Determination of an Application for an Environmental Permit under the Environmental Permitting (England & Wales) Regulations 2016

The Permit Number is:	EPR/CP3803LV
The Applicant / Operator is:	Northacre Renewable Energy Limited
The Installation is located at:	Northacre Industrial Estate Stephenson Road Westbury BA13 4WE

What this document is about

This is a decision document, which accompanies a permit.

It explains how we have considered the Applicant's Application, and why we have included the specific conditions in the permit we have issued 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.

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/CP3803LV/A001. We refer to the application as "the **Application**" in this document in order to be consistent.

The number we have given the permit is EPR/CP3803LV. We refer to the permit as "the **Permit**" in this document.

The Application was duly made on 20/10/2020.

The Applicant is Northacre Renewable Energy Limited. We refer to Northacre Renewable Energy Limited as "the **Applicant**" in this document. Where we are talking about what will happen after the Permit is granted we call Northacre Renewable Energy Limited "the **Operator**".

Northacre Renewable Energy Limited's facility is located at Northacre Industrial Estate, Stephenson Road, Westbury, BA13 4WE
We refer to this as "the **Installation**" 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.)

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

HHRAP	Human Health Risk Assessment Protocol
HPA	Health Protection Agency (now UKHSA, UK Health Security Agency)
HRA	Human Rights Act 1998
HW	Hazardous waste
HWI	Hazardous waste incinerator
IBA	Incinerator Bottom Ash
IED	Industrial Emissions Directive (2010/75/EU)
IPPCD	Integrated Pollution Prevention and Control Directive (2008/1/EC) – now superseded by IED
I-TEF	Toxic Equivalent Factors set out in Annex VI Part 2 of IED
I-TEQ	Toxic Equivalent Quotient calculated using I-TEF
LCPD	Large Combustion Plant Directive (2001/80/EC) – now superseded by IED
LCV	Lower calorific value – also termed net calorific value
LfD	Landfill Directive (1999/31/EC)
LADPH	Local Authority Director(s) of Public Health
LOI	Loss on Ignition
MBT	Mechanical biological treatment
MSW	Municipal Solid Waste
MWI	Municipal waste incinerator
NOx	Oxides of nitrogen (NO plus NO_2 expressed as NO_2)
OTNOC	Other than normal operating conditions
PAH	Polycyclic aromatic hydrocarbons
PC	Process Contribution
PCB	Polychlorinated biphenyls
PEC	Predicted Environmental Concentration
PHE	Public Health England (now UKHSA, UK Health Security Agency)
POP(s)	Persistent organic pollutant(s)
PPS	Public participation statement
PR	Public register
PXDD	Poly-halogenated di-benzo-p-dioxins
PXB	Poly-halogenated biphenyls
PXDF	Poly-halogenated di-benzo furans
RDF	Refuse derived fuel
RGS	Regulatory Guidance Series

SAC	Special Area of Conservation
SED	Solvent Emissions Directive (1999/13/EC) – now superseded by IED
SCR	Selective catalytic reduction
SGN	Sector guidance note
SHPI(s)	Site(s) of High Public Interest
SNCR	Selective non-catalytic reduction
SPA(s)	Special Protection Area(s)
SS	Sewage sludge
SSSI(s)	Site(s) of Special Scientific Interest
SWMA	Specified waste management activity
TDI	Tolerable daily intake
TEF	Toxic Equivalent Factors
TGN	Technical guidance note
TOC	Total Organic Carbon
UHV	Upper heating value –also termed gross calorific value
UN_ECE	United Nations Environmental Commission for Europe
US EPA	United States Environmental Protection Agency
WFD	Waste Framework Directive (2008/98/EC)
WHO	World Health Organisation
WID	Waste Incineration Directive (2000/76/EC) – now superseded by IED

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

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

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

The Permit contains many conditions taken from our standard Environmental Permit template including the relevant Annexes. We developed these conditions in consultation with industry, having regard to the legal requirements of the Environmental Permitting Regulations and other relevant legislation. This document does not therefore include an explanation for these standard conditions. Where they are included in the permit, we have

considered the Application and accepted the details are sufficient and satisfactory to make the standard condition appropriate. This document does, however, provide an explanation of our use of "tailor-made" or installation-specific conditions, or where our Permit template provides two or more options.

2 How we reached our decision

2.1 Receipt of Application

The Application was duly made on 20/10/2020. This means we considered it was in the correct form and contained sufficient information for us to begin our determination but not that it necessarily contained all the information we would need to complete that determination: see below.

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

2.2 Consultation on the Application

We carried out consultation on the Application in accordance with the EPR, our statutory PPS and our own internal guidance RGS Note 6 for Determinations involving Sites of High Public Interest. We consider that this process satisfies, and frequently goes beyond the requirements of the Aarhus Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters, which are directly incorporated into the IED, which applies to the Installation and the Application. We have also taken into account our obligations under the Local Democracy, Economic Development and Construction Act 2009 (particularly Section 23). This requires us, where we consider it appropriate, to take such steps as we consider appropriate to secure the involvement of representatives of interested persons in the exercise of our functions, by providing them with information, consulting them or involving them in any other way. In this case, our consultation already satisfies the Act's requirements.

We advertised the Application by a notice placed on our website, which contained all the information required by the IED, including telling people where and when they could see a copy of the Application. We also placed an advertisement in the Wiltshire Times on 27/11/2020 and sent out newsletters. Due to the COVID pandemic we were not able to carry out any face-to-face consultation such as a drop in event. However we carried out an extended consultation over a 12 week period.

We made a copy of the Application and all documents available to view on our **Online Consultation Portal, Citizen Space:** https://consult.environment-agency.gov.uk/psc/ba13-4we-northacre-renewable-energy-limited/

A hard copy of the Application was also available if people could not view the Application on-line.
We made a copy of the Application and all other documents relevant to our determination (see below) available to view on our Public Register

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

- Food Standards Agency
- Wiltshire Council
- Public Health England
- Director of Public Health

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

Written comments were accepted by the Environment Agency beyond the formal consultation period. Further details along with a summary of consultation comments and our response to the representations we received can be found in Annex 4. We have taken all relevant representations into consideration in reaching our determination.

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:

- 20/04/2021 and
- 22/11/2021

A copy of each information notice and the responses were placed on our public register. They were also made available to view on the consultation citizen space page listed in section 2.2 above.

We consulted on our draft decision from 10/03/22 until 22/04/22. Whilst the consultation closed on 22/04/22, we accepted (and considered) any representations received after this date up to permit issue. A newsletter was distributed to inform people of the consultation. A summary of the consultation responses and how we have taken into account all relevant representations is shown in Annex 4, Part B.

3 The legal framework

The Permit is granted under Regulation 13 of the EPR. The Environmental Permitting regime is a legal vehicle which delivers most of the relevant legal requirements for activities falling within its scope. In particular, the regulated facility is:

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

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

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

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

4 The Installation

4.1 Description of the Installation and related issues

4.1.1 The permitted activities

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

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

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

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

Many activities which would normally be categorised as "directly associated activities" for EPR purposes (see below), such as air pollution control plant,

and the ash storage bunker, are therefore included in the listed activity description.

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

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

4.1.2 The Site

The Installation is located at land off Stephenson Road in the Northacre Trading Estate, approximately 1.5 km to the north-west of Westbury town centre in Wiltshire. The Facility will be located at an approximate National Grid Reference of ST 85723 52037, with the nearest postcode listed as BA13 4WE.
The site is located on a parcel of land between Arla Foods Westbury Dairies to the north-east and the Northacre Resource Recovery Centre to the south-east. Stephenson Road is immediately north of the site whilst there are fields to the south side of the site. Access to the site is from Stephenson Road, which links via the B3097 to the A350.
The nearest residential properties are on Brook Lane to the east, Brook Farm and Orchard House to the south west, and houses on Storridge Road to the north-east. Biss Brook is ~ 140 m to the west.

Further information on the site is addressed below at 4.3.

4.1.3 What the Installation does

Our view is that for the purposes of IED (in particular Chapter IV) and EPR, the installation is a waste incineration plant because:

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

Waste will be delivered either by vehicles or via an enclosed conveyor from an adjacent Mechanical Biological Treatment (MBT) plant. The waste will be tipped by vehicles into the waste bunker in the reception hall; waste via the conveyor will go via a hopper into the bunker.

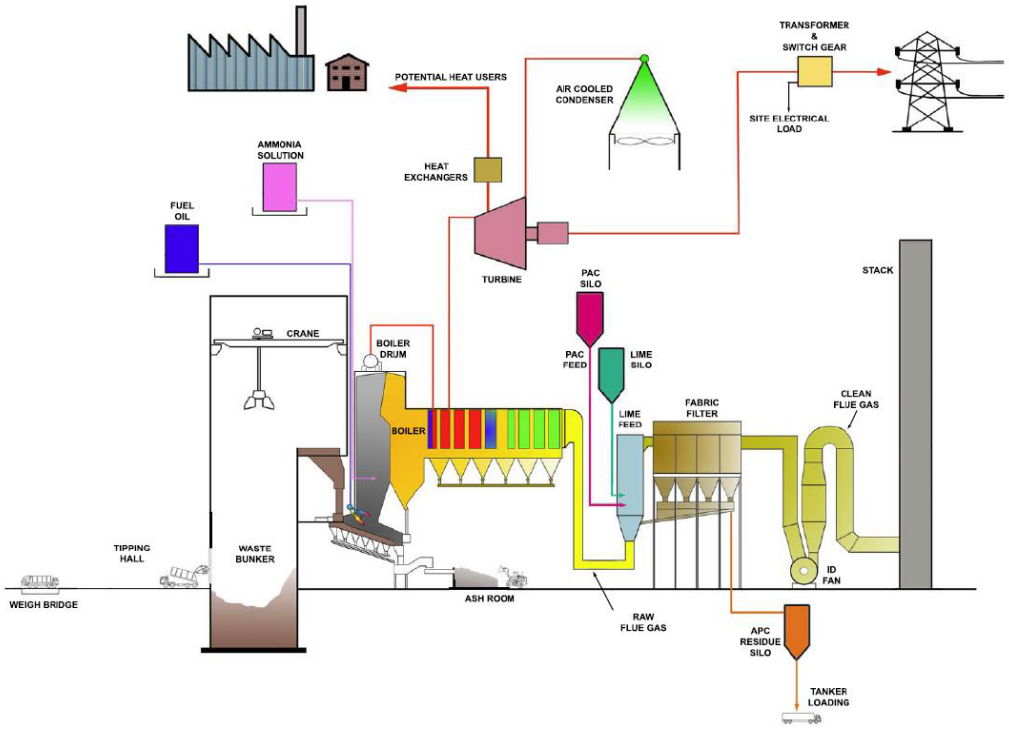
A grab crane will be used to homogenise the waste and transfer it to a feed hopper that will feed the moving grate furnace where the waste will be burned. Combustion will be controlled by feeding primary air through the grate and secondary air will be injected above the waste. The furnace will be designed

to ensure that the combustion gases are maintained, after the last injection of combustion air, to at least 850 ºC for a minimum of two seconds. Combustion air will be drawn from the waste reception area to maintain negative pressure to ensure odour control.
Emissions to air will be via a 75 m high stack and will be minimised by cleaning the waste combustion gases as follows:

- Oxides of nitrogen (NOx) will be abated using Selective Non-Catalytic Reduction (SNCR)
- Acid Gases will be abated using a lime abatement system
- Dioxins, mercury and volatiles abated using activated carbon injection
- Particulate matter and metals abated by bag filters

Hot gases from the incineration of waste will be used to generate steam in a boiler. The design of the boilers, will ensure that the flue gas temperature is quickly reduced to minimise the risk of dioxin reformation. The steam generated in the boilers will be fed to a steam turbine which will generate electricity. Water for steam generation will be sourced from the mains to use in the boilers. Steam will be condensed in an air cooled condenser and recycled to the boiler. Process waste water will be re-used for quenching bottom ash.
After quenching in water, bottom ash will be kept in an indoor storage area, before unloading onto vehicles in an enclosed building. Air pollution control (APC) residues will be stored in silos prior to removal from site in sealed tankers.
Under normal operation all process water will be re-used. In the case of abnormal operation, such as emptying of the boiler, effluent will be discharged to sewer or removed from site by tanker.

Surface water run-off will be collected from areas of hardstanding and building roofs and discharged into the surface water drainage systems. All surface run-off will pass through a petrol interceptor prior to discharge into the attenuation pond, before final discharge into the Northacre Trading Estate drainage system. The Installation will generate electricity at a rate of ~ 28.6 MWe with ~ 25.7 MWe available for export to the national grid.
The operator will have an environmental management system and intends to have it certified to ISO 14001.



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

Waste throughput, Tonnes/line	243,000 t/annum based on 7,800 hours operation or 270,600 tonnes per year based on continual operation	30.9 t/hour
Waste processed	MSW	
Number of lines	1	
Furnace technology	Grate	
Auxiliary Fuel	Gas Oil	
Acid gas abatement	Dry	Lime
NOx abatement	SNCR	Ammonia
Reagent consumption	Auxiliary Fuel: 260 t/annum Ammonia : 770 t/annum Lime : 4 ,450 t/annum Activated carbon: 70 t/annum Process water: 38,544 t/annum	
Flue gas recirculation	No	
Dioxin abatement	Activated carbon	
Stack	Grid Reference: 385787, 152056	
	Height, 75 m	Diameter, 2.30 m
Flue gas	Flow, 51.3 Nm^3/s	Velocity, 15.3 m/s
	Temperature 130°C	
Electricity generated	28.6 MW	
Electricity exported	25.63 MW	
Steam conditions	Temperature, 430 °C	Pressure, 76.5 bar

4.1.4 Key Issues in the Determination

The key issues arising during this determination were; assessment of the impact from air emissions and the assessment of BAT we therefore describe how we determined these issues in most detail in this document.

4.2 The site and its protection

4.2.1 Site setting, layout and history

The site is approximately 2.6 ha and situated on the Northacre Trading Estate, approximately 1.5 km to the north-west of Westbury town centre in Wiltshire Council.

The Applicant described previous uses of the site:

- 1886 to 1856 agricultural field. Fences and tree lines separate the south most corner and the eastern most corner from the site.
- By 1967, the boundary that separated the eastern corner is no longer shown on the Ordinance Survey mapping. There are no other changes to the land use.
- By 2014, an asphalt access road has been constructed.

There are no Groundwater Source Protection Zones within 500 m of the installation boundary.

The area of land which the Facility will be located on will be prepared for construction. Whilst it is considered unlikely due to the green-field nature of the site, if during preparation works any contamination is identified, samples will be taken and records retained. Records of any remediation undertaken during the construction phase will also be retained. This information will be used to further update the baseline ground conditions for the installation prior to the commencement of operations.

4.2.2 Proposed site design: potentially polluting substances and prevention measures

The Applicant described measures to prevent pollution to ground and groundwater from potentially polluting substances. They are summarised below:

- Waste will be delivered to and stored in a reinforced, waterproof concrete bunker.
- The waste water pit will be constructed of concrete in accordance with BS EN 1992-3. It will be subject to inspections and preventative maintenance.

- Potentially polluting liquids will be stored in tanks or containers in bunds on impermeable surfacing. All filling and emptying points will be within the bunds.
- The EMS will include procedures for unloading and storage of materials. The will include measures to prevent overfilling.
- Bottom ash will be stored inside a fully enclosed area with an impermeable surface with sealed drainage. It will be transported off-site in covered trucks.
- APC residues will be transferred to a storage silo via a pneumatic conveying system. The storage silo will be in an area of impermeable surfacing and sealed drainage. It will be transported off-site in enclosed tankers.
- Prompt clean-up will be undertaken if spills occur.

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

The Applicant has not submitted a complete baseline report. We have therefore set a pre-operational condition (PO6) 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 installation and at cessation of activities at the installation

4.2.3 Closure and decommissioning

Having considered the information submitted in the Application, we are satisfied that the appropriate measures will be in place for the closure and decommissioning of the Installation, as referred to in section 2.11 of the Application. Pre-operational condition PO1 requires the Operator to have an Environmental Management System in place before the Installation is operational, and this will include a site closure plan.

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

4.3 Operation of the Installation – general issues

4.3.1 Administrative issues

The Applicant is the sole Operator of the Installation.

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

4.3.2 Management

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

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

4.3.3 Site security

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

4.3.4 Accident management

The Applicant has 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 a pre-operational condition (PO1).

The Applicant submitted a Fire Prevention Plan. We are satisfied that the plan will minimise the risk of a fire and limit the impact of a fire in the event that one occurred.

4.3.5 Off-site conditions

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

4.3.6 Operating techniques

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

Description	Parts Included
The Application	Application supporting document sections: 1.3, 2.1, 2.2 (excluding table 5), 2.3, 2.4.2, 2.4.3, 2.4.4, 2.5.2, 2.6.4 point 1, 2.7.1, 2.8, 2.9
Response to Schedule 5 Notice 20/04/21	Response to questions 4,5,6,7,8,9,11. Air emissions management plan
Response to Schedule 5 Notice dated 22/11/21	Response to question 1

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

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

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

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

(i) these wastes are categorised as municipal waste in the European Waste Catalogue or are non-hazardous wastes similar in character to municipal waste;
(ii) the wastes are all categorised as non-hazardous in the European Waste Catalogue and are capable of being safely burnt at the installation.
(iii) these wastes are likely to be within the design calorific value (CV) range for the plant;

(iv) these wastes are unlikely to contain harmful components that cannot be safely processed at the Installation.

The Permit (conditions 2.3.5 and 2.3.6) restricts the receipt of separately collected fractions.

The design capacity of the Installation is 243,000 tonnes per year based on an average CV and 7,860 hours operation per year. The Applicant's risk assessments were based on continual operation which would equate to approximately 270,500 tonnes per year. The Permit restricts throughput to this maximum value.

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

4.3.7 Energy efficiency

(i) Consideration of energy efficiency

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

1. The use of energy within, and generated by, the Installation which are normal aspects of all EPR permit determinations. This issue is dealt with in this section.

2. The extent to which the Installation meets the requirements of Article 50(5) of the IED, which requires *"the heat generated* during the incineration and co-incineration process is *recovered as far as practicable through the generation of heat, steam or power*". This issue is covered in this section.

3. The combustion efficiency and energy utilisation of different design options for the Installation are relevant considerations in the determination of BAT for the Installation, including the Global Warming Potential of the different options. This aspect is covered in the BAT assessment in section 6 of this Decision Document.

4. The extent to which the Installation meets the requirement of Article 14(5) of the Energy Efficiency Directive which requires new thermal electricity generation installations with a total thermal input exceeding 20 MW to carry out a cost-benefit assessment to "*assess the cost and benefits of providing for the operation of the installation as a high-efficiency cogeneration installation*".
   Cogeneration means the simultaneous generation in one process of thermal energy and electrical or mechanical energy and is also known as combined heat and power (CHP)
   High-efficiency co-generation is cogeneration which achieves at least 10% savings in primary energy usage compared to the separate

generation of heat and power – see Annex II of the Energy Efficiency Directive for detail on how to calculate this.

(ii) Use of energy within the Installation

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

The Application details several measures that will be implemented at the Installation to increase its energy efficiency:

- The Facility has been designed with careful attention being paid to all normal energy efficiency design features, such as high efficiency motors, high efficiency variable speed drives, high standards of cladding and insulation
- An energy efficiency plan will be developed.

The Application shows that the specific energy consumption, a measure of total energy consumed per unit of waste processed, will be 96 kWh/tonne.

The BREF says that electricity consumption is typically between 60 KWh/t and 190 KWh/t depending on the LCV of the waste.

Specific energy consumption in the Application is in line with that set out above.

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

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

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

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

In cases where there are no immediate opportunities for the supply of heat from the outset, the Environment Agency considers that BAT is to build the plant to be CHP Ready (CHP-R) to a degree which is dictated by the likely

future opportunities which are technically viable and which may, in time, also become economically viable.

The BREF says that 0.4 – 0.8 MWh of electricity can be generated per tonne of waste.
Our technical guidance note, SGN EPR S5.01, states that where electricity only is generated, 5-9 MW of electricity should be recoverable per 100,000 tonnes/annum of waste (which equates to 0.4 – 0.72 MWh/tonne of waste).

The Installation will generate electricity only and has been specified to maximise electrical output with little or no use of waste heat. The Application shows 28.6 MW of electricity produced for an annual burn of 243,000 tonnes, which represents 11.8 MW per 100,000 tonnes/yr of waste burned (0.93 MWh/tonne of waste). The Installation is therefore above the indicative BAT range.

The Application shows that the gross electrical efficiency will be 31.7% which is towards the top of the BAT AEEL range of 25-35%.

In accordance with BAT 2 table S3.4 of the Permit requires the gross electrical efficiency to be measured by carrying out a performance test at full load.

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

The location of the Installation largely determines the extent to which waste heat can be utilised, and this is a matter for the planning authority. The Applicant carried out a feasibility study and provided a CHP-R assessment as part of their application, which showed there was potential to provide district heating to local businesses; suitable opportunities are being explored, though there are no firm commitments at this stage. There is provision within the design of the steam turbine to extract low-grade steam for a district heating scheme. Establishing a district heating network to supply local users would involve significant technical, financial and planning challenges such that this is not seen as a practicable proposition at present.

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

(iv) Choice of Steam Turbine

The Application showed that the steam conditions will be 430 ºC and 75.5 Bar. We are satisfied that this represents BAT in terms of steam conditions to ensure efficient energy recovery.

(v) Choice of Cooling System

The Applicant has chosen an air cooled cooling system. This was justified on the basis that it will reduce water usage, not require a cooling tower and not result in a water discharge.

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

The operator has submitted a cost-benefit assessment of opportunities for high efficiency co-generation within 15 km of the installation in which they calculated net present value. If the NPV is positive (i.e. any number more than zero) it means that the investors will make a rate of return that makes the scheme commercially viable. A negative NPV means that the project will not be commercially viable. The Applicant's assessment showed a net present value of -3.13 which demonstrates that operating as a high-efficiency cogeneration installation will not be financially viable. We agree with the Applicant's assessment and will not require the installation to operate as a high-efficiency cogeneration installation.

(viii) Permit conditions concerning energy efficiency

Pre-operational condition PO2 requires the Operator to carry out a comprehensive review of the available heat recovery options prior to commissioning, to ensure that waste heat from the plant is recovered as far as possible.

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 SNCR 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. Optimising reagent dosage for air abatement systems and minimising the use of auxiliary fuels is further considered in the section on BAT.

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

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

The first objective is to avoid producing waste at all. Waste production will be avoided by achieving a high degree of burnout of the ash in the furnace, which results in a material that is both reduced in volume and in chemical reactivity. Condition 3.1.3 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.

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

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

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

5. Minimising the Installation's environmental impact

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

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

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

5.1 Assessment Methodology

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

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

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

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

5.1.2 Use of Air Dispersion Modelling

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

Once short-term and long-term PCs have been calculated in this way, they are compared with Environmental Standards (ES). ES are described in our web guide 'Air emissions risk assessment for your environmental permit'.

Our web guide sets out the relevant ES as:

- Ambient Air Directive Limit Values
- Ambient Air Directive and 4th Daughter Directive Target Values
- UK Air Quality Strategy Objectives
- Environmental Assessment Levels

Where an Ambient Air Directive (AAD) Limit Value exists, the relevant standard is the AAD Limit Value. Where an AAD Limit Value does not exist,

AAD target values, UK Air Quality Strategy (AQS) Objectives or Environmental Assessment Levels (EALs) are used. Our web guide sets out EALs which have been derived to provide a similar level of protection to Human Health and the Environment as the AAD limit values, AAD target and AQS objectives. In a very small number of cases, e.g. for emissions of lead, the AQS objective is more stringent that the AAD value. In such cases, we use the AQS objective for our assessment.

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

PCs are screened out as **Insignificant** if:

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

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

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

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

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

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

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

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

provide suitable proposals. Whether or not exceedences are considered likely, the application is subject to the requirement to operate in accordance with BAT.

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

If after reviewing 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 appendix E of the Application. The assessment comprises:

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

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

The Applicant has assessed the Installation's potential emissions to air against the relevant air quality standards, and the potential impact upon local conservation and habitat sites and human health. These assessments predict the potential effects on local air quality from the Installation's stack emissions using the ADMS 5.2 dispersion model, which is a commonly used computer model for regulatory dispersion modelling. The model used 5 years of meteorological data collected from the weather station at RAF Lyneham between 2015 and 2019. The Applicant stated that Lyneham is approximately 30 km to the west of the Installation and is the closest and most representative meteorological station available. The impact of the terrain surrounding the site upon plume dispersion was considered in the dispersion modelling.

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 15(3), 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)
    - Ammonia (NH_3)
- Second, they assumed that the Installation operates continuously at the relevant long-term or short-term ELVs, i.e. the maximum permitted emission rate
- Metals were considered in more detail as summarised in section 5.2.3 of this decision document.
- Third, the model also considered emissions of pollutants not covered by Annex VI of IED, specifically, polycyclic aromatic hydrocarbons (PAH) and Polychlorinated biphenyls (PCBs). Emission rates used in the modelling have been drawn from data in the Waste Incineration BREF and are considered further in section 5.2.5.

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

Background pollutant levels were based on local and national monitoring data and national modelled background concentrations

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

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

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

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

5.2.1 Assessment of Air Dispersion Modelling Outputs

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

The Applicant's modelling predicted peak ground level exposure to pollutants in ambient air as well as at discreet receptors. In the table below 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 (due to rounding differences). Any such minor discrepancies do not materially impact on our conclusions.

Pollutant	EQS / EAL		Back-ground	Process Contribution (PC)		Predicted Environmental Concentration (PEC)	
	µg/m^3	Reference period	µg/m^3	µg/m^3	% of EAL	µg/m^3	% of EAL
NO_2	40	Annual Mean	13.19	0.76	1.90	14.0	34.9
	200	99.79th %ile of 1-hour means	-	5.04	2.5	-	-
PM_{10}	40	Annual Mean	-	0.05	0.13	-	-
	50	90.41st %ile of 24-hour means	-	0.15	0.30	-	-
$PM_{2.5}$	20	Annual Mean	-	0.05	0.25	-	-
SO_2	266	99.9th %ile of 15-min means	-	4.06	1.5	-	-
	350	99.73rd %ile of 1-hour means	-	3.57	1.02	-	-
	125	99.18th %ile of 24-hour means	-	1.89	1.5	-	-
HCl	750	1-hour average	-	1.27	0.17	-	-
HF	16	Monthly average	-	0.01	0.06	-	-
	160	1-hour average	-	0.21	0.13	-	-
CO	10000	Maximum daily running 8-hour mean	-	8.2	0.08	-	-

Pollutant	EQS / EAL		Back-ground	Process Contribution (PC)		Predicted Environmental Concentration (PEC)	
	µg/m³	Reference period	µg/m³	µg/m³	% of EAL	µg/m³	% of EAL
	30000	1-hour average	-	10.63	0.04	-	-
TOC	2.25	Annual Mean	0.16	0.09	4.00	0.25	11.11
	195	1-hour average	-	2.13	1.09	-	-
PAH	0.00025	Annual Mean	-	$9.50x10^{-7}$	0.38	-	-
NH_3	180	Annual Mean	-	0.09	0.05	-	-
	2500	1-hour average	-	2.13	0.09	-	-
PCBs	0.2	Annual Mean	-	0.00005	0.03	-	-
	6	1-hour average	-	0.00106	0.02	-	-

TOC as 1,3 butadiene for long term and benzene for short term
PAH as benzo[a]pyrene

Pollutant	EQS / EAL		Back-ground	Process Contribution		Predicted Environmental Concentration	
	ng/m³	Reference period	ng/m³	ng/m³	% of EAL	ng/m³	% of EAL
Cd	5	Annual mean	0.57	0.18	3.6	0.75	15.0
Hg	250	Annual mean	-	0.18	0.07	-	-
	7500	1-hour average	-	4.25	0.06	-	-
Sb	5000	Annual mean	-	2.71	0.05	-	-

Pollutant	EQS / EAL		Back-ground	Process Contribution		Predicted Environmental Concentration	
	ng/m³	Reference period	ng/m³	ng/m³	% of EAL	ng/m³	% of EAL
	150000	1-hour average	-	63.8	0.04	-	-
Pb	250	Annual mean	16	2.71	1.08	18.71	7.48
Cu	10000	Annual mean	-	2.71	0.03	-	-
	200000	1-hour average	-	63.8	0.03	-	-
Mn	150	Annual mean	36	2.71	1.81	38.71	25.81
	1500000	1-hour average	-	63.8	0.004	-	-
V	5000	Annual mean	-	2.71	0.05	-	-
	1000	24-hr average	-	63.8	6.38	-	-
As	3	Annual mean	1.1	2.71	90.33	3.81	127.0
Cr (II)(III)	5000	Annual mean	-	2.71	0.05	-	-
	150000	1-hour average	-	63.8	0.04	-	-
Cr (VI)	0.2	Annual mean	7.8	2.71	1355.00	10.51	5255.0
Ni	20	Annual mean	14	2.7100	13.55	16.71	83.6

(i) Screening out emissions which are insignificant

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

- PM10, PM2.5, SO_2, HCl, HF, CO, PAH, NH_3, PCBs and some metals

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

(ii) Emissions unlikely to give rise to significant pollution

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

- NO_2, TOC and some metals

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

(iii) Emissions requiring further assessment

Finally from the tables above the following emissions required further assessment

- As and Cr(VI)

These substances are considered further in section 5.2.3.

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

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

The impact on air quality from particulate emissions has been assessed against the ES for PM_{10} (particles of 10 microns and smaller) and $PM_{2.5}$ (particles of 2.5 microns and smaller). For PM_{10}, the ES are a long term annual average of 40 $\mu g/m^3$ and a short term daily average of 50 $\mu g/m^3$. For $PM_{2.5}$ the ES of 20 $\mu g/m^3$ as a long-term annual average was used, having changed from 25 $\mu g/m^3$ in 2020.

The Applicant's predicted impact of the Installation against these ESs is shown in the tables above. The assessment assumes that **all** particulate emissions are present as PM_{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 ES and below 10% of the short term ES and so can be screened out as insignificant. Therefore we consider the Applicant's proposals for preventing and minimising the emissions of particulates to be BAT for the Installation.

The above assessment also shows that the predicted process contribution for emissions of $PM_{2.5}$ is also below 1% of the ES. 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) <u>Acid gases, SO_2, HCl and HF</u>

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 ES. There is no long term ES for HCl. HF has 2 assessment criteria – a 1-hr ES and a monthly EAL – the process contribution is <1% of the monthly EAL and so the emission screens out as insignificant if the monthly ES is interpreted as representing a long term ES.

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 ES 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 ES values. Therefore we consider the Applicant's proposals for preventing and minimising the emissions of these substances to be BAT for the Installation.

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

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

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

The Applicant has used the ES for 1,3-butadiene for their assessment of the long term impact of VOC. This is based on 1,3-butadiene having the lowest ES of organic species likely to be present in VOC (other than PAH, PCBs, dioxins and furans). This is a conservative assessment with the actual impact likely to be lower.

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

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

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

From the tables above all the other emissions can be screened out as insignificant in that the process contribution is < 1% of the long term ES and <10% of the short term ES.

The ammonia emission is based on a release concentration of 10 mg/m^3. We are satisfied that this level of emission is consistent with the operation of a well controlled SNCR NO_x abatement system.

(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.

There are three sets of BAT AELs for metal emissions:

- An emission limit value of 0.02 mg/m^3 for mercury and its compounds (formerly WID group 1 metals).
- An aggregate emission limit value of 0.02 mg/m^3 for cadmium and thallium and their compounds (formerly WID group 2 metals).
- An aggregate emission limit of 0.3 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, Cu, V, Cr(II)(III)

Also in section 5.2.1, all other metals except for As and Cr(VI) whilst not screened out as insignificant were assessed as being unlikely to give rise to significant pollution.

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

For As and Cr (VI) the Applicant Used representative emissions data from other municipal waste incinerators using our guidance note Please refer to "Guidance to Applicants on Impact Assessment for Group 3 Metals Stack Releases – version 4". Measurement of Chromium (VI) at the levels anticipated at the stack emission points is expected to be difficult, with the likely levels being below the level of detection by the most advanced methods. Data for Cr (VI) was based on total Cr emissions measurements and the proportion of total Cr to Cr (VI) in APC residues.

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

- Cr(VI)

The following emissions of metals whilst not screened out as insignificant were assessed as being unlikely to give rise to significant pollution:

- As

The installation has been assessed as meeting BAT for control of metal emissions to air. See section 6 of this document.
Improvement condition IC6 has been set for the Applicant to confirm this assessment with monitoring data from the Installation.

5.2.4 Consideration of Local Factors

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

Wiltshire Council has declared an Air Quality Management Area (AQMA) with respect to annual mean oxides of nitrogen on a stretch of the A350 ~ 1.7 km from the Installation.

From the Applicants model, the process contribution of NO_2 at receptors near to the AQMA is predicted to be well below 1% of the ES, can be considered insignificant and not discernible. Therefore even though the background is already above the ES, the contribution from the Installation is negligible and will not impact of any plans by the local authority to improve air quality.

5.3 Human health risk assessment

5.3.1 Our role in preventing harm to human health

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

i) Applying Statutory Controls

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

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

HPA (now UKHSA) in 2009 stated that "The Health Protection Agency has reviewed research undertaken to examine the suggested links between emissions from municipal waste incinerators and effects on health. While it is not possible to rule out adverse health effects from modern, well regulated municipal waste incinerators with complete certainty, any potential damage to the health of those living close-by is likely to be very small, if detectable".

In 2012 the UK Small Area Health Statistics Unit (SAHSU) at Imperial College was commissioned by Public Heath England (now UKHSA) to carry out a study to extend the evidence base and to provide further information to the public about any potential reproductive and infant health risks from municipal waste incineration (MWIs).

A number of papers have been published by SAHSU since 2012 which show no effect on birth outcomes. One paper in the study looked at exposure to emissions from MWIs in the UK and concluded that exposure was low. Subsequent papers found no increased risk of a range of birth outcomes (including stillbirth and infant mortality) in relation to exposure to PM10 emissions and proximity to MWIs, and no association with MWIs opening on changes in risks of infant mortality or sex ratio.

The final part of the study, published on 21/06/19, found no evidence of increased risk of congenital anomalies from exposure to MWI chimney emissions, but a small potential increase in risk of congenital anomalies for children born within ten kilometres of MWIs. The paper does not demonstrate a causal effect, and it acknowledges that the observed results may well be down to not fully adjusting the study for factors such as other sources of pollution around MWIs or deprivation.

PHE have stated that 'While the conclusions of the study state that a causal effect cannot be excluded, the study does not demonstrate a causal association and makes clear that the results may well reflect incomplete control for confounding i.e. insufficiently accounting for other factors that can cause congenital anomalies, including other sources of local pollution. This possible explanation is supported by the fact no increased risk of congenital anomalies was observed as a result of exposure to emissions from an incinerator.'

Following this study, PHE have further stated that 'PHE's position remains that modern, well run and regulated municipal waste incinerators are not a significant risk to public health, and as such our advice to you [i.e. the Environment Agency] on incinerators is unchanged.'

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

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

The **Food Safety Authority of Ireland (FSAI) (2003)** investigated possible implications on health associated with food contamination from waste incineration and concluded: “In relation to the possible impact of introduction of waste incineration in Ireland, as part of a national waste management strategy, on this currently largely satisfactory situation, the FSAI considers that such incineration facilities, if properly managed, will not contribute to dioxin levels in the food supply to any significant extent. The risks to health and sustainable development presented by the continued dependency on landfill as a method of waste disposal far outweigh any possible effects on food safety and quality.”

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

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

The **British Society for Ecological Medicine (BSEM) published a report in 2005** on the health effects associated with incineration and concluded that “Large studies have shown higher rates of adult and childhood cancer and

also birth defects around municipal waste incinerators: the results are consistent with the associations being causal. A number of smaller epidemiological studies support this interpretation and suggest that the range of illnesses produced by incinerators may be much wider. Incinerator emissions are a major source of fine particulates, of toxic metals and of more than 200 organic chemicals, including known carcinogens, mutagens, and hormone disrupters. Emissions also contain other unidentified compounds whose potential for harm is as yet unknown, as was once the case with dioxins. Abatement equipment in modern incinerators merely transfers the toxic load, notably that of dioxins and heavy metals, from airborne emissions to the fly ash. This fly ash is light, readily windborne and mostly of low particle size. It represents a considerable and poorly understood health hazard."

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

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

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

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

iv) Health Risk Models

Comparing the results of air dispersion modelling as part of the Environmental Impact assessment against European and national air quality standards effectively makes a health risk assessment for those pollutants for which a standard has been derived. These air quality standards have been developed primarily in order to protect human health via known intake mechanisms, such as inhalation and ingestion. Some pollutants, such as dioxins, furans and dioxin like PCBs, have human health impacts at lower ingestion levels than lend themselves to setting an air quality standard to control against. For these pollutants, a different human health risk model is required which better reflects the level of dioxin intake.

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

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

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

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

COMEAP developed a methodology based on the results of time series epidemiological studies which allows calculation of the public health impact of exposure to the classical air pollutants (NO_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 the Environmental Impact assessment, there are high ambient background levels of these pollutants and we are advised that its use was appropriate by our public health consultees.

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

v) Consultations

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

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

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

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

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

Receptor type	adult	child
Agricultural	2.93	4.06
Residential	0.08	0.30

Calculated daily intake of dioxins (based on point of maximum impact) resulting from the operation of the proposed facility as % of TDI

Receptor type	adult	child
Agricultural	0.55	0.77

Calculated daily intake of dioxins (maximum at a receptor) resulting from the operation of the proposed facility as % of TDI

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 (now UKHSA) 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. PHE note that the coefficients that allow the use of number concentrations in impact calculations have not yet been defined because the national experts have not judged that the evidence is sufficient to do so. This is an area being kept under review by COMEAP.

In December 2010, COMEAP published a report on The Mortality Effects of Long-Term Exposure to Particulate Air Pollution in the United Kingdom. It says that "a policy which aims to reduce the annual average concentration of $PM_{2.5}$ by 1 µg/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."

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. PHE 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 $PM_{0.1}$. The National Atmospheric Emissions Inventory (NAEI) figures show

that in 2016 municipal waste incineration contributed 0.03% to ambient ground level PM_{10} levels and 0.05% to ambient ground level PM2.5 levels. The 2016 data also shows that road traffic contributed to 5.35% of PM10 and 4.96% of PM2.5 and that domestic wood burning contributed 22.4% to PM10 and 34.3% of PM2.5 levels.

This is consistent with the assessment of this application which shows emissions of PM_{10} to air to be insignificant.
A 2016 a paper by Jones and Harrison concluded that 'ultrafine particles (<100nm) in flue gases from incinerators are broadly similar to those in urban air and that after dispersion with ambient air ultrafine particle concentrations are typically indistinguishable from those that would occur in the absence of the incinerator.

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

5.3.4 Assessment of Health Effects from the Installation

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

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

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

The Applicant's assessment has shown that emissions screen out as insignificant or where the impact of emissions have not been screened out as insignificant, the assessment still shows that the predicted environmental concentrations are well within air quality standards or environmental action levels
The Environment Agency has reviewed the methodology employed by the Applicant to carry out the health impact assessment.

Overall, taking into account the conservative nature of the impact assessment (i.e. that it is based upon an individual exposed for a life-time to the effects of the highest predicted relevant airborne concentrations and consuming mostly

locally grown food), it was concluded that the operation of the proposed facility will not pose a significant carcinogenic or non-carcinogenic risk to human health.
Public Health England and the Local Authority Director of Public Health were consulted on the Application 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 did not raise any concern. Details of the responses provided by to the consultation on this Application can be found in Annex 4.

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

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

5.4.1 Sites Considered

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

Special Areas of Conservation
- Salisbury Plain
- River Avon

Special Protection Area
- Salisbury Plain

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

Westbury Ironstone Quarry is significant for geological features and is not sensitive to air emissions and no further assessment has been carried out.

Picket and Clanger Wood SSSI is more than 2 km from the Installation and is therefore outside of the screening distance for sites requiring an assessment. However the Applicant did include an assessment of impacts at this SSSI. Section 5.4.3 below has further details.

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

Local Wildlife Sites
- Brokerswood and Hazel Wood
- Round Wood
- Fairwood House Marsh
- Fairwood Road Railway Line
- Westbury Lakes

Ancient Woodland

High Wood/Hazel
High Wood/Hazel
Round Wood

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.

Consideration of critical levels

Site	Pollutant	Reference period	Critical level	PC	PC % CI	Background	PEC	PEC % critical level
Salisbury Plain SAC/SPA	NOx	Annual	30	0.07	0.23	-	-	-
		Daily	75	0.84	1.12	-	-	-
	SO2	Annual	10	0.02	0.20	-	-	-
	HF	Weekly	0.5	0.002	0.40	-	-	-
		Daily	5	0.01	0.20	-	-	-
	NH_3	Annual	1	0.01	1.00	-	-	-
River Avon SAC	NOx	Annual	30	0.03	0.10	-	-	-
		Daily	75	0.7	0.93	-	-	-
	SO_2	Annual	10	0.01	0.10	-	-	-
	HF	Weekly	0.5	0.0015	0.30	-	-	-
		Daily	5	0.005	0.10	-	-	-
	NH_3	Annual	1	0.003	0.30	-	-	-

Consideration of critical loads

Site	Pollutant	Critical load	PC	PC % Cl	Background	PEC	PEC % critical level
Salisbury Plain SAC/SPA	Nitrogen deposition	10	0.057	0.57	-	-	-
	Acid deposition	1.123	0.006	0.53	-	-	-
River Avon SAC	Nitrogen deposition	Not sensitive to nitrogen	-	-	-	-	-
	Acid deposition	Not sensitive to acid deposition	-	-	-	-	-

In line with our guidance, agreed with Natural England, we concluded not no likely significant effect alone or in-combination where:

- The PC is <1% of long term standards and <10% of short term standards; and
- Where the PC >1% of long term standards, the PEC is < 70%

The tables above we have concluded no likely significant effect alone or in-combination for all pollutants. However our checks of the Applicant's modelling showed that the PC for ammonia could be slightly above the 1% insignificance level and the background already exceeds the critical level. We have therefore conservatively concluded likely significant effect due to toxic contamination from ammonia emissions and assessed the impacts in further detail.

We checked the Natural England website for further details on the Salisbury Plain SAC. The SAC is split in many units. The closest units to the Installation are numbers 1 and 7 at ~ 3.7 km from the Installation . These units are described as being in favourable condition. Surveys of the SAC have been carried out and survey report 'Salisbury Plain SSSI Integrated Site Assessment 2014-15' was available on the Natural England website.
The report includes a section on rare mosses and liverworts (section F). This section shows that bryophytes are present in units 115, 129, 134, 136, 138, 146, 147, 148, 149, 150 and 155. The closest of these units is ~ 29km from the Installation. Any impacts at these units will be insignificant and at ~29 km is outside of the screening distance of 10 km where no assessment is required. Lichen are mentioned in the report as being present in shell craters in the central impact area, however there is no mention of sensitive lichen forming a key part of the ecosystem integrity. Therefore our view is that a critical load of 1 µg/m^3 should not be applied on the basis of lichen.

For the SAC units closest to the Installation a critical load of 3 µg/m^3 is applicable and with a critical load of 3 µg/m^3 the ammonia PC will be insignificant. We therefore concluded no adverse effect and Natural England agreed with our assessment.

5.4.3 SSSI Assessment

Westbury Ironstone Quarry is significant for geological features and is not sensitive to air emissions and no further assessment has been carried out.

The Applicant assessed impact at Picket and Clanger Wood SSSI even though it is more than 2 km from the Installation. The assessment showed that impacts were insignificant with the exception of ammonia, nitrogen deposition and acid deposition.
For acid deposition the Applicant used a critical load of 0.357 keq/ha/yr which corresponds to the MinCLminN whereas the correct critical load to use is the MinCLMaxN which is 1.907 keq/ha/yr. Impacts against this critical load are just above insignificant.
The PCs for nitrogen deposition and ammonia are just above the insignificance level at 1.9% and 2.3% of the respective critical load and critical level.

We are satisfied that the Installation will not damage the SSSI:

- PC are low with the main contribution to impacts being background levels
- The SSSI is > 2 km from the Installation. 2 km is a screening distance that has been agreed with Natural England outside of which emissions are unlikely to damage a SSSI.

5.4.4 Assessment of other conservation sites

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

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

Critical levels and loads are set to protect the most vulnerable habitat types. Thresholds change in accordance with the levels of protection afforded by the legislation. Therefore the thresholds for SAC SPA and SSSI features are more stringent than those for other nature conservation sites.

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

The Applicant's assessment showed that the PCs are below the critical levels or loads. 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.

5.5 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 ES. For the most part therefore consideration of abnormal operations is limited to consideration of its impact on short term ESs.

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

- Dioxin emissions of 6 ng/m^3 (100 x normal)
- Mercury emissions are 100 times those of normal operation
- NO_x emissions of 500 mg/m^3 (1.25 x normal)
- Particulate emissions of 150 mg/m^3 (5 x normal)
- Metal emissions other than mercury for which there is a short term ES are 30 times those of expected (based on Environment Agency guidance note) normal emissions. We also precautionary assumed that these metals could be 30 times above the ELV.
- SO_2 emissions of 450 mg/m^3 (2.25 x normal)
- HCl emissions of 900 mg/m^3 (15 x normal)
- PCBs (100 x normal)

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	99.79th %ile of 1-hour means	26.38	21.01	10.5	47.39	23.7
PM_{10}	50	90.41st %ile of 24-hour means	-	4.45	8.90	-	-
SO_2	266	99.9th ile of 15-min means	4.42	60.8	22.9	65.22	24.5

	350	99.9th ile of 15-min means	4.42	53.6	15.31	58.02	16.6
	125	99.18th %ile of 24-hour means	4.42	28.33	22.66	32.75	26.2
HCl	750	1-hr average	1.42	191.1	25.48	192.5	25.67
HF	160	1-hr average	-	4.2	2.63	-	-
	ng/m3		**ng/m^3**		**ng/m^3**		
Hg	7500	1-hr average	-	425.32	5.67	-	-
Sb	150000	1-hr average	-	73.37	0.05	-	-
Cu	200000	1-hr average	-	185.01	0.09	-	-
Mn	1500000	1-hr average	-	382.79	0.03	-	-
PCBs	6000	1-hr average	-	106.33	1.77	-	-
Cr (II)(III)	150000	1-hr average	-	586.94	0.39	-	-

From the table above emissions can still be considered insignificant, in that the PC is still <10% of the short-term ES or where 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 ES. Metals were also insignificant when also precautionary assumed that these metals could be 30 times above the ELV.

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

We have not assessed the impact of abnormal operations against long term ESs for the reasons set out above. Except that if dioxin emissions were at 10 ng/m^3 for the maximum period of abnormal operation, this would result in an increase of approximately 70% in the TDI reported in section 5.3.3. In these circumstances the intake would be 6.8% of the TDI, based on the point of maximum impact or 1.3% based on impact at most impacted receptor. At this level, emissions of dioxins will still not pose a risk to human health.

5.6 Impact of emissions at nearby dairy

The Installation is located next to a dairy that manufactures milk products. The dairy operator (Arla) expressed concern as to whether emissions from the Installation could adversely affect their products via the dairy air intake system.

The Applicant submitted details of control measures including an air emissions management (AEMP) plan. The Applicant also submitted a risk assessment specifically about any potential impacts on milk products. The key measures from AEMP are summarised in section 6.5.3.

This section summarises our review of the Applicant's risk assessment. Arla carried out their own review of the Applicant's risk assessment (using an environmental consultant) and submitted that review to us. We also received comments from the FSA and UKHSA; we have had regard to these responses in carrying out our own assessment of risk.

The Applicant's risk assessment considered health, odour and taste impacts during operation and periods of shut-down from VOCs. The Applicant also considered bioaerosol emissions.

5.6.1 Overall

The FSA's view was that emissions of VOCs do not impact on food safety. We agree with their view and therefore the following sections concentrate on odour and taste impacts.

5.6.2 Main stack emissions

Emissions from the main stack are from the incineration furnace. The risk of odour or taste impacts is negligible due to odorous compounds being destroyed in the combustion process.

5.6.3 Alternative abatement stack

The Applicant assessment was based on potential emissions of VOCs from waste in the bunker during periods when the incinerator is not operating. Emissions were based on monitoring carried out at an MBT plant prior to a biofilter. The Applicant claimed that this was conservative because generation of VOCs in a waste bunker would be less than those at a plant where biological degradation was the waste is being carried out.
The Applicant's results showed no exceedance of odour or taste taint thresholds. Arla's review agreed with the Applicant's with the exception of benzaldehyde when compared to the odour taint threshold. This was due to the consultant using a much lower odour taint threshold of 0.00001 mg/l compared to the Applicant's threshold of 0.32 mg/l.

The odour taint threshold of 0.32 mg/l was used in a 2008 assessment of impacts from an adjacent MBT on the dairy. It was taken from a 2003 publication by L.J. Van Gemert, with the same value included in a 2011 publication by the same author.
The value used by Arla's consultant of 0.00001 mg/l was taken from Haese et al (2014) that quoted a range of values from 0.00001 to 4.6 mg/l.
Both the threshold used by the Applicant and the one used by Arla are based on odour taint of water.

The Applicant provided justification as to why the value used by Arla's consultant was overly conservative:
L.J. Van Gemert's 2011 publication lists taint thresholds for various substances in various media from many different sources, but does not provide a taint threshold for benzaldehyde in milk. An odour taint threshold of 7.413 mg/kg is provided for another aldehyde, 4-Hydroxy-3-Methoxybenzaldehyde, in milk. The odour taint threshold for the same substance in water (from the same source) is given as 0.064 mg/kg which is over 100 times lower than the milk threshold demonstrating that odour is much more likely to be detected in water than in milk.

We agree with the Applicant that basing the odour taint assessment on thresholds for water will be overly conservative.

The Applicant also listed several other conservative assumptions of their assessment:

- It was assumed that the odour abatement system runs at 70% efficiency for the odour assessment, which is the lower value of the range provided in the BREF of 70-99% efficiency. The Applicant stated that typical efficiency (based on information from technology providers) is 95-99%. For the assessment of VOC taint the lower end of the range of 95% removal was used.
- Assessment based on worst hour of weather data over 5 years and assumes that odour abatement system operates during that worst hour.
- It was assumed that 90% of substances in the air would be transferred to the product. The background concentration of benzene, as reported in the air quality assessment is 0.39 µg/m^3. It is assumed that Arla's

current product complies with the health-based taint threshold therefore the transfer rate to the product of benzene must be 10% or less.
- The assessment is based on the impact on the powdered milk product. No account has been made for the dilution of product with water before it is used.

Based on all the conservative assumptions we are satisfied that there will not be a significant impact.

5.6.4 Open reception hall doors

The Applicant proposed detailed control measures to ensure that negative pressure would be maintained both during operation of the furnace and during periods of shut-down. We are satisfied that the proposed measures along with pre-operational condition PO10 will ensure that there are no significant emissions. Section 6.5.3 has further details.

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.

- 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. The BAT conclusions were published in December 2019.

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 BREF states that Municipal Waste can be incinerated in traveling grates, rotary kilns and fluidised bed technology. Fluidised bed technology requires MSW to be of a certain particle size range, which usually requires some degree of pre-treatment even when the waste is collected separately. The BREF describes other process such as gasification and pyrolysis. The BREF notes that some of the processes have encountered technical and economic problems when scaled up to commercial, industrial sizes. Some are used on a commercial basis in Japan and are being tested in demonstration plants in Europe but still only have a small share of overall capacity.

Section 4.3 of the BREF provides a comparison of combustion and thermal treatment technologies, used in Europe and factors affecting their applicability and operational suitability for various waste types. 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
Rotary Kiln	Can accept liquids and pastes as well as gases Solid feeds more limited than grate (due to refractory damage) often applied to hazardous Wastes	<16 t/h	• Very well proven • Broad range of wastes • Good burn out even of HW	Throughputs lower than grates	TOC <3 %	Higher specific cost due to reduced capacity

Technique	Key waste characteristics and suitability	Throughput per line	Advantages	Disadvantages / Limitations of use	Bottom Ash Quality	Cost
Fluid bed - bubbling	• Wide range of CV (5-25 MJ/kg) • Only finely divided • consistent wastes. • Limited use for raw MSW • Often applied to sludges co fired with RDF, shredded MSW, sludges, poultry manure	Up to 25 t/h	• Good mixing • Fly ashes of good leaching quality	• Careful operation required to avoid clogging bed. • Higher fly ash quantities.	TOC <1%	FGT cost may be lower. Costs of waste preparation
Fluid bed - circulating	• Wide range of CV (6-25 MJ/kg) • Only finely divided consistent wastes. • Limited use for raw MSW • Often applied to sludges co-fired with RDF, coal, wood waste	Up 70 70 t/h	• Good mixing • High steam parameters up to 500oC • Greater fuel flexibility than BFB • Fly ashes of good leaching quality	• Cyclone required to conserve bed material • Higher fly ash quantities	TOC <1%	• FGT cost may be lower. • Costs of waste preparation
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

Technique	Key waste characteristics and suitability	Throughput per line	Advantages	Disadvantages / Limitations of use	Bottom Ash Quality	Cost
Gasification - fixed bed	• Mixed plastic wastes • Other similar consistent streams • Gasification less widely used/proven than incineration	Up 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 operating/ maintenance costs
Gasification - entrained flow	• Mixed plastic wastes • Other similar consistent streams • Not suited to untreated MSW • Gasification less widely used/proven than incineration	Up 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 • High pre-treatment costs
Gasification - fluidised bed	• Mixed plastic wastes • Shredded MSW • Shredder residues • Sludges • Metal rich wastes • Other similar consistent streams • Gasification less widely used/proven than incineration	5 – 20 t/h	• Can use low reactor temperatures e.g. for Al recovery • Separation of main 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

Technique	Key waste characteristics and suitability	Throughput per line	Advantages	Disadvantages / Limitations of use	Bottom Ash Quality	Cost
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 level • Not widely proven • Need market for syngas	• Dependent on process temperature • Residue produced requires further processing and sometimes combustion	High pre-treatment, operation and capital costs

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

- Moving Grate Furnace
- Fixed hearth
- Pulsed Hearth
- Rotary and oscillating Kilns
- Fluidised Bed
- Pyrolysis / Gasification

Fixed hearth, pulsed hearth rotary and oscillating kiln and pyrolysis/gasification were discounted for the following reasons:

- Fixed hearth - not suitable for large volumes of waste
- Pulsed hearth - burnout of waste not reliable
- Rotary and oscillating Kilns – lower energy conversion, suitable for lower throughputs
- Pyrolysis / Gasification – limited experience in the UK for waste. Difficulty in obtaining investment for this technology.

Moving grate and fluidised bed were considered further in a more detailed BAT assessment. The Applicant concluded that moving grate was BAT primarily because it can cope with large quantities of heterogeneous fuel whereas fluidised beds are suited to more homogeneous pre-treated fuel.

The Applicant has proposed to use a furnace technology comprising a moving grate furnace which is identified in the tables above as being considered BAT in the BREF or TGN for this type of waste feed.

The Applicant proposes to use gasoil as support fuel for start-up, shut down and for the auxiliary burners. The choice of support fuel is based on lack of an available high pressure gas main.

Boiler Design

In accordance with BAT 30 of the BAT C and our Technical Guidance Note, EPR 5.01, the Applicant has confirmed that the boiler design will include the following features to minimise the potential for reformation of dioxins within the de-novo synthesis range:

- 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 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 Flue Gas Cleaning System (FGC) 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 (FGC) systems as:

- type of waste, its composition and variation
- type of combustion process, and its size
- flue-gas flow and temperature
- flue-gas content, including magnitude and rate of composition fluctuations
- 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
- noise
- arrangement of different flue-gas cleaning devices if possible with decreasing flue-gas temperatures from boiler to stack

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

6.2.1 Particulate Matter

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 Higher energy use than ESP Sensitive to condensation and corrosion	Multiple compartments Bag burst detectors	Most plants
Wet scrubbing	May reduce acid gases simultaneously.	Not normally BAT. Liquid effluent	Require reheat to prevent visible plume and dew point	Where scrubbing required for other

		produced	problems.	pollutants
Ceramic filters	High temperature applications Smaller plant.	May "blind" more than fabric filters		Small plant. High temperature gas cleaning required.
Electrostatic precipitators (ESP)	Low pressure gradient. Use with BF may reduce the energy consumption of the induced draft fan.	Not normally BAT by itself Risk of dioxin formation if used in 200-400^{o}C range		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.

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. Can result in elevated CO and other products of incomplete combustion		Justify if not used

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 40-150mg/ m^3 Reduces CO, VOC, dioxins	Expensive. Re-heat required – reduces plant efficiency		All plant
SCR by catalytic filter bags	50-120 mg/m^3			Applicable to new and existing plants with or without existing SNCR. Can be used with NH_3 as slip catalyst with SNCR
Selective	NOx emissions	Relies on an	Port injection	All plant

non-catalytic reduction (SNCR)	80 -180 mg/m^3 Lower energy consumption than SCR Lower costs than SCR	optimum temperature around 900 °C, and sufficient retention time for reduction May lead to Ammonia slip	locations	unless lower NOx release required for local environmental protection.
Reagent Type: Ammonia	Likely to be BAT	More difficult to handle Lower nitrous oxide formation Narrower temperature window		All plant
Reagent Type: Urea	Likely to be BAT	Higher N_2O emissions than ammonia, optimisation particularly important		All plant

The Applicant proposes to implement the following primary measures:

- Low NO_x burners – this technique reduces 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 is not proposed. The Applicant stated that where furnaces have been designed to operate without FGR optimised (design focussed on primary and secondary air control) FGR gives little benefit. We agree with that assessment and in addition FGR can result in corrosion issues and reduced energy efficiency.

There are three recognised techniques for secondary measures to reduce NO_x. These are Selective Catalytic Reduction (SCR), SCR by catalytic filter bags and Selective Non-Catalytic Reduction (SNCR) with or without catalytic filter bags. For each technique, there is a choice of urea or ammonia reagent.

SCR can reduce NO_x levels to below 50 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. The use of SCR by catalytic filter bags can reduce emissions to 50 -120 mg/m^3 with low investment costs but needs a flue gas temperature of 180-210 ^oC. SNCR can typically reduce NO_x levels to between 80 and 180 mg/m^3, it relies on an optimum temperature of around 900 ^oC 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 SNCR with ammonia as the reagent.

Emissions of NO_x cannot be screened out as insignificant. Therefore the Applicant has carried out a cost / benefit study of the alternative techniques. The cost per tonne of NO_x abated over the projected life of the plant has been calculated and compared with the environmental impact as shown in the table below.

	Cost of NO_x removal /tonne of NOx abated (£)	PC (long term) ($\mu g/m^3$)	PEC (long term) ($\mu g/m^3$)
SCR	3,030	0.32	13.51
SNCR	780	0.76	13.95

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

The amount of urea / ammonia used for NO_x abatement will need to be optimised to maximise NO_x reduction and minimise 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 BAT AEL for ammonia has been set and the Operator is also required to monitor and report on 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.	Requires closer control of waste management		All plant with heterogeneous waste feed

	PVC) through 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		Used for wide range of waste types Can be used as polishing step after other techniques where emissions are high or variable
Dry	Low water use Higher reagent consumption to achieve emissions of other FGC techniques but may be reduced by recycling in plant Lower energy use Higher reliability	Higher solid residue production Reagent consumption controlled only by input rate		All plant

	Lowest visible plume potential			
Semi-dry (also described as semi-wet in the Bref)	Medium reaction rates Reagent delivery may be varied by concentration and input rate	Higher solid waste residues than wet but lower than dry system		All plant
Direct injection into boiler	Reduced acid loading to subsequent cleaning stages. Reduced peak emissions and reduced reagent usage			Generally applicable to grate and rotary kiln plants.
Direction desulphurisation	Reduced boiler corrosion	Does not improve overall performance. Can affect bottom ash quality. Corrosion problems in flue gas cleaning system.		Partial abatement upstream of other techniques in fluidised beds
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	Corrosive material May give greater residue	Wide range of uses	MWIs, CWIs

	Temperature of reaction well suited to use with bag filters	volume if no in-plant recycle		
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 has justified its choice gasoil as the support fuel on the basis that there is no high pressure gas main available and we agree with that assessment.
- Management of heterogeneous wastes – this will disperse problem wastes such as PVC by ensuring a homogeneous waste feed.

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

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

Both dry and semi-dry methods rely on the dosing of powdered materials into the exhaust gas stream. Semi-dry systems (i.e. hydrated reagent) offer

reduced material consumption through faster reaction rates, but reagent recycling in dry systems can offset this.

In both dry and semi-dry systems, the injected powdered reagent reacts with the acid gases and is removed from the gas stream by the bag filter system. The powdered materials are either lime or sodium bicarbonate. Both are effective at reducing acid gases, and dosing rates can be controlled from continuously monitoring acid gas emissions. The decision on which reagent to use is normally economic. Lime produces a lower leaching solid residue in the APC residues than sodium bicarbonate and the reaction temperature is well suited to bag filters, it tends to be lower cost, but it is a corrosive material and can generate a greater volume of solid waste residues than sodium bicarbonate. Both reagents are BAT, and the use of one over the other is not significant in environmental terms in this case.

Direct boiler injection is applicable for all plants and can improve overall performance of the acid gas abatement system as well as reducing reagent usage.

Reagent will be recirculated and optimised. Improvement condition IC5 requires the Operator to submit a report on optimisation.

In this case, the Applicant proposes to use a dry system with lime as the reagent. Acid gas impacts have been screened out as insignificant and the Environment Agency is satisfied that this is BAT

6.2.4 Carbon monoxide and volatile organic compounds (VOCs)

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

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. Metallic mercury is also absorbed.	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.
Catalytic filter bags	High destruction efficiency	Does not remove mercury. Higher cost than non-catalytic filter bags		

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.
- Use of catalytic filter bags. These can achieve low levels of emissions but mercury is not removed.

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

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. Can be impregnated with bromine or sulphur to enhance reactivity, for use during peak emissions.	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.
Fixed or moving bed adsorption	Mainly for mercury and other metals, as well as organic compounds			Limited applicability due to pressure drop
Boiler bromine injection	Injection during mercury peaks. Oxidation of mercury leading to improved removal in downstream removal method.	Consumption of aqueous bromine. Can lead to formation of polybrominated dioxins. Can damage bag filter. Effects can be limited use is restricted to dealing with peak emissions		Not suitable for pyrolysis or gasification. Can deal with mercury peaks.

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 one or a combination of the techniques listed above. The Applicant has proposed dosing of activated carbon into the exhaust gas stream. This can be combined with the acid gas reagent or

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

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

6.3 BAT and global warming potential

This section summarises the assessment of greenhouse gas impacts which has been made in the determination of this Permit. Emissions of carbon dioxide (CO_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 will therefore be required to optimise the performance of the secondary NO_x abatement system to ensure its GWP impact is minimised.

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 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.

The Applicant considered energy efficiency and BAT for the de-NOx process in its BAT assessment. This is set out in sections 4.3.7 and 6.2.2 of this decision document.

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

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

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

6.4 BAT and POPs

International action on Persistent Organic pollutants (POPs) is required under the UN's Stockholm Convention, which entered into force in 2004. The EU implemented the Convention through the POPs Regulation (2019/1021), 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 to significantly modify existing facilities using processes that release chemicals listed in Annex III , 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, without prejudice to Directive 2010/75/EU of the European Parliament and of the Council"

The 1998 Protocol to the Convention recommended that unintentionally produced POPs 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

Surface water run-off will be collected from areas of hardstanding and building roofs and discharged into the surface water drainage systems. Surface run-off from vehicle movement areas will pass through a petrol interceptor. All surface water run-off will discharge into the on-site attenuation pond followed by final discharge into the Northacre Trading Estate drainage system.

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

Process waters will be re-used in the process such as for quenching bottom ash. If excess waters are produced (during boiler draining) they will either be removed from site or discharged to sewer in accordance with a Trade Effluent Consent.

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's proposed the following key measures:

- Waste delivered into indoor reception hall under negative pressure
- Filters on silo vents
- APC silo discharged to tanker
- Good housekeeping
- Bunded storage tanks
- Storage areas with contained drainage

- Tanker off-loading in areas of contained drainage
- Firewater containment using bunker and kerbing

Concern was expressed about impacts on the adjacent milk processing plant in terms of odour and bioaerosols causing impacts on milk products. The Applicant submitted an air emissions management plan (AEMP). The AEMP set out details of how fugitive emissions including dust, odour, bioaerosols would be controlled during normal operation and during periods of shut-down. The AEMP set out in detail the systems and procedures that would be used. They included the following key measures:

- Reception hall kept under negative pressure with air pulled through combustion unit which will destroy odorous compounds and any bioaerosols. Designed to achieve 2 air changes per hour.
- Building management system will monitor negative pressure and control door openings and ventilation louvres to maintain negative pressure. The system will ensure that only 1 door is open at a time.
- During shut-down air from the reception hall will be extracted via an alternative extraction system comprising of bag filters and carbon filter. The building management system will ensure this operates during planned or un-planned shut-down.
- The alternative extraction system will be designed for 3 air changes per hour. It will have a duty and standby fan. There will be 2 duty and 1 stand-by carbon filters.
- Waste deliveries will be stopped and doors will remain closed during shut-down.
- Odour monitoring will be carried out by a trained competent individual.
- Fire prevention plan to minimise the risk of a fire and minimise the impacts if a fire were to occur.

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

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

Waste accepted at the installation will be delivered in enclosed vehicles or via an enclosed conveyor from an adjacent MBT facility to the reception hall bunker. A roller shutter door will be used to close the entrance to the tipping hall outside of the waste delivery periods and combustion air will be drawn from above the waste storage bunker to prevent odours and airborne particulates from leaving the facility building.
During shut-down air will be extracted via an alternative system through bag filters and a carbon filter and emitted through a 43 m high stack.

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.

The assessment includes a:

- description of the existing sound environment;
- outline of the likely evolution of the future baseline sound levels;
- identification of construction and operation activities that may cause noise effects;
- predictions of noise levels during the operation phase upon the nearest
- Noise Sensitive Receptors (NSRs);
- details of potential cumulative effects where noise from other potential developments may also affect the same NSRs; and
- likely residual significant effects taking account additional mitigation.

The assessment shows that there would be no significant impacts during the operation of the Proposed Development provided proposed mitigation measures are implemented.

An Improvement Condition (IC11) requires the operator to carry out an operational noise assessment within 4 months of the completion of commissioning.

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.

BAT conclusions for waste incineration or co-incineration were published in December 2019.

The use of BAT AELs and 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 BAT AELs and Chapter IV limits.

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

(i) Local factors

We have considered the location in assessing BAT. However no measures beyond BAT were required. We are satisfied that the measures described above as BAT will ensure a high level of protection for the environment as a whole at this location.

(ii) National and European ESs

We are satisfied that the Installation will not result in an exceedance of any National or European ES.

(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 purpose of the plant, which is the destruction of waste. Controls in the form of restrictions on the volume and type of waste that can be accepted at the Installation and permit conditions relating to energy efficiency effectively apply equivalent technical measures to limit CO_2 emissions.

(iv) Commissioning

Pre-operational condition PO4 will ensure that measures to protect the environment during commissioning are agreed with the Environment Agency.

6.7 Monitoring

6.7.1 Monitoring during normal operations

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

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

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

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

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

6.7.3 Continuous emissions monitoring for dioxins and heavy metals

The BAT conclusions specify either manual extractive monitoring or long term monitoring for dioxins. For mercury either continuous or long term monitoring is specified, manual extractive monitoring is specified for other metals.

For dioxins long term monitoring does not apply if emissions are stable, and for mercury long term monitoring can be used instead of continuous if the mercury content of the waste is low and stable.

Based on the waste types and control measures proposed in the Application we expect that emissions of dioxins will be stable and that the mercury content of the waste will be low and stable. We have therefore set manual extractive monitoring in the Permit. However the Permit requires the stable and low criteria to be demonstrated through Improvement conditions IC8 and IC9 and we can require long term monitoring for dioxins and continuous monitoring for mercury if required.

6.8 Reporting

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

7 Other legal requirements

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

7.1 The EPR 2016 and related Directives

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

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

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

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

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

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

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

- The Environmental Statement submitted with the planning application (which also formed part of the Environmental Permit Application).
- The response of the Environment Agency to the local planning authority in its role as consultee to the planning process.
- Wiltshire Council's Strategic Planning Committee voted to approve the planning application. The application was referred to the Secretary of State who decided not to call in the application for determination. A final decision on the planning application has not yet been made.

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

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

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

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

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

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

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

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

Article 23(1) requires the permit to specify:

- the types and quantities of waste that may be treated;
- for each type of operation permitted, the technical and any other requirements relevant to the site concerned;
- the safety and precautionary measures to be taken;
- the method to be used for each type of operation;
- such monitoring and control operations as may be necessary;
- 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 2016 – **Water Framework and Groundwater Directives**

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

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

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

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

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

Our decision in this case has been reached following a programme of extended public consultation, on the original application. The way in which this has been done is set out in Section 2. A summary of the responses received to our consultations and our consideration of them is set out in Annex 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 5 (Preventing or Minimising Effects of Pollution of the Environment)

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

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

We have a duty to the extent we consider it desirable generally to promote the conservation and enhancement of the natural beauty and amenity of inland and coastal waters and the land associated with such waters, and the conservation of flora and fauna which are dependent on an aquatic environment.

We consider that no additional or different conditions are appropriate for this Permit.

(v) Section 7 (Pursuit of Conservation Objectives)

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

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

(vi) Section 39 (Costs and Benefits)

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

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

(vii) Section 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.

We have also had regard to the clean air strategy 2019 and consider that our decision complies with the Strategy, and that no additional or different conditions are appropriate for this Permit.

(viii) National Emissions Ceiling Regulations 2018

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

7.2.2 **Section 108 Deregulation Act 2015 – Growth duty**

We have considered our duty to have regard to the desirability of promoting economic growth set out in section 108(1) of the Deregulation Act 2015 and

the guidance issued under section 110 of that Act in deciding whether to grant this permit.
Paragraph 1.3 of the guidance says:
"The primary role of regulators, in delivering regulation, is to achieve the regulatory outcomes for which they are responsible. For a number of regulators, these regulatory outcomes include an explicit reference to development or growth. The growth duty establishes economic growth as a factor that all specified regulators should have regard to, alongside the delivery of the protections set out in the relevant legislation."
We have addressed the legislative requirements and environmental standards to be set for this operation in the body of the decision document above. The guidance is clear at paragraph 1.5 that the growth duty does not legitimise non-compliance and its purpose is not to achieve or pursue economic growth at the expense of necessary protections.
We consider the requirements and standards we have set in this permit are reasonable and necessary to avoid a risk of an unacceptable level of pollution. This also promotes growth amongst legitimate operators because the standards applied to the operator are consistent across businesses in this sector and have been set to achieve the required legislative standards.

7.2.3 **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.

7.2.4 **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.

7.2.5 **Wildlife and Countryside Act 1981**

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

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

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

7.2.6 **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.

7.2.7 Countryside Act 1968

Section 11 imposes a duty on the Environment Agency to exercise its functions relating to any land, having regard to the desirability of conserving the natural beauty and amenity of the countryside including wildlife. We have done so and consider that no different or additional conditions in the Permit are required.

7.2.8 National Parks and Access to the Countryside Act 1949

Section 11A and section 5(1) imposes a duty on the Environment Agency when exercising its functions in relation to land in a National Park, to have regard to the purposes of conserving and enhancing the natural beauty, wildlife and cultural heritage of the areas, and of promoting opportunities for the understanding and enjoyment of National Parks by the public.

We have done so and consider that no different or additional conditions in the Permit are required. There is no National Park which could be affected by the Installation.

7.3 National secondary legislation

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

We have assessed the Application in accordance with guidance agreed jointly with Natural England and concluded that there will be no 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 Habitats Risk Assessment can be found on the public register.

7.3.2 **Water Environment (Water Framework Directive) Regulations 2017 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 compliance with the requirements of the Water Framework Directive, Groundwater directive and the EQS Directive through (inter alia) environmental permits, and its obligation in regulation 33 to have regard to the river basin management plan (RBMP) approved under regulation 31 and any supplementary plans prepared under regulation 32. However, it is felt that existing conditions are sufficient in this regard and no other appropriate requirements have been identified

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

7.3.3 **The Persistent Organic Pollutants Regulations 2007**

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

7.4 Other relevant legal requirements

7.4.1 Duty to Involve

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

The way in which the Environment Agency has consulted with the public and other interested parties is set out in section 2 of this document. The way in which we have taken account of the representations we have received is set

out in Annex 4. Our public consultation duties are also set out in the EP Regulations, and our statutory Public Participation Statement, which implement the requirements of the Public Participation Directive. In addition to meeting our consultation responsibilities, we have also taken account of our guidance in Environment Agency Guidance Note RGS6 and the Environment Agency's Building Trust with Communities toolkit.

ANNEX 1A: 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 2.3.4(a) and Table S2.2 in Schedule 2 of the Permit.
45(1)(b)	The permit shall include the total waste incinerating or co-incinerating capacity of the plant.	Condition 2.3.4 (a) and Table S2.2 in Schedule 2 of the Permit.
45(1)(c)	The permit shall include the limit values for emissions into air and water.	Conditions 3.1.1 and 3.1.2 and Tables S3.1, 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 3.6.1 to 3.6.4 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.	Condition 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	Not Applicable

IED Article	Requirement	Delivered by
	polychlorinated biphenyls, pentachlorophenol, chlorine, fluorine, sulphur, heavy metals and 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 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 3 of Annex VI.	Conditions 3.1.1 and 3.1.2 and tables S3.1, S3.1(a).
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. The permit requires that these measures are used. Various permit conditions address this and when taken as a whole they ensure compliance with this requirement.
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/m3), CO and TOC not to be exceeded during this period.	Conditions 2.3.9 and 2.3.13
47	In the event of breakdown, reduce	Conditions 2.3.9 to

IED Article	Requirement	Delivered by
	or close down operations as soon as practicable. Limits on dust (150 mg/m3), CO and TOC not to be exceeded during this period.	2.3.13
48(1)	Monitoring of emissions is carried out in accordance with Parts 6 and 7 of Annex VI.	Conditions 3.6.1 to 3.6.4, 3.2.1, 3.2.2, tables S3.1, S3.1(a). Reference conditions are defined in Schedule 6 of the Permit.
48(2)	Installation and functioning of the automated measurement systems shall be subject to control and to annual surveillance tests as set out in point 1 of Part 6 of Annex VI.	Conditions 3.6.1, 3.6.3, table S3.1, S3.1(a), and S3.4
48(3)	The competent authority shall determine the location of sampling or measurement points to be used for monitoring of emissions.	Conditions 3.6.1. Pre-operational condition PO7 and IC12.
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, 4.2, 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, 3.1.2, 3.2.1, 3.2.2 and tables S3.1, S3.1(a)
50(1)	Slag and bottom ash to have Total Organic Carbon (TOC) < 3% or loss on ignition (LOI) < 5%.	Conditions 3.6.1 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 2.3.7, Pre-operational condition PO5, 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 2.3.14
50(4)(a)	Automatic shut to prevent waste	Condition 2.3.9

IED Article	Requirement	Delivered by
	feed if at start up until the specified temperature has been reached.	
50(4)(b)	Automatic shut to prevent waste feed if the combustion temperature is not maintained.	Condition 2.3.9
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 2.3.9, 2.3.13
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 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 me.	No such conditions Have been allowed
51(2)	Changes in operating conditions do not cause more residues or residues with a higher content of organic polluting substances compared to those residues which could be expected under the conditions laid down in Articles 50(1), (2) and (3).	No such conditions Have been allowed
51(3)	Changes in operating conditions shall include emission limit values for CO and TOC set out in Part 3 of Annex VI.	No such conditions Have been allowed
52(1)	Take all necessary precautions concerning delivery and reception of Wastes, to prevent or minimise pollution.	Conditions 2.3.1, 2.3.2, 2.3.3, 2.3.4, 2.3.5 and 3.7
52(2)	Determine the mass of each	Condition 2.3.4(a) and

IED Article	Requirement	Delivered by
	category of wastes, if possible according to the EWC, prior to accepting the waste.	Table S2.2 in Schedule 2of 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 3.6.1 with Table S3.5
53(2)	Prevent dispersal of dry residues and dust during transport and storage.	conditions 1.4.1 2.3.1, 2.3.2 and 3.3.1.
53(3)	Test residues for their physical and chemical characteristics and polluting potential including heavy metal content (soluble fraction).	Condition 3.6.1 and Table S3.5 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 4.2.1 and 4.2.2

ANNEX 1B: COMPLIANCE WITH BAT CONCLUSIONS

BAT conclusion	Criteria	Delivered by
1	Implement environmental management system	Condition 1.1 and pre-operational condition PO1
2	Determine gross electrical efficiency	Section 4.3.7 of this decision document. Permit table S3.4
3	Monitor key process parameters	Condition 3.6.1 and table S3.4
4	Monitoring emissions to air	Condition 3.6.1 and table S3.1
5	Monitoring emissions to air during OTNOC	Condition 1.1.1 and pre-operational condition PO1
6	Monitoring emissions to water from flue gas treatment and/or bottom ash treatment	There are no such emissions from the installation
7	Monitor unburnt substances in slags and bottom ashes	Conditions 3.1.3 and 3.6.1, and table S3.5
8	Analysis of hazardous waste	Not applicable
9	Waste stream management techniques	The Application explains the measures that will be used. Permit condition 2.3.1, table S1.2.
10	Quality management system for bottom ash treatment plant	This will form part of the EMS as required by condition 1.1 and pre-operational condition PO1
11	Monitor waste deliveries as part of waste acceptance procedures	The Application explains the measures that will be used. Permit condition 2.3.1, table S1.2.
12	Reception, handling and storage of waste	Measures are described in the Application and FPP. Permit conditions 2.3.1, table S1.2 and condition 3.8.1
13	Storage and handling of clinical waste	Not applicable
14	Improve overall performance of plant including BAT-AELs for TOC or LOI	Techniques described in the Application. Permit condition 2.3.1, table S1.2, 3.1.3, and table S3.5

BAT conclusion	Criteria	Delivered by
15	Procedures to adjust plant settings to control performance	Measures described in the Application condition 2.3.1 and table S1.2
16	Procedures to minimise start-up and shut down	Measures described in the Application and condition 2.3.1
17	Appropriate design, operation and maintenance of FGC system	FGC measures described in Application. Operation and maintenance procedures will form part of the EMS
18	OTNOC management plan	Pre-operational condition PO1
19	Use of heat recovery boiler	Described in the Application. Permit condition 2.3.1, table S1.2
20	Measures to increase energy efficiency and BAT AEEL	Measures described in the Application. Permit condition 2.3.1, table S1.2 Section 4.3.7 of this decision document.
21	Measures to prevent or reduce diffuse emissions including odour	Measures described in the Application. Permit conditions 2.3.1, table S1.2, 3.4.1, 3.4.2, 3.3.1, 3.3.2. Sections 4.2.2, 6.5.3 and 6.5.4 of this decision document.
22	Handling of gaseous and liquid wastes	Not applicable
23	Management system to prevent or reduce dust emissions from treatment of slags and ashes	Not applicable
24	Techniques to prevent or reduce diffuse emissions to air from treatment of slags and ashes	Not applicable
25	Minimisation of dust and metal emissions and compliance with BAT AEL	Section 5.2 of this decision document. Permit conditions 2.3.1, table S1.2, 3.3.1, 3.3.2. 3.1.1 and 3.1.2 and table S3.1
26	Techniques and BAT AEL for dust emissions from enclosed slags and ashes treatment	Not applicable

BAT conclusion	Criteria	Delivered by
27	Techniques to reduce emissions of HCl, HF and SO_2	Measures described in the Application. Permit condition 2.3.1 and table S1.2 Permit condition 2.3.1 and table S1.2 Section 5.2 of this decision document.
28	Techniques to reduce peak emissions of HCl, HF and SO_2, optimise reagent use and BAT AELs	Measures described in the Application. Permit conditions 2.3.1, table S1.2, 3.1.1 and 3.1.2 and table S3.1
29	Techniques to reduce emissions of NO_2, N_2O, CO and NH_3 and BAT AELs	Measures described in the Application. Section 5.2 of this decision document. Permit conditions 2.3.1, table S1.2, 3.1.1 and 3.1.2 and table S3.1
30	Reduce emissions or organic compounds including dioxins/furans and PCBs. BAT AELs	Measures described in the Application. Section 5.2 of this decision document. Permit conditions 2.3.1, table S1.2, 3.1.1 and 3.1.2 and table S3.1
31	Reduce emissions of mercury. BAT AEL	Measures described in the Application. Section 5.2 of this decision document. Permit conditions 2.3.1, table S1.2, 2.3.1, table S1.2, 3.1.1 and 3.1.2 and table S3.1
32	Segregate waste water streams to prevent contamination	Measures described in the Application Sections 4.2.2, 6.5.1 and 6.5.3 of this decision document. Permit conditions 2.3.1, table S1.2, 3.1.1, 3.1.2 and table S3.2
33	Techniques to reduce water usage and prevent or reduce waste water	Measures described in the Application. Sections 4.2.2 and 4.3.8 of this decision document Permit conditions 1.3.1, 2.3.1, table S1.2
34	Reduce emissions to water from FGC and/or from treatment or storage of bottom ashes. BAT AELs	Not applicable

BAT conclusion	Criteria	Delivered by
35	Handle and treat bottom ashes separately from FGC residues	Permit condition 2.3.15
36	Techniques for treatment of slags and bottom ashes	No treatment carried out on site
37	Techniques to prevent or reduce noise emissions.	Measures are described in the Application. Section 6.5.5 of this decision document. Permit conditions 2.3.1, table S1.2, 3.5.1, 3.5.2

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.

Table S1.4 Pre-operational measures	
Reference	**Pre-operational measures**
PO1	Prior to the commencement of commissioning, the Operator shall send a summary of the site Environment Management System (EMS) to the Environment Agency and obtain the Environment Agency's written approval to the EMS summary. The summary shall include a copy of the full other than normal operating conditions (OTNOC) management plan which shall be prepared in accordance with BAT 18 of the BAT conclusions and include: • a list of potential OTNOC situations that are considered to be abnormal operation under the definition in Schedule 6 of this permit. • a definition of start-up and shut-down conditions having regard to any Environment Agency guidance on start-up and shut-down. • any updates on the design of critical equipment to minimise OTNOC since the permit application The Operator shall make available for inspection all documents and procedures which form part of the EMS. The EMS shall be developed in line with the requirements set out in Environment Agency web guide on developing a management system for environmental permits (found on www.gov.uk) and BAT 1 of the incineration BAT conclusions. The EMS shall include the approved OTNOC management plan. The documents and procedures set out in the EMS shall form the written management system referenced in condition 1.1.1 (a) of the permit.
PO2	Prior to the commencement of commissioning, the Operator shall send a report to the Environment Agency, and obtain the Environment Agency's written approval to it, which will contain a comprehensive review of the options available for utilising the heat generated, including operating as CHP or supplying district heating, by the waste incineration process in order to ensure that it is recovered as far as practicable. The review shall detail any identified proposals for improving the recovery and utilisation of heat and shall provide a timetable for their implementation.
PO3	Prior to the commencement of commissioning, the Operator shall submit to the Environment Agency, and obtain the Environment Agency's written approval to it, a protocol for the sampling and testing of incinerator bottom ash for the purposes of assessing its hazard status. Sampling and testing shall be carried out in accordance with the protocol as approved.
PO4	Prior to the commencement of commissioning, the Operator shall submit to the Environment Agency, and obtain the Environment Agency's written approval to it, a written commissioning plan, including timelines for completion, for approval by the Environment Agency. The commissioning

Table S1.4 Pre-operational measures	
Reference	**Pre-operational measures**
	plan shall include the expected emissions to the environment during the different stages of commissioning, the expected durations of commissioning activities and the actions to be taken to protect the environment and report to the Environment Agency in the event that actual emissions exceed expected emissions. Commissioning shall be carried out in accordance with the commissioning plan as approved.
PO5	No later than one month after the final design of the furnace and combustion chamber, the operator shall submit a written report to the Environment Agency, and obtain the Environment Agency's written approval to it, of the details of the computational fluid dynamic (CFD) modelling. The report shall explain how the furnace has been designed to comply with the residence time and temperature requirements as defined by Chapter IV and Annex VI of the IED whilst operating under normal load and the most unfavourable operating conditions (including minimum turn down and overload conditions), and that the design includes sufficient monitoring ports to support subsequent validation of these requirements during commissioning.
PO6	Prior to the commencement of commissioning, the Operator shall submit a report, and obtain the Environment Agency's written approval to it, on the baseline conditions of soil and groundwater at the installation. The report shall contain the information necessary to determine the state of soil and groundwater contamination so as to make a quantified comparison with the state upon definitive cessation of activities provided for in Article 22(3) of the IED. The report shall contain information, supplementary to that already provided in application Site Condition Report, needed to meet the information requirements of Article 22(2) of the IED.
PO7	At least three months before (or other date agreed in writing with the Environment Agency) the commencement of commissioning, the Operator shall submit a written report to the Environment Agency, and obtain the Environment Agency's written approval to it, specifying arrangements for continuous and periodic monitoring of emissions to air to comply with Environment Agency guidance notes M1, web guide on Monitoring stack emissions: techniques and standards for periodic monitoring (previously M2) and M20. 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
PO8	At least 3 months before the commencement of commissioning (or other date agreed in writing with the Environment Agency) the Operator shall submit, for approval by the Environment Agency, a methodology (having regard to Technical Report P4-100/TR Part 2 Validation of Combustion Conditions) to verify the residence time, minimum temperature and oxygen content of the gases in the furnace whilst operating under normal load, minimum turn down and overload conditions.

Table S1.4 Pre-operational measures	
Reference	**Pre-operational measures**
PO9	The operator shall submit a report to the Environment Agency for approval to confirm the construction details of the dirty water pit. The report shall also confirm measures that will be used to prevent overfilling.
PO10	During commissioning, the operator shall carry out tests to demonstrate that negative pressure (as described in the application) will be maintained throughout the reception hall both during normal operation and during periods of shut-down when the alternative extraction system is used. Prior to completion of commissioning, the operator shall submit a report to the Environment Agency and obtain the Environment Agency's written approval to that report. The report shall include: • Details of testing carried out to show how negative pressure during normal operation and shut-down is being achieved • Testing to show that appropriate negative pressure is maintained when reception hall doors are open. • Testing of the building management system to ensure that is operates as described in the application. • If required, any proposed improvements with timescales for implementation.

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.

Table S1.3 Improvement programme requirements		
Reference	**Requirement**	**Date**
IC1	The Operator shall submit a written report to the Environment Agency on the implementation of its Environmental Management System (EMS) and the progress made in the certification of the system by an external body or if appropriate submit a schedule by which the EMS will be certified.	Within 12 months of the completion of commissioning.
IC2	The Operator shall submit a written proposal to the Environment Agency to carry out tests to determine the size distribution of the particulate matter in the exhaust gas emissions to air from emission point A1, identifying the fractions within the PM_{10}, and $PM_{2.5}$ ranges. On receipt of written approval from the Environment Agency to the proposal and the timetable, the Operator shall carry out the tests and submit to the Environment Agency a report on the results.	Within 6 months of the completion of commissioning.
IC3	The Operator shall submit a written report to the Environment Agency on the commissioning of the installation. The report shall summarise the environmental performance of the plant as installed against the design parameters set out in the Application. The report shall also include a review of the performance of the facility against the conditions of this permit and details of procedures developed during commissioning for achieving and demonstrating compliance with permit conditions and confirm that the Environmental Management System (EMS) has been updated accordingly.	Within 4 months of the completion of commissioning.
IC4	The operator shall notify the Environment Agency of the proposed date(s) that validation testing is planned for.	Notification at least 3 weeks prior to validation testing
	During commissioning the operator shall carry out validation testing to validate the residence time, minimum temperature and oxygen content of the gases in the furnace whilst operating under normal load and most unfavourable operating conditions. The validation shall be to the methodology as approved through pre-operational condition PO8.	Validation tests completed before the end of commissioning
	The operator shall submit a written report to the Environment Agency on the validation of residence time, oxygen and temperature whilst operating under normal load, minimum turn down and overload	Report submitted within 2

Table S1.3 Improvement programme requirements		
Reference	**Requirement**	**Date**
	conditions. The report shall identify the process controls used to ensure residence time and temperature requirements are complied with during operation of the incineration plant.	months of the completion of commissioning.
IC5	The Operator shall submit a written report to the Environment Agency describing the performance and optimisation of: • The lime injection system for minimisation of acid gas emissions • The carbon injection system for minimisation of dioxin and heavy metal emissions. • The Selective Non Catalytic Reduction (SNCR) system and combustion settings to minimise oxides of nitrogen (NOx). The report shall include an initial assessment of the level of NOx, N_2O and NH_3 emissions that can be achieved under optimum operating conditions.	Within 4 months of the completion of commissioning.
	The operator shall carry out a further assessment of the performance of the SNCR system and submit a written report to the Environment Agency on the feasibility of complying with an emission limit value (ELV) for NOx of 100 mg/Nm^3 as a daily average, including a description of any relevant cross-media effects identified. If an ELV for NOx of 100 mg/Nm^3 as a daily average is determined not to be feasible, the report shall propose an alternative ELV which would provide an equivalent level of NOx reduction on a long-term basis such as an annual mass emission limit or percentile-based ELV.	Within 12 months of the completion of commissioning
IC6	The Operator shall carry out an assessment of the impact of emissions to air of the following component metals subject to emission limit values: • As and Cr. A report on the assessment shall be made to the Environment Agency. Emissions monitoring data obtained during the first year of operation shall be used to compare the actual emissions with those assumed in the impact assessment submitted with the Application. An assessment shall be made of the impact of each metal against the relevant ES. In the event that the assessment shows that an environmental standard can be exceeded, the report shall include proposals for further investigative work.	15 months from the completion of commissioning
IC7	The Operator shall submit a written summary report to the Environment Agency to confirm 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. The report shall include the results of calibration and verification testing,	Initial calibration report to be submitted to the Agency within 3 months of completion of commissioning.

Table S1.3 Improvement programme requirements		
Reference	**Requirement**	**Date**
		Full summary evidence compliance report to be submitted within 18 months of completion of commissioning.
IC8	The operator shall carry out a programme of dioxin and dioxin like PCB monitoring over a period and frequency agreed with the Environment Agency. The operator shall submit a report to the Environment Agency with an analysis of whether dioxin emissions can be considered to be stable.	Within 6 months of completion of commissioning or as agreed in writing with the Environment Agency
IC9	The operator shall carry out a programme of mercury monitoring over a period and frequency agreed with the Environment Agency. The operator shall submit a report to the Environment Agency with an analysis of whether the waste feed to the plant can be proven to have a low and stable mercury content.	Within 6 months of completion of commissioning or as agreed in writing with the Environment Agency
IC10	The Operator shall submit a report to the Environment Agency for approval on start-up and shut-down conditions over the first 12 months of operation. The report shall identify any amendments to the start-up and shut-down definitions that were described in the application.	Within 15 months of completion of commissioning or as agreed in writing with the Environment Agency
IC11	The Operator shall undertake a noise assessment during normal operations in accordance with the procedures given in BS4142: 2014 (Rating industrial noise affecting mixed residential and industrial areas) in order to verify the assessment provided within the application. The assessment shall include, but not be limited to: • A review of the noise sources from the facility. Where any noise sources are identified as exhibiting tonal contributions, they shall be quantified by means of frequency analysis. • A review of noise mitigation measures A report shall be provided to the Environment Agency detailing the findings of the assessment and a review of whether any improvements are required together with proposals for their implementation.	Within 4 months of the completion of commissioning.
IC12	During commissioning, the operator shall carry out tests to assess whether the air monitoring location(s) meet the requirements of BS EN 15259 and supporting Method Implementation Document (MID). A written report shall be submitted for approval setting out the results and conclusions of the assessment including where necessary	Report to be submitted within 3 months of completion of commissioning.

Table S1.3 Improvement programme requirements		
Reference	**Requirement**	**Date**
	proposals for improvements to meet the requirements. The report shall specify the design of the ports for PM10 and PM2.5 sampling. Where notified in writing by the Environment Agency that the requirements are not met, the operator shall submit proposals or further proposals for rectifying this in accordance with the time scale in the notification. The proposals shall be implemented in accordance with the Environment Agency's written approval.	

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 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 27/11/20 to 21/02/21 and in the Wiltshire Times on 27/11/20. The Application was made available to view on line and a hard copy was also available if people could not view the Application on-line.

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

- Food Standards Agency
- Wiltshire Council
- Public Health England
- Director of Public Health

1) Consultation Responses from Statutory and Non-Statutory Bodies

Response Received from Public Health England	
Brief summary of issues raised:	**Summary of action taken / how this has been covered**
Environment Agency should check whether buildings and air intake at Arla foods site will affect dispersion modelling results.	We audited the Applicant's modelling, this included checking any effects from nearby buildings. We are satisfied with the way it was carried out and that not further consideration was required.
Check that the impact at the AQMA is not significant.	The process contribution of NO_2 at receptors near to the AQMA is predicted to be well below 1% of the ES and can be considered insignificant.
Check whether any additional receptors need to be considered especially those at higher elevations.	We are satisfied that the worst case impacts have been assessed and that further consideration of impacts at additional receptors is not required.
PHE is aware of local concern as to whether meteorological data available at the adjacent MBT plant could be used in the modelling.	We checked the weather data used by the Applicant when we audited the Applicant's dispersion modelling. This included checking weather data from other weather stations around the site and using our own weather data. Based on our audit. we are satisfied with the weather data that was used by the Applicant.
PHE is satisfied that the emissions do not pose a significant risk to public health.	Noted.

Response Received from Wiltshire Council Environmental Control and Protection Team	
Brief summary of issues raised:	**Summary of action taken / how this has been covered**
Would not support permitting if it would have a detrimental effect on the AQMA or affected the councils ability to reduce air quality..	The process contribution of NO_2 at receptors near to the AQMA is predicted to be well below 1% of the ES and can be considered insignificant and not discernible. Also see section 5.2.4.
Regard should also be given to air quality objectives, specifically for $PM_{2.5}$	Regard was given to air quality objectives. The Impacts of PM2.5 will be insignificant. Section 5.2.2 has further details.
Abnormal operation assessment should show pollution levels in $\mu g/m^3$	The abnormal operation assessment does show this. Further details are in section 5.5.
Concern over abnormal operation impacts at the AQMA.	The AQMA is declared for long term NO2 impacts. As explained in section 5.5 generally it is only short term impacts that are relevant for assessing abnormal operation. However the Applicant did consider the small increase in the long term PC for NO_2 which could occur from abnormal operation; this was an increase of 0.025% of the ES which is a negligible increase and make no difference to our conclusion of impacts at the AQMAU as set out in section 5.2.4.
The permit application does not contain all final design details. If these details, when available, make material changes to the application, the council wish to be consulted.	We will consult the local authority as required.
The council expects the environmental permit to contain conditions to control noise, smoke, odour and flies.	The Permit contains appropriate conditions to control these concerns. Smoke is not emitted from incineration plants, with an emission limit on particulates ensuring that is the case.
The council are concerned that the plant relies on carbon filtration alone to control odour and questions the actions to be taken if this system is out of use for maintenance.	The carbon filter is only for use when the incinerator is not operating.
Concern over odour impacts from adjacent MBT plant and whether the operator is therefore competent to operate an incinerator.	The adjacent waste site is operated by Hills Waste Solutions Limited. We regulate the MBT plant and have taken action to reduce odour from the plant. Hills Group have a number of companies that sit under their group umbrella and the arm of the company responsible for managing the MBT will be different from the part of the business operating the EFW which is Northacre Renewable Energy Ltd jointly owned by the Hills Group and Bioenergy Infrastructure Group. Bioenergy Infrastructure Group have experience of running EFW plants elsewhere in the country. Much of the control of the emissions from an EFW facility are mitigated by the design of the plant, nevertheless they do still require a competent operator and we

	are satisfied that the Operator is competent.
Concern over odour and other fugitive emissions impacts from the incinerator including via vents.	We are satisfied that odour impacts and other fugitive emissions will be controlled and will not be significant, sections 6.5.3 and 6.5.4 have further details.
Odour monitoring should be carried out at off-site locations.	Our view is that this is not required. We are satisfied with the measures proposed.
The air emissions management plan should limit to one door open at a time.	The schedule 5 response received on 23/08/21 confirmed that only 1 door at a time would be open. This is incorporated into the Permit as an operating technique in table S1.2.
Concern over overflow of dirty water pit. This should be included in a pre-operational condition.	Pollution prevention measures for the pit were provided by the Applicant but will be confirmed through a pre-operational condition. We have set PO9 for it to be confirmed with approval required by the Environment Agency.
Concern over discharge to sewer.	There will be no routine discharge of effluent to sewer. Process water is recycled with occasional discharge to sewer in the event of excess effluent is generated. We are satisfied that emissions will not cause significant pollution.
Concern over fire water supply and containment.	The firewater provision will not meet guidance requirement of 2000 l/min for 3 hours. However the Applicant proposed alternative measures in their fire prevention plan (FPP) that we are satisfied with. Measures to contain firewater including use of the bunker and kerbing were described and we are satisfied.
Concern over PM2.5 emissions.	Emissions were screened out as insignificant. Section 5.2.2 has further details.
Concern over emissions from conveyor for waste deliveries.	The conveyor will be used to transport waste from the MBT plant to the Installation. It does not form part of this Permit up to the point it enters the incineration plant site, but in any event it will be an enclosed conveyor.

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

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

Guidance on the interaction between planning and pollution control is given in the National Planning Policy Framework. It says that the planning and pollution control systems are separate but complementary. We are only able

to take into account those issues, which fall within the scope of the Environmental Permitting Regulations.

a) Representations from Local MP, Councillors and Parish / Town / Community Councils

- Representations were received from the Member of Parliament, local Councillors, Trowbridge Town Council, Bradford on Avon Town Council, Chapmanslade Parish Council, Melksham Town Council, Frome Town Council, Dilton Marsh Parish Council, Heywood Parish Council, Westbury Town Council, who raised the following issues.

Brief summary of issues raised:	Summary of action taken / how this has been covered
Comments about regulation	
Concern as to whether the Applicant is competent to operate this type of facility.	We are satisfied that the Applicant will be a competent operator because: • An EMS certified to ISO 14001 will be in place • A suitably qualified facility manager will be appointed who will have responsibility for Permit compliance • An environmental policy will require that the Installation operates in full compliance with legislative requirements See additional information in section 4.3 of this decision document
Comments about air emissions and air risk assessment	
Concern over the impact of fine particulate matter and the uncertainty about the actual size profile of the particulates.	We are satisfied that there will not be a significant impact from very fine particles. Section 5.3 of this decision document has further details.
Concern over the selection and adequacy of the proposed stack height with regard to the local topography.	We are satisfied that the stack height has been calculated in accordance with IED article 46(1). Having assessed the Application as a whole we are satisfied that the measures proposed, of which stack height is one aspect, are BAT.
Concern that the weather data used in the modelling is not representative of conditions at the Installation.	We checked the weather data used by the Applicant when we audited the Applicant's dispersion modelling. We are satisfied with the weather data that was used
Concern over the way terrain was considered. The impact at receptors that are higher up. Some receptors are higher than the stack.	Terrain was taken into account in the modelling and when we audited the modelling. We are satisfied that the worst case impacts have been assessed and that further consideration of impacts is not required.

Brief summary of issues raised:	Summary of action taken / how this has been covered
Concern over the impact of emissions on air quality and health.	We are satisfied that there will not be a significant impact on air quality or health due to the Installation. Section 5.3 of this decision document has further details.
Concern over the impact of emissions on the Westbury Air Quality Management Area.	The Westbury AQMA has been declared for NO_2. The process contribution of NO_2 at receptors near to the AQMA is predicted to be well below 1% of the ES and can be considered insignificant and not discernible. Also see section 5.2.4
Concern over the photochemical ozone creation potential	Ozone can be produced by the action of sunlight on volatile organic compounds (VOCs) and oxides of nitrogen (NOx). Whilst the PC for NO2 and VOCs have not been screened out as insignificant, it is considered that there is very little if any risk from the incinerator of an exceedance of an air quality standard. This has been considered in Section 5.2 of this document. The potential of substances to form ozone and other substances when reacting with sunlight is a factor considered when setting ambient air quality standards. Therefore it is not considered that any additional controls or conditions are required, beyond those already proposed to minimise emissions
Concern over how bottom ash and APC residues ash will be handled and dealt with.	Measures for handling of IBA and APC residues are summarised in section 4.2.2 of this decision document. We are satisfied that the measures are appropriate.
Concern that the most exposed sensitive receptors have not been identified. Many responses were submitted with details of receptors not included in the air dispersion modelling. They included schools, nurseries, nearby houses, housing estates and other towns/villages. Concern that the impact of emissions on users of the nearby sailing lake have not been assessed.	The Applicant has reported maximum concentrations in the modelled grid, these represent 'worst case' predictions and do not necessarily represent public exposure. However, the predicted impacts have been shown to be not significant. As a result making predictions at further discrete receptor locations is not required as these will be less than the reported maximums which are already considered to be permissible and not cause any significant air quality pollution issues. Air emissions are not at the level where they could cause pollution of any waterways.
Comments about health impacts	
Concern over impacts from dioxins/furans including accumulation of dioxins/furans in the food chain.	The Applicant's human health risk assessment included consideration of accumulation in the food chain. The impact from dioxins/furans is described in more detail in section 5.3 of this decision document. We are satisfied that impacts will not be significant.
Concern that the HHRA was not carried out appropriately	We audited the HHRA and we are satisfied that it was appropriate.

Brief summary of issues raised:	Summary of action taken / how this has been covered
Comments about impacts	
Concern over impacts at adjacent Arla Foods site.	We are satisfied that there will not be a significant impact. Further details of control measures and the risk assessment are in section 6.5.3 and 5.6 respectively
Comments about noise impacts	
Concern over noise from HGV movements.	The environmental impact of HGV movements off the site of the facility are not regulated under EPR. The impact of HGV movement on site is assessed in the Application and we are satisfied that there will not be a significant impact from noise.
Concern over noise from the site and the validity of the applicant's assessment.	We have audited the Applicant's noise impact assessment and we are satisfied that there will not be a significant impact from noise.
Comments about odour impacts	
Concern over the impact from odour	We are satisfied that there will not be a significant impact from odour, further details are in section 6.5.4 of this decision document.
Comments about impacts at ecological sites	
Concern over the impact at habitat sites and other ecological sites.	Our assessment at ecological sites is described in section 5.4 of this decision document. We are satisfied that there will not be a significant impact and Natural England agreed with our assessment.
Comments about BAT, emissions limits and control measures	
Concern that the proposed technology is not BAT	Our view is that the proposed technology is BAT, see section 6 for further details.
Concern that the use of bag filters may not be BAT	Our view is that bag filters are BAT, see section 6.2.1 for further details.
Concern over the emissions of carbon dioxide and the impact on global warming.	Our assessment of global warming is covered in sections 6.3 and 6.6 of this decision document.
Comments about accidents	
Concern over the provision of firewater including whether it will meet the guidance requirement of 2000 l/min for 3 hours.	The firewater provision will not meet guidance requirement of 2000 l/min for 3 hours. However the Applicant proposed alternative measures in their FPP that we are satisfied with.
Comments about energy efficiency	
Concern over the energy efficiency and the lack of combined heat and power (CHP)	The Applicant assessed the possibility of supplying heat to the local area. The conclusion was that opportunities are not currently viable. Section 4.3.7 of this decision document has further details.
Comments about waste	
Concern that the proposed waste throughput is greater than that for the gasification plant.	Gasification plant related to a planning permission previously granted for a gasification plant. The permit Application is for a moving grate plant with a throughput of 243,000 tonnes/annum and we have determined the Application on that basis.

Brief summary of issues raised:	Summary of action taken / how this has been covered
Concern over the types of waste and where they come from.	The Operator will have waste pre-acceptance and waste acceptance procedures to ensure that only waste authorised by the Permit is received and burned. The Permit does not control where the waste comes from because that falls outside the scope of this permit determination. Waste types are specified in table S2.2 of the Permit. We are satisfied that these wastes are suitable for burning at the Installation, further details are in section 4.3.6 of this decision document. We are satisfied that the operating techniques will ensure that emission limits can be met, the emission limits apply at all times whatever wastes are being burned.

Brief summary of issues raised:	Summary of action taken / how this has been covered
Concern that an increase in recycling rates and a reduction in the availability of residual waste will mean that the plant becomes unviable.	The viability of the facility is a matter for the Operator. Waste disposal strategy is the responsibility of the local authority.
Concern that incineration will discourage recycling.	This is primarily outside the scope of this determination. Recycling initiatives are a matter for the local authority. Permit conditions 2.3.5 and 2.3.6 restrict the receipt of separately collected fractions.
Comments on the consultation	
Concern with the way the consultation was carried out including that it took place during the Covid-19 pandemic.	We are satisfied that we took appropriate steps to inform people of the Application and on how they could submit comments. We have a statutory duty to determine the application and it was not practicable to delay the consultation to an unspecified date at the end of the pandemic.
Comments about other issues	
Concern that the operation of incineration plant is in breach of UK Government policies.	We determine the Application in accordance with current regulations. We do not consider the operation of incineration plant to breach UK Government policy.
Concern that the size of the site is too small for the scale of operation.	We consider the site layout is adequate for the activities taking place.

b) Representations from Community and Other Organisations

Representations were received from Wiltshire Friends of the Earth, Bristol Avon Catchment Partnership, Westbury Gasification Action Group and Exeter University, Arla Foods

A number of these issues are the same as those raised by the Local MP / Councillors/ Town Council and are not necessarily repeated below.

Brief summary of issues raised:	Summary of action taken / how this has been covered
Comments about air emissions and air risk assessment	
Concern that particulate emissions will be composed of toxic substances.	Emissions limits have been set for those substances considered to be the most potentially polluting emissions from waste incineration. The limit for particulates is to cover all particulates whatever they may comprise off except for those for which a separate limit has been set such as some metals and dioxins. These limits will ensure that significant pollution is not caused.

Electrostatic precipitators should be used in addition to bag filters.	We are satisfied that fabric (bag) filters are BAT. Section 6.2.1 has further details.
Concern over the lack of offsite monitoring of air quality in nearby residential areas.	Ambient air monitoring around operating incinerators is not a reliable method of establishing the impact as it does not identify the source of the emissions. We consider it is better to use air dispersion modelling to predict the impact based on the highest allowed emissions (emission limit values). We have audited the modelling and we are satisfied that it is suitable for assessing the impact from the Installation. The Permit requires monitoring to be carried out to ensure that the emission limits values that were used in the modelling are met
Concern over the impact of plume grounding effects due to atmospheric conditions such as temperature inversions and topography.	The air dispersion modelling carried out by the Applicant and audited by our experts includes the effect of weather conditions and terrain and we are satisfied that there will be no significant impacts.
Concern over the impact on the adjacent Arla Foods site and taint of milk products in particular: • during maintenance or emergency events • lack of detail on control measures • negative pressure will not prevent emissions	We are satisfied that there will not be a significant impact. Further details of control measures and the risk assessment are in section 6.5.3 and 5.7 respectively.
Concern over impacts of stand-by diesel generator and whether it is BAT.	The diesel generator will only operate in the event of electrical power to enable operate of abatement equipment. This would be in the event that the incineration plant turbine was not operating and electricity from the grid was lost at the same time. We have limited operating times of the generator in the permit. For context, if the generator was to be permitted alone it would meet the requirements for a standard rules permit (SR2018 No 7). We are satisfied that there will not be any significant impacts.
Concern over the odour taint threshold that was used for benzaldehyde.	We have considered this in section 5.7.3 and are satisfied that there will not be a significant impact.
Comments about health impacts	
Concern over health impacts due to the Installation.	We are satisfied that there will not be a significant impact on health due to the Installation. Section 5.3 of this decision document has further details.
Comments about noise impacts	
Concern over the way the noise assessment was carried out including: • background noise levels not appropriate. • Noise when building doors open • Vehicle warning devices • Noise levels from other similar sites	We audited the Applicant's noise assessment and took these factors into account. We are satisfied that there will not be a significant impact from noise. Section 6.5.5 has further details. IC11 requires the Applicant to demonstrate

• Concern over noise echoes due to adjacent buildings at the Arla foods site	that the proposed control measures will be effective.
Concern that noise levels based on other similar sites.	Our view is that using levels from other sites is an appropriate way to assess the noise impacts from the Installation.
Comments about odour	
An odour management plan should be required.	A specific odour management plant was not required. Measures to control odour were set out in the application documents and in the Applicant's air emissions management plan. We are satisfied with the proposed measures.
Comments about impacts at ecological sites	
Concern over impacts on ancient woodlands, Salisbury Plain and SSSIs No assessment of Nitrogen on Salisbury Plain calcareous grasslands	See section 5.4 of this decision document for details.
Comments about other issues	
Concern over the FPP not meeting the guidance in respect of water supply.	The firewater provision will not meet guidance requirement of 2000 l/min for 3 hours. However that is only guidance and the Applicant proposed alternative measures that we are satisfied with.
Concern over water discharge to sewer including bottom ash.	There will be no routine discharge of effluent to sewer. Process water is recycled with occasional discharge to sewer in the event of excess effluent being generated. We are satisfied that emissions will not cause significant pollution.
Electrostatic precipitators should be used to remove ultrafine particulates (PM0.1).	Our view is that bag filters are BAT. Filter bags provide particulate abatement from the fabric itself. In addition, particulate removal also occurs via a three-dimensional dust cake which is maintained on the surface of the filter membrane by controlling the bag cleaning process and the pressure drop through the fabric filter. The membranes have very small pores which in combination with the filter cake which accumulates on the bag filters provide effective abatement of particulates. Research has shown the removal efficiency is very high even for smaller particles. See section 5.3.3 of this decision document for further details
APC residues ash should be vitrified.	APC residues will be disposed off in a suitably permitted facility. We are satisfied with the way APC residues will be dealt with. Permit condition 1.4.1 will ensure that waste is dealt with appropriately.
Concern over hydrogen evolution from bottom ash.	IBA will be stored in an enclosed area but will have ventilation so our view is that there will not be a significant risk.

Concern over the global warming assessment in particular how direct CO_2 emissions were calculated and how CO_2 offset was calculated.	Our consideration of GWP, including carbon dioxide emissions, is set out in sections 6.3 and 6.6.1. The key part of this assessment is comparisons of different BAT options and that the key factor is ensuring as much energy is generated from the waste as practicable. Therefore any changes in the way direct CO2 emissions or CO_2 offset are calculated will be the same for each option and will not affect the conclusions of the assessment.
GWP could be reduced by: • Removing plastic from waste feed • Export of heat • Use of carbon capture	The amount of plastics in the waste feed will be affected by the amount of recycling which is primarily outside the scope of this determination. Recycling initiatives are a matter for the local authority. Permit conditions 2.3.5 and 2.3.6 restrict the receipt of separately collected fractions. The export of heat is covered in section 4.3.7 We require combustion plants that generate 300 MW or more electricity to be carbon capture ready. This Installation is well below this level and carbon capture is not appropriate at this scale.

c) Representations from Individual Members of the Public

Over 600 responses were received from individual members of the public. Some of the issues raised were the same as those considered above and are not necessarily repeated below.

Brief summary of issues raised:	**Summary of action taken / how this has been covered**
Comments about air emissions and air risk assessment	
Concern that the existing pollution levels are high and should not be added to.	The Applicant considered existing pollution (background) levels in their dispersion modelling. As part of our audit we checked the background levels and we are satisfied that they were appropriate and that significant pollution will not be caused.
Concern that the most exposed sensitive receptors have not been identified. Many responses were submitted with details of receptors not included in the air dispersion modelling. They included schools, nurseries, nearby houses, housing estates and other towns/villages.	The Applicant has reported maximum concentrations in the modelled grid, these represent 'worst case' predictions and do not necessarily represent public exposure. However, the predicted impacts have been shown to be not significant. As a result making predictions at further discrete receptor locations is not required as these will be less than the reported maximums which are already considered to be permissible and not cause any significant air quality

	pollution issues.
Concern that the impact of emissions on the nearby sailing lake have not been assessed	Air emissions are not at the level where they could cause pollution of any waterways or cause significant harm to health for users of the lake.
Concern over the impact of air emissions on nearby businesses.	We are satisfied that there will not be a significant impact from emissions to air when based on the maximum concentrations that represent the worst case predictions. Impacts at individual receptors will be lower than the maximum. Section 5.2 of this decision document has further details.
Concern that there has been no independent technical report on the air dispersion modelling.	The air dispersion modelling carried out by the applicant has been audited by our experts.
Concern over the effect of wind direction on impacts.	Weather data was included in the dispersion modelling and therefore the wind direction has been taken into account.
Concern that the weather data used in the modelling is not representative of conditions at the Installation.	We checked the weather data used by the Applicant when we audited the Applicant's dispersion modelling. We are satisfied with the weather data that was used.
Concern that the proposed plant does not fit with policy of reducing air pollution.	We do not agree that the plant will contravene government or local authority air quality policy. We are satisfied that the plant will not have a significant effect on air quality.
Concern that the plume grounding assessment is based on the visible plume.	The dispersion modelling calculates the ground level concentration of all pollutants emitted from the stack, not just the visible components.
Concern over the emission of bioaerosols from the waste.	Our view is that bio-aerosols will not be a significant issue. Waste will be stored inside the reception building and will only be stored for short periods before being burned. Emissions from the reception hall will be minimised by maintaining it under negative pressure. During shut-down air will be extracted through a fabric filter and a carbon filter.
Concern that there may be unknown substances in the stack emissions.	We consider that the emissions are sufficiently understood and that there will not be a significant impact on health. IED chapter IV and the BAT conclusions set limits for the most significant substances that will be emitted, this is discussed in more detail in section 5 of this decision document.
Concern that the facility breaches the Clean Air	We are satisfied that the facility will

Strategy 2019	not breach the Clean Air Strategy.
Concern that the Environment Agency does not take account of CO_2 emissions.	The global warming potential of CO_2 emissions is considered in section 6.3 of this document.
Comments about health impacts	
Concern was expressed that there will be an impact on health due to the Installation including on those with existing health conditions. Concern over health of young people.	We are satisfied that there will not be a significant impact on health due to the Installation. Section 5.3 of this decision document has further details. The standards that we have used to assess against are set to protect all members of the public including young people and people with existing conditions.
Concern over impact on pregnant women and on unborn children including birth deformities.	We are satisfied that there will not be a significant impact on health including pregnant women and unborn children. The Environment Agency takes advice from UKHSA on the health implications of incinerators generally and specifically on each application for a permit. In January 2012 they confirmed they would be undertaking a study to look for evidence of any link between municipal waste incinerators and health outcomes including low birth weight, still births and infant deaths. Further details of the findings are in section 5.3 of this decision document. UKHSA's position remains that modern, well run municipal waste incinerators are not a significant risk to public health.
Concern over impacts from dioxins/furans including accumulation of dioxins/furans in the food chain.	The Applicant's human health risk assessment included consideration of accumulation in the food chain. The impact from dioxins/furans is described in more detail in section 5.3 of this decision document. We are satisfied that impacts will not be significant.
Concern over the impact on animals including livestock and grazing animals.	We are satisfied that emissions will not have a significant impact on animals including livestock and grazing animals. We are also satisfied that there will not be a significant impact on the food chain from grazing animals. The HHRA included the uptake of dioxins from the food chain which included grazing animals.
Concern over health impacts due to traffic.	We are satisfied that on-site vehicle movements will not have a significant effect on health. The air quality assessment considered

	existing background pollution levels which includes emissions from traffic. Movement of traffic to and from the Installation is outside of our remit but will normally be an issue for the planning authority to consider. Our consideration is whether the emissions from traffic could affect the prevailing pollutant background levels which could be a consideration where there are established high background concentrations contributing to poor air quality. In this case the small increase in pollutants from traffic would not affect the background levels to the point where it would affect the conclusions of the air quality assessment
Concern that future housing developments and population growth will increase the health risk.	If new housing was proposed in the future they would require planning permission and the incinerator should be taken into account in assessing those proposals. However, we have the ability to review the Permit and vary the conditions if required.
Concern over the mental health of residents due to the perceived risk of emissions from the site and the visual impact.	Our view as set out in this decision document (section 5.3) is that emissions from the Installation will not have a significant effect on health. There is therefore no reason that there should be an impact on mental health.
Concern that the Precautionary Principle implies that the permit should not be issued where there is any uncertainty about the health impact.	The United Kingdom Interdepartmental Liaison Group on Risk Assessment (UK-ILGRA) state in their paper "The Precautionary Principle: Policy and Application" that the precautionary principle should be invoked when there is good reason to believe that harmful effects may occur and the level of scientific uncertainty about the consequences or likelihood of the risk is such that the best available scientific advice cannot assess the risk with sufficient confidence to inform decision making. The Health Protection Agency (as it was called then) stated in its response to the British Society for Ecological Medicine Report, "The Health Effects of Waste Incinerators that "as there is a body of scientific evidence strongly indicating that contemporary waste management practices, including incineration, have at most a minor effect on human health and the environment, there are no grounds for adopting the 'precautionary principle'

	to restrict the introduction of new incinerators". As explained in section 5.3 Public Health England maintain their view on impacts from incineration.
Papers /articles on health impacts were cited to support the claim that the incinerator would cause health impacts	We considered the reports, papers and articles that were submitted. Our view is that the Installation will not have a significant impact on health. This view is supported by Public Health England. See section 5.3 of this decision document for more detail on our health assessment.
Comments about pollution of water and land	
Concern that water emissions will pollute ground and surface water.	The only water emission allowed under the Permit will be clean surface water run-off, there will be no emissions to land or groundwater. Measures will be in place to prevent fugitive emissions.
Comments about noise impacts	
Concern over noise from traffic.	Only vehicle movements within the Installation can be considered through environmental permitting. Vehicle movements outside of Installations may be within the remit of the planning authority. The Applicant's noise assessment included on-site vehicle movements and we are satisfied that there will not be a significant impact.
Comments about impacts at ecological sites	
Concern over the impact at habitat sites and other ecological sites.	Our assessment at ecological sites is described in section 5.4 of this decision document. We are satisfied that there will not be a significant impact.
Concern over the impact on wildlife, plants and protected species.	We are satisfied that there will not be an impact on wildlife or species. Section 5.4.4 has further details.
Concern over the impact of nearby bat roosts.	Emissions from the facility will not have an impact on wildlife including bats. The issue was also considered in planning and the planning authority's view was that there was no mechanism for adverse effect.
Comments about odour impacts	
Concern over the impact from odour	We are satisfied that there will not be a significant impact from odour, further details are in section 6.5.4 of this decision document.
Concern over emissions from the delivery of waste.	Incoming waste will be delivered in covered vehicles, containers or enclosed conveyor and unloaded in the enclosed waste reception areas. We are satisfied that there will not be

	a significant issue.
Comments about other impacts	
Concern over the emissions of carbon dioxide and the impact on global warming.	Our assessment of global warming is covered in sections 6.3 and 6.6 of this decision document.
Concern about the impact from pests, there are impacts at other incinerator sites.	We are satisfied that there will not be a significant problem with pests. Pests are not usually a problem at other municipal waste incinerators that we regulate.
Comments about BAT, emissions limits and control measures	
Concern that the proposed technology is not BAT.	The proposed technology is BAT and is well proven in the UK and across Europe.
Concern over regulatory changes and changes to BAT.	BAT for incineration was recently reviewed and BAT conclusions were issued in December 2019. The Installation is compliant with the BAT conclusions. The permit will be subject to regular review. If regulatory standards or BAT change again then the Permit can be varied if required
Claim that landfill is a better environmental option than incineration.	The Applicant has not applied to operate a landfill site, the Application is for an incineration plant and we have to assess whether what they propose is acceptable. Our assessment of BAT is set out in section 6 of this decision document.
Concern that Britain leaving the EU will result in lower environmental standards being imposed.	The current standards are in line with EU Directives. We have to determine this Application based on the law as it currently is.
Concern over the ability of the waste storage access doors to be kept closed and maintain negative pressure in the building. Suggests that double airlock doors should be BAT.	The use of combustion air in the furnace to generate negative pressure in the reception hall is used in many incineration plants and generally works well to control odour. We are satisfied that there will not be a significant impact from odour. Pre-operational condition PO 10 has also been set to ensure that it works effectively. Further information is in section 6.5.3.
Concern that some detail within the application is not yet finalised and that the permit should not be issued before they are.	The Permit contains pre-operational conditions requiring outstanding detail to be agreed with us before commissioning can begin. We are satisfied that we do not need this detail before issuing the permit.
Comments about residues	
Concern over how APC residues will be handled and dealt with.	Measures for handling of APC residues are summarised in section 4.2.2 of this decision document. We are satisfied that the measures are

	appropriate.
Concern over how bottom ash and APC residues will be disposed of.	Bottom ash will be sent to an off-site treatment facility for recovery. APC residues will be disposed of at a hazardous waste landfill site. The permits for those facilities will control operations and emissions.
Comments about waste	
Concern over the types of waste and where they come from. Concern as to how receipt of waste and the types will be monitored and enforced.	The Operator will have waste pre-acceptance and waste acceptance procedures to ensure that only waste authorised by the Permit is received and burned. We will check that these procedures are being adhered to when we inspect the Installation The Permit does not control where the waste comes from because that falls outside the scope of this permit determination. Waste types are specified in table S2.2 of the Permit. We are satisfied that these wastes are suitable for burning at the Installation, further details are in section 4.3.6 of this decision document. We are satisfied that the operating techniques will ensure that emission limits can be met, the emission limits apply at all times whatever wastes are being burned.
Concern that the waste might not all be residual waste and could be recycled.	This is primarily outside the scope of this determination. Recycling initiatives are a matter for the local authority. Permit conditions 2.3.5 and 2.3.6 restrict the receipt of separately collected fractions.
Concern over the burning of waste containing plastics.	Recovery and recycling initiatives are a matter for the local authority. However the Applicant confirmed that large amounts of plastic will not be burned. We are satisfied that the plastics proposed in the Application can be burned whilst complying with the Permit emission limits.
Concern over dust emissions from waste handling.	We consider that the waste handling procedures are adequate to prevent dust emissions. See section 6.5.3 for further details.
List of permitted wastes should be made public.	The permitted wastes are listed in the Permit. The Permit will be available on our public register and published on-line.

Concern over the lack of detail on waste reception, including operation of the proposed conveyor from the MBT Plant.	We are satisfied that sufficient information was provided on these aspects.
Concern that the waste will be hazardous.	The Permit does allow the incineration of hazardous waste.
View that food waste should be treated in an anaerobic digester.	Waste collection strategy is a matter for the local authority. The Permit restricts the burning of separately collected fractions.
Comments about energy efficiency	
Concern over the energy efficiency and the lack of combined heat and power.	We are satisfied that energy will be recovered as far as practicable. Section 4.3.7 of this decision document has further details.
Concern that burning waste is not BAT for generating electricity as the CO_2 emissions per unit of electricity are higher than for a coal fired power station.	We have not compared emissions to coal combustion in our assessment of this Application. The Applicant has not applied to operate a power station, the Application is for an incineration plant with the primary purpose of waste disposal whereas a power station's primary purpose is to generate energy. Our assessment of BAT is set out in section 6 of this decision document and relates to whether they are using BAT to incinerate the waste which is the primary purpose of the plant.
Comments about regulation	
Concern over how the Environment Agency will regulate the site.	We will regulate the site carrying out a continual assessment of plant operations and its environmental performance. The operator must monitor emissions and report the results to us. We will regularly inspect the Installation, review monitoring techniques and assess monitoring results to measure the performance of the plant, review operating techniques and review management systems and plans. We will carry out on-site audits of operator monitoring. The operator must inform us within 24 hours of any breach of the emissions limits, followed by a further report of the size of the release, its impact and how they propose to avoid this happening in the future. The operator's monitoring results will be placed on the public registers.
Concern over what action the Environment Agency will take if there are permit breaches.	Permit breaches will be dealt with in line with our enforcement and sanctions policy. We will investigate to determine the cause of the breach. If appropriate, we will require the Operator to put measures in place to

	prevent re-occurrence.
A claim was made that the environmental record and compliance history is poor at other incinerators.	We do not agree with this claim. The sector is generally a good sector in terms of compliance.
Concern over how noise issues would be investigated.	If there are noise and/or noise complaints we will investigate and look into the source and cause. There are several ways we can do this including visiting the site, discussions with the complainant and with the Operator. If appropriate we will require the Operator to put measures in place to rectify any issues.
Concern about the permit conditions and emission limits. How they are set and how they are regulated.	The emission limits and the permit conditions are in accordance with the regulations. Our regulation of the facility is described above.
Concern that if the permit is issued that the operator will be able to change the technology used.	If the operator proposes to make any changes to the technology approved in the permit then they must apply for a variation to the permit.
Comments about accidents	
Concern over the impacts in the event of a fire.	The Applicant submitted a Fire Prevention Plan. We are satisfied with the plan and are satisfied that appropriate measures will be in place to prevent fires and to minimise the impact from a fire if it was to occur.
Concern over the adequacy of the Fire Prevention Plan and the arrangements for firefighting.	The Applicant submitted a Fire Prevention Plan. We have approved this plan and incorporated this within operating techniques table S1.2 meaning that the site has to follow such requirements. We are satisfied that appropriate measures will be in place to prevent fires and to minimise the impact from a fire if it was to occur.
Concern over the impact in the event of a major leak and how this would be managed.	Measures to prevent leaks are summarised in section 4.2.2 of this decision document. We consider that the risk of a major leak is low. We are satisfied that the risk of accidents and their consequences will be minimised through the EMS and condition 1.1. See section 4.3.4 of this decision document.
Concern over the storage of raw materials on site.	We consider that the storage arrangements for all material on site are appropriate to prevent pollution. Section 4.2.2 has details.
Comments about monitoring	
Concern over Operator carrying out the monitoring.	The Environment Agency used to

	carry out it's own check-monitoring when there were relatively few standards for monitoring. Check monitoring is no longer normally required because of the following that provide assurance that the results are reliable. • There is now a wide variety of standards for monitoring, covering CEMs, periodic monitoring, and quality assurance. • We have MCERTS for CEMs and test labs. • We have EN 14181 for quality assurance of CEMs. • We require CEMs and test labs to be accredited to MCERTS and all the applicable standards. • We carry out audits of operators' provisions for monitoring. However, we still do check monitoring where it is considered appropriate. Furthermore, as well as auditing operators' provisions for monitoring, and how they apply the monitoring requirements of the permit, we also regularly audit test laboratories.
Comments on other Issues	
Concern over the location of the facility including concern at the proximity to residential properties.	Location is primarily a land use planning issue. We have a legal duty to determine any application made to us for an environmental permit. Our role is to determine whether appropriate measures are used to prevent and minimise emissions and whether any impacts on the environment and health are acceptable. We have considered the location of receptors in making our decision. We are satisfied that there will be no significant pollution of the environment or harm to human health at residential receptors.
Concern over differences between the planning application documents and the EPR application.	Our view is that the planning and the Permit are not likely to conflict but in any event the Applicant will have to comply with both their planning permission and the Permit. So if there was conflict they would need to vary one or the other to resolve the issue before operations began. In the event of any difference in standards they would need to comply with the most

	stringent.
Concern that the process requires supplementary fuel, contributing to climate change.	Supplementary fuel will only be used in limited circumstances (at start up/shutdown or other short periods to maintain the combustion temperature above 850 °C). Our assessment of global warming is covered in sections 6.3 and 6.6 of this decision document.
The view expressed that there has been inadequate consultation by the Environment Agency and the Applicant, partly due to the COVID restrictions	We are not responsible for the level of engagement carried out by the Applicant. We are satisfied that we took appropriate steps to inform people about the Application and to inform people about the consultation. This was proven by the large number of consultation responses that we received. Further details on how we consulted are in section 2.2 of this decision document.
Request for the Environment Agency to delay determination because of the impact of Covid on the public consultation.	We are legally obliged to determine the Application that was submitted to us and we cannot delay the determination to an unknown point in the future. In any event, we are satisfied we have sufficient information and that there has been adequate consultation to allow the determination to proceed.
Concern over light pollution.	Pollution from light is primarily a concern for considering visual impacts and as such covered by the planning process. In any event light pollution is not likely to have a significant effect on health or the environment
Concern over the possibility of the presence of anthrax spores on the site from an outbreak in 2015, which may be dispersed during construction	Impacts from construction are a matter for the planning authority.
Comment that the development and pollution is a breach of the Human Rights of the residents.	We do not agree that human rights will be contravened or that the proposal will give rise to pollution.
Concern over whether it will be a disposal or recovery operation.	Incineration is a disposal activity. The operator can apply for R1 status which if granted would classify it as a recovery operation. The decision on R1 is outside the scope of environmental permitting.

d) Representations on issues that do not fall within the scope of this permit determination

Brief summary of issues raised:	Environment Agency comment
Concern over the effects of increased traffic on the local roads.	Movement of traffic to and from the Installation is a relevant consideration for the grant of planning permission, but does not form part of the Environmental Permit decision making process.
Concern that the incinerator is not necessary as there is adequate existing capacity to dispose of non-recyclable waste.	Need and waste management strategy are matters for the relevant local authority. Our role is to determine whether the facility can be operated without giving rise to significant pollution of the environment or harm to human health.
Concern that the business case for the incinerator is flawed	This is not an issue we can take into account in the determination of this application. Notwithstanding the concerns raised we are satisfied the operator will be financially capable of complying with the terms of the permit
Concern over the impact of the facility on local amenity, visual impact, and tourism.	These issues may be covered by the planning process. So far as local amenity is concerned the emissions from the facility will not impact this.
Concern about planning decisions by Trowbridge Council and Wiltshire Council	These are matters for the planning authority and are not things we can consider in the permit determination.
Concern that there has been no public consultation meeting into the planning application.	This is an issue for the planning authority. We have consulted in accordance with our policy and procedures.
Concern over the need to lay new cables to supply electricity to the National Grid.	This is an issue for the planning authority and National Grid.
Concern over the impact of the facility on property prices.	These are not issues that are relevant to our assessment of whether the facility can be operated without giving rise to significant pollution of the environment or harm to human health.
Suggestion that the facility should be located near the railway to minimise road deliveries of waste.	
Concern that the incinerator is of no financial benefit to local residents.	
Claims there should be a moratorium on incineration, believed to be supported by the local MP.	
Concern over the impact of construction work.	
Suggestion that the Environment Agency should support public civil claims for damages resulting from construction work and emissions.	
Suggestion that there should be an archaeological investigation of the site before development commences.	

B) Advertising and Consultation on the Draft Decision

This section reports on the outcome of the public consultation on our draft decision carried out between 10/03/22 and 22/04/22. In some cases the issues raised in the consultation were the same as those raised previously and already reported in section A of this Annex. Where this is the case, the Environment Agency response has not necessarily been repeated and reference should be made to section A for an explanation of the particular concerns or issues

a) Representations from Local MPs, Councils, Councillors and Parish / Town / Community Councils

Brief summary of issues raised:	Environment Agency comment
Previous comments dismissed with no explanation	Comments were not dismissed. This decision document shows how we have taken the key issues raised during the consultation into account.
Duty of care under health and safety act not considered	Health and safety is a matter for the HSE. We consulted HSE on this Application. HSE did not contact us to express any concerns.
A cost benefit analysis (CBA) should have been carried out for impacts on the AQMA.	The process contribution of NO_2 at receptors near to the AQMA is predicted to be well below 1% of the ES and can be considered insignificant. Section 5.2.4 has further details. In any event a CBA on NOx abatement was carried out by the Applicant and we are satisfied that the measures are BAT.
Concern over the impact of ultrafine particles	We are satisfied that there will not be a significant impact from very fine particles. Section 5.3 of this decision document has further details.
Concern that the Environment Agency never refuses permits.	This is not correct. We do refuse permits where we consider it appropriate and justified to do so.
Consultation should be extended to allow for Easter holidays.	Our standard consultation period is four weeks, we extended this to six weeks for this consultation.

b) Representations from Community and Other Organisations

Representations were received from UKHSA, UK without incineration network (UKWIN), Wiltshire Climate Alliance, North Wiltshire Friends of the Earth, Westbury Town Council. A number of these issues are the same as those raised in (a) above. Of the additional issues raised.

Brief summary of issues raised:	Environment Agency comment
The UKHSA provided comments that they were satisfied with our thorough assessment of air quality and had no objection to issue of the Permit.	No response required.
The health risk assessment (HHRA)	The modelling files require specialist

modelling files were not available for the consultation on the Application.	software to open them but were available on request if someone had had the applicable software. We used the modelling files to assess the Applicant's heath risk assessment.
Concern over the way the HHRA was carried out including that it is not a conservative assessment.	We audited the HHRA and we are satisfied with the way it was carried out. Our view is that the HHRA methodology is conservative and our audit assumed a range of conservative assumptions.
Concern that measurement uncertainties and confidence intervals have not been taken into account.	Modelled predictions already include an uncertainty when compared to observed ambient concentrations. This uncertainty range already includes measurement uncertainties and confidence intervals.
Appendix D of dispersion modelling assessment is missing from the application.	This document was submitted by the Applicant, it was titled ecological interpretation of air quality modelling. Our assessment of impacts on ecological sites included consideration of all the documents that were submitted. The ecological interpretation of air quality modelling document was on our public register and was available to view on request.
Concern that long term impacts from abnormal operation was not considered.	Long term impacts are not an issue due to the limited duration of abnormal operation. Section 5.5 has further details.
Concern that the habitat risk assessment is not part of the decision document.	The decision document sets out our assessment at habitat sites in detail. See section 5.4.
The permit does not control odour impacts during shut-down.	Measures will be in place (including alternative extraction) to control odour during shut-down. Sections 6.5.3 and 6.5.4 have further details. Key operating techniques are incorporated into the Permit and the Operator will need to operate the plant in line with those techniques including during periods of shut-down..
Water flow diagram does not show all water discharges.	The indicative water flow diagram along with other details in the Application provided sufficient information for us to be satisfied with the proposed measures. These are summarised in section 6.5.1, 6.5.2 and 6.5.3.
In parts of the Application the term melting furnace is used.	This term is used in the Application to describe that the high temperature in the furnace minimises the amount of organic or putrescible solid material from residues.
Concern over emissions at start-up and shut-down.	The combustion units will be fired on a support fuel (gas oil), to ensure that the temperature meets the required levels before waste is permitted to be fed for incineration. This support fuel is automatically fed if the temperature of the furnace falls below a permitted level. The

	impact at start-up and shut-down, when emission limits do not apply, is considered not insignificant. A report by AEA for the Environment Agency showed that the mass of dioxins emitted during shutdown and start-up for a four day outage was similar to the emission which would have occurred during normal operation in the same period and so the overall impact (given that we are considering long term impacts) will be the same.
FSA comments (see section 5.6.1) were not included in the consultation section of the decision document.	The comments that we included in section 5.6.1 were received in response to us asking the FSA a specific question about food impacts. Our view was that this was the best place to include their comments.
Quenching bottom ash is not BAT for resource efficiency and metal recovery.	Dry bottom ash handling is not employed in the UK due to increase dust risk. Our view is that quenching and then handling of damp bottom ash is BAT.
The Permit does not enforce high energy recovery.	Various conditions in the Permit require energy to be recovered and used efficiently as well as regular review of those measures. Further information is in section 4.3.7 of this decision document.
A full EMS should be in place prior to issue of the Permit.	This is not practicable for a plant that will not start to operate for a considerable time. We are satisfied that sufficient information was provided in the Application to show that an appropriate EMS will be in place and we have set pre-operational condition PO1.
Concern over the validation of dispersion models.	The validation of dispersion models is well known. Software validation documents are publicly available on the software model developer websites. We are satisfied that the models are appropriately validated.
Flue gas recirculation (FGR) should be used.	This issue is covered in section 6.2.2. Our experience is that plants in the UK that have removed FGR have seen an increase in energy efficiency will little affect on NOx emissions.
SCR is BAT for NOx abatement.	The Applicant's BAT assessment is summarised in section 6.2.2 and concluded that SCR is not BAT. Our view is that SCR is not BAT due to increase energy usage and costs.
Catalytic filter bags should be used for NOx abatement.	The measures proposed by the Applicant will achieve emissions below the BAT AEL. Effective abatement using catalytic filter bags would require the flue gas to be re-heated resulting in lower energy recovery and we are therefore satisfied that it is not BAT.
Continuous monitoring should be used for mercury and dioxins.	The Permit allows us to require this should it be required. Section 6.7.3 has further details.
Impacts at Picket & Clanger Woods SSSI justified because it is >2km away.	As set out in section 5.4 even though the SSSI is >2km from the Installation we still

	assessed impacts at this site. We were satisfied that impacts would not damage the features of the SSSI. We consulted with Natural England and they agreed with this assessment.
Concern over impacts at other conservation sites where the threshold is a PC of 100%.	The assessment of impacts and other conservation sites and the reasoning behind how the assessment is carried out is in section 5.4.4 of this decision document. We are satisfied that there will be no significant pollution of the environment at these sites
Concern over the emissions levels used in the abnormal operation assessment.	The levels used are appropriate and are in line with what we would expect to model abnormal operation due to abatement plant failure. Further details are in section 5.5.
Concern that tonal noise was not adequately considered.	The Applicant considered the tonal nature of noise. We audited the noise modelling and did consider tonal effects in our audit. In this case we were satisfied that noise is a low risk for this site.
Dispersion modelling does not account for plume grounding when the plume is not visible.	This is not correct. The dispersion modelling uses 5 years of weather data and does account for periods when the plume is not visible.
Concern over impacts on Studland Park which is in an elevated position level with the stack.	The Applicant has reported maximum concentrations in the modelled grid, these represent 'worst case' predictions and do not necessarily represent public exposure. However, the predicted impacts have been shown to be not significant. As a result making predictions at further discrete receptor locations (including elevated ones) is not required as these will be less than the reported maximums which are already considered to be permissible and not cause any significant air quality pollution issues
Bag filters do not abate very fine particles.	Bag filters are effective at removal of fine particles. Section 5.3.3 has further details.
The AQMAU report refers to RAF Lyneham as being west of the site but it is north east of the site.	This is a typographical error in the report and does not affect our conclusions from our audit of the Applicant's modelling.
Dispersion modelling should be based on continual operation.	The modelling is based on continual operation.
The consideration of global warming assumes fossil fuel displacement but concern that could displace renewable electricity instead	Our consideration of global warming is an assessment of incineration BAT options. Emissions of carbon dioxide will occur when waste is burned with the amount determined by waste composition and not the technology. So our consideration of BAT is to ensure that the chosen incineration option is BAT in terms of energy recovery from the waste. Section 6.3 has further details.
The Permit does not list the types and quantities of waste as required by the legislation.	Waste types are listed in table S2.2 of the Permit with a total limit on throughput. Given the types of waste that will be burned we did not consider it necessary to set limits on the quantities of individual waste types.
The Permit does not require checking of	The Applicant will have waste pre-

waste including checking that it is not suitable for recycling.	acceptance and acceptance procedures which are incorporated in the Permit through table S1.2. They will also form part of the EMS. Receipt of recyclable material is primarily outside the scope of this determination. Recycling initiatives are a matter for the local authority. However permit conditions 2.3.5 and 2.3.6 restrict the receipt of separately collected fractions.
Concern expressed by Arla Food who did not agree with our assessment on taint of milk products including: • Applicant's assessment assumes 95% removal of VOCs by the carbon filter not 70% • The permit does not control the situation where negative pressure fails. There should be an emissions management plan • The Permit does not set odour limits or require odour monitoring • Concern over emissions during commissioning	We are satisfied that there will not be a significant impact as covered in section 5.6. In response to the specific issues raised: • The 70% in section 5.6 refers to the odour assessment. We have amended the text to make it clearer. • The Permit does control this. Operating techniques including an emissions management plan are incorporated into the Permit through table S1.2. • Our approach is to not set odour limits but to ensure that operating techniques are used to prevent odour impacts from occurring. Specific odour monitoring against limits is therefore not required. • Pre-operational condition PO4 requires a commissioning plan to be submitted and approved by the Environment Agency. The commissioning plan will ensure that there are no significant impacts during commissioning.

c) Representations from Individual Members of the Public

Over 40 responses were received from individual members of the public. Many of the issues raised were the same as those considered above. Only those issues additional to those already considered are listed below:

Brief summary of issues raised:	Environment Agency comment
Concern over applicant competence. Hills Waste and the Applicant have shared directors.	There are directors of the Applicant that are also directors of Hills Waste. This does not affect our conclusion that the Applicant is competent to operate the plant in accordance with the Permit.
Concern over health impact with reports quoted including an all parliamentary group report on air quality.	We reviewed the information quoted and are satisfied that there will not be a significant impact on health. This is in line

	with the views of the UKHSA.
Concern as to how long the plant will take to shut-down in the event of an ELV being exceeded.	The Permit allows ELVs to be exceeded during abnormal operation for a period of 4 hours after that it requires the plant to be shut-down. As explained in section 5.5 allowing such periods of abnormal operation to enable any problems to be rectified is preferable to requiring the plant to shut-down and start up again.
Concern over the impact on insects.	We are satisfied that the impact assessment shows there will not be a significant impact on wildlife including insects.
Office of National Statistics data shows higher infant mortality rates in areas with Incinerators.	We do not agree that there is a link between living near an incinerator and infant mortality. The SAHSU study, discussed in section 5.3, found no link.
Concern over the background data used in the dispersion modelling.	We are satisfied that background data was appropriate and we checked this in our audit.
Concern that an accident management plan is not in place.	We are satisfied that an appropriate plan will be in place before the plant starts to operate. Further details are in section 4.3.4