Draft determination of an Application for an Environmental Permit under the Environmental Permitting (England & Wales) Regulations 2010[PE(1)]

Consultation on our decision document recording our decision-making process

The Permit Application Number is:	EPR/UP3232AC/A001
The Applicant is:	North London Waste Authority
The Regulated Facility is located at:	Edmonton EcoPark, Advent Way, Edmonton, London, N18 3AG
Consultation commences on:	DD/MM/YY
Consultation ends on:	DD/MM/YY

What this document is about

This is a draft decision document, which accompanies a draft permit.

It explains how we have considered the Applicant's Application, and why we have included the specific conditions in the draft permit we are proposing to issue to the Applicant. It is our record of our decision-making process, to show how we have taken into account all relevant factors in reaching our position. Unless the document explains otherwise, we have accepted the Applicant's proposals.

The document is in draft at this stage, because we have yet to make a final decision. Before we make this decision we want to explain our thinking to the public and other interested parties, to give them a chance to understand that thinking and, if they wish, to make relevant representations to us. We will make our final decision only after carefully taking into account any relevant matter raised in the responses we receive. Our mind remains open at this stage: although we believe we have covered all the relevant issues and reached a reasonable conclusion, our ultimate decision could yet be affected by any information that is relevant to the issues we have to consider. However, unless we receive information that leads us to alter the conditions in the draft Permit, or to reject the Application altogether, we will issue the Permit in its current form.

In this document we frequently say "we have decided". That gives the impression that our mind is already made up; but as we have explained above, we have not yet done so. The language we use enables this document

to become the final decision document in due course with no more re-drafting than is absolutely necessary.

We try to explain our decision as accurately, comprehensively and plainly as possible. Achieving all three objectives is not always easy, and we would welcome any feedback as to how we might improve our decision documents in future. A lot of technical terms and acronyms are inevitable in a document of this nature: we provide a glossary of acronyms near the front of the document, for ease of reference.

Preliminary information and use of terms

We gave the application the reference number EPR/UP3232AC/A001. We refer to the application as "the **Application**" in this document in order to be consistent.

The number we propose to give to the permit is EPR/UP3232AC. We refer to the proposed permit as "the **Permit**" in this document.

The Application was duly made on 07/03/16.

The Applicant is North London Waste Authority. We refer to North London Waste Authority as "the **Applicant**" in this document. Where we are talking about what would happen after the Permit is granted (if that is our final decision), we call North London Waste Authority "the **Operator**".

North London Waste Authority's proposed facility is located at Advent Way, Edmonton, London, N18 3AG. We refer to this as "the **Regulated Facility**" in this document.

How this document is structured

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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.)

AOD	Above Ordnance Datum
APC	Air Pollution Control
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
COSHH	Control of Substances Hazardous to Health Regulations
CROW	Countryside and rights of way Act 2000
CV	Calorific value
CW	Clinical waste
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 2010 (SI 2010 No. 675) as amended
EQS	Environmental quality standard
EU-EQS	European Union Environmental Quality Standard
EWC	European waste catalogue
FGT	Flue gas treatment
FSA	Food Standards Agency
GWP	Global Warming Potential
HHRAP	Human Health Risk Assessment Protocol
HMIP	Her Majesty's Inspectorate of Pollution
HPA	Health Protection Agency (now PHE – Public Health England)

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_2 expressed as NO_2)
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)
PXDD	Poly-halogenated di-benzo-p-dioxins
PXB	Poly-halogenated biphenyls
PXDF	Poly-halogenated di-benzo furans
RGS	Regulatory Guidance Series
RHI	Renewable Heat Incentive
ROC	Renewables Obligation Certificates
RRC	Reuse and Recycling Centre
RRF	Resource Recovery Facility
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)
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
WWTW	Waste Water Treatment Works

1 Our proposed decision

We are minded to grant the Permit to the Applicant. This will allow it to operate the Regulated Facility, 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 a regulated facility which is subject principally to the Industrial Emissions Directive (IED) and the Waste Framework Directive.

The draft 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 regulated facility-specific conditions, or where our Permit template provides two or more options.

2 How we reached our draft decision

2.1 Receipt of Application

The Application was duly made on 07/03/16. 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 initially made a claim for commercial confidentiality but confirmed during the duly making stage that that they do not consider any of the information contained in the application commercially confidential. We have not received any information in relation to the Application that we consider 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 Public Participation Statement and our own guidance 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 Regulated Facility 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 Edmonton Advertiser newspaper.

We made a copy of the Application and all other documents relevant to our determination available to view on our Public Register at Apollo Court, Bishops Square Business Park, Hatfield,AL10 9EX. Anyone wishing to see these documents could do so and arrange for copies to be made.

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

- Public Health England
- The Director of Public Health
- Enfield Council - Department of Environmental Health
- Health and Safety Executive
- Food Standards Agency
- London Fire Service

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 regulated facility on designated Habitats sites.

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 draft determination.

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 information notices on 19/04/16, 15/08/16 and 19/12/16. A copy of each information notice was placed on our public register.

Having carefully considered the Application and all other relevant information, we are now putting our draft decision before the public and other interested parties in the form of a draft Permit, together with this explanatory document. As a result of this stage in the process, the public has been provided with all

the information that is relevant to our determination, including the original Application and additional information obtained subsequently, and we have given the public two separate opportunities (including this one) to comment on the Application and its determination. Once again, we will consider all relevant representations we receive in response to this final consultation and will amend this explanatory document as appropriate to explain how we have done this, when we publish our final decision.

3 The legal framework

The Permit will be granted, if appropriate, 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 Industrial Emissions Directive (IED);
- a site where operations covered by the Waste Framework Directive (WFD) are carried out, 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, if we grant the Permit, it will ensure that the operation of the Regulated Facility 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 Regulated Facility

4.1 Description of the Regulated Facility and related issues

4.1.1 The permitted activities

The EcoPark will comprise three key areas:

- An Energy Recovery Facility (ERF) in the northern area;
- A waste water treatment plant (WWTP) in the northern area; and
- A Resource Recovery Facility (RRF) in the southern area.

The Regulated Facility is subject to the EPR because it carries out activities listed in Part 1 of Schedule 1 to the EPR.

Energy recovery facility

The following Part 1 activity will be carried out at the ERF:

- 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."*

Any activities which would normally be categorised as "directly associated activities" for EPR purposes, such as air pollution control plant, (including storage and preparation of treatment chemicals), and the ash storage bunker, are therefore included in the incineration listed activity description. The generation of electricity using a steam turbine and a back up electricity generator for emergencies are however considered directly associated activities to the incineration activities because the incineration plant and the steam turbine are successive steps in an integrated activity.

Waste water treatment plant

The following Part 1 activities will be carried out at the WWTW for processing gully waste, boiler blow down, effluent from the demineralisation plant and washdown water:

- Section 5.4 Part A(1)(a)(ii) - Disposal of non-hazardous waste in a plant with a capacity exceeding 50 tonnes per day.
- Section 5.3 Part A(1)(a)(ii) - Disposal of hazardous waste in a plant with a capacity exceeding 10 tonnes per day.

The final design of the WWTW including the listed activity under which it will operate will be confirmed during the design phase.

As outlined in section 6 – Application of best available techniques, we have restricted the flue gas treatment for the site to either dry or combined. The WWTP will therefore not primarily process waste water from the incinerator and the WWTP is therefore not considered part of the incineration activity itself.

Resource recovery facility

The resource recovery facility as a whole is not considered a Part A(1) activity or part of the incineration activity itself because the operating proposal is that

it is not solely in place to serve the Edmonton EcoPark. Output from the RRF could be sent to other incineration plants for utilisation.

Waste activities which are not Part A(1) activities to be carried out at the RRF are:

- Management of less than 50 tonnes per day of non-contaminated gully wastes.
- Waste sorting, shredding for recovery and transfer to an ERF from a fuel preparation facility.
- Waste sorting, shredding at a household recycling facility and onward transfer to the fuel preparation facility or ERF or off site for disposal or recovery as required with a capacity of less than 50 tonnes per day.

Together, these listed activities, directly associated activities and waste activities comprise the regulated facility.

We asked the applicant for clarification regarding the capacity and classification of the shredding activity which will take place within the fuel preparation facility via a Schedule 5 notice dated 15/08/16. The Applicant has confirmed that the shredding is for recovery only and therefore is not a listed Part A1 activity. We have specified that shredding shall be carried out for recovery only within activities table S1.1.

4.1.2 The Site

The Edmonton EcoPark is a waste management complex approximately 16 hectares in size. It is located in the London Borough of Enfield and accessed via Advent Way, which leads onto the A406 North Circular Road.

To the north of the EcoPark there are a number of industrial and commercial premises beyond which lies Deephams Waste Water Treatment Plant. The Lee Valley Regional Park is located to the east of the EcoPark. The A406 North Circular Road is located to the south beyond which are retail and trading estates. To the West is Salmons Brook watercourse.

The closest residential receptors to the EcoPark were identified as:

- Badma Close, approximately 60m to the west
- Zambezi Drive, approximately 125m to the west
- Lower Hall Lane, approximately 150m to the east
- Proposed residential receptors at Meridian Water development to the south (assumed to be within 300m of the Application site boundary)

Ecological receptors within the relevant screening thresholds to the EcoPark were identified as follows:

There are two European sites within 10km of the regulated facility which are Lee Valley Special Protection Area (SPA) and Ramsar at 1961m and Epping Forest Special Area of Conservation (SAC) at 2994m from the site.

Sites of Special Scientific Interest (SSSI) within 2km of the regulated facility are Chingford Reservoirs SSSI at 447m and Walthamstow Reservoirs at 1961m from the site.

There are 10 local wildlife and conservation sites within 2km of the regulated facility, the closest of which is Lee Valley Local Wildlife Site approximately 125m from the site.

There is an existing Energy from Waste Plant within the EcoPark wider site though this will not be included within the regulated facility boundary for the new site. The existing incinerator will be demolished when the new incinerator is operational.

The Applicant submitted a plan which we consider is satisfactory, showing the site of the Regulated Facility 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 Regulated Facility does

Energy Recovery Facility (ERF)

The Applicant has described the facility as Energy Recovery Facility. Our view is that for the purposes of IED (in particular Chapter IV) and EPR, the ERF 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 ERF will generate electricity using residual waste as a fuel and will be capable of an electrical output of approximately 70MW. The facility will comprise:

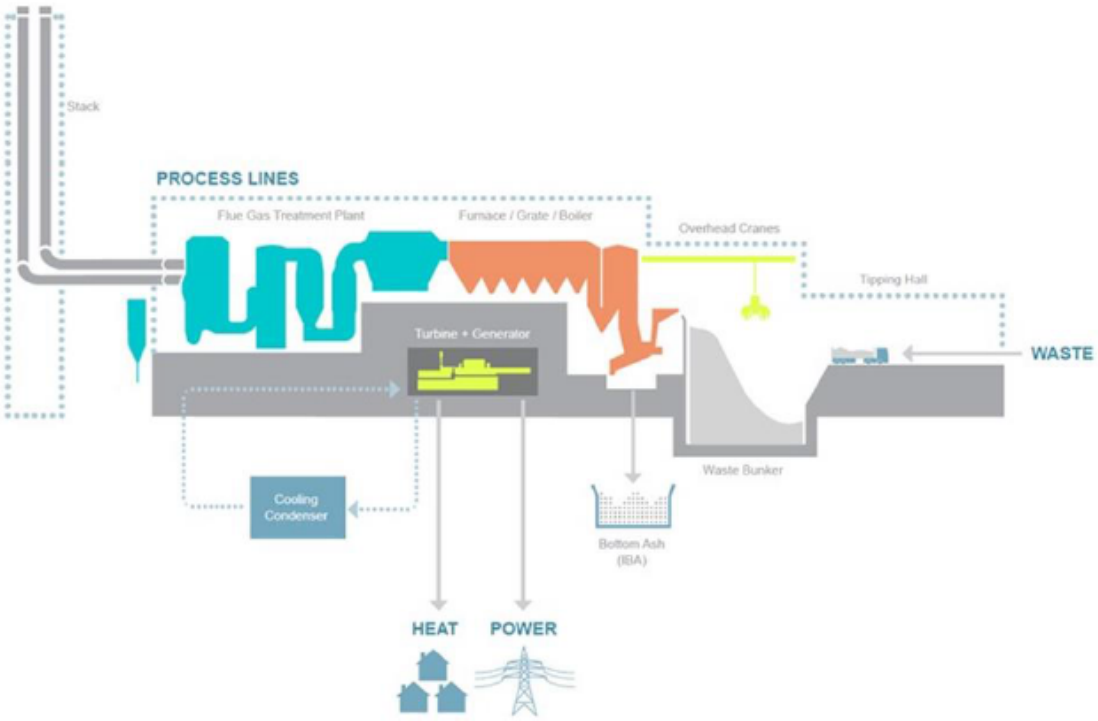
- Two process lines, each with a capacity to burn 350,000 tonnes of waste per year, using an advanced moving grate furnace, heat recovery boiler and a flue gas treatment plant and stack;
- A steam turbine and generator set;
- A waste tipping hall and waste bunker with two overhead cranes and capacity to hold a minimum equivalent to approximately 7 days of residual waste;
- Air cooled condensers;
- A plant control and monitoring system; and
- Two emergency backup diesel engines

The refuse collection vehicles will enter the tipping hall via an access ramp. The waste will be tipped from the vehicles into the waste bunker where two overhead cranes will move the waste to the furnace feed hoppers and continually mix the waste to ensure a homogenous fuel mix.

The tipping hall will be fitted with fast acting roller shutter doors for the tipping vehicles for both the entrance and exit routes. The tipping hall is maintained under negative pressure which is created by mechanical fans that will extract air from the waste bunker to be used as combustion air in the furnaces.

The storage capacity of the waste bunker will be around 7 days. The waste bunker will be fitted with a fire detection system, anticipated to use combined infrared, thermal and smoke detectors, linked to automated water sprays. A pre operational condition requiring a full fire prevention plan is included in the permit and will be required to confirm the final details of the system.

Figure 2.5 Schematic representation of the ERF



Two individual moving grate furnaces will each have a treatment capacity of 350,000 tonnes of waste per annum. Waste will be fed into the furnaces from the feed chutes with hydraulically controlled systems that will vary the feed rate and waste depth on the furnace grate.

Once fed onto the grate, the waste will be combusted and moved along the grate towards the ash extraction system. Combustion air will be fed from below the grate to ensure the complete combustion of the waste prior to it being discharged into the bottom ash collection system. Bottom ash will be

transported by conveyor internally to the enclosed bottom ash storage bunker prior to removal from site.

The hot gas produced by the combustion of the waste will pass from the furnace to a secondary combustion zone where it will be subjected to a temperature of at least 850ºC for at least 2 seconds.

The hot exhaust gases from the furnace combustion stage will pass to a multi-pass steam boiler that will recover the energy from the flue-gas. This will also control the outlet flue-gas temperature. The boiler will deliver superheated steam to a steam turbine and generator to produce electricity. The system will consist of a high efficiency multistage turbine with a generator and air-cooled condensers with condensate pumps. Generated electricity will be used on site and the excess exported to the National Grid.

The flue gas generated by the combustion process will pass through the boiler and will enter a gas cleaning system before being emitted to atmosphere. The design of the plant will constitute a combination of the following methods:

- Acid gases removal (lime injection or equivalent) or scrubbing;
- Heavy metal, dioxins and furans removal (carbon injection or equivalent);
- Particulate matter removal (bag filter plant or equivalent);
- Urea / ammonia injection prior to a catalyst for reduction of oxides of nitrogen (Selective Catalytic Reduction); and
- Polishing wet scrubbing system.

Once the flue gas has been cleaned, any remaining pollutants within the flue gas will be measured using a system of continuous emissions monitoring equipment and periodic manual sampling.

Finally, the treated flue gases will be discharged to the atmosphere, via a 100m high stack.

Water will be abstracted via a pumping system from the Deephams Sewage Treatment Works outfall for use as process water, for example for the boilers following appropriate treatment.

The key features of the incineration activity are summarised in the table below.

Waste throughput, Tonnes/line	350,000/annum (700,000 aggregated)	8.8/hour
Waste processed	Municipal waste (MSW), commercial and industrial waste, non-hazardous clinical waste	
Number of lines	2	
Furnace technology	Grate	
Auxiliary Fuel	Gas	
Acid gas abatement	To be confirmed at the	Hydrated lime

	design stage	
NOx abatement	SCR	Urea proposed
Reagent consumption	Auxiliary Fuel <200 m^3/annum Urea : 5,000 te/annum Lime/Other : <50,000 te/annum Activated carbon: 5,000 te/annum Process water: 90,000 m^3/annum	
Flue gas recirculation	To be confirmed at the design stage	
Dioxin abatement	Activated carbon	
Stack	535667, 192848	
	Height, 100 m	Diameter, 3.78 m
Flue gas	Flow, 84 m^3/s	Velocity, 15 m/s
	Temperature 60°C	
Electricity generated	70 MWe	574,000 MWh
Electricity exported	59 MWe	483,800 MWh
Steam conditions	Temperature, 425 °C	Pressure, 40 - 45 bar/MPa
Waste heat use	Pre heating of combustion air	

Waste Water Treatment Works (WWTW)

The WWTW will treat all process water prior to discharge to Chingford sewer. Process water will include boiler blowdown. The WWTW will also treat gully wastewater from the gully waste management facility.

The Applicant has specified in their application that gulley wastewater will be non-hazardous. An H1 assessment of predicted pollutant levels outlines that these will be insignificant when taking into account the sewage treatment reduction factor. The operator included both a non hazardous and a hazardous waste treatment activity schedule reference for the waste water treatment plant within their permit application to provide flexibility. We consider that it is appropriate for the Operator to provide additional information on the likely content of the waste as additional research or evidence may be available nearer to the time of final design. Pre-operational condition PO14 requires the operator to submit a report to the Environment Agency outlining the results of the characterisation of both the liquid and solid fractions of gully waste using samples taken from existing sites and / or published research. The analysis shall include but is not limited to the following parameters:

- Hydrocarbons, metals, BOD and COD.

Based on the characterisation results the operator shall confirm how the wastewater treatment plant will be designed to treat the gully waste.

At present we have not set limits within the permit for this discharge to sewer. Discharge limits will be specified by Thames Water within the relevant trade

effluent consent. However, this could be reviewed following the completion of pre-operational condition PO14.

IED does specify limits for wastewater discharge for effluent derived from wet flue gas treatment. Wet flue gas treatment will not be utilised on this site and therefore these limits are not relevant (see section 6 for additional information).

A physico-chemical waste water treatment system is proposed including settlement and removal of solids, chemical dosage and final polishing with carbon filters and sand filters.

A pre-operational condition will require the operator to confirm the final design of the wastewater treatment plant prior to installation under pre operational conditions PO13.

Resource Recovery Facility (RRF)

The RRF will be located on the southern part of the site and will have the capacity to manage approximately 390,000 tonnes of waste annually. The RRF will receive and sort a variety of wastes to recover items for re-use, recycling or further processing. Equipment will be used to remove recyclables from residual waste (e.g. metals) including mechanical and manual sorting. The remaining residual waste suitable for thermal treatment will be transported to the ERF for energy recovery. Where there are collected food and garden wastes, these will be bulked for transport to off-site composting facilities.

The RRF will comprise the following building, structures and plant:

- A Recycling and Fuel Preparation Facility (RFPF);
- A gully waste management area housed within the RFPF building;
- A reuse and recycling centre (RRC);
- Odour abatement and dust suppression plant and equipment;
- Fire control water tanks, pump house and equipment; and
- Offices and staff welfare facilities.

Automatic number plate recognition and a data recording system will be installed adjacent to the in and out weigh bridges.

The Recycling and Fuel Preparation Facility

The RFPF will consist of an enclosed reception hall with sorting/preparation and storage areas. The building will have space for the operation of at least three loading shovels/excavators fitted with a grab attachment or bucket and shredder. The facility will manage up to 378,000 tonnes of waste annually.

A discrete area for the reception and bulking of different material streams will be provided. Mobile plant will be used to move the waste inside the facility for sorting, pre-treatment, storage and bulking into outgoing vehicles. Waste that is suitable for combustion after pre-treatment will be moved to the shredding area for sorting and size reduction. After shredding, residual waste suitable for the ERF will be moved via bulkers to the ERF waste bunker.

Bulky waste and RRC residual waste containing materials suitable for recycling will be moved to the sorting line where it will be sorted and bulked. The sorting line will include an elevated picking belt with picking station and a series of underlying bays that will be suitable for the storage of sorted fractions (e.g. wood, metals and plastics) with appropriate access for loading shovels and other required vehicles for the collection of the following wastes:

- Recyclable waste being transferred to a reprocessing facility;
- Residual waste suitable for combustion being transported to the ERF; and
- Residual waste unsuitable for recycling or combustion being transported to a landfill for disposal.

The building will be maintained under negative pressure with rapid roller shutter doors. A dust extraction unit and a dust suppression misting system will be installed.

Gully waste management area

Approximately 4,000 tonnes of gully waste will be accepted onto site per year. Tankers will deliver gully waste to a gully waste management area inside the main RRF building. The gully waste will discharge via an interceptor to the foul water system which will then drain to the WWTP for treatment.

Gully wastes which include significant quantities of hazardous wastes, such as from an oil spillage will not be accepted on site. The drivers will be required to provide information about the source of the gully waste at the weighbridge before the waste is deposited and an inspection of the loads will be carried out as it is being discharged. If it is found that the gully waste is from a contaminated source, it will be returned without discharging or placed in a quarantine area that will not have any connection to the site drainage system. The waste would then be transferred to a site which is permitted to accept such waste.

Reuse and recycling centre (RRC)

The RRC will receive waste from the general public and small traders. The RRC will handle approximately 8,000 tonnes of waste per year.

The RRC would comprise a main reception area with space for the circulation of vehicles and pedestrians, parking areas and direct access to dedicated containers for hand unloading of recyclable materials and residual waste. A separate route and entry will be created for users to access the RRC to ensure they cannot enter the Recycling and Fuel Preparation Facility.

The public area will be elevated above the operational area and users would deposit waste into containers or bays over a safety barrier. A roll on - roll off container lorry or loading shovels would remove the containers / empty the bays as necessary. Material would then be moved to appropriate bays in the storage areas of the RFPF.

A site operative will check the waste arrivals and identify any non-compliant deliveries. Closed circuit television (CCTV) recording of vehicle movements and number plates will be available to identify any instance of non-compliance.

Associated equipment

Several other buildings and items of equipment will be located in the southern part of the EcoPark to support the operation of the permitted activities as follows:

- Weighbridges
- Administrative buildings and visitor centre
- New internal roads
- Parking areas

4.1.4 Key issues in the determination

The key issues arising during this determination were noise and air quality and 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 regulated facility site is located within the Edmonton EcoPark, an existing waste management complex covering approximately 16 hectares (ha) in area. The site will occupy a smaller area within the EcoPark of approximately 10.3 ha.

Currently the regulated facility site is generally flat and low lying at approximately 11m above Ordnance Datum (AOD), with the exception of raised areas in the northeast. Substantial ground works will be undertaken for the construction of the ERF and the proposed ground level for the ERF is 12.5m AOD. The new RRF will be relatively flat and at an elevation of around 11m AOD.

British Geological Survey borehole records and regional mapping record the geological sequence as ‘made ground’ overlying natural deposits. The site is mapped as London Clay overlain by superficial deposits of Alluvium. Kempton

Park Gravels, Lambeth Group, Thanet Sand and Upper Chalk were also encountered.

The Alluvium and the Kempton Park Gravels (River Terrace Deposits) are designated as secondary aquifers. The London clay is classed as unproductive strata. The Lambeth Group and the Thanet Sand are designated as secondary aquifers and the Upper Chalk as a principle aquifer. Groundwater levels are between 7.12 and 9.45m AOD.

The site is within an inner (zone 1) and outer (zone 2) groundwater source protection zone for a public water supply borehole at Chingford, 400m to the east. The public water supply abstracts groundwater from the chalk principal aquifer.

4.2.2 Proposed site design: potentially polluting substances and prevention measures

The Applicant has confirmed that the following key measures will be put into place at the in order to prevent pollution to ground and groundwater.

The waste delivery, storage and treatment areas will have impermeable surfaces and a sealed drainage system going to the WWTW. Fuel tanks and chemical storage will be bunded with 110% of the capacity of the tanks.

Suitable equipment to clean up any spillages will be provided and maintained. Installation and maintenance records for pollution control measures, such as impermeable surfacing and sealed drainage system, will be documented. Evidence will also be recorded as to how any spillages have been cleaned up on the site.

The solid materials on site, such as hydrated lime and granular activated carbon, will be stored in silos surrounded by concrete hardstanding. The silos will have high level alarms and vent to atmosphere via a fabric filter.

Ancillary materials such as oils and chemicals will be handled and stored in accordance with the Control of Substances Hazardous to Health Regulations (COSHH).

Given the materials used within the activities of the Regulated Facility, the management and physical measures proposed to prevent and minimise pollution and the sensitivity of the land on which the site is located, we consider that the likelihood of incidents involving loss of containment is low and the overall risk to the environment is not significant. We also consider that the provisions for contaminated fire water retention will be sufficient to meet the requirements of IED Article 46(5) based on the current proposals and the inclusion of pre-operational conditions to submit an FPP for each part of the site prior to operation. We are therefore satisfied that the ground and groundwater can be protected from the activities of this Regulated Facility.

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. We have set pre-operational conditions (PO7A and PO7B) requiring the Operator to provide this information prior to the commencement of operations.

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

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. Pre-operational conditions PO1A and PO1B require the Operator to have an Environmental Management System in place before the Regulated Facility 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 Regulated Facility – general issues

4.3.1 Administrative issues

The Applicant is the sole Operator of the Regulated Facility.

We are satisfied that the Applicant is the person who will have control over the operation of the Regulated Facility after the granting of the Permit; and that the Applicant will be able to operate the Regulated Facility so as to comply with the conditions included in the Permit.

We are satisfied that the Applicant's submitted installations Opra profile and waste Opra profiles are accurate.

The Opra score will be used as the basis for subsistence and other charging, in accordance with our Charging Scheme. Opra is the Environment Agency's method of ensuring application and subsistence fees are appropriate and proportionate for the level of regulation required.

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. Pre-operational conditions (PO1A and PO1B) are 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 Regulated Facility is operational. An improvement conditions (IC1A and IC1B) are included requiring the Operator to report progress towards gaining certification of its EMS.

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

Permit condition 1.1.4 requires the operator to comply with the requirements of an approved competence scheme. The Operator has confirmed that they will hold the relevant WAMITAB certifications prior to operation of the site. Evidence of this will be documented within the pre-commissioning report which will be submitted to the Environment Agency.

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.

The site will be surrounded by security fencing and CCTV will be monitored to prevent vandalism.

4.3.4 Accident management

The Applicant has not submitted an Accident Management Plan. However, having considered the 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 pre-operational conditions (PO1A and PO1B).

The Applicant submitted a high level fire strategy applicable to the whole regulated facility and an additional fire strategy applicable only to the ERF with their Application. We have included two pre-operational conditions (PO10A and PO10B) requiring the Operator to submit Fire Prevention Plans for both the RRF and the ERF prior to operation. These will be required to be in line with the Environment Agency's Fire Prevention Plan guidance current at the time of completion of the pre-operational conditions. The high level fire strategy outlines the following key points for fire risk minimisation and control:

- Fire risk assessments will be produced for each building.
- Fire detection systems appropriate to the fire risk and the layout of the building.
- Portable fire extinguishers to be located in adequate numbers and in appropriate places.
- Suppression systems to be installed where required.

- Visual inspection of waste to check for smouldering loads.
- Waste quarantine area to be provided on site which would be used for smouldering loads or to control waste fires.
- Housekeeping procedures will be put in place to prevent any build-up of dust or debris, especially in the vicinity of machinery which could act as a source of ignition.
- The site will be protected by a palisade fence at least 2m high with access gates manned by security staff to minimise the potential for arson.

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 Regulated Facility in accordance with the following documents contained in the Application:

Description	Parts Included	Justification
The Application EPR/UP3232AC/A001	• Parts B2 and B3 of the Application Form including technical standards listed in Table 3a of form B3. • The Supporting Information documents referenced: *Final Report 15568i2* and *Appendices B to J* • Response to Not Duly Made email questions 2 - 5.	Together these sections describe key operating techniques and how the Regulated Facility will be operated to ensure that best available techniques are applied.
Response to Schedule 5 Notice dated 19/04/16, EPR/UP3232AC/A001	Response to questions 1 - 6.	
Response to Schedule 5 Notice dated 19/04/16, EPR/UP3232AC/A001	• Fire Strategy V3.1 dated 12/08/15 • ERF Fire Safety Strategy dated 14 June 2015	
Response to Schedule 5 Notice dated 15/08/16, EPR/UP3232AC/A001	• Technical note 16338i2 • CHP Development strategy	

Description	Parts Included	Justification
Response to Schedule 5 Notice dated 19/12/16, EPR/UP3232AC/A001	• Response to Schedule 5 questions 1 - 6 covering the following: o Questions 1 - 4: Waste acceptance o Question 5 - Waste treatment • Question 6 - Water abstraction	
Additional information received	Information relating to waste types and waste storage capacity.	

The details set out above describe the techniques that will be used for the operation of the Regulated Facility 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:

Raw Material or Fuel	Specifications	Justification
Fuel 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 accepting, storing, treating and incinerating 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 tables S2.2, S2.3, S2.4, S2.5 and S2.6. Table S2.2 outlines the wastes that can be accepted for incineration and tables S2.3 - S2.6 outline the wastes that can be accepted at the southern part of the site, into the RRF.

Energy Recovery Facility

We have limited the annual throughput to the ERF to 700,000 tonnes per annum: 350,000 tonnes per line. This is based on the ERF operating 8,000 hours per year per line at a nominal capacity of 8.8 tonnes per hour per line.

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

(i) the wastes codes in table S2.2 are all categorised as non-hazardous in the European Waste Catalogue and are capable of being safely burnt by the incinerator.
(ii) these waste codes in table S2.2 are likely to be within the design calorific value (CV) range for the incineration plant;
(iii) these wastes in table S2.2 are unlikely to contain harmful components that cannot be safely burnt by the incinerator.

Some types of non-hazardous clinical waste will be accepted for direct input to the ERF. Procedures for clinical waste acceptance, pre-acceptance and storage will be implemented in accordance with our guidance EPR SGN S5.07 on clinical waste management.

The Installation has been or will be required to demonstrate via pre-operational conditions that it has been designed, constructed and will be operated using BAT for the incineration of the permitted wastes. We are satisfied that the proposed operating and abatement techniques are BAT for incinerating these types of waste. Our assessment of BAT is set out later in this document.

Resource Recovery Facility

We have limited the total annual throughput to the RRF to a maximum of 390,000 tonnes. We have also limited the annual throughput to a number of specific activities within the RRF as follows:

- Management of non-contaminated gulley wastes: 4,000 tpa
- Input of waste to the household waste recycling centre: 8,000 tpa

The Applicant specified a number of wastes containing asbestos within the list of waste codes in the Application. The Applicant confirmed in a response dated 25/01/17 to a schedule 5 notice request for further information that wastes containing asbestos will not be accepted under routine operation at the installation. The Applicant also confirmed that small quantities of hazardous waste will be accepted at the RRF, mainly at the household waste recycling centre for onward transfer. The Applicant confirmed that the capacity for storage of hazardous waste will be less than 50 tonnes. A condition within the permit limiting this storage volume has also been included.

We are satisfied that the Applicant can accept the wastes contained in tables S2.3 - S2.6 of the Permit because the regulated facility has been or will be required to demonstrate via pre-operational conditions that it has been

designed, constructed and will be operated using appropriate measures for the acceptance, storage and treatment of the permitted wastes. We are satisfied that the proposed operating and abatement techniques are BAT for the acceptance, storage and transfer or processing of these types of waste.

We made these decisions with respect to waste types in accordance with our sector guidance note S5.06: recovery and disposal of hazardous and non-hazardous waste.

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 Regulated Facility which are normal aspects of all EPR permit determinations. This issue is dealt with in this section.

2. The extent to which the incineration activity 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 incinerator are relevant considerations in the determination of BAT for the Part A(1) activity and its directly associate activities, 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 incineration activity 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).

(ii) Use of energy within the Regulated Facility

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 Regulated Facility.

The Application details a number of measures that will be implemented at the Regulated Facility in order to increase its energy efficiency.

Energy Recovery Facility

The overall efficiency of the ERF will be optimised by the selection of efficient boilers and turbines and the minimisation of the facility's parasitic load. Additional specific measures incorporated into the design of the ERF plant to improve energy efficiency include:

- The use of high pressure steam
- Optimising steam extraction points for auxiliary heat supply
- ACC system expanding steam to low pressure
- Optimising boiler feed water temperature
- Combustion air pre-heating
- Closed waste steam cycle to minimise losses
- Internally insulated furnace
- Automated control system regulating combustion air requirements
- SCR and flue gas recirculation where required
- Insulation on high-temperature circuits
- Selection of high efficiency electrical motors and variable speed drives
- Fully draught proofed double glazed self-closing internal doors on heated sections of the building
- Space heating control systems
- Motion sensors controlling internal lighting

Resource Recovery Facility

The RRF will consist of an unheated building with high efficiency lighting. Procedures will be in place to minimise the operation of non-road machinery and ensure the process equipment is turned off or maintained in idle mode when waste is not being processed.

Energy balance

The Application states that the specific energy consumption of the incineration activity, a measure of total energy consumed per unit of waste processed, will be 180 kWh/tonne. The ERF capacity is 700,000 tonnes per annum.

Data from the BREF for Municipal Waste Incinerators shows that the range of specific energy consumptions is as in the table below. This indicates that the specific energy consumption for the Edmonton EcoPark is within the specified range.

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

(iii) Generation of energy within the Regulated Facility - 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 incineration 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 plant will generate electricity only and has been specified to maximise electrical output with little or no use of waste heat. The Sankey diagram submitted in support of the R1 Application shows 70.5 MW of electricity produced for an annual burn of 700,000 tonnes, which represents 10.07 MW per 100,000 tonnes/yr of waste burned (0.81 MWh/tonne of waste). The plant 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 incinerator 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, 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.

Our CHP-R guidance also states that opportunities to maximise the potential for heat recovery should be considered at the early planning stage, when sites are being identified for incineration facilities. In our role as a statutory consultee on the planning application, we ensured that the issue of energy utilisation was brought to the planning authority's attention. We have made comments about this to Enfield Council (the planning authority) in our role as a statutory consultee for the planning application.

We consider that, within the constraints of the location of the site explained above, the incinerator will recover heat as far as practicable, and therefore that the requirements of Article 6(6) are met.

(iv) R1 Calculation

Although the Applicant has submitted a R1 calculation with this application, 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. R1 status was granted for the Edmonton EcoPark incinerator on 05/12/16 by the Environment Agency.

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.

(v) Choice of Steam Turbine

The steam turbine will be a multistage condensing turbine to maximise the efficiency of the system by discharging steam at sub atmospheric pressure to the air cooled condensers. The system will be 'CHP-Ready' with capability to export heat to local heat users.

(vi) Choice of Cooling System

The cooling system options considered by the Applicant were: wet, hybrid and air cooled. The table below shows a review of the features of each of these.

Table 1 Cooling System Options

	Air Cooled Condensers (ACC)	Wet Cooling Tower	Hybrid Cooling Tower
Estimated Cost (£) based on 2014 prices	£9.4M	£3.5M	£4.9M
Potential Reduced Power use vs ACC (used as base case)	-	700 kWe	430 kWe
Induced backpressure	100 mbara	80 mbara	80 mbara
Footprint	Large (>1000m^2)	Small (<500 m^2)	Medium (~800m^2)
Noise	Medium to low	Low	Medium to Low
Water Use	Low	High (160m^3/h)	Medium (80m^3/h)
Plume visibility	None	High frequency of plume visibility	Low frequency of plume visibility (only visible when below 0°C and above 90% RH)

The Applicant confirmed that the proposed cooling technology is air cooled condensers due to the lack of plume and lower water use than a water cooled system. We are satisfied with the Applicant's proposals.

The cooling system will be such that steam turbine exhaust of 0.1 bara or less is achieved at 15ºC ambient temperature during full turbine load without heat export.

(vii) Compliance with Article 14(5) of the Energy Efficiency Directive

The applicant has carried out an assessment of the potential for operating the incinerator as a high-efficiency cogeneration installation and has identified a potential heat user. Proposed arrangements for the supply of heat to Decentralised Energy Networks (DEN) starting with the Lee Valley Heat Network Limited (LVHN) are referred to in the Application although it specifies that input to the LVHN does not form part of the permit application at this stage. The principle input source to the LVHN is intended to be the heat generated by treatment of waste at the Edmonton EcoPark if the DEN is developed and a commercial agreement is reached between operators.

The development of the LVHN is outside of the scope of the Permit although the incinerator will be fitted with suitable connections should the DEN become available. The turbine will be CHP enabled through one or more extraction points for supplying heat to a district heat network. The likely heat take off requirements that have been considered are up to 50 or 80MWth heat supply.

The Application did not include a cost benefit analysis. This was requested by a Schedule 5 notice dated 15/08/16 and provided by the Applicant on 06/09/16 in line with Article 14 of the Energy Efficiency Directive. Pre-operational condition PO2 requires the Operator to carry out a comprehensive review of the available heat recovery options prior to commissioning, in order to ensure that waste heat from the plant is recovered as far as possible.

(viii) 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 5. 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 MSW 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 5, including consumption of lime, activated carbon and urea / 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 SCR to abate NO_x. 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 waste combustion furnace, which results in a material that is both reduced in volume and in chemical reactivity. Condition 3.1.3 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 and APC residues are adequately characterised, pre-operational condition PO3 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 main waste products expected to be generated by the EcoPark will be bottom ash and fly ash from the ERF, sludge from the WWTP, stones and metal from the ERF and RRF and waste lubricating oil. The Application proposes that waste will be transported offsite for recovery where possible.

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 Regulated Facility'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 a regulated facility 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 H1 Guidance

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 Quality Standards (EQS) referred to as "benchmarks" in the H1 Guidance.

Where an EU EQS exists, the relevant standard is the EU EQS. Where an EU EQS does not exist, our guidance sets out a National EQS (also referred to as Environmental Assessment Level - EAL) which has been derived to provide a similar level of protection to Human Health and the Environment as the EU EQS levels. In a very small number of cases, e.g. for emissions of Lead, the National EQS is more stringent that the EU EQS. In such cases, we use the National EQS standard for our assessment.

National EQSs do not have the same legal status as EU EQSs, and there is no explicit requirement to impose stricter conditions than BAT in order to comply with a national EQS. However, national EQSs 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 EQS; and
- the **short-term** process contribution is less than **10%** of the relevant EQS.

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 EQS 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 excedance of an EU EQS 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 *Air Quality and Odour Report* contained within the Application. The assessment comprises:

- An H1 screening assessment of emissions to air from the operation of the incinerator.
- Dispersion modelling of emissions to air from the operation of the incinerator.
- A study of the impact of emissions on nearby sensitive habitat / conservation sites.
- A study of the impact of odour emission on nearby sensitive receptors.

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 and potential odour impacts are considered in section 6.5.

The Applicant has assessed the potential emissions to air from the incineration activity 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 using the ADMS 5 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 London City Airport between 2010 and 2014. The operator has justified the choice of data station as it is the closest meteorological monitoring site to Edmonton. We accept this justification.

The air impact assessments, 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_x), expressed as NO_2

- Total dust
- Carbon monoxide (CO)
- Sulphur dioxide (SO_2)
- 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 incinerator operates continuously at the relevant long-term or short-term emission limit values, 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_3), Polycyclic Aromatic Hydrocarbons (PAH) and PCBs. Emission rates used in the modelling have been drawn from data in the Waste Incineration BREF or in the case of ammonia, manufactures data and are considered further in section 5.2.2.

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

A review of data sources was carried out by the Applicant to determined background air quality at and around the Application site. Information from the Defra 1 x 1km grid square background maps have been used in combination with measured data where available. We consider the assumed background concentrations to be appropriate. We have included a condition within the permit specifying that both incineration plants cannot be operated at the same time to cover the succession from the existing plant to the operation of the new plant.

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, the selection of input data, use of background data and the assumptions that were 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 tables 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.

Non-metals

Pollutant	EQS / EAL		Back-ground	Process Contribution (PC)		Predicted Environmental Concentration (PEC)	
	µg/m³		µg/m³	µg/m³	% of EAL	µg/m³	% of EAL
NO_2	40	1	31.9	0.69	1.73	32.6	81.5
	200	2	63.8	15.1	7.6	78.9	39.5
PM_{10}	40	1	23.4	0.083	0.21	23.5	58.7
	50	3	46.8	0.35	0.70	47.15	94.3
$PM_{2.5}$	25	1	16	0.083	0.33	16.08	64.3
SO_2	266	4	13.4	15.3	5.8	28.7	10.8
	350	5	13.4	12.7	3.63	26.1	7.5
	125	6	13.4	5.00	4.0	18.4	14.7
HCl	750	7	0.76	4.6	0.61	5.4	0.71
HF	16	8	0	0.044	0.28	0.044	0.28
	160	7	0	0.46	0.28	0.46	0.3
CO	10000	9	600	10.95	0.11	611	6.1
TOC	2.25	1	0.2	0.12	5.33	0.320	14.22
PAH	0.000 25	1	0.00018	0.000008 5	3.40	0.000189	75.4
NH_3	180	1	3.1	0.008	0.00	3.11	1.73
	2500	10	6.2	0.46	0.02	6.66	0.3
PCBs	0.2	1	0.000042	8.2E-10	0.00	0.00004	0.02

Pollutant	EQS / EAL		Back-ground	Process Contribution (PC)		Predicted Environmental Concentration (PEC)	
	µg/m³		µg/m³	µg/m³	% of EAL	µg/m³	% of EAL
	6	10	0.000085	4.6E-08	0.00	0.00009	0.0
Dioxins			0.000042	8.2E-10		4.20E-05	

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

Metals

Although the Applicant did not include metals in their short term impact assessment, we used short term predicted concentrations from other pollutants to assess the potential impact. We consider that the predicted emissions of metals are unlikely to result in an exceedence of the EQS/EAL. The long term predictions based on annual means for metals are outlined in the table below.

Pollutant	EQS / EAL	Back-ground	Process Contribution		Predicted Environmental Concentration	
	µg/m³	µg/m³	µg/m³	% of EAL	µg/m³	% of EAL
Cd	0.005	0.00021	0.00021	4.2	0.00042	8.4
Tl		0	0.00021		0.00021	
Hg	0.25	0.0024	0.00041	0.16	0.00281	1.12
Sb	5	0.0011	0.000029	0.00	0.001129	0.02
Pb	0.25	0.009	0.00013	0.05	0.00913	3.65
Co		0.00014	0.000003		0.00014	
Cu	10	0.036	0.00006	0.00	0.03606	0.361
Mn	0.15	0.0086	0.00014	0.09	0.00874	5.83
V	5	0.0016	0.000002	0.00	0.001602	0.03
As	0.003	0.00079	0.000006	0.20	0.00080	26.5
Cr (II)(III)	5	0.0044	0.00009	0.00	0.00449	0.090

Cr (VI)	0.0002	0.00000	0.000001	0.50	0.00000	0.5
Ni	0.02	0.0017	0.0002	0.90	0.00188	9.4

(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 EQS/EAL and/or <10% of the short term EAQ/EAL. These are:

- Short term NO_2, PM_{10}, $PM_{2.5}$, SO_2, HCl, HF, CO, NH_3, PCBs and emissions of mercury (Hg), Antimony (Sb), lead (Pb), copper (Cu), magnesium (Mn), Vanadium (V), arsenic (As), chromium (II)(III), chromium (VI) and nickel (Ni).

Therefore we consider the Applicant's proposals for preventing and minimising the emissions of these substances to be BAT 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 EQS/EAL

- Long term NO_2, TOC, PAH, cadmium (Cd)

As outlined above, although the Applicant did not include metals in their short term impact assessment, we consider that the predicted emissions of metals are unlikely to result in an exceedence of the EQS/EAL.

For the emissions which were not categorised as insignificant, 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

All emissions either screen out as insignificant or where they do not screen out as insignificant are considered unlikely to give rise to significant pollution.

5.2.2 Consideration of key pollutants

(i) Nitrogen dioxide (NO_2)

The impact on air quality from NO_2 emissions has been assessed against the EU EQS of 40 $\mu g/m^3$ as a long term annual average and a short term hourly average of 200 $\mu g/m^3$. The model assumes a 70% NO_x to NO_2 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 short term PC is less than 10% of the EU EQS and so can be screened out as insignificant. Therefore we consider the Applicant's proposals for preventing and minimising the short term emissions of NO_2 to be BAT.

The above tables show that the peak long term PC is greater than 1% of the EUEQS and therefore cannot be screened out as insignificant. Even so, from the table above, the emission is not expected to result in the EUEQS being exceeded due to the headroom between the PEC and the EQS. In addition, the Applicant has demonstrated that the NO_2 emissions from the proposed plant will be less than those from the existing plant and will therefore result in an environmental improvement. We have checked these conclusions and agree with them.

In some circumstances we may set an ELV lower than IED, for example where the surrounding environment is particularly sensitive. In this instance we have set an ELV of 80mg/m^3 for NO_2 which is below the IED ELV. This level was proposed by the Applicant and we have accepted this as BAT based on the BAT assessment provided by the Applicant including the emissions to air impact assessment. The ELV for the existing plant is 200mg/m^3 and the ELV for the proposed plant is 80mg/m^3 which will have a fundamental contribution to the reduction in NO_2.

(ii) Particulate matter PM_{10} and $PM_{2.5}$

The impact on air quality from particulate emissions has been assessed against the EQS for PM_{10} (particles of 10 microns and smaller) and $PM_{2.5}$ (particles of 2.5 microns and smaller). For PM_{10}, the EUEQSs are a long term annual average of 40 μg/m^3 and a short term daily average of 50 μg/m^3. For $PM_{2.5}$ the EUEQS of 25 μg/m^3 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 EQSs is shown in the tables above. The assessment assumes that **all** particulate emissions are present as PM_{10} for the PM_{10} assessment and that **all** particulate emissions are present as $PM_{2.5}$ for the $PM_{2.5}$ 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_{10}) or 2.5 microns ($PM_{2.5}$), 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_{10} is below 1% of the long term EQS and below 10% of the short term EQS 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.

The above assessment also shows that the predicted process contribution for emissions of $PM_{2.5}$ is also below 1% of the Environmental Quality Objective. Therefore the Environment Agency concludes that particulate emissions from the installation, including emissions of PM_{10} or $PM_{2.5}$, 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_{10} or $PM_{2.5}$ fraction. Whilst the Environment Agency is confident that current monitoring techniques will capture the fine particle fraction ($PM_{2.5}$) 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_2, HCl and HF

From the tables above, emissions of HCl and HF can be screened out as insignificant in that the process contribution is <10% of the short term EQS/EAL. There is no long term EQS/EAL for HCl. HF has 2 assessment criteria – a 1-hr EAL and a monthly EAL – the process contribution is <1% of the monthly EAL and so the emission screens out as insignificant if the monthly EAL is interpreted as representing a long term EAL.

There is no long term EAL for SO_2 for the protection of human health. Protection of ecological receptors from SO_2 for which there is a long term EAL is considered in section 5.4.

Emissions of SO_2 can also be screened out as insignificant in that the short term process contribution is also <10% of each of the three short term EUEQS values. Therefore we consider the Applicant's proposals for preventing and minimising the emissions of this substance to be BAT.

(iv) Emissions to Air of CO, TOCs, PAHs, PCBs, Dioxins and Ammonia (NH_3)

The above tables show that for CO emissions, the peak long term PC is less than 1% of the EAL/EQS and the peak short term PC is less than 10% of the EAL/EQS 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.

For TOC emissions, the peak long term PC is greater than 1% of the EAL/EQS and therefore cannot be screened out as insignificant. Even so, from the table above, the emission is not expected to result in the EQS being exceeded due to the headroom between the PEC and EQS.

The Applicant has used the EQS for benzene for their assessment of the impact of VOC. We consider that this approach is sufficiently precautionary.

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

The above tables show that for PAH emissions, the peak long term PC is greater than 1% of the EAL/EQS and therefore cannot be screened out as insignificant. Even so, from the table above, the emission is not expected to result in the EQS being exceeded due to the headroom between the PEC and EQS.

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

There is no EAL 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 all the other emissions can be screened out as insignificant in that the process contribution is <1% of the long term EQS/EAL and <10% of the short term EAQ/EAL.

The ammonia emission rate is based on a release concentration of 1 mg/m^3 based on technical information regarding potential releases from the flue gas abatement system. The applicant will be required to monitor emissions of ammonia although no emission limit value will be set.

Whilst all emissions cannot be screened out as insignificant, the Applicant's modelling shows that there is unlikely to result in a breach of the EAL. The Applicant is required to prevent, minimise and control PAH and TOC 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. Therefore we consider the

Applicant's proposals for preventing and minimising emissions to be BAT for the Installation. 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^3 for mercury and its compounds (formerly WID group 1 metals).
- An aggregate emission limit value of 0.05 mg/m^3 for cadmium and thallium and their compounds (formerly WID group 2 metals).
- An aggregate emission limit of 0.5 mg/m^3 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, Sb, Pb, Cu, Mn, V, As, chromium (II)(III), chromium (VI) and Ni.

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

There were no metal emissions requiring further assessment. The Applicant has concluded that exceedences of the EAL for all metals are not likely to occur. The installation has been assessed as meeting BAT for control of metal emissions to air. See section 6 of this document. The Environment Agency's experience of regulating incineration plant is that emissions of metals are in any event below the Annex VI limits set in IED, and that the above assessment is an over prediction of the likely impact We therefore agree with the Applicant's conclusions.

5.2.4 Consideration of Local Factors

(i) Impact on Air Quality Management Areas (AQMAs)

The Local Boroughs of Enfield, Waltham Forest and Haringey declared their whole boroughs as AQMAs in 2001 for exceedence of the annual mean NO_2 objective and 24 hour mean PM_{10} objective.

Although the peak long term PC is greater than 1% of the EUEQS, the Applicant has demonstrated that the NO_2 emissions from the proposed plant

will be less than those from the existing plant and will therefore result in an environmental improvement for the AQMAs. We have checked these conclusions and agree with them. The ELV for the existing plant is 200mg/m^3 and the ELV for the proposed plant is 80mg/m^3 which will have a fundamental contribution to the reduction in NO_2 emissions. As outlined above, we have included a condition within the permit specifying that both incineration plants cannot be operated at the same time to cover the succession from the existing plant to the operation of the new plant.

From the Applicants model, the maximum process contribution for PM_{10} is below 1% of the long term EQS and below 10% of the short term EQS and can therefore be considered insignificant at the AQMAs.

The Applicant is required to prevent, minimise and control emissions using the best available techniques; this is considered further in Section 6.

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.

The main conditions in a permit covering an incineration 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 states 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. Their current position that modern, well run municipal waste incinerators are not a significant risk to public health remains valid. The study will extend the evidence base and provide the public with further information

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 Public Position Statement 10** 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 H1 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 PCB's 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 HHRAP and the HMIP 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

HMIP model uses a similar approach to the HHRAP model, but does not attempt to predict probabilistic risk and does not include biotransfer factors specific to PCBs. As such only the HHRAP model can fully make comparisons with the TDI.

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 PCBs, the HHRAP model enables a risk assessment from human intake of a range of heavy metals. The HMIP report does not consider metals. In principle, the respective EQS 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_2, SO_2 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_x, SO_2 and particulates cannot be screened out as insignificant in an H1 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 H1 assessment methodology 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). The results showed that the predicted daily intake of dioxins, furans and dioxin like PCBs at all receptors, resulting from emissions from the proposed facility, were significantly below the recommended TDI levels. For the proposed incinerator, the contribution to the COT TDI is less than 2.0% for the farmer receptors, 0.3% for the allotment receptors and less than 0.6% for the residential receptors. We therefore consider that the COT TDI level of 2 picograms I-TEQ / Kg bodyweight/ day is unlikely to be exceeded.

Receptor	adult	child
Allotment A10	0.0018	0.0057
Farmer North 1	0.026	0.038
Resident Chingford	0.0032	0.010

Calculated maximum daily intake of dioxins by local receptors resulting from the operation of the proposed facility (I-TEQ/ kg-BW/day)

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 as shown in the table above 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 ($PM_{0.1}$). 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 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_{10} and $PM_{2.5}$ 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. The HPA notes 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 $PM_{2.5}$ by 1 $\mu g/m^3$ 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."

The HPA (now PHE) also point out that in 2007 incinerators contributed 0.02% to ambient ground level PM_{10} levels compared with 18% for road traffic and 22% for industry in general. The HPA noted that in a sample collected in a day at a typical urban area the proportion of $PM_{0.1}$ is around 5-10% of PM_{10}. It goes on to say that PM_{10} includes and exceeds $PM_{2.5}$ which in turn includes and exceeds $PM_{0.1}$.

This is consistent with the assessment of this application which shows emissions of PM_{10} 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 the HPA (now 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 H1 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 showed that the following emissions can be screened out as insignificant.

- Short term NO_2, PM_{10}, $PM_{2.5}$, SO_2, HCl, HF, CO, NH_3, PCBs and long term emissions of mercury (Hg), Antimony (Sb), lead (Pb), copper (Cu), magnesium (Mn), Vanadium (V), arsenic (As), chromium (II)(III), chromium (VI) and nickel (Ni).

Although the following emissions were not screened out as insignificant, the assessment still shows that the predicted environmental concentrations are well within air quality standards or environmental action levels.

- Long term NO_2, TOC, PAH and cadmium (Cd)

Although the Applicant did not include metals in their short term impact assessment, we consider that the predicted emissions of metals are unlikely to result in an exceedence of the EQS/EAL.

The Environment Agency has reviewed the methodology employed by the Applicant to carry out the health impact assessment. Based on our check modelling, we agree that the methodology used in the HHRA is appropriate. We also agree with the conclusion of the modelling, that there is no significant risk from the proposed facility.

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 were consulted on the Application 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 and it concluded that it is unlikely that there will be any unacceptable effects on the human food chain as a result of the operations at the Installation. Details of the responses provided by Public Health England, the Local Authority Director of Public Health and the FSA 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 (SAC), Special Protection Areas (SPA) and Ramsar) sites are located within 10km of the Installation, with their distance from the installation in brackets:

- Epping Forest SAC (2994m)
- Lee Valley SPA (1961m)
- Lee Valley Ramsar (1961m)

The following Sites of Special Scientific Interest are located within 2km of the Installation:

- Chingford Reservoirs SSSI (447m)
- Walthamstow Reservoirs SSSI (1961m)

The following non-statutory local wildlife and conservation sites are located within 2km of the Installation:

- Banbury Reservoir LWS (1100m)
- Tottenham Marshes LWS (1276m)
- Lee Valley LWS (125m)
- Mansfield Park LWS (1935m)
- Ching Brook in Central Walthamstow LWS (1554m)
- Chingford Mount Cemetery LWS (1678m)
- Tottenham Hale to Northumberland Park Railsides LWS (1322m)
- Marsh Lane Allotments LWS (1869m)
- Tottenham Marshes East LWS (1425m)
- Pymmes Park LWS (1828m)

5.4.2 Habitats Assessment

The Applicant's Habitats assessment 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 there would be no likely significant effect on the interest features of the protected sites for pollutants, other than a potential impact from SO_2

emissions and associated acid deposition. The predicted impact on the Habitats sites from these pollutants could not be considered insignificant and were higher than from the existing plant.

We requested additional information on this aspect of the application from the Applicant via a Schedule 5 notice dated 15/08/16.The Applicant confirmed that the modelling for emissions of SO_2 was based on the Industrial Emissions Directive Emission Limit Value (ELV) for 50mg/m^3 whereas the equipment provider has confirmed that a concentration of 10mg/m^3 can be achieved.

An Appendix 11 was sent to Natural England for consultation on 06/03/17.

Tables showing the predicted impacts on habitats from both the existing plant and the proposed plant are shown.

Epping Forest SAC

Epping Forest SAC is 2994m from the installation.

Table A: Epping Forest SAC – proposed plant

Pollutant	Critical level (CLe) / load (CLo) (µg/m³)	Back-ground (µg/m³)	Process Contribution (PC) (µg/m³)	PC as % of CLe / CLo	Predicted Environmental Concentration (PEC) (µg/m³) (2)	PEC as % CLe / CLo
Direct Impacts						
NO_x Annual	30	-	0.24	0.8	-	-
SO_2	10 (1)	6.697	0.153	1.53	6.85	68.5
Ammonia	1 (1)	-	0.003	0.3	-	-
HF Weekly Mean	0.5	NA	0.012	2.44	NA	NA
HF Daily Mean	5	-	0.026	0.52	-	-
HCl	-	NA	0.031	-	-	-
Deposition Impacts						
N Deposition (kg N/ha/yr)	10 - 20	-	0.053	0.53	-	-
Acidification - Nitrogen Dep (Keq/ha/yr)	0.892	-	0.005	0.56	-	-
Acidification Sulphur Dep (Keq/ha/yr)	0.880	0.21	0.011	1.25	0.916	25.1

(1) The lichen and bryophyte sensitivity standards for ammonia and sulphur dioxide have been assigned for this assessment.

(2) Where the PC is less than 1% of the critical level or load we do not carry our further assessment so do not consider the PEC.

Table B: Epping Forest SAC – existing plant

Pollutant	Critical level (CLe) / load (CLo) (µg/m³)	Back-ground (µg/m³)	Process Contribution (PC) (µg/m³)	PC as % of CLe/ CLo	Predicted Environmental Concentration (PEC) (µg/m³) (2)	PEC as % CLe / CLo
Direct Impacts						
NO_x Annual	30	34.4	0.53	1.8	33.87	114.8
SO_2	10 (1)	6.70	0.016	0.16	-	-
Ammonia	1 (1)	3.10	0.018	1.8	3.12	311.8
HF Weekly Mean	0.5	NA	0.0002	0.05	-	-
HF Daily Mean	5	NA	0.001	0.01	-	-
HCl	-	NA	0.015	-	-	-
Deposition Impacts						
N Deposition (kg N/ha/yr)	10 - 20	14.97	0.246	2.46	15.216	152.16
Acidification - Nitrogen Dep (Keq/ha/yr)	0.892	1.07	0.014	1.57	1.084	121.5
Acidification Sulphur Dep (Keq/ha/yr)	0.880	-	0.003	0.34	-	-

(1) The lichen and bryophyte sensitivity standards for ammonia and sulphur dioxide have been assigned for this assessment.

(2) Where the PC is less than 1% of the critical level or load we do not carry our further assessment so do not consider the PEC.

Direct impacts

Table A above indicates that both the process concentration (PC) for annual NO_x, SO_2, ammonia and daily mean HF for the proposed plant are less than 1% of the critical level (CLe) at Epping Forest SAC and can therefore be considered insignificant and that there will be no likely significant effect. When comparing the proposed PCs in table A and from the existing plant in table B, the proposed scenario will result in a reduced PC for annual NO_x at Epping Forest SAC and is therefore an environmental improvement.

Direct impacts of weekly mean HF cannot be considered insignificant as is above 1% of the CLe. Weekly mean HF is 2.44 of the CLe. There is no site specific background data available for HF but we consider that background levels are likely to be low and therefore it is unlikely that the emission would result in an exceedence and therefore there will be no likely significant effect.

Deposition

The table above indicates that the PC for nitrogen deposition and acidification – nitrogen deposition for the proposed plant are both less than 1% of the critical load (CLo) and can therefore be considered insignificant. Both of these

levels are also lower than those from the existing plant demonstrating that it is an environmental improvement in relation to these pollutants.

The PC for acidification – sulphur deposition is above 1% of the CLo and can therefore not be considered insignificant. However, when taking the background into account the PEC is 25% of CLo which indicates there is adequate headroom so that an exceedence is unlikely and therefore there will be no likely significant effect.

As outlined above, in reality the levels of SO_2 are likely to be below the IED limit used within the modelling and therefore the predicted impacts for sulphur deposition lower.

Lee Valley SPA and Ramsar

Lee Valley SPA and Ramsar is 1961m from the installation.

Table C: Lee Valley SPA and Ramsar – proposed plant

Pollutant	Critical level (CLe) / load (CLo) (µg/m³)	Back-ground (µg/m³)	Process Contribution (PC) (µg/m³)	PC as % of CLe / CLo	Predicted Environmental Concentration (PEC) (µg/m³) (2)	PEC as % CLe / CLo
Direct Impacts[2]						
NO_x Annual	30	36.43	0.41	1.37	36.84	122.8
SO_2	10 (1)	6.695	0.255	2.55	6.95	69.5
Ammonia	1 (1)	-	0.005	0.2	-	-
HF Weekly Mean	0.5	NA	0.027	5.44	NA	NA
HF Daily Mean	5	NA	0.070	1.41	-	-
Deposition Impacts[2]						
N Deposition (kg N/ha/yr)	15 - 30	-	0.003	0.22	-	-
Acidification - Nitrogen Dep (Keq/ha/yr)	0.438	1.16	0.008	1.83	1.168	266.7
Acidification Sulphur Dep (Keq/ha/yr)	0.880	-	0.030	0.91	-	-

(1) The lichen and bryophyte sensitivity standards for ammonia and sulphur dioxide have been assigned for this assessment.

(2) Where the PC is less than 1% of the critical level or load we do not carry our further assessment so do not consider the PEC.

Table D: Lee Valley SPA and Ramsar – existing plant

Pollutant	Critical level (CLe) / load (CLo) (µg/m³)	Back-ground (µg/m³)	Process Contribution (PC) (µg/m³)	PC as % of CLe / CLo	Predicted Environmental Concentration (PEC) (µg/m³) (2)	PEC as % CLe / CLo
Direct Impacts[2]						
NO_x Annual	30		0.78	2.6	37.3	124.2
SO_2	10 (1)	-	0.024	0.24	-	-
Ammonia	1 (1)	-	0.026	0.9	-	-
HF Weekly Mean	0.5	-	0.0006	0.12	-	-
HF Daily Mean	5	-	0.001	0.03	-	-
Deposition Impacts[2]						
N Deposition (kg N/ha/yr)	15 - 30	16.28	0.214	1.43	16.28	108.5
Acidification - Nitrogen Dep (Keq/ha/yr)	0.438	1.16	0.015	3.42	1.175	268
Acidification Sulphur Dep (Keq/ha/yr)	0.880	-	0.003	0.34	-	-

(1) The lichen and bryophyte sensitivity standards for ammonia and sulphur dioxide have been assigned for this assessment.

(2) Where the PC is less than 1% of the critical level or load we do not carry our further assessment so do not consider the PEC.

Direct impacts

Table C above shows that the PC for SO_2, ammonia, and daily HF for the proposed plant are below 1% of the CLe and can therefore be considered insignificant. Long term impacts for NO_x are marginally greater than 1% of the CLe and therefore cannot be considered insignificant however, the level of NO_2 is reduced compared to the existing scenario and is therefore an environmental improvement. The predictions also reflect worst case for both emissions and meteorological conditions. It is anticipated that in reality, emissions are be anticipated to be significantly below these levels and that there will be no likely significant effect.

Deposition

Table C above shows that the PC for nitrogen deposition and acidification – sulphur deposition from the proposed plant are less than 1% of the critical load and can therefore be considered insignificant. The PC for acidification – nitrogen deposition is over 1% at 1.83% and is therefore not considered insignificant. However, compared to the existing plant outlined in the table above there is an environmental improvement with the PC being approximately half when compared to the existing plant.

Conclusion

All emissions represent an environmental improvement, screen out as insignificant, or where they do not screen out as insignificant there is adequate headroom between the process contribution and the critical level or load to indicate that there will be no likely significant effect on the European Habitats within the relevant screening distances of 10km.

The Applicant's assessment of European sites 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 there will be no likely significant effect on the sites.

5.4.3 SSSI Assessment

We have only assessed Chingford Reservoirs as it is closer to the installation than Walthamstow Reservoirs and has lower PCs for all pollutants. The two SSSIs share similar features of interest and therefore if the predicted impacts on the nearer site are acceptable, so will the impacts on the site which is a greater distance from the proposed EcoPark.

Chingford Reservoirs

Chingford Reservoirs SSSI is 447m from the installation.

Table E: Chingford Reservoirs SSSI – proposed plant

Pollutant	Critical level (CLe) / Critical load (CLo) (µg/m³)	Back-ground (µg/m³)	Process Contribution (PC) (µg/m³)	PC as % of CLe / CLo	Predicted Environmental Concentration (PEC) (µg/m³) (2)	PEC as % CLe / CLo
Direct Impacts[2]						
NO_x Annual	30	43.75	0.45	1.5	44.2	147
SO_2	10 (1)	6.696	0.284	2.84	6.98	69.8
Ammonia	1 (1)	-	0.003	0.1	-	-
HF Weekly Mean	0.5	NA	0.024	4.9	-	-
HF Daily Mean	5	NA	0.063	1.26	-	-
Deposition Impacts[2]						
N Deposition (kg N/ha/yr)	20	-	0.075	0.38	-	-
Acidification - Nitrogen Dep (Keq/ha/yr)	0.438	1.25	0.005	1.14	1.255	286
Acidification Sulphur Dep (Keq/ha/yr)	0.910	0.23	0.010	1.1	0.24	26

(1) 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.

Pollutant	Critical level (CLe) / Critical load (CLo) (µg/m³)	Back-ground (µg/m³)	Process Contribution (PC) (µg/m³)	PC as % of CLe / CLo	Predicted Environmental Concentration (PEC) (µg/m³) (2)	PEC as % CLe / CLo
(2) Where the PC is less than 1% of the critical level or load we do not carry our further assessment so do not consider the PEC.						

Table F: Chingford Reservoirs SSSI – existing plant

Pollutant	Critical level (CL) (µg/m³)	Back-ground (µg/m³)	Process Contribution (PC) (µg/m³)	PC as % of CLe	Predicted Environmental Concentration (PEC) (µg/m³) (3)	PEC as % CLe
Direct Impacts						
NO_x Annual	30	43.8	1.20	4.0	45.0	150
SO_2	10 (1)	-	0.037	0.18	-	-
Ammonia	3 (2)	3.1	0.040	1.3	3.14	314
HF Weekly Mean	0.5	-	0.0010	0.19	-	-
HF Daily Mean	5	-	0.002	0.03	-	-
Deposition Impacts						
N Deposition (kg N/ha/yr)	20 - 30	-	0.128	0.64	-	-
Acidification - Nitrogen Dep (Keq/ha/yr)	0.438	1.25	0.024	5.48	1.274	291
Acidification Sulphur Dep (Keq/ha/yr)	0.910	-	0.004	0.44	-	-

(1) The lichen and bryophyte sensitivity standards for sulphur dioxide has 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.

(2) A sensitivity standards for ammonia of 3µg/m³ has been assigned for this assessment as no presence of lichen and bryophyte confirmed on APIS on 05/08/16.

(3) Where the PC is less than 1% of the critical level or load we do not carry our further assessment so do not consider the PEC.

Direct impacts

Table E above shows that the PC for direct impacts from ammonia, SO_2 and weekly HF for the proposed plant are below 1% of the CLe and are therefore considered insignificant. Daily mean HF is below 10% of the short term CLe

and is therefore also considered insignificant. We do not consider that these emissions will damage the special features of the SSSI.

Table E above shows the PC for direct impacts from long term NO_x is marginally above the 1% of the CLe, however, when comparing this to long term NO_x PC of the existing plant at 4% of the CLe in table F, the PC is significantly less. This is therefore an environmental improvement. The predictions reflect worst case for both emissions and meteorological conditions. It is also anticipated that in reality, emissions are be anticipated to be significantly below these levels and therefore unlikely to damage the special features of the SSSI.

Deposition

Table E above shows that the PC for nitrogen deposition is less than 1% of the CLo and is therefore considered insignificant. The PC for acidification – sulphur deposition is 1.1% of the CLo. This is not considered insignificant, however, when taking the background into account the PEC is 26% of the CLo and therefore there is adequate headroom to indicate that an exceedence is unlikely and that the emission is unlikely to damage the SSSI.

As outlined above, in reality the levels of SO_2 are likely to be below the IED limit used within the modelling and therefore the predicted impacts for sulphur deposition lower.

Conclusion

All emissions represent an environmental improvement, screen out as insignificant, or where they do not screen out as insignificant there is adequate headroom between the process contribution and the critical level or load to indicate that the emissions will be unlikely to damage the SSSIs within the relevant screening distance of 2km.

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 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 tables above show that the PCs are below the critical levels or loads or there is anticipated to be an improvement in comparison to the existing plant. We are satisfied that the Installation will not cause significant pollution at the sites. The Applicant is required to prevent, minimise and control emissions using BAT, this is considered further in Section 6.

5.4.5 Assessment of impact on habitats from water abstraction

Water will be abstracted via a pumping system from the Deephams Sewage Treatment Works outfall for use as process water, for example for the boilers after appropriate treatment. As this abstraction does not take water from a surface water body but from a sewage outfall, it is not covered under our water resources permitting regime and therefore we have incorporated this into the Edmonton EcoPark permit as a directly associated activity. We have considered the potential impact from the abstraction on the environment within the permitting process.

Consultation with our Fisheries and Biodiversity specialists confirmed that consideration of the presence of eels in the vicinity of the pumping equipment needed to be considered. As a result a requirement for the installation of a screen to prevent the entrapment, entrainment or impingement of eel at the point of abstraction is included in the permit. The Operator is required to maintain, repair or replace the screen as required to ensure the screen remains effective at all times.

The impact of the proposed EcoPark abstraction on the receiving catchment, primarily Salmon's Brook has been considered. The proposed maximum abstraction rate of 130m^3 per hour would represent approximately 1.3% of the

daily discharge which we consider unlikely to have a significant impact on the overall flow. In reality the application indicates that an abstraction rate of less than 50% of this is more likely, reducing the potential impact further.

A meter to measure quantities of water abstracted must be in place and must be maintained, repaired or replaced as required to ensure that accurate measurements of abstraction are recorded at all times.

As outlined previously we have included a permit condition which specifies that the new incinerator cannot be operated at the same time as the existing incinerator. This will ensure that water is not abstracted for both activities simultaneously.

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^3 (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 EQS. For the most part therefore consideration of

abnormal operations is limited to consideration of its impact on short term EQSs.

In making an assessment of abnormal operations the following worst case scenario has been assumed:

- Dioxin emissions of 5 ng/m^3 (50 x normal operation)
- Mercury emissions are 0.5 mg/m^3 (10 x normal operation)
- NO_x emissions of 450 mg/m^3 (112.5 x normal operation)
- Particulate emissions of 150 mg/m^3 (5 x normal operation)
- Metal emissions other than mercury 2.5 mg/m^3 (5 x normal operation)
- SO_2 emissions of 1,200 mg/m^3 (6 x normal operation)
- HCl emissions of 300 mg/m^3 (5 x normal operation)

This is 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 assumes that any failure of any equipment results in all the negative impacts set out above occurring simultaneously.

The result on the Applicant's short-term environmental impact is summarised in the table below.

Pollutant	**EQS / EAL**	**Back-ground**	**Process Contribution (PC)**		**Predicted Environmental Concentration (PEC)**	
	µg/m^3	**µg/m^3**	**µg/m^3**	**% of EAL**	**µg/m^3**	**% of EAL**
NO_2	200	63.8	72.9	36.5	136.7	68.4
PM_{10}	50	46.8	5.2	10.40	52	104.0
SO_2	266	13.4	366.7	137.9	380.1	142.9
	350	13.4	305	87.14	318.4	91.0
HCl	750	0.76	138.9	18.52	139.7	18.62
HF	160	0	9.3	5.81	9.30	5.8
Hg	7.5	0.0048	0.23	3.1	0.23	3.1
Sb	150	0.0022	0.0081	0.005	0.0103	0.007
Cr II and III	150	0.0088	0.0255	0.02	0.0343	0.02
Cu	200	0.072	0.0174	0.009	0.0888	0.04
Mn	1500	0.0172	0.0394	0.003	0.0566	0.004
V	1	0.0032	0.0007	0.07	0.0039	0.4

From the table above the emissions of the following substances can still be considered insignificant, in that the PC is still <10% of the short-term EQS/EAL.

- HF, Hg, Sb, Cr II and III, Cu, Mn and V

Also from the table above emissions of 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% of short term EQS/EAL.

- NO_2, one hourly SO_2 and HCL

For PM_{10} and the 15 minute mean for SO_2, the PEC is greater than the short term EQS. We therefore consider these in further detail.

The PEC for PM_{10} was 104% of the ELV, however, the assessment standard is based on an averaging period of 24 hours, whereas, abnormal operations would cease after a maximum of 4 hours. We therefore consider that in reality, even under abnormal operating conditions, that it is unlikely that emissions of PM_{10} would result in a PEC of greater than 100% of the EQS.

For the 15 minute mean for SO_2, the PEC is 143% of the EQS. The Applicant has outlined the following:

- Background concentrations are assumed to be twice the annual mean concentration and are therefore likely to be overestimated;
- The abnormal operation emissions are based on worst case assumptions;
- The assessment assumes that the plausible abnormal emissions would coincide with the worst case meteorological conditions, which is highly unlikely.

We agree with the applicant's conclusions and consider that EQSs are unlikely to be exceeded during abnormal operations by any pollutant.

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 EQSs for the reasons set out above. Except that if dioxin emissions were at 10 ng/m^3 for the maximum period of abnormal operation, this would result in an increase of approximately 70% in the TDI reported in section 5.3.2. In these circumstances the TDI would be 0.041 pg(I-TEQ/ kg-BW/day), which is 2.1% of the COT TDI. At this level, emissions of dioxins 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: long term NO_2, TOC, PAH and Cd.

- 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. However BAT Conclusions and a revised BREF for Incineration have not yet been drafted or published, so the existing BREF and Chapter IV of the IED remain relevant.

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)

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

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 hazardous waste	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 Low NOX level Low LOI of bottom ash	-higher thermal loss than with grate furnace - LCV under 15 GJ/t	TOC 0.5 – 3 %	Similar to other technologies

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

Technique	Key waste characteristics and suitability	Throughput per line	Advantages	Disadvantages / Limitations of use	Bottom Ash Quality	Cost
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
- Fluidised Bed
- Gasification

The Applicant has proposed to use a furnace technology comprising a moving grate furnace. This 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 gas as support fuel for start-up, shut down and for the auxiliary burners. We agree that the use of gas is BAT.

Boiler Design

In accordance with our Technical Guidance Note, S5.01, 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:

- ensuring that the steam/metal heat transfer surface temperature is a minimum where the exhaust gases are within the de-novo synthesis range;
- design of the boilers using computational fluid dynamics (CFD) to ensure no pockets of stagnant or low velocity gas;
- boiler passes are progressively decreased in volume so that the gas velocity increases through the boiler; and
- Design of boiler surfaces to prevent boundary layers of slow moving gas.

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 Regulated Facility.

6.2.1 Particulate Matter

Particulate matter				
Technique	**Advantages**	**Disadvantages**	**Optimisation**	**Defined as BAT in BREF or TGN for:**
Bag / Fabric filters (BF)	Reliable abatement of particulate matter to below 5mg/m^3	Max temp 250°C	Multiple compartments Bag burst detectors	Most plants
Wet scrubbing	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
Ceramic	High	May “blind”		Small plant.

filters	temperature applications Smaller plant.	more than fabric filters		High temperature gas cleaning required.
Electrostatic precipitators	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^3 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

Oxides of Nitrogen : Primary Measures				
Technique	**Advantages**	**Disadvantages**	**Optimisation**	**Defined as BAT in BREF or TGN for:**
Low NOx burners	Reduces NOx at source		Start-up, supplementary firing.	Where auxiliary burners required.
Starved air systems	Reduce CO simultaneously.			Pyrolysis, Gasification systems.
Optimise primary and secondary air injection				All plant.
Flue Gas Recirculation (FGR)	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)

Oxides of Nitrogen : Secondary Measures (BAT is to apply Primary Measures first)				
Technique	**Advantages**	**Disadvantages**	**Optimisation**	**Defined as BAT in BREF or TGN for:**
Selective catalytic reduction (SCR)	NOx emissions < 70mg/ m^3 Reduces CO, VOC, dioxins	Expensive. Re-heat required – reduces plant efficiency		All plant
Selective non-catalytic reduction (SNCR)	NOx emissions typically 150 - 180mg/m^3	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.
Reagent Type: Ammonia	Likely to be BAT Lower nitrous oxide formation	More difficult to handle Narrower temperature		All plant

		window		
Reagent Type: Urea	Likely to be BAT			All plant

The Applicant proposes to implement the following primary measures:

- Low NO_x burners – this technique will result in reduced NO_x 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.
- Flue gas recirculation – flue gas may be circulated to increase boiler efficiency. However, there are also operational disadvantages with this approach (e.g. duct corrosion). The Application specifies that the possibility for applying flue gas recirculation will be revisited during detailed design stage.

There are two recognised techniques for secondary measures to reduce NO_x. 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_x levels to below 70 mg/m^3 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_x levels to between 150 and 180 mg/m^3, 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_x 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_2O. Both reagents are BAT and the use of one over the other is not normally significant in environmental terms.

The Applicant proposes to use SCR with urea as the reagent. We consider this abatement options BAT for the incineration activity.

The amount of urea used for NO_x abatement will need to be optimised to maximise NO_x reduction and minimise ammonia (NH_3) slip. Improvement condition IC5 requires the Operator to report to the Environment Agency on optimising the performance of the NO_x abatement system. The Operator is also required to monitor and report on NH_3 and N_2O emissions every 6 months.

6.2.3 Acid Gases, SO_x, HCl and HF

Acid gases and halogens : Primary Measures				
Technique	**Advantages**	**Disadvantages**	**Optimisation**	**Defined as**

				BAT in BREF or TGN for:
Low sulphur fuel, (< 0.1%S gasoil or natural gas)	Reduces SOx at source		Start-up, supplementary firing.	Where auxiliary fuel required.
Management of waste streams	Disperses sources of acid gases (e.g. PVC) through feed.	Requires closer control of waste management		All plant with heterogeneous waste feed

Acid gases and halogens : Secondary Measures (BAT is to apply Primary Measures first)				
Technique	**Advantages**	**Disadvantages**	**Optimisation**	**Defined as BAT in BREF or TGN for:**
Wet	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 wet plume Energy required for effluent treatment and plume reheat		Plants with high acid gas and metal components in exhaust gas – hazardous waste incinerators
Dry	Low water use Reagent consumption may be reduced by recycling in plant Lower energy use	Higher solid residue production Reagent consumption controlled only by input rate		All plant

	Higher reliability			
Semi-dry	Medium reaction rates Reagent delivery may be varied by concentration and input rate	Higher solid waste residues		All plant
Reagent Type: Sodium Hydroxide	Highest removal rates Low solid waste production	Corrosive material ETP sludge for disposal		HWIs
Reagent Type: Lime	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
Reagent Type: Sodium Bicarbonate	Good removal rates Easiest to handle Dry recycle systems proven	Efficient temperature range may be at upper end for use with bag filters – Leachable solid residues Bicarbonate more expensive	Not proven at large plant	CWIs

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_x at source. The Applicant will use gas as the support fuel which we consider to be BAT.

- 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 not usually considered 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. Wet scrubbing has a high water and energy consumption.

Both dry and semi-dry methods of secondary measures can be BAT for acid gas abatement 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. The use of one over the other is not significant in environmental terms in this case.

The Applicant has include a BAT assessment covering dry, semi-wet and wet scrubbing, however, we do not consider that the Applicant has demonstrated that wet scrubbing is BAT in relation to water or energy use within the Application. We also consider that until details of the waste water treatment plant have been finalised that it will not be clear whether appropriate treatment of the effluent associated with wet scrubbing could be achieved. We have therefore excluded wet treatment as an option for the Applicant to use. They will be required to confirm their final selection and justification along with a BAT assessment and report confirming that the environmental impact assessment for the selection reflects that provided with the permit application. This is specified within pre-operational condition PO11 within the permit. The Application has confirmed that a semi-dry FGT system is the most likely selection.

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.

Carbon monoxide and volatile organic compounds (VOCs)				
Technique	**Advantages**	**Disadvantages**	**Optimisation**	**Defined as BAT in BREF or TGN for:**
Optimise combustion control	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)

Dioxins and furans				
Technique	**Advantages**	**Disadvantages**	**Optimisation**	**Defined as BAT in BREF or TGN for:**
Optimise combustion control	All measures will increase oxidation of these species.		Covered in section on furnace selection	All plants
Avoid *de novo* synthesis			Covered in boiler design	All plant
Effective Particulate matter removal			Covered in section on particulate matter	All plant
Activated Carbon injection	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 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.

We are satisfied that in principle the Applicant's proposals are BAT and that the final details of the choice can be confirmed later on during the final design stage. In this case the Applicant will select the final feed scenario at a later date and outline the selection and justification within the pre commissioning report which will be submitted to the Environment Agency for approval.

6.2.6 Metals

Metals				
Technique	**Advantages**	**Disadvantages**	**Optimisation**	**Defined as BAT in BREF or TGN for:**
Effective Particulate matter removal			Covered in section on particulate matter	All plant
Activated Carbon injection for mercury recovery	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.

We are satisfied that in principle the Applicant's proposals are BAT and that the final details of the choice can be confirmed later on during the final design stage. In this case the Applicant will select the final feed scenario at a later date and outline the selection and justification within the pre commissioning report which will be submitted to the Environment Agency for approval.

6.3 BAT and global warming potential (GWP)

This section summarises the assessment of greenhouse gas impacts which has been made in the determination of this Permit. Emissions of carbon dioxide (CO_2) 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_2 is clearly a pollutant for IED purposes.

The principal greenhouse gas emitted is CO_2, but the plant also emits small amounts of N_2O arising from the operation of secondary NO_x abatement. N_2O has a global warming potential 310 times that of CO_2. The Applicant has considered the performance of the secondary NO_x abatement system in relation to GWP.

The major source of greenhouse gas emissions from the installation is however CO_2 from the combustion of waste. There will also be CO_2 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 Operator has considered the energy balance in relation to the CO_2 emissions from the installation.

The electricity that is generated by the Installation will displace emissions of CO_2 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_2 emissions from the Installation are:
On the debit side

- CO_2 emissions from the burning of the waste;
- CO_2 emissions from burning auxiliary or supplementary fuels;
- CO_2 emissions associated with electrical energy used;
- N_2O from the de-NOx process.

On the credit side

- CO_2 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 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_2O emitted.

We are satisfied that in principle the Applicant's proposals are BAT and that the final details of the choice can be confirmed later on during the final design stage. In this case the Applicant will select the final details of the flue gas

treatment system at a later date and outline the selection and justification within the pre commissioning report which will be submitted to the Environment Agency for approval.

The Applicant considered energy efficiency and ability to achieve the required ELV and compared SCR to SNCR in its BAT assessment.

The Applicant concluded that the proposed ELV of 80mg/m^3 could not be achieved by SNCR alone and therefore SCR will be a requirement for the abatement system.

The Environment Agency agrees with the Applicant's proposals to include SCR as a minimum and that this option reflects 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^3 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^{o}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^{o}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^3.

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^3. 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]

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

Emissions to surface water will be solely from non-contaminated run-off via attenuation tanks and interceptors to the Enfield Ditch.

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

There will be emissions from the WWTW to sewer. This will include small quantities of process water, such as boiler blowdown and effluent from the demineralised water system and washdown water along with the liquid fraction of the gully waste. This will be discharged to sewer in accordance with a Trade Effluent Consent via emission point S1.

An application for the Trade Effluent Consent will be submitted to the sewerage undertaker following completion of detailed design.

A pre-operational condition will require the operator to confirm the final design of the WWTW prior to installation under pre operational conditions PO13.

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

6.5.3 Fugitive emissions

The IED specifies that plants 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.

The Applicant has provided a risk assessment for fugitive emissions, which the Environment Agency considers to be satisfactory and should ensure compliance with permit conditions, specifically condition 3.3.

The ERF bunker will be maintained under negative pressure which will minimise emissions of fugitive dust or odour releases.

Waste bring brought onto the installation and during storage will be appropriately enclosed to minimise the potential for fugitive emissions.

The incinerator bottom ash will be stored within an enclosed building prior to removal from site.

Silos will be fitted with dust filters on vents to minimise fugitive dust releases.

Potentially polluting liquids will be stored in bunded tanks on surfaces with sealed drainage.

Other measures regarding the protection of land, surface water and groundwater at the site are recorded in section 4.2.2 above.

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

6.5.4 Odour

Waste handling, storage, shredding and sorting have the potential for odour creation.

Waste accepted at the installation will be delivered in covered vehicles or within containers. Storage of waste within the RRF reception area should be for a maximum of five working days and treated or removed off site within a maximum of six months.

A roller shutter door will be used to close the entrance to the ERF tipping hall outside of waste delivery periods and combustion air will be drawn from above the waste storage bunker into the combustion plant in order to prevent odours and airborne particulates from leaving the facility building. Effective mixing of the waste within the ERF bunker will help prevent the development of anaerobic conditions.

For planned periods of maintenance for the ERF, the level of waste within the bunker will be reduced prior to the shutdown. If an unplanned event occurs and both lines are non-operational for a prolonged period, the waste in the bunker may be removed for disposal at other suitable facilities. When both lines are not operating, the air from the waste bunkers will be extracted and discharged to atmosphere via appropriate treatment technology such as carbon filters and roof mounted fans.

A number of active methods of odour abatement for the RRF were considered within the Application. An activated carbon filter system will be installed within the RRF. The proposal is for hoods to be placed above the waste storage bays within the RRF to capture odour directly from the source. There will be a minimum number of two air changes per hour. Each carbon filter will have a dust filter placed in front of it to prevent blockage.

The gully waste management area will be within the main RRF building and will be connected to the main odour treatment system via local extract ventilation hoods mounted above the gully waste bay. Within the gully waste bay there will be a solids interceptor which will be within the RRF. Cleaning of this trap will only be carried out while the odour extraction system is operational.

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. Pre-operational conditions PO12A and PO12B specify that the development of a final odour management plan is required prior to operation of the installation.

6.5.5 Noise and vibration

The application contained a noise impact assessment which identified local noise-sensitive receptors, potential sources of noise at the proposed plant 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.

Noise modelling considered the potential impact from noise at the nearest sensitive receptors including Zambezi Drive, Russell Road, Lower Hill Lane and the proposed Meridian Water Development.

The initial noise assessment modelling report did not include all noise sources from the proposed site. We requested the modelling to be updated to reflect the full extent of the operations via a Schedule 5 request on 19/04/16. This was received on 26/05/16 and audited by our Air Quality Modelling and Assessment Unit (AQMAU).

Noise modelling was completed using the SoundPlan 7.3 model. The assessment of the noise rating levels, from the proposed facility, against the measured background levels shows that the predicted noise does not exceed the background sound levels. This indicates that there will not be any adverse impacts at residential receptors.

Based on our interpretation of the modelling submission, background monitoring analysis and our check modelling, we agree with the conclusions drawn in the modelling assessment, that the potential impacts are likely to be low.

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.

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 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.

In some circumstances we may set an ELV lower than IED, for example where the surrounding environment is particularly sensitive. In this instance we have set an ELV of 80mg/m^3 for NO_2 which is below the IED ELV. This level was proposed by the Applicant and we have accepted this as BAT based on the BAT assessment provided by the Applicant including the emissions to air impact assessment.

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).

(ii) National and European EQSs

We have considered the impact on local receptors and habitat conservation sites for those emissions not screened out as insignificant and do not consider it necessary to impose further conditions, or set more stringent emission limits than those specified by IED.

(iii) Global Warming

CO_2 is an inevitable product of the combustion of waste. The amount of CO_2 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_2, 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_2. 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 purposes of the plant, which are the destruction of waste and the recovery of energy from 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_2 emissions.

(iv) Commissioning

Before the plant can become fully operational it will be necessary for it to be commissioned. Before commissioning can commence the Operator is required by pre-operational condition PO4 to submit a commissioning plan to the Agency for approval. Commissioning can only begin and be carried out in accordance with the approved proposals in the plan.

In addition, it is recognised that certain information presented in the Application was based on design data, or data from comparable equipment, the commissioning phase is the earliest opportunity to verify much of this information. The following improvement conditions have been included:

- Calibration of CEMs in accordance with BS EN 14181 (a requirement in improvement condition IC6).
- Verification of furnace residence time, temperature and oxygen content (IC4).
- The plant in total conforms with the permit conditions and that satisfactory process control procedures for the plant have been developed (IC3).
- Abatement plant optimisation details (IC5).

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 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 2.3.8 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 2010 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 2010 – **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
- 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 2010 – **Waste Framework Directive**

As the Installation involves the treatment of waste, it is carrying out a *waste operation* for the purposes of the EPR 2010, 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.

The permit does not allow the mixing of hazardous waste so Article 18(2) is not relevant.

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 2010 – **Groundwater, Water Framework and Groundwater Daughter Directives**

To the extent that it might lead to a discharge of pollutants to groundwater (a "groundwater activity" under the EPR 2010), 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 59 of the EPR 2010 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 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 draft decision in this case has been reached following a programme of extended public consultation, on the original application. A summary of the responses received to our consultations and our consideration of them is set out in Annex 4.

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*".

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.

(ii) Section 7 (Pursuit of Conservation Objectives)

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.

We have considered the impact of the installation on local wildlife sites within 2km which are not designated as either European Sites or SSSIs. We are satisfied that no additional conditions are required.

(iii) 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 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, which was saved to our electronic data management system.

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 **The Conservation of Natural Habitats and Species Regulations 2010**

We have assessed the Application in accordance with guidance agreed jointly with Natural England and concluded that there will be no likely significant effect on any European Site.

We consulted Natural England by means of an Appendix 11 assessment, and they agreed with our conclusion, that the operation of the Installation would not have a likely significant effect on the interest features of protected sites.

The habitat assessment is summarised in greater detail in section 5.4 of this document. A copy of the full Appendix 11 Assessment can be found on the public register.

7.3.2 **Water Framework Directive Regulations 2003**

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 the requirements of the Water Framework Directive through (inter alia) EP permits, and its obligation in regulation 17 to have regard to the river basin management plan (RBMP) approved under regulation 14 and any supplementary plans prepared under regulation 16. However, it is felt that existing conditions are sufficient in this regard and no other appropriate requirements have been identified.

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 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

IED Article	Requirement	Delivered by
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 2.3.3(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 2.3.3(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), S3.3 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 2.3.12 and 2.3.13.
45(2)(a)	The permit shall include a list of the quantities of the different categories of hazardous waste which may be treated.	Not Applicable
45(2)(b)	The permit shall include the minimum and maximum mass flows of those hazardous waste, their lowest and maximum calorific values and the maximum contents of polychlorinated biphenyls, pentachlorophenol, chlorine, fluorine, sulphur, heavy metals and	Not Applicable

IED Article	Requirement	Delivered by
	other polluting substances.	
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.
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.	Not applicable
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^3), CO and TOC not to be exceeded during this period.	Condition 2.3.12
47	In the event of breakdown, reduce or close down operations as soon as practicable. Limits on dust (150 mg/m^3), CO and TOC not to be exceeded during this period.	Condition 2.3.12
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	Condition 3.5.3, and tables S3.1, S3.1(a), and S3.4

IED Article	Requirement	Delivered by
	shall be subject to control and to annual surveillance tests as set out in point 1 of Part 6 of Annex VI.	
48(3)	The competent authority shall determine the location of sampling or measurement points to be used for monitoring of emissions.	Conditions 3.5.3 and 3.5.4
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 850ºC for two seconds, as measured at representative point of the combustion chamber.	Condition 2.3.8, Pre-operational condition PO6 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 2.3.9
50(4)(a)	Automatic shut to prevent waste feed at start up until the specified temperature has been reached.	Condition 2.3.8
50(4)(b)	Automatic shut to prevent waste feed if the combustion temperature is not maintained.	Condition 2.3.8
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 2.3.8
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 PO2) and then every 2

IED Article	Requirement	Delivered by
		years (Conditions 1.2.1 to 1.2.3)
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, 2.3.3, 3.2, 3.3, 3.4 and 3.6.
52(2)	Determine the mass of each category of wastes, if possible according to the EWC, prior to accepting the waste.	Condition 2.3.3(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 S3.6
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.

IED Article	Requirement	Delivered by
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 S3.6 and pre-operational condition PO3.
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.

Pre-operational measures		
Reference	Operation	Pre-operational measures
PO1A	Resource recovery facility (AR6, AR7, AR8)	Prior to the commencement of commissioning of the resource recovery facility, 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 including operational procedures relevant to the energy recovery facility. 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 www.gov.uk). 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.
PO1B	Energy recovery facility (AR1)	Prior to the commencement of commissioning of the energy recovery facility, 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 including operational procedures relevant to the energy recovery facility. 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 www.gov.uk). 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	Energy recovery facility (AR1)	Prior to the commencement of commissioning, the Operator shall send a report to the Environment Agency which will contain a comprehensive review of the options available for utilising the heat generated by the waste incineration process in order to ensure that it is recovered as far as practicable. The review shall

Pre-operational measures		
Reference	Operation	Pre-operational measures
		detail any identified proposals for improving the recovery and utilisation of waste heat and shall provide a timetable for their implementation.
PO3	Energy recovery facility (AR1)	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.
PO4A	Resource recovery facility (AR6, AR7, AR8)	Prior to the commencement of commissioning of the resource recovery facility; the Operator shall provide a written commissioning plan, including timelines for completion, for approval by the Environment Agency. The commissioning plan shall include the expected emissions to the environment during the different stages of commissioning, the expected durations of commissioning activities and the actions to be taken to protect the environment and report to the Environment Agency in the event that actual emissions exceed expected emissions. Commissioning shall be carried out in accordance with the commissioning plan as approved.
PO4B	Energy recovery facility (AR1)	Prior to the commencement of commissioning of the energy recovery facility; the Operator shall provide a written commissioning plan, including timelines for completion, for approval by the Environment Agency. The commissioning plan shall include the expected emissions to the environment during the different stages of commissioning, the expected durations of commissioning activities and the actions to be taken to protect the environment and report to the Environment Agency in the event that actual emissions exceed expected emissions. Commissioning shall be carried out in accordance with the commissioning plan as approved.
PO5A	Resource recovery facility (AR6, AR7, AR8)	Prior to the commencement of commissioning of the resource recovery facility, 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

Pre-operational measures		
Reference	Operation	Pre-operational measures
		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 Environment Agency.
PO5B	Energy recovery facility (AR1)	Prior to the commencement of commissioning of the energy recovery facility, 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 Environment Agency.
PO6	Energy recovery facility (AR1)	After completion of furnace design and at least three calendar months before any furnace operation; the operator shall submit a written report to the Agency of the details of the computational fluid dynamic (CFD) modelling. The report shall demonstrate whether the design combustion conditions comply with the residence time and temperature requirements as defined by Chapter IV of the IED.
PO7A	Resource recovery facility	Prior to the commencement of commissioning, the Operator shall submit a report on the baseline conditions of soil and groundwater at the installation. The report shall contain the information necessary to determine the state of soil and groundwater contamination so as to make a quantified comparison with the state upon definitive cessation of activities provided for in Article 22(3) of the IED. The report shall contain information, supplementary to that already provided in application Site Condition Report, needed to meet the information requirements of Article 22(2) of the IED.
PO7B	Energy recovery facility (AR1)	Prior to the commencement of commissioning, the Operator shall submit a report on the baseline conditions of soil and groundwater at the installation. The report shall contain the information necessary to determine the state of soil and groundwater contamination so as to

Pre-operational measures		
Reference	Operation	Pre-operational measures
		make a quantified comparison with the state upon definitive cessation of activities provided for in Article 22(3) of the IED. The report shall contain information, supplementary to that already provided in application Site Condition Report, needed to meet the information requirements of Article 22(2) of the IED.
PO8	Any part of the installation	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.
PO9	Energy recovery facility (AR1)	At least three months before operation, the Operator shall 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: • Plant and equipment details, including accreditation to MCERTS • Methods and standards for sampling and analysis Details of monitoring locations, access and working platforms
PO10A	Resource recovery facility (AR6, AR7, AR8)	The operator shall submit a written report to the Environment Agency demonstrating how the site meets the relevant criteria set out within the Environment Agency's Fire Prevention Plan guidance. The report shall be submitted to the Environment Agency for approval.
PO10B	Energy recovery facility (AR1)	The operator shall submit a written report to the Environment Agency demonstrating how the site meets the relevant criteria set out within the Environment Agency's Fire Prevention Plan guidance. The report shall be submitted to the Environment Agency for approval.
PO11	Energy recovery facility (AR1)	At least 6 months prior to construction of the Energy Recovery Facility the operator shall submit

Pre-operational measures		
Reference	Operation	Pre-operational measures
		a report to the Environment Agency providing detailed designs for the proposed flue gas treatment system and obtain the Environment Agency's written approval to it. The report shall include but is not limited to the following considerations: 1) that the final design will meet the requirements of BAT; 2) that the application still accurately reflects the final operating proposals; and 3) that the environmental impact assessment still accurately reflects the predicted impacts from the proposal. The operator shall submit a written report to the Environment Agency for approval, 6 months prior to construction, detailing the findings of this review.
PO12A	Resource recovery facility (AR6, AR7, AR8)	The operator shall submit an odour management plan (OMP) to the Environment Agency demonstrating how emissions of odour will be either prevented or where this is not practicable, minimised in line with Environment Agency guidance H4. The OMP shall be submitted to the Environment Agency for approval.
PO12B	Energy recovery facility (AR1)	The operator shall submit a written odour management plan (OMP) to the Environment Agency for approval. The OMP should demonstrate how emissions of odour will be either prevented or where this is not practicable, minimise odour in line with Environment Agency guidance H4.
PO13	Waste water treatment plant (AR2)	The operator shall submit a report to the Environment Agency providing detailed designs for the waste water treatment plant. The operator shall undertake a review of the final detailed design prior to installation to ensure that: 1) the final design will meet the requirements of BAT; and 2) the predicated emissions from the proposal will not result in an unacceptable deterioration of the receiving waters. This shall be supported by a risk assessment using the Environment Agency's H1 screening tool

Pre-operational measures		
Reference	Operation	Pre-operational measures
		The operator shall submit a written report to the Environment Agency for approval, 6 months prior to construction, detailing the findings of this review.
PO14	Gully waste management	The operator shall submit a report to the Environment Agency outlining the results of the characterisation of both the liquid and solid fractions of gully waste using samples taken from existing sites and / or published research. The analysis shall include but is not limited to the following parameters: • Hydrocarbons, metals, BOD and COD. Based on the characterisation results the operator shall outline how the wastewater treatment plant will be designed to treat the gully waste to a achieve levels of pollutant that will result in no unacceptable environmental impact on the environment in line with the Environment Agency's H1 guidance. The operator shall submit a written report to the Environment Agency for approval, 6 months prior to construction of the gulley waste management facility, detailing the findings of this review.

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.

Improvement programme requirements		
Reference	**Improvement measure**	**Completion date**
IC1A	The Operator shall submit a written report to the Environment Agency on the implementation of the resource recovery facility Environmental Management System 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 of the resource recovery facility.
IC1B	The Operator shall submit a written report to the Environment Agency on the implementation of the energy recovery facility Environmental Management System 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 date on which waste is first burnt.
IC2	The Operator shall submit a written proposal to the Environment Agency to carry out tests to determine the size distribution of the particulate matter in the exhaust gas emissions to air from emission point A1 and A2, identifying the fractions within the PM_{10}, and $PM_{2.5}$ ranges. The proposal shall include a timetable for approval by the Environment Agency to carry out such tests and produce a report on the results. On receipt of written agreement by the Environment Agency to the proposal and the timetable, the Operator shall carry out the tests and submit to the Environment Agency a report on the results.	Within 6 months of the completion of commissioning of the energy recovery facility.
IC3A	The Operator shall submit a written report to the Environment Agency on the commissioning of the resource recovery facility. The report shall summarise the environmental performance of the plant as installed against the design parameters set out in the Application. The report shall also include a review of the performance of the facility against the conditions of this permit and details of	Within 4 months of the completion of commissioning of the resource recovery facility.

	procedures developed during commissioning for achieving and demonstrating compliance with permit conditions.	
IC3B	The Operator shall submit a written report to the Environment Agency on the commissioning of the energy recovery facility. The report shall summarise the environmental performance of the plant as installed against the design parameters set out in the Application. The report shall also include a review of the performance of the facility against the conditions of this permit and details of procedures developed during commissioning for achieving and demonstrating compliance with permit conditions.	Within 4 months of the completion of commissioning of the energy recovery facility.
IC4	The Operator shall carry out checks to verify the residence time, minimum temperature and oxygen content of the exhaust gases in the furnace whilst operating under the anticipated most unfavourable operating conditions. The results shall be submitted in writing to the Environment Agency.	Within 4 months of the completion of commissioning of the energy recovery facility.
IC5	The Operator shall submit a written report to the Environment Agency describing the performance and optimisation of the Selective Catalytic Reduction (SCR) system and combustion settings to minimise oxides of nitrogen (NO_x) emissions within the emission limit values described in this permit with the minimisation of nitrous oxide emissions. The report shall include an assessment of the level of NO_x and N_2O emissions that can be achieved under optimum operating conditions. The report shall also provide details of the optimisation (including dosing rates) for the control of acid gases and dioxins.	Within 4 months of the completion of commissioning of the energy recovery facility.
IC6	The Operator shall submit a written summary report to the Agency to confirm by the results of calibration and verification testing that the performance of Continuous Emission Monitors for parameters as specified in Table S3.1 and Table S3.1(a) complies with the requirements of BS EN 14181, specifically the requirements of QAL1, QAL2 and QAL3.	Initial calibration report to be submitted to the Agency within 3 months of completion of commissioning of the energy recovery facility. Full summary evidence compliance

		report to be submitted within 18 months of commissioning of the energy recovery facility.

ANNEX 4: Consultation Reponses

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 draft 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 30/03/16 to 27/04/16 and in the Enfield Advertiser on 30/03/16. The Application was made available to view on our Public Register at Apollo Court, Bishops Square Business Park, Hatfield, AL10 9EX.

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

- Enfield Council – Local Authority, Environmental Health
- London Fire Service
- Public Health England
- Director of Public Health
- Food Standards Agency
- Health and Safety Executive

1) Consultation Responses from Statutory and Non-Statutory Bodies

Response Received from Enfield Council – Environmental Health	
Brief summary of issues raised:	Summary of action taken / how this has been covered
No response received	Not applicable

Response Received from London Fire Service	
Brief summary of issues raised:	Summary of action taken / how this has been covered
No response received	Not applicable

Response Received on 06/04/16 from Public Health England	
Brief summary of issues raised:	Summary of action taken / how this has been covered
We recommend that any Environmental Permit issued for this site should contain conditions to ensure that the following potential emissions do not impact upon public health: • Emissions to air from point sources, in particular nitrogen dioxide (NO_2) and particulate matter, given that the site is	Our consideration of the installation's environmental impact and health impacts from point source emissions to air is recorded at sections 5.1 – 5.3 of this document. We are satisfied that operation of the installation will deliver a high level of protection for human health. The permit would contain emission limit values in line with or where appropriate,

located within an Air Quality Management Area (AQMA); • Fugitive emissions of particulate matter or dusts from activities on site; and • Odours arising from all activities on site including waste delivery, handling, sorting, shredding, storage and transfer. Furthermore, the Environment Agency may wish to ensure that an Accident Management Plan is in place for the site which sufficiently covers the risk of fire, in accordance to the guidance on Fire Prevention Plans. Based solely on the information contained in the application provided, PHE has no significant concerns regarding risk to health of the local population from this proposed activity, providing that the applicant takes all appropriate measures to prevent or control pollution in accordance with the relevant sector technical guidance or industry best practice. In relation to potential risk to public health, we recommend that the Environment Agency also consult the following relevant organisations in relation to their areas of expertise: 1. The local Authority 2. The Food Standards agency 3. The Director of Public Health.	below the Industrial Emissions Directive and suitable monitoring and reporting requirements to ensure that the plant will be operated in a way that minimise its impact on human health and the environment. Our consideration of the potential impact from odour, noise and fugitive emissions is recorded in sections 6.5 of this document. We are satisfied that appropriate control measures have been proposed to prevent and / or minimise potential impact on human health and the environment. The Operator is required to have both an Accident Management Plan and a Fire Prevention Plan in accordance with the Environment Agency's guidance prior to operation of the site. These are specified within pre-operational conditions. We have consulted with the following relevant organisations in relation to their areas of expertise: 1. The local Authority 2. The Food Standards Agency 3. The Director of Public Health.

Response Received from Director of Public Health	
Brief summary of issues raised:	Summary of action taken / how this has been covered
No response received	Not applicable

Response Received from Food Standards Agency	
Brief summary of issues raised:	Summary of action taken / how this has been covered
No response received	Not applicable

Response Received from Health and Safety Executive		
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Summary of issues raised:	Summary of action taken / how this has been covered
No response received	Not applicable

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

a) Representations from Local MP, Assembly Member (AM), Councillors and Parish / Town / Community Councils

No responses were received.

b) Representations from Community and Other Organisations

No responses were received.

c) Representations from Individual Members of the Public

One response was received from an individual member of the public dated 21/04/16. The response raised the following issues:

Summary of issues raised	Summary of action taken / how this has been covered
• Concern that the activity could have a detrimental effect on the health of the people in Edmonton. • The waste facility which treats sewage for all seven London boroughs is located in Edmonton.	**Potential impact on health** Our consideration of the installation's environmental impact and health impacts is recorded at Sections 5.1 – 5.3 of this document. We are satisfied that operation of the installation will deliver a high level of protection for human health. **Location of the installation:** Decisions over land use are matters for the planning system. The location of the installation is a relevant consideration for Environmental Permitting, but only in so far as its potential to have an adverse environmental impact on communities or sensitive environmental receptors. The environmental impact is assessed as part of the determination process and has been reported upon in the main body of this document. Where relevant our assessment has taken into account existing background levels of pollutants including those from existing facilities.