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/WP3934AK

The Applicant / Operator is: Lostock Sustainable Energy Plant Ltd

The Installation is located at: Lostock Sustainable Energy Plant, Lostock Gralam, Northwich, Cheshire, CW9 7NU.

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 EA/EPR/WP3934AK/V004. We refer to the application as "the **Application**" in this document in order to be consistent.

The number we have given to the permit is EPR/WP3934AK. We refer to the permit as "the **Permit**" in this document.

The Application was duly made on 22/02/2023.

The applicant is Lostock Sustainable Energy Plant Ltd. We refer to Lostock Sustainable Energy Plant Ltd as "the **Applicant**" in this document. We call Lostock Sustainable Energy Plant Ltd "the **Operator**".

Lostock Sustainable Energy Plant Ltd's facility is located at Lostock Sustainable Energy Plant, Lostock Gralam, Northwich, Cheshire, CW9 7NU. We refer to this as “the **Installation**” in this document.

How this document is structured

Contents

Glossary of acronyms used in this document

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

AAD	Ambient Air Directive (2008/50/EC)
APC	Air Pollution Control
AQS	Air Quality Strategy
BAT	Best Available Technique(s)
BAT-AEL	BAT Associated Emission Level
BREF BAT C	Best Available Techniques (BAT) Reference Documents for Waste Incineration BAT conclusions
CEM	Continuous emissions monitor
CFD	Computerised fluid dynamics
CHP	Combined heat and power
COMEAP	Committee on the Medical Effects of Air Pollutants
CROW	Countryside and rights of way Act 2000
CV	Calorific value
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 Standard
ES	Environmental standard
EWC	European waste catalogue
FGC	Flue gas cleaning
FPP	Fire prevention plan
FSA	Food Standards Agency
GWP	Global Warming Potential
HHRAP	Human Health Risk Assessment Protocol
HPA	Health Protection Agency (now UKHSA – UK Health Security Agency)
HW	Hazardous waste

HWI	Hazardous waste incinerator
IBA	Incinerator Bottom Ash
IED	Industrial Emissions Directive (2010/75/EU)
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)
LOI	Loss on Ignition
MBT	Mechanical biological treatment
MSW	Municipal Solid Waste
MWI	Municipal waste incinerator
NOx	Oxides of nitrogen (NO plus NO_2 expressed as NO_2)
OTNOC	Other than normal operating conditions
PAH	Polycyclic aromatic hydrocarbons
PC	Process Contribution
PCB	Polychlorinated biphenyls
PEC	Predicted Environmental Concentration
PHE	Public Health England (now UKHSA – UK Health Security Agency)
POP(s)	Persistent organic pollutant(s)
PPS	Public participation statement
PR	Public register
PXDD	Poly-halogenated di-benzo-p-dioxins
PXB	Poly-halogenated biphenyls
PXDF	Poly-halogenated di-benzo furans
RDF	Refuse derived fuel
RGN	Regulatory Guidance Note
SAC	Special Area of Conservation
SCR	Selective catalytic reduction
SNCR	Selective non-catalytic reduction
SPA(s)	Special Protection Area(s)
SS	Sewage sludge
SSSI(s)	Site(s) of Special Scientific Interest
SWMA	Specified waste management activity

TDI	Tolerable daily intake
TEF	Toxic Equivalent Factors
TGN	Technical guidance note
TOC	Total Organic Carbon
UHV	Upper heating value –also termed gross calorific value
UN_ECE	United Nations Environmental Commission for Europe
US EPA	United States Environmental Protection Agency
WFD	Waste Framework Directive (2008/98/EC)
WHO	World Health Organisation
WID	Waste Incineration Directive (2000/76/EC) – now superseded by IED

Links to guidance documents

The table below provides links to the key guidance documents referred to in this document. The links were correct at the time of producing this document.

Name of guidance document	**Link**
RGN 6: Determinations involving sites of high public interest	RGN 6
CHP Ready Guidance for Combustion and Energy from Waste Power Plants	CHP ready
Risk assessments for your environmental permit	Risk assessments
Guidance to Applicants on Impact Assessment for Group 3 Metals Stack Releases – version 4".	Metals guide
The Incineration of Waste (EPR 5.01)	EPR 5.01
Waste incineration BREF and BAT conclusions	BREF and BAT C
UKHSA: Municipal waste incinerators emissions: impact on health	UKHSA reports

1 Our proposed decision

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

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

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

The Permit contains many conditions taken from our standard Environmental Permit template including the relevant Annexes. We developed these conditions in consultation with industry, having regard to the legal requirements of the Environmental Permitting Regulations 2016 (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 condition acceptable and appropriate. This document does, however, provide an explanation of our use of "tailor-made" or installation-specific conditions, or where our Environmental Permit template provides two or more options, an explanation of the reason(s) for choosing the option that has been specified.

2 How we reached our decision

2.1 Receipt of Application

The Application was duly made on 22/02/2023. 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 RGN 6 for Determinations involving Sites of High Public Interest. RGN 6 was withdrawn as external guidance, but it is still relevant as Environment Agency internal guidance.
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 Northwich Guardian (20/04/2023), 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 and Citizen Space:

https://consult.environment-agency.gov.uk/psc/cw9-7nu-lostock-sustainable-energy-plant-ltd/

Anyone wishing to see these documents could do so and arrange for copies to be made.

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

- *Food Standards Authority (FSA)*
- *Health and Safety Executive (HSE)*
- *UK Health Security Agency (UKHSA)*
- *Natural England (NE)*
- *Chester - Local authority Environmental Protection Department*
- *Chester – Department of Public Health (DPH)*

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.

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 a Schedule 5 information notice on 22/09/2023. A copy of the information notice was placed on our public register.

Finally, we have consulted on our draft decision from 03/05/24 to 14/06/24. 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 granted, 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* and a *waste incineration plant* as described by the IED;
- an *operation* covered by the WFD, and
- subject to aspects of other relevant legislation which also have to be addressed.

We address some of the major legal requirements directly where relevant in the body of this document. Other requirements are covered in section 7 towards the end of this document.

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

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

4 The Installation

4.1 Description of the Installation and related issues

4.1.1 The permitted activities

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

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

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

> *“all incineration lines or co-incineration lines, waste reception, storage, on-site pre-treatment facilities, waste, fuel and air*

supply systems, boilers, facilities for the treatment of waste gases, on-site facilities for treatment or storage of residues and waste water, stacks, devices for controlling incineration or co-incineration operations, recording and monitoring incineration or co-incineration conditions."

Many activities which would normally be categorised as "directly associated activities" (DAA) for EPR purposes, such as air pollution control plant, (including storage and preparation of treatment chemicals e.g. lime slaking), and the ash storage bunker, are therefore included in the listed activity description.

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

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

4.1.2 The Site

The site is located near the village of Lostock Gralam, centred at grid reference (NGR) SJ68287403. It is approximately 2 km east of Northwich town centre. The site is part of a 68-hectare complex of chemical and chemical-related manufacturing facilities. The site is adjacent to the Tata Chemicals Sodium Carbonate manufacturing installation.

Within 10 km of the site there are three ecological sites with protected species and habitats. The West Midland Mosses Special Area of Conservation (SAC), the Midland Meres & Mosses Ramsar sites and The Witton Lime Beds Site of Specific Scientific Interest (SSSI). There are also several local wildlife sites within 2 km of the installation 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 4.3.

4.1.3 What the Installation does

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

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

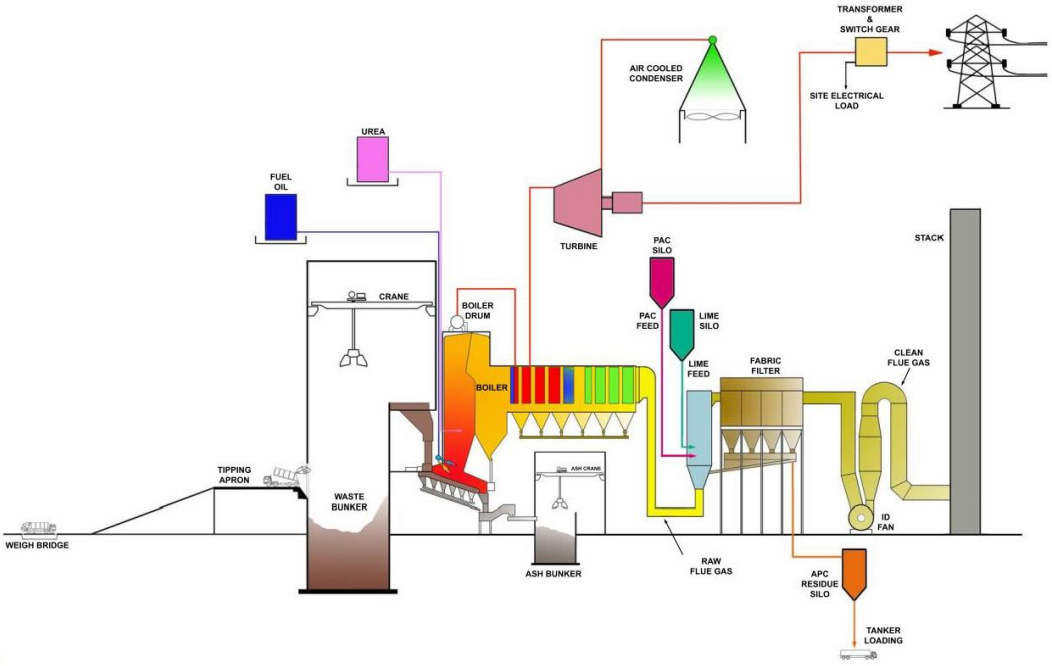

Figure 1. Facility operation schematic.

Waste will be transported by road to the Installation from waste transfer stations in large articulated vehicles. The site will also have the potential to accept some local municipal and commercial & industrial waste delivered in refuse collection vehicles. Incoming waste would have been pre-weighed or will be weighed upon entry to the site at the weighbridge. Waste materials will be deposited in the fuel bunker. The bunker will take the form of a rectangular pit set down into the floor of the reception area. It will have a depth of up to 12 metres below the general floor level of the plant. The capacity of the bunker will be approximately 9,000 tonnes of waste. Automatic, rapid closing roller shutter doors will be used to minimise odours escaping the building.

Waste feedstock will be regularly mixed to promote a homogenous feed to the plant. Waste fuel is transferred from the bunker to the stacking bunker by two cranes with hydraulic grabs. The cranes can operate in manual or semi-manual modes and waste feed operation will be semi-automatic. Waste is then fed to the charging hoppers which in turn feed the furnace located within the boiler house.

The charging hopper connects into a feed chute, the lower part of which is of a double shell design and is water cooled. Hydraulically driven ram feeders are used to evenly distribute the incinerator charge along the extent of the feed chute and transport it to the grate area. The grate is designed as a multi-line sliding grate/feed stoker and longitudinally consists of four separate grate zones. The grate is longitudinally inclined and cooled by primary air. Secondary air will be injected at high velocity through nozzles positioned in the walls of the combustion chamber above the level of the fuel, thereby creating turbulence which assists in mixing to achieve complete combustion. The furnace design has been sized to ensure that the IED requirements are met.

The incinerator has two lines. Each line will have a 120 MWth input boiler, generating a total of circa 85 tonnes per hour of steam. Energy is recovered from the hot flue gases within the steam boiler. The resulting high-pressure steam is directed to the turbine, generating electricity which is exported to the national grid. There is potential to export heat to local users in the future should suitable recipients be identified.

A Sankey diagram is presented below in figure 2. The diagram shows an indicative process flow assuming the plant is operating in full condensing mode. It is based on both lines operating at the maximum allowable hourly throughput of 45.5 tonnes per hour, per line.

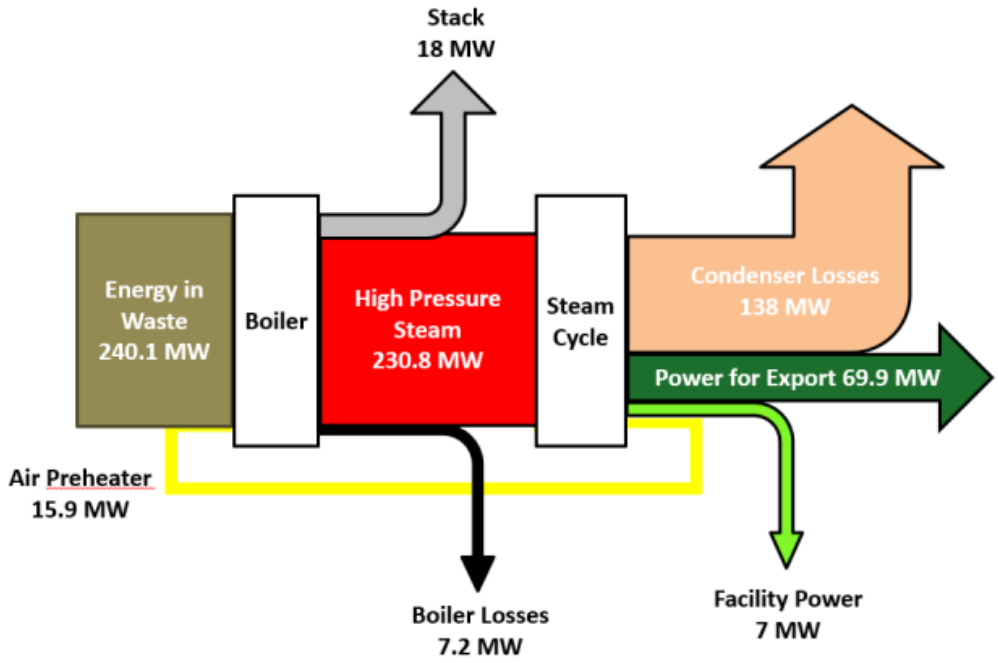

Figure 2; Sankey diagram.

The flue gases flow from the grate via four passes and enters the super-heater and economiser sections before the flue gas, dry scrubbing treatment system. This consists of a dry sorption reactor and a bag filter system using sodium bicarbonate and activated carbon to remove acid gas, metals, dioxins and furans, and other organic compounds. An induced draft fan draws the gas through the system and passes it, cleaned, into the 90-metre stacks. Secondary NO_x control, which takes place in the combustion chamber, is achieved by means of a selective non-catalytic reduction (SNCR) system which uses ammonium hydroxide (ammonia) as the reduction agent.

The residual wastes from the operation of the Installation include:

- Bottom Ash: Bottom ash discharges from the grate to the ash quench bath, where it is transferred into the bottom ash storage bunker. Boiler ash (excluding ash from the two economiser sections) will be combined

with bottom ash and stored on-site prior to being transferred to an off-site processing facility.

- Flue Gas Treatment Residues (also known as Air Pollution Control Residues, (APCr): The residues from the treatment of the flue gases, comprising sodium bicarbonate, spent carbon and salts with traces of heavy metals and dioxins/furans, are collected by bag filters. Flue gas treatment residues are kept separate from the bottom ash. The residues are handled within a fully enclosed system and stored in silos prior to discharge into fully contained disposal vehicles via sealed connections. They are removed from site for disposal at a designated hazardous waste landfill.

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

Waste throughput, Tonnes/line	685,000 /annum	45.5 /hour
Waste processed	MSW, C&I, SRF	
Number of lines	2	
Furnace technology	Moving Grate	
Auxiliary Fuel	Gas Oil	
Acid gas abatement	Dry	Sodium bicarbonate
NOx abatement	SNCR	Ammonia
Reagent consumption	Auxiliary fuel: 430 te/annum Ammonia: 3,400 te/annum Sodium carbonate: 11,000 te/annum Activated carbon: 320 te/annum Process water: 35,200 te/annum	
Flue gas recirculation	No	
Dioxin abatement	Activated carbon	
Stack 1	SJ6832173942	
	Height, 90 m	Diameter, 2.4 m
Stack 2	SJ6832773941	
	Height, 90 m	Diameter, 2.4 m
Flue gas	Flow (long-term) 63.2 Nm^3/s	Velocity, 17.1 m/s (long-term, based on 685,000 tonnes/year
	Flow (short-term) 73.6 Nm3/s	Velocity, 19.9 m/s (short-term, based on 45.5 tonnes/hour)
	Temperature 135 °C	
Electricity generated	76.9 MWe	
Electricity exported	69.9 MWe	
Steam conditions	Temperature, 440 °C	Pressure, 85 bar/MPa

4.1.4 Key Issues in the Determination

The key issues arising during determination of the Application were the effects arising from the emissions to air at ecological sites 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

Historical mapping shows the land where the site is located to be predominantly fields from the late 1800's to the early-mid 1900's. During the First World War, it is understood that ammonium nitrate production for use in explosives was undertaken on the site. By 1954, the western side of the site is shown to be a reservoir for waste lime. In the 1977 historical map, the land is labelled as 'refuse or slag heap' – this is assumed to mean waste lime. By 1993, most of the site appears to be hardstanding. By 1999, some small buildings are shown on the site.

The area to be occupied by the proposed Installation overlaps the existing Tata Chemicals installation. Whilst the land is predominantly unused as a result of the closure of the former power station prior to the Tata Chemicals site being permitted, there are some current uses namely coke storage and an existing water treatment plant with associated chemical and water storage. The existing water treatment plant includes storage of lime solution and brine.

The coke storage area and existing water treatment plant will be relocated elsewhere within the Tata Chemicals site and a new water treatment plant will be installed to serve the Installation. All existing plant and connections associated with these facilities, alongside existing buildings will be removed as part of the demolition and construction works. The Tata Chemicals existing sub-station will also be re-located elsewhere inside the Tata Chemicals boundary.

As part of the Application the Applicant proposes amending the site boundary, surrendering, and gaining small sections of land. The parcels of land to be surrendered are areas of the site in which operations have not yet begun, as such, the risks of land contamination are low.

The Applicant submitted a revised plan which we consider is satisfactory, showing the site and its extent on which the permitted activities will take place and of the Installation as a whole. A plan is included in Schedule 7 to the Permit, and the Operator is required to carry on the activities set out in table S1.1 within the site boundary.

4.2.2 Proposed site design: potentially polluting substances and prevention measures

Auxiliary fuel for the proposed facility will be gas oil and will be stored in a 150 m^3 double-skinned storage tank. Other reagents will be delivered by road and discharged into dedicated bulk storage tanks.

All process areas will be located on hard standing. All liquid tanks and drums will be bunded to 110% of the largest storage tank. Bunds will be constructed

to appropriate standards and lined with materials that are impervious to the content of the material which they hold. The bottom ash bunker will be constructed of concrete and will be watertight. Bottom ash will be stored and treated in a building. Underground drains will be tested for integrity prior to the start of operations and then periodically by closed circuit television (CCTV). The fuel bunker will be constructed of concrete and will be watertight. It will be visually inspected during shutdowns.

Procedures will be in place to deal with any spillages. The operational section of the site condition report will be updated which will include inspection records of all pollution prevention measures.

At the time of determination of the Application, final details of the precise routing for underground drains had not been established. We have set pre-operational condition POC3 for the final drainage plan to be completed and submitted to the Environment Agency. The plan should include details of secondary containment for any drains that could carry contaminated liquid and details of secondary containment for rainwater and firewater tanks.

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

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

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

4.3 Operation of the Installation – general issues

4.3.1 Administrative issues

The Applicant is the sole Operator of the Installation.

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

4.3.2 Management

The Applicant has stated in the Application that they will implement an Environmental Management System (EMS) that will be certified under ISO14001. A pre-operational condition (PO1) is included requiring the Operator to provide a summary of the EMS prior to commissioning of the plant and to

make available for inspection all EMS documentation. The Environment Agency recognises that certification of the EMS cannot take place until the Installation is operational. An improvement condition (IC1) is included requiring the Operator to report progress towards gaining accreditation of its EMS.

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

4.3.3 Site security

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

4.3.4 Accident management

The Applicant has not submitted an Accident Management Plan. However, having considered the other information submitted in the Application, we are satisfied that appropriate measures will be in place to ensure that accidents that may cause pollution are prevented but that, if they should occur, their consequences are minimised. An Accident Management Plan will form part of the Environmental Management System and must be in place prior to commissioning as required by a pre-operational condition (PO1).

4.3.5 Off-site conditions

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

4.3.6 Operating techniques

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

Description	Parts Included	Justification
The Application	Application supporting document, page 22, B. Review of Operating Techniques.	The Applicant has provided a technique by technique review of the operating procedures for the installation.
	Document, Addendum to Appendix B – Review of Operating Techniques	This document provides the Operating Techniques as set out within the original permit application and it adds the proposed changes within the variation application.
Response to Schedule 5 Notice dated 17/11/2023	Revised non-technical summary re. reduction of NOx ELV and DCS interlock to limit annual	The Applicant has outlined a protocol for limiting the annual throughput to meet the

	throughput to 685,000 tonnes per annum.	ELVs with the implementation of an interlock system.

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 BAT; they form part of the Permit through Permit condition 2.3.1 and Table S1.2 in the Permit Schedules.

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

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

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

The incineration plant will take municipal waste, commercial & industrial waste (C&I) and solid recovered fuel (SRF) which has not been source-segregated or separately collected or otherwise recovered, recycled or composted. The amount of recyclable material in the waste feed is largely outside the remit of this permit determination with recycling initiatives being a matter for the local authority. However Permit conditions 2.3.5 and 2.3.6 limit the burning of separately collected fractions in line with regulation 12 of the Waste (England and Wales) Regulations 2011.

We have limited the capacity of the Installation to 685,000 tonnes per annum. This is based on the installation operating 8,000 hours per year at a nominal capacity of 91 tonnes per hour (45.5 tonnes per hour, per line). Throughput has been limited to reduce potential adverse effects at local ecological sites with features sensitive to acid deposition. This is further discussed in section 5.4.2.

The Installation will be designed, constructed and operated using BAT for the incineration of the permitted wastes. We are satisfied that the operating and

abatement techniques are BAT for incinerating these types of waste. Our assessment of BAT is set out later in this document.

4.3.7 Energy efficiency

(i) Consideration of energy efficiency

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

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

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

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

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

(ii) Use of energy within the Installation

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

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

1. Maintenance and housekeeping procedures to ensure efficient operation;

2. Insulation will be provided to avoid heat losses from relevant plant items such as the main furnace and steam systems. The main plant items will be housed within buildings and doors will be kept shut other than for access;

3. Energy efficient lighting will be employed where feasible and lights will be turned off in unoccupied buildings where they are not required for safety or security reasons;

4. Energy use will be monitored and recorded. Usage will be reviewed to identify areas for improvement and ensure that any abnormal increase in energy use is investigated and appropriate action taken to resolve the issue.

5. An energy efficiency plan will be incorporated within the EMS.

6. Air pre-heat will be minimised by extracting secondary air from the highest (which is also the warmest) point in the building;

7. Optimization of the plant layout of the Installation will avoid excessive transfer of materials;

8. The furnace section will be effectively insulated and lined to ensure heat is retained;

9. Uncontrolled air ingress will be prevented through design;

10. Plant maintenance regime to ensure energy efficiency is maintained;

The Application states that the specific energy consumption, a measure of total energy consumed per unit of waste processed, will be 0.08 MWh/tonne. The installation capacity is 685,000 t/a.

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

The LCV in this case is expected to be *9.5* MJ/kg. The specific energy consumption in the Application is in line with that set out above.

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

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

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

The Installation will generate electricity only and has been specified to maximise electrical output with little or no use of waste heat. The Application shows 69.9 MW of electricity produced for an annual burn of 685,000 tonnes, which represents 10.2 MW per 100,000 tonnes/yr of waste burned (0.768 MWh/tonne of waste). The Installation is therefore at the top of the indicative BAT range.

As a 'CHP-ready facility', the Installation has been designed to be ready, with minimum modification, to supply heat in the future to the identified potential heat users and also any additional future heat users. While there are currently no recipients of off-site heat export the Applicant is committed to undertaking ongoing reviews to identify additional potential opportunities to export heat from the facility and realise CHP. Therefore, the Installation will be constructed CHP Ready as this is considered to represent BAT.

The Applicant provided a calculation of the gross energy efficiency and compared it to the BAT AEEL specified in BAT conclusions BAT 20.

The gross electrical efficiency was calculated as 32.04%

The BAT AEEL for gross electrical efficiency is 20-35.

In accordance with BAT 2 table S3.8 of the Permit requires the gross energy efficiency to be measured by carrying out a performance test at full load.

Guidance note EPR 5.01 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.

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

this to The Department for Business, Energy, and Industrial Strategy in our role as a statutory consultee for the planning application.

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

(iv) R1 Calculation and the DEFRA Good Quality CHP Scheme

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

The Applicant has not presented an R1 calculation with this Application, nor have we received a separate application for a determination on whether the Installation is a recovery or a disposal facility.

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

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

The Applicant has carried out an assessment of the potential for operating the installation as a high-efficiency cogeneration installation and has concluded that this will not be possible because there are no opportunities identified in the Comprehensive Assessment within 15 km of the installation and we agree with the Applicant's assessment.

The operator subsequently submitted a cost-benefit assessment of opportunities for high efficiency co-generation within 15 km of the installation, in which they calculated net present value. If the NPV is positive (i.e. any number more than zero) it means that the investors will make a rate of return that makes the scheme commercially viable. A negative NPV means that the project will not be commercially viable.
The Applicant's assessment showed a net present value of -£753,608 which demonstrates that operating as a high-efficiency cogeneration installation will not be financially viable. We agree with the Applicant's assessment and will not require the installation to operate as a high-efficiency cogeneration.

(viii) Permit conditions concerning energy efficiency

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

The Operator is required to report energy usage and energy generated under condition 4.2 and Schedule 5 of the Permit. The following parameters are required to be reported: total electrical energy generated; electrical energy

exported; total energy usage and energy exported as heat (if any). Together with the total MSW burned per year, this will enable 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.

The Operator is required to report with respect to raw material usage under condition 4.2. and Schedule 5, including consumption of sodium bicarbonate, activated carbon and ammonia used per tonne of waste burned. This will enable the Environment Agency to assess whether there have been any changes in the efficiency of the air pollution control plant, and the operation of the SNCR to abate NO_x. These are the most significant raw materials that will be used at the Installation, other than the waste feed itself (addressed elsewhere in this document). The efficiency of the use of auxiliary fuel will be tracked separately as part of the energy reporting requirement under condition 4.2.1. Optimising reagent dosage for air abatement systems and minimising the use of auxiliary fuels is further considered in the section on BAT.

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

This requirement addresses wastes produced at the Installation and does not apply to the waste being treated there. The principal waste streams the Installation will produce are incinerator bottom ash (IBA) including boiler ash and air pollution control residues (APCr).

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

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.

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

In order to ensure that the IBA residues are adequately characterised, pre-operational condition POC5 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, global warming potential (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) for air emissions. ES are described in our web guide ‘Air emissions risk assessment for your environmental permit’.

Our web guide sets out the relevant ES as:

- Air Quality Standards Regulations 2010 Limit Values
- Air Quality Standards Regulations 2010 Target Values
- UK Air Quality Strategy Objectives
- Environmental Assessment Levels

Where a Limit Value exists, the relevant standard is the Limit Value. Where a Limit Value does not exist, target values, UK Air Quality Strategy (AQS) Objectives or Environmental Assessment Levels (EALs) are used. Our web guide sets out EALs which have been derived to provide a similar level of protection to human health and the environment as the limit values, target values and AQS objectives. In a very small number of cases, e.g. for emissions of lead, the AQS objective is more stringent that the Limit Value. In such cases, we use the AQS objective for our assessment.

Target values, AQS objectives and EALs do not have the same legal status as 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 exceedances are considered likely, the Application is subject to the requirement to operate in accordance with BAT.

This is not the end of the risk assessment, because we also take into account local factors (for example, particularly sensitive receptors nearby such as a SSSI, SAC or SPA). 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, Appendix 5, 5-01 to 5-5, of the Environmental Impact Assessment, appendices E1 to E4 of the Air Quality Analysis for Environmental Permit Application, a revised AQA report dated 22/02/2023 and an addendum to the reports dated, 17/11/2023. The assessment comprises:

- Dispersion modelling of emissions to air from the operation of the incinerator.
- A study of the impact of emissions on nearby protected conservation areas
- Dispersion modelling of the impact of additional off site road traffic arising from the operation of the incinerator.

Of these the amenity impacts during construction and air quality impacts arising from additional road traffic have not been considered as these are essentially matters for the local planning authority when considering the parallel application for planning permission, and outside the scope of our determination under the Environmental Permitting Regulations.

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, 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 air dispersion model software ADMS 5.2 dispersion model, which is a commonly used computer model for regulatory dispersion modelling. The model used meteorological data collected from the weather station at Manchester Airport collected between 2016 and 2020. The Applicant stated that this data was selected because the site is directly upwind of Manchester Airport when considering the prevailing wind direction, has excellent data capture, and is at a similar altitude to Installation. The effect of the terrain surrounding the site upon plume dispersion was considered in the dispersion modelling.

The air impact assessments, and the dispersion modelling upon which they were based, employed the following assumptions.

- First, they assumed that the ELVs in the Permit would be the maximum permitted by Article 15(3), Article 46(2) and Annex VI of the IED. These substances are:
    - Oxides of nitrogen (NO_x), expressed as NO_2
    - Total dust
    - Carbon monoxide (CO)
    - Sulphur dioxide (SO_2)
    - Hydrogen chloride (HCl)
    - Hydrogen fluoride (HF)

    - Metals (cadmium, thallium, mercury, antimony, arsenic, lead, chromium, cobalt, copper, manganese, nickel and vanadium)
    - Polychlorinated dibenzo-para-dioxins and polychlorinated dibenzo furans (referred to as dioxins and furans)
    - Gaseous and vaporous organic substances, expressed as Total Organic Carbon (TOC)
    - Ammonia (NH_3)
- Second, they assumed that the Installation operates continuously at the relevant long-term or short-term ELVs, i.e. the maximum permitted emission rates (metals are considered further in section 5.2.3 of this decision document).

We are in agreement with this approach. The assumptions underpinning the model have been checked and are a reasonable worst-case.

The Applicant established the background (or existing) air quality against which to measure the potential impact of the incinerator. The consultant has used background data from different air quality networks and DEFRA background maps. We have reviewed the data and can confirm they are reasonably representative.

As well as predicting the maximum ground level concentration of the pollutants within the modelling domain, the Applicant has modelled several discrete receptor locations to represent human and ecological exposure.

The Applicant's use of the dispersion models, selection of input data, use of background data and the assumptions 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 protected conservation areas. Our audit takes account of modelling uncertainties. We make reasonable worst case assumptions and use the uncertainties (minimum 140%) in analysing the likelihood of exceeding any particular standard.

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 their predicted ground level concentrations at the most impacted receptor.

As part of our checks, we carry out sensitivity analysis of the data provided and conduct our own check modelling to ensure that the Applicant's modelling predictions are reliable.

Whilst we have used the Applicant's modelling predictions in the table below, we have made our own simple verification calculation of the percentage PC 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.

During determination, new Environmental Assessment Levels (EAL) were implemented for a few pollutants including some metals. The values were updated on the GOV.UK risk assessment page on 20 November 2023, Air emissions risk assessment for your environmental permit - GOV.UK (www.gov.uk).
We checked the Applicants modelling against these new EALs and requested more information from the Applicant for specific pollutants where required. We are satisfied that the new EALs do not change the conclusions of our audit.

Assessment of emissions to air – non-metals

Pollutant	ES		Back-ground	Process Contribution (PC)		Predicted Environmental Concentration (PEC)	
	µg/m^3	**Reference period**	**µg/m^3**	**µg/m^3**	**% of EAL**	**µg/m^3**	**% of EAL**
NO_2	40	Annual Mean	17.05	0.44	1.10	17.5	43.7
	200	99.79th %ile of 1-hour means	34.1	6.58	3.3	40.7	20.3
PM_{10}	40	Annual Mean	12.98	0.02	0.05	13.0	32.5
	50	90.41st %ile of 24-hour means	25.96	0.08	0.16	26.04	52.1
$PM_{2.5}$	20	Annual Mean	8.79	0.02	0.10	8.81	44.1
SO_2	266	99.9th %ile of 15-min means	29.4	5.83	2.2	35.23	13.2
	350	99.73rd %ile of 1-hour means	29.4	4.88	1.39	34.28	9.8
	125	99.18th %ile of 24-hour means	29.4	1.93	1.5	31.33	25.1
HCl	750	1-hour average	1.42	1.66	0.22	3.1	0.41

HF	16	Monthly average	2.35	0.004	0.03	2.354	14.71
	160	1-hour average	4.7	0.21	0.13	4.91	3.1
CO	10000	Maximum daily running 8-hour mean	690	8.4	0.08	698	7.0
	30000	1-hour average	690	11.1	0.04	701	2.3
TOC	2.25	Annual Mean	0.25	0.04	1.78	0.29	12.89
	30	Daily average	1.12	0.89	2.97	2.01	6.70
	2.25	24-hour Mean (Short Term)	0.25	0.04	1.78	0.29	12.89
PAH	250	Annual Mean	0.98	0.84	0.34	1.81	0.7
NH_3	180	Annual Mean	4.23	0.04	0.02	4.27	2.37
	2500	1-hour average	8.46	2.22	0.09	10.68	0.4
PCBs	200	Annual Mean	128.93	0.02	0.01	128.95	64.48
	6000	1-hour average	257.86	1.11	0.02	258.97	4.32
TOC as 1,3 butadiene for long term and benzene for short term PAH as benzo[a]pyrene							

Assessment of emissions to air – metals

Pollutant	**ES**		**Back-ground**	**Process Contribution**		**Predicted Environmental Concentration**	
	ng/m³	**Reference period**	**ng/m³**	**ng/m³**	**% of EAL**	**ng/m³**	**% of EAL**
Cd	5	Annual mean	0.16	0.08	1.6	0.24	4.8
	30	24-hour mean (short term)	0.16	4.44	14.8	4.60	15.3

Hg	250	Annual mean	0.57	0.08	0.03	0.65	0.26
	600	1-hour mean (short term)	1.14	4.44	0.74	5.58	0.93
Sb	5000	Annual mean	2.5	1.25	0.03	3.75	0.08
	150000	1-hour average	2.5	66.58	0.04	69.08	0.046
Pb	250	Annual mean	16	1.25	0.50	17.25	6.90
Co		Long-term mean	0.92	1.25		2.17	
Cu	10000	Annual mean	33	1.25	0.01	34.25	0.343
	200000	1-hour average	66	66.58	0.03	132.58	0.066
Mn	150	Annual mean	36	1.25	0.83	37.25	24.83
	1500000	1-hour average	72	66.58	0.004	138.58	0.01
V	5000	Annual mean	1.7	1.25	0.03	2.95	0.06
	1000	24-hr average	3.4	26.68	2.67	30.08	3.01
As	6	Annual mean	1.1	1.25	20.83	2.35	39.2
Cr (II)(III)	5000	Annual mean	39	1.25	0.03	40.25	0.81
	150000	1-hour average	78	66.58	0.04	144.58	0.096
Cr (VI)	0.25	Annual mean	28.00	66.58	26632	94.58	37832
Ni	20	Annual mean	14	1.25	6.25	15.25	76.3

(i) Screening out emissions which are insignificant

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

- Particulate matter (PM_{10} & $PM_{2.5}$)

- Sulphur dioxide (SO_2)
- Hydrogen chloride (HCl)
- Hydrogen fluoride (HF)
- Carbon monoxide (CO)
- Ammonia (NH_3)
- Metals (mercury, antimony, lead, chromium (II) (III), cobalt, copper and manganese)
- PAH

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.

- Oxides of nitrogen (NO_x), expressed as NO_2
- Metals (cadmium, arsenic and nickel)

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.

For these emissions, the Applicant has demonstrated that the process contribution to the PEC is negligible. As part of our detailed audit of the Applicant's modelling assessment, we agree with the Applicant's conclusions in this respect taking modelling uncertainties into account.

In any case, with respect to these pollutants, as mentioned above we have carefully scrutinised the Applicant's proposals to ensure that they are applying the Best Available Techniques to prevent and minimise emissions of these substances. This is reported in section 6 of this document.

We have also carefully considered whether additional measures are required above what would normally be considered BAT in order to prevent significant pollution. Consideration of additional measures to address the pollution risk from these substances is set out in section 5.2.4.

5.2.2 Consideration of key pollutants

(i) Nitrogen dioxide (NO_2)

The impact on air quality from NO_2 emissions has been assessed against the ES of 40 $\mu g/m^3$ as a long term annual average and 200 $\mu g/m^3$ as a short term hourly average.
The model assumes a 70% NO_X to NO_2 conversion for the long term and 35% for the short term assessment in line with Environment Agency guidance on the use of air dispersion modelling.

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

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

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

The Applicant's predicted impact of the Installation against these ES is shown in the tables above. The assessment assumes that **all** particulate emissions are present as PM_{10} for the PM_{10} assessment and that **all** particulate emissions are present as $PM_{2.5}$ for the $PM_{2.5}$ assessment.

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

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

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

The above table shows that the predicted PC for emissions of PM_{10} is below 1% of the long term ES and below 10% of the short term ES and so can be screened out as insignificant. Therefore, we consider the Applicant's proposals for preventing and minimising the emissions of particulates to be BAT for the Installation.

The above table also shows that the predicted PC for emissions of $PM_{2.5}$ is also below 1% of the ES. Therefore, the Environment Agency concludes that particulate emissions from the installation, including emissions of PM_{10} or $PM_{2.5}$, will not give rise to significant pollution.

(iii) Acid gases, sulphur dioxide (SO_2), hydrogen chloride (HCl) and hydrogen fluoride (HF)

From the tables above, emissions of HCl and HF can be screened out as insignificant in that the process contribution is <10% of the short term ES. The ES for HCl is 750 $\mu g/m^3$, this is an hourly short term average, there is no long term ES for HCl. HF has 2 assessment criteria – a 1-hr ES of 160 $\mu g/m^3$ and a monthly ES of 16 $\mu g/m^3$ – the process contribution is <1% of the monthly ES and so the emission screens out as insignificant if the monthly ES is interpreted as representing a long term ES.

There is no long term EAL for SO_2 for the protection of human health. Protection of ecological receptors from SO_2 for which there is a long term ES is considered in section 5.4. There are three short term ES, hourly of 350 $\mu g/m^3$, 15 – minute of 266 $\mu g/m^3$ and daily of 125 $\mu g/m^3$.

From the above table, emissions of SO_2 can be screened out as insignificant in that the short term process contribution is <10% of each of the three short term ES values. Therefore, we consider the Applicant's proposals for preventing and minimising the emissions of these substances to be BAT for the Installation.

(iv) Emissions to air of carbon monoxide (CO), Volatile Organic Compounds (VOCs), Polycyclic Aromatic Hydrocarbons (PAHs), Polychlorinated Biphenyls (PCBs), Dioxins and ammonia (NH_3)

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

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

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

The ammonia emission is based on a release concentration of 15 mg/m^3. We are satisfied that this level of emission is consistent with the operation of a well controlled SNCR NO_x abatement system.

The Applicant is required to prevent, minimise and control PAH and VOC emissions using BAT, this is considered further in Section 6. We are satisfied that PAH and VOC emissions will not result in significant pollution.

(V) Summary

For the above emissions to air, for those emissions that have not screened out as 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. Therefore, we consider the Applicant's proposals for preventing and minimising emissions to be BAT for the Installation. Dioxins and furans are considered further in section 5.3.2.

5.2.3 Assessment of Emission of Metals

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

There are three sets of BAT AELs for metal emissions:

- An emission limit value of 0.02 mg/m^3 for mercury and its compounds (formerly WID group 1 metals).
- An aggregate emission limit value of 0.02 mg/m^3 for cadmium and thallium and their compounds (formerly WID group 2 metals).
- An aggregate emission limit of 0.3 mg/m^3 for antimony, arsenic, lead, chromium, cobalt, copper, manganese, nickel and vanadium and their compounds (formerly WID group 3 metals).

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

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

- *Mercury (Hg)*
- *Antimony (Sb)*
- *Lead (Pb)*
- *Chromium (II) (III) (Cr)*
- *Cobalt (Co)*
- *Copper (Cu)*
- *Manganese (Mn)*

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

- *Cadmium (Cd)*
- *Arsenic (As)*
- *Nickel (Ni).*

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

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

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

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

- Chromium (VI)

The Installation has been assessed as meeting BAT for control of metal emissions to air. See section 6 of this document.

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 Installation.

5.2.5 Consideration of Additional Measures to Control Emissions

In response to a request for more information the Applicant remodelled emissions to air of NO_x. The Applicant proposes to lower the ELV for NO_x from 180 mg/Nm^3 to 150 mg/Nm^3. This lower ELV, combined with the implementation of an interlock to limit the site's annual waste throughput will act to reduce the effects of acid deposition at sensitive ecological sites.

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 Installation will be regulated under EPR. The EPR include the requirements of relevant EU Directives, notably, the IED, the WFD, and ADD.

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 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 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. Section 5.1 and 5.2 above explain how we have approached the critical issue of assessing the likely impact of the emissions to air from the Installation on human health and the environment and any measures we are requiring to ensure a high level of protection.

iii) Expert Scientific Opinion

There is a significant amount of literature on whether there are links between operation of incineration plants and effects on health. We have not referenced them here, but we have included information on one of the most recent studies that was commissioned by the UK Health Security Agency (UKHSA), previously Public Health England (PHE). The overall weight of the evidence is that there is not a significant impact on human health.

UKHSA review research undertaken to examine suggested links between emissions from municipal waste incinerators and effects on health. UKHSA's risk assessment is that modern, well run and regulated municipal waste incinerators are not a significant risk to public health. While it is not possible to rule out adverse health effects from these incinerators completely, any potential effect for people living close by is likely to be very small.

UKHSA keep literature on health effects under review and would inform us if there were any changes to the above position. Similarly, we would consult UKHSA if new evidence was provided to us.

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 incineration (MWIs).

A number of papers have been published by SAHSU since 2012 which show no effect on birth outcomes. One paper in the study looked at exposure to emissions from MWIs in the UK and concluded that exposure was low. Subsequent papers found no increased risk of a range of birth outcomes (including stillbirth and infant mortality) in relation to exposure to PM_{10} emissions and proximity to MWIs, and no association with MWIs opening on changes in risks of infant mortality or sex ratio.

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

UKHSA 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, UKHSA have further stated that their position remains that modern, well run and regulated municipal waste incinerators are not a significant risk to public health.

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

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

HHRAP has been developed by the US EPA to calculate the human body intake of a range of carcinogenic pollutants and to determine the mathematical 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 to allow for different body size, such as for adults and children of different ages. In the UK, the COT has set a TDI for dioxins, furans and dioxin like PCBs of 2 picograms WHO-TEQ/kg-body weight/day (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 PCBs, 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 (NO_2, SO_2 and particulates) in terms of the numbers of "deaths brought forward" and the "number of hospital admissions for respiratory disease brought forward or additional". Defra reviewed this methodology and concluded that the use of the COMEAP methodology is not generally recommended for modelling the human health impacts of individual installations.

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 modelling 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 the lifetime of the receptor.

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

The results of the Applicant's assessment of dioxin intake are detailed in the table below (worst case results for each category are shown). The results showed that the predicted daily intake of dioxins, furans and dioxin like PCBs at all receptors, resulting from emissions from the proposed facility, were significantly below the recommended TDI levels. The levels of dioxins and dioxin like PCBs were predicted to be 1.87% of the TDI at the maximum point of impact for adults. The Process Contribution at the maximum point of impact for children was predicted to be 2.58% of the TDI. These figures were modelled as agricultural, where people living in the vicinity of the point of maximum impact are assumed to consume a greater proportion of locally grown produce and are consuming animals grazed on land contaminated by the emission source.

Receptor	adult	child

Agricultural	0.037	0.052
Residential	0.00097	0.0031
Allotment	0.0013	0.0037

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

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

5.3.3 Particulates smaller than 2.5 microns

The Operator will be required to monitor particulate emissions using the method set out in Table S3.1 of Schedule 3 of the Permit. This method requires that the filter efficiency must be at least 99.5 % on a test aerosol with a mean particle diameter of 0.3 µm, at the maximum flow rate anticipated. The filter efficiency for larger particles will be at least as high as this. This means that particulate monitoring data effectively captures everything above 0.3 µm and much of what is smaller. It is not expected that particles smaller than 0.3 µm will contribute significantly to the mass release rate / concentration of particulates because of their very small mass, even if present. This means that emissions monitoring data can be relied upon to measure the true mass emission rate of particulates.

Nano-particles are considered to refer to those particulates less than 0.1 µm in diameter ($PM_{0.1}$). Questions are often raised about the effect of nano-particles on human health, in particular on children's health, because of their high surface to volume ratio, making them more reactive, and their very small size, giving them the potential to penetrate cell walls of living organisms. The small size also means there will be a larger number of small particles for a given mass concentration. However, the UKHSA 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 UKHSA addresses the issue of the health effects of particulates in their September 2009 statement 'The Impact on Health of Emissions to Air from Municipal Incinerators'. It refers to the coefficients linking PM_{10} and $PM_{2.5}$ with effects on health derived by COMEAP and goes on to say that if these coefficients are applied to small increases in concentrations produced, locally, by incinerators; the estimated effects on health are likely to be small. UKHSA 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 $\mu g/m^3$ would result in an increase in life expectancy of 20 days for people born in 2008." However, "The Committee stresses the need for careful interpretation of these metrics to avoid incorrect inferences being drawn – they are valid representations of population aggregate or average effects, but they can be misleading when interpreted as reflecting the experience of individuals."

UKHSA also point out that in 2007 incinerators contributed 0.02% to ambient ground level PM_{10} levels compared with 18% for road traffic and 22% for industry in general. UKHSA noted that in a sample collected in a day at a typical urban area the proportion of $PM_{0.1}$ is around 5-10% of PM_{10}. It goes on to say that PM_{10} includes and exceeds $PM_{2.5}$ which in turn includes and exceeds $PM_{0.1}$. The National Atmospheric Emissions Inventory (NAEI) figures show that in 2016 municipal waste incineration contributed 0.03% to ambient ground level PM_{10} levels and 0.05% to ambient ground level PM2.5 levels. The 2016 data also shows that road traffic contributed to 5.35% of PM10 and 4.96% of PM2.5 and that domestic wood burning contributed 22.4% to PM10 and 34.3% of PM2.5 levels.

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

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

5.3.4 Assessment of Health Effects from the Installation

Our assessment of health impacts is summarised below

i. We have applied the relevant requirements of the environmental legislation in imposing the permit conditions. We are satisfied that

compliance with these conditions will ensure protection of the environment and human health.

ii. In carrying out air dispersion modelling as part of the environmental impact assessment and comparing the PC and PEC with the ES, the Applicant has effectively made a health risk assessment for many pollutants. The ES have been developed primarily to protect human health. The Applicant's assessment of the impact from

- Total dust (PM_{10} & $PM_{2.5}$)
- Sulphur dioxide (SO_2)
- Hydrogen chloride (HCl)
- Hydrogen fluoride (HF)
- Carbon monoxide (CO)
- Ammonia (NH_3)
- Metals (mercury, antimony, lead, chromium (II) (III), cobalt, copper and manganese)
- PAH

have all indicated that the Installation emissions screen out as insignificant; where the impact of emissions of

- Oxides of nitrogen (NO_x), expressed as NO_2
- TOC
- Metals (chromium (VI), cadmium, arsenic and nickel)

have not been screened out as insignificant, the assessment still shows that the PEC are well within the ES, with the exception of the predicted levels of Chromium (VI) which was discussed in section 5.2.3.

iii. We have assessed the health effects from the operation of this installation in relation to the above (sections 5.3.1 to 5.3.3).

iv. We have reviewed the methodology employed by the Applicant to carry out the health impact assessment.

The Applicant submitted a human health risk assessment (HHRA) of the potential effects on human health due to intake from diet and inhalation of dioxins, furans, and dioxin-like polychlorinated biphenyls (PCBs). It considered the following pathways; direct inhalation and ingestion of soil, home grown produce, drinking water, eggs from homegrown chickens, homegrown poultry, beef, pork, milk and breast milk. The ingestion of fish was disregarded due to the distance to the nearest fishing site being over 10 km.

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

v. We agree with the conclusion reached by UKHSA that modern, well run and regulated municipal waste incinerators are not a significant risk to public health. While it is not possible to rule out adverse health effects from these incinerators completely, any potential effect for people living close by is likely to be very small.

vi. UKHSA and the Local Authority Director of Public Health were consulted on the Application. They concluded that they had no significant concerns regarding the risk to the health of humans from the installation. The Local Authority Director of Public Health did not provide a response. The Food Standards Agency was also consulted during the permit determination process, and it did not provide a response to our consultation. Details of the responses provided by UKHSA, the Local Authority Director of Public Health and the FSA to the consultation on this Application can be found in Annex 4.

We are therefore satisfied that the Applicant's conclusions presented above are reliable and we conclude that the potential emissions of pollutants including dioxins, furans and metals from the proposed facility are unlikely to have a significant impact on human health.

5.4 Impact on protected conservation areas (SPAs, SACs, Ramsar sites and SSSIs and local nature sites)

5.4.1 Sites Considered

The following Special Areas of Conservation (SAC), Special Protection Areas (SPA) and Ramsar sites are located within 10 km of the proposed Installation:

- West Midland Mosses Special Area of Conservation (SAC)
- Midland Meres & Mosses Ramsar

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

- Witton Lime Beds Site of Specific Scientific Interest (SSSI).

The following local nature sites (ancient woodlands, local wildlife sites and national and local nature reserves) are located within 2 km of the proposed Installation:

- Griffiths Park
- Wade Brook
- Wincham Brook Valley and Mill Wood
- Ashton's and Neumann's Flashes
- Marston Flashes
- Long Wood, Lostock

- Long Wood
- Gadbrok Valley

5.4.2 Habitats Assessment

The Applicant's habitats assessment was reviewed by our technical specialists for air dispersion modelling and assessment and specialists for habitats and conservation who agreed with the assessment's conclusions, that there would be no likely significant effect on the interest features of the protected sites.

The original proposal submitted by the Applicant was for an annual throughput of 728,000 tonnes of waste per annum, an increase of 128,000 tonnes from the original throughput of 600,000 tonnes. At this level, the air dispersion modelling submitted with the Application predicted a Process Contributions (PC) of <0.01 keq/ha/yr which is 1.16% of the critical load (0.54 keq/ha/yr), and is above the significance threshold. Further calculations to determine the Predicted Environmental Concentration (PEC) yielded a PEC of 371% of the critical load. The background load for acid deposition used for these calculations was 2.0 keq/ha/yr, which is considerably in exceedance of the critical load. In accordance with our guidance and the legal obligations, an appropriate assessment of the effects on the designated habitats was carried out.

The assessment was submitted to Natural England on 07/09/2023. It identified that the bryophytes present in the transition mires and quaking bogs at the West Midlands Mosses SAC and Midland Meres and Mosses Phase 2 Ramsar would be impacted by exceedances of the relevant critical loads, in this instance acid deposition and concluded that the Application could not be ascertained to have no adverse effect on the West Midlands Mosses SAC and the Midland Meres and Mosses Phase 2 Ramsar. Natural England agreed that there were likely to be adverse impacts on the two designated sites and they advised against the Environment Agency granting the Permit variation.

A Schedule 5 Notice, request for additional information was issued to the Applicant on 20/09/2023. The Applicant was asked to submit a proposal to reduce the levels of acid deposition resulting from activities at the installation at designated ecological sites.

On 17/11/2023 the Applicant submitted revised air dispersion modelling and an addendum to the original air quality report. The Applicant proposed to reduce the annual throughput from the requested 728,000 tonnes per annum to 685,000 tonnes per annum. This equates to an overall increase of 85,000 tonnes per annum above currently the permitted throughput. The proposal retained the increased hourly throughput of 45.5 tonnes per hour/per line. The Applicant also proposed a reduction in the NO_x ELV from the original limit of 180 mg/Nm^3 to 150 mg/Nm^3. This proposal resulted in a reduction of the assessed levels of acid deposition at West Midlands Mosses SAC and the Midland Meres and Mosses Phase 2 Ramsar to under 1% of the critical load for both sites.

The Applicant's revised habitats assessment was reviewed by our technical specialists for air dispersion modelling and assessment and specialists for,

habitats and conservation who agreed with the assessment's conclusions, that there would be no likely significant effect on the interest features of the protected sites.

The tables below summarise the effects at the designated ecological sites using the predictions from the revised air dispersion modelling.

Pollutant	ES / EAL (µg/m³)	Back-ground (µg/m³)	Process Contribution (PC) (µg/m³)	PC as % of ES	Predicted Environmental Concentration (PEC) (µg/m³)	PEC as % ES
Direct Impacts[2]						
NO_x Annual	30	15.6	0.06	0.20	15.7	52.2
NO_x Daily Mean	75	15.6	0.84	1.1	16.4	21.9
SO_2	10 (1)	1.2	0.16	1.6	1.36	13.6
Ammonia	1 (1)	3.23	0.004	0.12	3	323.4
HF Weekly Mean	0.5	2.35	0.002	0.40	2.23	470.4
HF Daily Mean	5	2.23	0.005	0.1	2.36	47.1
Deposition Impacts[3]						
N Deposition (kg N/ha/yr)	*5 - 10*	1.8	0.007	2	18.1	353.2
Acidification (Keq/ha/yr)	0.511	1.8	0.004	0.12	3	323.4

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

(2) Direct impact units are µg/m³ and deposition impact units are kg N/ha/yr or Keq/ha/yr.

5.4.3 SSSI Assessment

The Applicant's assessment of SSSIs was reviewed by our technical specialists for air dispersion modelling and assessment and specialists for habitats and conservation, who agreed with the assessment's conclusions, that the proposal would not damage the special features of the SSSI.

Pollutant	ES / EAL (µg/m³)	Back-ground (µg/m³)	Process Contribution (PC) (µg/m³)	PC as % of ES	Predicted Environmental Concentration (PEC) (µg/m³)	PEC as % ES
Direct Impacts[2]						
NO_x Annual	30	26.4	0.0726	0.242	26.5	88.2
NO_x Daily Mean	75	26.4	2.76	3.68	29.16	38.9
SO_2	10 (1)	2.3	0.293	0.293	2.33	23.3
Ammonia	1 (1)	3.23	0.007	0.7	3.24	323.7
HF	0.5	2.25	0.002	0.4	2.25	470.4

Pollutant	ES / EAL (µg/m³)	Back-ground (µg/m³)	Process Contribution (PC) (µg/m³)	PC as % of ES	Predicted Environmental Concentration (PEC) (µg/m³)	PEC as % ES
Weekly Mean						
HF Daily Mean	5	2.35	0.005	0.1	2.26	47.1
Deposition Impacts[3]						
N Deposition (kg N/ha/yr)	*5 - 10*	26.4	0.046	0.184	26.4	105.8
Acidification (Keq/ha/yr)	0.511	1.90	0.0003	0.06	1.90	323.7

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

(2) Direct impact units are µg/m³ and deposition impact units are kg N/ha/yr or Keq/ha/yr.

5.4.4 Assessment of local nature sites

Conservation sites are protected in law by legislation which provides the highest level of protection for SACs and SPAs, and also for protection of protection Ramsars and SSSIs. 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 impacts on other sites (such as ancient woodlands, local wildlife sites and national and local nature reserves) 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 local nature sites under the Environment Act 1995 we look at the impact from the Installation alone 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 local nature sites.

Therefore, having reviewed the Applicant's assessment of impacts on local nature sites, we would generally conclude that the Installation would not

cause significant pollution at these other sites if the PC is less than the relevant critical level or critical load, provided that the Applicant is using BAT to control emissions.

The Applicant's air emissions report stated that the PCs are below the critical levels or loads. 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 complete or partial shut-down and re-start.

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

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

These abnormal operations are limited to no more than a period of 4 hours continuous operation and no more than 60 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.

Emissions arising from abnormal operations were not re-evaluated after the Applicant remodelled their air emissions at a throughput of 685,000 tonnes per year. We are satisfied there are no predicted exceedances of any of the short

term or long term ESs associated with abnormal operation. The abnormal emissions assessment included with the original application can be used as a worst-case scenario.

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 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 in particular control measures for the emissions which were not screened out as insignificant in the previous section on minimising the installation's environmental impact. They are:

    - *Oxides of nitrogen (NO_x), expressed as NO_2*
    - *Sulphur Dioxide (SO_2)*
    - *Hydrogen Chloride (HCI)*

    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 ELV. 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. The BAT-C were published on 03/12/2019 and set BAT AELs for various substances mainly as daily average values which are in many cases lower than the chapter IV limits.

Operational controls complement the ELV 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, suspension or revocation) being taken.

Assessments based on BAT AELs or Chapter IV limits are therefore “worst-case” scenarios.

We are 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

There have been no changes to the proposed furnace design as a result of this variation.

6.2 BAT and emissions control

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

The BREF lists the general factors requiring consideration when selecting 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 BREF points to a range of technologies being BAT subject to circumstances of the Installation.

6.2.1 Particulate Matter

Particulate matter				
Technique	**Advantages**	**Disadvantages**	**Optimisation**	**Defined as BAT in BREF or TGN for:**

Bag / Fabric filters (BF)	Reliable abatement of particulate matter to below 5mg/m^3	Max temp 250°C Higher energy use than ESP Sensitive to condensation and corrosion	Multiple compartments Bag burst detectors	Most plants
Wet scrubbing	May reduce acid gases simultaneously.	Not normally BAT. Liquid effluent produced	Require reheat to prevent visible plume and dew point problems.	Where scrubbing required for other pollutants
Ceramic filters	High temperature applications Smaller plant.	May "blind" more than fabric filters		Small plant. High temperature gas cleaning required.
Electrostatic precipitators (ESP)	Low pressure gradient. Use with BF may reduce the energy consumption of the induced draft fan.	Not normally BAT by itself Risk of dioxin formation if used in 200-400^{o}C range		When used with other particulate abatement plant

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

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

Oxides of Nitrogen : Primary Measures				
Technique	**Advantages**	**Disadvantages**	**Optimisation**	**Defined as BAT in BREF or TGN for:**
Low NOx burners	Reduces NOx at source		Start-up, supplementary firing.	Where auxiliary burners required.
Starved air systems	Reduce CO simultaneously.			Pyrolysis, Gasification systems.
Optimise primary and secondary air injection				All plant.
Flue Gas Recirculation (FGR)	Reduces the consumption of reagents used for secondary NOx control. May increase overall energy recovery	Some applications experience corrosion problems. Can result in elevated CO and other products of incomplete combustion		Justify if not used

Oxides of Nitrogen : Secondary Measures (BAT is to apply Primary Measures first)				
Technique	**Advantages**	**Disadvantages**	**Optimisation**	**Defined as BAT in BREF or TGN for:**
Selective catalytic reduction (SCR)	NOx emissions 40-150mg/ m^3 Reduces CO, VOC, dioxins	Expensive. Re-heat required – reduces plant efficiency		All plant
SCR by catalytic filter bags	50-120 mg/m^3			Applicable to new and existing plants with or without existing SNCR. Can be used with NH_3 as slip catalyst with SNCR

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

The Applicant proposes to implement the following primary measures:

- Low NO_x burners – this technique reduces NO_x at source and is defined as BAT where auxiliary burners are required.
- Optimise primary and secondary air injection – this technique is BAT for all plant.

Flue gas recirculation (FGR) is not proposed. This technique can reduce the consumption of reagents for secondary NOx control and can increase overall energy recovery. The Applicant stated that if the FGR take-off point was installed after the APC plant then ducting with trace heating would be required which would outweigh any energy efficiency benefits. If the off-take was direct from the boiler, corrosion will arise due to SOx and abrasion problems from particles meaning replacement of ducting and blower blades after a relatively short time. Use of FGR at another similar plant led to significant down-time and eventual removal of the FGR system.

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

SCR can reduce NO_x levels to below 50 mg/m^3 and can be applied to all plant, it is generally more expensive than SNCR and requires reheating of the waste gas stream which reduces energy efficiency, periodic replacement of the catalysts also produces a hazardous waste. The use of SCR by catalytic filter

bags can reduce emissions to 50 -120 mg/m^3 with low investment costs. SNCR can typically reduce NO_x levels to between 80 and 180 mg/m^3, it relies on an optimum temperature of around 900^{o}C and sufficient retention time for reduction. SNCR is more likely to have higher levels of ammonia slip. The technique can be applied to all plant unless lower NO_x releases are required for local environmental protection. Urea or ammonia can be used as the reagent with either technique, urea is somewhat easier to handle than ammonia and has a wider operating temperature window, but tends to result in higher emissions of N_2O. Both reagents are BAT, and the use of one over the other is not normally significant in environmental terms.

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

Emissions of NO_x cannot be screened out as insignificant. The Applicant carried out a cost/benefit study of the alternative techniques with their original application. The Applicant considers that the additional cost of SCR over SNCR is not justified by the reduction in environmental impact. Thus, SCR is not BAT in this case, and SNCR is BAT for the Installation. The Applicant has justified the use of urea / ammonia as the reagent on the basis of lower emissions of nitrous oxide than the use of urea and that the risks associated with its storage can be controlled. We agree with this assessment.

The amount of ammonia used for NO_x abatement will need to be optimised to maximise NO_x reduction and minimise NH_3 slip. Improvement condition IC1 requires the Operator to report to the Environment Agency on optimising the performance of the NO_x abatement system. The BAT AEL for ammonia has been set and the Operator is also required to continuously monitor and report on N_2O emissions every 3 months.

6.2.3 Acid Gases, SO_x, HCl and HF

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

Acid gases and halogens : Secondary Measures (BAT is to apply Primary Measures first)				
Technique	**Advantages**	**Disadvantages**	**Optimisation**	**Defined as BAT in BREF or TGN for:**

Wet	High reaction rates Low solid residues production Reagent delivery may be optimised by concentration and flow rate	Large effluent disposal and water consumption if not fully treated for re-cycle Effluent treatment plant required May result in wet plume Energy required for effluent treatment and plume reheat		Used for wide range of waste types Can be used as polishing step after other techniques where emissions are high or variable
Dry	Low water use Higher reagent consumption to achieve emissions of other FGC techniques but may be reduced by recycling in plant Lower energy use Higher reliability Lowest visible plume potential	Higher solid residue production Reagent consumption controlled only by input rate		All plant
Semi-dry (also described as semi-wet in the Bref)	Medium reaction rates Reagent delivery may be varied by	Higher solid waste residues than wet but lower than dry system		All plant

	concentration and input rate			
Direct injection into boiler	Reduced acid loading to subsequent cleaning stages. Reduced peak emissions and reduced reagent usage			Generally applicable to grate and rotary kiln plants.
Direction desulphurisation	Reduced boiler corrosion	Does not improve overall performance. Can affect bottom ash quality. Corrosion problems in flue gas cleaning system.		Partial abatement upstream of other techniques in fluidised beds
Reagent Type: Sodium Hydroxide	Highest removal rates Low solid waste production	Corrosive material ETP sludge for disposal		HWIs
Reagent Type: Lime	Very good removal rates Low leaching solid residue Temperature of reaction well suited to use with bag filters	Corrosive material May give greater residue volume if no in-plant recycle	Wide range of uses	MWIs, CWIs

Reagent Type: Sodium Bicarbonate	Good removal rates Easiest to handle Dry recycle systems proven	Efficient temperature range may be at upper end for use with bag filters Leachable solid residues Bicarbonate more expensive	Not proven at large plant	CWIs

The Applicant proposes to implement the following primary measures:

- Use of low sulphur fuels for start up and auxiliary burners – gas should be used if available, where fuel oil is used, this will be low sulphur (i.e. <0.1%), this will reduce SO_x at source. The Applicant has justified its choice of gas oil as the support fuel on the basis that there is no existing natural gas connection to the Installation. In the event of a gas connection, an uninterrupted supply would be required leading to high tariffs. The Applicant asserts that the additional costs to install the required gas infrastructure and secure an uninterrupted supply for auxiliary firing of natural gas are not justified for any small savings that may be achieved and we agree with that assessment.
- Management of heterogeneous wastes – this will disperse problem wastes such as PVC by ensuring a homogeneous waste feed.

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

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

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

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

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

In this case, the Applicant proposes to use a dry system using sodium bicarbonate on the basis that it is a proven, effective and efficient reagent for neutralising acid gases and well suited to operation with bag filters. Moreover, the reagent can be easily sourced from the adjacent soda ash works thereby minimizing the effects of transporting the reagent to the facility. We are satisfied that this is BAT.

The amount of reagent used for abatement will need to be optimised to maximise acid gas reduction and minimise sodium bicarbonate waste. Improvement condition IC5 requires the Operator to report to the Environment Agency on optimising the performance of the sodium bicarbonate injection abatement system.

6.2.4 Carbon monoxide and volatile organic compounds (VOCs)

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

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

6.2.5 Dioxins and furans (and other POPs)

Dioxins and furans				
Technique	**Advantages**	**Disadvantages**	**Optimisation**	**Defined as BAT in**

				BREF or TGN for:
Optimise combustion control	All measures will increase oxidation of these species.		Covered in section on furnace selection	All plants
Avoid *de novo* synthesis			Covered in boiler design	All plant
Effective Particulate matter removal			Covered in section on particulate matter	All plant
Activated Carbon injection	Can be combined with acid gas absorber or fed separately. Metallic mercury is also absorbed.	Combined feed rate usually controlled by acid gas content.		All plant. Separate feed normally BAT unless feed is constant and acid gas control also controls dioxin release.
Catalytic filter bags	High destruction efficiency	Does not remove mercury. Higher cost than non-catalytic filter bags		

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

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

6.2.6 Metals

Metals

Technique	Advantages	Disadvantages	Optimisation	Defined as BAT in BREF or TGN for:
Effective Particulate matter removal			Covered in section on particulate matter	All plant
Activated Carbon injection for mercury recovery	Can be combined with acid gas absorber or fed separately. Can be impregnated with bromine or sulphur to enhance reactivity, for use during peak emissions.	Combined feed rate usually controlled by acid gas content.		All plant. Separate feed normally BAT unless feed is constant and acid gas control also controls dioxin release.
Fixed or moving bed adsorption	Mainly for mercury and other metals, as well as organic compounds			Limited applicability due to pressure drop
Boiler bromine injection	Injection during mercury peaks. Oxidation of mercury leading to improved removal in downstream removal method.	Consumption of aqueous bromine. Can lead to formation of polybrominated dioxins. Can damage bag filter. Effects can be limited use is restricted to dealing with peak emissions		Not suitable for pyrolysis or gasification. Can deal with mercury peaks.

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

Unlike other metals however, mercury if present will be in the vapour phase. BAT for mercury removal is one or a combination of the techniques listed above. The Applicant has proposed dosing of activated carbon into the exhaust gas stream. This can be combined with the acid gas reagent or dosed separately. Where the feed is combined, the combined feed rate will be controlled by the acid gas concentration in the exhaust. Therefore, separate feed of activated carbon would normally be considered BAT unless the feed was relatively constant.

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

6.3 BAT and global warming potential

This section summarises the assessment of greenhouse gas impacts which has been made in the determination of this Application. Emissions of carbon dioxide (CO_2) and other greenhouse gases differ from those of other pollutants in that, except at gross levels, they have no localised environmental impact. Their impact is at a global level and in terms of climate change. Nonetheless, CO_2 is clearly a pollutant for IED purposes.

The principal greenhouse gas emitted is CO_2, but the plant also emits small amounts of N_2O arising from the operation of secondary NO_x abatement. N_2O has a global warming potential 310 times that of CO_2. The Applicant will therefore be required to optimise the performance of the secondary NO_x abatement system to ensure its GWP impact is minimised.

The major source of greenhouse gas emissions from the installation is however CO_2 from the combustion of waste. There will also be CO_2 emissions from the burning of support fuels at start up, shut down and should it be necessary to maintain combustion temperatures. BAT for greenhouse gas emissions is to maximise energy recovery and efficiency.

The electricity that is generated by the Installation will displace emissions of CO_2 elsewhere in the UK, as virgin fossil fuels will not be burnt to create the same electricity.

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

Factors influencing GWP and CO_2 emissions from the Installation are:
On the debit side

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

On the credit side

- CO_2 saved from the export of electricity to the public supply by displacement of burning of virgin fuels;

The GWP of the plant will be dominated by the emissions of carbon dioxide that will be released as a result of waste combustion. This will be constant for all options considered in the BAT assessment. Any differences in the GWP of the options in the BAT appraisal will therefore arise from small differences in energy recovery and in the amount of N_2O emitted.

The Applicant considered energy efficiency and BAT for the de-NOx process in its BAT assessment. This is set out in sections 4.3.7, 6.1.1 and 6.2.2 of this document.

Note: avoidance of methane which would be formed if the waste was landfilled has not been included in this assessment. If it were included due to its avoidance it would be included on the credit side.

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

We agree with this assessment and that the chosen option is BAT for the installation.

6.4 BAT and POPs

International action on Persistent Organic pollutants (POPs) is required under the UN's Stockholm Convention, which entered into force in 2004. The EU implemented the Convention through the POPs Regulation (2019/1021), which is directly applicable in UK law. We are required by national POPs Regulations (SI 2007 No 3106) to give effect to Article 6(3) of the EC POPs Regulation when determining applications for environmental permits.

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

The unintentionally-produced POPs addressed by the Convention are:

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

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

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

> "Member States shall, when considering proposals to construct new facilities or to significantly modify existing facilities using processes that release chemicals listed in Annex III , give priority consideration to alternative processes, techniques or practices that have similar usefulness but which avoid the formation and release of substances listed in Annex III, without prejudice to Directive 2010/75/EU of the European Parliament and of the Council"

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

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

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

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

The release of **dioxins and furans** to air is required by the IED to be assessed against the International Toxic Equivalence (I-TEQ) limit of 0.1 ng/m^3. Further development of the understanding of the harm caused by dioxins has resulted in the World Health Organisation (WHO) producing updated factors to calculate the WHO-TEQ value. Certain **PCBs** have structures which make them behave like dioxins (dioxin-like PCBs), and these also have toxic equivalence factors defined by the WHO to make them capable of being considered together with dioxins. The UK's independent health advisory committee, the Committee on Toxicity of Chemicals in Food, Consumer Products and the Environment (COT) has adopted WHO-TEQ values for both dioxins and dioxin-like PCBs in their

review of Tolerable Daily Intake (TDI) criteria. The Permit requires that, in addition to the requirements of the IED, the WHO-TEQ values for both dioxins and dioxin-like PCBs should be monitored for reporting purposes, to enable evaluation of exposure to dioxins and dioxin-like PCBs to be made using the revised TDI recommended by the COT. The release of dioxin-like PCBs and PAHs is expected to be low where measures have been taken to control dioxin releases. The Permit also requires monitoring of a range of PAHs and dioxin-like PCBs at the same frequency as dioxins are monitored. We have included a requirement to monitor and report against these WHO-TEQ values for dioxins and dioxin-like PCBs and the range of PAHs as listed in the Permit. We are confident that the measures taken to control the release of dioxins will also control the releases of dioxin-like PCBs and PAHs. Section 5.2.1 of this document details the assessment of emissions to air, which includes dioxins and concludes that there will be no adverse effect on human health from either normal or abnormal operation.

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

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

Pentachlorobenzene (PeCB) is another of the POPs list to be considered under incineration. PeCB has been used as a fungicide or flame retardant, there is no data available however on production, recent or past, outside the UN-ECE region. PeCBs can be emitted from the same sources as for PCDD/F: waste incineration, thermal metallurgic processes and combustion plants providing energy. As discussed above, the control techniques described in the UN-ECE BAT guidance and included in the permit, are effective in controlling the emissions of all relevant POPs including PeCB.

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

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

6.5 Other Emissions to the Environment

6.5.1 Emissions to water

The only discharges to water from the Installation are uncontaminated surface water. Rainwater run-off is collected and directed to the on-site rain water reservoir. The capacity of the reservoir is sufficient to accommodate water flow from the Installation. Surface water is passed through class 1 interceptors and discharged to Wade Brook and Trent and Mersey Canal. The Operator will undertake monitoring of the discharges from the Installation to ensure that only uncontaminated site surface water enters the environment.

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

6.5.2 Emissions to sewer

This variation adds a discharge to sewer for excess process water. Excess process water can potentially be generated (and discharged) during periods of shutdown, maintenance and while emptying the boiler.

The pollutants likely to be present in the waste water were screened in accordance with our guidance, as insignificant in a H1 risk assessment.

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

6.5.3 Fugitive emissions

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

- Waste is stored in the reception area on impermeable surfaces. All surfaces are of hard standing and designed to accommodate the operations carried out and constructed so as to consider permeability and resistance to chemical attack.
- Spill kits are kept at several locations on site in the event of a spillage.
- Tanks containing potentially polluting liquids are constructed so that any leaks/spillages are contained. Bunds have a capacity greater than 110% of the largest tank or 25% of total tankage, whichever is the larger.
- Rainwater and firewater will be stored in underground tanks. Underground drains will be tested for integrity prior to start of operations and then periodically by CCTV. The precise routing of drains will be established at the detailed design stage. Process water will be collected for re-use.
- Air Pollution Control (APC) residues will be handled within an enclosed system. It will be stored in silos and discharged via sealed connections to

fully contained disposal vehicles. There will be a filter on the silo vent fitted with a differential pressure alarm. Bottom ash will be treated and stored in a building. It will be dampened with ash run-off to minimise dust.

- Activated carbon and sodium bicarbonate will be used within the flue gas treatment plant. These reagents are potentially dusty. Sealed connections will be used for deliveries. Air displaced during deliveries will vent via a filter unit installed on the storage vessel. The filter unit will be visually inspected during unloading operations to ensure that it is operating effectively. In the event of a dust emission, the filter will be replaced.
- During a delivery of ammonium hydroxide, displaced air will be vented back to the delivery vehicle. In the event of a spillage, any spilt material will be cleaned up immediately and disposed of appropriately.

The Applicant has proposed measures to minimise potential off-site fugitive emissions impact during bottom ash treatment activities. Key proposals are:

- Processing activities are carried out in a treatment building on impermeable surfaces
- Facilities for damping down of stockpiles of processed and unprocessed IBA to prevent emissions of dust.
- An internal bund for the containment of any run-off from the bottom ash treatment.

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

6.5.4 Odour

The Applicant employs the following methods and techniques to prevent and minimise odour emissions:

- *Automatic fast-acting roller shutting doors are employed for access and egress to the building to minimise the potential for odours exiting the building;*

- *The use of pre-prepared waste thereby limiting odour emissions;*

- *Waste will be rotated on a first-in first-out principle to avoid the generation of putrescible odours;*

- *The incinerator will operate so that combustion air is drawn from the top of the waste reception and storage building for use in the combustion process to create an airflow direction into the building minimising the potential for dust and odour emissions;*

- *All plant areas will be cleaned out regularly to prevent the build-up of putrescible waste, and*

- *Waste will not be delivered to the site during periods of extended shut- down to prevent build-up of waste.*

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

Waste accepted at the installation will be delivered in covered vehicles or within containers and bulk storage of waste will only occur in the installation's waste bunker. A roller shutter door will be used to close the entrance to the tipping hall outside of the waste delivery periods and combustion air will be drawn from above the waste storage bunker in order to prevent odours and airborne particulates from leaving the facility building.

6.5.5 Noise and vibration

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

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

The Applicant's noise impact assessment showed no significant change in noise levels as a result of this variation to the existing permit. It reported a negligible to minor magnitude impact, resulting in a neutral to slight level of effect in residential areas from any increase in road traffic noise. These effects were considered not to be significant. The report concluded that there would be no significant change in the residual noise levels which indicates a negligible magnitude impact.

6.6 Setting ELVs and other Permit conditions

6.6.1 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 BAT as laid down in the decisions on BAT-C.

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

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

Below we consider whether, for those 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 have considered the information submitted by the Applicant in their Application for the adjacent Habitats sites, SSSIs and local wildlife sites. The impact of the activity on the nearby LWS, SSSIs, SACs and Ramsar sites is not significant based on a throughput of 685,000 tonnes of waste per annum and a NO_X ELV of 150 mg/m^3.

(ii) National and European EQSs

There are no additional National and European EQSs that need to be considered other than the limits in Article 18 of IED to protect the local environment.

(iii) Global Warming

CO_2 is an inevitable product of the combustion of waste. The amount of CO_2 emitted will be essentially determined by the quantity and characteristics of waste being incinerated, which are already subject to conditions in the Permit. It is therefore inappropriate to set an ELV for CO_2, which could do no more than recognise what is going to be emitted. The gas is not therefore targeted as a key pollutant under Annex II of 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 CO_2. However, provided energy is recovered efficiently (see section 4.3.7 above), there are no additional equivalent technical measures (beyond those relating to the quantity and characteristics of the waste) that can be imposed that do not run counter to the primary purpose of the plant, which is the destruction of waste Controls in the form of restrictions on the volume and type of waste that can be accepted at the Installation and Permit conditions relating to energy efficiency effectively apply equivalent technical measures to limit CO_2 emissions.

(iv) Commissioning

The proposed Installation will undergo a period of commissioning before the plant becomes fully operational. The IED and the conditions set out in the Permit cover activities at the Installation once the plant is fully operational burning waste and providing electricity to the grid. Prior to commissioning, the Applicant shall submit a commissioning plan (required under pre-operational condition POC7) to the Agency for approval outlining the expected emissions during different stages of commissioning, the expected duration and timeline for completion of activities and any necessary action to protect the environment in the event that actual emissions exceed expected emissions in accordance with the approved commissioning plan.

It is recognised that certain information provided in the Application is based upon design data or data from similarly designed operational plant. The commissioning stage provides an early opportunity to verify much of this information and will be verified by the Applicant in a commissioning plan to be agreed with the Environment Agency (POC7).

7 Other legal requirements

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

7.1 The EPR 2016 and related Directives

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

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

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

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

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

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

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

- The Environmental Statement submitted with the planning application (which also formed part of the Environmental Permit Application).

- The decision of the Department for Business, Energy & Industrial Strategy to refuse planning permission on 06/12/2022.
- The report and decision notice accompanying the refusal of planning permission.
- The response of the Environment Agency to the local planning authority in its role as consultee to the planning process.

We have reviewed the reasons given for the refusal of planning permission and specifically whether this conclusion is based on information given in the Environmental Statement. We are satisfied that these matters are entirely matters of planning policy and not relevant to our determination. The pollution control and planning regimes are intended to be complementary and should avoid duplication.

From our consideration of all the documents above, the Environment Agency considers that no additional or different conditions are necessary.

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

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

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

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

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

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

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

Article 23(1) requires the permit to specify:

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

These are all covered by permit conditions.

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

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

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

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

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

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

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

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

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

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

Our decision in this case has been reached following a programme of extended public consultation, both on the original application and later, separately, on the draft permit and a draft decision document. The way in which this has been done is set out in section 2.2. A summary of the responses received to our consultations and our consideration of them is set out in Annex 4.

7.2 National primary legislation

7.2.1 Environment Act 1995

(i) Section 4 (Pursuit of Sustainable Development)

We are required to contribute towards achieving sustainable development, as considered appropriate by Ministers and set out in guidance issued to us. The Secretary of State for Environment, Food and Rural Affairs has issued *The Environment Agency's Objectives and Contribution to Sustainable Development: Statutory Guidance (December 2002)*. This document:

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

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

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

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

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

(iii) Section 7 (General Environmental Duties)

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 or urban area or on any such flora, fauna, features, buildings, sites or objects.

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.

(iv) 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.

(v) 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.

We have had regard to the National Air Pollution Control Programme (set under the National Emissions Ceiling Regulations 2018) and consider that our decision complies with the Strategy, and that no additional or different conditions are appropriate for this Permit.

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

We 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 statutory guidance issued by the Department of Business, Energy and Industrial Strategy in March 2017 says:

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

factor that all specified regulators should have regard to, alongside the delivery of the protections set out in the relevant legislation."

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

We consider the requirements and standards we have set in this permit are reasonable and necessary to avoid a risk of an unacceptable level of pollution. This promotes growth amongst legitimate operators because the standards applied to the operator are consistent across businesses in this sector and have been set to achieve the required legislative standards. It also ensures that any pollution that may arise from the regulated facility does not adversely affect local businesses.

7.2.3 **Human Rights Act 1998**

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

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

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

7.2.5 **Wildlife and Countryside Act 1981**

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

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

The Wildlife and Countryside Act (CRoW) assessment is summarised in greater detail in section 5.3.4 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 the Natural Environment and Rural Communities Act 2006 has been amended with effect from 1 January 2023 to require consideration of the general biodiversity objective, which is to further the conservation and enhancement of biodiversity through the exercise of our functions. We have considered the general biodiversity objective when carrying out our permit application determination and, consider that no different or additional conditions are required in the permit.

7.2.7 Countryside Act 1968

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

7.2.8 National Parks and Access to the Countryside Act 1949

Section 11A and section 5(1) imposes a duty on the Environment Agency when exercising its functions in relation to land in a National Park, to have regard to the purposes of conserving and enhancing the natural beauty, wildlife and cultural heritage of the 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 our guidance and concluded that there will be no likely significant effects on any European Site. This assessment is based on the revised proposal detailed in section 5.4.2.

The Habitats Regulations Assessment is summarised in greater detail in section 5.4.2 of this document. A copy of the Habitats Regulations Assessment can be found on the public register.

We have also considered our general duties under Regulation 9(3) to have regard to the requirements of the Habitats Directive in the exercise of our powers and under Regulation 10 in relation to wild bird habitat to take such steps in the exercise of their functions as they consider appropriate so far as lies within our powers to secure preservation, maintenance and re-establishment of a sufficient diversity and area of habitat for wild birds.

We considered whether we should impose any additional or different requirements in the permit in terms of these duties but concluded that we should not.

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

Consideration has been given to whether any additional requirements should be imposed in terms of the Environment Agency's duty under regulation 3 to secure compliance with the requirements of the Water Framework Directive, Groundwater Directive and the EQS Directive through, amongst other things, environmental permits, and its obligation in regulation 33 to have regard to the river basin management plan (RBMP) approved under regulation 31 and any supplementary plans prepared under regulation 32. However, it is felt that existing conditions are sufficient in this regard and no other appropriate requirements have been identified.

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

7.3.3 **The Persistent Organic Pollutants Regulations 2007**

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

7.4 Other relevant legal requirements

7.4.1 Duty to Involve

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

Annexes

Annex 1A: Application of chapter IV of the Industrial Emissions Directive

IED Article	Requirement	Delivered by
45(1)(a)	The permit shall include a list of all types of waste which may be treated using at least the types of waste set out in the European Waste List established by Decision 2000/532/EC, if possible, and containing information on the quantity of each type of waste, where appropriate.	Condition 2.3.4(a) and Table S2.2 in Schedule 2 of the Permit.
45(1)(b)	The permit shall include the total waste incinerating or co-incinerating capacity of the plant.	Condition 2.3.4(a) and Table S2.2 in Schedule 2 of the Permit.
45(1)(c)	The permit shall include the limit values for emissions into air and water.	Conditions 3.1.1 and 3.1.2 and Tables S3.1, S3.1(a) in Schedule 3 of the Permit.
45(1)(d)	The permit shall include the requirements for pH, temperature and flow of waste water discharges.	Not Applicable
45(1)(e)	The permit shall include the sampling and measurement procedures and frequencies to be used to comply with the conditions set for emissions monitoring.	Conditions 3.6.1 to 3.6.54 and Tables S3.1, S3.1(a), S3.3 and S3.4 in Schedule 3 of the Permit.
45(1)(f)	The permit shall include the maximum permissible period of unavoidable stoppages, disturbances or failures of the purification devices or the measurement devices, during which the emissions into the air and the discharges of waste water may exceed the prescribed emission limit values.	Conditions 2.3.14 and 2.3.15.
45(2)(a)	The permit shall include a list of the quantities of the different categories of hazardous waste which may be treated.	Not Applicable
45(2)(b)	The permit shall include the minimum and maximum mass flows of those hazardous waste, their lowest and maximum calorific	Not Applicable

IED Article	Requirement	Delivered by
	values and the maximum contents of polychlorinated biphenyls, pentachlorophenol, chlorine, fluorine, sulphur, heavy metals and other polluting substances.	
46(1)	Waste gases shall be discharged in a controlled way by means of a stack the height of which is calculated in such a way as to safeguard human health and the environment.	Condition 2.3.1(a) and Table S1.2 of Schedule 1 of the Permit.
46(2)	Emission into air shall not exceed the emission limit values set out in part 3 of Annex VI.	Conditions 3.1.1 and 3.1.2 and Tables S3.1, S3.1a.
46(3)	Relates to conditions for water discharges from the cleaning of exhaust gases.	There are no such discharges as condition 3.1.1 prohibits this.
46(4)	Relates to conditions for water discharges from the cleaning of exhaust gases.	There are no such discharges as condition 3.1.1 prohibits this.
46(5)	Prevention of unauthorised and accidental release of any polluting substances into soil, surface water or groundwater. Adequate storage capacity for contaminated rainwater run-off from the site or for contaminated water from spillage or fire-fighting.	The application explains the measures to be in place for achieving the directive requirements. The permit requires that these measures are used. Various permit conditions address this and when taken as a whole they ensure compliance with this requirement.
46(6)	Limits the maximum period of operation when an ELV is exceeded to 4 hours uninterrupted duration in any one instance, and with a maximum cumulative limit of 60 hours per year. Limits on dust (150 mg/m3), CO and TOC not to be exceeded during this period.	Conditions 2.3.14 and 2.3.15
47	In the event of breakdown, reduce or close down operations as soon as practicable.	condition 2.3.13

IED Article	Requirement	Delivered by
	Limits on dust (150 mg/m3), CO and TOC not to be exceeded during this period.	
48(1)	Monitoring of emissions is carried out in accordance with Parts 6 and 7 of Annex VI.	Conditions 3.6.1 to 3.6.4, 3.2.1, 3.2.2, tables S3.1, S3.1(a). Reference conditions are defined in Schedule 6 of the Permit.
48(2)	Installation and functioning of the automated measurement systems shall be subject to control and to annual surveillance tests as set out in point 1 of Part 6 of Annex VI.	Conditions 3.6.1, 3.6.3, table S3.1, S3.1(a), and S3.4
48(3)	The competent authority shall determine the location of sampling or measurement points to be used for monitoring of emissions.	Conditions 3.6.1. Pre-operational condition PO6
48(4)	All monitoring results shall be recorded, processed and presented in such a way as to enable the competent authority to verify compliance with the operating conditions and emission limit values which are included in the permit.	Conditions 4.1.1 and 4.1.2, and Tables S4.1 and S4.4
49	The emission limit values for air and water shall be regarded as being complied with if the conditions described in Part 8 of Annex VI are fulfilled.	conditions 3.1.1, 3.1.2, 3.2.1, 3.2.2 and tables S3.1, S3.1(a)
50(1)	Slag and bottom ash to have Total Organic Carbon (TOC) < 3% or loss on ignition (LOI) < 5%.	Conditions 3.6.1 and Table S3.4
50(2)	Flue gas to be raised to a temperature of 850ºC for two seconds, as measured at representative point of the combustion chamber.	Condition 2.3.9 and pre-operational condition PO8
50(3)	At least one auxiliary burner which must not be fed with fuels which can cause higher emissions than those resulting from the burning of gas oil liquefied gas or natural gas.	Condition 2.3.14
50(4)(a)	Automatic shut-down to prevent waste feed if at start up until the specified temperature has been reached.	Condition 2.3.10

IED Article	Requirement	Delivered by
50(4)(b)	Automatic shut-down to prevent waste feed if the combustion temperature is not maintained.	Condition 2.3.10
50(4)(c)	Automatic shut-down to prevent waste feed if the CEMs show that ELVs are exceeded due to disturbances or failure of waste cleaning devices.	Condition 2.3.10 and 2.3.14
50(5)	Any heat generated from the process shall be recovered as far as practicable.	(a) The plant will generate electricity (b)Operator to review the available heat recovery options every 2 years (Conditions 1.2.1 to 1.2.3)
50(6)	Relates to the feeding of infectious clinical waste into the furnace.	No infectious clinical waste will be burnt
50(7)	Management of the Installation to be in the hands of a natural person who is competent to manage it.	Conditions 1.1.1 to 1.1.3 and 2.3.1 of the Permit.
51(1)	Different conditions than those laid down in Article 50(1), (2) and (3) and, as regards the temperature Article 50(4) may be authorised, provided the other requirements of this chapter are me.	No such conditions Have been allowed
51(2)	Changes in operating conditions do not cause more residues or residues with a higher content of organic polluting substances compared to those residues which could be expected under the conditions laid down in Articles 50(1), (2) and (3).	No such conditions Have been allowed
51(3)	Changes in operating conditions shall include emission limit values for CO and TOC set out in Part 3 of Annex VI.	Not Applicable
52(1)	Take all necessary precautions concerning delivery and reception of Wastes, to prevent or minimise pollution.	Conditions 2.3.1, 2.3.3, 3.3, 3.4, 3.5 and 3.7
52(2)	Determine the mass of each category of wastes, if possible according to the EWC, prior to accepting the waste.	Condition 2.3.4(a) and Table S2.2 in Schedule 3 of the Permit.

IED Article	Requirement	Delivered by
52(3)	Prior to accepting hazardous waste, the operator shall collect available information about the waste for the purpose of compliance with the permit requirements specified in Article 45(2).	Not Applicable
52(4)	Prior to accepting hazardous waste, the operator shall carry out the procedures set out in Article 52(4).	Not Applicable
52(5)	Granting of exemptions from Article 52(2), (3) and (4).	Not Applicable
53(1)	Residues to be minimised in their amount and harmfulness, and recycled where appropriate.	Conditions 1.4.1, 1.4.2 and 3.6.1 with Table S3.10
53(2)	Prevent dispersal of dry residues and dust during transport and storage.	conditions 1.4.1 2.3.1, 2.3.2 and 3.3.1.
53(3)	Test residues for their physical and chemical characteristics and polluting potential including heavy metal content (soluble fraction).	Condition 3.6.1 and Table S3.4 and pre-operational condition PO5.
55(1)	Application, decision and permit to be publicly available.	All documents are accessible from the Environment Agency Public Register.
55(2)	An annual report on plant operation and monitoring for all plants burning more than 2 tonne/hour waste.	Condition 4.2.2 and 4.2.3.

Annex 1B: Compliance with Bat Conclusions

BAT conclusion	Criteria	Delivered by
1	Implement environmental management system	Condition 1.1 and Pre-operational condition POC4.
2	Determine gross electrical efficiency	Section 4.3.7 of this decision document. Permit table S3.3
3	Monitor key process parameters	Condition 3.6.1 and table S3.3
4	Monitoring emissions to air	Condition 3.6.1 and table S3.1
5	Monitoring emissions to air during OTNOC	Condition 1.1.1
6	Monitoring emissions to water from flue gas treatment and/or bottom ash treatment	There are no such emissions from the installation.
7	Monitor unburnt substances in slags and bottom ashes	Conditions 3.6.1, and table S3.4
8	Analysis of hazardous waste	Not applicable
9	Waste stream management techniques	The Application explains the measures that will be used. Permit condition 2.3.1, table S1.2
10	Quality management system for bottom ash treatment plant	Not applicable
11	Monitor waste deliveries as part of waste acceptance procedures	The Application explains the measures that will be used. Permit condition 2.3.1, table S1.2
12	Reception, handling and storage of waste	Measures are described in the Application and FPP. Permit conditions 2.3.1, table S1.2 and condition 3.8.1.
13	Storage and handling of clinical waste	The Application explains the measures that will be used. Permit condition 2.3.1, table S1.2
14	Improve overall performance of plant including BAT-AELs for TOC or LOI	Techniques described in the Application. Permit condition 2.3.1, table S1.2, 3.6.1 and table S3.4

BAT conclusion	Criteria	Delivered by
15	Procedures to adjust plant settings to control performance	Measures described in the Application condition 2.3.1 and table S1.2
16	Procedures to minimise start-up and shut down	Measures described in the Application
17	Appropriate design, operation and maintenance of FGC system	FGC measures described in Application. Operation and maintenance procedures will form part of the EMS
18	OTNOC management plan	Measures described in the Application and condition 1.1
19	Use of heat recovery boiler	Described in the Application. Permit condition 2.3.1, table S1.2
20	Measures to increase energy efficiency and BAT AEEL	Measures described in the Application. Permit condition 2.3.1, table S1.2 Section 4.3.7 of this decision document.
21	Measures to prevent or reduce diffuse emissions including odour	Measures described in the Application. Permit conditions 2.3.1, table S1.2, 3.4.1, 3.3.1, 3.3.2. Sections 4.2.2, 6.5.3 and 6.5.4 of this decision document.
22	Handling of gaseous and liquid wastes	Not applicable
23	Management system to prevent or reduce dust emissions from treatment of slags and ashes	Not applicable
24	Techniques to prevent or reduce diffuse emissions to air from treatment of slags and ashes	Not applicable
25	Minimisation of dust and metal emissions and compliance with BAT AEL	Section 5.2 of this decision document. Permit conditions 2.3.1, table S1.2, 3.4.1, 3.3.1, 3.3.2. 3.1.1 and 3.1.2 and table S3.1
26	Techniques and BAT AEL for dust emissions from enclosed slags and ashes treatment	Not applicable

BAT conclusion	Criteria	Delivered by
27	Techniques to reduce emissions of HCl, HF and SO_2	Measures described in the Application. Permit condition 2.3.1 and table S1.2 Permit condition 2.3.1 and table S1.2 Section 5.2 of this decision document.
28	Techniques to reduce peak emissions of HCl, HF and SO_2, optimise reagent use and BAT AELs	Measures described in the Application. Permit conditions 2.3.1, table S1.2, 3.1.1 and 3.1.2 and table S3.1
29	Techniques to reduce emissions of NO_2, N_2O, CO and NH_3 and BAT AELs	Measures described in the Application. Section 5.2 of this decision document. Permit conditions 2.3.1, table S1.2, 3.1.1 and 3.1.2 and table S3.1
30	Reduce emissions or organic compounds including dioxins/furans and PCBs. BAT AELs	Measures described in the Application. Section 5.2 of this decision document. Permit conditions 2.3.1, table S1.2, 3.1.1 and 3.1.2 and table S3.1
31	Reduce emissions of mercury. BAT AEL	Measures described in the Application. Section 5.2 of this decision document. Permit conditions 2.3.1, table S1.22.3.1, table S1.2, 3.1.1 and 3.1.2 and table S3.1
32	Segregate waste water streams to prevent contamination	Measures described in the Application Sections 4.2.2, 6.5.1 and 6.5.3 of this decision document. Permit conditions 2.3.1, table S1.2, 3.1.1, 3.1.2 and table S3.2
33	Techniques to reduce water usage and prevent or reduce waste water	Measures described in the Application. Sections 4.2.2 and 4.3.8 of this decision document Permit conditions 1.3.1, 2.3.1, table S1.2
34	Reduce emissions to water from FGC and/or from treatment or storage of bottom ashes. BAT AELs	Not applicable

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

Annex 2: Pre-Operational Conditions

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

Table S1.4 Pre-operational measures	
Reference	**Pre-operational measures**
POC1	At least six months prior to the commencement of commissioning, the operator shall submit a report on the baseline conditions of soil and groundwater at the Installation. The report shall contain the information necessary to determine the state of soil and groundwater contamination so as to make a quantified comparison with the state upon definitive cessation of activities provided for in Article 22(3) of the Industrial Emissions Directive (IED). The report shall contain information, supplementary to that already provided in the Application Site Condition Report, needed to meet the information requirements of Article 22(2) of the IED.
POC2	The operator shall submit the written protocol referenced in condition 3.2.4 for the monitoring of soil and groundwater for approval by the Environment Agency. The protocol shall demonstrate how the operator will meet the requirements of Articles 14(1)(b), 14(1)(e) and 16(2) of the IED. The procedure shall be implemented in accordance with the written approval from the Agency.
POC3	At least 2 months before operation, the operator shall submit the final site drainage plan to the Environment Agency for approval. The drainage plan shall include details of secondary containment for any drains that could carry contaminated liquid and also details of secondary containment for underground rainwater and firewater tanks.
POC4	Prior to the commencement of commissioning, the operator shall send a summary of the site Environment Management System (EMS) to the Environment Agency and make available for inspection all documents and procedures which form part of the EMS. The EMS shall be developed in line with the requirements set out in Section 1 of "*How to comply with your environmental permit*". The documents and procedures set out in the EMS shall form the written management system referenced in condition 1.1.1 (a) of the permit.
POC5	Prior to the commencement of commissioning, the operator shall submit to the Environment Agency for approval a protocol for the sampling and testing of incinerator bottom ash for the purposes of assessing its hazard status. Sampling and testing shall be carried out in accordance with the protocol as approved.

Table S1.4 Pre-operational measures	
Reference	**Pre-operational measures**
POC6	Prior to the commencement of commissioning, the operator shall provide the Environment Agency with a written report for approval, describing the detailed programme of noise and vibration monitoring that will be carried out at the site at the commissioning stage and also when the plant is fully operational as proposed in the Application. The report shall include confirmation of locations, time, frequency and methods of monitoring. The monitoring programme shall be carried out in accordance with the Environment Agency's written approval.
POC7	Prior to the commencement of commissioning, the operator shall provide a written commissioning plan, including timelines for completion, for approval by the Environment Agency. The commissioning plan shall include the expected emissions to the environment during the different stages of commissioning, the expected durations of commissioning activities and the actions to be taken to protect the environment and report to the Environment Agency in the event that actual emissions exceed expected emissions. Commissioning shall be carried out in accordance with the commissioning plan as approved.
POC8	After completion of furnace design and at least three calendar months before any furnace operation, the operator shall submit a written report to the Environment Agency of the details of the computational fluid dynamic (CFD) modelling. The report shall demonstrate whether the design combustion conditions comply with the residence time and temperature requirements as defined by the Industrial Emissions Directive.
POC9	Prior to the commencement of commissioning, the operator shall submit an odour management plan to the Environment Agency for written approval. The plan shall take into account the appropriate measures for odour control specified in section 2.2.6 of Sector Guidance Note IPPC S5.06 – *Guidance for the Recovery and Disposal of Hazardous and Non Hazardous Waste*. The plan shall also incorporate all the required detailed information as specified in the Environment Agency's Horizontal Guidance H4 – *Odour Management*. Operations at the site shall not commence until the odour management plan is approved in writing by the Environment Agency.
POC10	Prior to the commencement of commissioning the operator shall submit details of the emergency diesel generator to the Environment Agency for written approval. Including where appropriate the information required by the Medium Combustion Plant and Specified Generator Regulations.

Annex 3: Improvement Conditions

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

Table S1.3 Improvement programme requirements		
Reference	**Requirement**	**Date**
IC1	The operator shall perform a study to determine the extent to which the operation of the current systems in place at the plant to minimise NOx emissions can be further optimised such that emissions are reduced as far as possible below 180 mg/Nm^3 as a daily average, without significantly increasing emissions of other pollutants or having a significant negative effect on plant operation, reliability or bottom ash quality. The study shall be based on the results of trials carried out at the installation and shall have regard to the recommendations for test conditions set out in Section 5.4.3 of report titled 'Establishing factors that influence NOx reduction at waste incineration plant to levels below the upper end of the BAT-AELs' (dated 14/01/2022), or other methodology agreed in writing with the Environment Agency. A written report of the study shall be submitted to the Environment Agency which shall include but not necessarily be limited to the following: • A brief description of the currently installed measures at the installation to minimise NOx emissions, including details of how the reagent dosing system responds to emissions monitoring data and historic data which illustrates the current achievable level of daily NOx emissions. • The results of trials conducted to further reduce daily average NOx emissions using currently installed measures, including: o a description of the parameters that were varied during the trial e.g. ammonia or urea feed rates, physical form of urea injected, air flows, and the range over which they were varied o the levels of NOx achieved and associated levels of ammonia and nitrous oxide emissions and reagent consumption o observed effects and predicted long-term impacts on plant operation, reliability and maintenance regime o any changes to the composition of the bottom ash and boiler ash and the implications of	Within 12 months of the completion of commissioning

Table S1.3 Improvement programme requirements		
Reference	**Requirement**	**Date**
	those changes for the ability to process and use the ash, as well as for the pollution potential of the ash both during processing and its subsequent use as a secondary aggregate ○ any other relevant cross-media effects The report shall also include a description of the extent to which current systems in place at the plant to minimise NOx emissions can be optimised on a permanent basis, including justification and an implementation plan where relevant.	
IC2	The operator shall submit a report to the Environment Agency on whether waste feed to the plant can be proven to have a low and stable mercury content. The report shall have regard to BAT 4 of the BAT conclusions, be based on historic mercury emissions monitoring data and have regard to the Environment Agency Mercury Monitoring Protocol.	Within 12 months of the completion of commissioning
IC3	The operator shall submit a report to the Environment Agency on whether dioxin emissions to air are stable. The report shall have regard to BAT 4 of the BAT conclusions, be based on historic dioxin emissions monitoring data and have regard to the Environment Agency Dioxins Monitoring Protocol.	Within 12 months of the completion of commissioning.

Annex 4: Consultation Reponses

A) Advertising and Consultation on the Application

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

The Application was advertised on the Environment Agency website from 20/04/2023 to 05/06/2023 and in the Northwich Guardian on 20/04/2023. The Application was made available to view on the Environment Public Register.

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

- Food Standards Agency
- Local Authority Environmental Protection Department
- Health and Safety Executive
- Local Authority Director of Public Health
- UK Health and Security Agency

1) Consultation Responses from Statutory and Non-Statutory Bodies

Response Received from UK Health and Security Agency	
Brief summary of issues raised:	Summary of action taken / how this has been covered
UKHSA had no significant concerns regarding the risk to the health of the local population from the installation.	No further action necessary.

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

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

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

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

Representations were received from Robert Cernik from Northwich Town Council, who raised the following issues.

Brief summary of issues raised:	Summary of action taken / how this has been covered
Concern over emissions from traffic.	The air quality assessment considered existing background pollution levels which includes emissions from traffic. Movement of traffic to and from the Installation is outside of our remit but will normally be an issue for the planning authority to consider. Our consideration is whether the emissions from traffic could affect the prevailing pollutant background levels which could be a consideration where there are established high background concentrations contributing to poor air quality. In this case the small increase in pollutants from traffic would not affect the background levels to the point where it would affect the conclusions of the air quality assessment. Vehicle movements within the Installation boundary are considered within the remit of the Environmental Permit. However, the emissions from this limited area are highly unlikely to be significant and will not affect the conclusions of the air quality impact assessment.
Concern over noise from traffic.	Only vehicle movements within the Installation can be considered through environmental permitting. Vehicle movements outside of Installations are not within our remit. The Applicant's noise assessment included on-site vehicle movements and we are satisfied that there will not be a significant impact.
Concern over the types of waste and where they come from.	The Operator will have waste pre-acceptance and waste acceptance procedures to ensure that only waste authorised by the Permit is received and burned. The Permit does not control where the waste comes from because that falls outside the scope of this permit determination. Waste types are specified in table S2.2 of the Permit. We are satisfied that these wastes are suitable for burning at the Installation, further details are in section 4.3.6 of this decision document. We are satisfied that the operating techniques will ensure that emission limits can be met, the emission limits apply at all times whatever wastes are being burned.
Concerns that the consultation was not adequate.	We are satisfied that we took appropriate steps to inform people about the Application and how they could comment on it. How we did this is described in section 2 of this decision document.

No representations were received from the local MP, any local Councillors or any other Parish or Town Councils.

b) Representations from Individual Members of the Public

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

Brief summary of issues raised:	Environment Agency comment
Concern over the effects of increased operating hours and the potential increase in noise.	We audited the Applicant's noise assessment. As part of the audit, we checked that these factors were considered appropriately by the Applicant and we are satisfied that they were. Based on the Applicant's modelling we are satisfied that there will not be a significant impact from noise from the Installation. See section 6.5.5 for further details.
Questions about the financial viability of the development.	The core EPR guidance states at 9.22 we should only consider financial solvency explicitly in cases where we have doubts as to the financial viability of the activity. We have no doubts as to the general financial viability of the activity. Based on this we have no reason to consider that the Applicant will not be financially competent. In any event, given the conditions in the Permit if they cannot discharge the pre-operational conditions, they will not be able to commence activities and they can only get to that stage if they are financially competent.
Concern about the ability of the local sewerage infrastructure to cope with the additional volumes	Water will be re-used at the site, there will be an occasional discharge to sewer in the event that there is an excess of process water. We are satisfied that this occasional discharge will not be significant. See section 6.5.2 for further details.

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

Brief summary of issues raised:	Environment Agency comment
View expressed that this is not the right location for the Installation.	Decisions over land use are matters for the planning system. The location of the installation is a relevant consideration for Environmental Permitting, but only in so far as it relates to its potential to have an adverse environmental impact on communities or sensitive environmental receptors. The environmental impact is assessed as part of the determination

	process and has been reported upon in the main body of this document. The location of the installation can have an impact on the ability to recover waste heat for use in nearby residential, commercial or industrial premises and we commented on this in our consultation response to the local planning authority.
Comments about vehicle access to the installation and traffic movements on local roads.	These are relevant considerations for the grant of planning permission, but do not form part of the Environmental Permit decision making process except where there are established high background concentrations contributing to poor air quality and the increased level of traffic might be significant in these limited circumstances.

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 03/05/2024 and 14/06/2024.

a) Consultation Responses from Statutory and Non-Statutory Bodies

The UK Health and Security Agency confirmed they had no additional comments to make.

b) Representations from Individual Members of the Public

The only 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.