

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

Decision document recording our decision-making process

The Permit Number is: EPR/HP3238AF/V002

The Applicant / Operator is: Omega Proteins Limited

The Installation is located at: Penrith Rendering Facility, Wildriggs, Penrith, Cumbria, CA11 0BX

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 are issuing 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/HP3238AF/V002. We refer to the application as "the **Application**" in this document in order to be consistent.

The number we propose to give to the varied permit is EPR/HP3238AF/V002. We refer to the proposed varied permit as "the **Permit**" in this document.

The Application was duly made on 27/01/2021.

The applicant is Omega Proteins Limited and we refer to Omega Proteins Limited as "the **Applicant**" in this document.

Where we are talking about what would happen after the Permit is granted (if that is our final decision), we call Omega Proteins Limited “the **Operator**”.

Omega Proteins Limited’s facility is located at Penrith Rendering Facility, Wildriggs, Penrith, Cumbria, CA11 0BX. We refer to this as “the **Installation**” in this document.

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Glossary of acronyms used in this document

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

AAD	Ambient Air Directive (2008/50/EC)
APC	Air Pollution Control
APHA	Animal and Plant Health Agency
APIS	Air Pollution Information System
AQS	Air Quality Strategy
BAT	Best Available Technique(s)
BAT-AEL	BAT Associated Emission Level
BAT-C	BAT Conclusions
BREF	BAT Reference Note
CEM	Continuous emissions monitor
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
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
EQS	Environmental Quality Standards
ES	Environmental standard
EWC	European waste catalogue
FPP	Fire Prevention Plan
FSA	Food Standards Agency
GTO	Gas Thermal Oxidiser
GWP	Global Warming Potential
HHRAP	Human Health Risk Assessment Protocol

HPA	Health Protection Agency (now PHE – Public Health England)
HRA	Human Rights Act 1998
HW	Hazardous waste
HWI	Hazardous waste incinerator
IBA	Incinerator Bottom Ash
IED	Industrial Emissions Directive (2010/75/EU)
IPPCD	Integrated Pollution Prevention and Control Directive (2008/1/EC) – now superseded by IED
I-TEF	Toxic Equivalent Factors set out in Annex VI Part 2 of IED
I-TEQ	Toxic Equivalent Quotient calculated using I-TEF
LCV	Lower calorific value – also termed net calorific value
LfD	Landfill Directive (1999/31/EC)
LADPH	Local Authority Director(s) of Public Health
LOI	Loss on Ignition
MBT	Mechanical biological treatment
MSW	Municipal Solid Waste
MWI	Municipal waste incinerator
NOx	Oxides of nitrogen (NO plus NO ₂ expressed as NO ₂)
Opra	Operator Performance Risk Appraisal
PAH	Polycyclic aromatic hydrocarbons
PC	Process Contribution
PCB	Polychlorinated biphenyls
PEC	Predicted Environmental Concentration
PHE	Public Health England
POP(s)	Persistent organic pollutant(s)
PPS	Public participation statement
PR	Public register
PXDD	Poly-halogenated di-benzo-p-dioxins
PXB	Poly-halogenated biphenyls
PXDF	Poly-halogenated di-benzo furans
RGS	Regulatory Guidance Series
SAC	Special Area of Conservation
SED	Solvent Emissions Directive (1999/13/EC) – now superseded by IED
SGN	Sector guidance note

SHPI(s)	Site(s) of High Public Interest
SPA(s)	Special Protection Area(s)
SSSI(s)	Site(s) of Special Scientific Interest
TDI	Tolerable daily intake
TEF	Toxic Equivalent Factors
TGN	Technical guidance note
TOC	Total Organic Carbon
UN_ECE	United Nations Environmental Commission for Europe
US EPA	United States Environmental Protection Agency
WFD	Waste Framework Directive (2008/98/EC)
WHO	World Health Organisation
WID	Waste Incineration Directive (2000/76/EC) – now superseded by IED

1 Our proposed decision

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

The variation will secure at least an equivalent level of protection to human health and the environment and will offer improvements to the current Installation in terms of odour abatement improvements, energy efficiency improvements and carbon consumption improvements through a reduction in the use of fossil fuels.

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 make changes to the operation of an installation which is subject principally to the Industrial Emissions Directive (IED).

The draft varied 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 (EPR) 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 that the details provided are sufficient and satisfactory to make use of the standard conditions acceptable and appropriate.

2 How we reached our decision

2.1 Receipt of Application

The Application was duly made on 27/01/2021. 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 Section 2.3 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 Public Participation Statement (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, we consider that our consultation already satisfies the requirements of the 2009 Act.

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 Cumberland and Westmorland Herald on 13/02/2021 that contained the same information.

We made a copy of the Application and all other documents relevant to our determination available to view on our Public Register. Anyone wishing to see these documents could do so via the advertisement on GOV.UK.

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

- Eden District Council
- Public Health England and Director of Public Health
- Food Standards Agency
- Animal and Plant Health Authority
- Health and Safety Executive
- Cumbria Fire & Rescue Service
- United Utilities PLC

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

In addition to our advertising the Application, we undertook a programme of extended public consultation. Interested parties were notified by newsletter and written comments were also accepted by us 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 an information notice on 05/05/2021. A copy of the information notice and the responses were placed on our public register.

Finally we have consulted on our draft decision from 20/05/2022 to 20/06/2022. A summary of the consultation responses and how we have taken into account all relevant representations is shown in Annex 4B.

3 The legal framework

The Permit will be varied under Regulation 20 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:

- whose primary activity is the treatment and processing of animal wastes and by-products;
- which operates a *waste co-incineration plant* as described by the IED; and
- which is 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 Section 7 towards the end of this document.

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

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

4 The Installation

4.1 Description of the Installation and related issues

4.1.1 The permitted activities

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

- Section 6.8 Part A(1)(c) - *Disposing of or recycling animal carcasses or animal waste, other than by rendering or by incineration falling within Section 5.1, at a plant with a treatment capacity exceeding 10*

tonnes per day of animal carcasses or animal waste or both in aggregate.

- Section 6.8 Part A(2)(a) - *Disposing of or recycling animal carcasses or animal waste by rendering at plant with a treatment capacity exceeding 10 tonnes per day of animal carcasses or animal waste or both in aggregate.*
- Section 5.4 Part A(1)(b)(i) - *Recovery or a mix of recovery and disposal of non-hazardous waste with a capacity exceeding 75 tonnes per day involving biological treatment.*

For the purposes of the Application, notwithstanding the other changes being made as outlined in Section 4.1.3, the operation of a new multi-fuel thermal oxidiser will require an additional listed activity to be added to the Permit as follows:

- 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” (DAA) for EPR purposes, such as air pollution control plant, and the ash storage unit, are therefore included in the listed activity description.

An installation may also undertake DAA which, at this Installation, include the use of wet scrubbers. All of these activities comprise one installation, because the operations are successive steps in an integrated activity.

Together, the listed activities and the DAA’s comprise the Installation.

4.1.2 The Site

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

Further information on the site is addressed below at Section 4.3.

4.1.3 What the Installation does

The primary activity of the Installation is a Category 3 animal by-products processing plant, which processes poultry and mixed species by-products (including offal, skin, carcase and offcuts), poultry and mixed species blood, and poultry feathers to produce animal feed (meal) and oils (tallow) via the following lines:

- Poultry offal rendering line comprising cooker, press and milling system.
- Mammalian offal rendering line comprising cooker, press and milling system.
- Feather processing line comprising hydrolyser, condenser, dryer and milling system.
- Poultry blood processing line comprising coagulator, dryer, and milling system.
- Mixed species blood processing line comprising coagulator and steriliser.

The main processes are delivery, receipt and storage of raw materials; product processing (cooking, drying and milling) and final product storage.

Ancillary processes include the operation of the boiler; biofilters; thermal oxidisers; chemical and oil storage, and washing and cleaning.

Waste water from the process is treated on site, and an existing listed activity in the Permit covers that process.

For the purposes of the Application, the Applicant proposes the following changes to the existing site permit:

Changes to the poultry and mixed species blood processing lines

The Installation currently has poultry blood processing (including drying) and mixed species blood processing in the permit, listed as two separate activity references. Poultry blood is stored and processed separately to mixed species blood to allow for the differences in permitted use of the end product.

Blood processing lines included in the current permit are listed as Part A(1) scheduled activities:

Section 6.8 Part A(1)(c) - Disposing of or recycling animal carcasses or animal waste, other than by rendering or by incineration falling within Section 5.1, at a plant with a treatment capacity exceeding 10 tonnes per day of animal carcasses or animal waste or both in aggregate.

The proposal outlined in the Application is to maintain the poultry blood processing activity, with improvements to the equipment, and to enhance the quality and marketability of the mixed species blood product by the introduction of a dedicated drying stage (an additional Section 6.8 Part A(1)(c)

activity). Blood meal will be produced which has a value for use as pet food ingredients and fertiliser.

In addition, self-contained wet scrubbers will be installed to provide dedicated odour and chemical species abatement to the blood lines, venting to two new emission points – A8 (mixed species) and A9 (poultry).

Changes to poultry offal rendering line

The Installation currently has poultry offal processing (rendering) included in the permit as a Part A(2) scheduled activity:

Section 6.8 Part A(2)(a) - Disposing of or recycling animal carcasses or animal waste by rendering at plant with a treatment capacity exceeding 10 tonnes per day of animal carcasses or animal waste or both in aggregate.

The proposal outlined in the Application is to introduce a new low temperature fat melting process (an additional Section 6.8 Part A(2)(a) activity), together with an additional cooker.

The new equipment to be installed comprises a pre-heat vessel implemented on the poultry line, in order to separate the oil from the raw material at a lower temperature than the existing rendering process. The pre-heat vessel contains a vertical stage water jacket and raw material will move through it. The use of steam will increase the water jacket temperature to 60 - 90°C and the vessel is designed for gentle heating of the raw material without causing damage to the oil.

The material leaving the vessel will be mechanically pressed to release the oils, before the solid greaves material is processed in a Haarslev disc cooker, which will heat the material up to 121°C for 42+ minutes (Animal and Plant Health Agency (APHA) approved method 7). The discharged material is then separated to leave further oil and poultry meal. The thermal energy consumption of the preheater will be far less than that of the disc cooker. Water condensate will be recirculated for heat recovery or re-use for washing tasks or, if not so required, circulated back to the hot well for use in the combustion plant.

In addition to the new process of pre-heating the raw material to take off oil, an additional cooker of the same size & design as existing will be added. This will increase the efficiency of the process. No new presses are being added. As with the existing processes, all methods are validated by the APHA before use for commercial production.

Odour abatement from this process is via the thermal oxidiser and biofilters.

Operation of new thermal oxidisers

The Installation is currently permitted to operate two recuperative thermal oxidisers (OX1 with a thermal input of 9.3MW and OX2 with a thermal input of 11MW), which have dual fuel burners, operating on tallow or natural gas.

The proposal outlined in the Application is to install a new multi-fuel thermal oxidiser (primary) and a new gas-fired thermal oxidiser (support).

The existing thermal oxidisers will remain in-situ on site, but will be “moth-balled”, only being brought back into use in an emergency scenario, subject to controls as specified by the Operating Techniques and permit conditions.

New multi-fuel oxidiser:

The new equipment to be installed comprises a new multi-fuel thermal oxidiser fired primarily on solid biomass, but also capable of being fired by natural gas and/or tallow as auxiliary fuels. This plant has a net rated thermal input of 29.8 MWth. The plant is required to provide heat and energy (via a steam turbine) to the Installation, as well as being a primary means of odour abatement.

As mentioned above, the Applicant has described this plant as a waste incineration activity, as the plant has the option to be fuelled by non-hazardous waste comprising solid biomass and has a capacity of up to 5 tonnes per hour. Our view is that for the purposes of the IED (in particular Chapter IV) and the EPR, the thermal oxidiser is a waste co-incineration plant because:

Notwithstanding the fact that waste will be thermally treated by the process; the process is nevertheless ‘co-incineration’ because it is considered that the main purpose of this plant is the generation of energy for use at the installation as well as a primary means of odour abatement.

The operation of this plant will therefore require a new listed activity to be added to the Permit:

- 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 key features of the multi-fuel thermal oxidiser can be summarised in the table below.

Waste throughput, Tonnes/line	Up to 5 tonnes per hour	
“Waste” processed	Category 1 Meat and Bone Meal Grade A Waste Wood Waste water treatment plant sludge	
Number of lines	1	
Technology	Rotary kiln	
Auxiliary Fuel	Natural Gas/Tallow	
Gas abatement	Activated charcoal, sodium bicarbonate	
Stack	Grid Reference, NY 49956 29602	
	Height, 25.3 m	Diameter, 1.7 m
Flue gas	Flow, 38 Nm ³ /s	Velocity, 11 m/s
	Temperature, 199 °C	
Electricity generated	770 Kw	
Steam generated	26 tonnes/hour	
Waste heat use	Waste heat generated is used on site in the production processes.	

New gas fired thermal oxidiser (support plant):

The new equipment to be installed comprises a new thermal oxidiser fired primarily on gas, but also capable of being fired by tallow as auxiliary fuel. This plant has a net rated thermal input of 23 MWth. The plant is required to provide additional support for the provision of heat to the Installation, as well as being a means of odour abatement, should the primary multi-fuel oxidiser fail, require routine maintenance or should demand require it.

4.1.4 Key Issues in the Determination

The key issues arising during determination of the Application were air quality, odour, noise and demonstration of use of Best Available Techniques (BAT); and we therefore describe how we determined these issues in greater detail in the body of this document.

4.2 The site and its protection

4.2.1 Site setting, layout and history

The site covers an area of approximately 1.8 hectares and is situated approximately 150 m above ordnance datum. The site is within a predominantly rural area, with agricultural land bordering the site on all sides.

The site is thought to be a former clay pit and associated brick works followed by operation as a glue factory finally moving onto rendering operations, first permitted in 2006 by Eden District Council before moving to Environment Agency regulation in 2018.

4.2.2 Proposed site design: potentially polluting substances and prevention measures

We established the baseline conditions of the site when the Installation was first permitted.

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.

The Applicant submitted a revised site condition report to reflect the new activities on site.

We have reviewed that report and consider that it adequately describes the condition of the soil and groundwater prior to the start of any newly permitted operations, and the appropriate protection measures that have been put in place.

4.2.3 Closure and decommissioning

At the definitive cessation of permitted activities at the Installation, 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 account 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 Management

The site operates under an Environmental Management System (EMS), accredited to the ISO14001 standard.

The Applicant has stated in the Application that any newly permitted operations will be implemented under the accredited 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.

4.3.2 Fire prevention

The Applicant submitted a Fire Prevention Plan (FPP).

The plan sets out alternative measures that we consider meet the objectives of our FPP guidance.

We have approved the submitted FPP as we consider it to set out appropriate fire prevention and control measures for the Installation, based on information available to us at the current time. The Applicant should not take our approval of this plan to mean that the measures in the plan are considered to cover every potential circumstance throughout the life of the Permit.

The plan has been incorporated into the operating techniques at S1.2.

4.3.3 Operating techniques

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

Description	Parts Included	Justification
The Application	<p>Answers to Section 3 on EP application form Part C3 including references to:</p> <ul style="list-style-type: none">• Sector Guidance Note IPPC SG8.• Slaughterhouses and Animal By-products BREF.• Waste Incineration BREF BAT Conclusions. <p>The following sections of the Application supporting information:</p> <ul style="list-style-type: none">• Technical Description Thermal Oxidiser, Report reference OP-PV-RO1C v2.0, dated October 2019.• Technical Description Poultry Line,	These documents outline how the plant will operate in accordance with BAT and what control measures will be in place to minimise pollution.

	<p>Report reference OP-PV-R01B & Addendum, dated October 2019.</p> <ul style="list-style-type: none"> • Technical Description Blood Line, Report reference OP-PV-R01A V3.0 (updated Nov 2021) & Addendum, dated October 2019. • BAT Assessment, Report reference OP-PV-R04-BAT & Addendums, dated October 2019. • Approved Odour Management Plan 	
Response to Schedule 5 Notice dated 05/05/2021	All responses to Schedule 5 Notice including revised Fire Prevention Plan (V002), received on 28/07/2021, 09/09/2021, 18/11/2021, 21/12/2021, 11/01/2022, 25/01/2022 & 13/04/2022.	These documents outline how the plant will operate in accordance with BAT and what control measures will be in place to minimise pollution.

The details set out above describe the techniques that will be used for the operation of the Installation that have been assessed by us as representing 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 per extant permit - As required by Sulphur Content of Liquid Fuels Regulations.
Tallow	End of waste	As per extant permit.

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) the wastes are all categorised as non-hazardous in the EWC and are capable of being safely burnt at the Installation.
- (ii) these wastes are likely to be within the design calorific value (CV) range for the plant;

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

We have limited the capacity of the Installation to 43,800 tonnes per annum. This is based on the Installation operating 8,760 hours per year at a nominal capacity of 5 tonnes per hour.

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

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 (GWP) of the different options. This aspect is covered in the BAT assessment in Section 6 of this Decision Document.

(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.

(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 Combined Heat and Power (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, we consider 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 Sector Guidance Note (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 Installation will primarily generate heat and electricity for use on site, and there will be minimal scope for waste heat to be generated.

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

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

It will not be technically feasible to supply the required amount of heat required to operate the installation as a high-efficiency co-generation installation (as the heat generated will be utilised on-site). Therefore, no cost benefit assessment is required.

The Operator is required to report energy usage and energy generated under condition 4.2 and Schedule 5 of the Permit. The following parameters are required to be reported: total electrical energy generated and total energy usage. This will enable us 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 we accept 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 that the Operator will make efficient use of raw materials and water.

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

This requirement addresses wastes produced at the Installation and does not apply to the waste being treated there. The principal waste stream the Installation will produce is Incinerator Bottom Ash (IBA).

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 IBA at the Installation 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.

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

Having considered the information submitted in the Application, we are satisfied that the waste hierarchy referred to in Article 4 of the Waste Framework Directive (WFD) will be applied to the generation of waste and that any waste generated will be treated in accordance with that 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, GWP 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 (AAD) Limit Values
- AAD and 4th Daughter Directive Target Values
- UK Air Quality Strategy (AQS) Objectives
- Environmental Assessment Levels (EAL)

Where an AAD Limit Value exists, the relevant standard is the AAD Limit Value. Where an AAD Limit Value does not exist, AAD Target Values, UK AQS Objectives or 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 Values and AQS Objectives. In a very small number of cases, e.g. for emissions of lead, the AQS Objective is more stringent than the AAD Limit Value. In such cases, we use the AQS Objective for our assessment.

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

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

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

The **long term** 1% PC 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 human health and the environment.

The **short term** 10% PC 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 human health and the environment.

Where an emission is screened out in this way, we would normally consider 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 SSSIs, SACs or SPAs). These additional factors may also lead us to include more stringent conditions than BAT.

If, as a result of 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 on air quality is set out in the Thermal Oxidiser Modelling Report provided in support of the Application.

The assessment comprises:

- H1 Risk Assessment.
- Dispersion modelling of emissions to air.
- 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 AERMOD (Lakes Environmental model version 9.9.0) dispersion model, which is a commonly used computer model for regulatory dispersion modelling. The model uses 5 years of meteorological data collected from the weather station at Carlisle between 2009 and 2013.

The Applicant has used pollutant emission rates derived from manufacturer emission limits or monitoring carried out on the old GTOs on the site, which are due to be replaced. The proposal replaces this very old plant, with more efficient plant, which is likely to provide a demonstrable improvement to air quality overall. It is anticipated that there will be an improvement in the efficiency and operation of the GTO, therefore actual emission rates are anticipated to be lower than those specified in the model.

The air impact assessments, and the dispersion modelling upon which they were based also employed the assumption that the Installation operates continuously at maximum load.

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

The way in which the Applicant used dispersion models, its selection of input data, use of background data and the assumptions it has made have been reviewed by our 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 human 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 pollutant concentrations at discreet receptors. The tables below show the ground level concentrations at the most impacted receptor.

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

Pollutant	Air Quality Standard µg/m³	Process Contribution (PC) µg/m³	% PC of AQS	Predicted Environmental Concentration (PEC) µg/m³	% PEC of AQS
NO ₂ – 1 hour mean	200	37.4	18.7	47.3	23.7
NO ₂ – Annual mean	40	2.8	7	7.8	19.4
SO ₂ – 1 hour mean	350	48.5	13.9	53.5	15.3
SO ₂ – 24 hour mean	124	16	12.8	21	16.8
SO ₂ – 15 minute mean	266	67.5	25.4	72.5	27.7
PM ₁₀ - 24 hour mean	50	0.7	1.3	20.6	41.1
PM ₁₀ – Annual mean	40	0.2	0.3	10.4	26
CO – 8 hour running average over 24 hours	10,000	3.9	0.039	4.3	0.043
Ammonia – 1 hour mean	2500	8.2	0.3	10.2	0.4
Ammonia – Annual mean	180	0.28	0.16	1.3	0.7

(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:

- Ammonia
- PM₁₀
- CO

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 PEC is less than 100% (taking expected modelling uncertainties into account) of both the long term and short term ES.

- NO₂
- SO₂

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

(iii) Emissions requiring further assessment

All emissions either screen out as insignificant or, where they do not screen out as insignificant, are considered unlikely to give rise to significant pollution. Therefore we are satisfied that there are no emissions requiring further assessment.

5.2.2 Consideration of key pollutants

(i) Nitrogen dioxide (NO₂)

The impact on air quality from NO₂ emissions has been assessed against the ES of 40 µg/m³ as a long term annual average and 200 µg/m³ as a short term hourly average.

The Applicant will utilise low NO_x burners for auxiliary systems. The risk assessments demonstrate that the emissions of NO_x will be lower than the old GTOs, with no predicted exceedances of the AQS.

(ii) Particulate matter PM₁₀ and PM_{2.5}

The impact on air quality from particulate emissions has been assessed against the ES for PM₁₀ (particles of 10 microns and smaller). For PM₁₀, the ES are a long term annual average of 40 µg/m³ and a short term daily average of 50 µg/m³.

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 PM₁₀.

The Applicant will utilise abatement to minimise emissions. The risk assessments demonstrate that the emissions of PM₁₀ will be lower than the old GTOs, with no predicted exceedances of the ES.

The Applicant did not undertake an assessment for PM_{2.5} (particles of 2.5 microns and smaller). However, we reviewed this as part of our audit and concluded that we should assume that all emissions are present as PM_{2.5} for the PM_{2.5} assessment.

For our assessment of PM_{2.5}, the ES of 20 µg/m³ as a long-term annual average was used, having changed from 25 µg/m³ in 2020.

The above assessment shows that the predicted PC for emissions of PM_{2.5} is exactly 1% of the long term ES and so cannot be screened out as insignificant. However, the assessment is based very much on a worst case scenario, and in reality, the PC is expected to be <1% of the long term ES. Therefore, the emission is not expected to result in the long term ES being exceeded.

There is currently no emission limit prescribed nor any continuous emissions monitor for particulate matter specifically in the PM₁₀ or PM_{2.5} fraction. Whilst we are 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 (IC36) 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 we are satisfied that the health of the public would not be put at risk by such emissions, as explained in Section 5.3.3.

(iii) Acid gases, Sulphur Dioxide (SO₂), Hydrogen Chloride (HCl) and Hydrogen Fluoride (HF)

Emissions of HCl and HF are not anticipated to be significant from this proposal, based on the operating techniques and fuel types used.

There is no long term EAL for SO₂ for the protection of human health. Protection of ecological receptors from SO₂ for which there is a long term ES, is considered in Section 5.4.

Whilst SO₂ emissions cannot be screened out as insignificant, the Applicant's modelling shows that the installation is unlikely to result in a breach of the ES. We are satisfied that SO₂ emissions will not result in significant pollution.

(iv) Emissions to Air of Carbon Monoxide (CO), Volatile Organic Compounds (VOCs), Polycyclic Aromatic Hydrocarbons (PAHs), Polychlorinated Biphenyls (PCBs), Dioxins and Ammonia (NH₃)

The above tables show that CO and NH₃ can be screened out as insignificant.

The emissions of VOCs, PAH, PCBs, dioxins and furans are not expected to be significant, due to the operating techniques and fuel types. The Applicant has shown that the emissions are negligible and/or below the limits of detection.

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

(V) Summary

For the above emissions to air, for those emissions that have not been screened out as being insignificant, 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. Dioxins and furans are considered further in Section 5.3.2.

5.2.3 Assessment of Emission of Metals

The emissions of metals are not anticipated due to the operating techniques and fuel types so an assessment is not considered necessary.

5.2.4 Consideration of Local Factors

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

No AQMAs have been declared within an area likely to be affected by emissions from the proposed plant.

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. The EPR include the requirements of relevant EU Directives, notably, the IED, the WFD, and the 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 of the IED. 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 (ELVs) 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 (BAT-C) or Chapter IV of the 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, GWP and the 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. Sections 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. Whilst this application is not for a municipal waste incinerator, 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 the Department for the Environment, Food and Rural Affairs (**DEFRA**) in 2004. It concluded that there was no convincing link between the emissions from Municipal Solid Waste (MSW) incinerators and adverse effects on public health in terms of cancer, respiratory disease or birth defects. On air quality effects, the report concluded “Waste incinerators contribute to local air pollution. This contribution, however, is usually a small proportion of existing background levels which is not detectable through environmental monitoring (for example, by comparing upwind and downwind levels of airborne pollutants or substances deposited to land). In some cases, waste incinerator facilities may make a more detectable contribution to air pollution. Because current MSW incinerators are located predominantly in urban areas, effects on air quality are likely to be so small as to be undetectable in practice.”

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

In 2012 the UK Small Area Health Statistics Unit (SAHSU) at Imperial College was commissioned by PHE 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 Incinerators (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 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 (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.

The Committee on the Medical Effects of Air Pollution (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 (NO₂, SO₂ 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, SO₂ 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 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, the FSA studied the levels of chlorinated, brominated and mixed (chlorinated-brominated) dioxins and dioxin-like PCBs in fish, shellfish, meat and eggs consumed in the 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 consider 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 reasonably 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 PHE) addresses the issue of the health effects of particulates in their September 2009 statement 'The Impact on Health of Emissions to Air from Municipal Incinerators'. It refers to the coefficients linking PM₁₀ 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/m³ 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 PM₁₀ 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 PM₁₀. It goes on to say that PM₁₀ 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 PM₁₀ levels and 0.05% to ambient ground level PM_{2.5} levels. The 2016 data also shows that road traffic contributed to 5.35% of PM₁₀ and 4.96% of PM_{2.5} and that domestic wood burning contributed 22.4% to PM₁₀ and 34.3% of PM_{2.5} levels.

This is consistent with the assessment of the Application, which shows emissions of PM₁₀ 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 the 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 PECs with all relevant legislation and air quality standards, the Applicant has effectively made a health risk assessment for many pollutants. These air quality standards have been developed primarily in order to protect human health.

The Applicant’s assessment of the impact from NH₃, PM₁₀ and CO have all indicated that these Installation emissions screen out as insignificant. Where the impact of emissions of NO₂ and SO₂ have not been screened out as insignificant, the assessment still shows that the PECs are well within air quality standards or environmental action levels.

Further assessment of additional parameters which impact upon human health are not deemed to be required as the Installation is not a MSW incinerator, and due to the limited “waste” types allowed to be utilised as biomass; and the predicted emission rates, the potential impact on human health is not considered to be significant.

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:

- River Eden Special Area of Conservation
- Tarn Moss Special Area of Conservation

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

- River Eden and Tributaries Site of Special Scientific Interest

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

- Skirsgill Wood Local Wildlife Site (LWS)
- Disused Railway LWS.
- Myers Beck LWS.
- Yanwath Wood LWS.
- Thacka Beck Local Nature Reserve (LNR).

5.4.2 Habitats Assessment

The Applicant's Habitats Assessment was reviewed by our technical specialists for modelling, air quality, conservation and ecology technical services, and they agreed with the Assessment's conclusions, that there would be no likely significant effect on the conservation interest features of the protected sites.

Predicted impact on Critical Levels (CLe) for River Eden SAC

Parameter	CLe (µg/m³)	PC (µg/m³)	% PC of CLe
NOx (Annual)	30	0.10	0.3
NOx (Daily)	75	2.35	3.1
SOx (Annual)	10	0.07	0.7

The outcome of the modelling demonstrates that the PC is less than 1% and 10% of the relevant long and short term Critical Levels respectively, therefore we can conclude no likely significant effect.

Predicted impact on Critical Loads (CLo) for River Eden SAC

Parameter	CLo	Deposition rate (= PC)	% PC of CLo
Nutrient nitrogen deposition	3 KgN/ha/yr	0.07 kgN/ha/yr	2.3
Acid deposition (for River Eden & Tributaries SSSI)	0.536 Keq/ha/yr	0.02 Keq/ha/yr	3.7

Note: No critical loads data recorded on the Air Pollution Information System for the SAC. In order to provide a quantitative assessment, we have used the acid deposition values for River Eden and Tributaries SSSI.

For nitrogen deposition, the modelling demonstrates an exceedance of the 1% screening threshold for the most stringent Critical Load.

It should also be noted that the Critical Load range for nutrient nitrogen deposition is 3 – 10 kgN/ha/yr. When the deposition rate is compared to the less stringent value, this demonstrates a PC below the 1% significance threshold (0.7%).

Similarly, for acid deposition, the modelling demonstrates an exceedance of the 1% screening threshold for the most stringent Critical Load.

In this case, it should be noted that when assessed against the MaxCLMaxN of 4.483 Keq/ha/yr, this demonstrates a deposition rate below the 1% significance threshold (0.4%).

The next stage would be to look at the PEC and compare it to the relevant Critical Load for nutrient nitrogen deposition. However, we recognise the designated site already reports an exceedance for this parameter.

The key issue therefore is whether the proposal could impact on the conservation objectives for the designated site. The main conservation target for this site in relation to air quality impacts is to “maintain the concentrations and deposition of air pollutants to at or below the site-relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System” (APIS).

Natural England advised that the closest unit of the River Eden SAC to the Installation is unit 221 which contains the SAC feature ‘H3260 Water courses of plain to montane levels with the Ranunculus fluitantis’ in unfavourable recovering condition due to structural issues and is subject to a River Restoration Strategy.

In this assessment, the Minimum Critical Load for Nitrogen has been used; “Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoetes-Nanojuncetea (H3130)”, and “M23 Acid grassland” for acid deposition. These are the most sensitive habitats in the River Eden SAC but are not representative of the habitat present in unit 221 under consideration. As per APIS data on Nitrogen Deposition in Rivers and Streams; “A critical load cannot be given for nitrogen, as quantitative relationships between biology and nitrogen concentrations are poorly understood. The nitrogen to phosphorus ratio can be important, with a molar ratio of around 16:1 (7:1 by weight) being the threshold between N- and P-limitation. Impacts could be assessed by deviation from a 'natural' ratio for an individual site. In most lowland rivers and burns, nitrogen inputs from catchment land-use, not deposition from the atmosphere, are likely to be much more significant”.

The whole of the surrounding area is agricultural. If this part of the River Eden is P limited through agricultural run-off, the amount of N deposited from the air is unlikely to make a difference, and according to ‘Literature review on critical limits of acid neutralizing capacity (ANC), pH and alkalinity for designated features of Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) in acid-sensitive regions of England and Wales’, “H3260 Water courses of plain to montane levels with the Ranunculus fluitantis’ are not sensitive to acidification.”

Whilst we cannot conclude no likely significant effect based on the quantitative assessment, when taken into consideration in the context of the prudent and conservative nature of the assessment, the actual likely emissions, the improvements this proposal presents and the sensitivity of the relevant features; we do not consider that the proposal will have a likely significant effect on, or otherwise undermine, the conservation objectives for this designated site.

Predicted impact on Critical Levels (CLe) for Tarn Moss SAC

Parameter	CLe ($\mu\text{g}/\text{m}^3$)	PC ($\mu\text{g}/\text{m}^3$)	% PC of CLe
NOx (Annual)	30	0.09	0.3
NOx (Daily)	75	2.58	3.4
SOx (Annual)	10	0.06	0.6

The outcome of the modelling demonstrates that the PC is less than 1% and 10% of the relevant long and short term Critical Levels respectively, therefore we can conclude no likely significant effect.

Predicted impact on Critical Loads (CLo) for Tarn Moss SAC

Parameter	CLo	Deposition rate (= PC)	% PC of CLo
Nutrient nitrogen deposition	10 N/ha/yr	0.06 N/ha/yr	0.6
Acid deposition	0.971 Keq/ha/yr	0.01 Keq/ha/yr	1.02

For nutrient nitrogen deposition, the modelling demonstrates that the PC is less than 1% of the Critical Load, and therefore we can conclude no likely significant effect.

For acid deposition, the modelling demonstrates a slight exceedance of the 1% screening threshold for the most stringent Critical Load.

The next stage would be to look at the PEC and compare it to the relevant Critical Load for acid deposition. However, we recognise the designated site already reports an exceedance for this parameter.

The key issue therefore is whether the proposal could impact on the conservation objectives for the designated site.

The main conservation target for this site in relation to air quality impacts is to *“restore the concentrations and deposition of air pollutants to within the site-relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System”*.

Whilst we cannot conclude no likely significant effect based on the quantitative assessment, when taken into consideration in the context of the prudent and conservative nature of the assessment, the actual likely emissions and the improvements this proposal presents, we do not consider that the proposal will have a likely significant effect on, or otherwise undermine, the conservation objectives for this designated site.

5.4.3 SSSI Assessment

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

Short-term NOx

Predicted PC of NOx is < 10% (3.1%) of the short-term Cle and therefore screens out as insignificant.

Long term NOx

Predicted PC of long-term NOx is < 1% (0.3%) of the long-term CLe and therefore screens out as insignificant.

Long term SOx

Predicted PC of long-term NOx is < 1% (0.7%) of the long-term CLe and therefore screens out as insignificant.

Nutrient nitrogen and acid deposition

For nitrogen deposition, the modelling demonstrates a slight exceedance of the 1% (1.1%) screening threshold for the most stringent Critical Load. Similarly, for acid deposition, the modelling demonstrates an exceedance of the 1% (3.7%) screening threshold for the most stringent Critical Load. In this case, it should be noted that when assessed against the MaxCLMaxN of 4.483 Keq/ha/yr, this demonstrates a deposition rate below the 1% significance threshold (0.4%).

The next stage would be to look at the PEC and compare it to the relevant Critical Load for nutrient nitrogen deposition. However, we recognise the designated site already reports an exceedance for this parameter.

The key issue therefore is whether the proposal could impact on the recovery of the designated site to favourable conditions.

Natural England advised that the closest unit of the River Eden SSSI to the Installation is unit 221.

This assessment uses M23 "Acid grassland" for acid deposition. This is the most sensitive habitat but is not representative of the habitat present in unit 221 under consideration. As per APIS data on Nitrogen Deposition in Rivers and Streams; "A critical load cannot be given for nitrogen, as quantitative relationships between biology and nitrogen concentrations are poorly understood. The nitrogen to phosphorus ratio can be important, with a molar ratio of around 16:1 (7:1 by weight) being the threshold between N- and P-limitation. Impacts could be assessed by deviation from a 'natural' ratio for an individual site. In most lowland rivers and burns, nitrogen inputs from catchment land-use, not deposition from the atmosphere, are likely to be much more significant".

The whole of the surrounding area is agricultural. If this part of the River Eden SSSI is P limited through agricultural run-off, the amount of N deposited from the air is unlikely to make a difference.

Whilst we cannot conclude the proposal is unlikely to cause damage based on the quantitative assessment, when taken into consideration in the context of the prudent and conservative nature of the assessment, the actual likely emissions, the improvements this proposal presents and the sensitivity of the relevant features; we do not consider that the proposal will damage the special features of the SSSI or undermine the recovery (to favourable conditions) of this designated site.

5.4.4 Assessment of other conservation sites

Conservation sites are protected in law by legislation, which provides the highest level of protection for SACs and SPAs, a lower but important level of protection for SSSIs. Finally the Environment Act 1995 provides more generalised protection for flora and fauna rather than for specifically named conservation designations. It is under the Environment Act 1995 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 PC and the background levels in making an assessment of impact. In assessing the other sites under the Environment Act 1995, 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.

We are satisfied that the Installation will not cause significant pollution at any of the other conservation 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 the 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 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.

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 ELVs. 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 hours 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.

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.

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.

5.6 Odour Impacts

The Applicant also undertook modelling of the odour emissions from the thermal oxidisers.

We undertook a full audit of the assessment and agreed with the methodology and the conclusions.

The conclusions of the model states that *“odour concentrations at sensitive receptors from the proposed TO plant, and from combined emissions with the back-up TO also in operation, would be well below the most stringent odour benchmark.”*

The model has assumed solid biomass as the fuel choice, to provide more conservative modelled emissions.

In addition to modelling gridded receptors, the Applicant made predictions at multiple sensitive receptors located near the facility.

We have checked the locations of these receptors and we are satisfied that they are likely to be reasonably representative of a worst-case odour impact.

Whilst the Applicant has used an odour benchmark of 3 ouE/m³ at the nearest receptor on a 98th percentile basis, the model demonstrates that the site would also not likely exceed the most stringent benchmark of 1.5 ouE/m³

Historically, the site is a significant source of odour from point source and fugitive emissions by the nature of the activities undertaken at the installation. The site is in close proximity to human receptors and is a known source of odour complaints.

Our approach is that BAT requirements embed the hierarchy of preventing, minimising, and capturing and treating odours to ensure the operator takes all reasonable steps to minimise the risk of odour pollution. The application of BAT and the implementation of a robust management system and Odour

Management Plan (OMP) ensures that the risks are minimised as far as reasonably practicable.

The use of thermal oxidation at rendering facilities is a proven technique. The installation of new thermal oxidation plant at this site will provide additional capacity, and should improve odour destruction efficiency, in order to improve the overall odour impacts from the site.

The application also includes the installation of dedicated wet scrubbers to the blood lines, to provide additional capacity to the odour abatement systems to minimise the impacts.

Based upon the information in the application we are satisfied that the appropriate measures will be in place.

5.7 Noise and vibration impacts

The Application contained a noise impact assessment which identified local noise-sensitive receptors and potential sources of noise at the proposed plant. Measurements were taken of the prevailing ambient noise levels to produce a baseline noise survey and an assessment was carried out in accordance with BS 4142:2014 to compare the predicted plant rating noise levels with the established background levels.

We undertook a full audit of the assessment and agreed with the methodology and the conclusions.

The assessment concludes that the proposal in scope for this variation will not significantly increase the predicted noise impact, and that the key operational measures are in place.

However, the site as a whole has the potential for an adverse impact (but not significantly adverse) on very nearby receptors. In accordance with the Noise Policy Statement for England, this requires the Operator to ensure they are using Best Available Techniques to prevent or where that is not practicable to minimise noise and vibration and to prevent pollution from noise and vibration outside the site.

The latter section of extant improvement condition IC26 requires the Operator to undertake further investigations following the outcome of a BS4142 assessment, to ensure any dominant sources of noise have the appropriate mitigation measures in place.

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 BAT 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 the control measures for the emissions.
- 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 GWP 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 ELVs. 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-C 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-C were published on 03/12/2019.

Even if the Chapter IV limits are appropriate, operational controls can 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 that sought to operate its installation continually at the maximum permitted limits 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/Loss On Ignition (LOI) level in the bottom ash.

Overall, any of the furnace technologies identified in BREF 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 NO_x as the furnace choice could have an effect on the amount of unabated NO_x produced
- energy consumption – whole plant, waste preparation, effect on GWP
- Need, if any, for further processing of residues to comply with TOC
- Cost

The Applicant has proposed to use a furnace technology comprising rotary kiln which is identified as being considered BAT in the BREF for this type of waste feed and throughput.

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 (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 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 TGN points to a range of technologies being BAT subject to circumstances of the Installation.

In this case, the proposal includes the following FGC systems:

- A reactor, in which is mixed activated carbon and sodium bicarbonate for neutralization of the gases.
- A bag filter to remove particulates

Boiler Design

The Applicant has demonstrated BAT by installing a boiler which vaporises water using the high temperature of the gases. This steam is used for the production processes, together with an economizer, that pre-heats the vapor fumes before the kiln.

The system also includes two multicyclones, which in addition to pre-heating the combustion air, also clean the gases of ashes and particles.

6.2.1 Particulate Matter

The Applicant proposes to use fabric bag filters for the abatement of particulate matter. Fabric filters provide reliable abatement of particulate matter to below 7.5 mg/m³ and are BAT for most installations.

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

6.2.2 Oxides of Nitrogen

Emissions of NO_x have been previously screened out as unlikely to give rise to significant pollution, and so we agree that the Applicant's proposed technique is BAT for the installation.

6.2.3 Acid Gases, SO_x, HCl and HF

The Applicant proposes to implement use of low sulphur fuels for start up and auxiliary burners, this will reduce SO_x at source.

The Applicant has justified its choice of gas/tallow as the support fuel and we are satisfied that we can agree with that justification/assessment.

Management of wastes will also ensure that the risks are minimised.

In terms of abatement, the Applicant proposes to use an automated dosage system with sodium bicarbonate as reagent. We are satisfied that this is BAT.

6.2.4 CO and VOCs

The prevention and minimisation of emissions of CO and VOCs 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 <i>de novo</i> 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 bags		
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The prevention and minimisation of emissions of dioxins and furans is achieved through:

- optimisation of combustion control including the maintenance of permit conditions on combustion temperature and residence time;
- 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 Section 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. Effective control of acid gas emissions also assists in the control of dioxin releases.

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.	Consumption of aqueous bromine. Can		Not suitable for pyrolysis or gasification.

	Oxidation of mercury leading to improved removal in downstream removal method.	lead to formation of polybrominated dioxins. Can damage bag filter. Effects can be limited use is restricted to dealing with peak emissions		Can deal with mercury peaks.
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The prevention and minimisation of metal emissions is achieved through the effective removal of particulate matter, and this has been considered in Section 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 in the Table above.

Although the concentrations of metals are likely to be negligible, based on the fuel types; 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, on an automated basis.

6.3 BAT and GWP

This section summarises the assessment of greenhouse gas impacts which has been made in the determination of the Application. Emissions of carbon dioxide (CO₂) 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, CO₂ is clearly a pollutant for IED purposes.

The principal greenhouse gas emitted is CO₂, but the plant also emits small amounts of N₂O arising from the operation of secondary NO_x abatement. N₂O has a global warming potential 310 times that of CO₂. 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 CO₂ from the combustion of waste. There will also be CO₂ 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 CO₂ 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 the IED to investigate how emissions of greenhouse gases emitted from the Installation might be prevented or minimised.

Factors influencing GWP and CO₂ emissions from the Installation are:

On the debit side

- CO₂ emissions from the burning of the waste;
- CO₂ emissions from burning auxiliary or supplementary fuels;
- CO₂ emissions associated with electrical energy used;
- N₂O from the de-NO_x process.

On the credit side

- CO₂ 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 will be released as a result of waste combustion. This is a 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 N₂O emitted.

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

6.4 Other Emissions to the Environment

6.4.1 Emissions to water

There are no proposed changes to the emissions to water as a result of the Application.

6.4.2 Emissions to sewer

There are no proposed significant changes to the emissions to sewer as a result of the Application.

6.4.3 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 under Article 46(5) of the IED must be arranged.

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 Setting ELVs and other Permit conditions

6.5.1 Translating BAT into Permit conditions

Article 14(3) of the IED states that BAT-C 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-C.

BAT-C for waste incineration or co-incineration were published on 03/12/2019.

Below we consider whether, for those emissions 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 (EQS) (Article 18).

(i) Local factors

We are satisfied that all relevant BAT standards are sufficient and there are no local factors which require additional measures.

(ii) National and European ESs

We are satisfied that all relevant BAT standards are sufficient and Article 18 does not require any additional measures to meet an ES.

(iii) Global Warming

CO₂ is an inevitable product of the combustion of waste. The amount of CO₂ 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 ELV for CO₂, 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 the IED, which lists the main polluting substances that are to be considered when setting ELVs in Permits.

We have therefore considered setting equivalent parameters, or technical measures, for CO₂. 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 recovery of energy from waste. Controls in the form of restrictions on the volume and type of waste that can be accepted at the Installation and Permit conditions relating to energy efficiency effectively apply equivalent technical measures to limit CO₂ emissions.

(iv) Commissioning

We have applied requirements for commissioning of the plant as Pre-Operational Conditions.

6.6 Monitoring

6.6.1 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 ELVs and to enable correction of measured concentration of substances to the appropriate reference conditions, to establish data on the release of dioxin-like PCBs and PAHs from the incineration process, and to deliver the requirements of Chapter IV of the 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 our MCERTS certification or MCERTS accreditation as appropriate.

6.6.2 Continuous emissions monitoring for dioxins and heavy metals

The BAT-C 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 IC39 and IC40, and we can require long term monitoring for dioxins and continuous monitoring for mercury if required.

6.7 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 us 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 to 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 the 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. Our 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 decision of the *Eden District Council Planning Authority* to grant planning permission on *03/11/2017*.
- The report and decision notice of the local planning authority accompanying the grant of planning permission.

From consideration of all the documents above, we consider that no additional or different conditions are necessary.

We have also carried out our own consultation on the Application. 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 WFD is applied to the generation of waste and that any waste generated is treated in accordance with Article 4 of the WFD. (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 WFD; ensuring that the requirements in the second paragraph of Article 23(1) of the WFD are met; and ensuring compliance with Articles 18(2)(b), 18(2)(c), 23(3), 23(4) and 35(1) of the WFD.

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 takes 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 in that way 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 us to prepare and publish a statement of our policies for complying with our public participation duties. We have published our Public Participation Statement.

This Application is being consulted upon in line with our PPS, 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. We believe this satisfies the requirements of the Public Participation Directive.

Our draft decision in this case has been reached following a programme of 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 consultation 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) (the Guidance)*. 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...*”. We consider that we have 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 necessary or appropriate for this Permit.

(iv) Section 6(6) (Fisheries)

We have a duty to maintain, improve and develop fisheries of salmon, trout, eels, lampreys, smelt and freshwater fish.

We consider that no additional or different conditions are necessary or 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 Ceilings Regulations 2018

We have had regard to the National Air Pollution Control Programme, issued in compliance with the National Emissions Ceilings Regulations 2018, and consider that our decision complies with the Programme, 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 Installation in the body of this 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 the 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 that have been 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 or compromised in relation to this determination.

7.2.4 Countryside and Rights of Way Act 2000 (CROW 2000)

Section 85 of the CROW 2000 imposes a duty on us to have regard to the purpose of conserving and enhancing the natural beauty of areas of outstanding natural beauty (AONB). There are 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 we have 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 we have 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 2000 Appendix 4 form, which was sent to Natural England for consultation.

The CROW 2000 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 of this Act imposes a duty on us to exercise our 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) of this Act imposes a duty on us, when exercising our 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 area, 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.

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 conservation interest features of any protected sites.

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

7.3.2 Water Environment (Water Framework Directive) Regulations 2017 2003

Consideration has been given to whether any additional requirements should be imposed in terms of our 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 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 the 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 had regard to the Stockholm Convention on POPs and the EU's POPs Regulation. Given the activity should not give rise to POPs, we are satisfied that no different or additional conditions in the Permit are required.

7.4 Other relevant legal requirements

7.4.1 Duty to Involve

Section 23 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. Section 24 requires us to have regard to any Secretary of State guidance as to how we should do that.

The way in which we have 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 EPR, and our statutory PSP, 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

Key requirements	Delivered by
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.	<ul style="list-style-type: none"> The permit conditions
The permit shall include the total waste incinerating or co-incinerating capacity of the plant.	<ul style="list-style-type: none"> The permit conditions
The permit shall include the limit values for emissions into air and water.	<ul style="list-style-type: none"> The permit conditions
The permit shall include the sampling and measurement procedures and frequencies to be used to comply with the conditions set for emissions monitoring.	<ul style="list-style-type: none"> The permit conditions
Emission into air shall not exceed the emission limit values set out in parts 4 or determined in accordance with part 4 of Annex VI.	<ul style="list-style-type: none"> The permit conditions
Monitoring of emissions is carried out in accordance with Parts 6 and 7 of Annex VI.	<ul style="list-style-type: none"> The permit conditions
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.	<ul style="list-style-type: none"> The permit conditions
The competent authority shall determine the location of sampling or measurement points to be used for monitoring of emissions.	<ul style="list-style-type: none"> The permit conditions
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.	<ul style="list-style-type: none"> The permit conditions
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.	<ul style="list-style-type: none"> The permit conditions
Slag and bottom ash to have Total Organic Carbon (TOC) < 3% or loss on ignition (LOI) < 5%.	<ul style="list-style-type: none"> The permit conditions
Flue gas to be raised to a temperature of 850°C for two seconds, as measured at representative point of the combustion chamber.	<ul style="list-style-type: none"> The permit conditions
Automatic shut-down to prevent waste feed if at start up until the specified temperature has been reached.	<ul style="list-style-type: none"> The permit conditions
Automatic shut-down to prevent waste feed if the combustion temperature is not maintained.	<ul style="list-style-type: none"> The permit conditions

Key requirements	Delivered by
Automatic shut-down to prevent waste feed if the CEMs show that ELVs are exceeded due to disturbances or failure of waste cleaning devices.	<ul style="list-style-type: none"> • The permit conditions
Any heat generated from the process shall be recovered as far as practicable.	<ul style="list-style-type: none"> • The plant will generate electricity for use at the Installation
Management of the Installation to be in the hands of a natural person who is competent to manage it.	<ul style="list-style-type: none"> • The permit conditions
Take all necessary precautions concerning delivery and reception of Wastes, to prevent or minimise pollution.	<ul style="list-style-type: none"> • The permit conditions
Residues to be minimised in their amount and harmfulness, and recycled where appropriate.	<ul style="list-style-type: none"> • The permit conditions
Test residues for their physical and chemical characteristics and polluting potential including heavy metal content (soluble fraction).	<ul style="list-style-type: none"> • The permit conditions
Application, decision and permit to be publicly available.	<ul style="list-style-type: none"> • All documents are accessible from the Environment Agency Public Register.
An annual report on plant operation and monitoring for all plants burning more than 2 tonne/hour waste.	<ul style="list-style-type: none"> • The permit conditions

ANNEX 1B: COMPLIANCE WITH BAT CONCLUSIONS FOR ENERGY FROM WASTE

Key BAT requirements	How this is achieved
Implement environmental management system	<ul style="list-style-type: none"> The extant EMS will be amended to include all relevant requirements, as required by the permit conditions.
Monitor key process parameters	<ul style="list-style-type: none"> As outlined in the Operating Techniques and as required by the permit conditions
Monitoring emissions to air	<ul style="list-style-type: none"> As outlined in the Operating Techniques and as required by the permit conditions
Waste stream management techniques	<ul style="list-style-type: none"> As outlined in the Operating Techniques and as required by the permit conditions
Procedures to minimise start-up and shut down	<ul style="list-style-type: none"> As outlined in the Operating Techniques and as required by the permit conditions
Measures to prevent or reduce diffuse emissions including odour	<ul style="list-style-type: none"> As outlined in the Operating Techniques and as required by the permit conditions. The fuel types are not anticipated to be highly odorous.
Reduce emissions of organic compounds including dioxins/furans and PCBs BAT AELs	<ul style="list-style-type: none"> As outlined in the Operating Techniques and as required by the permit conditions. The emissions of such parameters are considered to be low based on throughputs.
Techniques to reduce water usage and prevent or reduce waste water	<ul style="list-style-type: none"> As outlined in the Operating Techniques and as required by the permit conditions.
Handle and treat bottom ashes separately from FGC residues	<ul style="list-style-type: none"> As outlined in the Operating Techniques and as required by the permit conditions.
Techniques to prevent or reduce noise emissions.	<ul style="list-style-type: none"> As outlined in the Operating Techniques and as required by the permit conditions.

ANNEX 1C: COMPLIANCE WITH BAT CONCLUSIONS FOR ANIMAL BY-PRODUCTS INSTALLATIONS:

This application includes changes to the rendering & blood drying activities as set out in Section 4.

The Animal By-products and Slaughterhouse BREF states that no additional BAT measures have been identified for fat melting other than the general measures for this type of installation.

The Applicant has demonstrated they will achieve the key BAT measures as follows:

Key BAT requirements	How this is achieved
Operate continuous, dry and segregated collection of animal by-products throughout animal by-products treatment.	<ul style="list-style-type: none"> • The plant processes Category 3 Animal By-products, with the poultry and non-poultry operations kept segregated to avoid cross contamination.
Reduce the size of carcasses and parts of animal carcasses before rendering.	<ul style="list-style-type: none"> • Raw materials are size transformed via crusher, macerator or screw conveyor, as appropriate.
Totally enclose the rendering line.	<ul style="list-style-type: none"> • Rendering lines are enclosed.
Cookers charged under reduced pressure.	<ul style="list-style-type: none"> • Cookers charged under negative pressure. • Charging area hooded with extracted gases directed to abatement plant. • Automated charging in place.
Gases from process areas should be extracted directly to abatement equipment.	<ul style="list-style-type: none"> • Odorous process fumes are extracted to biofilter or thermal oxidiser. • Scrubbers are in place.
Ensure good housekeeping in process areas.	<ul style="list-style-type: none"> • Ongoing housekeeping requirements are embedded into the EMS.

ANNEX 2: Pre-Operational Conditions

Based on the information in 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 activities AR8 and AR12 .

Reference	Pre-operational measures for activity AR8
PO2	Prior to the commencement of commissioning, the Operator shall submit to the Environment Agency, and obtain the Environment Agency's written approval to, 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.
PO3	Prior to the commencement of commissioning, the Operator shall submit to the Environment Agency, and obtain the Environment Agency's written approval to, a written commissioning plan. The commissioning plan shall include: timelines for completion; 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.
PO4	Prior to the commencement of commissioning, the Operator shall submit to the Agency, and obtain the Environment Agency's written approval to, a written report detailing the waste acceptance procedure to be used at the site. The waste acceptance procedure shall include the process and systems by which wastes unsuitable for incineration at the site will be controlled. The procedure shall be implemented in accordance with the report as approved.
PO5	At least three months (or such other time period as may be agreed in writing with the Environment Agency) before the commencement of commissioning, the Operator shall submit to the Environment Agency, and obtain the Environment Agency's written approval to, a written report specifying arrangements for continuous and periodic monitoring of emissions to air to comply with Environment Agency guidance notes M1, M2 and M20. The report shall include the following: <ul style="list-style-type: none"> • Plant and equipment details, including accreditation to MCERTS • Methods and standards for sampling and analysis • Details of monitoring locations, access and working platforms Continuous and periodic monitoring of emissions shall be undertaken in accordance with the report as approved.
PO6	At least 3 months (or such other time period as may be agreed in writing with the Environment Agency) before the commencement of commissioning the Operator shall submit to the Environment Agency, and obtain the Environment Agency's written approval to, 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. Combustion conditions shall be verified in accordance with the methodology as

	approved.
Reference	Pre-operational measures for activity AR12
PO7	<p>The Operator shall submit to the Environment Agency, and obtain the Environment Agency's written approval to, a report detailing completion of a comprehensive monitoring programme of the operational performance and emissions characteristics of the wet chemical scrubbers serving the blood processing operations, including the predicted impacts of emissions to air from modelling.</p> <p>The performance of the chemical scrubbers shall be monitored in accordance with the report, as approved.</p>

Note: The previous permit contained PO1, which has been retained.

ANNEX 3: Improvement Conditions

Based on the information in the Application we consider that we need to set improvement conditions. These conditions are set out below - justification 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.

Commissioning and validation of multi-fuel thermal oxidation unit		
IC33	The operator shall submit a written report to the Environment Agency on the commissioning of the plant. 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.
IC34	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 PO6.	Validation tests to be completed before the end of commissioning
IC35	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 conditions. The report shall identify the process controls used to ensure residence time and temperature requirements are complied with during operation of the co-incineration plant.	Report to be submitted within 2 months of the completion of commissioning.
IC36	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 A5, identifying the fractions within the PM10, and PM2.5 ranges. On receipt of written approval from the Environment Agency to the proposal and the timetable, the Operator shall carry out the tests in accordance with the approved proposal and submit to the Environment Agency a report on the results.	Within 6 months of the completion of commissioning.
IC37	The Operator shall carry out an assessment of the impact of emissions to air of all component metals subject to emission limit values. A report on the assessment shall be submitted to the Environment Agency.	Within 15 months from the completion of

	Emissions monitoring data obtained during the first year of operation shall be used to compare the actual emissions with those assumed in the impact assessment submitted with the Application. An assessment shall be made of the impact of each metal against the relevant EQS/EAL. In the event that the assessment shows that an environmental standard can be exceeded, the report shall include proposals for further investigative work.	commissioning
IC38	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 within 3 months of completion of commissioning. Full summary evidence compliance report to be submitted within 18 months of completion of commissioning.
IC39	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 may otherwise be agreed in writing with the Environment Agency
IC40	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 may otherwise be agreed in writing with the Environment Agency
IC41	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 are described in the application.	Within 15 months of completion of commissioning or as may otherwise be agreed in writing with the Environment Agency

Note: The previous permit contained ICs 1 – 32. We have updated the permit where these have been satisfied.

ANNEX 4: Consultation Responses

A) Advertising and Consultation on the Application

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

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 Cumberland and Westmorland Herald on 13/02/2021.

We made a copy of the Application and all other documents relevant to our determination available to view on our Public Register. Anyone wishing to see these documents could do so via the advertisement on GOV.UK.

The following statutory and non-statutory bodies were consulted:

- Eden District Council
- Public Health England and Director of Public Health
- Food Standards Agency
- Animal and Plant Health Authority
- Health and Safety Executive
- Cumbria Fire & Rescue Service
- United Utilities PLC

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
It is assumed by PHE that the installation will comply in all respects with the requirements of the permit, including the application of Best Available Techniques (BAT). This should ensure that emissions present a low risk to human health.	No action required – We have assessed the application against the key BAT requirements as outlined in this document.

Response Received from Eden Council Environmental Protection	
Brief summary of issues raised:	Summary of action taken / how this has been covered
Concerns over the use of back-up systems, including boilers and condensers.	The operating scenarios for the back-up systems are detailed in the Schedule 5 response, which is available as part of our minded-to consultation. This now forms part of the Operating Techniques.
Concern over the robustness of the Noise Impact Assessment (NIA), including the omission of a nearby receptor.	An amended NIA was submitted in response to our Schedule 5 notice, which is available as part of our minded-to consultation. We have completed a full audit of the revised NIA as detailed in Section 5.7, having regard for all relevant receptors.
Concern over the robustness of the Air Quality Impact Assessment (AQIA), including omission of a nearby receptor.	We have completed a full audit of the AQIA as detailed in Sections 5.1 and 5.2. We were able to use the data to have regard for all relevant receptors, so did not request an amended report.

No other consultation responses were received from Statutory or Non-Statutory bodies.

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

Some of the issues raised are outside of 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. Such issues included:

- Concerns about the transport of Animal By-products and increased traffic on the public highway.
- Concerns about the visual impact of the development.

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

A representation was received from Penrith Town Council, who generally considered the proposal to be favourable in terms of best available techniques and tackling climate change, but also raised the following issues:

- Commented that a robust response to odour complaints is needed.
- Commented that robust emissions reporting requirements are needed (in particular, reporting of exceedances).

We have considered these responses in our decision making. The Odour Management Plan (OMP) is the main management system for responding to odour complaints. We have reviewed this to ensure it meets our guidance. The OMP is a “live” document which will be under regular review and revision through the life of the permit. This will form part of the compliance audits, both remotely and through site inspections, which we routinely undertake.

In terms of reporting, the permit conditions require the Operator to report their emissions data to us, including any exceedances of ELVs. This information is made available on the public register.

Any exceedances form part of our on-going compliance assessments, and form part of the picture for the overall compliance rating for the site.

b) Representations from Community and Other Organisations

A representation was received from Fresh AIR for Penrith who raised the following issues:

- Concerns about Operator competence.
- Concerns about the impact of the current odour issues caused by the site, and their impact on amenity.

We have considered these responses in our decision making.

We have assessed operator competence as part of the determination and consider that the Applicant will operate the facility in accordance with the varied permit. However, we are mindful of the compliance history of the site and will continue to monitor this as we routinely do through our compliance audits.

We are aware of the history of the odour impacts from this installation and have considered the odour impacts from this proposal in Section 5.6.

The proposal does represent an improvement to the current odour abatement systems used on site and represents BAT.

c) Representations 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:

- Concerns about the impact of the current odour issues caused by the site, and the impact on tourism (in addition to amenity as captured above).
- Comments that no further development should be allowed until the current odour issues are better controlled.
- Comments that the Odour Management Plan is not robust enough.

We have considered these responses in our decision making.

We are aware of the history of the odour impacts from this installation and have considered the odour impacts from this proposal in Section 5.6. We are satisfied there will be no significant pollution of the environment or harm to human health, including to visitors.

Whilst there is an increase in operations from the site, the proposal does represent an improvement to the current odour abatement systems, and represents Best Available Techniques, as well as reducing the reliance on fossil fuels. We also have a consideration under the Growth Duty to allow economic growth.

A revised Odour Management Plan has been submitted as part of this proposal. The OMP is a “live” document which will be under regular review and revision through the life of the permit. This will form part of the compliance audits which we routinely undertake.

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 20/05/2022 and 20/06/2022.

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 and so have not been repeated in this section.

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

a) Consultation Responses from Statutory and Non-Statutory Bodies

Further representations were received from Public Health England, who raised no new issues.

Further representations were also received from Eden District Council Environmental Protection Department, who sought further clarification some on previous issues raised:

- Concerns over receptors omitted from the Applicant's Noise, Odour and Air Quality Impact Assessments.
- Concerns over the choice of meteorological data and emission concentrations used in the Applicant's Air Quality Impact Assessment.
- Concerns over the background noise levels used in the Applicant's Noise Impact Assessment.

Our Audit of the Air Quality and Odour Impact Assessments

We also identified that nearby sensitive receptors had been omitted from the Air Quality and Odour Impact Assessments. We undertook our own sensitivity analysis and included these receptors in our assessment. Our conclusions are based on this.

Our checks and observations include using:

- Our own meteorological data: Numerical Weather Prediction Data from 2008 to 2011 extracted at the location of the facility and sensitivity to observed data: Shap 1994, 1994 and 1997, Keswick 1993 and Carlisle 1994.
- Applicant's terrain elevations, and our own elevations obtained from SRTM terrain data with resolutions of 30 m and 90 m.
- Emission sources emitting at ELVs.
- Individual contributions from emission sources.
- Maximum possible concentrations at receptors for different met data.
- Measured background data from the Local Authority.
- Alternative emission rates and source parameters.

Our Audit of the Noise Impact Assessment

We also identified that nearby sensitive receptors had been omitted from the original Noise Impact Assessment.

In addition, we identified issues with the methodology and some of the measurements used to undertake the original assessment.

We therefore asked a revised assessment, which was made available as part of the “minded-to” consultation process.

We considered this revised assessment to be more representative, including the background noise levels at nearby sensitive receptors. Our conclusions are based on our own audit and sensitivity analysis of this revised assessment.

No other statutory or non-statutory comments provided representations.

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

No representations received.

c) Representations from Community and Other Organisations

Representations were received from a number of organisations who operate in the sector, who raised the following issues:

- The correct planning permission is not in place and no pre-operational conditions are included in the permit to require such.
- Allowing a proposal which exceeds the Critical Load for ecological receptors.
- The proposal does not demonstrate Best Available Techniques in terms of energy efficiency.
- The Environment Agency assessment does not consider the impacts from the Gas Thermal Oxidiser (and focuses only on the multi-fuel thermal oxidiser).
- No conditions relating to the receipt and storage of wastes.
- No controls relating to operation of “moth balled” thermal oxidation plant.
- No approvals in place under the Animal By-products Regulations to receive and store Category 1 ABP.
- No conditions relating to a commissioning plan for the thermal oxidation plant.
- The Air Quality Assessment does not take into account the existing (background) conditions.
- A number of previous improvement conditions are unsatisfied.

Planning requirements and our consideration of the relevant information under IED:

Whilst the interpretation of the activity reference under EPR is a waste activity, we are unable to influence interpretation within the planning regulations.

Development consents are the remit of the relevant planning authorities. Our obligation is to review any available information which is relevant to the permit application. In some cases, applications for permits are made before planning permissions are obtained. There is no legal requirement for planning permission to be in place prior to a permit being issued. Therefore, we are not in a position to add any conditions in the permit relating to the planning requirements.

It is the Operators responsibility to ensure they have all the relevant permissions in place, in consultation with the relevant planning authority.

In this case, we reviewed the information found on the planning portal which we thought was relevant - relating to the planning permission for the installation of a thermal oxidiser. We also consulted the local planning authority on the permit application and did not receive any information to take into account.

We are satisfied that we have met the requirement of IED, this is covered in section 7.1.1 of this decision document.

Best Available Techniques for Energy Efficiency:

Full consideration has been given to the energy efficiency of the plant in scope, as per Section 4.3.7 of this decision document.

For clarity, despite us including an additional listed activity as required by EPR as outlined above (due to the type of material under which the multi-fuel thermal oxidiser is powered), the additional activity is still considered to be ancillary to the animal by-products processing/rendering process. The purpose of the thermal oxidation plant is to generate heat and provide power used on site to undertake the primary permitted processes, as well as thermally destructing odours arising from the process. This is much in the same way as the old thermal oxidisers work.

Ongoing appropriate measures and the assessment of the energy efficiency are maintained under permit condition 1.2.1.

Consideration of the gas thermal oxidiser

We recognise that the decision document does focus more on the key issues for the multi-fuel thermal oxidiser but this due to the additional permitting requirements for this type of operation.

Full consideration has been given to the key issues of air quality, odour, noise and BAT for all the aspects of the changes in scope for this permit variation, including the operation of the gas-fired thermal oxidiser.

The permit controls these operations, including provision of emission limit values and monitoring requirements.

Conditions relating to receipt and storage of wastes.

The permit conditions 2.1.2, 2.3.1 and 2.3.4 relate to the receipt and storage of wastes.

Controls relating to “moth-balled” plant.

Permit condition 2.1.1 limits the operation of this plant to emergency use only, when the duty and stand-by plants are non-operational. Condition 2.3.1 controls the detailed operating techniques of such scenarios and the steps the operator shall undertake to bring the “moth-balled” plant into operation, if ever needed. The potential impact on air quality is a key consideration for including these permit controls.

Approvals under the Animal By-products Regulations

We consulted the relevant competent authorities which implement these Regulations, such as the Animal and Plant Health Authority, and no issues were raised.

Conditions for the storage and testing of bottom ash and APC residues

The permit conditions 2.3.1, 3.1.3, 3.6.1(c) and Pre-operational condition PO2 relate to the storage and testing of bottom ash and APC residues.

Conditions for commissioning of the thermal oxidation plant

Pre-operational condition PO3 relates to the commissioning plan requirements.

Consideration of the prevailing environmental conditions in the Air Quality Impact Assessment.

The Air Quality Impact Assessment, as detailed in Section 5.2 of this decision document, includes the calculation of the Predicted Environmental Concentration (PEC). The PEC takes into account the background emission concentrations. We have considered the PECs as appropriate in accordance with our assessment methodology as detailed in Section 5.1 of this decision document.

Unsatisfied improvement conditions

Where these improvement conditions have been satisfied, these are marked as “completed” in the permit. We recognise that six of the 32 original improvement programme requirements remain unsatisfied. We have retained these conditions and will ensure these are satisfied through compliance.

d) Representations from Individual Members of the Public

These raised many of the same issues as previously addressed, such as the planning permissions and exceedance of the critical loads at designated sites. These are addressed above.