for BOD, ammonia and suspended solids. Due to the nature of the discharge and the relatively small discharge volume a limit for phosphorous is not deemed necessary.
It is highlighted that the manufacturer of the specified sewage treatment plant (STP) states that cooking oil and fat should not be discharged to the STP as it may impact on performance. Concern has been raised as the plant will treat waste from the canteen which will contain fats and oils.	The Applicant has stated that significant amounts of cooking oils and fats are not anticipated, However as a precaution their proposals include a fat/oil trap to be fitted in the kitchen and routinely maintained. We are satisfied that the proposed package treatment plant is appropriate.
Request made that the proposed oil interceptor is designed to allow adequate access, are labelled above ground and adequate maintenance procedures are in place.	The Applicant has confirmed that all these features will be provided.
Concern raised about potential pollution of the River Lee from surface water runoff during demolition and construction of the proposed ERF.	Impacts during construction are a consideration for the planning process and not for this determination. However, the Applicant has confirmed that the Canal and River Trust comments are addressed in the proposed Planning conditions.

b) Representations from Charles Walker MP for Broxbourne.

Response Received from Charles Walker MP		
Brief summary of issues raised:	Summary of action taken / how this has been covered	
Concern raised that the decision document stated that the closest residential human receptor is located on Stortford Road 615m northwest of the site, when there are closer residential receptors and these have not been considered. Also the description of the location does not acknowledge the existence of the Lee Valley Regional Park.	The statement made in the decision document was a drafting error. As stated in the introductory note of the draft permit the closest residential receptor is Lock Keepers Cottage, which is located approximately 20m from the installation boundary. This receptor and other key receptors (including Lee Valley Park) have been considered in the assessments we have completed as part of this determination.	
Concern that emissions from The Advanced Thermal Treatment Plant has not been considered in the assessment of air quality. Cumulative data which is available shows that both Wormley Hoddesdon Park Woods SAC and Lee Valley SPA/Ramsar would have nitrogen (NOx and nutrient nitrogen deposition) levels above the critical loads.	The Applicant assessed the "cumulative impact" from Trent Developments Sustainable Energy Facility (which includes the ATT, also known as the Rye House Energy from Waste Plant) and Rye House Power Station. Their results are based on the maximum combined PC's across the model domain which represents a worst-case impact approach. We acknowledge that the background nutrient nitrogen deposition already exceeds the critical load at both Wormley Hoddesdon Park Woods SAC and Lee Valley SPA/Ramsar, however we are satisfied that the process contribution from Rye House ERF is either insignificant or in the case of	
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	Lee Valley SPA/Ramsar very small and is unlikely to result in a measurable adverse impact on the integrity of the site. See section 5.2.4 and 5.4.2 for further details.	
Concern that emissions from High Leigh Village, Gilston Garden Town and Pharmaron R&D Company have not been considered in our assessment of habitat and ecological receptors.	Our assessment of the impact on habitat sites includes consideration of these other proposals. See section 5.4.2 for further details.	
Concern that if cumulative emissions are considered the WID limit for group 3 metals will be exceeded.	The Applicant assessed the “cumulative impact” from Trent Developments Sustainable Energy Facility (which includes Hoddesdon Anaerobic Digestion Facility and Hoddesdon Energy from Waste Plant -also known as Advanced Thermal Treatment (ATT) Plant) and Rye House Power Station. Their results are based the maximum combined PC’s across the model domain which represents a worst-case impact approach. Our audit and check modelling assessment, included assessment of Group 3 metals taking into account cumulative emissions. Based on our assessment, and following permit guidance, we found that the group 3 metal PCs from the ERF are either insignificant or the PEC is below 100% of the ES threshold. See section 5.2.4 for further details	
Concern that the risk of odour from the storage of IBA in open sided sheds has not been properly considered as it will be stored close to Lee Valley Regional Park and local residents. It is on record that the EA recognise that IBA smells.	We recognise that IBA can have an odour however we are satisfied that it is unlikely to cause significant pollution at this site. See section 6.5.4, which we have updated, for further details of our assessment. The permit includes conditions to control odour including condition 3.3.2 which could be used to require the Operator to submit an odour management plan in the unlikely event that odour was to be an issue. Also pre-operational condition PO3 requires a commissioning plan to be submitted, we expect odour control to be an important consideration in the plan and that if deemed necessary further controls can be implemented prior to full operation of the facility.	
Concern that due to the location of the installation being in a valley pollutants will not be adequately dispersed.	We are satisfied that our assessment takes account of the topography of the Lee Valley. A similar comment has been raised in section C below, that also includes concern over how meteorological conditions have been considered. Therefore refer to our response in section C below for a detailed account of our assessment.	
Concern that dispersion of pollutants from the ATT plant stack which is under half the height of the proposed ERF stack will be adversely affected. The downwash effect caused by the	We have checked the effect of building downwash due to the installation on the emissions from the Advanced Thermal Treatment (ATT) facility’s 40m stack. Using a	
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ERF building has not been modelled.	conservative approach we found that the impact would be negligible and would not affect the original air dispersion modelling conclusions.
Concern that if resources are to be conserved and greenhouse gas emissions reduced then front end recycling should be required in keeping with Government Policy – Green futures: a 25 year plan.	This is outside the scope of this determination which is to assess the impact of emissions from the proposed activity. Recycling initiatives are a matter for the local authority.

c) Representations from Community and Other Organisations

Representations were received from Hoddesdon Society, Herts Without Waste, The Wormley & Turnford Society, Broxbourne & Wormley Area Woods Conservation Society, Hoddesdon and District Old People's Welfare Committee and the Royden Society who raised the following issues.

<b>Brief summary of issues raised:</b>	<b>Summary of action taken / how this has been covered</b>
<b>Comments about air emissions and air risk assessment</b>	
Concern raised that the meteorological data used in the air dispersion modelling assessment is inappropriate.	We are satisfied that the meteorological data used in air dispersion modelling is valid, however as part of our audit of the air dispersion modelling we have conducted sensitivity analysis of the model using alternative meteorological data and this did not change the conclusions of the assessment.
Concern that the air quality assessment has not considered the cumulative impact of nearby consented operations.	Our assessment did consider emissions from other consented operations. The previous draft of the decision document did explain this, however we have now updated sections 5.2.4 and 5.4.2 providing further details of our assessment.
Concern that downwash from the ATT stack could be a potential problem.	We have checked the effect of building downwash due to the installation on the emissions from the Advanced Thermal Treatment (ATT) facility's 40m stack. Using a conservative approach we found that the impact would be negligible and would not affect the original modelling conclusions.
Concern that the Environment Agency's response in the Draft Decision document with regards to the increased risk of pollution due to a local temperature inversion and topography (the site is in a valley) is not convincing.	<p>We are satisfied that our assessment takes account of meteorological conditions and topography in the Lee Valley.</p> <p>Although the specific weather conditions in the valley may not be reproduced exactly using Gaussian plume modelling, we have considered sensitivity to potential variations through:</p> <ul style="list-style-type: none"> <li>o Detailed checks using meteorological data from Stanstead (1993 to 1996) 14km north east of the site and also from Andrewsfield, 34km north east of the site</li> </ul>

	<p>(1993 to 1997) and Hatfield 18 km west of the site (1993 to 1996).</p> <ul style="list-style-type: none"> <li>○ The inclusion of complex terrain files in the dispersion models to take account of local topography.</li> <li>○ Sensitivity analysis to the surface parameter known as surface roughness. This parameter is dependent on land-use and affects atmospheric stability.</li> <li>○ Sensitivity checks using both ADMS and AERMOD dispersion models.</li> </ul> <p>Based on our check modelling assessments, that consider other conservative assumptions, and using our worst-case predictions we found that the proposed ERF is not likely to contribute to exceedences of the Environmental Standards (ES).</p> <p>The effect of localised temperature gradients and inversion layers are not explicitly taken into account in the dispersion models used, but we are confident that any specific meteorological conditions prevailing locally will not affect conclusions.</p> <p>The Met Office state that temperature inversions are quite common across England. The applicants chosen model CERC's ADMS accounts for some temperature inversion types such as stable conditions and capping inversions. Our sensitivity checks include the use of both ADMS and Lakes AERMOD a dispersion model that also takes account of dispersion in stable boundary layers, vertical profiles of wind, turbulence, and temperature and plume penetration into elevated inversions. What the models do not explicitly predict is complex terrain stagnation or fumigation.</p> <p>The US EPA Appendix W (<a href="http://www3.epa.gov/ttn/scram/guidance/guide/apw_17.pdf">www3.epa.gov/ttn/scram/guidance/guide/apw_17.pdf</a>) gives guidance on the complex conditions that may warrant the use of alternative models, these are "very rugged hilly or mountainous terrain, along coastlines, or near large land use variations". In some of these special cases they recommend considering an alternative model such as CALPUFF. Although we understand that all locations have their own specific meteorological patterns and topography our understanding and experience of the local conditions in this case did not indicate the complex conditions described in Appendix W.</p>
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	<p>However, as part of our audit we interpreted the results based on our experience of using Lakes CALPUFF View in more rugged hilly terrain in the UK. CALPUFF models predictions through a 3-dimensional meteorological wind field. Lakes states that “The US EPA recommends CALPUFF for modelling near-field impacts in situations which involve: complex terrain stagnation, inversion, recirculation, and fumigation conditions as well as costal interaction effects such as coastal fumigation.”</p> <p>Comparing predictions using CALPUFF to the more commonly used models (ADMS, AERMOD) indicates that CALPUFF predictions can give higher short-term and long-term predictions at many sensitive receptors than the peak predictions using ADMS or AERMOD. As an example, for some receptors, the increase in long-term predictions using CALPUFF can be a factor of 2 (double). However, our case studies of sites have shown that the increase in predicted concentrations is not significant enough to change the conclusions even when taking expected modelling uncertainties into account. These cases are in areas where the meteorological conditions and terrain are more complex (in terms of that described by the US EPA Appendix W) than those at the proposed ERF development.</p> <p>Therefore, we are confident that our conservative modelling using both ADMS and AERMOD will sufficiently take account of the meteorological conditions and terrain in Lee Valley and use of CALPUFF would not alter the conclusions of the audit.</p>
<p>Concern over our comments on the use of CALPUFF meteorological and air quality modelling system from the USA, as stated in page 111 of the draft decision document and how CALPUFF results relate to this proposal.</p>	<p>Our work on cases where CALPUFF, ADMS and AERMOD have been used, show that any differences in predictions are within modelling uncertainties. These cases are in areas where the meteorological conditions and terrain are more complex than those at the proposed ERF development. Therefore, we are confident that our conservative modelling using both ADMS and AERMOD sufficiently takes account of the meteorological conditions and terrain in Lee Valley and use of CALPUFF would not alter the conclusions of the audit.</p> <p>Our check modelling is based on conservative assumptions that apply a substantial worst-case bias to the predictions that is much greater than expected uncertainties in the air dispersion model. We can therefore be confident that our</p>

	<p>predictions are at the upper limits of any uncertainties.</p> <p>For further details on our sensitivity checks to meteorological conditions and terrain, including temperature inversions, please see our response to comments raised on these issues in this section of the decision document.</p>
<p>Request made that the EA should ask the UK Government to review the assessment of cumulative health impacts of gaseous and particulate emissions; and the assessment of the EP application should be deferred until this has been responded to or carried out.</p>	<p>The EA and the UK Government take advice from PHE on health matters. The PHE's position is "While it is not possible to rule out adverse health effects from modern, well regulated municipal waste incinerators with complete certainty, any potential damage to the health of those living close-by is likely to be very small, if detectable. This view is based on detailed assessments of the effects of air pollutants on health and on the fact that modern and well managed municipal waste incinerators make only a very small contribution to local concentrations of air pollutants."</p> <p>Therefore there is no reason to delay the assessment of the permit application as we are satisfied for the reasons set out in this document that the proposed installation will not cause significant harm to human health or the environment. With regards to a government a review this would be something for the government to consider however we are satisfied that there is sufficient information on which we can base our decision without such a review.</p>
<p>Suggestions that the WHO limits should be adopted for determining permit applications.</p>	<p>The Environmental Standards (ES) used for this permit determination are derived from the national air quality objectives and EU limit target values (as explained in section 5.1.2 of this decision document) and do not necessarily reflect the WHO limits. We are satisfied that the ES used are appropriate.</p>
<p>Concern raised about the assessment of Cr VI, including the validity of CrVI data from Sheffield RERF used in the assessment of CrVI.</p>	<p>In order to ensure that Cr VI data provided by the Applicant was consistent with emissions at other similar facilities we carried out our own assessment based on the maximum emission from 34 measured values recorded at 18 Municipal Waste Incinerators and Waste Wood Co-incinerators between 2007 and 2015 as detailed in our Group 3 metals guidance. Our checks showed that all Group 3 metals, including Chromium VI screened out as "insignificant" or less than 100% of the ES as a PEC.</p>
<p>Concern at the cumulative impact of both the Advanced Thermal Treatment (ATT) plant and the proposed Energy Recovery Facility (ERF) on PC for Group 3 metals.</p>	<p>The Applicant assessed the "cumulative impact" from Trent Developments Sustainable Energy Facility (which includes the ATT) and Rye House Power Station. Their results are based on the maximum</p>



	<p>combined PC's across the model domain which represents a worst-case impact approach.</p> <p>We also took account of other consented activities including the Trent Developments Sustainable Energy Facility (which includes the ATT) in our audit and check modelling assessment, which included assessment of Group 3 metals. Based on this, and following permit guidance, the group 3 metal PC from the ERF are either insignificant or the PEC is below 100% of the EAL threshold.</p>
<p>Concern that the predicted Environmental Concentration (PEC) for Arsenic is above the ES.</p>	<p>The arsenic concentration and percentage (%) of ES presented in the decision document is based on the Applicants initial screening value and not their detailed assessment PC. The Applicant's detailed assessment predictions following our guidance is presented in the Application and discussed in section 5.2.3 of this document. Based on using the maximum recorded arsenic emission in our metals guidance the Process Contribution (PC) 15.1% and the PEC is 34%. We have carried out our own checks, assuming worse case, and we agree with the Applicant's conclusions.</p>
<p>Concern that the impact on background pollution from emissions from Pharmaron UK Limited and Woollensbrook Crematorium should be taken into consideration.</p>	<p>The Pharmaron UK Limited facility is located approximately 2.3 km from the proposed ERF. As it stands there is an Environmental Permit Application currently being determined for the Pharmaron UK facility. We have assessed the proposal and whether emissions could affect our conclusions. We are satisfied based on the information in the application that emissions from the Pharmaron Facility will not have a significant impact on background pollution and therefore does not lead us to change our conclusions.</p> <p>Woollensbrook Crematorium is located approximately 2.5km from the proposed ERF. The combustion activity is relatively small scale and any impact on background pollution levels is not likely to be significant. Also the facility opened in 2017 so emissions will already be accounted for in the background pollution concentrations that have been used in our air quality assessment checks.</p>
<p>Concern raised that the decision document stated that the closest residential human receptor is located Stortford Road 615m northwest of the site, when there are closer residential receptors.</p>	<p>The statement made in the decision document was a drafting error. As stated in the introductory note of the draft permit the closest residential receptor is Lock Keepers Cottage, which is located approximately 20m from the installation boundary. This was taken into account in all the relevant assessments.</p>
<p><b>Comments on impacts on habitat and conservation sites</b></p>	

<p>Concern that there is a discrepancy in the Ammonia process contributions where cumulative impact is less than the alone PC at Lee Valley North LWS.</p>	<p>We acknowledge that the discrepancy is likely to be an error in the Application documents. However, our check modelling assessment carried out as part of our audit of the Applicant's air modelling assessment shows that the PC at LWS will not exceed the relevant critical level for Ammonia and therefore we are satisfied that there will be no significant pollution at the LWS and therefore we have not required the applicant to amend the Application.</p>
<p>Concern about the in-combination impact contribution of 8.4%/PC NOx at Lee Valley SPA/Ramsar.</p>	<p>We have assessed the impact on Lee Valley SPA/Ramsar including consideration of in combination effects for NOx. We are satisfied that PC will not lead to a significant adverse effect on the integrity of the site either alone or in combination. See section 5.4 for further details of our assessment.</p>
<p>Concern that an in combination assessment for Nutrient nitrogen deposition at Lee Valley SPA/Ramsar has not been completed. And the combined impact is unacceptable.</p>	<p>We have assessed the impact on Lee Valley SPA/Ramsar including consideration of in combination effects for Nutrient Nitrogen Deposition. We are satisfied that PC will not lead to a significant adverse effect on the integrity of the site either alone or in combination. See section 5.4.2 for further details of our assessment, which was repeated following the consultation on the draft permit.</p>
<p>Concern that an in combination assessment for Wormley-Hoddesdon Park Woods SAC has not been carried out.</p>	<p>The assessment shows that for all pollutants the process contribution at the SAC are &lt;1% of the relevant critical levels and loads and therefore insignificant. Therefore an in-combination assessment is not required. See section 5.4.2 for further details of our assessment which was repeated following the consultation on the draft permit.</p>
<p>Concern that the impact on Lee Valley Ramsar has not be fully considered, Myriophyllum verticillatum and Micronecta minutissima can be found in open water habitat and has not been given sufficient attention.</p>	<p>The Applicant has concluded in their assessment that the open water habitats are likely to be much less influenced by atmospheric sources of nitrogen being essentially phosphate-limited. They have therefore focused their assessment on the most sensitive part of the habitat, the fen and flood meadow habitat. We agree with the Applicant's assessment and we are therefore satisfied there will not be a significant adverse effect on the integrity of the Lee Valley SPA &amp; Ramsar, which includes populations of Myriophyllum verticillatum and Micronecta minutissima. See section 5.4.2 for further details of our assessment.</p>
<p>Concern raised that if Phosphorous levels increase at Lee Valley SPA/Ramsar over the next 30/40 years then the potency of the additional nitrogen would be enhanced.</p>	<p>We asked the Applicant to respond to this query as the application did not specifically address this point. They provided additional information, and explained that this comment had been raised at the recent planning inquiry. In summary they explained that fluvial inputs of nitrogen are likely to be of much greater importance than atmospheric</p>

	<p>inputs in determining the nutrient status of plant communities, while likely phosphate limitation means that additional inputs of nitrogen would be unlikely to result in a growth response. If phosphate levels were to increase to such an extent that nitrogen limitation occurred, the key problem would not arise from the switch to nitrate limitation, it would be the eutrophication caused by excess phosphates. In this scenario, the priority would be to identify the source of the additional phosphate and implement measures to reduce it.</p> <p>The Applicant goes on to say that action is already being taken by the Environment Agency to reduce the levels of environmental phosphorous, and they consider it is reasonable to conclude that the long term level of phosphorous will reduce.</p> <p>We agree with the Applicant's response.</p>	
<p>Concern that if critical loads are exceeded the precautionary principle should be invoked.</p>	<p>The United Kingdom Interdepartmental Liaison Group on Risk Assessment (UKILGRA) state in their paper "The Precautionary Principle: Policy and Application" that the precautionary principle should be invoked when there is good reason to believe that harmful effects may occur and the level of scientific uncertainty about the consequences or likelihood of the risk is such that the best available scientific advice cannot assess the risk with sufficient confidence to inform decision making.</p> <p>We are satisfied that the assessment provided by the Applicant demonstrates that although critical loads for nutrient nitrogen deposition are already exceeded at Lee Valley SPA/Ramsar and Wormley-Hoddesdon Park Woods SAC the PCs from Rye House ERF will not have a significant adverse effect alone or in-combination on the integrity of the sites. Therefore we can conclude 'harmful effects' are unlikely to occur and we and Natural England agree with their conclusions. Therefore there are no grounds for adopting the 'precautionary principle' in this case.</p>	
<p>Concern that assessment of local wildlife sites and other conservation sites do not include an in-combination assessment.</p>	<p>We do not carry out in-combination assessments for these sites. Our methodology and reasoning for the scope of the assessment of local wildlife sites and other conservation sites is discussed in section 5.4.4 of this document.</p> <p>We are satisfied that the PC from the Rye House ERF will not exceed a relevant critical level or load at the non-statutory local wildlife site (LWS) and other conservation sites listed in section 5.4.1 of this document. See section 5.4.4 for further details of our assessment.</p>	
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Concern that the habitats in-combination assessment does not include the following plans/schemes: Leigh Garden Village, Gilston Garden Town, gravel extraction at Briggens, Pharmaron R&D Company and Woollensbrook Crematorium.	We have assessed the relevance of these and whether they are likely to act in-combination. See section 5.4.2 for further details.
Concern about Environment Agency's assessment of local wildlife sites (LWS) as the applicant did not include assessment of all site's in the application.	<p>We have audited and checked the Applicant's assessment and although they did not include all the local wildlife sites in their assessment, we have considered the sites that they modelled. Our checks show that they are likely to represent worst-case locations and worst-case sensitivity. These worst case predictions at other sites can therefore be used to represent values that can be used in assessments for the missing ecological receptors.</p> <p>The threshold for significance for local wildlife sites (LWS) is 100% of Environmental Standard. Even using the maximum predictions and worst-case sensitivities from all the wildlife sites presented by the applicant the PC's are significantly below the LWS threshold (less than 100% of the ES). The maximum PC for all relevant pollutants is 36.7% of the critical level for 24-hour NOx &amp; 12.6% of the annual mean NOx critical level at the Lee Valley North LWS. This is directly adjacent to the proposed ERF and will represent the worst-case. Taking uncertainties into account our predictions at this site and the other sites we agree with the Applicant's conclusions. We are also satisfied that there will be no significant pollution at the LWS sites the Applicant failed to consider.</p>
Concern that impacts on Hunsdon Mead SSSI should be assessed, despite it being outside the 2km screening distance.	The permitting process is that only SSSI's within 2km of the proposed installation shall be included in the assessment. Despite this the Applicant has included assessment of Hunsdon SSSI in their Application. The assessment shows that the process contributions of pollutants assessed do not lead to the exceedance of a relevant critical level or load alone or in combination.
<b>Comments about how the Environment Agency consulted on the draft decision</b>	
Concern that the timing of the draft consultation was not appropriate and request to extend the consultation period.	The consultation period on the draft decision was extended from a deadline of 30 <sup>th</sup> August 2018 until 24 <sup>th</sup> September 2018. We are satisfied the consultation period was appropriate.
Concern raised that a drop-in event was not held for the consultation on the draft decision document.	There is no statutory requirement to hold a public drop in. We consider that we took appropriate steps to consult on the draft decision.
Concern raised that the consultation was not adequately advertised.	We placed notices in 2 local papers and advertised the consultation on the .gov.uk website. We consider that we took

	appropriate steps to advertise the draft decision consultation.	
<b>Comments about traffic impacts</b>		
Concern raised that the effect of increased traffic has not been properly considered.	This issue was raised in the consultation on the Application and is covered in Annex 4, part A.	
<b>Comments on noise</b>		
Concern that the effect of noise on sensitive receptors both residents and park users has been played down.	A noise assessment has been completed see section 6.5.5 for further details. The assessment considered impacts at the closest receptors including lock keepers cottage located approximately 20 meters from installation boundary.	
Concern that the 3 year construction period would involve sudden loud noises	Assessment of Noise impact during the construction phase is not within the scope of the Environment Permit determination however it is assessed as part of the planning process.	
The acceleration of HGVs to the top of the tipping hall 10m above ground level will involve sudden noise which could disturb birds in nearby habitat sites.	Whilst sudden loud noise can potentially disturb birds, we are satisfied that noise due to the acceleration of HGVs at this site will not cause significant disturbance of birds at nearby habitat sites. The impact of noise disturbance on birds is discussed in section 5.4.5 of this decision document.	
<b>Comments on storage of IBA</b>		
Concern that IBA storage proposals will not adequately prevent pollution due to noise.	We have carried out a noise assessment as part of the determination and we are satisfied that noise will not cause significant pollution.	
Concern that IBA storage proposals will not adequately prevent pollution due to odour; and IBA should be stored in an enclosed building in a modern facility.	Whilst there is an odour from IBA our experience of regulating sites that store IBA shows that odour potential is low, and whilst the stock piles will not be fully enclosed the storage proposals and management techniques proposed by the Applicant are BAT for this site and we are therefore satisfied odour from IBA is unlikely to result in significant pollution. The permit contains conditions to control odour including condition 3.3.2 which could be used to require the Operator to submit an odour management plan in the unlikely event that odour was to be an issue. Please note that the Applicant has provided further clarification on their operating techniques in relation to IBA storage and handling since the draft permit consultation. See section 6.5.4 for further details of our assessment and a summary of the proposals	
Concern that the pollution risk from the transfer of IBA from the storage bays by mechanical shovels to the railway trucks in the open air has not been addressed.	We are satisfied that operating techniques proposed by the Applicant will prevent significant pollution when transferring and loading IBA. Please note that the Applicant has provided further clarification on their operating techniques in relation to IBA storage and handling since the draft permit consultation. See section 6.5.3 of this document for a summary of the proposals.	
<b>Comments on discharges to water</b>		
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<p>With reference to the discharge of secondary treated domestic effluent how was the limit of 9m<sup>3</sup>/day calculated?</p>	<p>The Applicant calculated their maximum daily discharge using the British Water design parameters: flows and loads 3 guidance note. They calculated a maximum usage of 9m<sup>3</sup>/day, we have therefore set this as a limit in the permit.</p>
<p>Question raised over why the discharge of treated sewage can't be discharged to sewer.</p>	<p>Due to the distance from the source of the secondary treated sewage and the local sewage network and the relatively small volume of sewage it would not be practical to require the Applicant to install a link to the network. As detailed in section 6.5.1 of this document we assessed the impact on receiving waters.</p>
<p>Concern about what survey evidence is there for compliance with the prohibition of discharge into ponds or lakes or freshwater downriver of the discharge points as detailed in standard rules SR2010 No.3.</p>	<p>These restrictions apply to a standard rules SR2010 No.3 permit application. As stated in section 6.5.1 of this document the Applicant's proposals did not meet the standard rules. We have therefore treated the application as a bespoke application and have carried out a full assessment of the impact on receiving waters from the proposed discharge and we are satisfied the discharge will not cause significant pollution.</p>
<p><b>Comments on BAT</b></p>	
<p>Concern raised that the Kelvedon Rivenhall Incinerator application was refused due to high NO<sub>x</sub> PC and this application has a similar NO<sub>x</sub> PC so why is this an acceptable level of pollution.</p>	<p>The permit application referred to was refused because we were not satisfied that the applicant had demonstrated that the stack height was BAT. This was a site specific decision which is explained in the decision document that accompanies the refusal decision.</p> <p>For this Application we are satisfied that the stack height proposed for the Installation is BAT. The Applicant provided a stack height assessment which showed that whilst there may be some minor reduction in process contribution from a taller stack, those reductions were not significant. We are satisfied that process contributions of NO<sub>x</sub> from the proposed Rye House ERF will not be significant and do not lead to the exceedance of an ES. We are also satisfied that the proposed pollution abatement techniques are BAT.</p>
<p>Concern as to why the NO<sub>x</sub> process contributions are higher for the Rye House ERF than for larger incinerators such as the ones in Devonport or Runcorn.</p>	<p>There are a number of site specific factors that can influence the dispersion of pollutants including local topography (terrain and surface roughness), local meteorological conditions and nearby buildings. It is therefore not possible to directly compare process contributions between similar incineration plants in other locations. We are satisfied that process contributions of NO<sub>x</sub> from the proposed Rye House ERF will not lead to the exceedance of an air quality standard. We are satisfied that the proposed installation is BAT.</p> <p>Also, it is important to note that the PC for</p>

	<p>NOx referenced in this decision document is the maximum on the grid and not at a human receptor. The Applicant's assessment shows that the maximum annual mean NOx PC at a human receptor (which in this case is Lee Valley Caravan Park) is 0.9µg/m<sup>3</sup> (2.3%/EQS).</p>	
<p>With reference to text in the decision document, do the qualifying phrases such as 'for this installation' imply that there are specific features (other than site-specific features) of the proposed installation in regard to BAT?</p>	<p>We have assessed the proposals and we are satisfied that the techniques proposed for this application are BAT. The way we have done this is discussed in this document. The text 'for this installation' recognises that BAT for another installation could be different, for example there may be circumstances where we may require an Operator to go beyond BAT, for example when there is a risk of significant harm to the environment or human health. This is not the case for this Application as we are satisfied that the proposals will not result in harm to the environment or human health and the Applicant has demonstrated that their proposals are BAT.</p>	
<p>Concern raised that pre-treatment is not proposed.</p> <p>Concerns also that pre-treatment was proposed for the New Barnfield Incinerator and this was considered BAT but it is not proposed for the Rye House ERF even though the proposals are similar.</p>	<p>Pre-treatment is not usually required for moving grate furnaces as explained in the BREF. The text in the New Barnfield decision document was intended to show that the pre-treatment that was proposed was itself BAT rather than that pre-treatment was required for the choice of furnace type to be BAT. Pre-treatment at New Barnfield was intended to remove recyclable material from the waste received at the site. Whether this is required would be dependent on what recycling initiatives are in place in the area from which the waste is sourced. Such recycling initiatives are under the remit of the local authority.</p> <p>Pre-treatment may also be required in some cases to reduce variations in feed composition and to control emissions within ELVs and prevent unnecessary waste production. The Applicant has stated that the proposed ERF will process residual municipal waste generated in Hertfordshire (residual waste being that portion remaining following kerbside and other waste reduction/recycling initiatives by the waste collection authorities). We are satisfied that these waste types are appropriate for incineration in the proposed ERF and the ELVs set out in the permit will be met. We also anticipate that unnecessary waste production will be avoided. We are therefore satisfied that pre-treatment is not required for this site.</p>	
<b>Comments on permit conditions</b>		
<p>With reference to condition 2.3.12 in the permit concern raised as to why is operation in abnormal operation is deemed to have</p>	<p>Article 46(6) of IED allows for the continued incineration and co-incineration of waste under such conditions provided that this</p>	
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<p>ceased after 4 hours and on what evidential base is this justified. And What does that imply e.g. for remedial measures and cumulative totals of periods of abnormal operation.</p>	<p>period does not (in any circumstances) exceed 4 hours uninterrupted continuous operation or the cumulative period of operation does not exceed 60 hours in a year. So abnormal operations are not deemed to have ceased but actual operations have to cease if either of these limits are reached. This provision is a recognition that the emissions during transient states (e.g. start-up and shut-down) are higher than during steady-state operation, and the overall environmental impact of continued operation with a limited exceedance of an ELV may be less than that of a partial shut-down and re-start. See section 5.5 of this document for further details of our assessment of impacts during abnormal operations.</p> <p>The Applicant has carried out an assessment of the potential impacts during this period, as discussed in section 5.5 of this document. We are satisfied that emissions during this period would not lead to significant harm to human health or the environment.</p>
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d) Representations from Individual Members of the Public

A total of 107 responses were received from individual members of the public. Many of the issues raised were the same as those considered above. Only those issues additional to those already considered are listed below:

<b>Brief summary of issues raised:</b>	<b>Summary of action taken / how this has been covered</b>
<b>Comments about air emissions and air risk assessment</b>	
Concern raised about the impact of particulate matter emitted from the stack when it is raining.	The impact from particulate emissions was shown to be insignificant. This is the case of whether it is raining or not. Section 5.2 of this decision document has more details on particulate impacts.
Concern raised about the effect of pollution on the nearby historical monument of Rye House Gatehouse.	The only pathway for damage would be acid rain caused by acid gas emissions then affecting stonework on buildings; or from emissions of dust and particulates.  We have considered impacts of acid gases and particulates and the impacts were shown to be insignificant. We are satisfied that impacts from this Installation will not have a significant adverse effect on local buildings.
Concern about what verification has been carried out on the Applicant's dispersion modelling and background pollution levels.	Environment Agency technical specialists have audited and assessed the Applicant's pollution modelling assessments and use of background pollution levels.
Concern raised about the level of NO <sub>x</sub>	We have assessed the impact of emission of



released and impact on local air quality.	NO <sub>x</sub> and we are satisfied that emissions will not lead to significant pollution or harm to human health. See section 5.2 for details of our assessment.	
<b>Comments on impacts on habitat and conservation sites</b>		
Concern raised about the impact of NO <sub>x</sub> emissions on the trees and wildlife in Broxbourne Woods.	Broxbourne Woods is located outside the 2km screening distance for assessment under this determination. In any case we are satisfied that there will not be a significant impact on site. Section 5.4 of this decision document has further details of our assessment of impacts on habitat and conservation sites.	
<b>Comments about Operator competence</b>		
Concern raised about the Applicant's record of convictions for environmental and health and safety incidents, and their competence to safely operate the proposed installation.	<p>We have checked our National Enforcement Database and Case Management System and no relevant offences have been found for the Applicant Veolia ES Hertfordshire Limited. However, as highlighted in the consultation response, there are some previous offences involving other companies in the Veolia group. We are also aware of previous convictions under Health and Safety law that have been brought by the HSE.</p> <p>Whilst we recognise that the Veolia group of companies do have a history of previous convictions, we have put this into context with the high number of permitted sites the Veolia group operate nationally, including a number of Incineration Plant (e.g. Tyseley Energy from Waste Plant, Sheffield Energy Recovery Facility) which have been Operated by Veolia group companies for a number of years. So when looking at the competence of the Veolia Group across all of these permitted operations, the number of convictions is small compared to the number of permitted sites. So when looked at in this context there is nothing that leads us to have any fundamental concerns over the competence of the wider Veolia Group or the Applicant in particular. Also, we have consulted the HSE on the application and they have not raised any concerns about the competence of the Applicant.</p> <p>We carry out announced and unannounced inspections to check the permit is being complied with.</p>	
<b>Comments about traffic impacts</b>		
Concern raised about increased risk of road safety issues due to the proposed installation.	This issue was raised in the consultation on the Application and is covered in Annex 4, part A.	
Concern about vehicles leaving site carrying hazardous waste being involved in accidents on the public roads	Highways issues including the movement of hazardous goods outside the installation boundary is not within the remit of the Environmental permit decision making process. However we are satisfied that waste leaving site will be adequately contained to	
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	minimise the risk of pollution.	
Concern about noise and traffic during the construction phase of the incinerator	Impacts during construction are a consideration for the planning process. We have assessed the impacts during operation and we are satisfied that the impacts will not cause significant pollution. See section 6.5.5 of this document for further details.	
Concern about access to the proposed installation for emergency vehicles in the event of a major incident on site.	Highways issues are matters for planning. We have assessed the measures to prevent accidents on site and minimise their consequences and are satisfied with the measures proposed and we have no concerns about the ability of the emergency services to access the site.	
Concern about risk of pollution from road vehicles using the site, in particular on the health of children as research suggests that pollution stays close to the ground.	Emissions from off-site traffic do not form part of the Environmental permitting decision process (which relates to emissions from the installation) except to the extent that they could affect the prevailing background pollution levels.	
<b>Comments about how the Environment Agency consulted on the draft decision</b>		
Concern raised that the draft decision has been made prior to the findings of the public enquiry for the planning application has been announced.	The Planning decision and the Environmental Permitting decisions are determined under separate legislation and therefore one is not dependent on the other.	
<b>Comments about discharges to water</b>		
Concern raised about impact of surface water discharges on drinking water in the New River and have Thames Water objected.	As detailed in section 6.5.1 of the decision document we have assessed the potential impact on receiving water and are satisfied that there will be no significant pollution.  We can confirm that Thames Water were consulted on the Application, we received no objection in response to the consultation. We have also consulted with the Canal and River Trust, their comments and our response are detailed in Annex 4.	
<b>Comments about health impacts</b>		
Concern raised about a recent report from UKWIN on the health risk from PM2.5s emitted by incinerators.	We are aware and have reviewed the recent report from UK Without Incineration. We are satisfied from our assessment of particulate emissions that particulate emissions from the installation, including emissions of PM <sub>10</sub> or PM <sub>2.5</sub> , will be insignificant.	
Concern raised about the impact of contaminated air and water on surrounding areas including the nursery and school on Pindar Road.	The Applicant's air dispersion modelling showed the maximum concentrations in the modelled grid, so these represent 'worst case' predictions. Therefore making predictions at further discrete receptors, including receptors on Pindar Lane locations is not required as these will be lower than the area of maximum concentration. We therefore consider that there will be no significant impact on the environment or human health. See section 5.2 for details of our assessment.	
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	We have also assessed the impact from emissions of surface water and secondary treated sewage and we are satisfied there will be no significant impact on the environment or human health. See section 6.5.1 for details of our assessment.	
<b>Comments about other impacts and issues</b>		
Concern raised that the proposed incinerator will have an adverse impact on the local economy particularly the Lea Valley Growers.	This issue was raised in the consultation on the Application and is covered in Annex 4, part A.	
Concern raised that the Application did not contain a major impact risk assessment.	We are satisfied that the Application contained the appropriate risk assessments.	
Concern raised that the European Directive 2004/35/CE of the European Parliament and Council of 21/4/2004 was never discussed at the tender stage.	This comment relates to the tendering stage and is not a consideration for the Environmental permitting process. We are satisfied that we have sufficient information to determine this application and that adequate measures will be in place to protect the environment and human health. The Applicant will not be able to surrender the permit unless any pollution risks have been addressed and the site returned to satisfactory state.	
Concern raised that there are a number of housing developments planned close to the facility and the impact on these have not been considered.	<p>The Applicant's dispersion modelling showed the maximum concentrations in the modelled grid, so these represent 'worst case' predictions. Therefore making predictions at further discrete receptor locations is not required as these will be lower than the area of maximum concentration. We therefore consider that no significant impacts will result at locations not specifically assessed.</p> <p>Noise impacts were considered at the closest receptor. Any housing built closer than this could potentially be subject to higher noise levels. Housing would have to go through the planning process which should take account of the proposed incinerator.</p>	
Concern raised about the inclusion of the clinical waste storage activity in the permit. Concern that clinical waste could be incinerated on site.	We are satisfied that the proposals to store hazardous clinical waste for transfer are appropriate. The permit does not allow the incineration of hazardous clinical wastes.	
Concern raised that as the facility will operate for 30 years and how it aligns with the government's 2018 clean air strategy.	We are satisfied that the proposal will not cause any significant pollution or harm to human health or breach air quality standards. Whilst the Government has not yet published its final strategy the measures in the permit will minimise the environmental impact from the proposals.	
Concern raised about whether house prices will reduce.	Impacts on house prices is not a relevant consideration for the Environmental Permitting process.	
Concern raised that there will be too many incinerators and not enough waste.	This is a matter for waste planning and government strategy but does not form part of the Environmental Permit decision making process.	
Concern raised about the risk of accepting waste not suitable for incineration as the	We are satisfied that the Applicant will have suitable procedures in place so that only	
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Applicant will be unable to sort the waste.	suitable waste is accepted. Waste acceptance procedures will meet the requirements of our guidance. The procedures will form part of the Applicant's management system. For clarity we have added a separate pre-operational condition (PO4) so that waste acceptance procedures will be approved before the Installation can operate.
Concern raised that in the event of a fire or flood water contaminated with IBA will be leaked into the River Lea or underground aquifers.	Control measures will be in place to prevent pollution in the event of flooding and to contain firewater. We are satisfied these measures are appropriate.
Concerned raised that the facility has no recycling facilities on site to segregate waste prior to incineration.	This is outside the scope of this determination which is to assess the impact of emissions from the proposed activity. Recycling initiatives are a matter for the local authority. The permit contains a condition (2.3.4) that does not allow the incineration of waste separately collected for recycling unless it is subsequently deemed unsuitable for recovery by recycling.
Concern about the adequacy of monitoring and that Operator's self-report.	The Operator's monitoring will have either MCERTS certification or MCERTS accreditation as appropriate. This still applies when carried out by external third party assessors. MCERTS is the Environment Agency's Monitoring Certification Scheme. If monitoring complies with MCERTS we can have confidence in the monitoring of emissions. In addition we will carry out audits of the Operator's monitoring. If we find a problem we will take action to put this right. The Environment Agency may carry out its own monitoring as part of its regulation of the site if required.
Concern about how the Operator will be penalised for breaches of permit conditions and how will this be reported to the local public.	The Environment Agency will regulate the site carrying out a continual assessment of the plant's operations and its environmental performance. This will be achieved in the following ways: <ul style="list-style-type: none"> <li>• The Operator must monitor emissions and report the results to us;</li> <li>• We will periodically inspect the installations, review monitoring techniques and assess monitoring results to measure the performance of the plant;</li> <li>• We will carry out on-site audits of operator monitoring;</li> <li>• The Operator must inform us within 24 hours of any breach of the emission limits, followed by a fuller report of the size of the release. Its impact and how they propose to avoid this happening in the future;</li> <li>• The Operator's monitoring results are placed on the public register;</li> </ul>

	<ul style="list-style-type: none"> <li>Depending on the seriousness of any breach, we will take appropriate enforcement action and/or prosecute</li> </ul> <p>Copies of inspections reports and monitoring results will be available on our public register to view by the public.</p>	
Concern about how local people can report pollution and nuisance caused by the installation and how will they know any issues are addressed.	Our incident hotline, shown below, can be used. It is a 24 hour Freephone number: 0800 80 70 60. Copies of inspections reports and monitoring results are available to view by the public.	
Will the installation be closed if permit limits are exceeded?	<p>Permit conditions require waste feed to stop if emission limits are exceeded. Short periods where ELVs are exceeded are allowed to avoid un-necessary start-up and shut-down (abnormal operation). Abnormal operation is limited by permit conditions. Section 5.5 of this decision document has further details of abnormal operation.</p> <p>If ELVs are exceeded we will take action in line with our enforcement and sanctions statement.</p>	
What are the fines and penalties for permit breaches and who will receive them.	Action would be taken in line with our enforcement and sanctions statement. The permit holder would be responsible. The level of any fines would be set by a court if there was a prosecution.	
Concern about the risk of fires and explosions at the installation.	The Applicant submitted a fire prevention plan (FPP). We are satisfied that the Applicant's proposed techniques will minimise the risk of fire occurring and also minimise any impacts if a fire was to occur. However we recognise that some of the finer detail (such as the exact location of hydrants for example) may change after the detailed design stage. We have set pre-operational condition PO9 for the Operator to submit a revised FPP after the detailed design stage. The Applicant has also submitted an accident prevention and management plan which covers the risk of explosions. We are satisfied appropriate management techniques are in place to minimise the risk.	
Will the Environment Agency be held accountable if there is a pollution or health and safety incident at the installation?	In the event of a breach of a permit condition action would be taken in line with our enforcement and sanctions statement. The permit holder would be responsible. Any action as a result of Health and Safety incident is the responsibility of the HSE, however in the event that significant pollution resulted from such an incident the Environment Agency would also take appropriate action. Accountability would be with the Operator.	
Concern that the impact of pollution on Harlow has not been considered.	Our view is that impacts have been considered at appropriate receptors including impacts at the point of maximum impact.	
Concern raised about the impact on the	Impact due to light was raised in the	
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<p>nearby bird sanctuary due to light, height and warmth.</p>	<p>consultation on the Application and is addressed in Annex 4, part A of this decision document.</p> <p>We assume impact of height refers to the building, we are satisfied that the height of the building will not impact nearby bird habitats.</p> <p>We are satisfied that any thermal impact from the installation will not be significant and will not adversely impact on nearby bird habitats.</p>
<p>Concern that odours from the site will taint food grown locally.</p>	<p>We are satisfied that emissions of odour will not be significant and will not adversely affect food grown locally. The permit contains conditions (3.3.1 and 3.3.2) to control odour.</p>
<p>Concern that pollution monitoring results will not be made available to the public.</p>	<p>Copies of inspections reports and monitoring results are available on the public register to view by the public.</p>