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

## Consultation on our decision document recording our decision-making process

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|---|---|
| The Permit Number is: | EPR/HP3441QA |
| The Applicant / Operator is: | Medworth CHP Limited |
| The Installation is located at: | Medworth EfW CHP Facility, Algores Way, Wisbech, Cambridgeshire |
| Consultation commences on: | 11/01/2024 |
| Consultation ends on: | 22/02/2024 |

## What this document is about

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

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

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

In this document we frequently say "we have decided". That gives the impression that our mind is already made up; but as we have explained above, we have not yet done so. The language we use enables this document to become the final decision document in due course with no more re-drafting than is absolutely necessary.

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

# Preliminary information and use of terms

We gave the application the reference number EPR/HP3441QA/A001. We refer to the application as "the **Application**" in this document in order to be consistent.

The number we propose to give to the permit is EPR/HP3441QA. We refer to the proposed permit as "the **Permit**" in this document.

The Application was duly made on 23/03/2023.

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

Medworth CHP Limited proposed facility is located at Medworth EfW CHP Facility, Algores Way, Wisbech, Cambridgeshire. 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) |
| ACC | Air Cooled Condenser |
| AOD | Above Ordnance Datum |
| AONB | Area of Outstanding Natural Beauty |
| APC | Air Pollution Control |
| APCr | Air Pollution Control residue |
| AQMA | Air Quality Management Area |
| AQMS | Air Quality Management Strategy |
| AQS | Air Quality Strategy |
| BAT | Best Available Technique(s) |
| BAT-AEL | BAT Associated Emission Level |
| BAT-AEEL | BAT Associated Energy Efficiency Level |
| BREF | Best Available Techniques (BAT) Reference Documents for Waste Incineration |
| BAT C | BAT conclusions |
| BS | British Standard |
| BS EN | British Standard European Norm |
| CBA | Cost benefit analysis |
| CEM | Continuous emissions monitor |
| CFD | Computerised fluid dynamics |
| CHP | Combined heat and power |
| CHP-R | Combined heat and power ready |
| CIRIA | Construction Industry Research and Information Association |
| 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 |
| DCO | Development Consent Order |
| DD | Decision document |
| DEFRA | Department of the Environment, Food and Rural Affairs |
| DLC | Design load conditions |

| | |
|---|---|
| EA | Environment Agency |
| EAL | Environmental assessment level |
| EfW | Energy from Waste |
| 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 |
| EU | European Union |
| EWC | European waste catalogue |
| FDC | Fenland District Council |
| FGC | Flue gas cleaning |
| FPP | Fire prevention plan |
| FSA | Food Standards Agency |
| GWP | Global Warming Potential |
| HGV | Heavy Goods Vehicle |
| HHRAP | Human Health Risk Assessment Protocol |
| HPA | Health Protection Agency (now UKHSA – UK Health Security Agency) |
| HW | Hazardous waste |
| HWI | Hazardous waste incinerator |
| HWIDB | Hundred of Wisbech Internal Drainage Board |
| IBA | Incinerator Bottom Ash |
| IED | Industrial Emissions Directive (2010/75/EU) |
| ISO | International Standards Organisation |
| I-TEF | Toxic Equivalent Factors set out in Annex VI Part 2 of IED |
| I-TEQ | Toxic Equivalent Quotient calculated using I-TEF |
| kWh | Kilowatt hours |
| LCV | Lower calorific value – also termed net calorific value |
| LfD | Landfill Directive (1999/31/EC) |
| LOI | Loss on Ignition |

| | |
|---|---|
| LPG | Liquid Petroleum Gas |
| LWS | Local wildlife site |
| m bgl | metres below ground level |
| MBT | Mechanical biological treatment |
| MCERTS | Monitoring Certification Scheme for equipment, personnel, and organisations |
| MJ | Mega Joules |
| MSW | Municipal Solid Waste |
| MW<br>MWe<br>MWh<br>MWth | Megawatts<br>Megawatts electrical<br>Megawatt hour<br>Megawatts thermal |
| MWI | Municipal waste incinerator |
| NFPA | National Fire Protection Association |
| NIA | Noise Impact Assessment |
| NOx | Oxides of nitrogen (NO plus $NO_2$ expressed as $NO_2$) |
| NMP | Noise Management Plan |
| NPV | Net Present Value |
| NWP | Numerical Weather Prediction |
| OMP | Odour Management Plan |
| 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) |
| PM | Particulate Matter |
| POCP | Photochemical Ozone Creation Potential |
| POP(s) | Persistent organic pollutant(s) |
| PPS | Public participation statement |
| 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 |

| | |
|---|---|
| RHI | Renewable Heat Incentive |
| ROC | Renewable Obligation Credits |
| SAC | Special Area of Conservation |
| SAHSU | Small Area Health Statistics Unit |
| 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 |
| SuDS | Sustainable Drainage System |
| 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 |
| UKHSA | UK Health Security Agency |
| UN_ECE | United Nations Environmental Commission for Europe |
| US EPA | United States Environmental Protection Agency |
| VOC | Volatile organic compound |
| 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 are minded 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 draft Permit contains many conditions taken from our standard Environmental Permit template including the relevant Annexes. We developed these conditions in consultation with industry, having regard to the legal requirements of the Environmental Permitting Regulations (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 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 draft decision

## 2.1 Receipt of Application

The Application was duly made on 23/03/2023. 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 Fenland Citizen on 21/06/2023 that contained the same information.

We made a copy of the Application and all other documents relevant to our determination available to view on Citizen Space on our website. 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":

- Local Authority Environmental Protection Department – Cambridgeshire County Council
- Anglian Water
- Food Standards Agency
- Health and Safety Executive
- Director of Public Health and UK Health Security Agency (Previously Public Health England)
- Fire & Rescue Service
- Animal and Plant Health Agency

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

In addition to our advertising the Application, we undertook a programme of extended public consultation. 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 draft determination.

### 2.3 Requests for Further Information

Although we were able to consider the Application duly made, we did in fact need more information in order to determine it and issued an information notice on 20/07/2023. A copy of the information notice, and the Applicant's subsequent response, was placed on our public register.

In addition to our information notice, we received additional information during the determination from the Applicant (email dated 19/07/2023). We made a copy of this information available to the public in the same way as the responses to our information notice.

Having carefully considered the Application and all other relevant information, we are now putting our draft decision before the public and other interested parties in the form of a draft Permit, together with this explanatory document. As a result of this stage in the process, the public has been provided with all the information that is relevant to our determination, including the original Application and additional information obtained subsequently, and we have given the public two separate opportunities (including this one) to comment on the Application and its determination. Once again, we will consider all relevant representations we receive in response to this final consultation and will amend this explanatory document as appropriate to explain how we have done this, when we publish our final decision.

## 3 The legal framework

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

- an *installation* and a *waste incineration plant* as described by the 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, if we grant 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, 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, the supply of steam to neighbouring commercial clients 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 proposed Installation is to be located at Medworth EfW CHP Facility, Algores Way, Wisbech, Cambridgeshire. The proposed location is within a wider industrial estate centred on Algores Way. Part of the site is currently occupied by Mick George Ltd, a waste and aggregates recycling facility and waste transfer station. Mick George Ltd will cease operations before Medworth EfW CHP Facility commence operations.

The location is bordered to the north and the east by industrial units of the Algores Way Industrial Estate. The location is bordered to the south by New Bridge Lane, with a residential property and fields beyond. To the west, the location is bordered by a strip of vegetation and a disused railway, with further industrial units beyond.

The residential property located approximately 20m south of the proposed Installation boundary beyond New Bridge Lane is the closet sensitive receptor. The following habitats are located within the relevant distances from the Installation:

- Special Areas of Conservation (SAC) – Nene Washes (approximately 7.7km to the southwest at the nearest point)
- Special Protection Areas (SPA) - Nene Washes (approximately 7.6km to the southwest at the nearest point)
- Ramsar Sites - Nene Washes (approximately 7.6km to the southwest at the nearest point)
- Sites of Special Scientific Interest (SSSI) – None within 2km
- Local Wildlife Sites – River Nene (approximately 0.6km to the northwest at the nearest point)
- Ancient Woodlands – None within 2km
- National Nature Reserves – None within 2km
- Local Nature Reserves – None within 2km
- World Heritage Sites – None within 2km
- Areas of Outstanding Natural Beauty (AONB) – None within 2km
- National Parks – None within 2km
- Ancient Monuments – None within 2km

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 <u>What the Installation does</u>

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

Notwithstanding the fact that energy will be recovered from the process, the process is nevertheless ‘incineration’ because it is considered that its main purpose is the thermal treatment of waste.

This is an installation for the incineration of household, commercial and industrial municipal waste. The energy produced by the incineration of the waste is converted into high pressure steam which in turn drives turbines that

produce electricity. The facility has been designed to incinerate about 625,600 tonnes of waste annually at a rate of 82 tonnes per hour (2 lines with a capacity of 41 tonnes per hour each) and produce up to 60MWe of electricity with approximately 55MWe of that electricity being exported. At this point the Applicant is assessing the feasibility of also supplying energy in the form of steam to nearby food production and packaging manufacturing facilities.

Waste will be delivered to site by road within covered lorries. Prior to incineration waste will be stored within the tipping hall building. Delivery lorries will enter the building and tip the waste into one of several tipping bays into the tipping bunker. From here, waste will be transferred to the main waste bunker by crane.

Waste delivered into the tipping hall will be available for visual inspection so that, when required, unsuitable or unauthorised items can be removed. Any wastes removed would be stored in a skip within a dedicated quarantine area within the building.

A slowly rotating waste shredder will reduce the size of any bulky waste delivered to the facility in order to make it easier to handle and reduce the likelihood of blockages within the process lines. Once shredded, waste is deposited back into the main waste bunker via a conveyor and chute.

One of two overhead cranes fitted with hydraulic grabs will be used to homogenise the waste by rotating and mixing within the storage pit. The cranes will be able to operate in fully automatic, semi-automatic and manual modes.

The mixed waste will then be fed into the waste feed hoppers associated with each of the two lines. From here, the waste will be transferred by a hydraulic ram onto the advanced inclined reciprocating grate; the thickness and length of the waste on the grate will be such that an adequate feed will be provided to the thermal process. Air distribution and grate speed will be adjusted across the grate to ensure ideal combustion conditions and complete combustion of the waste.

Primary combustion air is drawn from the waste bunker and tipping hall and supplied via small holes under the grate bars. Furnace temperatures will be maintained at between 850°C and 1,250°C for a minimum of 2 seconds. If the temperature arising from the combustion of waste on its own is insufficient to meet this requirement (for example, when burning very low calorific value waste), auxiliary burners fired on 0.1wt% sulphur gas oil (or similar alternative) will be used to maintain the minimum temperature and residence time requirements. Each incineration line will have interlocks such that if the temperature requirements are not met then the waste feed will stop until the temperature is returned to at least 850°C.

Two main waste streams will be produced as a result of the waste incineration process. These are:

(i) Air Pollution Control residue – APC (incorporating fly ash)

APC residue is a mixture of ash, ammonium salts, lime, calcium salts, carbon and small amounts of metals and dioxins (and similar compounds) which have been removed from the hot gases leaving the incinerator. Fly ash is finer particles of ash that pass though the boiler system and are carried over in the flue gas stream to the reaction chamber where the pollutants in the gas stream are removed. This waste is collected within a bag filter and will be removed off-site as a hazardous waste for specialist treatment prior to disposal in a suitably licensed off-site facility via fully enclosed disposal vehicles.

(ii) Incinerator Bottom ash (incorporating boiler ash) - IBA

IBA is the solid mass material that is discharged from the end of the combustion grate and includes some finer siftings that transmit through the grate as the main ash mass is conveyed along the grate. Boiler Ash comprises larger particles of ash that are carried over in the flue stream gas to the first stage of the boiler where they disengage from the gas stream and are collected.

IBA will be quenched with water and stored in a bunker with a drainage system in an enclosed building, before being removed off-site by covered lorry to a suitably licenced facility for recycling where possible, including the extraction of metals contained within the IBA with the remainder reclaimed for use as secondary aggregate.

The emissions to air from the site will be minimised by

(i) Hydrated lime injection into a reactor upstream of a fabric filter via an automated dosing control system, to reduce emissions of acid gases such as hydrogen chloride and sulphur dioxide,
(ii) Urea injection into the furnace using an automated dosing control system to reduce emissions of oxides of nitrogen (NOx). Dosing rates will be optimised based on NOx readings from the continuous emissions management system (CEMS); and
(iii) activated carbon injection into the reactor alongside the hydrated lime to reduce emissions of metals and dioxins.

There are no emissions to surface water or groundwater directly from the process. Surface water from non-process areas of site will be collected in a dedicated surface water drainage system and discharged to the Hundred of Wisbech Internal Drainage Board (HWIDB) drains at two locations. Penstock valves will be installed at key points on the drainage system and prior to the final discharge to surface water. This will allow the surface water drainage system to be isolated in the event of an emergency or spillage. During normal operations the only discharge to foul sewer will be domestic effluent from the amenity areas, which is outside the scope of this permit. The facility is designed to have zero process effluent under normal operations. During periodic maintenance there will be a requirement for the ion exchange unit to be regenerated using acid and alkali washes and for filters to be backflushed.

These effluents will be neutralised where possible in in a neutralisation tank for reuse in the process as quench water for the bottom ash. In scenarios where the system is at capacity, however, these effluents may be discharged to foul sewer under a trade effluent discharge consent with Anglian Water.

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

| | | |
|---|---|---|
| Waste throughput, Tonnes/line | 312,800 tonnes / annum / line<br><br>625,600 tonnes / annum total | 41 tonnes / hour / line<br><br>82 tonnes / hour total |
| Waste processed | Municipal, commercial & industrial | |
| Number of lines | 2 | |
| Furnace technology | Grate | |
| Auxiliary Fuel | Gas Oil | |
| Acid gas abatement | Dry | Hydrated lime |
| NOx abatement | SNCR | Urea |
| Reagent consumption | Auxiliary Fuel: 1,648 te/annum<br>Urea: 1,877 te/annum<br>Lime/Other: 10,635 te/annum<br>Activated carbon: 188 te/annum<br>Process water: 640,000 te/annum | |
| Flue gas recirculation | No | |
| Dioxin abatement | Activated carbon | |
| Stack | Grid Reference:<br>Stack 1 (A1): TF 45495 07893<br>Stack 2 (A2): TF 45499 07889 | |
| | Height: 84 m | Diameter: 2.61 m |
| Flue gas | Flow: 90.8 $Nm^3/s$ | Velocity: 17 m/s |
| | Temperature 150 °C | |
| Electricity generated | 60 MWe | 440,000 MWh |
| Electricity exported | 49.4 MWe | 395,200 MWh |
| Steam conditions | Temperature: 380 °C | Pressure: 46 barg |
| Steam exported | 125.7 tonnes/hour | 197,000 MWh |
| | Temperature: 217 °C | |
| Waste heat use | Several potential primary heat consumers have been identified in the CHP connection corridor, including food/pet food manufacturers and packaging manufacturing. The applicant has identified a potential heat load demand of 25.61 MWth within 5km of the facility. | |

4.1.4 Key Issues in the Determination

The key issues arising during determination of the Application were:

- Emissions to air and their impact
- Noise impacts
- Odour

and we therefore describe how we determined these issues in greater detail in the body of this document.

## 4.2 The site and its protection

### 4.2.1 Site setting, layout and history

The proposed Installation is to be located at Medworth EfW CHP Facility, Algores Way, Wisbech, Cambridgeshire. The proposed location is within a wider industrial estate centred on Algores Way. Part of the site is currently occupied by Mick George Ltd, a waste and aggregates recycling facility and waste transfer station. Mick George Ltd will cease operations before Medworth EfW CHP Facility commences operations.

The location is bordered to the north and the east by industrial units of the Algores Way Industrial Estate. The location is bordered to south by New Bridge Lane, with a residential property and fields beyond. To the west, the location is bordered by a strip of vegetation and a disused railway, with further industrial units beyond.

The site will comprise a number of buildings and two 84 metre stacks for release of treated gaseous emissions from the process to air. The site covers an area of approximately 4.7 hectares. 80% of this land is brownfield, and 20% of the land (southern area of the site) is greenfield.

The brownfield land is surfaced with compacted gravel hardstanding, underlain by made ground to a maximum proven depth of 2.1 metres below ground level (m bgl), overlying the Tidal Flat Deposits – Clay & Silt (Terrington Beds). Glaciofluvial Sand and Gravel is present below the Terrington Beds at depths of 19.2 – 24.0m bgl. This deposit is designated a Secondary A aquifer.

The topography slopes gently to the south-west, from 2.1m above Ordnance Datum (AOD) at the northern boundary, to 1.65m AOD close to the southern boundary.

Historical maps dating back to 1887 show the site as undeveloped agricultural land with drainage channels along the site boundaries. No significant on-site changes are noted until 2003, where aerial photography shows the northern area of the site has been developed with a rectangular building present and stockpiles of materials visible. The southern area of the site is still shown as greenfield, with a small structure present in a hedged area.

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

The Installation Site will have a newly constructed surface water drainage system, discharging to the Hundred of Wisbech Internal Drainage Board (HWIDB) drains. Uncontaminated run-off from hardstanding areas of the

Facility, including from roads and building roof areas, but excluding process areas where waste or other potentially polluting substances are stored, will be collected in a dedicated surface water drainage system and discharged to the HWIDB drains at two locations, via oil interceptors and attenuation tanks.

All received waste handling and processing will occur within a series of buildings. All waste produced (incinerator bottom ash, air pollution control residue, etc), will also be handled within either buildings or enclosed silos as in the case of APC. APC is handled in a fully enclosed system with fabric filters on the silos and residues discharging via sealed connections into fully enclosed disposal vehicles to prevent the release of dust from handling and transfer of the residues.

All storage tanks containing liquids potentially hazardous to the environment will have appropriate containment systems in place as per the guidance in CIRIA C736 'Containment systems for the prevention of pollution'. As a minimum, bunds will be designed to accommodate 110% of the storage capacity and constructed of materials that are impervious to the material being stored. If more than one vessel is located within a common bund, there will be a minimum of 110% of the capacity of the largest vessel, or 25% of the total vessel storage capacity, whichever is greatest. The bunds will slope to a sump, such that the contents of the bund (or rainwater if outdoors) can be pumped out to an appropriate point on the site process water system, or to a tanker for off-site treatment and disposal.

All tanks, equipment/plant and hardstanding will be subject to regular inspection and a planned maintenance programme implemented by the Applicant.

A fire suppression system will be designed and installed by an approved fire engineering company in accordance with NFPA 850, or equivalent standard, and requirements of the fire risk insurers. A fire ring main will be provided with a large capacity firewater storage tank (the capacity of this tank will be determined during detailed design but is likely to be in the order of 1,500 $m^3$). The ring main will serve the EfW CHP Facility with an electric firewater pump (and a diesel back up) to ensure that firewater can be delivered when needed. In accordance with the Chubb Guidance document - Energy from Waste (EfW) – Fire Systems, the firewater retention provision will be sized to accommodate at least:

- The spill of the largest single container of any flammable or combustible liquids in the area
- The maximum expected number of fire hose lines at a flow rate of 1,890l/min minimum operating for a minimum of 10 minutes
- The maximum design discharge of fixed fire suppressions systems operating for a minimum of 10 minutes.

Subject to detailed design, it is anticipated that the primary infrastructure for containment of firefighting water will be the waste bunker. The waste bunker will be designed and constructed as a water retaining structure in accordance with BS EN 1992-3. This will protect against the leak of contaminated firewater

from the bunker and minimise the risk of contamination of groundwater in the event of a fire within the bunker. The waste reception hall and turbine hall will drain to the waste bunker through the appropriate design of kerbing, floor falls and drains. Any firefighting water collected in the waste bunker will be tested before a decision is made on the appropriate disposal route.

The site external drainage system will be sealed by an automatic closing valve activated by the fire alarm on the final connection to the surface water drainage system. This will allow the surface drainage system to be isolated, with the contents of the system tested before a decision is made to continue the discharge or, alternatively, pump the contents to tanker for off-site treatment.

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

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

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

#### 4.2.3 Closure and decommissioning

Having considered the information submitted in the Application, we are satisfied that the appropriate measures will be in place for the closure and decommissioning of the Installation, as referred to in Section 3.6 of the Application document Supplementary Technical Information Report for Medworth CHP Ltd. Pre-operational condition PO1 requires the Operator to have an Environmental Management System in place before the Installation is operational, and this will include a site closure plan.

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

## 4.3 Operation of the Installation – general issues

#### 4.3.1 Administrative issues

The Applicant is the sole Operator of the Installation.

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

4.3.2 Management

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

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

4.3.3 Site security

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

4.3.4 Accident management

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

The installation lies within flood risk zone 3a and is located behind defences providing a standard of protection to the 0.5% (1 in 200 year) flood event. Hazard mapping indicates no overtopping of defences up to a 0.1% (plus climate change) scenario. Essential infrastructure has been designed to remain operational during a 2115 0.1% scenario, and we are satisfied that the appropriate precautions are in place to prevent a pollution incident in the unlikely event of a breach. Flood risk plans will form part of the Accident Management Plan.

The Applicant submitted a Fire Prevention Plan (FPP) for review, outlining measures specific for an incineration installation. The site is designed for early detection of hotspots in waste through use of infrared cameras. Crane operators can transfer hotspots for immediate injection into the combustion process, with less likelihood of suppression system usage. The site will hold

two hours' supply for all fixed suppression systems in accordance with NFPA 850 guidance, and fire water will be contained within the bunker and the external drainage system will be sealed. We are satisfied that appropriate measures are in place to minimise the likelihood of a fire and limit the impact of a fire in an event. Pre-operational condition PO11 requires an updated FPP to be submitted for approval upon completion of the final design.

4.3.5 Off-site conditions

An acoustic noise barrier is proposed to be constructed to mitigate noise impacts at 10 New Bridge Lane.

Refer to Section 5.6.2 Noise and Vibration for further details.

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 |
|---|---|---|
| Application EPR/HP3441QA/A001 | • Supplementary Technical Information Report (12417A-10-R02-01-F01), dated August 2022:<br>Sections:<br>○ 2.3;<br>○ 3.3;<br>○ 4.1 – 4.6; and<br>○ 5.8.<br>• Outline Operational Noise Management Plan (EN010110 Vol 6.4), dated June 2022 | These documents contain key operating techniques that will ensure environmental risk is managed on site. |
| Additional Information | • Technical Note: Regulation of Noise Controls (acoustic fence) (Revision 1.0), dated July 2023 | |
| Response to Schedule 5 Notice dated 20/07/2023 | • Revised Outline Fire Prevention Plan (BS.BC.XX.XX.SXX.MH), dated July 2023.<br>• Revised Outline Odour Management Plan (OS.HSE.XX.XX.S01.MH), dated August 2023 | |

| | | |
|---|---|---|
| | • Technical Note: Response to Schedule 5 Notice of Request for More Information (12417A-10-R04-01), dated August 2023 | |

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.

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

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

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

The original list submitted as part of the application accepted as duly made on 23/03/2023 included a number of waste streams that we do not consider suitable for waste incineration such as metals, inerts and glass. Therefore, the Schedule 5 notice issued on 20/07/2023 required the Applicant to review and revise the list of wastes that they proposed to incinerate at the facility. The revised list was submitted to us as part of their response to this Schedule 5 notice on 16/08/2023.

We have specified the permitted waste types, descriptions and, where appropriate, quantities which can be accepted at the installation in Table S2.2 of the Permit.

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

(i) these wastes are categorised as municipal waste in the European Waste Catalogue or are non-hazardous wastes similar in character to municipal waste;

(ii) the wastes are all categorised as non-hazardous in the European Waste Catalogue and are capable of being safely burnt at the Installation.

(iii) these wastes are likely to be within the design calorific value (CV) range for the plant;
(iv) these wastes are unlikely to contain harmful components that cannot be safely processed at the Installation.

The incineration plant will take municipal waste, which has not been source-segregated or separately collected or otherwise recovered, recycled or composted. 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 625,600 tonnes per annum. This is based on the Installation operating both incineration lines for 8,000 hours per year at a nominal capacity of 41 tonnes per hour per line.

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

4.3.7 Energy efficiency

(i) Consideration of energy efficiency

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

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

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

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

4. The extent to which the Installation meets the requirement of Article 14(5) of the Energy Efficiency Directive, which requires new thermal electricity generation installations with a total thermal input exceeding 20 MW to carry out a cost-benefit assessment to "*assess the cost and benefits of providing for the operation of the installation as a high-efficiency cogeneration installation*".

**Cogeneration** means the simultaneous generation in one process of thermal energy and electrical or mechanical energy and is also known as combined heat and power (CHP).
**High-efficiency cogeneration** 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, including:

- The potential for supplying medium pressure steam to nearby identified end-users, including food preparation and packaging manufacturing sites, with condensate being returned to the boiler system on the Medworth incinerator site.
- Insulation of steam systems.
- Provision of hoods, lids, air-tight seals and self-closing doors to maintain temperatures.
- Avoidance of unnecessary discharge of heated water or air by fitting simple timers or sensors.
- Use of high efficiency lighting.
- Use of energy efficient motors sized appropriately for their duty, and which will be variable speed drive, where appropriate.
- Operation of an Energy Management System accredited to the requirements of ISO 50001:2018.

The Application states that the specific energy consumption, a measure of total energy consumed per unit of waste processed, will be 94 kWh/tonne. The installation capacity is 625,600 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 10.9 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).

Energy efficiency has been assessed for two scenarios, namely when generating electricity only, and when primarily generating electricity but also providing heat in the form of steam.

When generating electricity only:

The Installation will generate electricity only and has been specified to maximise electrical output with little or no use of waste heat. The Sankey diagram in section 3.2.2 of the Application document Supplementary Technical Information Report for Medworth CHP Ltd shows 60 MW (gross) of electricity produced for an annual burn of 625,600 tonnes, which represents 9.6 MW per 100,000 tonnes/annum of waste burned (0.77 MWh/tonne of waste). The Installation is therefore above the indicative BAT range.

When generating electricity and heat:

The Installation will primarily generate electricity, but will also provide heat in the form of steam for other processes and customers. The maximum electrical output of the plant will be 44 MW with 50 MWth exported as heat.

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

The gross electrical efficiency was calculated as 30%.

The BAT AEEL for gross electrical efficiency is 25-35 for new plant.

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

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.

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

Our CHP-R guidance also states that opportunities to maximise the potential for heat recovery should be considered at the early planning stage, when sites are being identified for incineration facilities.

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 and / or gaining accreditation under the DEFRA Good Quality CHP Scheme does not form part of the matters relevant to our determination. They are however general indicators that the installation is achieving a high level of energy recovery.

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

$$R1 = (Ep – (Ef + Ei)) / (0.97 \times (Ew + Ef))$$

Where:

- Ep means annual energy produced as heat or electricity. It is calculated in the form of electricity being multiplied by 2.6 and heat for commercial use being multiplied by 1.1 (GJ/yr).
- Ef means annual energy input to the system from fuels contributing to the production of steam (GJ/yr).
- Ew means annual energy contained in the treated waste calculated using the net calorific value of the waste (GJ/yr).

- Ei means annual energy imported excluding Ew and Ef (GJ/yr)
- 0.97 is a factor accounting for energy losses due to bottom ash and radiation.

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

The EfW CHP Facility has a design R1 value of 0.81 (0.90 with application of climate change correction factor based on regional heating degree day analysis) at design load conditions (DLC) without the export of heat.

The EfW CHP Facility is designed to be CHP-ready (CHP-R) from the outset with the ability to export heat to local heat consumers where there are opportunities to do so and where suitable contractual arrangements can be established. The EfW CHP Facility is designed to be able to export up to 50MWth of heat in the form of medium pressure 20barg steam to a district heating network. Gross power generation will range from 60MWe with no heat export to 44MWe with maximum heat export.

While the quantity of heat demand identified is sufficient to achieve Primary Energy Savings (PES) in excess of the 10% technical feasibility threshold, it is not sufficient to be deemed 'Good Quality' CHP in accordance with the CHP Quality Assurance (CHPQA) scheme, which has a CHPQA Quality Index (QI) threshold of 105 at design stage. For the potential heat consumers, the PES was calculated to be 18.22 % and the CHPQA QI score was 66.5. The new efficiency criteria set out in the latest CHPQA guidance means that it is unlikely that any energy from waste plant will achieve 'Good Quality' CHP status.

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

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

(v) <u>Choice of Steam Turbine</u>

The facility is designed to deliver high temperature (380°C) and pressure (45 Bar) steam via appropriately insulated pipework into a single shaft condensing turbine. We are satisfied that this represents BAT (20f) in terms of steam conditions to ensure efficient energy recovery. The steam turbine design allows for heat export to local consumers via medium pressure steam.

(vi) Choice of Cooling System

The applicant has chosen an Air Cooled Condenser (ACC) cooling system to condense steam output and return condensate to the boiler. This was chosen over a once-through cooling system and a closed circuit wet evaporative cooling system on the basis that there is no water resource or significant water treatment required, no risk of biocides in purge water and no risk of bioaerosol emissions. There is a greater impact on energy efficiency (-0.6%) given the increased parasitic demand. The noise profile is considered within the noise assessment with no significant impacts.

We agree that an Air Cooled Condenser (ACC) represents BAT for this Installation.

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

The operator has submitted a cost-benefit assessment of opportunities for high efficiency co-generation within 15 km of the Installation in which they calculated net present value. This was presented as a 5 km radial search, with accompanying confirmation that there is no large consumer heat demand between 5 km and 15 km. This is confirmed by the BEIS heat map which indicates an aggregated demand of 158,102 MWh for large heat customers at both a 5 km and 15 km screening distance.

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 0.64 which demonstrates that operating as a high-efficiency cogeneration installation will be financially viable. We have therefore included conditions in the operator's permit as described in section (viii) below.

(viii) Permit conditions concerning energy efficiency

Condition 1.2.2 has been included in the Permit, which requires the Operator to review the options available for heat recovery on an ongoing basis.

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 the 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 4, including consumption of lime, activated carbon and urea used per tonne of waste burned. This will enable the Environment Agency to assess whether there have been any changes in the efficiency of the air pollution control plant, and the operation of the SNCR to abate $NO_x$. These are the most significant raw materials that will be used at the Installation, other than the waste feed itself (addressed elsewhere). The efficiency of the use of auxiliary fuel will be tracked separately as part of the energy reporting requirement under condition 4.2.1. 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) and air pollution control (APC) residues.

The first objective is to avoid producing waste at all. Waste production will be avoided by achieving a high degree of burnout of the ash in the furnace, which results in a material that is both reduced in volume and in chemical reactivity. Condition 3.1.3 and associated Table S3.5 specify limits for total organic carbon (TOC) of <3% in bottom ash. Compliance with this limit will demonstrate that good combustion control and waste burnout is being achieved in the furnaces and waste generation is being avoided where practicable.

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.

APC residues from flue gas treatment are hazardous waste and therefore must be sent for disposal to a landfill site permitted to accept hazardous waste, or to

an appropriately permitted facility for hazardous waste treatment. The amount of APC residues is minimised through optimising the performance of the air emissions abatement plant.

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

The Application also proposes that, where possible, bottom ash will be transported to a suitable treatment facility, from where it could be re-used in the construction industry as an aggregate.

Having considered the information submitted in the Application, we are satisfied that the waste hierarchy referred to in Article 4 of the 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.

4.3.10 Climate change adaptation

We have assessed the climate change adaptation risk assessment.

We consider the climate change adaptation risk assessment is satisfactory.

# 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 exceedances 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 SSSIs, SACs or SPAs). These additional factors may also lead us to include more stringent conditions than BAT.

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

## 5.2 Assessment of Impact on Air Quality

The Applicant's assessment of the impact of air quality is set out in the document Air Quality Technical Report, submitted as part of the Application. The assessment comprises:

- A screening assessment using the Environment Agency's risk assessment tool (H1 software tool).
- 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 odour impacts when the incinerator is shut down.
- A qualitative assessment of amenity impacts during construction.
- 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 and potential odour impacts including those during plant shutdowns are considered in section 5.7.

The Applicant has assessed the Installation's potential emissions to air against the relevant air quality standards, and the potential impact upon local conservation and habitat sites and human health. These assessments predict the potential effects on local air quality from the Installation's stack emissions using the air dispersion model software ADMS 5 (version 5.2) dispersion model, which is a commonly used computer model for regulatory dispersion

modelling. The model used 5 years of meteorological data collected from the Met Office's Numerical Weather Prediction (NWP) model interpolated for the specific location of the installation between 2015 and 2019. The nearest synoptic weather station that provides model-quality monitored meteorological data is located at RAF Marham, approximately 27km to the east of Wisbech. Due to this distance, the applicant reasoned that the data from this station may not necessarily be representative of conditions within Wisbech and as such used the NWP data instead. Observed data is our preferred meteorological data for dispersion models. However, we agree that NWP data is likely to be reasonably representative of the regional meteorology. 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 benzene
    - Ammonia ($NH_3$)

- Second, they assumed that the Installation operates continuously at the relevant long-term or short-term ELVs, i.e. the maximum permitted emission rate (metals are considered further in section 5.2.3 of this decision document).
- Third, the model also considered emissions of pollutants not covered by Annex VI of IED, specifically, polycyclic aromatic hydrocarbons (PAH) and polychlorinated biphenyls (PCBs). Emission rates used in the modelling have been drawn from data in the Waste Incineration BREF and are considered further in section 5.2.2.

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 Applicant has used background data from different air quality networks spread across the UK and Defra background maps for the pollutants considered. We have reviewed the data and can confirm they are reasonably representative. We have however

identified some minor differences and have used the most conservative background data for all the pollutants in our check modelling assessments.

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, although we do not necessarily agree with the consultant's absolute numerical predictions, taking account of the expected modelling uncertainties, we agree that the conclusions drawn in the reports are acceptable.

During determination new Environmental Assessment Levels (EALs) were implemented for a few pollutants including some metals. The value 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). A comparison of the changes can be viewed here, New Environmental Assessment Levels for 13 substances (sharepoint.com). We checked the applicants modelling against these new EALs and carried out our own screening checks. We are satisfied that the new EALS do no change the conclusions of our audit. We note that there is potential for the 1,3-butadiene short-term EAL to be exceeded under abnormal operating conditions. However, this is assuming that all VOC emissions are 1,3-butadiene and abnormal emissions coincide precisely with the worst daily meteorological conditions. Therefore, we conclude it is unlikely that there will be an exceedance of the revised short-term 1,3-butadiene EAL if one or more of these factors were appropriately accounted for.

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

### 5.2.1 Assessment of Air Dispersion Modelling Outputs

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

The Applicant's modelling predicted peak ground level exposure to pollutants in ambient air and 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.

| Pollutant | ES | | Back-ground | Process Contribution (PC) | | Predicted Environmental Concentration (PEC) | |
|---|---|---|---|---|---|---|---|
| | µg/m³ | Reference period | µg/m³ | µg/m³ | % of EAL | µg/m³ | % of EAL |
| $NO_2$ | 40 | Annual Mean | 16.82 | 0.78 | 1.95 | 17.6 | 44.0 |
| | 200 | 99.79th %ile of 1-hour means | 24.28 | 29.79 | 14.9 | 54.1 | 27.0 |
| $PM_{10}$ | 40 | Annual Mean | 16.49 | 0.05 | 0.13 | 16.5 | 41.4 |
| | 50 | 90.41st %ile of 24-hour means | 33.07 | 0.16 | 0.32 | 33.23 | 66.5 |
| $PM_{2.5}$ | 20 | Annual Mean | 10.46 | 0.05 | 0.25 | 10.51 | 52.6 |
| $SO_2$ | 266 | 99.9th %ile of 15-min means | 3.01 | 47.29 | 17.8 | 50.3 | 18.9 |
| | 350 | 99.73rd %ile of 1-hour means | 3.25 | 42.17 | 12.05 | 45.42 | 13.0 |
| | 125 | 99.18th %ile of 24-hour means | 3.25 | 20.23 | 16.2 | 23.48 | 18.8 |
| HCl | 750 | 1-hour average | 0.42 | 18.51 | 2.47 | 18.9 | 2.52 |
| HF | 160 | 1-hour average | 6 | 0.99 | 0.61875 | 6.99 | 4.4 |
| CO | 10000 | Maximum daily running 8-hour mean | 522 | 20.5 | 0.20 | 542 | 5.4 |
| | 30000 | 1-hour average | 558 | 30.85 | 0.10 | 589 | 2.0 |

| Pollutant | ES | | Back-ground | Process Contribution (PC) | | Predicted Environmental Concentration (PEC) | |
|---|---|---|---|---|---|---|---|
| | µg/m³ | Reference period | µg/m³ | µg/m³ | % of EAL | µg/m³ | % of EAL |
| TOC* | 5 | Annual Mean | 0.27 | 0.09 | 1.80 | 0.36 | 7.20 |
| | 30 | Daily average | 0.27 | 5.79 | 19.3 | 6.06 | 20.20 |
| PAH** | 0.001 | Annual Mean | 0.00006 | 0.000044 | 4.40 | 0.00010 | 10.4 |
| $NH_3$ | 180 | Annual Mean | 3.37 | 0.09 | 0.05 | 3.46 | 1.92 |
| | 2500 | 1-hour average | 4.7 | 3.08 | 0.12 | 7.78 | 0.3 |
| PCBs | 0.2 | Annual Mean | 8.70E-12 | 3.59E-11 | 0.00 | 0.00000 | 0.0 |
| | 6 | 1-hour average | 8.70E-12 | 9.58E-10 | 0.00 | 0.00000 | 0.00 |

* as benzene
** as benzo(a)pyrene

| 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 | 0.1 | 0.2 | 4.00 | 0.30 | 6.0 |
| Hg | 250 | Annual mean | 0 | 0.2 | 0.08 | 0.20 | 0.08 |
| | 7500 | 1-hour average | 0 | 6.2 | 0.08 | 6.20 | 0.083 |
| Sb | 5000 | Annual mean | 0.5 | 0 | 0.00 | 0.50 | 0.01 |
| | 150000 | 1-hour average | 0.1 | 0.1 | 0.00 | 0.20 | 0.000 |
| Pb | 250 | Annual mean | 3.1 | 0 | 0.00 | 3.10 | 1.24 |
| Cu | 10000 | Annual mean | 1.5 | 0 | 0.00 | 1.50 | 0.015 |

| Pollutant | ES | | Back-ground | Process Contribution | | Predicted Environmental Concentration | |
|---|---|---|---|---|---|---|---|
| | ng/m³ | Reference period | ng/m³ | ng/m³ | % of EAL | ng/m³ | % of EAL |
| | 200000 | 1-hour average | 3 | 0.1 | 0.00 | 3.10 | 0.002 |
| | 150 | Annual mean | 2.4 | 0 | 0.00 | 2.40 | 1.60 |
| Mn | 1500000 | 1-hour average | 4.7 | 0.5 | 0.00 | 5.20 | 0.00 |
| | 5000 | Annual mean | 1 | 0 | 0.00 | 1.00 | 0.02 |
| V | 1000 | 24-hr average | 1.9 | 2 | 0.20 | 3.90 | 0.39 |
| As | 6 | Annual mean | 0.5 | 0 | 0.00 | 0.50 | 8.3 |
| | 5000 | Annual mean | 0.5 | 0 | 0.00 | 0.50 | 0.010 |
| Cr (II)(III) | 150000 | 1-hour average | 0.9 | 0.8 | 0.00 | 1.70 | 0.0011 |
| Cr (VI) | 0.25 | Annual mean | 0.50 | 0 | 0.00 | 0.50 | 200.0 |
| Ni | 20 | Annual mean | 0.5 | 0.00 | 0.00 | 0.50 | 2.5 |

(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:

- $PM_{10}$
- $PM_{2.5}$
- HF
- HCl
- CO
- $NH_3$
- PCBs
- Hg, Sb, Pb, Cu, Mn, V, As, Cr (II)(III), Cr (VI), Ni

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.

- $NO_2$
- $SO_2$
- TOC (as benzene)
- PAHs
- Cd

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, 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.

There is currently no emission limit prescribed nor any continuous emissions monitoring for particulate matter specifically in the $PM_{10}$ or $PM_{2.5}$ fraction. Whilst

we are confident that current monitoring techniques will capture the fine particle fraction ($PM_{2.5}$) for inclusion in the measurement of total particulate matter, an improvement condition (IC2) has been included that will require a full analysis of particle size distribution in the flue gas, and hence determine the ratio of fine to coarse particles. In the light of current knowledge and available data however we are satisfied that the health of the public would not be put at risk by such emissions, as explained in section 5.3.3.

(iii) Acid gases, sulphur dioxide ($SO_2$), 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 hourly ES and as hourly mean PECs are below the monthly mean guideline value, it is highly unlikely that there would be any exceedances of the monthly mean guideline. Therefore 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, whilst $SO_2$ emissions cannot be screened out as insignificant, the Applicant's modelling shows that the Installation is unlikely to result in a breach of the ES. The Applicant is required to prevent, minimise and control $SO_2$ emissions using BAT, this is considered further in Section 6. We are satisfied that $SO_2$ emissions will not result in significant pollution.

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

The above tables show that for CO 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.

The Applicant has used the ES for benzene for their assessment of the impact of VOC, as agreed with the Agency during pre-application discussions. The above tables show that for emissions of VOCs (expressed as TOC), the maximum long term PC is marginally greater than 1% of the ES and therefore cannot be screened out as insignificant. However, the emission is not expected to result in the ES being exceeded. The maximum short term PC for VOCs is

above the level that would screen out as insignificant (>10% of the ES). However, the emission is not expected to result in the ES being exceeded.

The above tables show that for PCB 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 for PCBs and so can be screened out as insignificant. Therefore, we consider the Applicant's proposals for preventing and minimising the emissions of these substances to be BAT for the Installation.

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

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

From the tables above all the other emissions can be screened out as insignificant in that the 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 10 mg/m$^3$. We are satisfied that this level of emission is consistent with the operation of a well-controlled SNCR $NO_x$ abatement system.

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

(V) Summary

For the above emissions to air, for those emissions that 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
- Antimony
- Lead
- Copper
- Manganese
- Vanadium
- Arsenic
- Chromium (II)(III)
- Chromium (VI)
- Nickel

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

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

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)

Fenland District Council (FDC) has declared three AQMAs in Wisbech. These are located as follows:

- Wisbech AQMA No.1 ($SO_2$, 15-Minute Mean) approximately 1.0km north of the EfW CHP Facility Site;
- Wisbech AQMA No.2 ($PM_{10}$, 24-Hour Mean) approximately 1.7km north-east of the EfW CHP Facility Site; and
- Wisbech AQMA No.3 ($NO_2$, Annual Mean) approximately 1.2km north-east of the EfW CHP Facility Site.

In 2019 FDC proposed to revoke Wisbech AQMAs No. 1 & 2. As these have yet to be revoked they were considered in the Applicant's assessment. The 2021 FDC Air Quality Annual Status Report (ASR) confirms that the sources of pollution for Wisbech AQMA No. 1 and Wisbech AQMA No.2 have been removed.

From the Applicant's model, the process contribution at the majority of points within each of the AQMAs is predicted to be below 1% of the ES and can be considered insignificant. The modelled NOx PC does exceed 1% of the ES at Wisbech AQMA No.3, however, as the proposed emissions comply with BAT associated emission levels and the resulting PECs do not exceed environmental standards, the Applicant's modelling shows that the Installation is unlikely to result in a breach of the ES within the AQMA.

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

## 5.3 Human health risk assessment

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

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

### i) Applying Statutory Controls

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

The main conditions in an EfW permit are based on the requirements of the IED. Specific conditions have been introduced to specifically ensure compliance with the requirements of Chapter IV of the IED. The aim of the IED is to prevent or, where that is not practicable, to reduce emissions to air, water and land and prevent the generation of waste, in order to achieve a high level of protection of the environment taken as a whole. IED achieves this aim by setting operational conditions, technical requirements and emission limit values 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 predicted maximum contribution as presented in the below table is 2.2% of the TDI for an adult, and 6.5% of the TDI for a child, at the receptor "Resident Maximum 2". Since their predictions are below the TDI the Applicant concluded that "*It has been demonstrated that for the maximally exposed individual, exposure to dioxins, furans and dioxin-like PCBs is not significant.*" Note that although these predictions are below the UKHSA screening threshold they are overly conservative. They have calculated combined intakes without adjustment for lifetime exposure. The percentage predictions should therefore not be used to make conclusions against the TDI over a more relevant long term exposure period (e.g. lifetime). We have considered this in our assessment.

| Receptor | Adult (pg I-TEQ kg-BW$^{-1}$d$^{-1}$) | Adult (%age TDI) | Child (pg I-TEQ kg-BW$^{-1}$d$^{-1}$) | Child (%age TDI) |
|---|---|---|---|---|
| Farmer South-west 2 | 0.028 | 1.4% | 0.041 | 2.0% |
| Resident Maximum 2 | 0.044 | 2.2% | 0.130 | 6.5% |

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 µg/m$^3$ would result in an increase in life expectancy of 20 days for people born in 2008." However, "The Committee stresses the need for careful interpretation of these metrics to avoid incorrect inferences being drawn – they are valid representations of population aggregate or average effects, but they can be misleading when interpreted as reflecting the experience of individuals."

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 $PM_{10}$, $PM_{2.5}$, HCl, HF, CO, $NH_3$, PCBs and metals (except cadmium) have all indicated that the Installation emissions screen out as insignificant; where the impact of emissions of $NO_2$, $SO_2$, VOCs, PAHs and cadmium have not been screened out as insignificant, the assessment still shows that the PEC are well within the ES.

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.

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 Director of Public Health / UK Health Security Agency 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 Food Standards Agency was also consulted during the permit determination process and it concluded that it is unlikely that there will be any unacceptable effects on the human food chain as a result of the operations at the Installation. Details of the responses provided by 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 Installation:

- Nene Washes (SAC, SPA and Ramsar site), approximately 7.6km to the southwest at the nearest point

There are no Sites of Special Scientific Interest (SSSI) within 2 km of the proposed Installation.

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

- River Nene (Local Wildlife Site), approximately 0.6km to the northwest at the nearest point

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.

Nene Washes SAC, SPA & Ramsar:

| Direct Impacts[1] |
|---|

| Pollutant | ES / EAL (µg/m³) | Back-ground (µg/m³) | Process Contribution (PC) (µg/m³) | PC as % of ES |
|---|---|---|---|---|
| $NO_x$ Annual | 30 | 7.45 | 0.03 | 0.10 |
| $NO_x$ Daily Mean | 200[1] | 14.9 | 0.58 | 0.29 |
| $SO_2$ | 20 | 0.88 | 0.0079 | 0.04 |
| Ammonia | 3 | 1.56 | 0.0026 | 0.09 |
| HF Weekly Mean | 0.5 | 3 | 0.000263 | 0.05 |
| HF Daily Mean | 5 | 6 | 0.00487 | 0.10 |
| Deposition Impacts[2] | | | | |
| **Pollutant** | **Critical Load** | **Max. N PC** | **Max. S PC** | **Maximum PC as a % of CL** |
| N Deposition (kg N/ha/yr) | 20 | 0.047 | - | 0.24 |
| Acidification (Keq/ha/yr) | 0.4 | 0.003 | 0.002 | 0.1 |

(1) For detailed assessments where the ozone is below the AOT40 critical level and sulphur dioxide is below the lower critical level of 10 micrograms per cubic metre
(2) Direct impact units are µg/m³ and deposition impact units are kg N/ha/yr or Keq/ha/yr.

The table above show that the PCs are <10% for all short term environmental standards and <1% for all long term environmental standards at the Nene Washes SAC, SPA & Ramsar. Hence, we can conclude that impacts are insignificant.

### 5.4.3 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 for SSSIs. Finally, the Environment Act 1995 provides more generalised protection for flora and fauna rather than for specifically named conservation designations. It is under the Environment Act 1995 that we assess other sites (such as 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, we would generally conclude that the Installation is not causing significant pollution at these other sites if the PC is less than the relevant critical level or critical load, provided that the Applicant is using BAT to control emissions.

River Nene Local Wildlife Site (LWS):

| Direct Impacts[1] | | | | |
|---|---|---|---|---|
| **Pollutant** | **ES / EAL (µg/m³)** | **Back-ground (µg/m³)** | **Process Contribution (PC) (µg/m³)[2]** | **PC as % of ES** |
| $NO_x$ Annual | 30 | 33.98 | 0.28 | 0.93 |
| $NO_x$ Daily Mean | 200[1] | 27.04 | 9.79 | 4.90 |
| $SO_2$ | 20 | 1.87 | 0.0709 | 0.35 |
| Ammonia | 3 | 3.26 | 0.0236 | 0.79 |
| HF Weekly Mean | 0.5 | 3 | 0.002329 | 0.47 |
| HF Daily Mean | 5 | 6 | 0.08157 | 1.63 |
| Deposition Impacts[3] | | | | |
| **Pollutant** | **Critical Load** | **Max. N PC** | **Max. S PC** | **Maximum PC as a % of CL** |
| N Deposition (kg N/ha/yr) | 10 | 0.206 | - | 2.1 |
| Acidification (Keq/ha/yr) | 1 | 0.015 | 0.011 | 0.5 |

(1) For detailed assessments where the ozone is below the AOT40 critical level and sulphur dioxide is below the lower critical level of 10 micrograms per cubic metre
(2) The impact at the LWS was modelled at 10 locations. The worst-case PC is presented for each pollutant
(3) Direct impact units are µg/m³ and deposition impact units are kg N/ha/yr or Keq/ha/yr.

Where short term PCs and long term PCs are less than 100% of the environmental standard for protected conservation areas, we deem the emission insignificant. The above table indicates that PCs are well below these thresholds at the River Nene Local Wildlife Site, therefore we consider impacts to be insignificant.

## 5.5 Impact of abnormal operations

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

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.

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

- Dioxin emissions of 8 ng/m$^3$ (100x normal)
- Mercury emissions are 5 times those of normal operation
- $NO_x$ emissions of 800 mg/m$^3$ (2x normal)
- Particulate emissions of 150 mg/m$^3$ (5x normal)
- Metal emissions other than mercury are 5 times those of normal operation
- $SO_2$ emissions of 250 mg/m$^3$ (1.25x normal)
- HCl emissions of 1,200 mg/m$^3$ (20x normal)
- PCBs (10x normal)

This is a worst-case scenario in that these abnormal conditions include a number of different equipment failures not all of which will necessarily result in an adverse impact on the environment (e.g. a failure of a monitoring instrument does not necessarily mean that the incinerator or abatement plant is malfunctioning). This analysis assumes that any failure of any equipment results in all the negative impacts set out above occurring simultaneously.

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

| Pollutant | ES | | Back-ground | Process Contribution (PC) | | Predicted Environmental Concentration (PEC) | |
|---|---|---|---|---|---|---|---|
| | µg/m³ | Reference period | µg/m³ | µg/m³ | % of EAL | µg/m³ | % of EAL |
| $NO_2$ | 200 | 99.79th %ile of 1-hour means | 24.28 | 59.6 | 29.8 | 83.88 | 41.9 |
| $PM_{10}$ | 50 | 90.41st %ile of 24-hour means | 33.07 | 0.26 | 0.52 | 33.33 | 66.7 |
| | 266 | 99.9th %ile of 15-min means | 3.01 | 59.11 | 22.2 | 62.12 | 23.4 |
| | 350 | 99.73rd %ile of 1-hour means | 3.25 | 52.71 | 15.06 | 55.96 | 16.0 |
| $SO_2$ | 125 | 99.18th %ile of 24-hour means | 3.25 | 25.28 | 20.22 | 28.53 | 22.8 |
| HCl | 750 | 1-hour average | 0.21 | 370.14 | 49.352 | 370.4 | 49.38 |
| HF | 160 | 1-hour average | 6 | 18.51 | 11.56875 | 24.51 | 15.3 |
| **Pollutant** | **ES** | | **Back-ground** | **Process Contribution (PC)** | | **Predicted Environmental Concentration (PEC)** | |
| | **ng/m3** | **Reference period** | **ng/m3** | **ng/m3** | **% of EAL** | **ng/m3** | **% of EAL** |
| Cd | 1500 | 1-hr average | 0.20 | 30.8 | 2.05 | 31.00 | 2.067 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Hg | 7500 | 1-hr average | 0.10 | 30.8 | 0.41 | 30.90 | 0.412 |
| Sb | 150000 | 1-hr average | 0.10 | 0.5 | 0.0003 | 0.60 | 0.0004 |
| As | 15000 | 1-hr average | 1.10 | 1.1 | 0.01 | 2.20 | 0.015 |
| Cr (II)(III) | 150000 | 1-hr average | 0.90 | 4.2 | 0.00 | 5.10 | 0.0034 |
| Cu | 200000 | 1-hr average | 2.90 | 0.3 | 0.00 | 3.20 | 0.002 |
| Mn | 1500000 | 1-hr average | 4.70 | 2.3 | 0.00 | 7.00 | 0.0005 |
| Ni | 30000 | 1-hr average | 1.00 | 2.7 | 0.01 | 3.70 | 0.0123 |
| V | 1000 | 1-hr average | 2.00 | 10 | 1.00 | 12.00 | 1.2000 |
| PCBs | 6000 | 1-hr average | 8.70E-09 | 1.20E-09 | 0.00 | 0.00 | 0.00 |

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

- All metals
- PCBs

Also, from the table above emissions of the following emissions (which were not screened out as insignificant) have been assessed as being unlikely to give rise to significant pollution in that the predicted environmental concentration is less than 100% of short-term ES:

- $NO_2$
- $PM_{10}$
- $SO_2$
- HCl
- HF

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

We have not assessed the impact of abnormal operations against long term ESs for the reasons set out above. Except that if dioxin emissions were at 10 ng/$m^3$ for the maximum period of abnormal operation, this would result in an

increase of approximately 68% in the TDI reported in section 5.3.3. In these circumstances the TDI would be as follows:

| Receptor | Adult (pg I-TEQ kg-BW$^{-1}$d$^{-1}$) | Adult (%age TDI) | Child (pg I-TEQ kg-BW$^{-1}$d$^{-1}$) | Child (%age TDI) |
|---|---|---|---|---|
| Farmer South-west 2 | 0.047 | 2.4% | 0.069 | 3.4% |
| Resident Maximum 2 | 0.073 | 3.7% | 0.220 | 11.0% |

At this level, emissions of dioxins will still not pose a risk to human health.

## 5.6 Other Emissions

### 5.6.1 Odour

Based upon the information in the Application we are satisfied that the appropriate measures will be in place to prevent or where that is not practicable to minimise odour and to prevent pollution from odour. Pre-Operational Condition PO10 requires the Operator to provide an updated OMP for approval upon completion of the final design.

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. Acceptance procedures are in place to ensure odorous waste is preferentially submitted to the combustion process. If extremely malodorous wastes are received, this will be reported to the waste supplier to ensure future compliance. Drivers are encouraged to report concerns, however primary responsibility for identifying issues remains with the applicant's operatives. The site operates on a first-in-first-out basis, which will minimise odours from the waste.

A fast-acting 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.

During shut-down the Applicant proposed to extract air via an alternative system comprising of a shutdown fan maintaining negative pressure, with air passing through dust filters and activated carbon filters before being emitted. Improvement condition IC8 requires the operator to demonstrate that negative pressure will be maintained by the system during commissioning.

For planned shutdowns under seven days, the Applicant proposed controlling odour with neutralisation sprays, instead of using activated carbon filters. This alone was not considered BAT for this Installation. Therefore, the Applicant has agreed to utilise activated carbon filters any time both lines are shutdown. The above measures are in line with BAT Conclusion 21.

### 5.6.2 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 Application modelled predicted specific sound levels from the proposed facility using measured data from previous similar projects, in addition to manufacturer's data and guideline values in BS 5228-1:2009. We have set pre-operational condition PO9 requiring the Operator to produce an updated Noise Impact Assessment (NIA), noise model and Noise Management Plan (NMP) upon completion of detailed design for approval by the Environment Agency. We have set PO9 in order to confirm that the predictions and assumptions relating to noise impacts in the Application reflect the actual impacts resulting from the final detailed design of the Installation, as these may be subject to minor changes during the final design stage. We require the following information to be included in the updated NIA / NMP at a minimum:

- a reference for each sound source associated with the detailed design, i.e., each sound power level or internal reverberant sound pressure level.
- clarification whether the above reference data has been derived from a site measurement or manufacturer's data. If the data has been sourced from manufacturer's data, the name of the referenced unit/product is to be provided. If the data has been sourced from a site measurement, measured sound pressure level, measurement distance from the acoustic centre of the source and any other relevant notes should be included.
- Details of the construction and acoustic performance (for example in terms of octaves band insertion loss in dB) for proposed acoustic attenuators, in particular the attenuators mentioned for the chimney outlets and turbine venting outlet(s).
- Operational procedure(s) relating to the management and maintenance of the off-site acoustic barrier.

The Applicant has proposed to construct an acoustic barrier outside of the Installation boundary in order to mitigate the predicted significant adverse noise impacts associated with both on-site noise and road traffic which would otherwise be predicted at the property at 10 New Bridge Lane (Receptor R3).

The proposed barrier consists of a 3m high acoustic fence with automated doors to the northeastern and northwestern boundary of the residence at 10 New Bridge Lane. The fence will have no gaps (apart from a small gap below the automated doors) and have a minimum surface density of 20kg/$m^2$. This exceeds the minimum surface density requirement of 10kg/$m^2$ recommended in ISO 9613-2:1996. This is considered an effective form of mitigation to attenuate contributions from site traffic and onsite operational noise sources within the proposed site boundary. It will have an additional benefit of attenuating noise from HGV traffic that will pass the property on the public road New Bridge Lane, which will be used to access and exit the site. Road traffic noise from site traffic on public roads is not assessed within the Application for the environmental permit as this is not an emission from the Installation and so is not regulated by the Environment Agency.

We are satisfied that the conditions of the draft Development Consent Order provided to the Environment Agency afford the Applicant sufficient operational control over the land on which the acoustic barrier is proposed to be constructed, in order to allow suitable access to undertake any necessary construction, inspection and maintenance of the barrier. We have set pre-operational condition PO9 requiring the Applicant to provide, amongst other things, operational procedure(s) relating to the management and maintenance of the off-site acoustic barrier. This is to provide confirmation that procedures will be in place to ensure the mitigation remains effective. We have set pre-operational condition PO12 requiring the Operator to submit a copy of the final Development Consent Order to the Environment Agency prior to commencement of commissioning to verify that they have the right to construct and maintain the barrier.

# 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:

- $NO_2$
- $SO_2$
- TOC
- PAHs
- Cadmium

- 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

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

The BREF states that Municipal Waste can be incinerated in traveling grates, rotary kilns and fluidised bed technology. Fluidised bed technology requires MSW to be of a certain particle size range, which usually requires some degree of pre-treatment even when the waste is collected separately.

The BREF describes other process such as gasification and pyrolysis. The BREF notes that some of the processes have encountered technical and economic problems when scaled up to commercial, industrial sizes. Some are

used on a commercial basis in Japan and are being tested in demonstration plants in Europe but still only have a small share of overall capacity.

Section 4.3 of the BREF provides a comparison of combustion and thermal treatment technologies, used in Europe and factors affecting their applicability and operational suitability for various waste types. There is also some information on the comparative costs. The table below has been extracted from the BREF tables. This table is also in line with the Guidance Note "The Incineration of Waste (EPR 5.01)). However, it should not be taken as an exhaustive list nor that all technologies listed have found equal application across Europe.

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

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

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

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

| Technique | Key waste characteristics and suitability | Throughput per line | Advantages | Disadvantages / Limitations of use | Bottom Ash Quality | Cost |
|---|---|---|---|---|---|---|
| Rotary Kiln | Can accept liquids and pastes as well as gases<br><br>Solid feeds more limited than grate (due to refractory damage)<br><br>often applied to hazardous Wastes | <16 t/h | • Very well proven<br>• Broad range of wastes<br>• Good burn out even of HW | Throughputs lower than grates | TOC <3 % | Higher specific cost due to reduced capacity |
| Fluid bed - bubbling | • Wide range of CV (5-25 MJ/kg)<br>• Only finely divided<br>• consistent wastes.<br>• Limited use for raw MSW<br>• Often applied to sludges co fired with RDF, shredded MSW, sludges, poultry manure | Up to 25 t/h | • Good mixing<br>• Fly ashes of good leaching quality | • Careful operation required to avoid clogging bed.<br>• Higher fly ash quantities. | TOC <1% | FGT cost may be lower.<br><br>Costs of waste preparation |
| Fluid bed - circulating | • Wide range of CV (6-25 MJ/kg)<br>• Only finely divided consistent wastes.<br>• Limited use for raw MSW<br>• Often applied to sludges co-fired with RDF, coal, wood waste | Up 70 70 t/h | • Good mixing<br>• High steam parameters up to 500oC<br>• Greater fuel flexibility than BFB<br>• Fly ashes of good leaching quality | • Cyclone required to conserve bed material<br>• Higher fly ash quantities | TOC <1% | • FGT cost may be lower.<br>• Costs of waste preparation |

| Technique | Key waste characteristics and suitability | Throughput per line | Advantages | Disadvantages / Limitations of use | Bottom Ash Quality | Cost |
|---|---|---|---|---|---|---|
| Spreader - stoker combustor | • RDF and other particle feeds<br>• Poultry manure<br>• Wood wastes | No information | • Simple grate construction<br>• Less sensitive to particle size than FB | Only for well defined mono-streams | No information | No information |
| Gasification - fixed bed | • Mixed plastic wastes<br>• Other similar consistent streams<br>• Gasification less widely used/proven than incineration | Up to 20 t/h | • Low leaching residue<br>• Good burnout if oxygen blown<br>• Syngas available<br>• Reduced oxidation of recyclable metals | • Limited waste feed<br>• Not full combustion<br>• High skill level<br>• Tar in raw gas<br>• Less widely proven | • Low leaching bottom ash<br>• Good burnout with oxygen | High operating/ maintenance costs |
| Gasification - entrained flow | • Mixed plastic wastes<br>• Other similar consistent streams<br>• Not suited to untreated MSW<br>• Gasification less widely used/proven than incineration | Up to 10 t/h | • Low leaching slag<br>• Reduced oxidation of recyclable metals | • Limited waste feed<br>• Not full combustion<br>• High skill level<br>• Less widely proven | low leaching slag | • High operation/ maintenance costs<br>• High pre-treatment costs |
| Gasification - fluidised bed | • Mixed plastic wastes<br>• Shredded MSW<br>• Shredder residues<br>• Sludges<br>• Metal rich wastes<br>• Other similar consistent streams<br>• Gasification less widely used/proven than incineration | 5 – 20 t/h | • Can use low reactor temperatures e.g. for Al recovery<br>• Separation of main non combustibles<br>• Can be combined with ash melting<br>• Reduced oxidation of recyclable metals | • Limited waste size (<30cm)<br>• Tar in raw gas<br>• Higher UHV raw gas<br>• Less widely proven | If combined with ash melting chamber ash is vitrified | Lower than other gasifiers |

| Technique | Key waste characteristics and suitability | Throughput per line | Advantages | Disadvantages / Limitations of use | Bottom Ash Quality | Cost |
|---|---|---|---|---|---|---|
| Pyrolysis | • Pre-treated MSW<br>• High metal inert streams<br>• Shredder residues/plastics<br>• Pyrolysis is less widely used/proven than incineration | ~ 5 t/h (short drum)<br>5 – 10 t/h (medium drum) | • No oxidation of metals<br>• No combustion energy for metals/inert<br>• In reactor acid neutralisation possible<br>• Syngas available | • Limited wastes<br>• Process control and engineering critical<br>• High skill level<br>• Not widely proven<br>• Need market for syngas | • Dependent on process temperature<br>• Residue produced requires further processing and sometimes combustion | High pre-treatment, operation and capital costs |

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

- Moving Grate Furnace
- Rotary Kiln
- Fluidised Bed
- Pyrolysis / Gasification

The Applicant carried out an assessment of all the above options for furnace types. Below is a summary of those assessments.

- Moving Grate Furnace: - This is a common form of mass waste combustion that primarily handles municipal waste but can be adapted to accept sewage or clinical waste. It is common for the grate to comprise reciprocating bars or other means to ensure agitation of the waste; this ensures an efficient breakup of the waste as combustion takes place. Grates are typically cooled using air or water. Ash falls off the end of the grate into a collection area, commonly filled with water to quench the bottom ash. Large capacity range >25t/h. This method is in line with BREF as shown above and can meet relevant BAT-AELs.

- Rotary Kiln: - Waste and the required fuel and air are fed into a rotating drum (kiln). The agitation of the waste allows for good combustion of the material and allows the operator to adjust the residence time of the waste. The drum is usually refractory lined allowing for the burning of waste at higher temperatures, making it suitable for almost any type or composition of waste. However, the capacity range is small <10t/h.

- Fluidised Bed: - A fluidised bed waste incinerator operates by feeding waste material into the bottom of a combustion chamber where a bed of fluidised sand particles sits. Air is forced through these sand particles, causing movement and fluidising the bed. This method is easier to control pollutants influenced by combustion conditions, particularly NOx formation. However, due to the waste being combusted in a fluidised bed of sand, it requires small (<50mm) homogenous waste types and pre-processing is normally always required. Medium capacity range 10-25t/h.

- Pyrolysis / Gasification: - This method has been assessed and ruled out due to capacity, typically no more than 20t/h and well-documented construction and/or operational issues with many of these types of plant that have significantly affected availability and/or resulted in permits being revoked, cited in *Medworth EfW CHP Facility BAT Assessment* at section 2.2.

The Applicant has proposed to use a furnace technology comprising moving grate furnace*,* with a closed-circuit dry cooling system with a high temperature secondary combustion zone with multiple injection points of secondary combustion air. All of these are identified in the tables above as being considered BAT in the BREF for this type of waste feed.

The Applicant proposes to use 0.1wt% low sulphur gas oil (or similar alternative) as support fuel for start-up, shut down and for the auxiliary burners. The choice of support fuel is based on alternatives of liquified petroleum gas (LPG), and natural gas ruled out as being a fire/explosion risk and supply being dependant on third parties. The gas oil will be stored in tanks with a combined capacity of 250m$^3$ and will have appropriate containment systems in place as per CIRIA C736, as indicative BAT 1 & 2 requires for energy efficiency. Indicative BAT 50 for emissions to air states that natural gas will be the preferred option. If natural gas is not available, low sulphur gas oil provides an alternative. Based on this assessment the Applicant's choice of fuel is acceptable.

Boiler Design

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

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

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

## 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<br>Higher energy use than ESP<br>Sensitive to condensation and corrosion | Multiple compartments<br><br>Bag burst detectors | Most plants |
| **Wet scrubbing** | May reduce acid gases simultaneously. | Not normally BAT.<br><br>Liquid effluent produced | Require reheat to prevent visible plume and dew point problems. | Where scrubbing required for other pollutants |
| **Ceramic filters** | High temperature applications<br><br>Smaller plant. | May “blind” more than fabric filters | | Small plant.<br><br>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°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. Table 5-2 of Supplementary Information Report states fabric filter is to be the main emission control technique for particulate matter. Differential pressure monitors will be installed on the fabric filter unit, Table 5-3 Indicative BAT 4.

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.<br><br>May increase overall energy recovery | Some applications experience corrosion problems.<br><br>Can result in elevated CO and other products of | | Justify if not used |

| | | | | |
|---|---|---|---|---|
| | | incomplete combustion | | |

| **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/ $m^3$<br><br>Reduces CO, VOC, dioxins | Expensive.<br><br>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.<br><br>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<br><br>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<br><br>Lower nitrous oxide formation<br><br>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 NOx burners – this technique reduces NOx 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 has not been selected. This technique reduces the consumption of reagents for secondary $NO_x$ control and can increase overall energy recovery, although in some applications there can be corrosion problems. Flue gas recirculation can reduce NOx formation between 10%-20% but the increased costs of maintenance due to corrosion have been highlighted as mitigation for not using FGR. The Applicant has proposed that the BAT-AELs can be met through SNCR alone (Appendix 4, BAT Assessment, p24).

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 $^oC$ and sufficient retention time for reduction. SNCR is more likely to have higher levels of ammonia slip. The technique can be applied to all plant unless lower $NO_x$ releases are required for local environmental protection. Urea or ammonia can be used as the reagent with either technique, urea is somewhat easier to handle than ammonia and has a wider operating temperature window, but tends to result in higher emissions of $N_2O$. Both reagents are BAT, and the use of one over the other is not normally significant in environmental terms.

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

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

| | Cost of $NO_x$ removal £/tonne | PC (long term) | PEC (long term) |
|---|---|---|---|
| SCR | £1,979 | 0.32 µg/m$^3$ | 32.05 µg/m$^3$ |
| SNCR | £841 | 0.78 µg/m$^3$ | 32.28 µg/m$^3$ |

Based on the figures above the Applicant considers that the additional cost of SCR over SNCR is not justified by the reduction in environmental impact. Thus SCR is not BAT in this case, and SNCR is BAT for the Installation. The Applicant has justified the use of urea as the reagent on the basis of SNCR operates within a much higher, specific temperature band. This is reduced if ammonia is used as a reagent. We agree with this assessment.

The amount of urea / ammonia used for $NO_x$ abatement will need to be optimised to maximise $NO_x$ reduction and minimise $NH_3$ slip. Improvement condition IC5 requires the Operator to report to the Environment Agency on optimising the performance of the $NO_x$ abatement system. The BAT AEL for ammonia has been set and the Operator is also required to continuously monitor and report on $N_2O$ emissions quarterly.

### 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 gas oil 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<br><br>Low solid residues production<br><br>Reagent delivery may be optimised by | Large effluent disposal and water consumption if not fully treated for re-cycle<br><br>Effluent treatment plant required | - | Used for wide range of waste types<br><br>Can be used as polishing step after other technique |

| | | | | |
|---|---|---|---|---|
| | concentration and flow rate | May result in wet plume<br><br>Energy required for effluent treatment and plume reheat | | s where emissions are high or variable |
| **Dry** | Low water use<br><br>Higher reagent consumption to achieve emissions of other FGC techniques but may be reduced by recycling in plant<br><br>Lower energy use<br><br>Higher reliability<br><br>Lowest visible plume potential | Higher solid residue production<br><br>Reagent consumption controlled only by input rate | - | All plant |
| **Semi-dry (also described as semi-wet in the Bref)** | Medium reaction rates<br><br>Reagent delivery may be varied by concentration and input rate | Higher solid waste residues than wet but lower than dry system | - | All plant |
| **Direct injection into boiler** | Reduced acid loading to subsequent cleaning stages. | - | - | Generally applicable to grate and rotary kiln plants. |

| | | | | |
|---|---|---|---|---|
| | Reduced peak emissions and reduced reagent usage | | | |
| **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<br><br>Low solid waste production | Corrosive material<br><br>ETP sludge for disposal | - | HWIs |
| **Reagent Type: Lime** | Very good removal rates<br><br>Low leaching solid residue<br><br>Temperature of reaction well suited to use with bag filters | Corrosive material<br><br>May give greater residue volume if no in-plant recycle | Wide range of uses | MWIs, CWIs |
| **Reagent Type: Sodium Bicarbonate** | Good removal rates<br><br>Easiest to handle<br><br>Dry recycle systems proven | Efficient temperature range may be at upper end for use with bag filters<br><br>Leachable solid residues | Not proven at large plant | CWIs |

| | | | | |
|---|---|---|---|---|
| | | Bicarbonate more expensive | | |

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 alternatives of liquified petroleum gas (LPG), and natural gas ruled out as being a fire/explosion risk and supply being dependant on 3rd parties. The gas oil will be stored in tanks with a combined capacity of 250m3 and will have appropriate containment systems in place as per CIRIA C736. Indicative BAT 1 & 2 requirements for energy efficiency. Indicative BAT 50 for emissions to air states that natural gas will be the preferred option. If natural gas is not available, low sulphur gas oil provides an alternative, 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 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 hydrated lime. We are satisfied that this is BAT.

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

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

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

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

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

| | | | | |
|---|---|---|---|---|
| | mercury is also absorbed. | | | 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.

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

6.2.6 Metals

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

| | | | | |
|---|---|---|---|---|
| | with bromine or sulphur to enhance reactivity, for use during peak emissions. | | | 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.

The Applicant has justified combined feed on the ground that dosing rates will initially be set on the CEMS volumetric flow rate and optimised as part of commissioning trials. Hydrated lime will be varied on an automated system while activated carbon dose will be based on the flue gas volume, 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 Applicant's assessment shows that the difference in GWP between the best option in terms of GWP and the Applicant's preferred option is minor. The purpose of a BAT appraisal is to determine which option minimises the impact on the environment as a whole. In this context the small benefit in terms of GWP of the other options is considered to be more than offset by the other benefits of the preferred option.

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

There will be no process emissions to water from the Installation.

Uncontaminated surface run-off from the non-operational area (administrative building and staff car park) will leave the site via emission point W2, into a HWIDB drain.

Uncontaminated surface run-off from buildings and areas of hardstanding within the site's operational area will be collected in a Sustainable Drainage System (SuDS). Run-off will pass through a Class-1 oil interceptor and into a geocellular attenuation tank, before being discharged to a HWIDB drain via detention basins and a swale at emission point W1.

In the event of an emergency which results in fire water entering the drainage system, attenuation tanks can be isolated, and the water tested before discharge to HIWDB drains or the contents being pumped to a tanker for off-site treatment. Geocellular tank volumes are designed to accommodate a predicted 2050 climate change rainfall event.

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

### 6.5.2 Emissions to sewer

There will be no process emissions to sewer from the Installation during normal operation. The EfW CHP facility is designed to have zero-process effluent emitted, with all process effluents being reused for bottom ash quenching.

Infrequently, during certain maintenance activities, the process water system will reach capacity and there will be an excess of process effluent generated. The Applicant has confirmed that no harmful or specific substances will be emitted. The effluent will be neutralised and tested before discharging to sewer, to ensure compliance with the Anglian Water trade effluent discharge consent.

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

### 6.5.3 Fugitive emissions

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

Waste will be delivered to site in enclosed or covered vehicles; it is deposited and stored in a watertight concrete bunker to ensure no releases to groundwater. The bunker is designed to achieve a minimum class 2 tightness in accordance with BS EN 1992-3 requirements and will be subject to integrity tests during commissioning.

Negative pressure will be maintained within the tipping hall to prevent fugitive emissions of odour and particulates, with air being drawn through the furnace for combustion. When both incineration lines are shutdown, negative pressure will be maintained by a shutdown fan, with air passing through dust and carbon filters before release to atmosphere.

All potentially polluting liquids will be provided with impermeable secondary containment. Routine maintenance procedures include regular checks of hardstanding and bunding to ensure spills are contained. Bunding capacities will be in line with CIRIA C736 requirements, requiring the capacity to be the greater of:

1) 110% of the capacity of the largest tank within the bund
2) 25% of the total capacity of all the tanks within the bund, except where tanks are hydraulically linked in which case they should be treated as if they were a single tank

All filling and emptying points will be located within the bund to reduce risk of accidental emissions. Tanks for urea and gas oil, and silos for hydrated lime and activated carbon will have high level alarms to prevent spills from overfilling. Spillage containment and management procedures are followed in the case of any spill on site.

Tertiary containment is provided through the Sustainable Drainage System (SuDS) design. Firewater would be contained, as operational areas of the site drain into attenuation tanks which can be isolated when contamination is suspected.

Process effluent will be used for ash quenching, rendering the IBA less mobile. It is stored inside and transported off-site in covered trucks. APCr is loaded onto enclosed delivery vehicles via a sealed connection. Fugitive particulate releases from IBA and APCr are mitigated by measures in place.

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

## 6.6 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 location when assessing BAT, including proximity of human and ecological receptors, and the three declared AQMAs in Wisbech. We are satisfied that the BAT measures described will ensure a high level of protection for the environment and human health.

(ii) National and European ESs

We have assessed emissions against National and European environmental quality standards, determining that the Installation can comply without requiring stricter conditions than BAT.

(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 / recovery of energy from waste. Controls in the form of restrictions on the volume and type of waste that can be accepted at the Installation and Permit conditions relating to energy efficiency effectively apply equivalent technical measures to limit $CO_2$ emissions.

(iv) Commissioning

We have set pre-operational condition PO3 for the Operator to produce a commissioning plan. This must be reviewed and approved by the Environment Agency before commissioning can begin.

Improvement condition IC3 requires collection of data throughout the commissioning process to demonstrate that the plant performs in accordance with the Permit conditions. The Operator must demonstrate that design parameters assessed within the Application have been met.

## 6.7 Monitoring

### 6.7.1 Monitoring during normal operations

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

For emissions to air, the methods for continuous and periodic monitoring are in accordance with our guidance for monitoring of stack emissions to air.

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

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

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

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

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

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

Based on the waste types and control measures proposed in the Application we expect that emissions of dioxins will be stable, and that the mercury content of the waste will be low and stable. We have therefore set manual extractive monitoring in the Permit. However, the Permit requires the stable and low criteria to be demonstrated through Improvement Conditions IC9 and IC10 and we can require long term monitoring for dioxins and continuous monitoring for mercury if required.

### 6.8 Reporting

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

## 7 Other legal requirements

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

### 7.1 The EPR 2016 and related Directives

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

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

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

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

- Article 5 of EIA Directive relates to the obligation on developers to supply the information set out in Annex IV of the Directive when making an application for development consent.
- Article 6(1) requires Member States to ensure that the authorities likely to be concerned by a development by reason of their specific

environmental responsibilities are consulted on the Environmental Statement and the request for development consent.
- Article 6(2)-6(6) makes provision for public consultation on applications for development consent.
- Article 7 relates to projects with transboundary effects and consequential obligations to consult with affected Member States.

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

In determining the Application we have considered the following documents: -
- The Environmental Statement submitted with the planning application (which also formed part of the Environmental Permit Application).
- The response of the Environment Agency to the local planning authority in its role as consultee to the planning process.

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

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

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

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

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

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

We must also exercise our relevant functions for the purposes of implementing Article 13 of the Waste Framework Directive; ensuring that the requirements in

the second paragraph of Article 23(1) of the Waste Framework Directive are met; and ensuring compliance with Articles 18(2)(b), 18(2)(c), 23(3), 23(4) and 35(1) of the Waste Framework Directive.

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

Article 23(1) requires the permit to specify:

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

These are all covered by permit conditions.

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

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

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

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

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

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

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

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

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

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

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

## 7.2 National primary legislation

### 7.2.1 **Environment Act 1995**

(i) Section 4 (Pursuit of Sustainable Development)

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

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

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

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

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

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

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

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

(iv) Section 6(6) (Fisheries)

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

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

(v) Section 7 (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.

(vi) Section 39 (Costs and Benefits)

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

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

(viii) Section 81 (National Air Quality Strategy)

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

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 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.

There are no Sites of Special Scientific Interest (SSSI) within 2 km of the installation

### 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.

### 7.2.8 **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.

### 7.2.9 **National Parks and Access to the Countryside Act 1949**

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

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

## 7.3 National secondary legislation

### 7.3.1 Conservation of Habitats and Species Regulations 2017

We have assessed the Application in accordance with our guidance and concluded that there will be no likely significant effects on any European Site.

The Habitats Regulations Assessment is summarised in greater detail in section 5.4 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, and that it will not compromise the ability of this water body to achieve good status by 2027.

### 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 EP Regulations, and our statutory Public Participation Statement, which implement the requirements of the Public Participation Directive. In addition to meeting our consultation responsibilities, we have also taken account of our guidance in Environment Agency Guidance Note RGS6.

# 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 3.6.4 and Tables S3.1, S3.1(a), S3.3 and S3.4 in Schedule 3 of the Permit. |
| 45(1)(f) | The permit shall include the maximum permissible period of unavoidable stoppages, disturbances or failures of the purification devices or the measurement devices, during which the emissions into the air and the discharges of waste water may exceed the prescribed emission limit values. | Conditions 2.3.12 and 2.3.13. |
| 45(2)(a) | The permit shall include a list of the quantities of the different categories of hazardous waste which may be treated. | Not applicable |
| 45(2)(b) | The permit shall include the minimum and maximum mass | Not applicable |

| IED Article | Requirement | Delivered by |
|---|---|---|
| | flows of those hazardous waste, their lowest and maximum calorific values and the maximum contents of polychlorinated biphenyls, pentachlorophenol, chlorine, fluorine, sulphur, heavy metals and other polluting substances. | |
| 46(1) | Waste gases shall be discharged in a controlled way by means of a stack the height of which is calculated in such a way as to safeguard human health and the environment. | Condition 2.3.1 and Table S1.2 of Schedule 1 of the Permit. |
| 46(2) | Emission into air shall not exceed the emission limit values set out in part 3 of Annex VI. | Conditions 3.1.1 and 3.1.2 and Tables S3.1, S3.1a. |
| 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.<br>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.<br>Limits on dust (150 mg/m3), CO and TOC not to be exceeded during this period. | Conditions 2.3.12 and 2.3.13. |

| IED Article | Requirement | Delivered by |
|---|---|---|
| 47 | In the event of breakdown, reduce or close down operations as soon as practicable.<br>Limits on dust (150 mg/m3), CO and TOC not to be exceeded during this period. | Condition 2.3.11 |
| 48(1) | Monitoring of emissions is carried out in accordance with Parts 6 and 7 of Annex VI. | Conditions 3.6.1 to 3.6.4, 3.2.1, 3.2.2, tables S3.1, S3.1(a). Reference conditions are defined in Schedule 6 of the Permit. |
| 48(2) | Installation and functioning of the automated measurement systems shall be subject to control and to annual surveillance tests as set out in point 1 of Part 6 of Annex VI. | Conditions 3.6.1, 3.6.3, table S3.1, S3.1(a), and S3.4 |
| 48(3) | The competent authority shall determine the location of sampling or measurement points to be used for monitoring of emissions. | Conditions 3.6.1. Pre-operational condition PO7 |
| 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 S3.5 |
| 50(2) | Flue gas to be raised to a temperature of 850ºC for two seconds, as measured at representative point of the combustion chamber. | Condition 2.3.9, Pre-operational conditions PO5 and PO8 and Improvement condition IC4 and Table S3.4. |
| 50(3) | At least one auxiliary burner which must not be fed with fuels which can cause higher emissions than | Condition 2.3.14 |

| IED Article | Requirement | Delivered by |
|---|---|---|
| | those resulting from the burning of gas oil liquefied gas or natural gas. | |
| 50(4)(a) | Automatic shut-down to prevent waste feed if at start up until the specified temperature has been reached. | Condition 2.3.9 |
| 50(4)(b) | Automatic shut-down to prevent waste feed if the combustion temperature is not maintained. | Condition 2.3.9 |
| 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 2.3.9 and 2.3.12 |
| 50(5) | Any heat generated from the process shall be recovered as far as practicable. | (a) The plant will generate electricity (b)Operator to review the available heat recovery options prior to commissioning and then every 4 years (Conditions 1.2.1 and 1.2.2) |
| 50(6) | Relates to the feeding of infectious clinical waste into the furnace. | Not applicable - no infectious clinical waste will be burnt |
| 50(7) | Management of the Installation to be in the hands of a natural person who is competent to manage it. | Conditions 1.1.1 to 1.1.3 and 2.3.1 of the Permit. |
| 51(1) | Different conditions than those laid down in Article 50(1), (2) and (3) and, as regards the temperature Article 50(4) may be authorised, provided the other requirements of this chapter are me. | No such conditions Have been allowed |
| 51(2) | Changes in operating conditions do not cause more residues or residues with a higher content of organic polluting substances compared to those residues which could be expected under the conditions laid down in Articles 50(1), (2) and (3). | No such conditions Have been allowed |
| 51(3) | Changes in operating conditions shall include emission limit values for CO and TOC set out in Part 3 of Annex VI. | No such conditions Have been allowed |

| IED Article | Requirement | Delivered by |
|---|---|---|
| 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. |
| 52(3) | Prior to accepting hazardous waste, the operator shall collect available information about the waste for the purpose of compliance with the permit requirements specified in Article 45(2). | Not applicable |
| 52(4) | Prior to accepting hazardous waste, the operator shall carry out the procedures set out in Article 52(4). | Not applicable |
| 52(5) | Granting of exemptions from Article 52(2), (3) and (4). | Not applicable |
| 53(1) | Residues to be minimised in their amount and harmfulness, and recycled where appropriate. | Conditions 1.4.1, 1.4.2 and 3.6.1 with Table S3.5 |
| 53(2) | Prevent dispersal of dry residues and dust during transport and storage. | Conditions 1.4.1 2.3.1, 2.3.2 and 3.3.1. |
| 53(3) | Test residues for their physical and chemical characteristics and polluting potential including heavy metal content (soluble fraction). | Condition 3.6.1 and Table S3.5 and pre-operational condition PO2. |
| 55(1) | Application, decision and permit to be publicly available. | All documents are accessible from the Environment Agency Public Register. |
| 55(2) | An annual report on plant operation and monitoring for all plants burning more than 2 tonne/hour waste. | Condition 4.2.2 and 4.2.3. |

## Annex 1B: Compliance with Bat Conclusions

| BAT conclusion | Criteria | Delivered by |
|---|---|---|
| 1 | Implement environmental management system | Condition 1.1 and Pre-operational condition PO1 |
| 2 | Determine gross electrical efficiency | Section 4.3.7 of this decision document.<br><br>Permit table S4.3 |
| 3 | Monitor key process parameters | Condition 3.6.1 and table S3.4 |
| 4 | Monitoring emissions to air | Condition 3.6.1 and table S3.1 |
| 5 | Monitoring emissions to air during OTNOC | Condition 1.1.1 and pre-operational condition PO1 |
| 6 | Monitoring emissions to water from flue gas treatment and/or bottom ash treatment | There are no such emissions from the installation. |
| 7 | Monitor unburnt substances in slags and bottom ashes | Conditions 3.1.3 and 3.6.1, and table S3.5 |
| 8 | Analysis of hazardous waste | Not applicable |
| 9 | Waste stream management techniques | The Application explains the measures that will be used. Permit condition 2.3.1, table S1.2 and pre-operational condition PO5 |
| 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 and pre-operational condition PO5 |
| 12 | Reception, handling and storage of waste | Measures are described in the Application and FPP. Permit conditions 2.3.1, table S1.2 and Condition 3.8.1 |
| 13 | Storage and handling of clinical waste | Not applicable |
| 14 | Improve overall performance of plant including BAT-AELs for TOC or LOI | Techniques described in the Application. Permit condition 2.3.1, table S1.2, 3.1.3, 3.6.1 and table S3.1 |

| 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 | Pre-operational condition PO1 |
| 19 | Use of heat recovery boiler | Described in the Application. Permit condition 2.3.1, table S1.2 |
| 20 | Measures to increase energy efficiency and BAT AEEL | Measures described in the Application. Permit condition 2.3.1, table S1.2<br>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.<br>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.<br>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 |

| BAT conclusion | Criteria | Delivered by |
|---|---|---|
| 26 | Techniques and BAT AEL for dust emissions from enclosed slags and ashes treatment | Not applicable |
| 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<br>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.<br>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.<br>Section 5.2 of this decision document.<br>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.<br>Section 5.2 of this decision document.<br>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.<br>Section 5.2 of this decision document.<br>Permit conditions 2.3.1, table S1.2. Permit conditions 3.1.1 and 3.1.2 and table S3.1 |
| 32 | Segregate waste water streams to prevent contamination | Measures described in the Application<br>Sections 4.2.2, 6.5.1 and 6.5.3 of this decision document.<br>Permit conditions 2.3.1, 3.1.1, 3.1.2 and tables S1.2 and S3.2 |

| BAT conclusion | Criteria | Delivered by |
|---|---|---|
| 33 | Techniques to reduce water usage and prevent or reduce waste water | Measures described in the Application.<br>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 |
| 35 | Handle and treat bottom ashes separately from FGC residues | Permit condition 2.3.1 |
| 36 | Techniques for treatment of slags and bottom ashes | No treatment carried out on site<br><br>Permit conditions 2.3.1, table S1.2 |
| 37 | Techniques to prevent or reduce noise emissions. | Measures are described in the Application.<br>Section 6.5.5 of this decision document. Permit conditions 2.3.1, table S1.2, 3.5.1, 3.5.2 |

## Annex 2: Pre-Operational Conditions

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

| **Table S1.4 Pre-operational measures** | |
|---|---|
| **Reference** | **Pre-operational measures** |
| **PO1** | Prior to the commencement of commissioning, the Operator shall send a summary of the site Environment Management System (EMS) to the Environment Agency and obtain the Environment Agency's written approval to the EMS summary.<br><br>The summary shall include a copy of the full other than normal operating conditions (OTNOC) management plan which shall be prepared in accordance with BAT 18 of the BAT conclusions and include:<br>• a list of potential OTNOC situations that are considered to be abnormal operation under the definition in Schedule 6 of this permit.<br>• a definition of start-up and shut-down conditions having regard to any Environment Agency guidance on start-up and shut-down.<br>• any updates on the design of critical equipment to minimise OTNOC since the permit application.<br><br>The Operator shall make available for inspection all documents and procedures which form part of the EMS. The EMS shall be developed in line with the requirements set out in Environment Agency web guide on developing a management system for environmental permits (found on www.gov.uk) and BAT 1 of the incineration BAT conclusions. The EMS shall include the approved OTNOC management plan.<br><br>The documents and procedures set out in the EMS shall form the written management system referenced in condition 1.1.1 (a) of the permit. |
| **PO2** | Prior to the commencement of commissioning, the Operator shall submit to the Environment Agency, and obtain the Environment Agency's written approval to it, a protocol for the sampling and testing of incinerator bottom ash for the purposes of assessing its hazard status. Sampling and testing shall be carried out in accordance with the protocol as approved. |

| Table S1.4 Pre-operational measures | |
|---|---|
| **Reference** | **Pre-operational measures** |
| **PO3** | Prior to the commencement of commissioning, the Operator shall submit to the Environment Agency, and obtain the Environment Agency's written approval to it, a 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. |
| **PO4** | Prior to the commencement of commissioning, the Operator shall submit a written report to the Agency, and obtain the Environment Agency's written approval to it, detailing the waste acceptance procedure to be used at the site. The waste acceptance procedure shall include the process and systems by which wastes unsuitable for incineration at the site will be controlled.<br>The procedure shall be implemented in accordance with the written approval from the Agency. |
| **PO5** | No later than one month after the final design of the furnace and combustion chamber, the operator shall submit a written report to the Environment Agency, and obtain the Environment Agency's written approval to it, of the details of the computational fluid dynamic (CFD) modelling. The report shall explain how the furnace has been designed to comply with the residence time and temperature requirements as defined by Chapter IV and Annex VI of the IED whilst operating under normal load and the most unfavourable operating conditions (including minimum turn down and overload conditions), and that the design includes sufficient monitoring ports to support subsequent validation of these requirements during commissioning. |
| **PO6** | Prior to the commencement of commissioning, the Operator shall submit a report, and obtain the Environment Agency's written approval to it, on the baseline conditions of soil and groundwater at the installation. The report shall contain the information necessary to determine the state of soil and groundwater contamination so as to make a quantified comparison with the state upon definitive cessation of activities provided for in Article 22(3) of the IED. The report shall contain information, supplementary to that already provided in application Site Condition Report, needed to meet the information requirements of Article 22(2) of the IED. |
| **PO7** | At least three months before (or other date agreed in writing with the Environment Agency) the commencement of commissioning, the Operator shall submit a written report to the Environment Agency, and obtain the Environment Agency's written approval to it, specifying arrangements for continuous and periodic monitoring of emissions to air to comply with Environment Agency guidance notes '*Monitoring stack emissions: techniques and standards for periodic monitoring'* and M20. |

| **Table S1.4 Pre-operational measures** | |
|---|---|
| **Reference** | **Pre-operational measures** |
| | • Plant and equipment details, including accreditation to MCERTS<br>• Methods and standards for sampling and analysis<br>• Details of monitoring locations, access and working platforms |
| **PO8** | At least 3 months before the commencement of commissioning (or other date agreed in writing with the Environment Agency) the Operator shall submit, for approval by the Environment Agency, a methodology (having regard to Technical Report P4-100/TR Part 2 Validation of Combustion Conditions) to verify the residence time, minimum temperature and oxygen content of the gases in the furnace whilst operating under normal load, minimum turn down and overload conditions. |
| **PO9** | Upon completion of the final design, and at least 3 months before the commencement of commissioning (or other date agreed in writing with the Environment Agency) the Operator shall submit, for approval by the Environment Agency, a revised Noise Impact Assessment (NIA), noise model and an updated Noise Management Plan (NMP) and obtain the Environment Agency's written approval to it. We require the following information to be included in the updated NIA / NMP at a minimum:<br>• A reference for each sound source associated with the detailed design, i.e., each sound power level or internal reverberant sound pressure level.<br>• Clarification whether the above reference data has been derived from a site measurement or manufacturer's data. If the data has been sourced from manufacturer's data, the name of the referenced unit/product is to be provided. If the data has been sourced from a measurement at an alternative site where an equivalent sound source is installed and operational, measured sound pressure level, measurement distance from the acoustic centre of the source and any other relevant notes should be included.<br>• Details of the construction and acoustic performance (for example in terms of octaves band insertion loss in dB) for proposed acoustic attenuators, in particular the attenuators mentioned for the chimney outlets and turbine venting outlet(s).<br>• Operational procedure(s) relating to the management and maintenance of the off-site acoustic barrier. |
| **PO10** | Upon completion of the final design, the Operator shall submit a revised odour management plan and obtain the Environment Agency's written approval to it. |
| **PO11** | Upon completion of the final design, the Operator shall submit a revised fire prevention plan and obtain the Environment Agency's written approval to it. |
| **PO12** | Prior to the commencement of commissioning, the Operator shall submit a copy of the final Development Consent Order to the Environment Agency. |

## Annex 3: Improvement Conditions

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

| **Table S1.3 Improvement programme requirements** | | |
|---|---|---|
| **Reference** | **Requirement** | **Date** |
| **IC1** | The Operator shall submit a written report to the Environment Agency on the implementation of its Environmental Management System (EMS) and the progress made in the certification of the system by an external body or if appropriate submit a schedule by which the EMS will be certified. The report shall also include details of a review of the OTNOC management plan and any updates to the plan following the review. | Within 12 months of the completion of commissioning. |
| **IC2** | The Operator shall submit a written proposal to the Environment Agency to carry out tests to determine the size distribution of the particulate matter in the exhaust gas emissions to air from emission points A1 and A2, identifying the fractions within the $PM_{10}$, and $PM_{2.5}$ ranges. On receipt of written approval from the Environment Agency to the proposal and the timetable, the Operator shall carry out the tests and submit to the Environment Agency a report on the results. | Within 6 months of the completion of commissioning. |
| **IC3** | The Operator shall submit a written report to the Environment Agency on the commissioning of the installation. The report shall summarise the environmental performance of the plant as installed against the design parameters set out in the Application. The report shall also include a review of the performance of the facility against the conditions of this permit and details of procedures developed during commissioning for achieving and demonstrating compliance with permit conditions and confirm that the Environmental Management System (EMS) has been updated accordingly. | Within 4 months of the completion of commissioning. |

| Table S1.3 Improvement programme requirements | | |
|---|---|---|
| **Reference** | **Requirement** | **Date** |
| **IC4** | The operator shall notify the Environment Agency of the proposed date(s) that validation testing is planned for. | Notification at least 3 weeks prior to validation testing. |
| | During commissioning the operator shall carry out validation testing to validate the residence time, minimum temperature and oxygen content of the gases in the furnace whilst operating under normal load and most unfavourable operating conditions. The validation shall be to the methodology as approved through pre-operational condition PO9. | Validation tests completed before the end of commissioning. |
| | The operator shall submit a written report to the Environment Agency on the validation of residence time, oxygen and temperature whilst operating under normal load, minimum turn down and overload conditions.<br>The report shall identify the process controls used to ensure residence time and temperature requirements are complied with during operation of the incineration plant. | Report submitted within 2 months of the completion of commissioning. |
| **IC5** | The Operator shall submit a written report to the Environment Agency describing the performance and optimisation of:<br>• The lime injection system for minimisation of acid gas emissions.<br>• The carbon injection system for minimisation of dioxin and heavy metal emissions.<br>• The Selective Non Catalytic Reduction (SNCR) system and combustion settings to minimise oxides of nitrogen (NOx). The report shall include an initial assessment of the level of NOx, N2O and NH3 emissions that can be achieved under optimum operating conditions. | Within 4 months of the completion of commissioning. |
| | The operator shall carry out a further assessment of the performance of the SNCR system and submit a written report to the Environment Agency on the feasibility of complying with an emission limit value (ELV) for NOx of 100 mg/Nm3 as a daily average, including a description of any relevant cross-media effects identified. If an ELV for NOx of 100 mg/Nm3 as a daily average is determined not to be feasible, | Within 12 months of the completion of commissioning. |

| Table S1.3 Improvement programme requirements | | |
|---|---|---|
| **Reference** | **Requirement** | **Date** |
| | the report shall propose an alternative ELV which would provide an equivalent level of NOx reduction on a long-term basis such as an annual mass emission limit or percentile-based ELV. | |
| **IC6** | The Operator shall submit a written summary report to the Environment Agency to confirm that the performance of Continuous Emission Monitors for parameters as specified in Table S3.1 and Table S3.1(a) complies with the requirements of EN 14181, specifically the requirements of QAL1, QAL2 and QAL3. The report shall include the results of calibration and verification testing, | Initial calibration report to be submitted to the Agency within 3 months of completion of commissioning.<br><br>Full summary evidence compliance report to be submitted within 18 months of completion of commissioning. |
| **IC7** | The operator shall submit to the Environment Agency for approval a plan for implementing the CHP scheme identified in the cost benefit analysis (dated June 2022).<br><br>The plan shall include as a minimum:<br>• A timescale for implementation<br>• A description of any dependencies or further approvals required<br>• A description of any changes that will need to be made to the plant<br>• Whether there will be any operational changes which could affect the environmental impact of the installation, such as a reduction in stack temperature<br>• Consideration of whether a permit variation will be required<br><br>If required to do so by the Environment Agency the Operator shall implement the plan in accordance with the Environment Agency's written approval. | Within 6 months of completion of commissioning or as agreed in writing with the Environment Agency. |
| **IC8** | During commissioning, the operator shall carry out tests to demonstrate whether the furnace combustion air will ensure that negative pressure is achieved throughout the reception hall. The tests shall demonstrate whether air is pulled through the reception hall and bunker area and into the furnace with dead spots minimised. The operator shall also carry out tests of methods | Within 6 months of completion of commissioning. |

| Table S1.3 Improvement programme requirements | | |
|---|---|---|
| **Reference** | **Requirement** | **Date** |
| | used to maintain negative pressure during shut-down periods to ensure that adequate extraction will be achieved. The operator shall submit a report to the Environment Agency, for approval, summarising the findings along with any proposed improvements if required. | |
| **IC9** | The operator shall carry out a programme of dioxin and dioxin like PCB monitoring over a period and frequency agreed with the Environment Agency. The operator shall submit a report to the Environment Agency with an analysis of whether dioxin emissions can be considered to be stable. | Within 6 months of completion of commissioning or as agreed in writing with the Environment Agency. |
| **IC10** | The operator shall carry out a programme of mercury monitoring over a period and frequency agreed with the Environment Agency. The operator shall submit a report to the Environment Agency with an analysis of whether the waste feed to the plant can be proven to have a low and stable mercury content. | Within 6 months of completion of commissioning or as agreed in writing with the Environment Agency. |
| **IC11** | During commissioning, the operator shall carry out tests to assess whether the air monitoring location(s) meet the requirements of BS EN 15259 and supporting Method Implementation Document (MID).<br><br>A written report shall be submitted for approval setting out the results and conclusions of the assessment including where necessary proposals for improvements to meet the requirements. The report shall specify the design of the ports for PM10 and PM2.5 sampling.<br><br>Where notified in writing by the Environment Agency that the requirements are not met, the operator shall submit proposals or further proposals for rectifying this in accordance with the time scale in the notification.<br><br>The proposals shall be implemented in accordance with the Environment Agency's written approval. | Report to be submitted to the Agency within 3 months of completion of commissioning. |

| Table S1.3 Improvement programme requirements | | |
|---|---|---|
| **Reference** | **Requirement** | **Date** |
| **IC12** | The Operator shall submit a written proposal to the Environment Agency for approval to carry out a review of the noise impact of the installation at the most sensitive receptors once the facility is fully operational in its first year of operation. The proposal shall include as a minimum a review of the appropriate measurements to verify any modelling work to establish whether any noise emissions are likely to give rise to nuisance or complaints and an action plan to be developed and agreed if significant adverse impacts are identified. | Within 6 months of completion of commissioning or as agreed in writing with the Environment Agency. |
| | The Operator shall submit a written report to the Environment Agency for approval on the findings of the review of noise impacts, including an action plan to address any significant adverse impacts where they are identified. | Report to be submitted to the Environment Agency within 12 months of 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 draft 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 via Citizen Space from 21/06/2023 to 02/08/2023 and in the Fenland Citizen on 21/06/2023. The Application was made available to view at the Environment Public Register Spalding Office.

The following statutory and non-statutory bodies were consulted:

- Local Authority Environmental Protection Department – Fenland District Council
- Anglian Water
- Food Standards Agency
- Health and Safety Executive
- Director of Public Health and UK Health Security Agency (Previously Public Health England)
- Fire & Rescue Service
- Animal and Plant Health Agency

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

| Response Received from Anglian Water | |
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| Brief summary of issues raised: | Summary of action taken / how this has been covered |
| Anglian Water have not received any contact from the operator regarding the planned discharge of trade effluent.<br><br>No comments or concerns were raised regarding water resources or any designated sites that Anglian Water have interest in (i.e., SSSIs). | The Applicant was advised to contact Anglian Water / wastewater retailer to ensure a trade discharge consent is in place before operation of the Installation. The Applicant confirmed that they are in contact with Anglian Water regarding this. |

| Response Received from Food Standards Agency | |
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| Brief summary of issues raised: | Summary of action taken / how this has been covered |
| The applicants have made a reasonable assessment of the potential effects to human health from the proposed development. The assessment indicates that operation of the installation will not result in appreciable health risks. Inhalation and oral intake of dioxin and dioxin like PCBs in children and adults, the contribution by the facility is small and well below the TDI. | The Applicant's Air Quality Assessment and HHRA have been audited and we agree with the comments from the Food Standard Agency. |

| Response Received from Director of Public Health and UK Health Security Agency (Previously Public Health England) | |
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| Brief summary of issues raised: | Summary of action taken / how this has been covered |
| The main emissions of potential concern include nitrogen oxides, sulphur dioxide, other acid gases, dioxins, heavy metals and particulate matter. Assessments indicate no exceedance of UK Air Quality Strategy (AQS) objectives on a worst-case scenario. The Environment Agency should satisfy itself that modelling assumptions used are appropriate and valid.<br><br>The permit holder should take all appropriate measures to prevent or control pollution, in accordance with the relevant sector guidance and industry best practice. | We have audited the modelling data and files, and we are satisfied that they are appropriate and valid.<br><br>The Applicant has shown in their Application that they will follow the relevant Best Available Techniques (BAT) for the sector. These operating techniques are incorporated into Table S1.2 of the permit. |

| Response Received from Fenland District Council | |
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| Brief summary of issues raised: | Summary of action taken / how this has been covered |
| <u>Noise concerns:</u><br>• The effectiveness of noise mitigation at 10 New Bridge Lane<br>• Characterisation of noise (tonality, intermittency etc) | We have assessed the noise impact assessment (NIA) and noise management plan (NMP) and are satisfied that they meet requirements and BAT and that emissions from |

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| within the noise impact assessment | the Installation will not give rise to noise pollution. |
| • Whether all noise sources on site have been taken into consideration (e.g. from the maintenance area)<br>• Impact of noise outside of 07:00 to 20:00 should be considered | Noise sources have been taken into consideration, including start-up, maintenance and emergency conditions in the applicant's noise impact assessment. This also covers the characterisation of noise, with assessment covering nighttime hours (23:00-07:00). Pre-operational condition PO9 requires a revised noise impact assessment upon the completion of the final design. |
| • Regulation of the proposed noise barrier at 10 New Bridge Lane (outside the installation boundary) | This will be regulated under the permit, see section 5.6.2 of this decision document for more detail. |
| • There has been no consideration if the introduction of a noise barrier itself will change the current noise exposure 10 New Bridge Lane experiences from the A47. The installation of the noise barrier may result in an increase of road traffic noise from the A47 experienced at the residential part of the property due to a reflective surface resulting in noise build up and impacting on areas which were previously screened from noise, such as the rear of the property. | The residence at 10 New Bridge Lane is already subject to either direct or glancing incidence road traffic noise from the A47 at all facades apart from the western facade, which doesn't have any windows. Due to all other residential windows already being exposed to direct contributions from the A47 and the approximate 15m distance from the closest façade to the acoustic barrier, we are satisfied that any potential increase in residual sound levels due to the reflection of road traffic noise from the A47 would be negligible at the windowed areas of the residential facades. |
| <u>Odour Concerns:</u><br>• Rejection of malodourous loads would cause a detrimental impact during transit | The Applicant has reconsidered their approach to rejection of malodorous loads. Any identified malodorous loads will be preferentially fed to the incinerator to ensure odour is eliminated as quickly as possible. |
| • Effectiveness of sniff tests, considering acclimatisation to on-site odours | Sniff tests are carried out alongside other odour measures to ensure that odour is controlled appropriately. |

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| | This technique is not infallible, however it assists with early detection in case other odour controls are not functioning correctly. The odour management plan (OMP) contains a procedure for dealing with complaints if there are any odour issues arising from the Installation.<br><br>We have assessed the odour management plan (OMP) and are satisfied that this meets requirements and BAT. The OMP is subject to revision upon completion of the final design by PO10. |
| <u>Information sharing requests:</u><br>• All updated noise and odour plans to be made available to the local authority<br>• Compliance monitoring data to be made available, to assist with annual reporting to DEFRA regarding local air quality management | Management plans and monitoring/compliance data will be available to Fenland District Council via the public register. |

| Response Received from Cambridgeshire County Council | |
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| Brief summary of issues raised: | Summary of action taken / how this has been covered |
| <u>Noise Concerns:</u><br>• There is insufficient noise information provided to determine the application | We have assessed to noise impact assessment, noise modelling and noise management plan and are satisfied that they meet requirements and BAT. These are all subject to revision upon completion of the final design, as required by pre-operational condition PO9. Nevertheless we are satisfied we have sufficient information and that noise impacts from the Installation will be acceptable. |
| • The permitted delivery hours should not be set until there is sufficient information to robustly | Delivery hours are not specifically controlled through the permit but we |

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| assess risks and mitigation options. | are satisfied the risks from noise will be adequately controlled at all times. |
| • A permit should ensure any emissions are subject to permit conditions | Noise and vibrations are covered by condition 3.5.1. of the permit. |
| • Noise control options have not been thoroughly considered. The rejection of an on-site noise barrier removes the opportunity to effectively monitor noise at the site boundary | Noise control measures have been assessed, including a noise impact assessment and a noise management plan. These are based on proposals which may be subject to minor changes during detailed final design. We are satisfied that the proposed mitigation measures are indicative of future BAT compliance and deem these sufficient, however following final design stages a further assessment is required as per (PO9). An on-site noise barrier was considered by the Operator and subsequently rejected on the basis that it be a less effective mitigation measure than the off-site barrier. We are satisfied that the Operator has provided sufficient justification in this respect. |
| • The offsite noise barrier is for controlling both offsite noise (HGV noise) and onsite noise. If the barrier is also considered to be a noise control measure for the installation, regulatory wording should ensure enforcement action is not compromised. | The offsite noise barrier will be subject to the conditions of the Permit and enforceable by the Environment Agency. See section 5.6.2 of this decision document for more detail. |
| • The EA should satisfy themselves that it is within their power to regulate an off-site fence through the environmental permit. What is regulated through the EA must be clear and transparent. | We are satisfied that it is within our power to regulate the proposed off-site noise attenuation barrier. We are satisfied that it is clear what we are regulating as this will be referenced in the Operating Techniques table (S1.2) in the permit. |
| • Regulatory documents must control noise from all activities on site and also vehicle | It is not within our remit to regulate noise arising from off-site sources such as public highways. The |

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| movements on the public highway. Relevant controls must be readily and rapidly enforceable, and not compromised by technicalities with noise control proposals | Operator will be bound by the conditions in the Permit in relation to noise from the Installation. Any potential breach of these conditions will be enforceable by the Environment Agency. We do not consider our condition will prevent anyone else taking enforcement action under any regime they are responsible for. |
| • The County Council request clarification that the operator will affect, and EA can enforce BAT noise controls. | We are satisfied that we can enforce compliance with BAT and the operating techniques which we have accepted. |
| • Concern about impacts of reversing alarms; and whether there should be control on the hours which this noise can be allowed to be audible. | Provisions for plant movement alarms and hours of operation have been accounted for in the noise impact assessment and noise management plan. We are satisfied with these. Both are subject to revision upon completion of final design (PO9). |
| <u>Odour Concerns:</u><br>• Mitigation of odours from delivery vehicles before and after tipping | An updated odour management plan was submitted and assessed. We are satisfied that this meets our requirements and BAT. The OMP is subject to revision and approval upon completion of the final design, as required by pre-operational condition PO10. |
| • Not enough information is given regarding potential queueing of vehicles e.g., at the entrance or on the highway | The Applicant has confirmed that vehicles will not be queueing outside the Installation on public highways or at the entrance along New Bridge Lane. The site has a dedicated area for queueing and seven tipping bays. Maximum wait times would not exceed 30 minutes. |
| • Reminding drivers of site rules is not effective mitigation; non-compliance of sheeting should be against contractual specifications | The Applicant states that non-compliance with regards to sheeting will be discussed with the driver and photographic evidence provided to |

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| | the waste provider to ensure future compliance. |
| • Primary responsibility for assessing odorous wastes should rest with the operator's staff and subject to procedure | Medworth CHP Ltd staff have the primary responsibility for ensuring particularly odorous wastes are identified as part of their waste acceptance procedures. |
| • Non-conforming waste will have impacts on receptors, when passing through the local environment. Clarification is required from the EA on how EWC and Medworth CHP Ltd specifications could be used to preclude odorous waste | Waste acceptance procedures identify non-conformance with MVV specifications, which include malodorous loads. Waste customers are informed by the Operator of any non-compliance with closer monitoring of their future loads to ensure future compliance. |

| Response Received from Kings Lynn and West Norfolk Borough Council | |
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| Brief summary of issues raised: | Summary of action taken / how this has been covered |
| An Air Quality Monitoring Strategy (AQMS) has been agreed as part of the planning application, requiring ambient air quality monitoring for a baseline and during operation. The Borough Council have requested to integrate the outline AQMS within the EMS through the permit? | The Permit sets out emission limits and monitoring requirements on frequency and standards or methods. These are set to MCERTS standards and reportable to the Environment Agency.<br><br>We do not require ambient air quality monitoring as part of compliance. Ambient air monitoring around operating incinerators is not a reliable method of establishing the impact as it does not identify the source of the emissions. |
| Health damage costs of PM2.5 and NOx should be considered | In general terms the environmental damage costs would be relevant to the formulation of strategic decisions as a way of approximating impacts. They can also be relevant to comparing the costs of different technologies in terms of BAT assessment. However, they are not a replacement for a detailed assessment of environmental impact based on detailed air quality |

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| | modelling. We have based our decision on such an assessment and are satisfied that there will not a significant environmental impact, as set out in section 5 of this decision document. |
| The approach towards the Air Quality Meteorological Assessment is considered representative for the Borough Council's area. | We have audited the Applicant's Air Quality Assessment and agree that appropriate parameters have been used with regards to air dispersion. |
| Several concerns have been raised by local residents to the Borough Council regarding process emissions, therefore community engagement is considered important. | We have consulted the public on the Application and extended the consultation period. We are consulting the public on our draft decision. |

| Response Received from Hundred of Wisbech Internal Drainage Board | |
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| Brief summary of issues raised: | Summary of action taken / how this has been covered |
| Concerns over whether waste will be managed on site effectively, and how this affects water being discharged into the HWIDB system. | We are satisfied that the Applicant will manage waste on site effectively. Waste is stored in an enclosed bunker, from where there are no emissions to water. Uncontaminated surface run-off from the operational areas of the site would pass through a Class-1 Oil Interceptor, detention basins and swale before emission into HWIDB drains. No other emissions into the HWIDB system are permitted. We are satisfied that the measures proposed are suitable. |

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

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

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

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

Representations were received from Member of Parliament for North East Cambridgeshire, Rt Hon Stephen Barclay and Parson Drove Parish Council, who raised the following issues.

| Brief summary of issues raised: | Environment Agency comment |
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| Concern over emissions from the incineration process and how this will have an impact on residents' health | We audited the Applicant's dispersion modelling and are satisfied that there will not be a significant impact in air quality. Further information is in section 5.2 of this decision document.<br><br>We are satisfied that there will not be a significant impact on health due to the Installation. Section 5.3 of this decision document has further details. The standards that we have used to assess against are set to protect all members of the public. |
| 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 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. |

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| | Vehicle movements within the Installation boundary are 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. |
| Concerns over whether the installation will manage waste effectively and responsibly. | The facility will only accept waste specified in table 2.2 of the permit. We are satisfied that these wastes are suitable for burning at the Installation. This facility deals with residual waste after upstream segregation, recovery, and recycling initiatives. The EA's remit is to ensure that the waste arriving on site can be dealt with in an environmentally acceptable manner.<br><br>The permit does not allow separately collected fractions suitable for recycling to be accepted for incineration as set out in Condition 2.3.5 of the Permit.<br><br>Condition 1.4.1(b) of the Permit ensures that waste produced by the site is treated in accordance with the waste hierarchy. |
| Concern over risk of contamination in the event of a flood | Essential infrastructure has been designed to remain operational during a 1 in a 1000 year flood event. We are satisfied that appropriate precautions are in place to prevent a pollution incident in the unlikely event of a breach. |

b) Representations from Community and Other Organisations

Representations were received from RCCG Throne of Grace, all issues raised are the same as those raised by the Local MP and Parish Council.

c) Representations from Individual Members of the Public

A total of 209 of 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: | Summary of action taken / how this has been covered |
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| **Comments about air emissions and air risk assessment** | |
| Concern that the installation will give rise to significant air pollution. | An audit has been completed on the Applicant's dispersion modelling and Air Quality Assessment. We are satisfied that emissions are unlikely to give rise to significant pollution, as detailed in Section 5.2 of this decision document.<br><br>The permit contains Emission Limit Values, and monitoring / reporting requirements, to ensure that emissions levels do not exceed predictions made in the Air Quality Assessment. |
| Concern over impacts on air quality at close sensitive receptors including:<br>• Schools / Colleges<br>• Clinics / Hospitals<br>• Residential Homes | We are satisfied that there will not be a significant impact from emissions to air at any receptor.<br><br>Worst case assessments have been made on the most sensitive receptors, with no significant impact expected.<br><br>Sections 5.2 and 5.3 of this decision documents has further details. |
| Clarification required over whether the New Bridge Lane traveller site has been considered in this assessment. | New Bridge Lane traveller site has been included as a receptor in the assessment (R4). |
| Concerns that emission from the proposed installation should not be allowed in an area that has existing poor air quality | The Applicant considered existing pollution (background levels) in their dispersion modelling. As part of our audit, we checked the background levels and are satisfied that they are appropriate, and that the impacts |

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| | from the Installation are not significant. |
| Concern over whether local wind conditions and temperature had been considered as part of the air impact assessment. | We audited the Applicant's dispersion modelling. As part of the audit, we checked that the weather data used by the Applicant was appropriate and we are satisfied that this was. Based on the Applicant's modelling and our audit of it we are satisfied that there will not be a significant impact in air quality.<br><br>Further information is in section 5.2 of this decision document. |
| Concerns that prevailing winds will bring all pollution into Wisbech town centre | Weather conditions, including wind direction is taken into account in the Applicant's air dispersion modelling. Impacts are assessed and we are satisfied that there will not be a significant impact in air quality in Wisbech town centre. |
| Concerns that not all significant receptors have been assessed. | We have audited the Applicants modelling and have concluded that the most significant receptors have been assessed. In addition, the modelling assessed impacts across a grid as well as at discrete receptors. Modelling receptors further away is not required as impacts will be less than the reported maximums which are already considered to be permissible, and not cause significant air quality issues. |
| Concerns about impacts on air quality in nearby villages | The Applicants modelling gives worst case predictions for the closest receptors; we are satisfied that the predicted impacts have shown to be not significant. Modelling receptors further away (such as in nearby villages) is not required as impacts will be less than the reported maximums which are already considered to be permissible, and not cause significant air quality issues. |

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| 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.<br><br>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 that the applicant has not properly considered NOx outputs. | An audit has been completed on the Applicant's dispersion modelling and Air Quality Assessment, which included NOx emissions. Based on the information provided, we are satisfied that there will not be a significant impact. We have set ELV's based upon this modelling. Monitoring and reporting are also required to ensure compliance with ELVs and ensure there is no significant impact on the environment. |
| Concern that smoke will be emitted. | There will not be emissions of smoke from the Installation. Smoke is made up of high concentrations of particulates. Particulate emissions |

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| | will be controlled to low levels by the bag filter system. |
| Concern over the impacts from exposure to:<br>• Dioxins and Furans<br>• PCBS<br>• Oxides of nitrogen<br>• Particulate matter (PM10 and PM2.5)<br>• Heavy Metals | We have reviewed the Applicant's assessment of the impacts from these pollutants, and we are satisfied that there will not be any significant impacts. See section 5.2 including section 5.2.2 (consideration of key pollutants) of this decision document for further details. |
| Elevated dioxin emissions at start-up and shut-down | For dioxins and furans, the principal exposure route is through ingestion, usually through the food chain, and the main risk to health is through accumulation in the body over a period of time. Elevated levels of dioxins at start-up and shut-down will therefore not significantly impact on exposure. A report by AEA for the Environment Agency at a municipal waste incinerator showed that the mass of dioxins emitted during shutdown and start-up for a four day planned outage was similar to the emission which would have occurred during normal operation in the same period. The plant will not have any methods of bypassing the abatement plant during start-up and shut-down so particulate abatement will be effective at all times. |
| The full range of pollutants released from incinerators and their impacts are not assessed to indicate safety of incineration | All pollutants with the potential to impact human health or the environment, which are likely to be emitted in potentially significant quantities have been assessed. Pollutants are assessed on a site specific basis and ELVs are set to ensure the environment is protected. |
| Concern that emissions contain unknown combinations of toxins. | The Industrial Emissions Directive (IED) Annex VI sets out pollutants that require assessment. We assess against the relevant BAT and set appropriate ELVs based upon site specific assessments. |

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| | Other pollutants may be released in smaller quantities but are not considered to be high risk or to require specific assessment.<br><br>We are satisfied that the Environmental Standards that we have used to assess impacts are protective of synergistic effects. |
| Concern over whether long-term impacts are properly considered for pollutants including particulates, and whether long term studies have been taken | The Applicant's air quality assessment considers both the short term, and long-term impacts of all applicable pollutants.<br><br>UKHSA keep literature under review for long term studies conducted with regards to incinerators; Section 5.3.1 iii) discusses a longer term study conducted between 2012 and 2019. UKHSA have stated that their position remains that well run and regulated municipal waste incinerators are not a significant risk to public health. |
| There will be significant levels of POPs, including PFAS and PFOS from the activity. Temperatures for breakdown are required to be as high as 1400 degrees. | With the methods used, the BAT document concludes that incinerators can achieve an emission concentration of 0.1 TEQ/$m^3$. We believe that the Permit ensures formation and release of POPs will be minimised, eliminating emissions as far as practicable. See Section 6.4 of this decision document for more detail. |
| Concerns over impacts from commissioning of the installation which have the potential to last for years, whilst emission limit values are not enforced. | The Operator will be required to submit a commissioning plan for approval by the Environment Agency, as per Pre-Operational Condition 3. This will include measures to control emissions during commissioning, including timelines for completion. Commissioning shall be carried out in accordance with the commissioning plan as approved. |

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| Concerns over ash particulate being released into the atmosphere and settling in the local area. | Bag filters will minimise the emission of particulates into the atmosphere. Emissions of particulates (PM10 and PM2.5) have been assessed, with more detail provided in Section 5.2 of this decision document. We are satisfied that impacts from particulates will be insignificant. |
| Concerns that there is no statutory limit / level to assess dust deposition, indicating a statutory nuisance. | There is no statutory nuisance level for dust deposition, however particulate emissions have been assessed and we are satisfied that there will be no significant impact. More detail is provided in section 5.2.2 of this decision document. |
| The applicant has been selective when declaring particle sizes emitted by the incinerator – the quantity of PM2.5 has not been disclosed. | The Applicant's particulate assessment assumes that all particulate emissions are present as PM10 for the PM10 assessment, and all particulate emissions are present as PM2.5 for the PM2.5 assessment. We are satisfied with this approach as it is considered a worst-case assessment. |
| Concern over the impact from very fine particulate matter. | These issues are covered in section 5.3 of this decision document. We are satisfied that there will not be a significant impact from very fine particles. |
| Concern that the applicant has used Not Significant or Significant as a measurement of environmental impact; the use of this measurement of risk is flawed. | Emissions and their impacts were assessed by Environment Agency and our own assessments of significance are applied to conclude whether impacts from the Installation are acceptable and a high level of protection is provided for the environment and human health. We are satisfied that there will be no significant pollution of the environment or harm to human health. |
| Housing and mixed-use developments (including Godwin Developments Wisbech Gateway | Risk assessments consider only existing sites and those with planning permission. The Godwin |

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| Project) have been granted permission in several areas within close proximity to the installation site, creating more significant receptors where impacts should be assessed. Several others are in the planning stage including houses at Halfpenny Lane. | Developments Wisbech Gateway Project, and Halfpenny Lane Housing panning applications are both pending consideration for planning permission and have therefore not been included in the assessment.<br><br>Where additional receptors are added after permit determination, our regulatory officers may ask for a new assessment of air emissions as part of their ongoing compliance. The presence of an EfW plant would also be considered within planning applications.<br><br>Considering the Applicant's pollutant contour plots, we are satisfied that impacts upon both locations would be lower than the reported maximums, which we consider to be permissible. |
| Concerns about the build-up of methane during power failures / shutdown. | We have assessed the Installation against BAT 16 which refers to limiting shut down and start up operations. We are satisfied that the operator will comply with this, and do not expect significant impacts from methane during these limited periods. |
| **Comments about health impacts** | |
| Concern was expressed that there will be an impact on locals' health due to the Installation including:<br>• those with existing health conditions e.g. asthma, COPD<br>• young people, particularly those attending the schools within close proximity to the site<br>• elderly | We are satisfied that there will not be a significant impact on health due to the Installation. Sections 5.2 and 5.3 of this decision document have further details.<br><br>The standards that we have used to assess against are set to protect all members of the public. |
| Concern over impacts to human health, given the proximity of the installation to schools and houses. | We are satisfied that there will not be a significant impact on health due to the Installation. Sections 5.2 and 5.3 of this decision document have further details regarding the air |

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| | impacts and the impacts on human health. |
| Concerns that adding to air pollution by incineration is allowable, given that poor air quality was cause of death for a child in London in 2020. | The air quality assessment is based on site specific information, which takes into account existing background concentrations of pollutants and local conditions.<br>Based on the information provided, we are satisfied that there will not be a significant impact on air quality, and there will not be a significant impact on health from the Installation. See section 5.2 for more detail. |
| Concerns about the health impacts from:<br>• Particulates<br>• Polycyclic aromatic hydrocarbons | Impacts have been assessed for both pollutants in the Air Dispersion Modelling provided in the Application. Particulate emissions (PM2.5 and PM10) are shown to be insignificant, and PAH emissions are unlikely to give rise to significant pollution. See section 5.2 of this decision document for more information. |
| Concern over long term consequences. | We are satisfied that long term impacts have been appropriately assessed and we are satisfied that there will not be a significant impact. Section 5 of this decision document has the details of the assessment. |
| Concern over the validity of the HHRA considering the variability of waste entering, including unidentified/contaminated waste.<br><br>Concern that the HHRA provided was not robust. | We audited the Applicant's HHRA which included checking the key parameters and inputs. We are satisfied that the HHRA was carried our correctly, considering the variability of inputs, and that there is no significant risk to health. |
| Expert opinion and scientific research state that emissions from EfW plants are detrimental on human health.<br><br>A PHE (now UKHSA) Document (Spatial Planning for Health) was cited where a link is made between poor air quality and chronic conditions, neonatal complications, | The UKHSA (previously PHE) risk assessment remains that modern, well run and regulated municipal waste incinerators are not a significant risk to public health. The cited document does not alter this view. The UKHSA were consulted on the Application and based upon the information provided, where process |

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| poor birth outcomes, cancer, worsened respiratory outcomes and child mortality. Furthermore, they note that there is evidence of adverse impacts from exposure to particulate matter. | emissions are not predicted to exceed UK Air Quality Strategy objectives, they believe there will be no significant concerns regarding risk to the health of the local population, subject to us confirming validity of modelling assumptions.<br><br>We are satisfied that appropriate modelling parameters have been used, including for particulate matter. |
| Concerns that incinerators raise mortality rates and will cause cancers. | Our view is that the Installation will not have a significant impact on health. This view is supported by the UKHSA. Further details on the air and human health impacts are in sections 5.2 and 5.3 of this decision document. |
| A DEFRA and PHE (now UKHSA) document on Air Quality ("Air Quality: A guide for directors of public health") states that there are no safe levels for particulate matter, while $NO_2$ is associated with adverse health effects at concentrations at and below the legal limits. | The UKHSA position remains that modern, well run incinerators are not a significant risk to public health.<br><br>We set Emission Limit Values to ensure that there is no significant impact upon human health. Conditions within the Permit will require the Installation to be well-run. We regulate against these Permit conditions to ensure compliance.<br><br>It is not practicable to prevent emissions of particulate matter entirely; the IED accepts that there will be emissions of particulates, and sets emission limits for operators to comply with.<br><br>We consider that the emission limits imposed within the permit are reasonable and provide the necessary level of protection to avoid a risk of unacceptable levels of pollution, whilst promoting economic growth amongst legitimate operators. |

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| Other reports and papers were cited claiming that incineration causes health impacts due to air emissions. | We considered the reports, papers and articles that were cited, amongst others. Our view is that the Installation will not have a significant impact on health. This view is supported by the UKHSA. Further details on air and human health impacts are in sections 5.2 and 5.3 of this decision document. |
| ONS data shows an increase in infant deaths in the vicinity of an incinerator over a 10-year period in several areas. | Our view, in line with that of the UKHSA, is that there is not a link between incinerator emissions and infant deaths |
| A UKHSA study showed birth defects for people living near to incinerators. | Please refer to section 5.3 where the findings of this study are discussed. In summary the UKHSA confirmed that the study did not change their position on the health risks. |
| Concern that the installation will cause mental health issues and impact the wellbeing of local people.<br><br>Concern that the applicant has not researched or investigated the effect of the development on mental health | Mental health is not addressed in the Permit determination and is outside of the remit of the Environment Agency. EPR is concerned with the impact of emissions from the Installation and based on our assessment those emissions should have no significant impact on human health or be a cause for concern. |
| Concerns over impacts from deposition on the local farms and orchard, and accumulation in the food chain.<br><br>Concerns that pollution from the installation will result in farmland being taken out of food production.<br><br>Concerns that local residents will not be able to continue growing produce in their gardens | The HHRA included impacts from dioxin and furan intake from locally grown food. The HHRA is based on very conservative criteria and impacts were shown to be not significant.<br><br>The air dispersion modelling considered impacts across a grid which included agricultural land. We have audited the modelling and are satisfied that emissions are not significant, as detailed in section 5.2 of this decision document. |
| Concerns that particulates and harmful heavy metals such as lead, | The emission of metals has been considered in section 5 where emission to air have been compared |

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| will deposit on agricultural land and contaminate any food produced. | to the ES. The ESs are protective of human health, and we are satisfied that there will not be a significant impact and no further assessment is required. |
| Concern over the impact on the health of livestock. | The assessment of emissions to air looks at impacts across the whole grid within the area of assessment, to ensure maximums are considered.<br><br>The environmental standards for human health are set to safeguard humans and are not specifically set for animals. However, we are satisfied that if human health is protected, then impacts on animals/livestock are not likely to be significant. |
| **Comments about noise impacts** | |
| Concern over noise/vibrations on the local area. | We are satisfied that there will not be a significant impact from noise. Further details are in Section 6.5.5 of this decision document. Pre-Operational Condition PO9 has been set to ensure an updated noise impact assessment and management plan is submitted for approval upon completion of the final design of the incineration plant. |
| Additional mitigation is needed to ensure no significant effects from noise | Our assessment is made based on the mitigation measures described we are satisfied with those. See Section 6.5.5. of this decision document for more information. Pre-Operational condition PO9 requires an updated noise management plan to be submitted for approval upon completion of the final design of the incineration plant in case any refinements are needed to them. |
| Concern over noise from traffic | Only vehicle movements within the Installation can be considered through environmental permitting. Vehicle movements outside of the Installation are not within our remit. |

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| | The Applicant's noise assessment included on-site vehicle movements and we are satisfied that there will not be a significant impact on sensitive receptors outside the Installation from noise arising from the Installation. |
| Concerns that noise, particularly from traffic, will keep residents awake at night | Waste delivery acceptance is limited to the hours between 07:00 and 20:00, as detailed in the noise management plan, and adopted into operating techniques in Table S1.2 of the permit.<br><br>Our audit of the Applicant's noise impact assessment indicates there will not be a significant impact from Noise during the night. |
| **Comments about odour impacts** | |
| Concern over the impact from odour in the local area | We are satisfied that there will not be a significant impact from odour, further details are in section 6.5.4 of this decision document. |
| Concern over odour impacts during shutdown | The Applicant described measures in the Application and odour management plan to prevent odour impacts during shutdown including the use of carbon filters for air extraction in the absence of negative pressure. We are satisfied that the measures are appropriate. See section 6.5.4 for further details. |
| Stockpiled waste will cause odour | All waste will be stored inside in the waste bunker; the waste bunker maintains negative pressure, using the extracted air as combustion air for incineration. This is considered BAT. |
| Concern that local weather conditions will impact odour | The waste bunker maintains negative pressure, drawing air into the furnace for combustion. We are satisfied that local weather conditions will not impact the effectiveness of this system. |

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| Concerns over odours from lorries queueing with waste and being unable to discharge if the plant is out of operation. | Long queues are not expected due to the design of the site, with seven tipping bays. If the site was not operating, waste may be diverted to other installations if possible; once the bunker is full no waste will be accepted, and vehicles would not be waiting on site. |
| Chemicals for odour neutralisation are toxic and should not be used for long periods of time | No harmful chemicals will be used for odour neutralisation. Odour within the waste bunker will be controlled by negative pressure, pulling combustion air through to the furnace for combustion. If both incineration lines are shut off, odour will be controlled by a carbon filter. |
| **Comments about impacts at ecological sites** | |
| Concern over the impact at habitat sites and other ecological sites.<br><br>The site is too close to the River Nene, putting wildlife in danger. | Our assessment at ecological sites, including the River Nene Local Wildlife Site, is described in section 5.4 of this decision document. We are satisfied that there will not be a significant impact.<br><br>There are no direct process discharges to the River Nene. Only uncontaminated surface run-off is discharged to the River Nene via HWIDB surface water drains. |
| Concern over the impact on local wildlife, and protected species including:<br>- Spined Loach<br>- Water Voles<br>- Turtle Doves<br>- Hedgehogs, Muntjac, Roe Deer, Sparrowhawks, Green Woodpeckers, Greater Spotted Woodpeckers, Harriers, Ducks, Moorhens, Coots, Barn Owls, Egrets, Red Kites, Bats, Birds, Insects, Stoats, Otters, Kingfishers | We have carried out an assessment on the designated habitats, which includes protected species.<br><br>Our assessment is described in section 5.4 of this decision document. We are satisfied that there will be no likely significant effect on both habitats and protected species.<br><br>Our assessments indicate the impact on the habitat; based on the indication of no likely significant impact to the habitat, we are satisfied that there will not be a significant impact on species. |

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| The Nene Washes will be contaminated, impacting wildlife habitats | The Nene Washes have been considered as part of the habitats assessment. We are satisfied that there will be no likely significant effect on the habitat from the operation of the Installation. |
| Contaminates will find their way into local waterways, impacting habitats and wildlife | The only emission to surface water is clean runoff, which goes through an interceptor, attenuation pond and swale before leaving the site. The operations meet standards required by BAT, and we are satisfied that these emissions will not affect local waterways.<br><br>With regards to air emissions, nitrogen and acid deposition have been considered in assessments of designated habitats and PCs are shown to be insignificant for both the Nene Washes SAC, SPA and Ramsar, and the Nene River LWS.<br><br>Ecological receptors have been assessed in accordance with our guidance and we are satisfied that there will be no significant impact on local waterways from the Installation. |
| Concerns over wildlife currently living within the installation site boundary | Our remit is to look at the impacts from the operation of the Installation. An ecological survey has been completed as part of the application for planning permission, to ensure that there are no protected species on site that will be displaced. This will be assessed as part of the Development Consent order (DCO). |
| Concerns the stack is too high and would cause issues for migrating birds. | We are satisfied that the operation of the Installation will not have any significant impacts on migrating birds. |
| **Comments about other impacts** | |
| It is unclear what is happening to contaminated water waste. | There is no effluent from wet scrubbing of flue gases. Water will be reused at the site as IBA quench. |

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| Concerns that waterways will be contaminated by the installation, given that the area has shallow groundwater. | During maintenance work, there will be infrequent, small emissions to sewer from the water purification system. We are satisfied that this occasional discharge will not be significant.<br><br>The only emission to surface water allowed under the Permit will be clean uncontaminated runoff, emitted to the HWIDB drains via interceptors, an attenuation pond and swale.<br><br>The bunker is designed to be watertight, ensuring no risk of contamination to the water table. We are satisfied that appropriate measures are in place to prevent contamination of surface and ground waters. |
| Concern over the emissions of carbon dioxide and the impact on global warming. | Our assessment of global warming potential is covered in sections 6.3 and 6.6 of this decision document. |
| There will be impacts to over 266 historical and listed buildings | The only pathway for damage is via acid rain from acid gas emissions, which can affect stonework. We have considered the impacts of acid gases and the impacts are insignificant. We therefore do not consider that emissions from the Installation will impact listed buildings. |
| Concerns about acid deposition for farmers and gardeners | The proposed acid gas abatement is considered BAT for the Installation. Acid gases will be minimised.<br><br>Deposition is considered at ecological receptors (wildlife and habitats sites) and not directly addressed for farms and gardens. There is no environmental standard in place for acid deposition on farms or gardens as impacts are not considered to be significant. |
| **Comments about BAT, emission limits and control measures** | |
| Concerns that the operator is proposing to use old technology at | Our view is that the plant, abatement and other technologies proposed by |

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| the detriment of human and ecological receptors | the Applicant are BAT. This is explained in detail in section 6 of this decision document. |
| Concern that SNCR has been chosen for NOx abatement | For this application we are satisfied that use of SNCR is BAT. Other technologies such as SCR are only required where needed to prevent significant pollution, or where significant improvements in air quality are found and not outweighed by costs or other environmental factors. See section 6.2.2 for more information. |
| Concerns that using SNCR will mean higher dioxin levels | We have assessed the techniques proposed to minimise emissions of NOx and dioxins and are satisfied that both meet BAT for this Installation. |
| Concern that BAT is not being used including:<br>• NOx abatement techniques<br>• Particulate abatement techniques | We are satisfied that the abatement systems proposed by the Applicant are BAT. This is explained in detail in section 6 of this decision document. |
| Concerns that emission limits, monitoring controls and permit conditions do not protect the environment sufficiently as there are no safe limits. | Emission limits, monitoring requirements and permit conditions are integral to the environmental Permit and are set to ensure protection of the environment and human health. We are satisfied that the Installation will not have a significant impact on the environment or human health. |
| PM10 and PM2.5 monitoring and reporting should be made mandatory | Monitoring and reporting is in line with IED and BATCs, which require monitoring for total particulate matter. Monitoring of particulates is required as specified in tables S3.1 and S3.1a in the Permit. |
| Emission limits are not based on definitive scientific study, and stricter limits are required for several pollutants to ensure safety. | Emission limit values stricter than BAT are not required at this Installation. The Air Impact Assessment has shown that there is an insignificant impact from the |

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| | Installation and therefore limits on the Permit are in accordance with BAT and the Industrial Emissions Directive. |
| Concerns that better flue gas abatement causes higher particulate release | We are satisfied that the flue gas abatement meets BAT, as shown in 6.2 of this document. Limits have been set on particulate matter to ensure no significant impact. |
| Particulates need to be controlled<br><br>Concern that bag filters are not an appropriate technology and will not capture ultrafine particles | Our view is that bag filters are BAT for abating particulate emissions. Filter bags provide particulate abatement from the fabric itself. In addition, particulate removal also occurs via a three-dimensional dust cake which is maintained on the surface of the filter membrane by controlling the bag cleaning process and the pressure drop through the fabric filter. The membranes have very small pores which in combination with the filter cake which accumulates on the bag filters provide effective abatement of particulates. Research has shown the removal efficiency is very high even for smaller particles. See section 5.3.3 of this decision document for further details.<br><br>Emission limits are also set to ensure that there are no significant air impacts from particulate matter. |
| Concern that ultrafine particulate are not regulated or monitored in incinerators and the applicant has not considered the impacts. | Applicants are required to assess impacts from PM2.5 and PM10, in accordance with IED and BAT guidelines. It is not expected that particles smaller than 0.3 µm will contribute significantly to the mass release rate / concentration of particulates emitted because of their very small mass, even if present. See section 5.3.3 of this decision document for further detail. |
| Comments that carbon capture should be required | We require combustion plants that generate 300 MW or more electricity |

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| | to be carbon capture ready. This Installation is well below this level, and it is not appropriate to enforce carbon capture readiness at this scale. |
| Emission limits for Cadmium, Thallium, Mercury, Zinc, Chromium, Manganese, Antimony, Cobalt, Copper, Vanadium, Nickel, Arsenic and Lead are too high. | Emission limit values are set in line with IED Annex VI emission limits / BAT AELs. The Applicant's air impact assessment has been audited and we have concluded that tighter emission limit values are not required to ensure there are no significant impacts from the operation of the Installation.<br><br>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. |
| Concerns that pollution would not be mitigated / abated | The Applicant has described the proposed abatement that will be in place to ensure that Emission Limit Values are met for pollutants of concern. We are satisfied that emissions are minimised to ensure no significant impact on the environment and the Installation is compliant with BAT. |
| **Comments about monitoring** | |
| Monitoring should be conducted at the site and all across Wisbech | The Permit requires monitoring to be carried out at the Installation to ensure that the emission limit values that are imposed in the permit are complied with. Monitoring off site is not required; monitoring off site does not establish the impact as it does not identify the source of the emissions. |

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| Concern that dioxins and furans are not continually monitored | The prevention and minimisation of dioxins and furans is achieved through injection of activated carbon, optimisation of combustion control, avoidance of de novo synthesis and the effective removal of particulate matter.<br><br>The plant has to shut down if abatement is not operating outside of abnormal operation. The Permit also requires continuous monitoring of several process variables (e.g., combustion temperature) to ensure that the incinerator is running optimally and minimising emissions. Therefore, dioxin and furan control will be maintained in-between monitoring periods and we are satisfied with the monitoring frequency imposed. |
| Concerns that dangerously high emissions will not be detected by present monitoring systems | Monitoring of emissions is carried out in accordance with Parts 6 and 7 of Annex VI of the IED. Conditions 3.6.1 to 3.6.4 within the permit ensure that the Operator will monitor in line with the monitoring specified in tables S3.1, S3.1(a), S3.2 and S3.3, using equipment and methods approved by the Environment Agency.<br><br>Continuous emissions monitoring (CEMs) is required for parameters of highest concern, therefore high levels of these emissions would be detected instantly.<br><br>The Operator has stated that they will provide back-up CEMs working in parallel to the operating CEMs. These will be switched into full operation immediately in the event that there is any failure in the regular monitoring equipment.<br><br>We are satisfied that the monitoring required is appropriate and will be effective. |

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| Concerns that there will be frequent start-up and shutdowns of the incineration lines, and emissions reports will not include these emission figures. | Start-ups and shutdowns are expected to be infrequent; the Installation will only be shut down for periods of maintenance or following abnormal operation (which is limited to 4 hours for a single occurrence and 60 hours per year per line). CEMs will still be in operation during these periods.<br><br>Frequent shutdowns are not in the Applicants' best interests, and operating techniques are in place to ensure they are kept to a minimum. |
| Concern that heavy metals are not continuously monitored and levels will vary depending on the nature of the waste being burnt | The Applicant assessed the impact of metals in the air dispersion modelling based on worst case emissions. We have reviewed the modelling and agree that the worst case emissions have been assessed. We have set monitoring appropriate to the emissions and require the Operator to carry out this monitoring in accordance with specified standards. |
| Concern that the operator will carry out the monitoring. | The Environment Agency used to carry out check-monitoring when there were relatively few standards for monitoring. Check monitoring is no longer normally required because of the following that provide assurance that the results are reliable:<br><br>There is now a wide variety of standards for monitoring, covering CEMs, periodic monitoring, and quality assurance.<br><br>We have MCERTS for CEMs and test laboratories.<br><br>We have EN 14181 for quality assurance of CEMs.<br><br>We require CEMs and test laboratories to be accredited to |

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| | MCERTS and all the applicable standards.<br><br>We carry out audits of operators' provisions for monitoring.<br><br>However, we still do check monitoring where it is considered appropriate.<br>Furthermore, as well as auditing operators' provisions for monitoring, and how they apply the monitoring requirements of the permit, we also regularly audit test laboratories. |
| The application did not contain enough information about monitoring techniques | Monitoring requirements are set out in tables S3.1, S3.1(a), S3.2, S3.3, S3.4 and S3.5 and include monitoring standards and methodologies.<br><br>Monitoring standards or methods specified are EN 14181, CEN TS 17340, EN 14385, EN 13211, BS EN 16911-2, EN 1948 Parts 1, 2, 3 and 4, CEN TS 1948-5, BS ISO 11338 Parts 1 and 2, MCERTS BS EN 14792 and MCERTS BS EN 15058. |
| The applicant has not explained how they will act upon alarms indicating emission levels are too high | Condition 2.3.9 (b) and (c) within the Permit, indicate that the operator must stop charging waste into the incinerator when continuous emission limit values are exceeded. |
| **Comments about accident prevention** | |
| Concerns over impacts in the event of a major accident.<br><br>Access to vital amenities (hospital etc) would be affected. | An Accident Management Plan will be developed as part of the Environmental Management System (EMS); a pre-operational condition (PO1) is in place to ensure the EMS is incorporated prior to commencement of commissioning.<br><br>We regulate emissions from the activity and in this regard, are satisfied that measures will be in place to prevent accidents or minimise impacts if they did occur. |

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| There are only two fire engines locally which cannot provide sufficient emergency cover. | The Applicant submitted a Fire Prevention Plan. We have approved this plan and incorporated this within operating techniques table S1.2 meaning that the site has to follow such requirements.<br><br>We are satisfied that appropriate measures will be in place to prevent fires and to minimise the impact from a fire if it was to occur.<br><br>The local fire and rescue service were consulted on the application and raised no concerns. |
| Concern over who would be responsible for environmental remediation in the event of an explosion or serious spill. | The Operator is required to ensure the land is kept in a satisfactory state throughout the life of the Permit.<br><br>We are satisfied that measures are in place to prevent serious accidents. However in the unlikely event that this happens, we have various powers under EPR to require remediation if appropriate. Whilst it will always depend on the facts, where third parties are affected, they may be able to take their own actions against the operator. |
| **Comments about waste types** | |
| $CO_2$ emissions will be higher because mixed municipal waste will be burned rather than industrial waste. | $CO_2$ and Global Warming Potential are considered in Section 6.3.<br><br>$CO_2$ emissions may vary between these waste types. However, we only determine the application that is made to us. We are satisfied that the Applicant can operate this facility in an environmentally acceptable manner. |
| Some waste types could be recycled or recovered. | This is primarily outside the scope of this determination. Recycling initiatives are a matter for the local authority. The Permit restricts wastes |

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| | that have been separately collected for recycling. |
| Concern that wastes should be recycled more effectively, rather than using incineration | The obligation is on waste producers to apply the waste hierarchy and for local authorities to have their own waste strategy dealing with municipal collections.<br><br>The Permit does not allow for separately collected fractions suitable for recycling or reuse to be accepted at the Installation, as per condition 2.3.5.<br><br>Where there is residual waste, we are satisfied that this can be incinerated at the Installation in an environmentally acceptable manner. |
| 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.<br><br>The Permit does not control where the waste comes from because that falls outside the scope of this permit determination.<br><br>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 and the emission limits apply at all times whatever wastes are being burned. |
| Wastes would need sorting on site to remove non-combustibles; if this causes waste to get wet there could be issues with surface run-off and water pollution | We have assessed the proposed wastes and are satisfied that non-combustible waste is not permitted for acceptance at the Installation. |

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| | Wastes are not sorted on site and will only be kept in a watertight bunker – there is no risk with regards to contamination of surface water runoff. |
| Concern that the operator cannot know what is in the waste delivered to site, and wastes received will be very variable.<br><br>Specific waste types were raised including:<br>• Asbestos<br>• Light bulbs<br>• Hazardous waste<br>• Batteries<br>• Chemicals | Waste types allowed are specified in table S2.2 of the Permit.<br><br>It is possible that the waste received could contain some of these waste types, for example batteries could be placed in household bins and received at the incinerator under the municipal waste code. However, quantities are likely to be small and not pose a significant risk. |
| Compostable waste should not be accepted on site, as they could be composted and reused as fertiliser. | The permit does not allow separately collected fractions suitable for recycling/reuse to be accepted for incineration (Condition 2.3.5). |
| Concerns that operator may have to rely on burning recyclable waste to keep the facility financially viable. | The permit does not allow separately collected fractions suitable for recycling to be accepted for incineration (Condition 2.3.5). Only wastes listed in table S2.2 of the permit can be accepted at the Installation. |
| Concern over the burning of plastics. | Large amounts of plastic will not be burned. We are satisfied that the plastics proposed in the Application can be burned whilst complying with the Permit emission limits. |
| Concerns that the applicant has not been clear about which wastes / products will be incinerated | Waste types accepted by the facility are specified in table S2.2 of the permit and are considered suitable for the proposed plant. |
| Concern that varying wastes will have varying emissions | Air dispersion modelling was based on worst-case assessment. This ensures maximum emissions are assessed therefore actual emissions and impacts are likely to be less. |

| **Comments about energy efficiency/recovery** | |
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| Concern over the amount of energy that will be recovered from the waste. | We are satisfied that as much energy as practicable will be recovered from the waste. Further details are in section 4.3.7 of this decision document. |
| Concerns over energy recovery, and research showing that plants perform significantly worse than predicted at the permitting stage. | Gross electrical efficiency for an incinerator must be between 25 – 35% in accordance with BAT. The Application indicates that this Installation will operate with an efficiency of 30%.<br><br>Table S3.4 within the Permit requires the Operator to provide details of their energy efficiency (from testing at full load) within 6 months of operation to verify their energy efficiency.<br><br>The operator is required to report on energy recovery, and we can take action to require improvements if required. |
| The likely low calorific value of the waste will mean that there is a high probability the plant will not reach it's predicted power generation. | Assessments provided were based upon a lower calorific value than would likely be received, to ensure they were conservative.<br><br>Gross electrical efficiency for an incinerator must be between 25 – 35% in accordance with BAT. The Application indicates that this Installation will operate with an efficiency of 30%.<br><br>Table S3.4 within the Permit directs the operator to provide details of their energy efficiency (from testing at full load) within 6 months of operation to verify their energy efficiency. |
| Concern that the plant will not operate as combined heat and power (CHP). | The Applicant assessed the possibility of supplying heat to the local area. They have concluded that heat can be supplied, although contracts are not in place at this stage. |

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| | Permit conditions have been set to ensure that the site will operate as a CHP, with opportunities to supply heat being reviewed at set frequencies.<br><br>Section 4.3.7 of this decision document has further details. |
| **Comments about the Applicant** | |
| Concerns over perceived environmental issues (including noise and odour) and management at other EfW installations operated by the applicant, with EA describing odour levels as unacceptable.<br><br>Comments that the applicant does not comply with regulations at existing sites (e.g. MVV Davenport). | The Applicant's corporate group operate an existing EfW site (MVV Devonport), which has a good compliance history. Initial concerns regarding odour were reported which have now been dealt with to ensure no significant impact on ecological or human receptors, and there is compliance with permit conditions. |
| Concerns that the applicant has no experience operating plant of this size. | Based on the information provided, we are satisfied that the Applicant will be able to competently operate the Installation because:<br>• An EMS certified to ISO 14001 will be in place.<br>• A suitably qualified facility manager will be appointed who will have responsibility of Permit compliance.<br>• An environmental policy will require that the Installation operates in full compliance with legislative requirements. |
| Pledges from the applicant cannot be trusted | The Applicant will be bound by conditions set in the permit. We will regulate the site, carryout out regular assessments of plant operations and environmental performance to ensure compliance. |
| The applicant will illegally dispose of products that are not suitable for incineration | Wastes that can be accepted at the Installation are set out in Table S2.2. We consider the applicant will comply with conditions in the permit. |

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| | If there was a breach of Permit conditions, appropriate enforcement action will be taken. |
| Concerns over whether the operator will comply with the permit conditions | We consider that the Applicant will comply with the conditions set out in their environmental permit.<br><br>If the Applicant breaches any conditions in their permit, we will take appropriate enforcement action and/or prosecute. |
| **Comments about regulation/the regulator** | |
| The Environment Agency must thoroughly evaluate the impacts of the proposal, ensuring technical standards are met, EPR and IED are adhered to, local sensitivities are properly considered, and consultation responses from the local community are carefully considered. | In determining this Application, the Environment Agency has evaluated all details in the proposal to make sure that environmental standards are met, and BAT is applied. Local habitat sites and human receptors have been considered and consultation sought from the local community. Consultation comments are addressed in this decision document. |
| Comments that the Environment Agency will approve the permit because the site is not situated in an influential or affluent area. | The influence and/or affluency of an area is not taken into consideration when determining an environmental permit application. |
| Concern over how the Environment Agency will regulate the site. | We will regulate the site carrying out regular assessments of plant operations and its environmental performance. This will include:<br><br>The Operator must monitor emissions and report the results to us.<br><br>We will regularly inspect the Installation, review monitoring techniques and assess monitoring results to measure the performance of the plant, review operating techniques and review management systems and plans. |

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| | We will carry out on-site audits of Operator monitoring. The Operator must inform us within 24 hours of any breach of the emissions limits, followed by a fuller report of the size of the release, its impact and how they propose to avoid this happening in the future.<br><br>The Operator's monitoring results will be placed on the public registers.<br><br>If there is a breach, then we will take appropriate enforcement action and/or prosecute. |
| Environment Agency guidance indicates that incinerators emitting over 1 tonne of PM2.5 and PM10 should monitor and report however this is currently not being enforced, however should be mandatory. | Continuous monitoring of particulate matter is specified as a requirement in Table S3.1 of the Permit. Reporting of all air emissions to the Environment Agency is to be provided on a quarterly basis. Compliance with monitoring and reporting requirements is enforced by the Environment Agency. |
| The Environment Agency has shown that they do not have the resources to effectively regulate incinerators that are already operational. | Installations have an assigned regulatory officer to ensure that permits are regulated appropriately. They will carry out regular assessments of compliance and environmental performance and take enforcement action in the case of permit breaches. |
| **Comments about other issues** | |
| The applicant's Environmental Impact Statement is misleading to note that there will be no significant effect from the operation of the installation | Following our assessment of the emissions and environmental impacts, we agree that there will be no significant effect from the operation of this Installation. |
| The application is flawed and there is deliberate intention to override genuine objections and opposition to the plant. | We consider this to be untrue; as an environmental regulator we consider all the responses we receive to be sure that local interests and concerns have been taken into account. |
| Where waste is not immediately burned upon arrival to the site, | Waste is tipped into a bunker and is not usually immediately incinerated |

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| emissions will increase from vehicles on site. | on arrival. The Applicant has confirmed that vehicle engines will be required to be switched off when not in use. |
| The proposed time limit for deliveries can be extended, therefore delivery times of 07:00 to 20:00 are meaningless. | The Applicant has stated that this will only be in exceptional circumstances with all delivery times expected to occur between 07:00 and 20:00.<br><br>The Operator is required to take appropriate measures to prevent/minimise noise at all times and those measures will be more stringent during unsocial hours. |
| Concern that the installation will be extracting a large amount of water from the River Nene. Questions about whether this will be granted to the applicant. | Water resourcing is not covered within the permit determination for an installation. Any application for abstraction would be considered separately and on its own merits in accordance with the relevant statutory requirements. |
| Concern over building on a flood plain | The Environment Agency provides advice and guidance to the local planning authority on flood risk in our consultation response to the local planning authority. Our advice on these matters is normally accepted by both Applicant and Planning Authority. When making permitting decisions, flood risk is still a relevant consideration, but generally only in so far as it is taken into account for accident management plans and that appropriate measures are in place to prevent pollution in the event of a credible flooding incident.<br><br>Pre-operational condition PO1 requires an Accident Management Plan to be submitted for EA review prior to commissioning, which will ensure all appropriate pollution prevention measures are in place. |

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| Concern that current drainage issues will be exacerbated by the installation | Small amounts of process water will be emitted to sewer infrequently, only during periods of maintenance.<br><br>The site will implement a drainage system, including geocellular tanks, a detention basin and swale, to ensure there will be no impact on drainage in the area. |
| Concern over litter | Waste will be delivered in enclosed delivery vehicles and tipped into the bunker within the reception building. We are satisfied that impacts from litter are unlikely to occur. |
| Concern about the impact from pests. | We are satisfied that there will not be a significant problem with pests. Pests are not usually a problem at other municipal waste incinerators that we regulate. |
| Concern over soil contamination and other impacts during the construction phase | Impacts from construction cannot be considered through environmental permitting.<br><br>The Applicant has provided a site condition report describing the condition of the land before operations begin. They would be required to sample throughout the life of the permit and ensure the land is kept in a satisfactory state. |
| Concern over the impact of a visible plume and light pollution | Pollution from light or plumes are primarily a concern for considering visual impacts and as such generally covered by the planning process. In any event light pollution and pollution from a visible plume are not likely to have a significant effect on health or the environment. |
| Alternative technologies to incineration should be used. | It is argued that Incineration is not an environmentally sustainable technology and therefore almost by definition cannot be considered to be the Best Available Technique (BAT). Mass burn incineration at this scale is considered BAT provided it meets the |

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| | requirements (as set out in the BREF and BAT conclusions). See section 6 of this DD for more details. |
| Concerns about waste capacity – if the incinerator is unable to process the volume of waste intended, would there be a storage depot / holding area to hold untreated waste. | Waste will not be stored at the Installation outside of the waste bunker. If the bunker is at capacity, additional waste will not be accepted and would be diverted away from the site. |
| Questions about whether IBA and APCr are classified as hazardous wastes, and how these residues from the installation will be handled and removed from the site safely. | The characterisation of IBA and APC residues is described in section 4.3.9 of this decision document.<br><br>IBA waste is handled within enclosed buildings and APC residue is handled in a fully enclosed system with sealed connections to prevent fugitive emissions. Both will be taken off-site to suitably permitted facilities – the location of which is outside of the scope of this Permit determination, however, transportation of waste is subject to duty of care regulations. |
| Concerns that 25% of the waste received is left as ash and added to landfill. | The operator has confirmed that 26.5% of the waste will be left as IBA. This would be transported off-site to a suitably licenced facility for recycling and will not be sent to landfill.<br><br>Condition 1.4.1(b) of the Permit ensures that waste produced by the site is treated in accordance with the waste hierarchy. |
| Other local factories (e.g., food processing) will be forced to close because of the installation, causing local job losses | We do not consider there to be a significant effect on other local businesses, from the operation of this Installation. |
| The permit should not be issued because of the precautionary principal. | The United Kingdom Interdepartmental Liaison Group on Risk Assessment (UK-ILGRA) state in their paper “The Precautionary Principle: Policy and Application” that the precautionary principle should be |

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| | invoked when there is good reason to believe that harmful effects may occur and the level of scientific uncertainty about the consequences or likelihood of the risk is such that the best available scientific advice cannot assess the risk with sufficient confidence to inform decision making. The Health Protection Agency (as it was called then) stated in its response to the British Society for Ecological Medicine Report, "The Health Effects of Waste Incinerators" that "as there is a body of scientific evidence strongly indicating that contemporary waste management practices, including incineration, have at most a minor effect on human health and the environment, there are no grounds for adopting the 'precautionary principle' to restrict the introduction of new incinerators". As explained in section 5.3 the UKHSA maintain their view on impacts from incineration. We agree that the precautionary principle is not applicable to this determination. |

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

| Brief summary of issues raised: | Environment Agency comment |
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| 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 its potential to have an adverse environmental impact on communities or sensitive environmental receptors. The environmental impact is assessed as |

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| | 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, traffic movements on local roads and whether traffic assessments had been undertaken. | 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 – which is not the case here. |
| Views expressed that the Environment Agency should not be permitting incinerators as they are not a suitable technology for waste treatment, they are adding to climate change and preclude the UK meeting climate targets, and do not solve the landfill problems.<br><br>More emphasis should be put on recycling and reuse of waste, in line with the Government's 'Green Policies'<br><br>Other options for waste treatment should be considered at this site. | Our role in Environmental Permitting is to ensure that any installation does not cause significant pollution or harm to human health. We are satisfied that this Installation will not cause significant pollution or harm and that it will provide a high level of protection for the environment as a whole.<br><br>Recycling initiatives are a matter for the local authority. The Permit does not allow wastes that have been separately collected for recycling to be burned unless they are subsequently found to be unsuitable for recovery by recycling.<br><br>We have to assess whether what has been applied for has an acceptable environmental impact or not. |

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| Questions were raised about UK policies with regards to planning permission.<br><br>Concerns include the characterisation of EfW facilities as renewable energy, as only an estimated 14MW of energy will come from renewable sources | Planning policies, decisions relating to planning, and classification of energy as renewable, are considerations for the relevant authorities and are outside the remit of the Environment Agency. |
| A DCO cannot be awarded if it will result in a breach of legislation. The EA could/should not facilitate any breach by granting a permit | Planning and environmental permitting are considered separately, with differing remits.<br>If the DCO is not granted, the site will not be able to operate, and the operator would need to apply to surrender their environmental permit. We do not consider that we have any grounds for refusing a permit. |
| There is a lot of public opposition to the incinerator | We have considered the issues raised from the consultation responses that we received, as set out in this decision document. However, the number of responses and strength of opposition is not something we can take account of in this Permit determination. |
| Concerns that local councils and taxpayers will be fined for not supplying waste in the future if less waste is available.<br><br>Concerns that waste is not currently available. | This is outside of the scope of this determination. |
| Concerns that PHE believe there are effects from long-term exposure to electromagnetic fields | The permit does not cover the export of electricity outside of the site. |
| Concerns that the installation will not create jobs locally | This matter is not considered through environmental permitting. |

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| Concern over the visual impact of the site | This is a relevant consideration for the granting of planning permission but does not form part of the Environmental Permit decision making process. |
| Concern over damage general downgrading of the area including damage to the economy and house prices and tourism | This may be a relevant consideration for the granting of planning permission but does not form part of the Environmental Permit decision making process. Our remit relates to whether the incinerator can operate in an environmentally acceptable manner or not. |
| The need for and size of the plant was questioned, with many incinerators already in operation in the UK | We determine the application that has been submitted to us, and grant permits where we consider that there will not be an unacceptable environmental impact. Whether an incinerator is needed is not relevant to that determination. |
| A sorting and recycling facility should be located at the site instead | We can only assess the proposed application and not whether an alternative facility should be present. |
| Concerns over the state of the roads that waste will be travelling on to the site, and damage that increased traffic will cause | This may be a relevant consideration for the granting of planning permission but does not form part of the Environmental Permit decision making process. |
| Waste should not be imported from other area of the country | This matter is not relevant to whether an environmental permit can be granted. |
| Concerns that local planning permission has been avoided as the installation is a Nationally Significant Infrastructure Project, going through a Development Consent Order | The granting of planning permission is a separate process, outside of the remit of the Environment Agency. |
| The applicant is engaging in compulsory house purchase | Compulsory house purchase is a separate matter outside of the remit of the Environment Agency. |

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| The operator should consider rail or sea for transport of waste | This matter is outside the remit of environmental permitting. |
| Waste carrying vehicles are not electric | This matter is outside the remit of environmental permitting. |