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

The Permit Number is:	EPR/AP3304SZ
The Applicant / Operator is:	Portland Limited
The Installation is located at:	Portland Energy Recovery Facility, Portland Port, Castletown, Portland, DT5 1PP
Consultation commences on:	**12 July 2024**
Consultation ends on:	**11 August 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 information that is relevant to the issues we have to consider. However, unless we receive information that leads us to alter the conditions in the draft Permit, or to reject the Application altogether, we will issue the Permit in its current form.

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

We try to explain our decision as accurately, comprehensively and plainly as possible. Achieving all three objectives is not always easy, and we would welcome

any feedback as to how we might improve our decision documents in future. A lot of technical terms and acronyms are inevitable in a document of this nature: we provide a glossary of acronyms near the front of the document, for ease of reference.

Preliminary information and use of terms

We gave the application the reference number EPR/AP3304SZ/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/AP3304SZ. We refer to the proposed permit as "the **Permit**" in this document.

The Application was duly made on 18th May 2021.

The Applicant is Powerfuel Portland Limited. We refer to Powerfuel Portland 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 Powerfuel Portland Limited "the **Operator**".

Powerfuel Portland Limited's proposed facility is located at Portland Energy Recovery Facility, Portland Port, Castletown, Portland, DT5 1PP. We refer to this as "the **Installation**" in this document.

How this document is structured

Contents

Glossary of acronyms used in this document

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

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

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

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

Links to guidance documents

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

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

1 Our proposed decision

We 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 and other relevant legislation. This document does not therefore include an explanation for these standard conditions. Where they are included in the permit, we have considered the Application and accepted the details are sufficient and satisfactory to make the standard condition appropriate. This document does, however, provide an explanation of our use of "tailor-made" or installation-specific conditions, or where our Permit template provides two or more options.

2 How we reached our draft decision

2.1 Receipt of Application

The Application was duly made on 18th May 2021. This means we considered it was in the correct form and contained sufficient information for us to begin our determination but not that it necessarily contained all the information we would need to complete that determination: see below.

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

2.2 Consultation on the Application

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

involvement of representatives of interested persons in the exercise of our functions, by providing them with information, consulting them or involving them in any other way. In this case, our consultation already satisfies the Act's requirements.

We advertised the Application by a notice placed on our website, which contained all the information required by the IED, including telling people where and when they could see a copy of the Application. We placed an advertisement in the Dorset Echo on 11th June 2021. We also issued a press release notifying the public about the consultation and followed this with weekly reminders via the Environment Agency's social media channels. Due to the COVID pandemic we were not able to carry out any face-to-face consultation such as a drop in event. However, we carried out an extended consultation over a 15 week period.

We made a copy of the Application and all available to view on our **Online Consultation Portal, Citizen Space:** https://consult.environment-agency.gov.uk/psc/dt5-1pp-powerfuel-portland-limited/

We made a copy of the Application and all other documents relevant to our determination (see below) available to view on our Public Register. The Applicant also provided additional hard copies of the Application which were available to view at the public library in Weymouth and in Portland respectively.

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

- Dorset Council (Planning, and Environmental Health departments)
- Director of Public Health and Public Health England
- Food Standards Agency
- Health and Safety Executive
- National Grid
- Local Fire and Rescue Service
- Wessex Water
- Local Harbour and Port Authority

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

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

2.3 Requests for Further Information

Although we were able to consider the Application duly made, we did in fact need more information in order to determine it and issued information notices on 04 November 2021, 09 September 2022 and 08 September 2023. A copy of each information notice and the responses were placed on our public register. They were also made available to view on the consultation citizen space page listed in section 2.2 above.

In addition to our information notices, we received additional information during the determination from Fichtner Consulting Engineers Limited on behalf of their client Powerfuel Portland Limited, as follows:

- Impact of dioxins using the TDI approach (update to Human Health Risk Assessment), received 13 May 2022
- Legal operator and IBA response, received 22 June 2023

We made a copy of this information available to the public in the same way as the responses to our information notices. They were also made available to view on the Citizen Space consultation page listed in section 2.2 above.

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 a section 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" for EPR purposes (see below), such as air pollution control plant, and the ash storage bunker, are therefore included in the listed activity description. Incinerator bottom ash (IBA) will not be treated at the Installation. The Applicant intends to transfer IBA from the waste incineration plant to an off-site IBA processing facility for recovery/recycling.

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

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

4.1.2 The Site

The proposed installation is located at National Grid Reference SY 69607 74248 on the north eastern coast of the Isle of Portland, Dorset. The site lies within the largely industrialised Portland Port area and is not publicly accessible. Vehicular

access is from the west, through the main Portland harbour complex, via Castletown, Castel Road, Lerret Road and the A354.

The land upon which the site is located is owned by Portland Port and is an existing industrial area, currently unused, within the port, allowing waste to be transported by road or delivered by ship. The site is bordered to the south west by Incline Road, which is a private road within the port that is actively used by port traffic, and a former railway embankment. Cliffs supporting grassland, scrub and woodland habitats lie to the south west of the embankment and rise steeply to approximately 125m above ordnance datum (AOD). The eastern site boundary is formed by the shingle shoreline of Balaclava Bay and overland fuel pipes from Portland Bunkers, which are fuel bunkers in the nearby cliffs used for marine bunker fuel supply. Existing operational port development lies to the north and north-west of the site. In 2016/17, the main road leading to Incline Hill was realigned along the base of the hill / scree, creating the open development area on site. The land has since been cleared and is regarded as 'brownfield' land.

Her Majesty's Prison (HMP) The Verne is approximately 430m to the south west of the site at the top of the steep slope. The nearest residential dwellings are at Beel Close, Leet Close, East Weare Road and Ayton Drive, which are located approximately 630m to the west of the site.

The site is directly underlain by bedrock geology comprising mudstone of the Kimmeridge Clay formation which is classified as unproductive aquifer. Superficial geology comprising Tidal Flat Deposits are located to the north-east of the site only, along the Balaclava Bay shoreline. The site is not within a groundwater source protection zone, nor is it within a designated flood zone for planning. There are no surface water features on-site. The closest surface water is the coastal waters of Portland Harbour and Balaclava Bay.

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 in section 4.3.

4.1.3 <u>What the Installation does</u>

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

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

The proposed facility will incinerate refuse derived fuel (RDF) produced from domestic (municipal solid waste, MSW) and commercial & industrial (C&I) non-

hazardous waste. It will not take hazardous waste or clinical waste. It will operate continuously throughout the year.

The main activities associated with the Facility will be the combustion of incoming waste to raise steam and the generation of electricity in a steam turbine/generator which has been designed to generate up to 18.1 MWe. The Facility will have a parasitic load of approximately 2.9 MWe therefore approximately 15.2 MWe will be available for export to the National Grid as well as for providing ship-to-shore power to boats which dock in Portland harbour.

In addition to generating electricity, the Facility will also be configured so that heat can be exported in the form of hot water or high pressure steam to local heat users. The Application states that while several potential heat users have been identified there are currently no formal agreements in place. The Facility has therefore been designed to enable heat to be readily exported in the future.

The Facility will comprise of a single waste incineration line, incoming waste reception facilities, main thermal treatment process, turbine hall, on-site facilities for the treatment or storage of residues and waste water, flue gas treatment, stack, boilers, air cooled condenser, devices and systems for controlling operation of the waste incineration plant and recording and monitoring conditions.

In addition to the main elements described, the Facility will also include weighbridges (in and out), water, gas oil and air supply systems, site fencing and security barriers, external hardstanding areas for vehicle manoeuvring, internal access roads and car parking, transformers, grid connection compound, effluent storage and treatment facilities, offices, workshop, stores and staff welfare facilities.

The operation of the Facility is summarised as follows:

Waste could be delivered by road and/or by sea. Upon arrival at the Facility, delivery vehicles will be weighed and periodically inspected at the gatehouse before being directed to the Waste Reception Area which is a fully enclosed building maintained under slight negative pressure to prevent odour, dust or litter escaping the building. Waste will be delivered as both baled waste and ‘loose’ RDF, and depending on what form the incoming waste is delivered there will be separate initial storage arrangements, i.e. either in the bale storage area, or the waste bunker, both of which are located within the Waste Reception Area.

The baled waste will be unloaded from the HGV via a dedicated crane and transferred to the bale storage area. The baled waste will be regularly transferred to the waste bunker, via the crane which will transfer the baled waste from the bale storage area to a ‘de-baler’. The de-baled waste will then be conveyed to the waste bunker via a dedicated conveyor within the building.

Incoming ‘loose’ waste will be tipped directly into the waste bunker. The waste bunker will consist of a double bunker arrangement, with a shallow pit (referred to as the waste bunker) which will be used for the unloading of waste deliveries via

road and also for the baled waste (once de-baled), before being transferred to the waste storage bunker for storage prior to processing.

The bale storage area will have the equivalent storage to a maximum of up to 30 days of storage. Therefore, the maximum period of time which waste will be retained within the bale storage area will be up to 30 days. The storage capacity of the waste storage bunker is equivalent to up to 3 days of waste processing capacity. All of the waste processing areas within the Facility, including the Waste Reception Area will be fitted with fire detection and alarms systems, and fire suppression systems including automated sprinkler/ water deluge systems. We discuss the Applicant's Fire Prevention Plan (FPP) in section 4.3.4.

The incineration of waste will take place via a single line with a nominal design capacity of approximately 183,000 tonnes per annum. The exact figure will depend on the energy content (known as calorific value) of the waste, and the number of hours which the plant is operational. The feed rate will be adjusted to ensure that the energy recovery system runs, as far as possible, at full capacity at all times. The maximum capacity of the plant will be limited by the permit to 202,000 tonnes of waste per annum, taking into account potential variations in the calorific value of the waste being combusted, and for the Facility operating for more than the predicted 8,000 hours in a particular year, up to maximum of 8,760 hours.

A grab crane will transfer waste fuel from the waste storage bunker to the feed hopper of the combustion chamber. The grab will also be used to homogenise the incoming waste. The combustion chamber will use a conventional, moving grate which will agitate the fuel bed to promote a good burnout of the waste and a uniform heat release. The fuel is moved mechanically by means of reciprocating grate elements from the feed end, through a drying zone, a main combustion zone and, finally, a burn out zone. The furnace will be designed to ensure that the exhaust gases are raised to a minimum temperature of 850°C, with a minimum of 2 seconds flue gas residence time at this temperature. Primary combustion air will be drawn from the Waste Reception Area to maintain negative pressure and fed into the combustion chamber beneath the grate. Secondary combustion air will be injected into the flame body above the grate to facilitate the combustion of waste on the grate. Emissions of nitrous oxides will be controlled by control of combustion air and by the injection of ammonia into the combustion chamber via a process known as Selective Non-Catalytic Reduction (SNCR).

Once fully combusted, the solid residue (bottom ash) is discharged to a collection system where it is quenched in a water bath. Boiler ash, i.e. the ash fraction that collects within the boiler, will also be conveyed to the collection system, and will mix with the bottom ash within the water bath to form the residue known as incinerator bottom ash (IBA). The quenched IBA is pushed upwards and out of the water bath by hydraulically driven rams and transferred to a dedicated IBA storage area. There will be regular collections of IBA from the IBA storage area for transfer off-site to a suitably licensed waste facility. IBA treatment will not take place on-site.

Hot gases from waste combustion will be passed through a boiler to raise steam. The steam will then be passed to a steam turbine to generate electricity for export

to nearby users and the National Grid, with the potential to export heat to local heat users.

The hot exhaust gases from the furnace combustion stage will pass to a multi-pass water tube boiler integral with the furnace in order to recover the energy from the flue-gas. The boiler will deliver superheated steam to a high efficiency steam turbine and generator to produce electricity. The system will consist of a high efficiency multistage turbine with a generator and an air-cooled condenser (ACC). Generated electricity will be used on-site with the excess exported to the National Grid. Provision will be made for connection to a CHP scheme to provide further energy recovery by the export of heat, if any potential heat users become available in the future. Residual heat which is not recovered will be dissipated to the atmosphere by the ACC to allow the cooled water to be recirculated back to the steam/water circuit of the boiler.

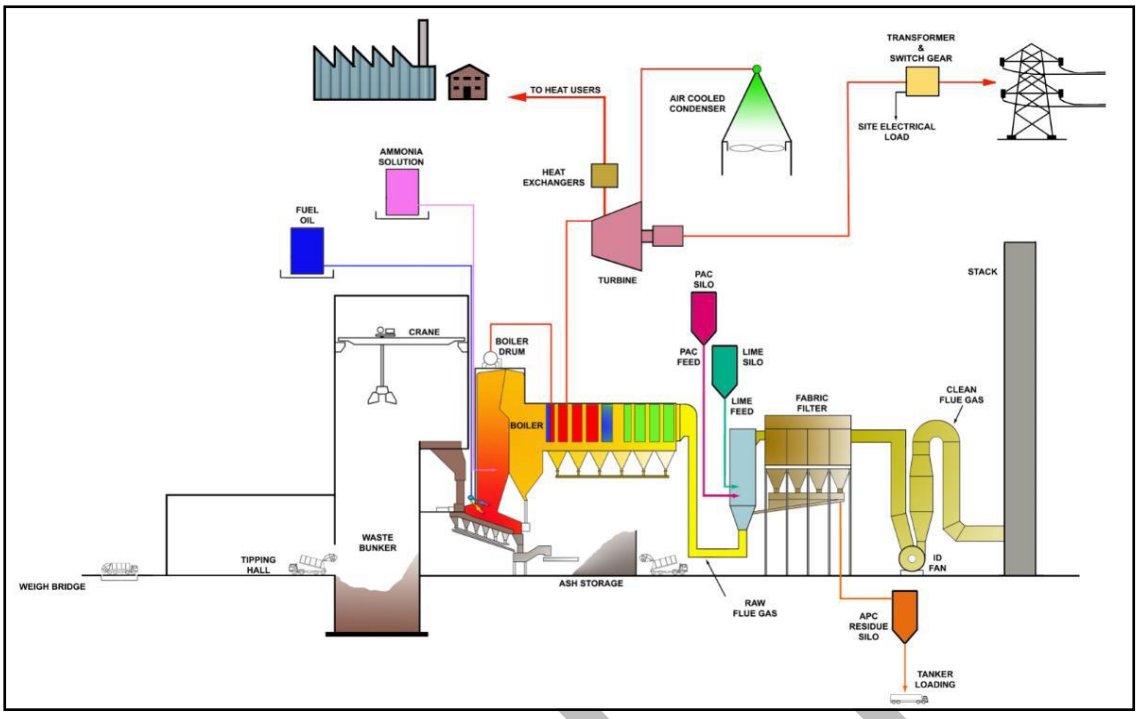
Following heat recovery, the hot flue gases are then passed to the flue gas treatment (FGT) plant where they will be cleaned before being released into the atmosphere. This will involve dosing various reagents into the flue gas, namely powdered activated carbon, primarily to control dioxin emissions, and hydrated lime to control acid gas emissions. Fabric filter bags will also be used to remove dust (particulates). The residue produced by flue gas treatment is called APCr (Air Pollution Control residue) and includes reaction products and un-reacted solids in the flue gas. APCr will accumulate on the outside of the filter bags which are then periodically cleaned by a reverse jet of air displacing the filtered solids into collection chutes beneath. The collected APCr will be held in a silo from where it will be recycled back into the flue gas stream at the top of the reaction chamber. As fresh reagents are added, an equivalent quantity of residue collected from the bag filters will be removed.

Once the flue gas has been cleaned, any remaining pollutants within the flue gas will be measured using a system of continuous emissions monitoring equipment and periodic manual sampling. Continuous monitoring of emissions to air of the flue gases from the Facility, including monitoring of oxygen, carbon monoxide, hydrogen chloride, sulphur dioxide, ammonia, nitrogen oxides, Volatile Organic Compounds (VOCs), and dust (particulates). Other pollutants will be monitored by spot measurements at regular intervals. Reporting of all emissions monitoring to the Environment Agency. The cleaned flue gas will be released to atmosphere via a single stack of 80 metres in height.

An emergency diesel generator will provide sufficient power to run or safely shutdown the Facility in the event of the loss of a grid connection. Otherwise, the generator is only expected to operate for short-term periods for testing purposes. The exact size of the generator will be confirmed during detailed design works; however it is expected to be approximately 8MWth.

The operator will develop and implement a documented environmental management system (EMS) to meet the requirements of ISO 14001.

An indicative process diagram for the Facility is presented in the figure below.



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

Waste throughput, Tonnes/line	183,000 te/annum nominal based on 8,000 operational hours; or 202,000 te/annum based on continual operation	22.8 te/hour nominal
Waste processed	Refuse Derived Fuel	
Number of lines	1	
Furnace technology	Moving grate	
Auxiliary Fuel	Gas Oil	
Acid gas abatement	Dry	Lime
NOx abatement	SNCR	Ammonia
Reagent consumption	Auxiliary Fuel: 880 te/annum Ammonia: 770 te/annum Hydrated Lime: 3,700 te/annum Activated carbon: 90 te/annum Process water: ~7m^3/hr	
Flue gas recirculation	No	
Dioxin abatement	Activated carbon	
Stack	Grid Reference – SY 69607, 74248	
	Height, 80 m	Diameter, 2.0 m
Flue gas	39.07, Nm^3/s	Velocity, 17.13 m/s
	140 °C	
Electricity generated	18.1 MWe	
Electricity exported	15.2 MWe	
Steam conditions	Temperature, 400 °C	Pressure, 51 bar

Waste heat use	Designed to be capable of exporting approximately 11 MWth heat to local heat users in the form of either high pressure steam, or hot water

4.1.4 Key Issues in the Determination

The key issues arising during this determination were assessment of the impact from emissions to air, and the assessment of Best Available Techniques (BAT). We therefore describe how we determined these issues in most detail in this document.

4.2 The site and its protection

4.2.1 Site setting, layout and history

The site setting on the northeastern coast of the Isle of Portland, within the area of Portland Port, is described in section 4.1.2 above.

The applicant has submitted site layout plans which shows how the various buildings and operational components will be laid out.

A summary of the historical land use of the area of the installation, as provided in the application, is set out below:

Year	Change in land use
1864	Several railway lines run across the site, servicing a number of buildings in the north and west of the site and a gas works to the south. A shingle beach lies within the northeast corner of the site.
1901	The gas works has been removed. 'Admiralty Slaughter House' occupies the south of the site. The buildings in the northwest of the site are occupied by the Royal Naval Hospital. There is a boat house in the east of the site. The area of shingle beach in the northwest of the site appears to have been infilled and now forms part of the side of the port.
1903	Timber yard occupies the northeast of the site.
1927	The railway lines have been removed and several buildings demolished.
1938	Two new buildings in the south and north of the site.
1963	Site is occupied by several large buildings which cover a significant proportion of the site area. Labelled as a Dockyard.
1973	Canteen Road and Balaclava Road marked in east of the site and Incline Road in the west of the site.
1999	Building in northwest of site has been demolished. Rubble remains stockpiled across building footprint area.

Year	Change in land use
2001	Buildings in west of site demolished.
2005	West of site divided into four open storage areas. Some stockpiled materials within.
2009	Buildings in the south have been demolished. Rubble remains stockpiled in former building footprint. Stockpiled materials in the storage areas to the west no longer present, this area appears to now be occupied by vehicles and other mechanical equipment.
2014	Storage areas and equipment to the west cleared and buildings in northeast corner demolished.
2017	One building remains in the north of the site. All other buildings demolished but some stockpiles on rubble remain.
2020	All buildings on site demolished.

The Applicant's review of site history has identified over 150 years of port and industrial uses, with made ground having been placed across the site in several phases. While the Application does not identify any particular sources of historical contamination such as fuel tanks, it does however state that spills and contaminant releases may have occurred. Two drainage outfalls are reported to have been present on the eastern Site boundary which discharged into Balaclava Bay. The Application also states that the demolition of twentieth century buildings may have resulted in the presence of asbestos within the fill material.
The land use for the area surrounding the installation has been Port uses similar to that within the installation boundary, with the exception of a gasworks to the south west of the site which was present in the late 1800s.

Portland and its harbour were designated as HM Naval Base Portland in 1923. From 1958, Portland was home to Flag Officer Sea Training. During this time, the site was dominated by a weapons research establishment building in the south east, with other buildings dedicated to mechanical repair facilities for military vehicles. The naval base and two major weapons research establishments were closed in 1995/96 and Portland Port Ltd began the transformation of the harbour into a commercial port. The buildings on site have been demolished to create cargo storage space when they were not being used by tenants.

4.2.2 Proposed site design: potentially polluting substances and prevention measures

The activities undertaken at the Facility will process incoming waste, utilise a range of chemicals, and fuel, and result in residual wastes, all of which have the potential to cause pollution of ground and groundwater if not stored properly. Chemicals associated with emissions abatement and flue gas treatment include ammonia solution, hydrated lime, and powdered activated carbon. Boiler water treatment chemicals e.g. oxygen scavengers and corrosion inhibitors, and auxiliary fuel such as gas oil (diesel) are also used. In addition, potentially harmful residues result from the incineration process including IBA and APCr. The Applicant has confirmed that

the following key measures will be put into place in order to prevent pollution to ground and groundwater from these substances.

- Chemicals will be supplied to standard specifications offered by different suppliers. All chemicals will be handled in accordance with Care of Substances Hazardous to Health (COSHH) Regulations as part of the quality assurance procedures and full product data sheets will be available.

- Tanker off-loading of chemicals will take place within areas where the drainage is contained with the appropriate capacity to contain a spill during delivery.

- All processing areas, loading/unloading areas, materials handling areas and roadways will be covered in concrete and/or tarmac hardstanding with contained drainage.

- Deliveries of all chemicals / fuel will be unloaded and transferred to suitable storage facilities. All areas and facilities for the storage of chemicals and liquid hazardous materials will be situated within secondary containment, and, where appropriate, tertiary containment. Secondary containment will have capacity to contain whichever is the greater of 110% of the tank capacity or 25% of the total volume of materials being stored, in case of failure of the primary storage system.

- Hydrated lime (solid calcium hydroxide) used to react with the acid gases in the flue gas and powdered activated carbon (PAC) used for the absorption of volatile heavy metals and organic components, will be stored in separate silos. These chemicals will be delivered by tanker and offloaded pneumatically by means of the onboard truck compressor into the silo. The displaced air will be vented to atmosphere through a fabric filter to retain dusts, located on the top of the silo. Cleaning of the filter will be done automatically with compressed air after the filling operation. Filters will be inspected regularly for leaks. All silos will be fitted with high level alarms.

- Ammonia solution (25%) used as a reagent in the NOx abatement system, and gas oil used as an auxiliary fuel will be off-loaded into primary storage tanks located within secondary containment bunds on areas of hardstanding with contained drainage.

- Boiler water treatment chemicals used to control water hardness, pH and scaling will be delivered in sealed containers and stored in a bunded area within the water treatment room. There will also be portable bottles of oxygen and acetylene gas stored on site for welding purposes. The gas bottles will be kept secure in a separate compound.

- In addition, various maintenance materials will be stored in an appropriate manner and used in small quantities. These include hydraulic and silicone-based oils, greases, insulants, refrigerant gases for the air conditioning plant, glycol/antifreeze for cooling, welding gases (oxyacetylene, TIG, MIG),

CO2 and foam agents for fire-fighting, electrical switchgear and gas emptying and filling equipment.

- IBA and APCr will be stored within primary containment, e.g. a silo, located on areas of hardstanding with contained drainage.

- Periodic reviews of all materials used will be made in the light of new products and developments. Any significant change of material, where it may have an impact on the environment, will not be made without firstly assessing the impact and seeking approval from the Environment Agency.

- The Operator will maintain a detailed inventory of raw materials used and will have procedures for the regular review of developments in the raw materials used.

- With regard to incoming waste, the surfaces of the waste reception, handling and storage areas have been designed and will be constructed as impermeable structures. Adequate drainage infrastructure will be fitted to areas where receipt, handling and storage of waste takes place – these areas will have appropriate falls to the process wastewater drainage system.

- The integrity of areas of hardstanding will be periodically verified by visual inspection. Regular maintenance of the drainage systems will be undertaken in accordance with documented management procedures to be developed for the Facility.

- Surface water run-off from vehicle movement areas, roadways and building roofs will be collected in a surface water drainage system. The surface water drainage system will be fitted with a retention interceptor and swales, prior to the discharge point, to prevent discharge of oils and sediment collected from vehicle movement areas and roadways being released off-site. All such uncontaminated surface water run-off will be discharged, via separate discharge points, to Balaclava Bay (east) and/or Portland Harbour.

Provided the measures set out in the risk assessment (multiple layers of containment and sealed drainage system), we are satisfied that pollution of ground and groundwater from the operation of the Facility is unlikely.

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 does not adequately describe the condition of the soil and groundwater prior to the start of operations. We have therefore set a pre-operational condition (PO7) requiring the Operator to provide this information prior to the commencement of operations.

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

4.2.3 Closure and decommissioning

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

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

4.3 Operation of the Installation – general issues

4.3.1 Administrative issues

The Applicant is the sole Operator of the Installation.

During the consultation on the application, we received a lot of responses expressing concern over who the legal Operator of the site would be.

Our guidance 'Legal Operator and Competence Requirements: Environmental Permits' specifies that the Operator needs to have sufficient control over the facility and that they must:

- have day-to-day control of the facility or activity, including the manner and rate of operation;
- make sure that permit conditions are complied with;
- decide who holds important staff positions and have incompetent staff removed, if required;
- make investment and financial decisions that affect the facility's performance or how the activity is carried out; and
- make sure its activities are controlled in an emergency.

In addition, the above-mentioned guidance also states: "If contractors work at your site, you can still be classed as the legal operator if you have sufficient control of the activities carried out by your contractors."

The Consultant confirmed that Powerfuel Portland Ltd is a private company which has been set up for the development, management and operation of the incinerator facility. It is understood that Powerfuel Portland Ltd would plan to

subcontract the day-to-day operation of the Installation to a third-party organisation through an operation and maintenance (O&M) contract. However, the Consultant also confirmed that Powerfuel Portland Ltd would retain control of the installation through the terms of the contract. Highlighting that the installation would be operated in accordance with the instructions of Powerfuel Portland Ltd and that any O&M contractor would not be able to '*make investment and financial decisions that affect the facility's performance or how the activity is carried out*'.

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

4.3.2 Management

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

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

4.3.3 Site security

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

4.3.4 Accident management

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

The Applicant submitted a Fire Prevention Plan (FPP). We requested additional information through a Schedule 5 notice dated 09/09/2022. An updated FPP was submitted in response to our request on 10/10/2022.

We are satisfied that the information contained in the updated FPP, combined with the information required through pre-operational condition PO11, will be adequate to meet our FPP guidance. Full design details, including firewater provision, containment design and quarantine area were not available at the time of permit determination and therefore a pre-operational condition requires that details and plans of these, including confirmation of how they meet the standards set out in our FPP guidance, are submitted and approved prior to commissioning.

4.3.5 Off-site conditions

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

4.3.6 Operating techniques

We have specified that the Applicant must operate the Installation in accordance with the documents set out in table S1.2 of the permit.

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

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

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

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

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

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

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

The nominal design capacity of the Installation is approximately 183,000 tonnes per year based on an average CV and 8,000 hours operation per year. The Applicant's risk assessments were based on continual operation and/or allowance for waste with a lower CV, which would equate to approximately 202,000 tonnes per year. The Permit restricts throughput to this maximum capacity.

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

4.3.7 Energy efficiency

(i) Consideration of energy efficiency

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

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

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

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

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

for the operation of the installation as a high-efficiency cogeneration installation".

Cogeneration means the simultaneous generation in one process of thermal energy and electrical or mechanical energy and is also known as combined heat and power (CHP)

High-efficiency co-generation is cogeneration which achieves at least 10% savings in primary energy usage compared to the separate generation of heat and power – see Annex II of the Energy Efficiency Directive for detail on how to calculate this.

(ii) Use of energy within the Installation

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

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

- The Facility has been designed with careful attention being paid to all normal energy efficiency design features, such as high efficiency motors, high efficiency variable speed drives, high standards of cladding and insulation.
- An energy efficiency plan would be built into the operation and maintenance procedures of the plant ensuring maximum, practical, sustainable, safe and controllable electricity generation. The plan would be reviewed regularly as part of the environmental management systems.
- The Facility will be designed to achieve a high thermal efficiency. In particular:

  (i) the boiler will be equipped with economisers and superheaters to optimise thermal cycle efficiency without prejudicing boiler tube life, having regard for the nature of the waste fuel that is combusted;
  (ii) unnecessary releases of steam and hot water will be avoided, to avoid the loss of boiler water treatment chemicals and the heat contained within the steam and water;
  (iii) low grade heat will be extracted from the turbine and used to preheat combustion air in order to improve the efficiency of the thermal cycle;
  (iv) steady operation will be maintained where necessary by using gas oil firing; and
  (v) boiler heat exchange surfaces will be cleaned on a regular basis to ensure efficient heat recovery.

- During normal operation, procedures will be reviewed and amended, where necessary, to include improvements in efficiency as and when proven new equipment and operating techniques become available.

The Application states that the specific energy consumption, (referred to as *'internal power consumption'* in the Application) a measure of total energy consumed per unit of waste processed, will be 130 kWh/tonne, at a nominal design capacity of 183,000 t/a.

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

The LCV in this case is expected to be 11 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 CHP Ready Guidance - February 2013 considers that BAT for energy efficiency for Energy from Waste (EfW) plant is the use of CHP in circumstances where there are technically and economically viable opportunities for the supply of heat from the outset.

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

In cases where there are no immediate opportunities for the supply of heat from the outset, the Environment Agency considers that BAT is to build the plant to be CHP Ready (CHP-R) to a degree which is dictated by the likely future opportunities which are technically viable and which may, in time, also become economically viable.

The BREF says that 0.4 – 0.8 MWh of electricity can be generated per tonne of waste.

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

The Installation will generate electricity only and has been specified to maximise electrical output with little or no use of waste heat. The Application shows 18.1 MW of electricity produced for an annual burn of 183,000 tonnes, which represents 9.9 MW per 100,000 tonnes/yr of waste burned (0.79 MWh/tonne of waste). The Installation is therefore at the upper end of the indicative BAT range, and also exceeds the upper end of the range stated in our technical guidance note.

The Application shows that the gross electrical efficiency will be 26% which is at the lower end of the BAT AEEL range of 25-35%, but not untypical for plants

processing less than 200,000 tonnes of waste per annum (nominal design capacity is approximately 183,000 tonnes per annum).

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 (Heat Plan) and provided a CHP-R assessment as part of their application, which showed there was potential to provide district heating to several local organisations/businesses; suitable opportunities are being explored, though there are no firm agreements at this stage. There is provision within the design of the steam turbine to extract steam and / or low temperature hot water for a district heating scheme. Establishing a district heating network to supply local users would involve significant technical, financial and planning challenges such that this is not seen as a practicable proposition at present.

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

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

(iv) R1 Calculation

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

The Applicant did not present an R1 calculation with this application, however we have now received a separate application for a determination on whether the installation is a recovery or disposal facility. This will be determined separately.

(v) Choice of Steam Turbine

The Application showed that the steam conditions will be 400°C and 51 bar. We are satisfied that this represents BAT in terms of steam conditions to ensure efficient energy recovery.

(vi) Choice of Cooling System

The Applicant has chosen an air cooled cooling system. This was justified on the basis that it will reduce water usage (compared to water cooling systems), that it does not create a visual impact (i.e. a visible plume) unlike that from evaporative cooling, and that it can be designed and guaranteed by the technology supplier with sufficient capacity to maintain turbine efficiency during warm weather. It was stated that that the use of a direct (once-through) cooling would necessitate significant abstraction infrastructure within the harbour and would also result in a discharge of cooling water to the harbour, neither of which were reported to be feasible based on initial design work.

(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 the Isle of Portland in which they calculated net present value. If the NPV is positive (i.e. any number more than zero) it means that the investors will make a rate of return that makes the scheme commercially viable. A negative NPV means that the project will not be commercially viable. The Applicant's assessment showed a net present value of -2.44 which demonstrates that operating as a high-efficiency cogeneration installation will not be financially viable. We agree with the applicant's assessment and will not require the installation to operate as a high-efficiency cogeneration installation.

The cost-benefit assessment considered opportunities within the Isle of Portland only, rather than within 15km of the installation. Given the local geography and the difficulties this would present in connecting to the mainland we agree with this approach.

(viii) Permit conditions concerning energy efficiency

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

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

The Operator is required to report energy usage and energy generated under condition 4.2 and Schedule 5. The following parameters are required to be reported: total electrical energy generated; electrical energy exported; total energy usage and energy exported as heat (if any). Together with the total MSW burned per year, this will enable the Environment Agency to monitor energy recovery efficiency at the Installation and take action if at any stage the energy recovery efficiency is less than proposed.

There are no site-specific considerations that require the imposition of standards beyond indicative BAT, and so the Environment Agency accepts that the Applicant's proposals represent BAT for this Installation.

4.3.8 Efficient use of raw materials

Having considered the information submitted in the Application, we are satisfied that the appropriate measures will be in place to ensure the efficient use of raw materials and water.

The Operator is required to report with respect to raw material usage under condition 4.2.2 and Schedule 4, including consumption of lime, activated carbon and ammonia used per tonne of waste burned. This will enable the Environment Agency to assess whether there have been any changes in the efficiency of the air pollution control plant, and the operation of the SNCR to abate NO_x. These are the most significant raw materials that will be used at the Installation, other than the waste feed itself (addressed elsewhere). The efficiency of the use of auxiliary fuel will be tracked separately as part of the energy reporting requirement under condition 4.2.2. Optimising reagent dosage for air abatement systems and minimising the use of auxiliary fuels is further considered in the section on BAT.

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

This requirement addresses wastes produced at the Installation and does not apply to the waste being treated there. The principal waste streams the Installation will produce are bottom ash and air pollution control 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% or loss on ignition (LOI) of <5% in bottom ash. Compliance with this limit will demonstrate that good combustion control and waste burnout is being achieved in the furnaces and waste generation is being avoided where practicable.

Incinerator bottom ash (IBA) will normally be classified as non-hazardous waste. However, IBA is classified on the European List of Wastes as a “mirror entry”, which means IBA is a hazardous waste if it possesses a hazardous property relating to the content of dangerous substances. Monitoring of incinerator ash will be carried out in accordance with the requirements of Article 53(3) of IED. Classification of IBA for its subsequent use or disposal is controlled by other legislation and so is not duplicated within the permit.

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

To ensure that the IBA residues are adequately characterised, pre-operational condition PO3 requires the Operator to provide a written plan for approval detailing the ash sampling protocols. Table S3.5 requires the Operator to carry out an ongoing programme of monitoring.

The Application proposes that bottom ash will be transported off-site to a suitably licensed waste treatment facility for recovery/disposal. There will be no bottom ash treatment undertaken at the installation.

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

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

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 and generation of waste and other environmental impacts. Consideration may also have to be given to the effect of emissions being subsequently deposited onto land (where there are ecological receptors). All these factors are discussed in this and other sections of this document.

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

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

5.1 Assessment Methodology

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

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

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

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

5.1.2 Use of Air Dispersion Modelling

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

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

Our web guide sets out the relevant ES as:

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

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

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

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

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

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

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

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

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

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

5.2 Assessment of Impact on Air Quality

The Applicant's assessment of the impact on air quality in relation to emissions from the main stack (chimney) via emission point A1 is set out in Appendix D of the Application, and in Annex A of their response to our Schedule 5 Notice dated 4th November 2021. Annex B of the Schedule 5 Notice response contains the Applicant's assessment of the impact on air quality in relation to emissions from the on-site emergency diesel generator (EDG) via emission point A2.

The assessment comprises:

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

The Applicant also submitted an assessment of emissions associated with the import and export of materials during the construction (traffic) and operational phases (traffic and shipping). These assessments 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 main stack and its impact on local air quality. The impact on conservation sites is considered in section 5.4. Section 5.7 of the decision document considers the dispersion modelling and impact assessment of emissions to air from the emergency diesel generator.

The Applicant has assessed the Installation's potential emissions to air against the relevant air quality standards, and the potential impact upon local conservation and habitat sites and human health. These assessments predict the potential effects on local air quality from the Installation's stack emissions using the ADMS 5.2 dispersion model, which is a commonly used computer model for regulatory dispersion modelling. The model used 5 years of data collected from the weather station at Portland meteorological recording station located approximately 5km to the south-west of the installation (at the National Coastwatch site), between 2014 and 2018. The Application states that alternative weather data from closer monitoring stations at Portland harbour were considered but that these datasets lacked all the variables needed for modelling purposes. The Applicant therefore considered Portland meteorological recording station to be the closest and most representative station available. We believe this is an appropriate location based on the predominant south westerly winds influenced by the sea, and that the data used by the Applicant is likely to be reasonably representative of the region. However, in addition to this meteorological data, in reviewing the Applicant's

assessment we also considered data from Portland Heliport located approximately 1.5 north-west of the installation.

The impact of the terrain surrounding the site upon plume dispersion was considered in the dispersion modelling. This is considered further in Section 5.2.4.

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

- First, they assumed that the ELVs in the Permit would be the maximum permitted by Article 15(3), Article 46(2) and Annex VI of the IED. These substances are:
    - Oxides of nitrogen (NO_x), expressed as NO_2
    - Total dust
    - Carbon monoxide (CO)
    - Sulphur dioxide (SO_2)
    - Hydrogen chloride (HCl)
    - Hydrogen fluoride (HF)
    - Metals (Cadmium, Thallium, Mercury, Antimony, Arsenic, Lead, Chromium, Cobalt, Copper, Manganese, Nickel and Vanadium)
    - Polychlorinated dibenzo-para-dioxins and polychlorinated dibenzo furans (referred to as dioxins and furans)
    - Gaseous and vaporous organic substances, expressed as Total Organic Carbon (TOC)
    - Ammonia (NH_3)

- Second, they assumed that the Installation operates continuously at the relevant long-term or short-term ELVs, i.e. the maximum permitted emission rate.

- Metals were considered in more detail as summarised in section 5.2.3 of this decision document.

- Third, the model also considered emissions of pollutants not covered by Annex VI of IED, specifically, polycyclic aromatic hydrocarbons (PAH) and Polychlorinated biphenyls (PCBs). Emission rates used in the modelling have been taken from the Environment Agency public register where the highest recorded emission concentration of Benzo(a)pyrene (PAH) was used, and from the Waste Incineration BREF for PCBs. Both are considered further in section 5.2.5.

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

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

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

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

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

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

5.2.1 Assessment of Air Dispersion Modelling Outputs

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

The Applicant's modelling predicted peak ground level exposure to pollutants in ambient air and at discrete receptors. In the tables below we have conservatively assumed that the maximum concentrations occur at the location of receptors.

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 process contribution and predicted environmental concentration. These are the numbers shown in the tables below and so may be very slightly different to those shown in the Application. Any such minor discrepancies do not materially impact on our conclusions.

In 2021 New Environmental Assessment Levels (EALs) were published in our guidance for arsenic (changing from 3 to 6 ng/Nm^3 as annual averages) and chromium VI (changing from 0.0002 to 0.00025 µg/m^3 as annual averages), Air emissions risk assessment for your environmental permit - GOV.UK (www.gov.uk). The Applicant assessed emissions of these pollutants against the old standards. As the new EALs are higher than the previous ones, the predicted impact will be lower than indicated in the Application. Therefore, the Applicant elected not to re-consider these. For these pollutants we have shown the Applicant's modelled PC but compared it with the new environmental standards. These are the numbers shown in the tables below and while they may differ slightly from those shown in the Application these differences do not materially impact on our conclusions.

The Applicant also considered the higher (now superseded) ES for PM2.5 of 25 (now 20). We have considered the lower EAL in our assessment. A new EAL has also been published for benzene (changing from 195 µg/m^3 hourly to 30 µg/m^3

daily). The Applicant used the hourly EAL, however we have considered the daily EAL in our assessment. This is shown in the table below.

Also, during determination new EALs were implemented for a number of pollutants including some metals. The values were updated on the GOV.UK risk assessment page on 20 November 2023, Air emissions risk assessment for your environmental permit - GOV.UK (www.gov.uk).These updated EALs are not shown in the tables below, however, we checked the Applicant's modelling against these new EALs and carried out our own screening checks. We have assessed the normal operations of the facility at the BAT-AELs. The conclusions of our assessment can be found in Sections 5.2.2 and 5.2.3 below.

There are also slight discrepancies in the ESs used by the applicant for PCBs (annual) and PAH (annual). For these pollutants we have shown the Applicant's modelled PC but compared it with the published environmental standards. The numbers may differ slightly from those shown in the Application, but these differences do not impact on our conclusions.

Pollutant (Non-metals)	**Environmental Standard (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	22.02	0.77	1.93	22.79	56.98
	200	99.79th %ile of 1-hour means	44.04	79.84	39.92	123.88	61.94
PM_{10}	40	Annual Mean	14.74	0.05	0.13	14.79	36.98
	50	90.41st %ile of 24-hour means	29.48	0.14	0.28	29.62	59.24
$PM_{2.5}$	20	Annual Mean	8.68	0.05	0.25	8.73	43.65
SO_2	266	99.9th %ile of 15-min means	6.64	49.16	18.48	55.80	20.98
	350	99.73rd %ile of 1-hour means	6.64	39.53	11.29	46.17	13.19
	125	99.18th %ile of 24-hour means	6.64	2.38	1.90	9.02	7.22

Pollutant (Non-metals)	Environmental Standard (ES)		Back-ground	Process Contribution (PC)		Predicted Environmental Concentration (PEC)	
	µg/m^3	Reference period	µg/m^3	µg/m^3	% of EAL	µg/m^3	% of EAL
HCl	750	1-hour average	1.42	17.53	2.34	18.95	2.53
HF	16	Monthly average	2.35	0.01	0.06	2.36	14.75
	160	1-hour average	4.7	1.17	0.73	5.87	3.67
CO	10000	Maximum daily running 8-hour mean	418	26.97	0.27	444.97	4.45
	30000	1-hour average	418	43.82	0.15	461.82	1.54
TOC Note 1	2.25	Annual Mean	0.09	0.09	4.00	0.18	8.00
	30	24-hour average	0.54	5.84	19.47	6.38	21.27
PAH Note 2	0.00025	Annual Mean	0.00098	0.00000096	0.38	0.0010	392.38
NH_3	180	Annual Mean	0.82	0.07	0.04	0.89	0.49
	2500	1-hour average	1.64	2.34	0.09	3.98	0.16
PCBs	0.2	Annual Mean	0.00013	0.00005	0.03	0.0002	0.09
	6	1-hour average	0.00026	0.00146	0.02	0.00172	0.03

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

Pollutant (Metals)	Environmental Standard (ES)		Back-ground	Process Contribution (PC) Note 1		Predicted Environmental Concentration (PEC)r	
	ng/m^3	Reference period	ng/m^3	ng/m^3	% of EAL	ng/m^3	% of EAL
Cd	5	Annual mean	0.57	0.18	3.60	0.75	15.00
Hg	250	Annual mean	2.8	0.18	0.07	2.98	1.19
	7500	1-hour average	5.6	10.22	0.14	15.82	0.21
Sb	5000	Annual mean	-	2.75	0.06	-	-
	150000	1-hour average	-	104.54	0.07	-	-
Pb	250	Annual mean	9.8	2.75	1.10	12.55	5.02
Cu	10000	Annual mean	33	2.75	0.03	35.75	0.36
	200000	1-hour average	66	104.54	0.05	170.54	0.09
Mn	150	Annual mean	36	2.75	1.83	38.75	25.83
	1500000	1-hour average	72	104.54	0.01	176.54	0.01
V	5000	Annual mean	1.70	2.75	0.06	4.45	0.09
	1000	24-hr average	3.4	104.54	10.45	107.94	10.79
As	6	Annual mean	1.1	2.75	45.83	3.85	64.17
Cr (II)(III)	5000	Annual mean	39	2.75	0.06	41.75	0.84
	150000	1-hour average	78	104.54	0.07	182.54	0.05
Cr (VI)	0.25	Annual mean	7.80	2.75	1100.00	10.55	4220.0
Ni	20	Annual mean	2.7	2.75	13.75	5.45	27.25

Note 1: Where short term PC is given as 104.54 and/or long term PC given as 104.54 modelling has been based on the assumption that metals are emitted at combined metal limit.

During our assessment we noted an error in the Applicant's figures for the calculated PEC for short term impacts where the PC of 104.54 had been used. We have substituted our own figures in the table above (calculated using the background and PC figures provided by the Applicant). These differences do not impact on our conclusions.

(i) Screening out emissions which are insignificant

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

- PM_{10}, $PM_{2.5}$, HCl, HF, CO, PAH, NH_3, PCB's, Hg, Sb, Cu, and Cr (II)(III)

Although the PC for PAH screens out, in that it is <1% of the long term ES, we note that the PEC exceeds 100% of the short term ES. It is considered further in section 5.2.2.

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

(ii) Emissions unlikely to give rise to significant pollution

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

- NO_2, SO_2, TOC, Cd, Pb, Mn, V, As, and Ni

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

(iii) Emissions requiring further assessment

Finally, from the tables above the following emissions are considered to have the potential to give rise to pollution in that the Predicted Environmental Concentration exceeds 100% of the long term or short term ES.

- Cr (VI)

This substance is considered further in section 5.2.3.

5.2.2 Consideration of key pollutants

(i) Nitrogen dioxide (NO_2)

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

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

(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 μg/m^3 and a short term daily average of 50 μg/m^3. For $PM_{2.5}$ the ES of 20 μg/m^3 as a long-term annual average was used, having changed from 25 μg/m^3 in 2020.

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

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

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

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

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

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

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

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

(iii) Acid gases, SO_2, HCl and HF

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

There is no long term EAL for SO_2 for the protection of human health. Protection of ecological receptors from SO_2 for which there is a long term ES is considered in section 5.4. 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 CO, VOCs, PAHs, PCBs, Dioxins and NH_3

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

The above tables show that for VOC emissions, the peak long term PC is greater than 1% of the ES and therefore cannot be screened out as insignificant. Even so, from the table above, the emission is not expected to result in the ES being exceeded. The Applicant has used the ES for 1,3 butadiene for their assessment of the impact of long term emissions of VOC. This is based on 1,3 butadiene having the lowest ES of organic species likely to be present in VOC (other than PAH, PCBs, dioxins and furans). This is a conservative assessment with the actual impact likely to be lower. New EALs for 1,3 butadiene were published on GOV.uk in November 2023. We checked the Applicants modelling against these new EALs and carried out our own screening checks. We are satisfied that the new EALs do not change the conclusions of our audit.

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 less than 1% of the ES and therefore can be screened out as insignificant. However, from the table above, the PEC exceeds 100% of the short term ES. The contribution from the Installation is negligible and the background is already above the ES. The Applicant is required to prevent, minimise and control emissions using the best available techniques; this is considered further in Section 6.

The impact from VOCs was based on the emission limit set in the permit for total organic carbon. The Applicant has also used the ES for benzo[a]pyrene (BaP) for their assessment of the impact of PAH. We agree that the use of the BaP ES is sufficiently precautionary.

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

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

The ammonia emission is based on a release concentration of 8 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. This limit was proposed by the Applicant and is tighter than the BREF limit of 10 mg/m^3.

(V) Summary

For the above emissions to air, for those emissions that do not screen out, we have carefully scrutinised the Applicant's proposals to ensure that they are applying the BAT to prevent and minimise emissions of these substances. This is reported in section 6 of this document. Therefore, we consider the Applicant's proposals for preventing and minimising emissions to be BAT for the Installation. Dioxins and furans are considered further in section 5.3.2.

5.2.3 Assessment of Emission of Metals

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

There are three sets of BAT AELs for metal emissions:

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

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

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

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

- Hg, Sb, Cu, and Cr (II)(III)

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

- Cd, Pb, Mn, V, As, and Ni

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

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

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

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

- Cr(VI)

During determination new EALs were implemented for a number of pollutants including some metals (Cd, Cr (III), Cu, Hg and Ni). The values were updated on the GOV.UK risk assessment page on 20 November 2023. We have re-assessed the process contributions (PCs) against the updated EALs and carried out our own screening checks. We are satisfied that the new EALs do not change the conclusions of our audit. Assessment of PCs for long-term Cr (III), Cu and Hg, and short-term Hg against the revised EALs show that the PCs screen out as insignificant. Normal operation long-term and short-term PCs for Cd and Ni are likely to be not insignificant against the revised EALs. However, when taking the

background concentrations into consideration, the predicted environmental concentrations (PECs) are well below the updated EALs.

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

Improvement Condition IC6 has been set for the Applicant to confirm this assessment with monitoring data from the Installation.

5.2.4 Consideration of Local Factors

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

No Air Quality Management Areas (AQMAs) have been declared within an area likely to be affected by emissions from the incinerator.

(ii) Topography

The site is bordered to the southwest by Incline Road and a former railway embankment. Cliffs, supporting grassland, scrub and woodland habitats lie to the southwest of the embankment and rise steeply to approximately 125 m above ordnance datum (AOD). The site is located at approximately sea level with an 80 m stack height. Inland terrain features are above 1 in 10. Software algorithms will treat this situation differently depending on approximations to atmospheric conditions and whether the plume would have enough momentum to move upwards in its entirety, partially or downwards.

Using AERMOD, our audit results indicated potential exceedances of the environmental standards for observed meteorological data with relatively more frequent north easterly winds. Therefore, we requested the Applicant to provide further evidence, including sensitivity to alternative modelling software and evaluation of the uncertainty to further evidence their conclusions. This was addressed in Annex A of their response to our Schedule 5 Notice dated 4th November 2021. The Applicant presented sensitivity analysis to various input parameters to evaluate uncertainty. They concluded that, except for the choice of modelling software, these do not have a significant effect on the predicted results and the conclusions would be the same if different input parameters were used. The Applicant's sensitivity analysis considered an evaluation of reasonable worst-case predictions based on the ADMS model. We consider that the Applicant's submitted evidence, supporting the ADMS model performance in this specific situation is reasonable. We are satisfied that predicted exceedances based on the AERMOD model (as used in our screening checks) are likely to be unrealistic worst-cases.

As a result of our evaluation and review of the evidence, we found no grounds to disagree with the Applicant's conclusion in this particular situation and are satisfied that the Applicant's conclusions, based on the ADMS model, can be used for permit determination.

(iii) Local weather conditions

During the consultation on the application we received a lot of responses expressing concern over local weather conditions including temperature inversions and whether this would trap emissions leading to increased impacts.

Temperature inversions typically occur on clear nights with calm winds. They develop during the night and typically break up a few hours after sunrise. The Applicant's ADMS model considered the impact under stable condition type temperature inversions.

Cloud cover affects the boundary layer height, this is considered in the meteorological model treatments. The boundary layer is defined as the part of the atmosphere that directly feels the effect of the earth's surface. Its depth is dependent on the local meteorology. The meteorological data used in both the Applicant's assessment and our audit of the Applicant's dispersion modelling included cloud cover data. Therefore, any influence it will have on dispersion was considered in the assessment.

As a result of our audit, we were satisfied that the Applicant's predictions represented a reasonable worst case and could be used for permit determination. We are still satisfied that there will not be a significant impact on air quality or health when taking into account local weather conditions and the costal location in proximity to the steep incline.

We also received a lot of responses about the suitability of the meteorological data used in the Applicant's modelling and whether it was representative of the conditions at the installation.

The model used 5 years of data collected from the weather station at Portland meteorological recording station located approximately 5km to the south-west of the installation (at the National Coastwatch site), between 2014 and 2018. The Application states that alternative weather data from closer monitoring stations at Portland harbour were considered but that these datasets lacked all the variables needed for modelling purposes. The Applicant therefore considered Portland meteorological recording station to be the closest and most representative station available. We believe this is an appropriate location based on the predominant south westerly winds influenced by the sea, and that the data used by the Applicant is likely to be reasonably representative of the region. However, in addition to this meteorological data, in reviewing the Applicant's assessment we also tested sensitivity to a total of twelve years of meteorological data from varying locations, data sources, decades and observed vs. modelled data. We consider that these are likely to capture local patterns and variation in meteorological conditions in the dispersion of pollutants. This did not materially affect the predictions and we are satisfied that the Applicant's conclusions can be used for permit determination.

(iv) Additional sensitive receptor considered: Bibby Stockholm

The Bibby Stockholm ("the barge") is now moored within 500 metres of the installation. The barge is considered to be an additional sensitive receptor and as such it needed to be taken into consideration during determination.

Once the location of the Bibby Stockholm was known, we reviewed the Applicant's Air Quality Assessment, and undertook screening checks to confirm if our conclusions could still apply to the location of the barge or if additional modelling was required. The location of the barge is within the domain already modelled by the Applicant's Air Quality Assessment, which was submitted with the application.

We consider that predictions from the Applicant's existing modelling can be used for assessment of potential impacts at the barge and that no additional modelling of emissions to air was required for this receptor. Based on this we can conclude that exceedances are unlikely for all pollutants against the environmental standards at the location of the barge.

5.2.5 Consideration of Additional Measures to Control Emissions

In the BREF, BAT is regarded as installing Selective Non Catalytic Reduction (SNCR), to control oxides of nitrogen (NOx) emissions, with the corresponding ELV for ammonia as 10 mg/m^3. However, due to the efficiency of the applicant's unit, a limit lower than the BREF is achievable. The applicant has proposed a limit for ammonia which is tighter than the BREF incineration emission limit (8 mg/m^3 rather than 10 mg/m^3) and this has been used in the assessment, and permit conditions reflect this tighter emission limit.

5.3 Human health risk assessment

5.3.1 Our role in preventing harm to human health

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

i) Applying Statutory Controls

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

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

11 and 18 of the IED. These requirements may in some circumstances dictate tighter emission limits and controls than those set out in the BAT conclusions or Chapter IV of IED on waste incineration and co-incineration plants. The assessment of BAT for this installation is detailed in section 6 of this document.

ii) Environmental Impact Assessment

Industrial activities can give rise to odour, noise and vibration, accidents, fugitive emissions to air and water, releases to air (including the impact on Photochemical Ozone Creation Potential (POCP)), discharges to ground or groundwater, global warming potential and generation of waste. For an installation of this kind, the principal environmental effects are through emissions to air, although we also consider all of the other impacts listed. Section 5.1 and 5.2 above explain how we have approached the critical issue of assessing the likely impact of the emissions to air from the Installation on human health and the environment and any measures we are requiring to ensure a high level of protection.

iii) Expert Scientific Opinion

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 UK Health Security Agency (previously PHE). We also consult the local communities who may raise health related issues. All issues raised by these consultations are considered in determining the application as described in Annex 4 of this document.

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

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

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

The results of the Applicant's assessment 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 Applicant's assessment presented intake values as a ratio, when considered as a percentage they were below the 10% UKHSA threshold criteria when compared against the UK COT TDI.

The Applicant's assessment reports PCs at the most impacted sensitive receptor. During our audit, we also considered intake from all pathways at the maximum at the grid, assuming that food is grown and sourced locally at the maximum predicted point of impact within the modelling domain. We have assumed that food is grown and sourced locally from the maximum predicted point of impact within the modelling domain for a conservative assessment.

As part of the consultation process on the planning application for the Portland Energy Recovery Facility, the former Public Health England (PHE) requested the assessment of impacts of dioxins, furans and dioxins-like-PCBs against the tolerable daily intake (TDI). As a result, the consultant undertook an assessment to supplement the original Human Health Risk Assessment (HHRA). This supplementary assessment was submitted to the Environment Agency on 13 May 2022. We have evaluated whether the complementary submission would affect our audit conclusions. The Applicant compares intakes against the UK Committee on Toxicity (COT) TDI of 2 pg WHO-TEQ/kg(BW)/day. The Applicant's values presented at the most impacted sensitive receptor are below the 10% threshold criteria (i.e., a maximum of 0.18% of the TDI). In the previous HHRA submitted with the application, intake values were presented as a ratio and were also below the 10% threshold criteria when compared against the UK COT TDI as a percentage. Our checks indicate that the supplementary assessment does not change our previous conclusion regarding impacts from dioxins, furans and dioxin-like PCBs. Although we do not necessarily agree with their exact numerical predictions, we agree with consultant's conclusions. The results of the Applicant's assessment of dioxin intake are detailed in the table below (worst – case results for each category are shown).

Receptor type	adult	child
Agricultural	0.0409	0.1007
Residential	0.0089	0.0310

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

The FSA has reported that dietary studies have shown that estimated total dietary intakes of dioxins and dioxin-like PCBs from all sources by all age groups fell by around 50% between 1997 and 2001 and are expected to continue to fall. A report in 2012 showed that Dioxin and PCB levels in food have fallen slightly since 2001. In 2001, the average daily intake by adults in the UK from diet was 0.9 pg WHO-TEQ/kg bodyweight. The additional daily intake predicted by the modelling as shown in the table above is substantially below this figure.

In 2010, FSA studied the levels of chlorinated, brominated and mixed (chlorinated-brominated) dioxins and dioxin-like PCBs in fish, shellfish, meat and eggs consumed in UK. It asked COT to consider the results and to advise on whether the measured levels of these PXDDs, PXDFs and PXBs indicated a health concern ('X' means a halogen). COT issued a statement in December 2010 and concluded that "The major contribution to the total dioxin toxic activity in the foods measured came from chlorinated compounds. Brominated compounds made a much smaller contribution, and mixed halogenated compounds contributed even less (1% or less of TDI). Measured levels of PXDDs, PXDFs and dioxin-like PXBs do not indicate

a health concern". COT recognised the lack of quantified TEFs for these compounds but said that "even if the TEFs for PXDDs, PXDFs and dioxin-like PXBs were up to four-fold higher than assumed, their contribution to the total TEQ in the diet would still be small. Thus, further research on PXDDs, PXDFs and dioxin-like PXBs is not considered a priority."

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

5.3.3 Particulates smaller than 2.5 microns

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

Nano-particles are considered to refer to those particulates less than 0.1 µm in diameter ($PM_{0.1}$). Questions are often raised about the effect of nano-particles on human health, in particular on children's health, because of their high surface to volume ratio, making them more reactive, and their very small size, giving them the potential to penetrate cell walls of living organisms. The small size also means there will be a larger number of small particles for a given mass concentration. However the HPA statement (referenced below) says that due to the small effects of incinerators on local concentration of particles, it is highly unlikely that there will be detectable effects of any particular incinerator on local infant mortality.

The HPA (now UKHSA) addresses the issue of the health effects of particulates in their September 2009 statement 'The Impact on Health of Emissions to Air from Municipal Incinerators'. It refers to the coefficients linking PM_{10} and $PM_{2.5}$ with effects on health derived by COMEAP and goes on to say that if these coefficients are applied to small increases in concentrations produced, locally, by incinerators; the estimated effects on health are likely to be small. PHE note that the coefficients that allow the use of number concentrations in impact calculations have not yet been defined because the national experts have not judged that the evidence is sufficient to do so. This is an area being kept under review by COMEAP.

In December 2010, COMEAP published a report on The Mortality Effects of Long-Term Exposure to Particulate Air Pollution in the United Kingdom. It says that "a policy which aims to reduce the annual average concentration of $PM_{2.5}$ by 1 $\mu g/m^3$ would result in an increase in life expectancy of 20 days for people born in 2008." However, "The Committee stresses the need for careful interpretation of these metrics to avoid incorrect inferences being drawn – they are valid representations

of population aggregate or average effects, but they can be misleading when interpreted as reflecting the experience of individuals."

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

This is consistent with the assessment of this application which shows emissions of PM_{10} to air to be insignificant.

A 2016 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}, $PM_{2.5}$, SO_2, HCl, HF, CO, PAH, NH_3, PCB's, Hg, Sb, Cu, Cr (II)(III) and Cr (VI) have all indicated that the Installation emissions screen out as insignificant; where the impact of emissions of NO_2, TOC, Cd, Pb, Mn, V, As, and Ni 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.

The Environment Agency has reviewed the methodology employed by the Applicant to carry out the health impact assessment. We are satisfied with the Applicant's conclusions that there will not be a significant impact on health.

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

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

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

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

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

5.4.1 Sites Considered

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

- Studland to Portland SAC
- Isle of Portland to Studland Cliffs SAC
- Crookhill Brick Pit SAC
- Chesil & The Fleet SAC

- Chesil Beach & The Fleet SPA and Ramsar

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

- Chesil & The Fleet SSSI
- Isle of Portland SSSI
- Nicodemus Heights SSSI

The Installation is also located within 2km of Chesil Beach and Stennis Ledges Marine Conservation Zone (MCZ).

The following non-statutory local wildlife sites (LWS) are located within 2km of the Installation:

- Portland Heights LWS
- Verne Yeates LWS
- Verne to Grove LWS
- Grove Quarry LWS
- East Weare Camp LWS
- Osprey Quay Bunds LWS
- East Weare Rifle Range LWS

5.4.2 Habitats Assessment

(i) Background levels

The Air Pollution Information System (APIS) confirmed that there had been a mapping error in the ammonia data, also translating to an error in the total nitrogen deposition. Once background levels had been corrected, some sites (including ammonia at the Isle of Portland to Studland Cliffs SAC) now show as exceeding the relevant environmental standards.

We have used the most up-to-date background values as found on the APIS website (2019 data). For consistency, we have taken this approach for all pollutants, including those not affected by the APIS mapping error. Therefore, predicted environmental concentration (PEC) figures may vary from those presented in the Applicant's assessment.

(ii) Consideration of the Studland to Portland and Crookhill Brick Pit SACs

The Applicant did not identify Studland to Portland SAC in their assessment. The SAC lies off the south coast of England, entirely in UK territorial waters. The site is designated to protect reef habitat. It is not anticipated that emissions to air from the installation will significantly impact the marine ecosystem. Any pollutants from emissions of atmospheric gases from the installation will be regularly removed by tidal action and it is considered unlikely that there would be an adverse impact from

nitrogen deposition or toxic contamination. Specifically for this site, APIS confirms that the designated feature is not sensitive to NOx, ammonia (NH3), SO2, eutrophication (from nutrient deposition), or acidification. We have therefore concluded that it is not sensitive to air pollution from the installation and have not considered it further in our assessment.

The Crookhill Brick Pit SAC is located approximately 7.5km from the installation. It has been identified as a site providing habitat for great crested newts. The listed broad habitat type is described as 'standing open water and canals'. Critical levels/loads are applicable to habitats and flora only. However, if damage to supporting habitats could not be ruled out there could be a consequential effect on dependent fauna.

Although no specific process contributions are given for this SAC within the Applicant's modelling, their assessment confirms that Crookhill Brick Pit SAC is located within an area where process contributions are less than 1% of the long term and 10% of the short-term Critical Levels. APIS does not provide critical loads for this site. See 5.4.2(iii) for further explanation of Critical Loads and Critical levels.

The closest designated site, which has been included in the modelled domain, is the Chesil and The Fleet SAC, SPA and Ramsar. When taking the background into account there is sufficient headroom to conclude that an exceedance of the environmental standard is unlikely. The predicted process contribution, plus the background concentration (i.e. PEC) is less than 70% of the environmental standard. Due to the increased distance and subsequent increased dispersion, we would expect process contributions at the Crookhill Brick Pit SAC to be lower than the maximum process contributions considered for the Chesil Beach and the Fleet sites. Therefore, we conclude 'no likely significant effect' the Crookhill Brick Pit SAC.

Natural England agree with our conclusions for both the Studland to Portland and Crookhill Brick Pit SACs.

(iii) Assessment of emissions from the main stack

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

Consideration of Critical Levels

Critical Levels are defined as gaseous concentrations of pollutants in the atmosphere, above which direct adverse effects on receptors, such as human beings, plants, ecosystems or materials, may occur according to present knowledge.

Site	**Pollutant**	**Reference period**	**Critical Level (CL_e)**	**PC ($\mu g/m^3$)** Note 1	**PC as % CL_e**	**Back-ground ($\mu g/m^3$)**	**PEC ($\mu g/m^3$)**	**PEC as % CL_e**

			(µg/m³)					
Isle of Portland to Studland Cliffs SAC	NO_x	Annual	30	0.38	1.27	10.1	11.37	34.93
		Daily	75	11.47	15.29	20.2	31.67	**42.23**
	SO_2	Annual	10(Note 2)	0.09	0.9	-	-	-
	HF	Weekly	0.5	0.02	4	-	-	-
		Daily	5	0.1	2	-	-	-
	NH_3	Annual	1 (1)	0.03	3	1.18	1.21	**121**
Chesil / Chesil Beach & The Fleet SAC / SPA / Ramsar	NO_x	Annual	30	0.16	0.53	-	-	-
		Daily	75	4.02	5.36	-	-	-
	SO_2	Annual	20(Note 3)	0.09	0.45	-	-	-
	HF	Weekly	0.5	0.02	4	-	-	-
		Daily	5	0.03	0.6	-	-	-
	NH_3	Annual	3 (2)	0.01	0.33	-	-	-

Note 1: Maximum predicted Process Contribution (PC) within each habitat site.

Note 2: The lichen and bryophyte sensitivity standards for ammonia and sulphur dioxide have been assigned for this assessment as the presence of these features has been recorded in the Site Management Plan for at least one of the sections of the site.

Note 3: The lichen and bryophyte sensitivity standards for ammonia and sulphur dioxide have not been assigned for this assessment as the presence of these features has not been recorded.

Consideration of Critical Loads

Critical Load relates to the quantity of pollutant deposited from air to the ground. It is defined as a quantitative estimate of exposure to one or more pollutants below which significant harmful effects on sensitive elements of the environment do not occur according to present knowledge.

Site	**Pollutant**	**Critical Load (CL_o)**	**PC** Note 1	**PC as % of CL_o**	**Back-ground**	**PEC**	**PEC as % of CL_o**
Isle of Portland to Studland Cliffs SAC	Nitrogen deposition (kg N/ha/yr)	15-25	0.169	1.12	11	11.168	**74.45**
	Acid deposition (Keq/ha/yr)	CL_{min} N: 0.856 CL_{max} N: 4.856 CL_{max} S: 4.0	0.061	1.26	1.429	1.489	30.66
Chesil / Chesil Beach & The Fleet SAC / SPA / Ramsar	Nitrogen deposition (kg N/ha/yr)	8-10	0.073	0.91	-	-	-
	Acid deposition (Keq/ha/yr)	CL_{min} N: 0.223 CL_{max} N: 2.018 CL_{max} S: 1.58	0.026	1.29	1.036	1.062	52.63

Site	Pollutant	Critical Load (CL_o)	PC Note 1	PC as % of CL_o	Back-ground	PEC	PEC as % of CL_o
Note 1: Maximum predicted Process Contribution (PC) within each habitat site.							

In line with our guidance, agreed with Natural England, we concluded no likely significant effect alone or in-combination where:

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

From the tables above we have concluded no likely significant effect alone or in-combination for all pollutants, with the exception of the following at the Isle of Portland to Studland Cliffs SAC:

- short term (daily) NOx
- ammonia
- nutrient nitrogen deposition

We have therefore conservatively concluded there may be a likely significant effect from the above emissions at the Portland to Studland Cliffs SAC and assessed the impacts in further detail.

Daily average nitrogen oxides

The short-term NOx PC is 11.47 µg/m^3, which is 15.29% of the daily NOx critical level of 75 µg/m^3. The PC is greater than 10% of the critical level. Where the PC is greater than the screening thresholds, the assessment must continue to determine the impact by considering the predicted environmental concentration (PEC). The PEC is the combination of the PC substance to air and the background concentration of the substance which is already present in the environment.

The PECs can be considered as having 'no adverse effect' on the integrity of the site if the assessment has shown that both the following apply:

- proposed emissions comply with associated emission levels (AELs) or the equivalent requirements where there is no AEL; and
- the resulting PECs won't exceed 100% of the environmental standards.

In the absence of monitoring, background concentrations have been obtained using mapped data available via the APIS website. The 1km^2 tile which covers the proposed installation, port and part of the Isle of Portland to Studland Cliffs SAC (and Isle of Portland SSSI) already exceeds the environmental criterion (i.e. at 31.3 µg/m^3, according to 2019 APIS data).

The Applicant's contour plots can be used to estimate NOx process contributions in this area and the areas of maximum impact for use in the assessment. The modelling shows that in the area with the highest background (i.e. the area already exceeding the environmental criterion) predicted process contributions from the main stack are below the relevant significance screening thresholds for critical levels (<1% of the long term and <10% of the short term). Where the background concentration is currently exceeding the appropriate environmental criterion and the new process contribution will cause an additional small increase, regarded as not significant relative to the background concentration, it is still possible to conclude 'no likely significant effect'. We consider that the small increase in the overall PEC attributed to the PC from the installation is unlikely to have a significant impact.

Areas where the contour plots show the process contributions are likely to exceed the screening thresholds are located in the 1 km^2 tiles where NOx backgrounds indicate sufficient headroom. Therefore, exceedances are unlikely. The PEC is 31.67µg/m^3 (PC plus twice long-term background), this is 42.23% of the critical level. When taking the background into account there is sufficient headroom to conclude that an exceedance of the environmental standard is unlikely. The PEC is below the critical level.

Based on the above, it can be concluded that there will be no likely significant effect in respect of short-term NOx emissions from the main stack. Natural England agrees with our conclusions.

Ammonia

The Applicant's modelling showed that the PC for ammonia is above the 1% insignificance screening threshold level and the background already exceeds the critical level. We have therefore conservatively concluded there may be a likely significant effect due to toxic contamination from ammonia emissions and assessed the impacts in further detail.

The maximum PC for ammonia at the Isle of Portland to Studland Cliffs SAC from the proposed project on its own is calculated as being up to 3% of the relevant critical level. It is noted that the highest PC is predicted over only a relatively small area of the Habitats site (as shown by the Applicant's process contribution contour plots), and at a maximum of 3% of the critical level. We regard this as a small contribution, suggesting that the effect may be low. Where the PC is greater than the thresholds, the assessment must continue to determine the impact by considering the predicted environmental concentration (PEC). The PEC is the combination of the PC substance to air and the background concentration of the substance which is already present in the environment. If the background concentration is currently exceeding the appropriate environmental criterion and the new process contribution will cause an additional small increase regarded as not significant relative to the background concentration it is still possible to conclude 'no likely significant effect'. In the area where the PC is exceeding the 1% screening threshold, the maximum ammonia background concentration for

this SAC is 1.18 µg/m^3 (source APIS 2019 data). Therefore, the background value already exceeds the relevant environmental standard (1 µg/m^3) by 18%. The background concentration is predicted to exceed the appropriate environmental criterion and the installation process contribution will cause an additional small increase. The predicted PEC for ammonia is 1.21 µg/m^3. Which is 21% above the critical level. The PC accounts for 2.48% of the total PEC, meaning 97.52% is the background. We consider that the small increase in the overall PEC attributed to the PC from the installation is unlikely to have a significant impact. The scale of the contribution from the installation (concentration and area/size of impact) is limited. Therefore, we concluded that the emissions from the installation will not have an adverse effect on the integrity of the Isle of Portland to Studland Cliffs SAC. Natural England agreed with our assessment and conclusions.

Nutrient Nitrogen Deposition

The PEC is above 70% of the critical load we therefore concluded a likely significant effect. However, the critical load is not exceeded and there remains reasonable headroom. At 74.46%, the PEC is below the nutrient-nitrogen critical load, and it can be concluded that there will be no adverse effect in respect of nutrient nitrogen deposition.

(iv) Assessment of emissions from the emergency diesel generator (EDG)

The installation will also include an EDG. The applicant has not considered the impact of the EDG operation in relation to the annual mean assessment levels. They conclude that the contribution to annual mean impacts would not be significant due to the limited period of operation. Based on the operating conditions (testing up to 26 hours per year, up to 30 minutes every time, between 8am and 5pm and emergency operation being infrequent), we agree that annual impacts are not likely to be significant.

The modelling has shown that impacts from the EDG occur close to the site. Its impact has therefore been considered on the designated sites closest to the proposed plant (Isle of Portland to Studland Cliffs SAC (and Isle of Portland SSSI)). The contribution from the main stack in this area is minimal as the taller stack height means that the emissions travel further and avoid significant building downwash effects. As a result, the emissions from the EDG and main stack have been considered separately by the applicant. We agree with and have followed this approach in our assessment.

The tables below present the maximum predicted impact at any grid point within the Isle of Portland to Studland Cliffs SAC and Isle of Portland SSSI (worst case from the 5 years of meteorological data considered). Both have been considered here as they are primarily overlapping designations. However, impacts have been presented for each site individually because the extents of the designations are slightly different where the greatest impacts from the EDG occur, with the SSSI being slightly closer to the PPP than the SAC

The reference period is daily, we consider that the annual background level is both representative and conservative and therefore appropriate for use in the assessment.

Testing of the EDG would occur at the same time as the operation of the EfW plant. However, it is highly unlikely that a significant contribution from the EfW plant would coincide with the operation of the EDG, or that the conditions which result in the greatest ground level contributions would occur in the same hour due to the significantly different stack heights.

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

Consideration of Critical Levels

Critical Levels are defined as gaseous concentrations of pollutants in the atmosphere, above which direct adverse effects on receptors, such as human beings, plants, ecosystems or materials, may occur according to present knowledge.

The table below presents the maximum predicted impact at any grid point within the Isle of Portland to Studland Cliffs SAC.

Operation	**Pollutant**	**Reference period**	**Critical Level (CL_e) ($\mu g/m^3$)**	**PC ($\mu g/m^3$)**	**PC as % CL_e**	**Back-ground ($\mu g/m^3$)**	**PEC ($\mu g/m^3$)**	**PEC as % CL_e**
Testing	NO_x	Daily	75	32.6	**43.5**	34	66.6	88.9
Emergency	NO_x	Daily	75	78.1	**104.1**	34	112	**149.4**

The table below presents the maximum predicted impact at any grid point within the Isle of Portland to Studland Cliffs SSSI.

Operation	**Pollutant**	**Reference period**	**Critical Level (CL_e) ($\mu g/m^3$)**	**PC ($\mu g/m^3$)**	**PC as % CL_e**	**Back-ground ($\mu g/m^3$)**	**PEC ($\mu g/m^3$)**	**PEC as % CL_e**
Testing	NO_x	Daily	75	38.4	51.2	34	72.40	96.5
Emergency	NO_x	Daily	75	113.9	**151.9**	34	147.9	**197.2**

Consideration of Critical Loads

The Applicant has not considered the impact of testing and emergency operation for the EDG in relation to the annual mean assessment levels, this includes Critical Loads. They conclude that the contribution to annual mean impacts would not be significant due to the limited period of operation. Based on the operating conditions (testing up to 26 hours per year, up to 30 minutes every time, from 8am to 5pm and emergency operation remains infrequent), we agree that annual impacts are not likely to be significant.

In line with our guidance, agreed with Natural England, we conclude no likely significant effect alone or in-combination where:

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

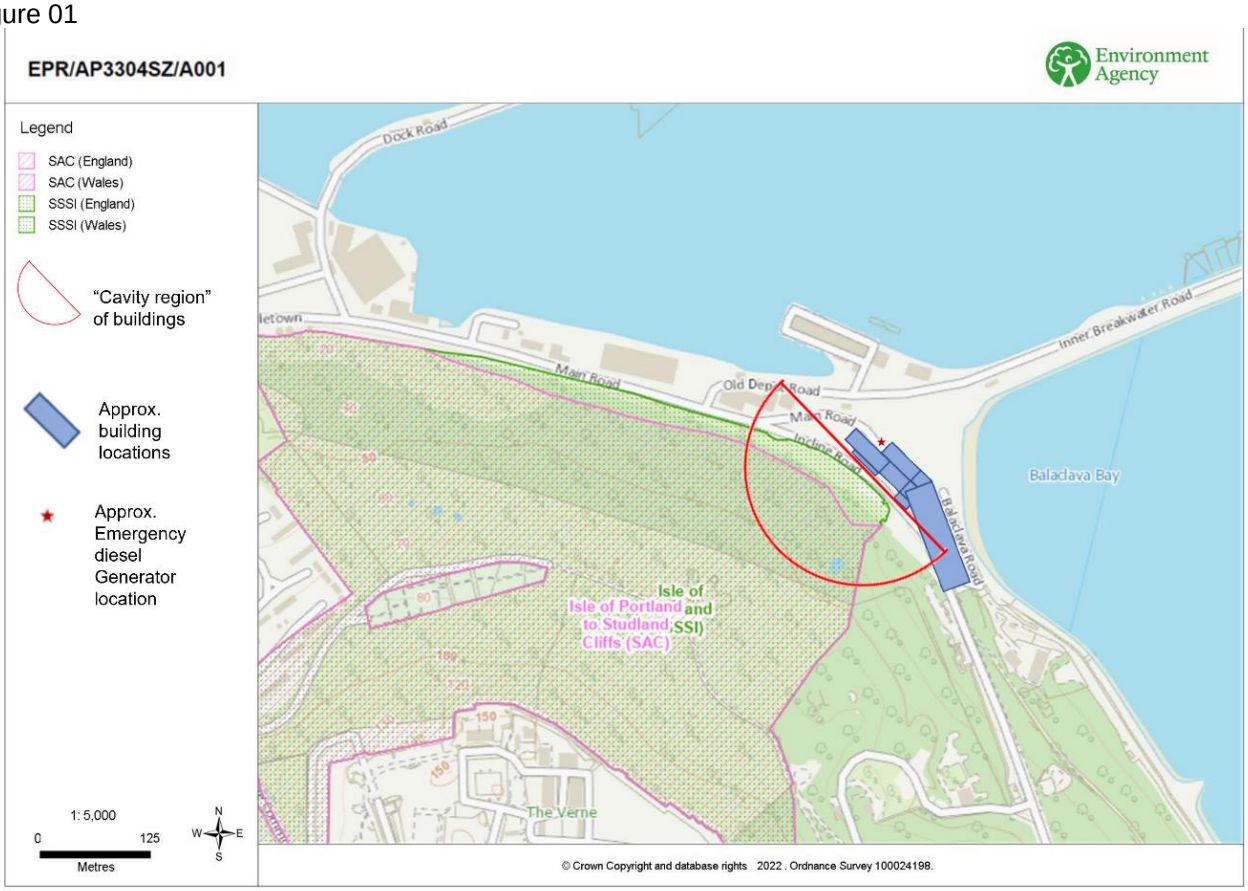
We have therefore conservatively concluded there may be a likely significant effect for short term NOx emissions and will consider this pollutant further for both operating scenarios.

Testing:

As shown in the table above, for testing operations, The PEC is not predicted to be exceeded at any point in the habitat sites. We can therefore conclude that there will be no adverse effect on site integrity. However, our assessment has highlighted an area of higher uncertainty due to building downwash effects, referred to as the 'cavity region' (see Figure 01). Airflow around buildings is often complex and may create zones of strong turbulence and downward mixing on the lee side, an effect known as building downwash. We have lower confidence in the applicant's predictions for this area and so further consideration is given below. We consider that exceedances of the daily NOx Critical level at the SAC and SSSI are unlikely at locations beyond the cavity region of the site buildings.

Figure 01 shows the approximate location of the proposed buildings, the proposed generator and the 'cavity region'. It also shows the locations of the SAC and SSSI.

Figure 01



Due to these higher uncertainties, we have little confidence in short-term (daily) NOx predictions in the area of the SSSI/SAC located within the 'cavity region' of the buildings. We therefore cannot rule out exceedances of the daily NOx Critical Level of 75µg/m^3 in this area. There is limited evidence to quantify uncertainties in modelling predictions in regions of such turbulent flow regimes and, therefore, predictions are highly uncertain. This does not mean that we consider that there will be an exceedance, but that the level of uncertainty in this area is too great to rule out the possibility.

It should be noted that the worst-case impacts in this area would only occur when the wind was coming from the north-east quadrant, and this is infrequent and is against the prevailing wind direction. The emissions from the EDG would need to rise, be taken over the 41m building and then drop into the building cavity region on the other side of the building.

We sought advice from Natural England on the characteristics of this area and whether there were any features present which could be sensitive to short term NOx. Natural England advised the following:

> *In the location you have indicated the SAC and SSSI habitats consist of dense scrub which is a supporting habitat rather than a feature for which the site is designated. In addition this area, which has been scrub for many years, is not an area where Natural England would seek to secure*

restoration to calcareous grassland (a SAC feature) hence the proposal is not preventing a restoration objective. The applicant has provided information on the location of sensitive lichens and bryophytes and none are recorded from this area of the SAC.

Therefore, Natural England can advise the EA that, whilst AQ thresholds are exceeded, there would not be an adverse effect on the SAC either on existing features or compromising the restoration of features in the future.

Based on the modelling undertaken by the applicant and the further information received from Natural England we are satisfied that it is possible to conclude no likely significant effect/damage on the integrity of the Isle of Portland to Studland Cliffs SAC and Isle of Portland SSSI. Natural England agrees with our conclusion.

Emergency operation:

In the event of loss of grid connection, the EDG would run to maintain operation of the abatement and control systems. This would enable a safe shutdown of the incinerator. It is assumed that the typical run time in this scenario would be no more than 4 hours for any one event.

As shown in the above table the maximum 24-hour impact is predicted to exceed the Critical Level of 75 µg/m^3. However, this conservatively assumes that the EDG is required for emergency usage during the worst-case weather conditions. The probability of this occurring has been calculated as follows:

1. The dispersion model has been used to determine how many times the contribution from the operation of the EDG during an emergency event is more than the headroom – i.e. more than the critical level of 75 µg/m^3 minus the background concentration.
2. There are 8757 hours during the year in which an event could have started and lasted for four hours during the year.
3. The chance of an event occurring which could have led to an exceedance is calculated as (1) divided by (2), assuming that one event occurs per year.

The probability of the PEC exceeding the daily mean Critical Level in an emergency scenario in an average year is 1.41% in the SSSI and 0.21% in the SAC. This is based on the maximum number of PEC exceedances of the Critical Level at any point using 5 years of weather data. This is conservative, as there have only been three grid outages over the past six years. Therefore, an exceedance of the daily mean Critical Level is unlikely.

The Environment Agency's "guidance for air quality assessments for specified generators" is designed to assess the situation where a generator only operates occasionally, but in every year, hence a 5% probability of an exceedance of the daily mean Critical Level in any one year leads to a likely exceedance over a 20 year period (5% x 20 years = 100%).

The average probability of the PEC exceeding the daily mean Critical Level in the SSSI is 1.41% meaning that the EDG would need to operate for approximately 70 years for the probability of the PEC exceeding the Critical Level in the SSSI to exceed 100% (100% / 1.41% = 70 years), or approximately 470 years for the SAC. Under the Environment Agency guidance the probability of an exceedance at the SAC can be described as ‘highly unlikely’.

As part of our assessment, we have also taken into account the likelihood of the source/pathway/receptor mechanism and screened out the environmental risk of operating scenarios that we consider highly unlikely. The emergency generator is designed and configured so that in the event of a mains failure, it will fire up to meet the load demand at the site and allow the safe shutdown of the incinerator. This scenario will not be permitted as a normal operation, it is an emergency operation allowed to happen only in the unlikely event of failure of electrical supply from the grid. Measures will be in place to prevent and manage/mitigate the occurrence of this emergency operation.

The primary prevention measure relied upon to avoid this emergency scenario is the highly reliable design of the electrical grid and of the site connections to it. Based on the information in the application, we agree that this feature of the installation is compliant with the best available techniques (BAT) and that the requirement to run the back-up generator in an emergency is therefore minimised as far as possible. These preventative, management and mitigation measures are not specifically implemented or specified to prevent and mitigate impacts at the conservation sites under assessment, instead they have been specified as part of the BAT compliance and structural set up of the installation.

The short-term NOx process contributions for the emergency operations of the site are above the insignificance screening threshold set in our guidance, however the structural preventative measures taken to avoid the occurrence of this emergency scenario make the source/pathway/receptor mechanism very unlikely. For the EDG, we consider that the only reasonably likely source/pathway/receptor mechanism would consist of periodic testing operations.

Based on the modelling and statistical analysis undertaken by the applicant, together with the unlikely occurrence of the emergency operational scenario, we are satisfied that it is possible to conclude no likely significant effect/damage on the integrity of the Isle of Portland to Studland Cliffs SAC and Isle of Portland SSSI.

(v) In combination assessment

‘Alone’ effects were considered above. It was concluded that there was no likely significant effect to the Isle of Portland to Studland Cliffs SAC. But effects were not completely avoided, therefore we also undertook an assessment of 'in combination effects' in line with our guidance.

The applicant has not identified information on any relevant future projects. We have considered existing developments identified by our screening as being

within 10km of the closest point of the habitat site to the installation in line with our guidance. Two relevant permitted sites, with emissions to air, were identified:

Sunseeker International Limited – Approximately 1.5km to the west of the installation. The facility comprises of one biomass boiler burning untreated waste wood chips with a thermal rated input of 1.1 MWth. The permit was granted in 2021, therefore emissions from the site are not included with the background used in the assessment. Detailed air quality modelling assessed during the permit determination of the Environmental Permit for this site showed the effects of NOx were limited to a small area in relatively close proximity to the emission point. The biomass boiler will not release any ammonia, hydrogen fluoride, or sulphur-based pollutants. The determination of the environmental permit for this site concluded that emissions will not affect any sites of nature conservation or habitats identified. Modelling demonstrated that the biomass boiler would have an insignificant impact at the nearest sensitive ecological habitats. We therefore consider that emissions from the biomass boiler are not likely to have a significant effect in combination with the installation. We conclude no adverse effect on the integrity of the SAC in combination with the installation.

Chickerell Generation - Approximately 7.5km to the north-west of the installation. This is a permitted large combustion plant (open cycle gas turbine). The permit was granted in 1997, therefore any emissions from the site are already included with the background. In addition, we consider that there is unlikely to be a significant effect in combination due to distance from the installation and the location of Chickerell Generation not being in the prevailing wind direction. We conclude no adverse effect on the integrity of the SAC in combination with the installation.

5.4.3 SSSI Assessment

The Applicant's assessment of SSSIs was reviewed by the Environment Agency's technical specialists for modelling, air quality, conservation and ecology technical services, who agreed with the assessment's conclusions, that the proposal does not damage the special features of the SSSI(s).

(i) Assessment of emissions from the main stack

Consideration of Critical Levels

Site	Pollutant	Reference period	Critical Level (CL_e) ($\mu g/m^3$)	PC ($\mu g/m^3$)	PC as % CL_e	Back-ground ($\mu g/m^3$)	PEC ($\mu g/m^3$)	PEC as % CL_e
Isle of Portland SSSI	NO_x	Annual	30	0.38	**1.27**	10.1	10.48	34.93
		Daily	75	11.47	**15.3**	20.2	31.67	42.23
	SO_2	Annual	10 (1)	0.04	0.4	-	-	-
	HF	Weekly	0.5	0.01	2	-	-	-
		Daily	5	0.03	0.6	-	-	-
	NH_3	Annual	1 (1)	0.03	**3**	1.18	1.21	**121**
Chesil & The Fleet SSSI	NO_x	Annual	30	0.16	0.53	-	-	-
		Daily	75	4.02	5.36	-	-	-
	SO_2	Annual	20	0.09	0.45	-	-	-
	HF	Weekly	0.5	0.02	4	-	-	-
		Daily	5	0.03	0.6	-	-	-
	NH_3	Annual	3	0.01	0.33	-	-	-
Nicodemus Heights SSSI	NO_x	Annual	30	0.17	0.57	-	-	-
		Daily	75	6.33	8.44	-	-	-
	SO_2	Annual	10 (1)	0.04	0.4	-	-	-
	HF	Weekly	0.5	0.02	4	-	-	-
		Daily	5	0.05	1	-	-	-
	NH_3	Annual	1 (1)	0.01	**1.1**	1.13	1.141	**114.1**

(1) The lichen and bryophyte sensitivity standards for ammonia and sulphur dioxide have been assigned for this assessment as the presence of these features has been recorded in the Site Management Plan for at least one of the sections of the site.
(2) The lichen and bryophyte sensitivity standards for ammonia and sulphur dioxide have not been assigned for this assessment as the presence of these features has not been recorded

Consideration of Critical Loads

Site	Pollutant	Critical Load (CL_o)	PC	PC as % of CL_o	Back-ground	PEC	PEC as % of CL_o
Isle of Portland SSSI	Nitrogen deposition (woodland) (kg N/ha/yr)	10-20	0.272	**2.72**	11.03	11.03	**113.02**
	Nitrogen deposition (grassland) (kg N/ha/yr)	15-25	0.169	**1.13**	11.03	11.12	**74.66**
	Acid deposition (Keq/ha/yr)	CL_{min} N: 0.856 CL_{max} N: 4.856 CL_{max} S: 4	0.061	**1.26**	0.797	0.858	17.67
Chesil & The Fleet SSSI	Nitrogen deposition (kg N/ha/yr)	8-10	0.073	0.91	-	-	-
	Acid deposition (Keq/ha/yr)	CL_{min} N: 0.223 CL_{max} N: 2.018 CL_{max} S: 1.58	0.027	**1.34**	1.036	1.063	52.67
Nicodemus Heights SSSI	Nitrogen deposition (kg N/ha/yr)	15-25	0.075	0.5	-	-	-
	Acid deposition (Keq/ha/yr)	CL_{min} N: 0.856 CL_{max} N: 4.856 CL_{max} S: 4	0.028	0.58	-	-	-

In line with our guidance, agreed with Natural England, we concluded no likely significant effect alone or in-combination where:

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

Isle of Portland SSSI:

The predicted PC of long-term NOx is >1% (1.27%) of the long-term CL_e. The PEC is 10.48 µg/m³, which is 34.93% of the critical level. The PEC is less than 70% of critical level, so there is sufficient headroom to conclude that an exceedance is unlikely.

Predicted PC of short-term NOx is >10% (15.3%) of the short-term Critical Level. The process contribution plus background concentration (i.e. PEC) is less than 100% of the appropriate environmental criterion. When taking the background into account, there is sufficient headroom to conclude that an exceedance of the environmental standard is unlikely.

The maximum ammonia background concentration for this SSSI is 1.18 µg/m^3 (source APIS 2019 data). Therefore, the background value already exceeds the relevant environmental standard by up to 18%. The background concentration is predicted to exceed the appropriate environmental criterion and the process contribution will cause an additional small increase. The predicted PEC for ammonia is 1.21 µg/m3. Which is 21% above the critical level. The PC accounts for 2.48% of the total PEC, meaning 97.52% is the background. We consider that the small increase in the overall PEC attributed to the PC from the installation is unlikely to have a significant impact. The scale of the contribution from the installation (concentration and area/size of impact) is limited. The maximum PC for ammonia at the Isle of Portland SSSI from the installation on its own is calculated as being up to 3% of the relevant critical level. It is noted that the highest PC is predicted over only a relatively small area of the SSSI, as shown by the Applicant's process contribution contour plots. We regard this as a small contribution, suggesting that the effect may be low. The PC over the rest of the SSSI is below the 1% screening threshold. Therefore, we can conclude that ammonia emissions are not likely to damage the SSSI.

For this SSSI, the maximum annual mean process contribution of nitrogen oxides, as nutrient nitrogen, predicted by the applicant is 0.272 kg N/ha/yr (woodland). This is above the significance screening threshold of 1% of the nutrient-nitrogen critical load (2.72%). The PEC is 11.3 kg N/ha/yr (based on 2019 background data, Source: APIS), which is 113.02% of the nutrient-nitrogen critical load for the most sensitive feature and therefore has the potential to cause not insignificant impacts at some locations within the SSSI. However, the background concentration is currently exceeding the appropriate environmental criterion and the new process contribution only will cause an additional small increase. PC as a percentage of the PEC is

2.41%, meaning the current background accounts for 97.59% of the PEC. We consider that the small increase in the overall PEC attributed to the PC from the installation is unlikely to have a significant impact. The scale of the contribution from the installation (both concentration and area/size of impact) is limited.

The critical load range for the grassland features is higher than the woodland features assessed above (15-25 kg N/ha/yr). For the grassland features, the maximum annual mean process contribution of nitrogen oxides, as nutrient nitrogen, predicted by the applicant is 0.169 kg N/ha/yr (1.13% of the critical load). The PEC is 11.12 kg N/ha/yr, which is 74.66% of the critical load. Therefore, when taking the background into account, there is sufficient headroom to conclude that an exceedance of the environmental standard is unlikely. We can conclude that the contribution of nitrogen oxides, as nutrient nitrogen, is not likely to damage special features of the SSSI.

For this SSSI, the maximum annual mean process contribution of pollutants responsible for acidification, predicted by the applicant is 0.061 keq/ha/yr, which is above the significance screening threshold of 1% of the acid critical load function (1.26%).

The PEC is 0.858 Keq/ha/yr, which is 17.67% of the acid critical load function. The PEC is less than 70% of the critical load therefore, when taking the background into account, there is sufficient headroom to conclude that an exceedance of the environmental standard is unlikely.

Based on the above assessment for emissions from the main stack we can conclude that the operation is not likely to damage special features of the SSSI. Natural England agrees with our conclusions.

Nicodemus Heights SSSI:

With the exception of ammonia, all process contributions screen out as insignificant.

The maximum PC for ammonia at the Nicodemus Heights SSSI from the proposed project on its own is calculated as being up to 1.1% of the relevant critical level. It is noted that the highest PC is predicted over only a relatively small area of the SSSI (as shown by the Applicant's process contribution contour plots) and at a maximum of 1.1% of the critical level. We regard this as a small contribution, suggesting that the effect may be low. The PC over the rest of the SSSI is below the 1% screening threshold.

The maximum ammonia background concentration for this SSSI is 1.13 µg/m^3 (source APIS 2019 data). Therefore, the background value already exceeds the relevant environmental standard by up to 13%. The new process contribution will only cause an additional small increase, which is not regarded as significant relative

to the background concentration. The predicted PEC for ammonia is 1.141 µg/m3. Which is 14.1% above the critical level. The PC accounts for 0.88% of the total PEC, meaning 99.12% is the background.

We consider that the small increase in the overall PEC attributed to the PC from the installation is unlikely to have a significant impact. The scale of the contribution from the installation (concentration and area/size of impact) is limited. Therefore, we can conclude that the operation is not likely to damage special features of the SSSI. Natural England agrees with our conclusions.

(ii) Assessment of emissions from the emergency diesel generator (EDG)

The modelling has shown that impacts from the EDG occur close to the site. Its impact has therefore been considered on the designated sites closest to the proposed plant (Isle of Portland to Studland Cliffs SAC and Isle of Portland SSSI). These are primarily overlapping designations. Therefore, our assessment of the emissions from the EDG to the SSSI is considered together with our assessment of the SAC in Section 5.4.2 (iv) of this Decision Document.

5.4.4 Assessment of other conservation sites

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

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

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

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

The Applicant's assessment showed that the PCs are below the critical levels or loads. We are satisfied that the Installation will not cause significant pollution at the sites. The Applicant is required to prevent, minimise and control emissions using BAT, this is considered further in Section 6.

5.5 Impact of abnormal operations

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

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

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

These abnormal operations are limited to no more than a period of 4 hours continuous operation and no more than 60 hour aggregated operation in any calendar year. This is less than 1% of total operating hours and so abnormal operating conditions are not expected to have any significant long term environmental impact unless the background conditions were already close to, or exceeding, an ES. For the most part therefore consideration of abnormal operations is limited to consideration of its impact on short term ESs.

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

- Dioxin emissions of 6 ng/m^3 (100 x normal)

- Mercury emissions are 100 times those of normal operation
- NO_x emissions of 500 mg/m^3 (1.25 x normal)
- Particulate emissions of 150 mg/m^3 (5 x normal)
- Metal emissions other than mercury are 30 times those of expected (based on Environment Agency guidance note) normal emissions
- SO_2 emissions of 450 mg/m^3 (2.25 x normal)
- HCl emissions of 900 mg/m^3 (15 x normal)
- HF emissions of 20 mg/m^3 (5 x normal)
- PCBs (100 x normal)

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

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

Pollutant	**Environmental Standard**		**Back-ground**	**Process Contribution (PC)**		**Predicted Environmental Concentration (PEC)**	
	µg/m^3		**µg/m^3**	**µg/m^3**	**% of EAL**	**µg/m^3**	**% of EAL**
NO_2	200	99.79th %ile of 1-hour means	44.04	34.93	17.5	78.97	39.5
PM_{10}	50	90.41st %ile of 24-hour means	-	4.22	8.44	-	-
SO_2	266	99.9th ile of 15-min means	6.64	110.6	41.6	117.24	44.1
	350	99.9th ile of 15-min means	6.64	88.9	25.40	95.54	27.3
	125	99.18th %ile of 24-hour means	6.64	35.76	28.61	42.4	33.9
HCl	750	1-hr average	1.42	262.9	35.05	264.3	35.24

Pollutant	Environmental Standard		Back-ground	Process Contribution (PC)		Predicted Environmental Concentration (PEC)	
	µg/m^3		µg/m^3	µg/m^3	% of EAL	µg/m^3	% of EAL
HF	160	1-hr average	-	5.8	3.625	-	-
Hg	7500	1-hr average	-	584.24	7.79	-	-
Sb	150000	1-hr average	-	100.78	0.07	-	-
Cu	200000	1-hr average	-	254.14	0.13	-	-
Mn	1500000	1-hr average	-	525.82	0.04	-	-
PCBs	6000	1-hr average	-	146.06	2.43	-	-
Cr (II)(III)	150000	1-hr average	-	806.25	0.54	-	-

From the table above, emissions can still be considered insignificant, in that the PC is still <10% of the short-term ES, or where not screened out as insignificant, have been assessed as being unlikely to give rise to significant pollution in that the predicted environmental concentration is less than 100% of short-term ES. Metals were also insignificant when also precautionarily assumed that these metals could be 30 times above the ELV.

During determination new EALs were implemented for a number of pollutants including some metals. Some of these new EALs are applicable to the assessment for the impact of abnormal operations. The values were updated on the GOV.UK risk assessment page on 20 November 2023.These updated EALs are not shown in the table above, however we checked the Applicant's modelling against these new EALs and carried out our own screening checks. We have used our own reasonable worst-case emissions scenarios for abnormal operations to conduct these additional checks. We are satisfied that the new EALs do not change the conclusions of our audit. Under abnormal operating conditions, the 1,3-butadiene, mercury, cadmium and nickel PCs are likely to be not insignificant. However, when taking the

background concentrations into consideration, the predicted environmental concentrations (PECs) are well below the updated EALs.

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 6 ng/m^3 for the maximum period of abnormal operation, this would result in an increase of approximately 70% in the TDI reported in section 5.3.2. In these circumstances the intake would be 0.17% of the TDI, based on impact at the most impacted receptor. At this level, emissions of dioxins will still not pose a risk to human health.

5.6 Impact of emissions from the Emergency Diesel Generator

The installation will also include an Emergency Diesel Generator (EDG). This will be required to safely shutdown the main plant in the event of a loss of grid connection to maintain operation of the abatement control systems. This event would typically occur for no more than 4 hours. In this operating scenario, the EDG would need to operate at 100% load following the initial loss of grid connection. However, as the shutdown sequence progressed the abatement and control systems would be reduced in operation so that the EDG could operate at a reduced load. Power for the start-up being provided by the grid connection, once restored, not the EDG.

The applicant has not considered the impact of the EDG operation in relation to the annual mean assessment levels. They conclude that the contribution to annual mean impacts would not be significant due to the limited period of operation. Based on the operating conditions (testing up to 26 hours per year, up to 30 minutes every time, between 8am and 5pm and emergency operation being infrequent), we agree that annual impacts are not likely to be significant.

The modelling has shown that impacts from the EDG occur close to the site. The contribution from the main stack in this area is minimal as the taller stack height means that the emissions travel further and avoid significant building downwash effects. As a result, the emissions from the EDG and main stack have been considered separately by the applicant. We have followed this approach in our assessment. Testing of the EDG would occur at the same time as the operation of the EfW plant. However, it is highly unlikely that a significant contribution from the EfW plant would coincide with the operation of the EDG, or that the conditions which result in the greatest ground level contributions would occur in the same hour due to the significantly different stack heights.

The 1-hour AQAL for nitrogen dioxide of 200 µg/m^3, which can be exceeded 18 times per year. The table below shows the maximum predicted impact at any grid point during testing and an emergency event, it shows the worst case from the 5 years of meteorological data considered in the modelling. The 1-hour AQAL does not apply

where public would not be expected to have regular access. Therefore, whilst this analysis has considered the point of maximum impact the AQAL does not necessarily apply at this point. It is therefore considered to be conservative.

Operation	**Pollutant**	**Reference period**	**AQAL (µg/m^3)**	**PC as % AQAL**
Testing	NO_x	1 hour	200	**246**
Emergency	NO_x	1 hour	200	**361**

Testing:

As shown, the maximum 1-hour nitrogen dioxide process contribution is predicted to exceed the AQAL. However, this conservatively assumes that testing occurs during the worst-case weather conditions for dispersion in the hours of 08:00 and 18:00 (i.e. 3650 hours in each year). Testing would occur on a 2-week basis and as such would only occur about 26 times in a year.

Therefore, it is necessary to assess how likely it is that the testing period would coincide with the worst-case weather years. To do this, a cumulative hypergeometric distribution calculation has been carried out in line with the EA's guidance for specified generators, which is designed to assess the situation where a generator only operates occasionally.

The 1-hour AQAL for nitrogen dioxide is 200 ug/m^3 is not to be exceeded more than 18 times a year. As a conservative assumption, the Applicant has also assumed that an emergency event would occur each year, which would last for 4 hours, and cause 4 exceedance hours. Therefore, the probability has been calculated as randomly selecting 15 or more exceedance hours in the sample size.

This has shown that the probability of the PEC exceeding the AQAL (allowing for the tolerable exceedances and emergency operation) is less than 0.1%, indicating that short term exceedances are highly unlikely.

Emergency operation:

As shown in the above table, the maximum 1-hour nitrogen dioxide process contribution is predicted to exceed the AQAL. As with the testing, this conservatively assumes that the emergency event occurs during the worst-case weather conditions for dispersion.

As part of our assessment, we have also taken into account the likelihood of the source/pathway/receptor mechanism and screened out the environmental risk of operating scenarios that we consider highly unlikely. The emergency generator is

designed and configured so that in the event of a mains failure, it will fire up to meet the load demand at the site. This scenario will not be permitted as a normal operation, it is an emergency operation allowed to happen only in the unlikely event of failure of electrical supply from the grid. Measures will be in place to prevent and manage/mitigate the occurrence of this emergency operation.

The primary prevention measure relied upon to avoid this emergency scenario is the highly reliable design of the electrical grid and of the site connections to it. Based on the information in the application, we agree that this feature of the installation is compliant with the best available techniques (BAT) and that the requirement to run the back-up generator in an emergency is therefore minimised as far as possible.

The short-term NOx process contributions for the emergency operations of the site are above the insignificance screening threshold set in our guidance, however the structural preventative measures taken to avoid the occurrence of this emergency scenario make the source/pathway/receptor mechanism very unlikely. For the EDG, we consider that the reasonably likely source/pathway/receptor mechanism would consist of periodic testing operations.

Our assessment of the impact on ecological sites from the EDG is considered in Section 5.4.2 (iv) of this Decision Document.

6 Application of Best Available Techniques

6.1 Scope of Consideration

In this section, we explain how we have determined whether the Applicant's proposals are the Best Available Techniques for this Installation.

- The first issue we address is the fundamental choice of incineration technology. There are a number of alternatives, and the Applicant has explained why it has chosen one particular kind for this Installation.

- We then consider in particular control measures for the emissions which were not screened out as insignificant in the previous section on minimising the installation's environmental impact.

- We also have to consider the combustion efficiency and energy utilisation of different design options for the Installation, which are relevant considerations in the determination of BAT for the Installation, including the Global Warming Potential of the different options.

- Finally, the prevention and minimisation of Persistent Organic Pollutants (POPs) must be considered, as we explain below.

Chapter IV of the IED specifies a set of maximum 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 listed below would be considered as BAT provided the Applicant has justified it in terms of:

- nature/physical state of the waste and its variability
- proposed plant throughput which may affect the number of incineration lines
- preference and experience of chosen technology including plant availability

- nature and quantity/quality of residues produced.
- emissions to air – usually NOx as the furnace choice could have an effect on the amount of unabated NOx produced
- energy consumption – whole plant, waste preparation, effect on GWP
- Need, if any, for further processing of residues to comply with TOC
- Costs

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

Technique	Key waste characteristics and suitability	Throughput per line	Advantages	Disadvantages / Limitations of use	Bottom Ash Quality	Cost
Moving grate (air-cooled)	• Low to medium heat values (LCV 5 – 16.5 GJ/t) • Municipal and other • heterogeneous solid wastes • Can accept a proportion of sewage sludge and/or medical waste with municipal waste • Applied at most modern • MSW installations	• 1 to 50 t/h with most projects 5 to 30 t/h. • Most industrial applications not below 2.5 or 3 t/h.	• Widely proven at large scales. • Robust • Low maintenance cost • Long operational history • Can take heterogeneous wastes without special • preparation	• Generally not suited to powders, liquids or materials that melt through the grate	TOC 0.5% to 3%	High capacity reduces specific cost per tonne of waste
Moving grate (liquid Cooled)	Same as air-cooled grates except: LCV 10 – 20 GJ/t	Same as air-cooled grates	As air-cooled grates but: • higher heat value waste is treatable • Better combustion control possible.	As air-cooled grates but: • risk of grate damage/ leaks • higher complexity	TOC 0.5% to 3%	Slightly higher capital cost than air-cooled
Rotary Kiln	Can accept liquids and pastes as well as gases Solid feeds more limited than grate (due to refractory damage) often applied to hazardous Wastes	<16 t/h	• Very well proven • Broad range of wastes • Good burn out even of HW	Throughputs lower than grates	TOC <3 %	Higher specific cost due to reduced capacity

Technique	Key waste characteristics and suitability	Throughput per line	Advantages	Disadvantages / Limitations of use	Bottom Ash Quality	Cost
Fluid bed - bubbling	• Wide range of CV (5-25 MJ/kg) • Only finely divided • consistent wastes. • Limited use for raw MSW • Often applied to sludges co fired with RDF, shredded MSW, sludges, poultry manure	Up to 25 t/h	• Good mixing • Fly ashes of good leaching quality	• Careful operation required to avoid clogging bed. • Higher fly ash quantities.	TOC <1%	FGT cost may be lower. Costs of waste preparation
Fluid bed - circulating	• Wide range of CV (6-25 MJ/kg) • Only finely divided consistent wastes. • Limited use for raw MSW • Often applied to sludges co-fired with RDF, coal, wood waste	Up 70 t/h	• Good mixing • High steam parameters up to 500oC • Greater fuel flexibility than BFB • Fly ashes of good leaching quality	• Cyclone required to conserve bed material • Higher fly ash quantities	TOC <1%	• FGT cost may be lower. • Costs of waste preparation
Spreader - stoker combustor	• RDF and other particle feeds • Poultry manure • Wood wastes	No information	• Simple grate construction • Less sensitive to particle size than FB	Only for well defined mono-streams	No information	No information
Gasification - fixed bed	• Mixed plastic wastes • Other similar consistent streams • Gasification less widely used/proven than incineration	Up to 20 t/h	• Low leaching residue • Good burnout if oxygen blown • Syngas available • Reduced oxidation of recyclable metals	• Limited waste feed • Not full combustion • High skill level • Tar in raw gas • Less widely proven	• Low leaching bottom ash • Good burnout with oxygen	High operating/ maintenance costs

Technique	Key waste characteristics and suitability	Throughput per line	Advantages	Disadvantages / Limitations of use	Bottom Ash Quality	Cost
Gasification - entrained flow	• Mixed plastic wastes • Other similar consistent streams • Not suited to untreated MSW • Gasification less widely used/proven than incineration	Up to 10 t/h	• Low leaching slag • Reduced oxidation of recyclable metals	• Limited waste feed • Not full combustion • High skill level • Less widely proven	low leaching slag	• High operation/ maintenance costs • High pre-treatment costs
Gasification - fluidised bed	• Mixed plastic wastes • Shredded MSW • Shredder residues • Sludges • Metal rich wastes • Other similar consistent streams • Gasification less widely used/proven than incineration	5 – 20 t/h	• Can use low reactor temperatures e.g. for Al recovery • Separation of main non combustibles • Can be combined with ash melting • Reduced oxidation of recyclable metals	• Limited waste size (<30cm) • Tar in raw gas • Higher UHV raw gas • Less widely proven	If combined with ash melting chamber ash is vitrified	Lower than other gasifiers
Pyrolysis	• Pre-treated MSW • High metal inert streams • Shredder residues/plastics • Pyrolysis is less widely used/proven than incineration	~ 5 t/h (short drum) 5 – 10 t/h (medium drum)	• No oxidation of metals • No combustion energy for metals/inert • In reactor acid neutralisation possible • Syngas available	• Limited wastes • Process control and engineering critical • High skill level • Not widely proven • Need market for syngas	• Dependent on process temperature • Residue produced requires further processing and sometimes combustion	High pre-treatment, operation and capital costs

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

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

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

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

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

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

The Applicant proposes to use gasoil as support fuel for start-up, shut down and for the auxiliary burners. The Applicant also considered using liquified gas (LPG) and natural gas as support fuel, however their choice of gasoil is based on the lack of an available high pressure gas main within the Installation Boundary or near to the site, and on the risk of explosion inherent with the pressurised storage of liquified gas (LPG) in the event of an on-site fire.

Boiler Design

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

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

Any of the options listed in the BREF and summarised in the table above can be BAT. The Applicant has chosen a furnace technique that is listed in the BREF and we are

satisfied that the Applicant has provided sufficient justification to show that their technique is BAT. This is not to say that the other techniques could not also be BAT, but that the Applicant has shown that their chosen technique is at least comparable with the other BAT options. We believe that, based on the information gathered by the BREF process, the chosen technology will achieve the requirements of Chapter IV of the IED for the air emission of TOC/CO and the TOC on bottom ash.

6.2 BAT and emissions control

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

The BREF lists the general factors requiring consideration when selecting flue-gas treatment (FGC) systems as:

- type of waste, its composition and variation
- type of combustion process, and its size
- flue-gas flow and temperature
- flue-gas content, including magnitude and rate of composition fluctuations
- target emission limit values
- restrictions on discharge of aqueous effluents
- plume visibility requirements
- land and space availability
- availability and cost of outlets for residues accumulated/recovered
- compatibility with any existing process components (existing plants)
- availability and cost of water and other reagents
- energy supply possibilities (e.g. supply of heat from condensing scrubbers)
- reduction of emissions by primary methods
- noise
- arrangement of different flue-gas cleaning devices if possible with decreasing flue-gas temperatures from boiler to stack

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

6.2.1 Particulate Matter

Particulate matter				
Technique	**Advantages**	**Disadvantages**	**Optimisation**	**Defined as BAT in BREF or TGN for:**
Bag / Fabric filters (BF)	Reliable abatement of particulate	Max temp 250°C	Multiple compartments	Most plants

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

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

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

6.2.2 Oxides of Nitrogen

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

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

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

The Applicant proposes to implement the following primary measures:

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

Flue gas recirculation is not proposed. The Applicant stated that where furnaces have been designed to operate with FGR these will benefit from reduced NOx generation from the use of FGR, whereas if FGR is not designed in from the start, with reduction in NOx generation being controlled by primary and secondary air and the grate design, then FGR will give little benefit. We agree with that assessment and in addition FGR can result in corrosion issues and reduced energy efficiency.

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

SCR can reduce NO_x levels to below 50 mg/m^3 and can be applied to all plant, it is generally more expensive than SNCR and requires reheating of the waste gas stream which reduces energy efficiency, periodic replacement of the catalysts also produces a hazardous waste. The use of SCR by catalytic filter bags can reduce emissions to 50 -120 mg/m^3 with low investment costs. SNCR can typically reduce NO_x levels to between 80 and 180 mg/m^3, it relies on an optimum temperature of around 900^{o}C and sufficient retention time for reduction. SNCR is more likely to have higher levels of

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

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

They have also indicated that it may be necessary for a layer of catalyst to be installed in the flue from the bag filters and prior to release from the stack to act as a 'polisher'. For the purposes of their BAT assessment they assumed that the proposed system be classified as an SNCR system with an SCR polisher, rather than an SCR system. The Environment Agency agrees with this assumption.

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

	Cost of NO_x removal / tonne of NOx abated (£)	PC (long term) (µg/m3)	PEC (long term) (µg/m3)
SCR	3,460	0.51	22.53
SNCR	910	0.77	22.79

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 ammonia as the reagent due to the lower nitrous oxide formation. The Environment Agency agrees with this assessment.

The amount of ammonia used for NOx abatement will need to be optimised to maximise NOx reduction and minimise NH^3 slip. Improvement condition IC5 requires the Operator to report to the Environment Agency on optimising the performance of the NOx abatement system. A limit lower than the BAT AEL for ammonia has been set. The Applicant has proposed a limit for ammonia of 8 mg/m^3 rather than 10 mg/m^3. The Operator is also required to monitor and report on N_2O emissions every quarter.

6.2.3 Acid Gases, SO_x, HCl and HF

Acid gases and halogens : Primary Measures				
Technique	**Advantages**	**Disadvantages**	**Optimisation**	**Defined as BAT in BREF or TGN for:**
Low sulphur fuel, (< 0.1%S gasoil or natural gas)	Reduces SOx at source		Start-up, supplementary firing.	Where auxiliary fuel required.

Management of waste streams	Disperses sources of acid gases (e.g. PVC) through feed.	Requires closer control of waste management		All plant with heterogeneous waste feed

Acid gases and halogens: Secondary Measures (BAT is to apply Primary Measures first)				
Technique	**Advantages**	**Disadvantages**	**Optimisation**	**Defined as BAT in BREF or TGN for:**
Wet	High reaction rates Low solid residues production Reagent delivery may be optimised by concentration and flow rate	Large effluent disposal and water consumption if not fully treated for re-cycle Effluent treatment plant required May result in wet plume Energy required for effluent treatment and plume reheat		Used for wide range of waste types Can be used as polishing step after other techniques where emissions are high or variable
Dry	Low water use Higher reagent consumption to achieve emissions of other FGC techniques but may be reduced by recycling in plant Lower energy use Higher reliability Lowest visible plume potential	Higher solid residue production Reagent consumption controlled only by input rate		All plant
Semi-dry (also described as	Medium reaction rates	Higher solid waste residues		All plant

semi-wet in the Bref)	Reagent delivery may be varied by concentration and input rate	than wet but lower than dry system		
Direct injection into boiler	Reduced acid loading to subsequent cleaning stages. Reduced peak emissions and reduced reagent usage			Generally applicable to grate and rotary kiln plants.
Direction desulphurisation	Reduced boiler corrosion	Does not improve overall performance. Can affect bottom ash quality. Corrosion problems in flue gas cleaning system.		Partial abatement upstream of other techniques in fluidised beds
Reagent Type: Sodium Hydroxide	Highest removal rates Low solid waste production	Corrosive material ETP sludge for disposal		HWIs
Reagent Type: Lime	Very good removal rates Low leaching solid residue Temperature of reaction well suited to use with bag filters	Corrosive material May give greater residue volume if no in-plant recycle	Wide range of uses	MWIs, CWIs
Reagent Type: Sodium Bicarbonate	Good removal rates Easiest to handle Dry recycle systems proven	Efficient temperature range may be at upper end for use with bag filters Leachable solid residues Bicarbonate more expensive	Not proven at large plant	CWIs

The Applicant proposes to implement the following primary measures:

- Use of low sulphur fuels for start up and auxiliary burners – gas should be used if available, where fuel oil is used, this will be low sulphur (i.e. <0.1%), this will reduce SO_x at source. The Applicant has justified its choice of gasoil as the support fuel on the basis of that previously described in section 6.1.1 above and we agree with that assessment.
- Management of heterogeneous wastes – this will disperse problem wastes such as PVC by ensuring a homogeneous waste feed.

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

The Applicant has considered dry and semi-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.

Reagent will be recirculated and optimised in order to reduce reagent consumption. Improvement condition IC5 requires the Operator to submit a report on optimisation.

In this case, the Applicant proposes to use a dry system with lime as the reagent. The Environment Agency is satisfied that this is BAT.

6.2.4 Carbon monoxide and volatile organic compounds (VOCs)

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

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

6.2.5 Dioxins and furans (and Other POPs)

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

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

- optimisation of combustion control including the maintenance of permit conditions on combustion temperature and residence time, which has been considered in 6.1.1 above;

- avoidance of de novo synthesis, which has been covered in the consideration of boiler design;
- the effective removal of particulate matter, which has been considered in 6.2.1 above;
- injection of activated carbon. This can be combined with the acid gas reagent or dosed separately. Where the feed is combined, the combined feed rate will be controlled by the acid gas concentration in the exhaust. Therefore, separate feed of activated carbon would normally be considered BAT unless the feed was relatively constant. Effective control of acid gas emissions also assists in the control of dioxin releases.
- Use of catalytic filter bags. These can achieve low levels of emissions but mercury is not removed.

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

6.2.6 Metals

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

	removal in downstream removal method.	dioxins. Can damage bag filter. Effects can be limited use is restricted to dealing with peak emissions		

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

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

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

6.3 BAT and global warming potential

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

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

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

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

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

Factors influencing GWP and CO_2 emissions from the Installation are:

On the debit side

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

On the credit side

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

The GWP of the plant will be dominated by the emissions of carbon dioxide that are released as a result of waste combustion. This will 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 and 6.2.2 of this decision document.

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

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

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

6.4 BAT and POPs

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

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

The unintentionally-produced POPs addressed by the Convention are:

- dioxins and furans;
- HCB (hexachlorobenzene)

- PCBs (polychlorobiphenyls) and
- PeCB (pentachlorobenzene)

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

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

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

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

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

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

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

The release of **dioxins and furans** to air is required by the IED to be assessed against the I-TEQ (International Toxic Equivalence) limit of 0.1 ng/m^3. Further development of the understanding of the harm caused by dioxins has resulted in the World Health Organisation (WHO) producing updated factors to calculate the WHO-TEQ value. Certain **PCBs** have structures which make them behave like dioxins (dioxin-like PCBs), and these also have toxic equivalence factors defined by WHO to make them capable of being considered together with dioxins. The UK's independent health advisory committee, the Committee on Toxicity of Chemicals in Food, Consumer Products and the Environment (COT) has adopted WHO-TEQ values for both dioxins and dioxin-like PCBs in their review of Tolerable Daily Intake (TDI) criteria. The Permit requires that, in addition to the requirements of the IED, the WHO-TEQ values for both dioxins and dioxin-like PCBs should be monitored for reporting purposes, to enable evaluation of exposure to dioxins and dioxin-like PCBs to be made using the revised TDI recommended by COT. The release of dioxin-like PCBs and PAHs is expected to be low where measures have been taken to control dioxin releases. The Permit also requires monitoring of a range of PAHs and dioxin-like PCBs at the same frequency as dioxins are monitored. We have included a requirement to monitor and report against these WHO-TEQ values for dioxins and dioxin-like PCBs and the range of PAHs as listed in the Permit. We are confident that the measures taken to control the release of dioxins will also control the releases of dioxin-like PCBs and PAHs. Section 5.2.1 of this document details the assessment of emissions to air, which includes dioxins and concludes that there will be no adverse effect on human health from either normal or abnormal operation.

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

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

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

We have assessed the control techniques proposed for dioxins by the Applicant and have concluded that they are appropriate for dioxin control. We are confident that

these controls are in line with the UN-ECE BAT guidance and will minimise the release of HCB, PCB and PeCB.

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

6.5 Other Emissions to the Environment

6.5.1 Emissions to water

Surface water run-off from vehicle movement areas, roadways and building roofs will be collected in a surface water drainage system. The surface water drainage system will be fitted with a retention interceptor and swales, prior to the discharge point, to prevent discharge of oils and sediment collected from vehicle movement areas and roadways being released off-site. All surface water run-off will be discharged, via separate discharge points, to Balaclava Bay (east) via emission point W1, and/or Portland Harbour via emission point W2.

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

6.5.2 Emissions to sewer

Process wastewaters from the installation will normally be re-used/ recycled within the process, for example in the ash quench system. If excess wastewaters are produced, for example during boiler draining, this will be discharged to foul sewer via emission point S1 in accordance with a Trade Effluent Consent secured from the local sewerage undertaker prior to commencement of operations.

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

6.5.3 Fugitive emissions

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

The Applicant has proposed the following key measures:

- Raw material storage facilities, such as tanks and silos, will back-vent to the tanker during silo loading operations
- Silo vents will be fitted with bag filter protection
- APCr silo will back-vent into the tanker during silo unloading operations
- Waste handling will take place within an indoor waste reception building kept under negative pressure

- Good housekeeping within waste reception building
- Chemicals stored with suitably designed secondary and tertiary containment measures in place, designed in accordance with recognised industry good practice
- Bunded chemical storage tanks used as appropriate
- Tanker off-loading of chemicals will take place in areas with contained drainage
- Storage areas provided with contained drainage
- Adequate quantities of spillage absorbent materials will be made available at easily accessible location(s), where chemicals are stored
- Spillages with the potential to cause environmental harm, or to leave the installation will be reported to the site management and recorded in accordance with inspection, audit and reporting procedures
- Effectiveness of site emergency response procedures will be subject to management review and will be revised and updated as appropriate following any major spillages
- In the event of a fire, contaminated fire water will be collected through the surface water drainage system which will be fitted with an isolation valve to prevent the discharge of water from the drainage system in the event of a fire.

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

6.5.4 Odour

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

Waste accepted at the installation will be delivered in covered vehicles or within containers. The unloading and bulk storage of waste will only occur indoors within the waste reception building. The main access doors to the reception building are fast closing roller shutters and will be kept closed (except during vehicles coming in and leaving) to maintain odour control.

In order to prevent odours and airborne particulates from leaving the waste reception building it will be maintained at negative pressure and air from the bale storage area and waste storage bunker will be extracted to be used as combustion air within the waste incineration plant.

Bunker management procedures (mixing and periodic emptying and cleaning) will be developed as part of the sites management system and implemented to avoid the development of anaerobic conditions in the waste storage bunker, which could generate odorous emissions.

During normal operation, daily inspections will be undertaken to monitor for odour including the waste reception area, and external boundary.

During shutdown periods odour will be controlled by minimising the amount of waste in storage. Waste will be run-down prior to periods of planned maintenance and bunker management procedures would not normally be implemented during this time to avoid the generation of odorous emissions especially when waste volumes within the bunker are low.

Where possible, negative pressure will be maintained by using the Induced Draft fan to draw air from above the waste bunker into the boiler and release from the stack to aid dispersion of potential pollutants.

In the event of an extended unplanned shutdown, if unacceptable levels of odour are identified at the installation boundary, waste would be unloaded from the waste storage bunker, or the bale storage area, for transfer off-site to a suitably licensed waste management facility.

During shutdown the frequency of the site inspections would be extended, including monitoring combustion air flow if the induced draft fan operation can be maintained, for instance during periods of maintenance. Daily sniff tests will be implemented at the site boundary. In addition, doors to the waste reception building will be kept shut during periods of shutdown.

The operation of the installation will not give rise to odorous liquid wastes. Therefore, the requirement to store liquid wastes in tanks under controlled pressure and duct the tank vents to the combustion air feed or other suitable abatement system will not apply to the Facility.

Odour condition 3.3.2 will require the implementation of an odour management plan if deemed necessary by the Environment Agency. If required this could ultimately require changes to be made on site if it is deemed that improvements are necessary.

6.5.5 Noise and vibration

The Application contained an assessment of the potential noise impact during operation of the installation. However, due to additional noise sensitive receptors (The Bibby Stockholm (“the barge”)) being introduced during determination of the permit application we requested additional information through a Schedule 5 notice dated 08/09/2023. The Applicant provided a revised noise impact (NIA) assessment to address the Schedule 5 requests, undertaking the following:

- Measured baseline sound survey data at the barge receptor.
- Measured additional baseline sound survey data at other receptors which were assessed previously, to account for potential changes to the underlying sound climate since 2021.
- Measured operational sound levels for operational generators present at the barge receptor and undertaking noise modelling to demonstrate whether the generators could have affected the baseline sound survey at other receptors (excluding the barge itself).

- Updated their BS 4142 impact assessment at nearest noise sensitive receptors based on the new background sound data.
- Proposed mitigation measures for the stack and turbine hall to reduce the predicted BS 4142 impacts, and revised noise modelling to account for the proposed measures.

The revised NIA supersedes the NIA submitted with the application. Our assessment, summarised below, is therefore based on the revised NIA.

The NIA is based on the modelling software package SoundPlan which is a commonly used computer model for regulatory noise modelling. As the site is proposed to operate on a 24/7 basis the Applicant assessed potential impacts during both daytime and night time periods. The assessment was carried out in accordance with the methodology contained within British Standard BS4142:2014+A1:2019, 'Methods for rating and assessing industrial and commercial sound.'

The significance of industrial/commercial sound depends on the difference between the "rating level" (which is the predicted sound output of the industrial/commercial premises, corrected to account for tonality, impulsivity, intermittency or other applicable sound characteristics) and the background sound level. Typically, the greater the difference, the greater the magnitude of the impact. A difference of around +10dB or more is likely to be an indication of a significant adverse impact, while a difference of around +5dB is likely to be an indication of an adverse impact. The lower the rating is, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. If the rating level does not exceed the background sound level, this is an indication of a low impact. BS4142:2014 requires that the assessment of potential impact takes into account the 'context' in which the sound occurs. This entails having a sufficient understanding of the situation to be rated and assessed, and placing the sound being assessed in context when making conclusions.

The Applicant's noise impact assessment identified local noise sensitive receptors (NSR's), and potential sources of noise at the proposed installation. While the majority of sound sources at the installation will be located indoors, external sound emissions will arise from the flue stack, air cooled condensers (ACCs) and HGV movements around the site.

The modelling software was used to calculate rating levels at nearby noise sensitive receptors (NSR's) including HMP The Verne to the south-west and the Bibby Stockholm to the west north-west which we consider to be the closest NSRs, and residential properties located due west of the installation at East Weare Road, Leet Close and Beel Close. We are satisfied that the Applicant identified the nearest NSR's to the installation.

In order to establish background sound levels, measurements of the prevailing ambient noise levels were taken at several locations close to the NSRs for 5 days (including a weekend period) during April 2021 and again for 9 days (including a weekend period) during September 2023. Generally we considered that the baseline survey was appropriate and in accordance with the BS4142 methodology.

The way in which the Applicant has used the noise model, the selection of input data, use of background data and the assumptions made have been reviewed by the Environment Agency's modelling specialists to establish the robustness of the Applicant's noise impact assessment. Our view is that the methodology used by the Applicant is acceptable.

We carried out sensitivity analysis and check modelling of the Applicant's BS4142 assessment, based on the model input data that they used. Their assessment indicated low and below adverse impacts during daytime and night-time hours at the nearest noise sensitive receptors, when considering context.

As per the previous NIA, the consultant has not presented a BS4142 impact assessment for receptors at HMP The Verne. It is not clear why this receptor has been omitted from the impact assessment, as background sound levels and rating sound levels are presented in Table 1 and Table 4 of the NIA respectively which can facilitate a BS4142 impact assessment. We have considered this NSR as part of our sensitivity analysis and check modelling.

Having reviewed the Applicant's BS4142 assessment and carried out our own check modelling and sensitivity analysis we consider that the worst-case rating levels at NSR's (including HMP The Verne) may be marginally higher than those presented by the Applicant, and without mitigation, we cannot rule out adverse impacts day and night at Top of Verne Common Road and HMP The Verne. For other NSRs, including The Bibby Stockholm, our checks indicate below adverse impacts day and night.

The Applicant has proposed the following additional mitigation measures to reduce their predicted BS4142 impacts:

- Stack: 5dB attenuation at source, achieved by locating in-line attenuators after the induced draft (ID) fans and just prior to the stack, with a suitably designed splitter configuration to attenuate across broadband frequencies but also designed to mitigate the blade passage frequency.
- Boiler room western façade: cladding panel with sound insulation of R_w 30 dB.
- Turbine Hall northern façade: cladding panel with sound insulation of R_w 30 dB.
- Turbine Hall louvre: 600mm acoustic louvre with sound insulation of R_w 24 dB.

The Applicant has revised their noise modelling to incorporate these measures and concludes that with the mitigation in place, the BS4142 impacts would be low at all receptors during day and night periods. Having reviewed the Applicant's revised BS4142 assessment including the proposed mitigation and carried out our own check modelling and sensitivity analysis we consider that the worst-case rating levels at NSR's (including HMP The Verne) may be marginally higher than those presented by the Applicant. However, we consider that with the proposed mitigation measures in place, the likely impacts at the most impacted receptors will be below adverse impacts day and night.

We consider that the mitigation measures proposed by the Applicant should be incorporated into the final design. We have set improvement condition (IC12) requiring the Applicant to confirm and implement the proposed mitigation measures

to minimise the noise impacts identified from the stack, boiler room and turbine hall. The improvement condition also requires the Applicant to undertake a further Noise Impact Assessment during commissioning to validate the post mitigation noise impacts.

Based upon the information in the Application and updated Noise Impact Assessment combined with the information required through improvement condition (IC12) we are satisfied that the appropriate measures will be in place to prevent or, where that is not practicable, to minimise noise and vibration and to prevent pollution from noise and vibration outside the site.

6.6 Setting ELVs and other Permit conditions

6.6.1 Translating BAT into Permit conditions

Article 14(3) of IED states that BAT conclusions shall be the reference for permit conditions. Article 15(3) further requires that under normal operating conditions; emissions do not exceed the emission levels associated with the best available techniques as laid down in the decisions on BAT conclusions.

BAT conclusions for waste incineration or co-incineration were published on 3rd December 2019.

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

In the BREF, BAT is regarded as installing Selective Non Catalytic Reduction (SNCR), to control oxides of nitrogen (NOx) emissions, with the corresponding ELV for ammonia as 10 mg/m^3. However, due to the efficiency of the applicant's unit, a limit lower than the BREF is achievable. The applicant has proposed a limit for ammonia which is tighter than the BREF incineration emission limit (8 mg/m^3 rather than 10 mg/m^3). This has been used in the assessment and permit conditions reflect this tighter emission limit.

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

(i) Local factors

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

(ii) National and European ESs

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

(iii) Global Warming

CO_2 is an inevitable product of the combustion of waste. The amount of CO_2 emitted will be essentially determined by the quantity and characteristics of waste being incinerated, which are already subject to conditions in the Permit. It is therefore inappropriate to set an emission limit value for CO_2, which could do no more than recognise what is going to be emitted. The gas is not therefore targeted as a key pollutant under Annex II of IED, which lists the main polluting substances that are to be considered when setting emission limit values (ELVs) in Permits.

We have therefore considered setting equivalent parameters or technical measures for CO_2. However, provided energy is recovered efficiently (see section 4.3.7 above), there are no additional equivalent technical measures (beyond those relating to the quantity and characteristics of the waste) that can be imposed that do not run counter to the primary purpose of the plant, which is the destruction of waste. Controls in the form of restrictions on the volume and type of waste that can be accepted at the Installation and permit conditions relating to energy efficiency effectively apply equivalent technical measures to limit CO_2 emissions.

(iv) Commissioning

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

The Operator will also be required to submit a written report to the Environment Agency on the commissioning of the installation within 4 months of completion of commissioning, in accordance with Improvement Condition IC3. In the report they will be required to summarise the environmental performance of the plant as installed against the design parameters set out in the Application. The report will 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.

6.7 Monitoring

6.7.1 Monitoring during normal operations

We have decided that monitoring should be carried out for the parameters listed in Schedule 3 using the methods and to the frequencies specified in those tables. These

monitoring requirements have been imposed in order to demonstrate compliance with emission limit values and to enable correction of measured concentration of substances to the appropriate reference conditions; to gather information about the performance of the SNCR system; to establish data on the release of dioxin-like PCBs and PAHs from the incineration process and to deliver the requirements of Chapter IV of IED for monitoring of residues and temperature in the combustion chamber.

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

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

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

The Operator has stated that they will provide back-up CEMS working in parallel to the operating CEMS. These will be switched into full operation immediately in the event that there is any failure in the regular monitoring equipment. The back-up CEMS measure the same parameters as the operating CEMS. In the unlikely event that the back-up CEMS also fail Condition 2.3.12 of the permit requires that the abnormal operating conditions apply.

6.7.3 Continuous emissions monitoring for dioxins and heavy metals

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

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

Based on the waste types and control measures proposed in the Application we expect that emissions of dioxins will be stable and that the mercury content of the waste will be low and stable. We have therefore set manual extractive monitoring in the Permit. However, the Permit requires the stable and low criteria to be demonstrated through Improvement conditions 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 4 of the Permit either to meet the reporting requirements set out in the IED, or to ensure data is reported to enable timely review by the Environment Agency to ensure compliance with permit

conditions and to monitor the efficiency of material use and energy recovery at the installation.

7 Other legal requirements

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

7.1 The EPR 2016 and related Directives

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

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

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

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

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

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

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

- The Environmental Statement submitted with the planning application (which also formed part of the Environmental Permit Application).
- The decision of Dorset Council to refuse planning permission on 24 March 2023.
- The report and decision notice of the local planning authority accompanying the refusal of planning permission.
- The response of the Environment Agency to the local planning authority in its role as consultee to the planning process.

We have reviewed the reasons given for the refusal of planning permission and specifically whether this conclusion is based on information given in the Environmental

Statement. We are satisfied that these matters are entirely matters of planning policy and not relevant to our determination. The pollution control and planning regimes are intended to be complementary and should avoid duplication.

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

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

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

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

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

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

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

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

Article 23(1) requires the permit to specify:

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

These are all covered by permit conditions.

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

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

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

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

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

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

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

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

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

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

Our 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 4.

7.2 National primary legislation

7.2.1 **Environment Act 1995**

(i) Section 4 (Pursuit of Sustainable Development)

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

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

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

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

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

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

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

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

(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.

(vii) Section 81 (National Air Quality Strategy)

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

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

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.

(viii) National Emissions Ceiling Regulations 2018

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

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).

During the consultation on the application, we received a lot of responses expressing concern over potential impacts on the AONB. However, visual impacts are not within our remit and are covered by the planning process. The installation is outside of the boundaries of the Dorset AONB. It is located approximately 7km due south of the Dorset AONB, the coastal portion of which stretches from Lyme Regis to the west, across to Poole and Swanage to the east.

In assessing the application, we have taken into account our duty under the Act and consider that no different or additional conditions in the Permit are required.

7.2.5 **Wildlife and Countryside Act 1981**

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

We assessed the Application and concluded that the Installation will not damage the special features of any SSSI. This was recorded on a CROW Appendix 4 form. Due to some of the SSSIs overlapping the sites which have been considered in our HRA, the CROW Appendix 4 assessment was sent to Natural England for completeness.

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

7.2.6 **Natural Environment and Rural Communities Act 2006**

Section 40 of the Natural Environment and Rural Communities Act 2006 has been amended with effect from 1 January 2023 to require consideration of the general biodiversity objective, which is to further the conservation and enhancement of biodiversity through the exercise of our functions. We have considered the general biodiversity objective when carrying out our permit application determination and, consider that no different or additional conditions are required in the permit.

7.2.7 **Marine and Coastal Access Act 2009**

Section 58 of this Act requires us to act in accordance with appropriate marine policy documents, unless relevant considerations indicate otherwise.

Section 125 of this Act requires that, so far as is consistent with their proper exercise, we exercise our functions in a manner that we consider best furthers the conservation objectives stated for Marine Conservation Zone(s) (MCZs) certain features of which are capable of being affected by our determination (to more than an insignificant degree) or else, where this is not possible, which least hinders the achievement of those objectives.

Section 126 of this Act requires that, before granting a Permit for an Installation capable of affecting certain features of a MCZ(s) (to more than an insignificant degree), we consult with Natural England and that we are satisfied that there is no significant risk of the operation of the Installation hindering the achievement of the conservation objectives stated for any relevant MCZ(s).

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.

7.3 National secondary legislation

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

We assessed the Application in accordance with our guidance and concluded that for the purposes of the Habitats Regulations there will be likely significant effects on any European Site and undertook an Appropriate Assessment (Habitats Regulations Assessment Stage 2) of those effects.

We consulted Natural England on the appropriate assessment, and they agreed with our conclusion, that the operation of the Installation would not have adverse effects on the interest features of European sites.

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 (inter alia) environmental permits, and its obligation in regulation 33 to have regard to the river basin management plan (RBMP) approved under regulation 31 and any supplementary plans prepared under regulation 32. However, it is felt that existing conditions are sufficient in this regard and no other appropriate requirements have been identified.

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

7.3.3 **The Persistent Organic Pollutants Regulations 2007**

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

7.3.4 **Bathing Water Regulations 2013**

We have considered our duty, under regulation 5 of these Regulations, to exercise our relevant functions to ensure compliance with the Bathing Water Directive, and in particular to take realistic and proportionate measures with a view to increasing the number of bathing waters classified as "good" or "excellent".

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

7.3.5 **Marine Strategy Regulations 2010**

In relation to Regulation 9 of the Marine Strategy Regulations 2010 we have had regard to the marine strategy (in so far as it has been developed and published to date) and consider that there is nothing in it which would lead us to any different conclusions from those we have already reached through our other marine assessments.

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 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), and S3.4 in Schedule 3 of the Permit.
45(1)(f)	The permit shall include the maximum permissible period of unavoidable stoppages, disturbances or failures of the purification devices or the measurement devices, during which the emissions into the air and the discharges of waste water may exceed the prescribed emission limit values.	Condition 2.3.11 and 2.3.12
45(2)(a)	The permit shall include a list of the quantities of the different categories of hazardous waste which may be treated.	Not Applicable
45(2)(b)	The permit shall include the minimum and maximum mass flows of those hazardous waste,	Not Applicable

IED Article	Requirement	Delivered by
	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 2.3.1and Table S1.2 of Schedule 1 of the Permit.
46(2)	Emission into air shall not exceed the emission limit values set out in part 3 of Annex VI.	Conditions 3.1.1 and 3.1.2 and Tables S3.1, S3.1a.
46(3)	Relates to conditions for water discharges from the cleaning of exhaust gases.	There are no such discharges as condition 3.1.1 prohibits this.
46(4)	Relates to conditions for water discharges from the cleaning of exhaust gases.	There are no such discharges as condition 3.1.1 prohibits this.
46(5)	Prevention of unauthorised and accidental release of any polluting substances into soil, surface water or groundwater. Adequate storage capacity for contaminated rainwater run-off from the site or for contaminated water from spillage or fire-fighting.	The application explains the measures to be in place for achieving the directive requirements. The permit requires that these measures are used. Various permit conditions address this and when taken as a whole they ensure compliance with this requirement.
46(6)	Limits the maximum period of operation when an ELV is exceeded to 4 hours uninterrupted duration in any one instance, and with a maximum cumulative limit of 60 hours per year. Limits on dust (150 mg/m^3), CO and TOC not to be exceeded during this period.	Condition 2.3.16
47	In the event of breakdown, reduce or close down operations as soon as practicable.	Conditions 2.3.9 to 2.3.13

IED Article	Requirement	Delivered by
	Limits on dust (150 mg/m^3), CO and TOC not to be exceeded during this period.	
48(1)	Monitoring of emissions is carried out in accordance with Parts 6 and 7 of Annex VI.	Conditions 3.6.1 to 3.6.4, 3.2.1, 3.2.2, tables S3.1, S3.1(a). Reference conditions are defined in Schedule 6 of the Permit.
48(2)	Installation and functioning of the automated measurement systems shall be subject to control and to annual surveillance tests as set out in point 1 of Part 6 of Annex VI.	Conditions 3.6.1, 3.6.3, table S3.1, S3.1(a), and S3.4
48(3)	The competent authority shall determine the location of sampling or measurement points to be used for monitoring of emissions.	Conditions 3.6.1. Pre-operational condition PO8 and IC11
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 condition PO6 and Improvement condition IC4 and Table S3.4
50(3)	At least one auxiliary burner which must not be fed with fuels which can cause higher emissions than those resulting from the burning of gas oil liquefied gas or natural gas.	Condition 2.3.14

IED Article	Requirement	Delivered by
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 2.3.13
50(5)	Any heat generated from the process shall be recovered as far as practicable.	(a) The plant will generate electricity (b)Operator to review the available heat recovery options prior to commissioning (Condition PO2) and then every 2 years (Conditions 1.2.1 to 1.2.3)
50(6)	Relates to the feeding of infectious clinical waste into the furnace.	No infectious clinical waste will be burnt
50(7)	Management of the Installation to be in the hands of a natural person who is competent to manage it.	Conditions 1.1.1 to 1.1.3 and 2.3.1 of the Permit.
51(1)	Different conditions than those laid down in Article 50(1), (2) and (3) and, as regards the temperature Article 50(4) may be authorised, provided the other requirements of this chapter are me.	No such conditions Have been allowed
51(2)	Changes in operating conditions do not cause more residues or residues with a higher content of organic polluting substances compared to those residues which could be expected under the conditions laid down in Articles 50(1), (2) and (3).	No such conditions Have been allowed
51(3)	Changes in operating conditions shall include emission limit values for CO and TOC set out in Part 3 of Annex VI.	No such conditions Have been allowed
52(1)	Take all necessary precautions	Conditions 2.3.1, 2.3.3, 3.3, 3.4, 3.5 and 3.7

IED Article	Requirement	Delivered by
	concerning delivery and reception of wastes, to prevent or minimise pollution.	
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 PO3.
55(1)	Application, decision and permit to be publicly available.	All documents are accessible from the Environment Agency Public Register.
55(2)	An annual report on plant operation and monitoring for all plants burning more than 2 tonne/hour waste.	Condition 4.2.2 and 4.2.3.

Annex 1B: Compliance with Bat Conclusions

BAT conclusion	Criteria	Delivered by
1	Implement environmental management system	Condition 1.1 and Pre-operational condition PO1
2	Determine gross electrical efficiency	Section 4.3.7 of this decision document. Permit table S3.4
3	Monitor key process parameters	Condition 3.6.1 and table S3.4
4	Monitoring emissions to air	Condition 3.6.1 and table S3.1
5	Monitoring emissions to air during OTNOC	Condition 1.1.1 and pre-operational condition PO1
6	Monitoring emissions to water from flue gas treatment and/or bottom ash treatment	There are no such emissions from the installation
7	Monitor unburnt substances in slags and bottom ashes	Conditions 3.1.3 and 3.6.1, and table S3.5
8	Analysis of hazardous waste	Not applicable
9	Waste stream management techniques	The Application explains the measures that will be used. Permit condition 2.3.1, table S1.2
10	Quality management system for bottom ash treatment plant	Not applicable
11	Monitor waste deliveries as part of waste acceptance procedures	The Application explains the measures that will be used. Permit condition 2.3.1, table S1.2
12	Reception, handling and storage of waste	Measures are described in the Application and FPP. Permit conditions 2.3.1, conditions 3.8.1 and 3.8.2. Pre-operational condition PO11
13	Storage and handling of clinical waste	Not applicable

BAT conclusion	Criteria	Delivered by
14	Improve overall performance of plant including BAT-AELs for TOC or LOI	Techniques described in the Application. Permit condition 2.3.1, table S1.2, 3.1.3 and table S3.5
15	Procedures to adjust plant settings to control performance	Measures described in the Application,condition 2.3.1 and table S1.2
16	Procedures to minimise start-up and shut down	Measures described in the Application and condition 2.3.1
17	Appropriate design, operation and maintenance of FGC system	FGC measures described in Application. Operation and maintenance procedures will form part of the EMS
18	OTNOC management plan	Pre-operational condition PO1
19	Use of heat recovery boiler	Described in the Application. Permit condition 2.3.1, table S1.2
20	Measures to increase energy efficiency and BAT AEEL	Measures described in the Application. Permit condition 2.3.1, table S1.2 Section 4.3.7 of this decision document.
21	Measures to prevent or reduce diffuse emissions including odour	Measures described in the Application. Permit conditions 2.3.1, table S1.2, 3.4.1, 3.3.1, 3.3.2. Sections 4.2.2, 6.5.3 and 6.5.4 of this decision document.
22	Handling of gaseous and liquid wastes	Not applicable
23	Management system to prevent or reduce dust emissions from treatment of slags and ashes	Not applicable
24	Techniques to prevent or reduce diffuse emissions to air from treatment of slags and ashes	Not applicable
25	Minimisation of dust and metal emissions and compliance with BAT AEL	Section 5.2 of this decision document. Permit conditions 2.3.1, table S1.2, 3.3.1, 3.3.2. 3.1.1 and 3.1.2 and table S3.1

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 Section 5.2 of this decision document.
28	Techniques to reduce peak emissions of HCl, HF and SO_2, optimise reagent use and BAT AELs	Measures described in the Application. Permit conditions 2.3.1, table S1.2, 3.1.1 and 3.1.2 and table S3.1
29	Techniques to reduce emissions of NO_2, N_2O, CO and NH_3 and BAT AELs	Measures described in the Application. Section 5.2 of this decision document. Permit conditions 2.3.1, table S1.2, 3.1.1 and 3.1.2 and table S3.1
30	Reduce emissions or organic compounds including dioxins/furans and PCBs. BAT AELs	Measures described in the Application. Section 5.2 of this decision document. Permit conditions 2.3.1, table S1.2, 3.1.1 and 3.1.2 and table S3.1
31	Reduce emissions of mercury. BAT AEL	Measures described in the Application. Section 5.2 of this decision document. Permit conditions 2.3.1, table S1.2, 3.1.1 and 3.1.2 and table S3.1
32	Segregate waste water streams to prevent contamination	Measures described in the Application Sections 4.2.2, 6.5.1 and 6.5.3 of this decision document. Permit conditions 2.3.1, table S1.2, 3.1.1, 3.1.2 and table S3.2
33	Techniques to reduce water usage and prevent or reduce waste water	Measures described in the Application. Sections 4.2.2 and 4.3.8 of this decision document Permit conditions 1.3.1, 2.3.1, table S1.2

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

Annex 2: Pre-Operational Conditions

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

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

Table S1.4A Pre-operational measures	
Reference	**Pre-operational measures**
PO4	Prior to the commencement of commissioning, the Operator shall submit to the Environment Agency, and obtain the Environment Agency's written approval to it, a written commissioning plan, including timelines for completion, for approval by the Environment Agency. The commissioning plan shall include the expected emissions to the environment during the different stages of commissioning, the expected durations of commissioning activities and the actions to be taken to protect the environment and report to the Environment Agency in the event that actual emissions exceed expected emissions. Commissioning shall be carried out in accordance with the commissioning plan as approved.
PO5	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. The procedure shall be implemented in accordance with the written approval from the Agency.
PO6	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.
PO7	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.
PO8	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 measuring locations, techniques and standards for periodic monitoring and M20. The report shall include the following: • Plant and equipment details, including accreditation to MCERTS • Methods and standards for sampling and analysis • Details of monitoring locations, access and working platforms
PO9	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

Table S1.4A Pre-operational measures	
Reference	**Pre-operational measures**
	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.
PO11	No later than one month after the final design of the site infrastructure (or other date agreed in writing with the Environment Agency) the Operator shall submit an updated Fire Prevention Plan (FPP) which meets the relevant criteria set out within the Environment Agency's Fire Prevention Plan guidance. Elements which were not finalised when the previously submitted version (received 10/10/2022) was submitted shall be addressed in detail, including but not limited to: • Provision of adequate firewater • Drainage, pollution control and firewater containment including a finalised drainage plan clearly marking emission points and any pollution control features • A plan showing the location of gas storage facilities and other flammable items • Details of fire detection system • Confirmation of fire wall specification and a layout plan showing the location of firewalls and waste storage details • Details of the quarantine area/s and a site layout plan showing the location/s • Updated receptor plan, including receptors and potential hazards within the port (for example fuel pipeline) The updated FPP shall be submitted to the Environment Agency for approval.

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 for approval 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 for approval to carry out tests to determine the size distribution of the particulate matter in the exhaust gas emissions to air from emission point A1, identifying the fractions within the PM10, and PM2.5 ranges. On receipt of written approval from the Environment Agency to the proposal and the timetable, the Operator shall carry out the tests 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 for approval on the commissioning of the installation. The report shall summarise the environmental performance of the plant as installed against the design parameters set out in the Application. The report shall also include a review of the performance of the facility against the conditions of this permit and details of procedures developed during commissioning for achieving and demonstrating compliance with permit conditions and confirm that the Environmental Management System (EMS) has been updated accordingly.	Within 4 months of the completion of commissioning.
IC4	The operator shall notify the Environment Agency of the proposed date(s) that validation testing is planned for.	Notification at least 3 weeks prior to validation testing
	During commissioning the operator shall carry out validation testing to validate the residence time, minimum temperature and oxygen content of the gases in the furnace whilst operating under normal load and most unfavourable operating conditions. The validation shall be to the methodology as approved through pre-operational condition PO9.	Validation tests completed before the end of commissioning
	The operator shall submit a written report to the Environment Agency for approval on the validation of residence time, oxygen and temperature whilst operating under normal load, minimum turn down and overload conditions. The report shall identify the process controls used to ensure residence time and temperature requirements are complied with during operation of the incineration plant	Report submitted within 2 months of the completion of commissioning.
IC5	The Operator shall submit a written report to the Environment Agency for approval describing the performance and optimisation of: • The lime injection system for minimisation of acid gas emissions	Within 4 months of the

Table S1.3 Improvement programme requirements		
Reference	**Requirement**	**Date**
	• The carbon injection system for minimisation of dioxin and heavy metal emissions. • The Selective Non Catalytic Reduction (SNCR) system and combustion settings to minimise oxides of nitrogen (NOx). The report shall include an initial assessment of the level of NOx, N2O and NH3 emissions that can be achieved under optimum operating conditions.	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, the report shall propose an alternative ELV which would provide an equivalent level of NOx reduction on a long-term basis such as an annual mass emission limit or percentile-based ELV.	Within 12 months of the completion of commissioning
IC6	The Operator shall carry out an assessment of the impact of emissions to air of the following component metals subject to emission limit values: Cr A report on the assessment shall be made to the Environment Agency for approval. Emissions monitoring data obtained during the first year of operation shall be used to compare the actual emissions with those assumed in the impact assessment submitted with the Application. An assessment shall be made of the impact of each metal against the relevant ES. In the event that the assessment shows that an environmental standard can be exceeded, the report shall include proposals for further investigative work.	15 months from the completion of commissioning
IC7	The Operator shall submit a written summary report to the Environment Agency for approval 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. Full summary evidence compliance report to be submitted within 18 months of completion of commissioning.
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 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	Within 6 months of completion of commissioning

Table S1.3 Improvement programme requirements		
Reference	**Requirement**	**Date**
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 for approval. 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). 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. Where notified in writing by the Environment Agency that the requirements are not met, the operator shall submit proposals or further proposals for rectifying this in accordance with the time scale in the notification. The proposals shall be implemented in accordance with the Environment Agency's written approval.	Report to be submitted to the Agency within 3 months of completion of commissioning.
IC12	The operator shall identify and implement mitigation measures to minimise the noise impacts identified from the stack, boiler room and turbine hall - as identified in "Powerfuel Portland, Portland Energy Recovery Facility, BS4142 Noise Impact Assessment, AAc/267701/R04", dated 17th October 2023. During commissioning, the operator shall undertake a further Noise Impact Assessment (NIA) in accordance with "BS 4142:2014+A1:2019 Method for Rating and Assessing Industrial and Commercial Sound", and associated Environment Agency guidance (https://www.gov.uk/government/publications/noise-and-vibration-management-environmental-permits/noise-and-vibration-management-environmental-permits and https://www.gov.uk/government/publications/method-implementation-document-mid-for-bs-4142). The assessment shall include, but not necessarily be limited to: • a review of noise mitigation measures implemented for the stack, boiler room and turbine hall, with an assessment of the post mitigation noise impacts. • A review of the noise sources from the facility. Where any noise sources are identified as exhibiting tonal contributions, they shall be quantified by means of frequency analysis. • a review of whether any improvements, or additional mitigation methods, are required for any noise sources from the facility together with timescale proposals for their implementation.	Within 4 months of the completion of commissioning.

Table S1.3 Improvement programme requirements		
Reference	**Requirement**	**Date**
	The operator shall submit the NIA to the Environment Agency for assessment and written approval.	

Annex 4: Consultation Reponses

A) Advertising and Consultation on the Application

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

The Application was advertised on the Environment Agency website from 11/06/2021 to 22/09/2021 and in the Dorset Echo on 11/06/2023. Additionally copies of the Application were placed at Portland and Weymouth public libraries.

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

- Food Standards Agency
- Health and Safety Executive
- Dorset Council (Planning, and Environmental Health departments)
- Public Health England (now The UK Health Security Agency (UKSHA))
- Director of Public Health
- Portland Port
- Wessex Water
- Fire Service
- National Grid

1) Consultation Responses from Statutory and Non-Statutory Bodies

Response Received from *Public Health Dorset*	
Brief summary of issues raised:	Summary of action taken / how this has been covered
Environment Agency (EA) or other appropriate independent body assess the modelling and the conclusion drawn by the applicant at paragraph 2.3 of the HHRA addendum, which concludes the provision of shore power will have a beneficial impact on human health	The air dispersion modelling is carried out by the Applicant and audited by our experts, this includes the HHRA. We are satisfied that there will be no significant impacts. We have to assess the environmental impacts of what is proposed and whether this is an activity that can be authorised under EPR. The Applicant highlights a potential benefit of the scheme as being that power would be provided to ships which currently operate onboard engines to provide power when they are docked. We assess power supply as part of energy efficiency. It is expected, and assessed on the basis, that electricity from incineration plants will be sent to the grid, if it is supplied elsewhere (e.g. shore to ship power) it will not affect our
Concern raised as to how the provision of shore power to vessels in Portland Harbour and it's potentially positive impact on air quality and human health is to be secured.	

	assessment of energy efficiency as set out in section 4.3.7 of the decision document. Approximately 15.2 MWe will be available for export to the National Grid as well as potentially for providing ship-to-shore power to vessels which dock in Portland harbour. Provision of shore power will not be secured through the permit but we are satisfied the proposal is acceptable without this.
Request for EA views on the additional modelling of the potential impacts from air emissions at HMP Verne. Including effects of site topography and surrounding built environment and whether or not it takes into account the particular circumstances and vulnerabilities of the population at HMP Verne.	We audited the Applicant's modelling, this included checking any effects from topography and nearby buildings. We are satisfied with the way it was carried out. The standards that we have used to assess against are set to protect all members of the public including the population at HMP Verne.
Concerns about the level of engagement carried out by the Applicant.	We are not responsible for the level of engagement carried out by the Applicant.

Response Received from *UKSHA (previously PHE)*	
Brief summary of issues raised:	Summary of action taken / how this has been covered
The applicant has used the COMEAP methodology. The recommended methodology set out in the guidance for comparison for most pollutants (including metals) and dioxin intake model is the HHRAP model for dioxins, furans and dioxin like PCBs. PHE would recommend that this model is used in this instance.	In addition to assessing emissions of SO_2, NO_2 and metals using COMEAP Dose-Response Factors, the applicant also assessed process contributions against the environmental standards, which are considered protective. We are satisfied with the information provided and that it is sufficient to inform our decision. The consultant used proprietary software Lakes Industrial Risk Assessment Program (IRAP) to conduct the Human Health Risk Assessment (HHRA) of dioxins and furans emitted from the facility and it was audited by our Air Quality Modelling Assessment Unit (AQMAU).
Recommend that the Environment Agency takes the following into account: • that the air quality modelling used is suitable and accurately reflects the local topography and provides reliable estimates of reasonable worst-case ground level pollutants • that an assessment against the tolerable daily intake (TDI) of dioxins, furans and other considered metals for the oral	• We audited the Applicant's modelling, this included checking any effects from topography. We are satisfied with the way it was carried out. We are satisfied that there will not be a significant impact from emissions to air when based on the maximum concentrations that represent the worst-case predictions. • The Applicant submitted a Human Health Risk Assessment (HHRA) that considered the worst case impacts of dioxins and furans and dioxin like PCBs through the food chain.

pathway at the worst-case receptors is conducted • a full Construction Environmental Management Plan (CEMP) is submitted prior to development detailing environmental management measures ensuring these are appropriate and address potential risk to human health • that a Pre-Operational Condition is included within the EP which requires the details of the proposed NOx abatement system to be confirmed during detailed design • when transport and commercial activity return to more business as usual a noise survey is conducted, with the results being used as a basis for confirming noise emission limits and designing the ERF accordingly • further ground investigation across the site, adhering to appropriate standards, to fully assess the potential for contamination which could impact the proposed redevelopment of the site and the potential associated health impacts	We audited the assessment and are satisfied that health impacts are likely to be insignificant compared to the tolerable daily intake (TDI). The results of the Applicant's assessment of dioxin intake are detailed in section 5.3 of this decision document (worst – case results for each category are shown). • Impacts from construction are not part of the environmental permitting process. • The Applicant's BAT assessment is summarised in section 6.2.2 and concluded that SNCR is BAT for the plant. We are satisfied that SNCR is BAT. A pre-operational condition is not required. • The noise baseline survey was undertaken while some COVID-19 restrictions were still in place in April 2021, so the measured background sound levels could be lower than we would normally expect, making the Applicant's assessment more conservative. An updated BS4142 Noise Impact Assessment was submitted in response to our request on 18/10/2023, with supporting modelling files and data submitted on 23/10/2023. As part of this a second baseline noise survey was undertaken in September 2023. • 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 does not adequately describe the condition of the soil and groundwater prior to the start of operations. We have therefore set a pre-operational condition (PO7) requiring the Operator to provide this information prior to the commencement of operations.

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, Assembly Member (AM), Councillors and Parish / Town / Community Councils

Representations were received from Weymouth Town Council and Portland Town Council. The key issues raised are shown below. Where an issue has already been covered above it is not necessarily repeated below.

Brief summary of issues raised:	Environment Agency comment
Comments about air emissions and air risk assessment	
The Air Quality Assessment is inadequate	We audited the Applicant's dispersion modelling, including any additional modelling and information submitted in response to our requests for further information. The audit concluded that the modelling was suitable for use in our Permit determination. We are satisfied that there will not be a significant impact in air quality. Further information is in section 5.2 of this decision document.
A re-assessment of air quality impacts is required following updated Environment Assessment levels (EALs) in 2021	We have considered the new 2021 and 2023 EALs in our assessment. This is described in Sections 5.2.1, 5.2.2, 5.2.3 and 5.5 of this decision document.
The background figures used are underestimated.	We audited the Applicant's dispersion modelling. As part of the audit, we checked that the background levels used by the Applicant were appropriate and we are satisfied that they were. We are satisfied that there will not be a significant impact in air quality. Further information is in section 5.2 of this decision document. Habitats assessment: APIS confirmed that there had been a mapping error in the ammonia data, also translating to an error in the total nitrogen deposition. Where relevant to our assessment we have used the most

	up-to-date background values as found on the APIS website (2019 data).
Emissions from stand-by generators have not been considered.	The Applicant proposes one emergency diesel generator (EDG). The Applicant's assessment of the impact on air quality in relation to emissions from the on-site EDG via emission point A2 can be found in Annex B of the response to our Schedule 5 Notice dated 4th November 2021. We have considered emissions from the EDG in our assessment. Further information is in section 5 of this decision document.
Concerns that the effects of wind tunnelling/ funnelling have not been fully considered	Air dispersion modelling algorithms are continually updated and validated against real world situations, field campaigns and wind tunnel experiments. We tested sensitivity using air dispersion modelling software ADMS and alternative modelling software - AERMOD and CALPUFF to represent the topography surrounding the site and consider modelling uncertainties. We are satisfied these concerns have been considered.
Comments submitted expressing concern over impacts on mortality	UKHSA have 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.
Concerns on the impact on air quality	We audited the Applicant's dispersion modelling. As part of the audit, we checked that the modelling parameters used by the Applicant were appropriate and we are satisfied that there were. We are satisfied that there will not be a significant impact in air quality. Further information in in section 5.2 of this decision document for further details.
Emissions from traffic should be taken into account	The air quality assessment considered existing background pollution levels which includes emissions from traffic. Movement of traffic to and from the Installation is outside of our remit but will normally be an issue for the planning authority to consider. Our consideration is whether the emissions from traffic could affect the prevailing pollutant background levels which could be a consideration where there are established high background concentrations contributing to poor air quality. In this case the small

	increase in pollutants from traffic would not affect the background levels to the point where it would affect the conclusions of the air quality assessment. Vehicle movements within the Installation boundary are considered within the remit of the Environmental Permit. However, the emissions from this limited area are highly unlikely to be significant and will not affect the conclusions of the air quality impact assessment.
In-combination effects from other facilities have not been considered	The air quality assessment considered existing background pollution levels which includes emissions from existing sources. We also undertook an in combination assessment, where required in line with our guidance, as part of our Habitats Regulations Assessment. Therefore, we are satisfied that emissions from the Installation acting in-combination are not likely to have a significant effect. See 5.4.2(v) for further details of this assessment.
Emissions from shipping are not captured in the background figures used.	The air quality assessment considered existing background pollution levels which includes emissions from traffic and shipping. The grid background level for the area of the port is much higher than the surrounding grid account of emissions from shipping.
Some tables in the Applicant's air quality impact assessment contain some incorrect values	During our assessment we noted errors in the figures presented by the Applicant for the PEC for some pollutants. We have substituted our own figures in the tables included in this decision document (calculated using the background and PC figures provided by the Applicant). These differences do not impact on our conclusions.
Some tables in the Applicant's air quality impact assessment contain incorrect units	During our assessment we noted errors in the units used by the Applicant for some of the tables in their Air Quality Assessment. We have corrected these to ensure the correct values and units have been used in our assessments. These corrections do not impact on our conclusions.
Concern that local topography, including steep cliffs, not properly considered	We audited the Applicant's dispersion modelling. As part of the audit, we checked that the topography considerations used by the Applicant were appropriate and we are satisfied that they were. Air dispersion modelling algorithms are continually updated and validated against real world situations, field campaigns and wind tunnel experiments. We tested sensitivity using air dispersion modelling software ADMS and alternative modelling software - AERMOD and CALPUFF to represent the topography surrounding the site and consider modelling uncertainties.

	Further information in in sections 5.2 and 5.2.4 of this decision document.
Impacts from NOx emissions were not considered at appropriate elevations for tall buildings	The consultant included five discrete receptors to represent human exposure and another eight receptors in the human health risk assessment. We have included additional locations of exposure in our sensitivity analysis, particularly short-term locations of exposure at the top of the island. The submitted Air Quality Assessment also includes predictions at the point of maximum impact (where relevant public exposure may not necessarily occur) and includes contour plots showing the spatial impacts from the site. Our audit indicates that the discrete receptor locations were likely to capture maximum predictions at human health receptors. Therefore, we consider additional discrete receptor modelling is not required.
Concerns about the stack, including: • the stack height has been incorrectly referenced; and • the stack height should be re-assessed	The Applicant has confirmed that the proposed stack height is 80m. We are aware that in some cases this is incorrectly given as 90m in the application. The Air Emissions Assessment and modelling uses a stack height of 80m. Having assessed the Application as a whole we are satisfied that the measures proposed, of which stack height is one aspect, are BAT. We are satisfied that the stack height has been calculated in accordance with IED article 46(1). The stack height will safeguard human health and the environment.
Concern that ammonia emissions will have a negative effect.	We have assessed the impacts from ammonia and we are satisfied that it is unlikely there will be any significant impacts. See section 5.2 including section 5.2.2 (consideration of key pollutants) of this decision document for further details and section 5.4.
Comments about health impacts	
Concerns about health impacts	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.
There are a number of farms within 2 km of the proposed development site which have not been considered	Specific details of these farms were not provided, however the HHRA considers the maximum impacted receptor and so we consider the conclusions to be protective of other potential receptors. We are satisfied that there will not be a significant impact on health or on soils.
Benzene and polycyclic aromatic hydrocarbons (PAHs) are not included in the human health risk assessment	Emissions of benzene and polycyclic aromatic hydrocarbons (PAH) are considered in the Applicant's dispersion

	modelling (Appendix D.2: Process Emissions Modelling). We have audited the dispersion modelling submitted with this Application and we are satisfied that there will not be any significant impacts. The Air Quality Risk Assessment considered emissions of benzene as well as pollutants not covered by Annex VI of IED, specifically, polycyclic aromatic hydrocarbons (PAH) and Polychlorinated biphenyls (PCBs). Both are considered further in section 5.2 of this decision document.
Daily dose for breast-fed infants is not reported in the assessment.	As part of the consultation process on the planning application for the Portland Energy Recovery Facility, the former Public Health England (PHE) requested the assessment of impacts of dioxins, furans and dioxins-like-PCBs against the tolerable daily intake (TDI). As a result, the consultant undertook an assessment to supplement the original Human Health Risk Assessment (HHRA). This supplementary assessment was submitted to the Environment Agency on 13 May 2022. The supplementary assessment considered the breast milk pathway and presented inhalation, ingestion and total uptake in pg/kg-day.
The HHRA does not consider potential intake by consuming locally sourced fish and other marine life	We have consulted a number of sources to investigate potential fish intake by members of the public and consider that the ingestion of fish is unlikely to be a pathway. However, we considered the consumption of locally caught fish pathway in our Human Health Risk Assessment screening checks, and it indicated intakes below the UKHSA screening criteria.
Comments about impacts at ecological sites	
Concerns over impacts to the marine environment from increased shipping	As is the case with road traffic movements, the Permit does not control any proposed shipping activities to and from the site, this falls outside the scope of this permit determination.
Concern over the impact at habitat sites and other ecological sites.	Our assessment at ecological sites is described in section 5.4 of this decision document. We are satisfied that there will not be a significant impact.
The Shadow Habitats Regulations Assessment is not fit for purpose	Shadow Habitat Regulation Assessments are undertaken by the applicant and submitted to the local authority as part of the planning process. A copy of the Shadow Habitat Regulation Assessment was also submitted to the Environment Agency as part of the permit application. However, we have undertaken our own Habitat Regulation Assessment. Our assessment for ecological sites is described in section

	5.4 of this decision document. We are satisfied that there will not be a significant impact. Natural England were consulted and agreed with our assessment of the impact at habitat sites.
Comments about BAT, emission limits and control measures	
The proposals do not meet BAT.	We have assessed documents submitted in support of the application, including the BAT assessment. Our view is that the measures proposed by the Applicant are BAT. This is explained in detail in section 6 of this decision document.
No specific proposals in relation to reduction of grate riddlings	The incinerator relies on waste for fuel therefore it is in the Applicants interests to ensure final design of the grate ensures the amount of waste able to fall through the grate is minimised, this is a standard consideration of incinerator design. However, some fine material (referred to as siftings/riddling) may fall through the grate, this can be recovered separately as part of off-site IBA processing.
Applicant does not consider the use of oxygen-enriched air.	This technique is discussed in the Best Available Techniques (BAT) Reference Document for Waste Incineration; however, it is not translated into the BAT conclusions. The BREF indicates limited applicability and current use; stating oxygen enrichment is not widely applied owing to the additional costs and cross-media impacts associated with the generation of oxygen, and the additional operational challenges such as handling molten fly ash.
Concern that the best technological option is not being proposed to reduce NOx emissions. Including that lower ammonia emissions could be achieved by using SCR	There are three recognised techniques for secondary measures to reduce NOx. These are Selective Catalytic Reduction (SCR), SCR by catalytic filter bags and Selective Non-Catalytic Reduction (SNCR) with or without catalytic filter bags. The Applicant's BAT assessment is summarised in section 6.2.2 and concluded that SNCR is BAT for the plant. We are satisfied that SNCR is BAT. Section 5 of the decision document sets out how we assessed the Applicant's air quality impact assessments. Ammonia screened out as not significant. Monitoring for ammonia has been set in order to monitor the efficiency of the SNCR abatement system.
Concern that factor of 349 gCO_2/kWh used for the electricity generation displaced is not appropriate The difference in greenhouse gas emissions from displaced grid generation between the	Our consideration of global warming potential, including carbon dioxide emissions, is set out in sections 6.3 and 6.6.1. The key part of this assessment is comparisons of different BAT options and that the key factor is ensuring as much

SNCR and SCR systems is likely to be less than the claimed.	energy is generated from the waste as practicable. Therefore, any changes in the way direct CO_2 emissions or CO_2 offset are calculated will be the same for each option and will not affect the conclusions of the assessment.
The emission limits proposed by the Applicant are at the top end of the BAT-AEL range.	It is the standard approach for emission limit values (ELVs) to be set using the upper-end of the BAT-AEL range. The upper end of the BAT-AEL range is the maximum emission that should be permitted under normal operating conditions when using one, or any combination of, the techniques that are considered BAT. The applicant has proposed a limit for ammonia which is tighter than the BREF incineration emission limit (8 mg/m^3 rather than 10 mg/m^3) and this has been used in the assessment, and permit conditions reflect this tighter emission limit.
The calculation of POCP in the BAT assessment and its use as an advantage of SNCR is not accepted.	Our assessment that SNCR is BAT is not based on POCP (Photochemical Ozone Creation Potential). We are satisfied that, taking all the relevant factors into account, SNCR is BAT. Persistent Organic Pollutants (POPs) (dioxins and others) are considered in section 6.4 of this decision document.
The wet scrubber should have been taken forward to the full quantitative BAT assessment, alongside the semi-dry and dry options.	Wet scrubbing is not BAT for the reasons set out in section 6.2 of this decision document. There are three recognised techniques for secondary measures to reduce NOx. These are Selective Catalytic Reduction (SCR), SCR by catalytic filter bags and Selective Non-Catalytic Reduction (SNCR) with or without catalytic filter bags. The Applicant's BAT assessment is summarised in section 6.2.2 and concluded that SNCR is BAT for the plant. We are satisfied that SNCR is BAT.
Concern that measures for mercury control is not BAT.	Our view is that it is BAT, see section 6.2.6 of the decision document for further information. The impacts of mercury were compared to the ES which is considered to be protective for human health impacts. The dispersion modelling for this Application has shown that impacts of mercury would not be significant. Section 5 of this decision document has further details.
Comments about waste types	
Concern that incoming waste is not screened for radioactivity.	The Permit will not allow radioactive material to be accepted. It is possible that smoke alarms (containing small radioactive sources) could be placed in household bins and received at the incinerator. However, they are likely to be small in number and

	have a low level of radioactivity so there is little likelihood of any significant risk if they were burned.
Comments about noise impacts	
Concerns about the Noise Impact Assessment submitted with the application, including that it is incomplete and flawed	An updated BS4142 Noise Impact Assessment was submitted in response to our request on 18/10/2023, with supporting modelling files and data submitted on 23/10/2023. As part of this a second baseline noise survey was undertaken in September 2023 as the initial noise survey was conducted in April 2021 at a time when some but not all the COVID-19 pandemic restrictions had been eased. This updated assessment (dated October 2023) supersedes the Noise Impact Assessments previously submitted (dated September 2020 and May 2021). We are satisfied with the revised assessment. Our assessment, summarised in section 6.5.5, is based on the updated NIA.
Concern over how the noise assessment was carried out including: • Source data is not representative • Background noise levels are not representative • Choice of receptors	We audited the Applicant's noise assessment. As part of the audit we checked that relevant factors, including representative source data and background noise levels, were considered appropriately by the Applicant and we are satisfied that they were. As per the previous NIA, the consultant has not presented a BS 4142 impact assessment for receptors at HMP The Verne. It is not clear why this receptor has been omitted from the impact assessment, as background sound levels and rating sound levels are presented in Table 1 and Table 4 of the NIA respectively. Having reviewed the Applicant's revised BS4142 assessment and carried out our own check modelling and sensitivity analysis we consider that there will not be a significant impact from noise (including at HMP The Verne). See section 6.5.5 for further details.
Concern that lockdowns affected the recorded noise levels.	An updated BS4142 Noise Impact Assessment was submitted in response to our request on 18/10/2023, with supporting modelling files and data submitted on 23/10/2023. As part of this a second baseline noise survey was undertaken in September 2023 as the initial noise survey was conducted in April 2021 at a time when some, but not all, the COVID-19 pandemic restrictions had been eased.
Weekend noise levels were not considered	The assessment is based on worst-case background sound levels which are representative of conditions during the most

	sensitive weekend period (Saturday & Sunday, daytime and night-time). Measurements were made between Friday 16th and Tuesday 20th April 2021, and include a weekend period.
Concern over noise from vehicle movements.	Only Vehicle movements within the Installation can be considered through environmental permitting. Vehicle movements outside of Installations may be within the remit of the planning permission. The Applicant's noise assessment included on-site vehicle movements and we are satisfied that there will not be a significant impact.
Concern over noise impacts during construction.	Impacts from noise during the construction phase are not considered as part of the environmental permitting decision. This may be assessed and controlled through planning permission. The remit of the Environmental Permit is to look at the impacts from noise during plant operation, which we have assessed as part of our determination.
Noise limits and perimeter noise monitoring may be required.	We have assessed noise from the Installation and are satisfied that it will not be significant. Permit conditions 3.5.1 and 3.5.2 will ensure that noise is controlled and will allow us to take further action should it be required.
Operational noise has been assessed against criteria taken from BS8233:2014 rather than BS4142.	This comment is in response to the Noise Impact Assessment (NIA) (dated September 2020) which was submitted with the application. A baseline survey could not be completed at the time due to Covid-19 restrictions. However, this NIA has since been superseded, most recently by an NIA submitted in response to our request on 18/10/2023, with supporting modelling files and data submitted on 23/10/2023. We are satisfied that the Noise Impact Assessment (dated September 2023) was carried out in accordance with the methodology contained within British Standard BS4142:2014+ A1:2019, 'Methods for rating and assessing industrial and commercial sound.'
Comments about accident prevention	
Concern about the quality of the Fire Prevention Plan (FPP) and comments submitted expressing concern over fire risk.	We requested additional information through a Schedule 5 notice dated 09/09/2022. An updated FPP was submitted in response to our request on 10/10/2022.
A further review of the FPP should be taken at the detailed design stage.	We are satisfied that the information contained in the updated FPP combined with the information required through pre-operational condition PO11 will be adequate to meet our FPP guidance. Full design

	details, including firewater provision, containment design and quarantine area were not available at the time of permit determination and therefore a pre-operational condition requires that details and plans of these, including confirmation of how they meet the standards set out in our FPP guidance, are submitted and approved prior to commissioning.
Concerns the quarantine area described in the FPP is inadequate	The FPP states that a suitable area for the quarantine of unacceptable waste will be designated as part of the detailed design stage. PO11 requires further update prior to commissioning of the installation. A number of elements, including further details about the quarantine area, will be subject to confirmation at the final design stage and will be assessed by the Environment Agency against our guidance.
How will the internal temperature of the bales be monitored?	Representative temperature readings from the centre of the bales and from bales within the centre of the pile is required where storage times are 3 months or longer. The maximum expected storage time of baled waste at the site is 30 days. However, thermal imaging cameras will continually monitor the temperature of the bales within the bale storage area and identify hotspots.
The FPP states that requirements relating to pile separation distance only applies to external storage of wastes.	The guidance makes no distinction between the separation distances required for internally or externally stored waste. Separation distances need to be at least 6m between waste piles and 6m between the waste piles and the site perimeter/buildings. Unless it is proposed to store waste in bays with suitable fire walls, in which case the separation distance is reduced. The FPP confirms the bale storage area will be made up of 8 separate bays with fire walls separating each bay. Other waste will be stored in the bunker.
All fire prevention measures should be covered by a third-party certification scheme and/or meet the appropriate recognised standards.	We are satisfied that the information contained in the updated FPP combined with the information required through pre-operational condition PO11 will be adequate to meet our FPP guidance. The FPP states that all fire detection systems will be designed, installed and maintained in accordance with an appropriate UKAS accredited third-party certification scheme. The FPP also states that the automatic fire suppression systems will be designed and maintained by a suitably qualified, experienced and registered fire protection engineer and that the suppression systems will be covered by a recognised (typically UKAS) third party certification scheme.
Concern that there will not be adequate water supply in the event of a fire	The firewater provision will not meet guidance requirement of 2000 l/min for 3

	hours. However, the Applicant proposed alternative measures that we are satisfied with.
Concerns about supply, handling and containment of firewater	The firewater provision will not meet guidance requirement of 2000 l/min for 3 hours. However, the Applicant proposed alternative measures in their FPP that we are satisfied with. There will be provision to contain fire water on site as set out in the fire prevention plan. Measures to contain firewater including use of the bunker were described and we are satisfied. This is a common alternative measure for this type of installation. The water used for fire-fighting will be sampled and analysed to identify whether it is suitable to be used as process water or if treatment/disposal of the water is required. If the firewater is contaminated, the water will be discharged to sewer or pumped out and transferred off-site to a suitably permitted waste management facility.
Comments about other issues	
Nationally there is already sufficient incinerator capacity	This is outside the scope of this determination. Waste management arrangements are a matter for the local authority.
The plant is larger than required	The waste throughput permitted is based on the capacity of the site and the tonnage at which the environmental risk assessments were based. The capacity of the incinerator is primarily a matter for the Applicant designed to meet the waste disposal needs of the local authority. The proposed facility forms part of an integrated waste management strategy; any material arriving at the facility will be residual waste arisings following upstream waste segregation, recovery and recycling initiatives. The shape and content of this strategy is a matter for the local authority.
The power generated by the incinerator could be achieved using alternative technology	We have to assess the environmental impacts of what is proposed and whether this is an activity that can be authorised under EPR.
Increase in heavy goods vehicles using the local road network	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.
The consultation period was flawed and based on out-of-date documents.	We are satisfied that we took appropriate steps to inform people about the Application and how they could comment on it. How we did this is described in Section 2 of this decision document. We were satisfied that the information the applicant provided was sufficient for us to determine the application. Although we were able to consider the application duly made,

	we did in fact need more information in order to determine it and issued information notices on 04 November 2021, 09 September 2022 and 08 September 2023. When additional and updated information was submitted by the Applicant during determination, for example in response to a Schedule 5 Notice, this has been made publicly available by being added to the Citizen Space page. Written comments were also accepted by the Environment Agency beyond the formal consultation period. We have taken all relevant representations into consideration in reaching our determination.
Comments about regulation	
Concern over how the Environment Agency will regulate the site.	We will regulate the site carrying out a continual assessment of plant operations and its environmental performance. This will be achieved in the following ways; • The operator must monitor emissions and report the results to us. • We will regularly inspect the Installations (both announced and unannounced at a frequency that we consider appropriate), review monitoring techniques and assess monitoring results to measure the performance of the plant. • We will carry out on-site audits of operator monitoring. • The operator must inform us within 24 hours of any breach of the emission 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; • The operator's monitoring results are placed on the public registers. If there is a breach of the permit then depending on the seriousness of it, we will take appropriate enforcement action and/or prosecute.

b) <u>Representations from Community and Other Organisations</u>

Representations were received from Stop Portland Waste Incinerator, Wyke Regis Surgery Patient Participation Group, Jurassic Coast Trust, The Incline Community Orchard and Gardens, Dorset Climate Action Network, Portland Museum, b-side, The Portland Association, Portland Access Group, Weymouth Civic Society, Portland Community Partnership, East Dorset Friends of the Earth and National Trust.

They key issues raised are shown below. Where an issue has already been covered above it is not necessarily repeated below.

Brief summary of issues raised:	Environment Agency comment
Concerns about location	
Concerns about impacts to the Jurassic Coast UNESCO World Heritage Site and Dorset Area of Outstanding Natural Beauty	The proposed Portland ERF is outside of the boundaries of the Dorset and East Devon Coast World Heritage Site and Dorset Area of Outstanding Natural Beauty (also referred to as National Landscapes). We do not consider that emissions from the installation will have an impact on these areas. Designation of AONBs is not within the remit of the Environment Agency. However, we will only issue a permit where we are satisfied with the environmental impacts of a proposed activity whether or not land has any particular designation. Visual impacts are not within our remit and is covered by the planning process
Concerns that Portland has lesser protections than other areas which are covered in Dorset's Area of Outstanding Natural Beauty.	
Concerns about impacts on quality of life, perception and enjoyment of the area.	We have to assess the environmental impacts of what is proposed and whether an activity can be authorised under EPR. Based on that there is no reason why they should be concerned about the matters identified.
Comments about air emissions and air risk assessment	
Concerns about the potential visual impact of a plume.	Visual impacts, including plumes, are generally covered by the planning process. Pollution from a visible plume is not likely to have a significant effect on health or the environment. Any visible plume from the stack is likely to be steam. The Applicant's choice of cooling system (air cooled), particulate abatement (fabric filters), and secondary measures for acid gas abatement (dry) are unlikely to contribute to a visible plume as they do not introduce large quantities of excess moisture into the system.
Concerns over the impacts of meteorological conditions (such as mist, fog, cloud cover and temperature inversions) and the impact this may have on dispersion.	We are satisfied that there will not be a significant impact on air quality or health when taking into account local weather conditions and the costal location in proximity to the steep incline. See section 5.2.4 of this decision document for how we have considered local weather conditions.
Concerns that conditions at the proposed site are different to those at Portland Bill.	We checked the weather data used by the Applicant when we audited the Applicant's dispersion modelling. This included checking weather data from other weather stations around the site and using our own weather data. We tested sensitivity to a total

	of twelve years of meteorological data from varying locations, data sources, decades and observed vs. modelled data. These are likely to capture local patterns and variation in meteorological conditions in the dispersion of pollutants. We are satisfied that the proposal is unlikely to result in a significant impact on air quality.
Concern about the impacts from peak emissions.	The Applicant's modelling predicted peak ground level exposure to pollutants in ambient air and at discrete receptors. We audited the Applicant's dispersion modelling. Based on the Applicant's modelling we are satisfied that there will not be a significant impact in air quality. The environmental standards for the pollutants considered in the modelling are protective of human health. Further information in in section 5.2 of this decision document for further details.
Concerns about gaseous emissions, including Greenhouse gases and accidental emissions.	See section 6.3 of this decision document for how we have considered Greenhouse gas emissions. Key measures proposed by the Applicant to control fugitive emissions are covered in section 6.5.3 of this document. Based upon the information in the application we are satisfied that appropriate measures will be in place to prevent and /or minimise fugitive emissions.
IED Article 46 should be considered to inform the calculation of stack height.	We are satisfied that the stack height has been calculated in accordance with IED article 46(1). Having assessed the Application as a whole we are satisfied that the measures proposed, of which stack height is one aspect, are BAT.
Concern about inaccuracies in the application documents, including insufficient understanding of the microclimate of the site affected as it is by the height and form of the Isle of Portland.	We are satisfied that there will not be a significant impact in air quality. We audited the Applicant's dispersion modelling. As part of the audit, we checked that the modelling parameters, impacts from topography, and weather data used by the Applicant were appropriate for the location. We are satisfied that there were. We are satisfied the modelling adequately takes the site setting into account and that the Applicant's conclusions can be used for permit determination. Further information in in sections 5.2 and 5.2.4 of this decision document.
The development would not be in line with international and national objectives of countering the effects of climate change. Concerns about emissions of carbon dioxide	Our role under Environmental Permitting is to assess local impact due to emissions from the Installation. We have done this and are satisfied that there will not be a significant impact.

Concerns about gaseous emissions, including Greenhouse gases and accidental emissions.	Our assessment of global warming potential is covered in sections 6.3 and 6.6 of this decision document.
Concern at potential impacts from air emissions at receptors which are situated at an elevation above, or similar to, the height of the flue.	We audited the Applicant's modelling, this included checking any effects from topography. We are satisfied with the way it was carried out. The standards that we have used to assess against are set to protect all members of the public. Air dispersion models include plume rise algorithms and modelling algorithms are continually updated and validated against real world situations, field campaigns and wind tunnel experiments. We tested sensitivity using ADMS and alternative modelling software - AERMOD and CALPUFF to represent the topography surrounding the site and consider modelling uncertainties.
Concern that wind may blow fumes towards Weymouth and other communities	We checked the weather data used by the Applicant when we audited the Applicant's dispersion modelling. This included checking weather data from other weather stations around the site and using our own weather data. Based on our audit, we are satisfied with the weather data that was used by the Applicant. We are satisfied that the proposal is unlikely to result in a significant impact on air quality at any location and regardless of wind direction.
Concern over the impacts as shown on the Plume Plotter website	Plume Plotter appears to be a tool which uses air quality modelling software to predict the ground level concentrations of nitrogen oxides and other pollutants that may arise from the incinerator based on a number of factors. The information on the website indicates that the results may be based on expected modelling methods. However, there is no information on the website as to how the model was validated and we have not seen the model input parameters, and so cannot comment on the validity of the predictions. We have audited the dispersion modelling submitted with this Application and we are satisfied that there will not be any significant impacts.
Concern that background emissions would have been elevated by an increased number of ships in the port during the pandemic.	Off-site shipping emissions do not form part of the Environmental Permitting decision process except to the extent that they could affect the prevailing background levels. We have reviewed all background concentrations, with particular focus on recorded values presented in the Annual Status Report for Weymouth & Portland local authority, and Defra UK Air website. These measured values include emissions

	from traffic and shipping. Following our review of the background and check modelling, although we do not agree with the consultant's absolute numerical predictions, we agree with their conclusions.
Concern that the impacts of wind have not been fully considered.	Weather conditions, including wind direction and speed, were taken into account in the Applicant's air dispersion modelling. The dispersion modelling tested sensitivity using five years of meteorological data observed at the Isle of Portland meteorological station recorded between 2014 and 2018 and 2 years of meteorological data at an alternative location - Portland Harbour between 2017-2018. We tested sensitivity to a total of twelve years of meteorological data from varying locations, data sources, decades and observed vs. modelled data. These are likely to capture local patterns and variation in meteorological conditions in the dispersion of pollutants.
Concerns over impacts from emissions caused by increased shipping, including ships to deliver/ remove waste from the installation	We have reviewed all background concentrations, with particular focus on recorded values presented in the Annual Status Report for Weymouth & Portland local authority, and Defra UK Air website. These measured values include emissions from traffic and shipping. Following our review of the background and check modelling, although we do not agree with the consultant's absolute numerical predictions, we agree with their conclusions. Movement of traffic and shipping 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 and shipping to and from the installation 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 and/or shipping would not affect the background levels to the point where it would affect the conclusions of the air quality assessment. Vehicle movements within the Installation boundary are considered within the remit of the Environmental Permit. However, the emissions from this limited area are highly unlikely to be significant and will not affect the conclusions of the air quality impact assessment.

Concern that Portland Island is at a higher elevation than the stack	We audited the Applicant's modelling, this included checking any effects from topography. We are satisfied with the way it was carried out. We tested sensitivity using ADMS and alternative modelling software - AERMOD and CALPUFF to represent the topography surrounding the site and consider modelling uncertainties. The impact of the terrain surrounding the site upon plume dispersion was considered in the dispersion modelling. This is considered further in Section 5.2.4 of this decision document.
Concerns about health impacts	
The adverse impacts of the development are likely to be dis-proportionally suffered by people with disabilities or by the very young.	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 about the impact on human health from particulate emissions, including very fine particulate matter such as PM2.5 and smaller.	These issues are covered in sections 5.2 and 5.3 of this decision document. We are satisfied that there will not be a significant impact from particulates.
Concern over impacts from accumulation of pollutants in the food chain.	Impact at receptors was considered in the air quality assessment (see section 5.2). Impact on the food chain was considered in the human health risk assessment. We are satisfied that there will not be a significant impact. See section 5.3 for further details. Dioxins and furans can accumulate in the food chain. This is considered in section 5.3 of this decision document. Other pollutants are assessed against the ES and we are satisfied that the ES are protective of human health and that further assessment of accumulation is not required.
Concern emissions may result in birth defects.	Please refer to section 5.3.1 where the findings of the UKHSA study are discussed. In summary, the UKHSA confirmed that the study did not change their position of the health risks.
A report by Air Quality Consultants Ltd, commissioned by the Greater London Authority (GLA) published in May 2020 on Health Effects due to Emissions from Energy from Waste Plants in London, found that: In total, 15 deaths of London residents per year are calculated to be attributable to emissions of nitrogen oxides and particulate matter from the five EfW facilities.	The calculated impact of incinerators in the GLA commissioned report is a notional calculated figure and should be compared to the estimated overall effect of emissions, from transport, lighting and heating in London. This is estimated to be 9,400 excess deaths in London every year, therefore the contribution from waste incineration is very small in comparison (0.16%). Before the GLA's commissioned report, there has been much research undertaken in the UK and internationally,

	into the links between waste incineration and possible health effects. Public Health England's (now UKHSA, UK Health Security Agency) risk assessment remains that modern, well run and regulated municipal waste incinerators are not a significant risk to public health.
Concern about mercury emissions leading to build-up in the sea and subsequent impacts on the food chain	We have consulted a number of sources to investigate potential fish intake from members of the public and agree that the ingestion of fish is unlikely to be a pathway. However, we considered the consumption of locally caught fish pathway in our Human Health Risk Assessment screening checks, and it indicated intakes below the UKHSA screening criteria. The impacts of mercury were compared to the ES which is considered to be protective for human health impacts. Bag filters and activated carbon will limit emissions of particulate phase metals and mercury. ELVs for metals apply as set out in table S3.1 of the Permit. We are satisfied that impacts from mercury will not be significant.
Comments about impacts at ecological sites	
The development would not be in line with international and national objectives of countering the effects of loss of biodiversity. The Environment Bill (2020) requires that all development provides a net gain in biodiversity. The current proposals for the development of the ERF will result in a significant net loss of biodiversity within the application site.	Our assessment at ecological sites is described in section 5.4 of this decision document. We are satisfied that there will not be a significant impact. Any requirement for biodiversity net gain is delivered through the planning system.
Concerns about the impacts of nitrogen deposition	Our assessment has considered the potential impact of acidification and contribution of nitrogen oxides, as nutrient nitrogen. Our assessment at ecological sites is described in section 5.4 of this decision document. We are satisfied that there will not be a significant impact.
Concern over emissions to water, including impact on the environment.	The only water emission allowed under the Permit will be clean surface water run off that will be emitted to the Balaclava Bay (east) and/or Portland Harbour. We are satisfied that this will not cause pollution. 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.
Concerns about the potential effects of dredging in Porland Harbour on water quality and the marine ecosystem.	Dredging is not within the remit of this permit determination. We would expect any dredging required as part of Port operations would be managed by the relevant authority and subject to the necessary controls to minimise negative impacts.

Concern about the way in which the impact from traffic emissions on habitat sites is considered.	The air quality assessment considered existing background pollution levels which includes emissions from traffic. Movement of traffic to and from the Installation is a relevant consideration for the grant of planning permission but does not form part of the Environmental Permit decision making process. Our consideration is whether the emissions from traffic could affect the prevailing pollutant background levels which could be a consideration where there are established high background concentrations contributing to poor air quality. In this case the small increase in pollutants from traffic would not affect the background levels to the point where it would affect the conclusions of the air quality assessment. Vehicle movements within the Installation boundary are considered within the remit of the Environmental Permit. However, the emissions from this limited area are highly unlikely to be significant and will not affect the conclusions of the air quality impact assessment.
Comments about BAT, emission limits and control measures	
Concern that BAT is not being used including: • Furnace type • Abatement techniques	Our view is that the furnace type and abatement systems proposed by the Applicant are BAT. This is explained in detail in section 6 of this decision document.
A permit should ensure the plant constantly improves as technologies improve (reduction of its emissions and overall reducing its impacts on the environment).	If standards change in the future, we can review the permits of sites in the incineration sector to check whether any additional controls would be required. We have the power to vary the Permit if required. We are also required to keep permits under review which could include updating to reflect changes in BAT.
Concern about the way emission limit values (ELV) are set in the permit and that the top end of the BAT-AEL range has been used.	In accordance with the Defra Industrial Emissions Directive EPR Guidance on Part A Installations, ELVs have been set on the basis of the top of the relevant BAT-AEL range. We are satisfied that emissions at the permitted limits would ensure a high level of protection for human health and the environment. Where we have accepted that the Applicant's proposals are BAT there is no justification to reduce ELVs below the BAT AELs and Chapter IV limits. Section 6.6 has further details. However, for ammonia the Applicant has proposed a limit which is tighter than the BREF incineration emission limit (8 mg/m^3 rather than 10 mg/m^3). This has been used in the assessment and permit conditions reflect this tighter emission limit. We are satisfied that this level of emission is consistent with the operation of a well-controlled SNCR NOx abatement system and is achievable.

Alternative sustainable and low-carbon solutions for generating energy should be used instead of waste incineration.	It is argued that Incineration is not an environmentally sustainable technology and therefore cannot be considered to be the Best Available Technique (BAT). At this time however, mass burn incineration at this scale can still be considered BAT, subject to the appropriate assessments being made. We have to assess the environmental impacts of what is proposed which is an activity that can be authorised under EPR. Wider issues of waste and energy policy are outside our remit. We have not compared emissions to other forms of power generation in our assessment of this Application. The Application is for an incineration plant with the primary purpose of waste disposal whereas the primary purpose of energy generation infrastructure is to generate energy. Our assessment of BAT is set out in section 6 of this decision document and relates to whether they are using BAT to incinerate the waste which is the primary purpose of the plant.
Concern that no limits will be set for dioxin-like PCBs	The BAT Conclusions for Waste Incineration gives a choice of ELVs. Under BAT 30 we can either set an ELV for dioxins and the related furans (PCDD/F) or a combined dioxin/dioxin-like PCB limit. An ELV is set in the permit for Dioxins / furans. We do not set emission limits in the permit for dioxin-like PCBs, however we do specify that monitoring is required. We have also set improvement condition IC9 which requires the operator to carry out a programme of dioxin and dioxin like PCB monitoring. This is so we can determine that dioxin emissions can be considered to be stable.
Concerns over figures used for global warming that were used in the application	The figures used for global warming in the BAT assessment are consistent with figures in similar installations. Our consideration of global warming potential, including carbon dioxide emissions, is set out in sections 6.3 and 6.6.1. The key part of this assessment is comparisons of different BAT options and that the key factor is ensuring as much energy is generated from the waste as practicable. Therefore, any changes in the way direct CO_2 emissions or CO_2 offset are calculated will be the same for each option and will not affect the conclusions of the assessment.
We received a copy of an IPCC (Intergovernmental Panel on Climate Change) paper: *Emissions from Waste Incineration*, together with concern that the	This paper is part of the report Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories. It appears to be a methodology for countries to use as part of calculating

findings of this paper had not been taken into account.	national CO_2 emissions, with methods for calculating direct and off-set emissions. The methodology in this paper doesn't affect our BAT assessment, where the key measure to minimise global warming is to maximise energy recovery. For permit determination, the method an Applicant uses to calculate direct or off-set CO_2 emissions does not make a difference to the conclusions of that assessment provided energy recovery is considered in the same way for each BAT option.
Comments about waste types	
Concern over the burning of plastics.	Waste types and quantities are specified in Table S2.2 of the permit. Only one EWC code is included: 19 12 10 *combustible waste (refuse derived fuel (RDF)).* Although it is likely that the RDF will contain some plastics, most plastics should be separated at source. Waste acceptance criteria will prevent separately collected plastic unless contaminated. Other measures such as bunker management, combustion control and emission limits will provide sufficient control to ensure that any plastic in the waste will not cause significant pollution or harm.
Concerns about toxic waste produced by abatement measures.	Potentially harmful residues result from the incineration process including APC. APC residues will be hazardous waste. We are satisfied that both hazardous and non-hazardous wastes produced on site will be handled and recovered or disposed of appropriately.
Comments about odour impacts	
Concerns about odour	We are satisfied that there will not be a significant impact from odour, further details are in section 6.5.4 of this decision document.
Concern about odour from waste being delivered by ship and unloaded in the port	The Applicant has said that port location of the installation allows waste to be transported by road or delivered by ship. The transport of waste does not form part of this Permit up to the point it enters the installation. Therefore, the use of ships to transport waste is outside of the remit for this Permit. The Permit can only control emissions that occur from inside the site. We are satisfied these will be adequately controlled. Waste will be delivered in enclosed or covered vehicles that will minimise odour emissions and prevent significant impacts.
Concern about odour from baled waste if plastic wrapping is damaged	Baled waste will be stored inside and transferred to the waste bunker on a regular basis with storage times minimised. Baled waste will be stored in a fully enclosed

	building maintained under slight negative pressure. This will reduce the risk of odour from baled waste. 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 about odour escaping the building when the doors are open	The main access doors to the reception area that will be used for the waste delivery vehicles are fast closing roller shutters and will be kept closed (except during vehicles coming in and leaving) to maintain odour control. We are satisfied with what has been proposed.
Concern about odour emissions arising from vents	The building operates under negative pressure which prevents fugitive emissions. Air from the reception area will be used for combustion air in the furnace to generate negative pressure in the reception hall, rather than being vented. We have also included in the permit, the condition 3.3 to manage any potential fugitive emissions. We will use permit condition 3.4.1 to control and regulate odour.
Concern about odour emissions from the stack	Odorous compounds will be destroyed in the furnace. Combustion at 850^{o}C for 2 seconds will destroy odorous substances.
Concern over odour control during shutdown when the furnace not operating.	We are satisfied that the measures proposed in the Application will prevent significant odour including during periods when the furnace is not operating. Further details are in section 6.5.4 of this decision document.
Concern that the design of the waste bunker will lead to odour from unmixed waste remaining at the bottom of the bunker	Air from the reception area will be used for combustion air in the furnace to generate negative pressure in the reception hall. This technique is used in many incineration plants and generally works well to control odour. We are satisfied that the measures proposed by the Applicant, and implemented through the Permit conditions, will ensure that that there will not be a significant impact from odour. Prior to periods of extended plant shutdown, the volumes of waste within the waste bunker will be reduced with the bunker being 'empty' during periods of planned shutdown. During the planned shutdown, assumed to be annual, deposits/residues retained within the base and corners of the bunker will be removed.
Concern that climate change may increase the risk of odour in the future and that the site should be required to adapt to the risk	We are satisfied with the 'climate change risk assessment' submitted with the application. The Operator is required to integrate climate change adaptation planning into their management system. Including considering if a changing climate could affect site operations and how this might affect their ability to comply with their permit conditions.

Concern that a move towards waste with a higher biodegradable content will increase odour risk	We are satisfied that our standard odour condition will allow effective regulation of the site and prevent odour pollution. Waste types and quantities are specified in Table S2.2 of the permit. Only one EWC code is included: 19 12 10 *combustible waste (refuse derived fuel (RDF)).* Any proposed changes to waste types would need to be considered under a separate future variation application.
Comments about other impacts	
Priority should be to recycle waste	This is primarily outside the scope of this determination. The obligation is on waste producers to apply the waste hierarchy and for local authorities to have their own waste strategy dealing with kerbside collections. Our role in this determination is to assess whether any residual waste that may be sent for incineration can be dealt with in an environmentally acceptable manner. This facility deals with residual waste after upstream segregation, recovery, and recycling initiatives. The initiatives higher up the waste chain should ensure RDF only includes residual waste not suitable for recycling. The permit does not allow separately collected fractions suitable for recycling to be accepted for incineration as set out in Conditions 2.3.5 and 2.3.6 of the Permit.
Deliveries of waste to the site via ship should not be allowed.	The Applicant has said that port location of the installation allows waste to be transported by road or delivered by ship. The transport of waste does not form part of this Permit up to the point it enters the installation. Therefore, the use of ships to transport waste is outside of the remit for this permit. It is for the port/ harbour authority to ensure that port operations can operate in a manner that avoids marine pollution. Depending on the nature of any future proposals, other permits/ permissions may also be required.
Other countries, including the EU, are reducing the use of incinerators. The UK should not be building more.	Whilst we cannot comment on the accuracy of the claim this is outside the scope of this determination. We have to assess the environmental impacts of what is proposed and whether this is an activity that can be authorised under EPR. Mass burn incineration at this scale is considered BAT provided it meets the requirements (as set out in the BREF and BAT conclusions). See section 6 of this decision document for more details.

Concerns about flies and pests	Pests are not usually an issue at incineration plants because the waste is only stored for a short period of time. The waste reception and storage area, and all incoming waste handling activities will be undertaken within a fully enclosed building. The Applicant has set out good housekeeping practices in the Application to prevent and minimise the risk of pests and vermin. Conditions 3.7.1 and 3.7.2 will provide controls.
Consideration should be given to breakdowns and emergency operations	The EMS will include a preventative maintenance scheme so that equipment is serviced and replaced before it breaks down. The permit sets limits on how long the plant can operate during abnormal operations. Section 5.5 of this decision document has more details including details of the risk assessment that shows there will not be a significant impact during abnormal operation. If an emission limit is exceeded at other times then the plant must stop feeding waste immediately.
Concerns over pollution impact on water quality	There are no emissions to water other than uncontaminated rainwater run-off. All such uncontaminated surface water run-off will be discharged, via separate discharge points, to Balaclava Bay (east) and/or Portland Harbour. Surface water run-off will be collected from areas of hardstanding and building roofs and discharged into the surface water drainage system. The surface water drainage system will be fitted with a retention interceptor and swales, prior to the discharge point, to prevent discharge of oils and sediment collected from vehicle movement areas and roadways being released off-site.
Concerns about litter and that waste will be lost during handling and reach the sea	Waste will be delivered in enclosed delivery vehicles and tipped into the bunker within the reception building. RDF bales would also be accepted at the site, these will be wrapped in plastic to prevent litter. The Applicant has set out good housekeeping practices in the Application to prevent and minimise the risk of litter escaping from the site. We are satisfied that based on the proposed control measures set out in the Application impacts from litter are unlikely to occur. See section 6.5.3 on fugitive emissions for further information.
Other sources of electricity should be used to provide power to the port	We have to assess the environmental impacts of what is proposed and whether this is an activity that can be authorised under EPR. Wider issues of energy policy are outside our remit.

Concerns over emissions of cooling water	There are no emissions of cooling water associated with this site. The installation will use Air Cooled Condensers (ACC) rather than Water Cooling. ACCs do not require significant quantities of water. The Facility will operate an ACC to condense the steam output from the turbine to allow return of the condensate to the boiler. The only discharge to surface water permitted is discharge of uncontaminated surface water.
Concerns about groundwater contamination	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.
Concerns about coastal flooding	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 the Applicant and Planning Authority. When making permitting decisions, flood risk is still a relevant consideration, but generally only in so far as appropriate measures are in place to prevent pollution in the event of a credible flooding incident. The risk of flooding is addressed as part of the planning process.
Comments about noise impacts	
Concerns about noise	Based on the Applicant's modelling we are satisfied that there will not be a significant impact from noise. See section 6.5.5 for further details.
Concern that the operational noise from the installation has not been adequately modelled.	We audited the Applicant's noise assessment. As part of the audit, we checked that relevant factors, including representative source data, were considered appropriately by the Applicant and we are satisfied that there were. We are satisfied that there will not be a significant impact from noise. See section 6.5.5 for further details.
Concern the noise assessment doesn't take into account the effect of the local geography i.e. sound resonation from the adjacent cliff and the carrying effect of noise across water.	Topographical data was included in the SoundPLAN modelling files provided with the application, to represent local topography. Our Air Quality Modelling Assessment Unit (AQMAU) checked alternative terrain data (LIDAR DTM resolution 1m), in their sensitivity check modelling. We consider the terrain data used to be representative of local topographical conditions. The consultant's SoundPLAN noise model and AQMAU's CadnaA noise model account for sound energy reflections off topographical features such as cliffs, water, and land.
The report '*Sharpe Acoustic Assessment of the effect of the operation of a proposed*	We received this report in response to the updated BS4142 Noise Impact Assessment

waste incinerator on the sound character and tranquillity at Portland, dated 7th November 2023' was submitted for consideration as part of a consultation response.	submitted on 18/10/2023. We have taken the report and points raised into consideration during our assessment of the BS4142 Noise Impact Assessment. We are satisfied that there will not be a significant impact from noise. See section 6.5.5 for further details.
Concern over noise from traffic including HGV movements	The environmental impact of HGV movements, and other traffic, off the site of the facility are not regulated under EPR. On site vehicle movements were included in the Applicant's noise assessment and we are satisfied that there will not be a significant impact from noise.
Concern about noise levels at the Bibby Stockholm	We have considered potential noise impacts at the Bibby Stockholm. Based upon the information in the noise impact assessment combined with the information required through improvement condition (IC12) 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. We are satisfied that noise will not cause a significant impact. See section 6.5.5 for further details.
Comments about accident prevention	
Accident risks from batteries were raised	It is possible that batteries could be placed in household bins and burned if received at the incinerator under the RDF code. However, quantities are likely to be small and not pose a significant risk. The likelihood of this is further reduced as the Applicant confirms that waste supply contracts for the site will include specifications for the supply of incoming waste. The site's waste specifications will require that the RDF has been pre-processed with incompatible and unstable wastes, such as batteries and other unacceptable materials, being removed from the incoming waste at the pre-processing facility.
Concern about fire risk from PVC mesh/ camouflage netting used to cover the buildings	The Environmental Statement discusses façade materials and concludes that cladding should be used, no mention is made of camouflage netting. In any case the aesthetic design/ appearance of the building is a matter for the planning authority. The fire risk from building design elements such as cladding (or netting) will be controlled by other legislation.

Concern as to how the public will be informed in the event of a major fire and how any evacuations would be managed.	Public action required during a fire would be dependent on a number of factors and would be managed by the relevant authority. It is not within the remit of this permit determination. In the unlikely event of a fire the FPP states that residents and business will be informed. There are several ways that this could be done and we expect the Operator to have procedures in place to achieve this. Pre-operational condition PO11 has been set for the Operator to submit a final FPP after the final design has been finalised and this will need to include these procedures.
Concern about the impacts from uncontrolled emissions resulting from a fire	We are satisfied that appropriate measures will be in place to prevent fires and to minimise the impact from a fire if it was to occur.
Concern about fire risk from stored RDF including self-combustion.	Many materials can self-combust under certain conditions. Self-combustion can be prevented by carefully managing storage times, pile volumes and height, and the temperature of the wastes. 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. The Applicant submitted a Fire Prevention Plan. Pre-operational condition PO11 requires further update to the Fire Prevention Plan prior to commissioning of the installation. A number of elements will be subject to confirmation at the final design stage and will be assessed by the Environment Agency against our guidance. We are satisfied that the current Fire Prevention Plan contains adequate information for permit issue.
Concerns that the current uses of the port mean there are additional risks including armaments, explosives, fuel pipelines and fuel storage bunkers nearby.	Pre-operational condition PO11 requires further update to the Fire Prevention Plan prior to commissioning of the installation. It is a requirement of part of this condition that the sensitive receptor plan/s is updated to include these land uses. The inclusion of these risks within the sensitive receptor plan/s will allow Environment Agency officers and fire fighters attending the site in the event of an incident to familiarise themselves with the surrounding risks and respond accordingly.
Concerns about explosions caused by hydrogen gas released from IBA storage	The example referred to is that of a cargo vessel off Plymouth being used to transport untreated IBA. The permit does not cover the loading of IBA onto boats or the use of boats to transport IBA. IBA at the installation will be stored in an enclosed area but will have ventilation so our view is that there will not be a significant risk. There will be regular collections of IBA from

	the IBA storage area for transfer off-site to a suitably permitted waste facility.
Concerns that the baled RDF storage will exceed that detailed in the application.	We have assessed the storage of baled RDF waste against our FPP guidance. The amount of baled waste permitted to be stored on site at anyone time is limited both through the FPP and Table S1.1 of the Environmental Permit. The Applicant stated that waste will not be accepted if there is insufficient storage capacity available.
Comments about the Applicant	
Concerns about the operator not having experience operating this type of plant.	We are satisfied that the Applicant will be a competent operator because: • An EMS certified to ISO 14001 will be in place • A suitably qualified facility manager will be appointed who will have responsibility of Permit compliance • An environmental policy will require that the Installation operates in full compliance with legislative requirements Additional information in section 4.3 of this decision document
Comments about regulation	
A claim was made that the compliance history is poor at other incinerators.	We do not agree with this claim. The sector is generally a good sector in terms of compliance.
Other concerns	
Concerns about use of a mechanical grabber to load bottom ash onto boats.	The permit does not cover the loading of incinerator bottom ash (IBA) onto boats. The bottom ash will be loaded onto road vehicles within an enclosed ash handling/storage area for transport off-site for treatment. The storage and transfer of IBA outside of the installation boundary has not been considered as part of this determination. The Permit does not control how IBA is used once it leaves the site although transport and subsequent use will be covered by duty of care, and other relevant, legislation.
Concern about the storage and handling of incinerator bottom ash (IBA) and Air Pollution Control residues (APCr)	Measures for handling of IBA and APC residues are summarised in sections 4.2.2 and 4.3.9 of this decision document. We are satisfied that the measures are appropriate.
Misleading claims that untreated bottom ash is inert	Bottom ash is not classed as inert waste, but normally as non-hazardous waste. A sampling protocol will be developed to ensure that the sampling and hazardous testing is done properly. Pre-operational condition (PO3) requires that the protocol is in place and approved.

Waste incineration is not consistent with UK Government policies to move towards zero carbon status. Concern that incineration encourages the continued use of "difficult to dispose-of" wastes. Local waste management policy should be to encourage waste minimisation and a circular economy.	We have to assess the environmental impacts of what is proposed which is an activity that can be authorised under EPR. Wider issues of policy are outside our remit. Recovery and recycling initiatives are a matter for the local authority.
Several concerns were expressed over differences between the documents submitted for planning and permitting	The planning application and this environmental permitting application are separate processes. We have assessed the application based on information that was submitted in the application. The operator is required to comply with any permit and any planning permission it obtains where any changes are required, they will need to be subject to separate application for a variation (for either planning or permitting). It is the Operator's responsibility to comply with all relevant statutory regimes and to ensure that any necessary authorisations are not in conflict.

c) Representations from Individual Members of the Public

Over 375 responses were received from individual members of the public. Many of the issues raised were the same as those considered above. Where an issue has already been covered above it is not necessarily repeated below.

Brief summary of issues raised:	**Environment Agency comment**
Comments about location	
Concern about the proximity to local housing, the sea and habitats	Decisions over land use are matters for the planning system. The location of the installation is a relevant consideration for Environmental Permitting, but only in so far as its potential to have an adverse environmental impact on communities or sensitive environmental receptors. The environmental impact is assessed as part of the determination process and has been reported upon in the main body of this document.
Concerns about future flooding of the coastal site due to climate change	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 in the accident management plan and that appropriate measures are in place to prevent pollution in the event of a credible flooding incident. As part of our determination we have assessed the climate change adaptation risk

	assessment and consider it to be satisfactory.
Concern that the location of the incinerator would restrict required access to a COMAH site already located at the port.	Decisions over land use are matters for the planning system. We have to assess the environmental impacts of what is proposed and whether this is an activity that can be authorised under EPR.
Comments about air emissions and air risk assessment	
Concern about impacts being averaged over a year	We have assessed both long- and short-term impacts. We are satisfied that there will not be a significant impact from emissions to air when based on the maximum concentrations that represent the worst-case predictions. Impacts at individual receptors will be lower than the maximum and we are satisfied there will not be an unacceptable impact at any receptor. Section 5.2 of this decision document has further details.
The impact on air quality for residents, workers and visitors was not adequately assessed.	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 has further details. The standards that we have used to assess against are set to protect all members of the public.
Concern that impacts at all receptors were not considered, including: • Prisons • Asylum seeker accommodation • Ships in the port	We are satisfied that there will not be a significant impact from emissions to air when based on the worst impacted receptors that represent the worst-case predictions. Impacts at individual receptors will be lower than the maximum and we are satisfied there will not be an unacceptable impact at any receptor. The port was included within the modelling domain. Sections 5.2 and 5.2.4 of this decision document has further details. The Bibby Stockholm (“the barge”) is now moored within 500 metres of the installation, the intended use of this barge is to provide accommodation for asylum seekers. The barge is considered to be an additional sensitive receptor and as such it needed to be taken into consideration during determination. As with all human health receptors, we considered potential impacts on the barge including odour, noise and impacts from air emissions. We are satisfied there will not be an unacceptable impact at this receptor.

The dispersion software used by the Applicant is not appropriate for the setting of the proposed site	We are satisfied the modelling adequately takes the site setting into account. We carried out check modelling in our audit using the consultant's modelling files in ADMS 5.2. We tested sensitivity using alternative modelling software AERMOD (US EPA executable version 19191) with AERMET meteorological data processor; and CALPUFF View (US EPA approved version), using CALMET meteorological data processor to consider modelling uncertainties and the sensitivity of results to alternative models. Based on the recommendations from our audit, the consultant remodelled their emissions with Breeze AERMOD. We are therefore satisfied that their modelling approach is sufficient with regards to model software selection and sensitivity to alternatives.
Concern that wind frequently comes from the north and east and that this was not considered in the modelling.	Weather conditions, including wind direction and speed, were taken into account in the Applicant's air dispersion modelling. The dispersion modelling tested sensitivity using five years of meteorological data observed at the Isle of Portland meteorological station recorded between 2014 and 2018 and 2 years of meteorological data at an alternative location - Portland Harbour between 2017-2018. We tested sensitivity to a total of twelve years of meteorological data from varying locations, data sources, decades and observed vs. modelled data. These are likely to capture local patterns and variation in meteorological conditions in the dispersion of pollutants.
Concerns about emissions of hydrocarbons	Impacts have been assessed for polycyclic aromatic hydrocarbons (PHA) pollutants in the Air Dispersion Modelling provided in the Application. PAH emissions are shown to be insignificant. See section 5.2 of this decision document for more information.
Emissions will cause pollution from ozone and peroxyacetyl nitrates (PANs).	Ozone and PANs are produced by the action of sunlight on volatile organic compounds (VOCs) and oxides of nitrogen (NOx). It is considered that there is very little if any risk from the incinerator of an exceedance of an air quality standard. This has been considered in Section 5.2 of this document. The potential of substances to form ozone and other substances when reacting with sunlight is a factor considered when setting ambient air quality standards. Therefore, it is not considered that any additional controls or

	conditions are required, beyond those already proposed to minimise emissions.
Concerns over the impacts of temperature inversion	Temperature inversions typically occur on clear nights with calm winds. They develop during the night and typically break up a few hours after sunrise. The applicant's ADMS model considered the impact under stable condition type temperature inversions.
The stack should be higher to aid dispersion	We are satisfied that the stack height has been calculated in accordance with IED article 46(1). Having assessed the Application as a whole we are satisfied that the measures proposed, of which stack height is one aspect, are BAT.
Concern about excess cadmium levels and that there are errors in the figures provided by the applicant.	The consultation response referred to figures given in Table 5 of document S2953-0320-0012RSF, dated 7 May 21. This table considers the process contributions for cadmium at discreet human health receptors. The units for this table are incorrectly presented as micrograms per metre cubed ($\mu g/m^3$), it should be nanograms per metre cubed (ng/m^3). This is an error in the table and although the units are incorrectly stated the figures in the table are correct when taken to be in ng/m^3. The Applicants Air Quality modelling considered the Ambient Air Directive (AAD) Target of $5ng/m^3$ for cadmium. Although cadmium didn't screen out as insignificant, it has been assessed as being unlikely to give rise to significant pollution in that the predicted environmental concentration is less than 100% (taking expected modelling uncertainties into account) of both the long term and short-term Environmental Standard.
Concerns about the in combination impacts from stack and traffic emissions	The air quality assessment considered existing background pollution levels which includes emissions from traffic. Movement of traffic to and from the Installation is outside of our remit but will normally be an issue for the planning authority to consider. Our consideration is whether the emissions from traffic could affect the prevailing pollutant background levels which could be a consideration where there are established high background concentrations contributing to poor air quality. In this case the small increase in pollutants from traffic would not affect the background levels to the point where it would affect the conclusions of the air quality assessment.
Concern about the bioaccumulation in the marine environment from emissions to air	The concern is that emissions to air from the installation will accumulate in the marine environment and pass into the food chain. We have consulted a number of sources to

	investigate potential fish intake by members of the public and agree that the ingestion of fish is unlikely to be a pathway. However, we considered the consumption of locally caught fish pathway in our Human Health Risk Assessment screening checks, and it indicated intakes below the UKHSA screening criteria. Therefore, our view is that no further assessment on the marine environment is required.
Concern that the high salinity content of the air may interact with emissions from the stack	We are satisfied that the Applicant's modelling represents a worst-case scenario for the assessed pollutants. The effects of plume depletion and chemical transformations were not modelled by the Applicant. We are satisfied that their approach is conservative.
Concern that predictions taking future weather data into account have not been considered	The consultant tested sensitivity using five years of meteorological data observed at the Isle of Portland meteorological station recorded between 2014 and 2018 and 2 years of meteorological data at an alternative location - Portland Harbour between 2017-2018. We tested sensitivity to a total of twelve years of meteorological data from varying locations, data sources, decades and observed vs. modelled data. These are likely to capture local patterns and variation in meteorological conditions in the dispersion of pollutants. Climate change is assumed to be less than the inter year variation in the data and so is not expected to affect the predictions significantly.
Comments about health impacts	
Concern was expressed that there will be an impact on health due to the Installation including: • those with existing health conditions • young people • elderly • receptors in schools, residential care facilities and prisons	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.
Concerns about health impacts from air pollutants, including nitrogen oxides, sulphur dioxides, particulate matter, lead, mercury, dioxins and furans.	We have assessed 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. The impact from dioxins/furans is described in more detail in section 5.3 of this decision document. We are satisfied that impacts will not be significant.

Concern over the mental health of residents due to the perceived risk of emissions from the site and the visual impacts.	Our view as set out in this decision document (section 5.3) is that emissions from the Installation will not have a significant effect on health. There is therefore no reason that there should be an impact on mental health.
Concern about the increased health impacts caused by poor dispersion	We checked the weather data used by the Applicant when we audited the Applicant's dispersion modelling. This included checking weather data from other weather stations around the site and using our own weather data. We tested sensitivity to a total of twelve years of meteorological data from varying locations, data sources, decades and observed vs. modelled data. These are likely to capture local patterns and variation in meteorological conditions in the dispersion of pollutants. We are satisfied that the proposal is unlikely to result in a significant impact on air quality.
Concern about health impacts from ammonia emissions	We have assessed the impacts from ammonia 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.
The HHRA doesn't consider Benzenes or PAHs	Emissions of benzene and polycyclic aromatic hydrocarbons (PAH) are considered in the Applicant's dispersion modelling (Appendix D.2: Process Emissions Modelling). We have audited the dispersion modelling submitted with this Application and we are satisfied that there will not be any significant impacts.
Comments about impacts at ecological sites	
Concern that the full impact of emissions on protected sites has not been considered.	The assessment considers potential impacts on relevant ecological sites, including: • Habitats sites (i.e. Special Areas of Conservation (SAC), Special Protection Areas (SPA) and Ramsar) located within 10Km of the Installation • Sites of Special Scientific Interest (SSSI) located within 2Km of the Installation • non-statutory local wildlife sites (LWS) located within 2Km of the Installation Our assessment at ecological sites is described in section 5.4 of this decision document. We are satisfied that there will not be a significant impact.
Concern about the impact of acidic gases on habitats, flora and fauna	Our assessment has considered the potential impact of acidification and contribution of nitrogen oxides, as nutrient nitrogen. Our assessment at ecological sites is described in section 5.4 of this decision

	document. We are satisfied that there will not be a significant impact.
Concern over impacts on the marine environment, including impacts on its ecosystem, flora and fauna	It is not anticipated that emissions to air from the installation will significantly impact the marine ecosystem. Our assessment at ecological sites is described in section 5.4 of this decision document. We are satisfied that there will not be a significant impact.
Concern about effects on marine conservation zones	Our assessment at marine conservation zones is described in section 7.2.7 of this decision document. We are satisfied that there will not be a significant impact. It is not anticipated that emissions to air from the installation will significantly impact the marine ecosystem. Our assessment at ecological sites is described in section 5.4 of this decision document. We are satisfied that there will not be a significant impact.
Concern about the impact of increased nitrogen on calcareous grasslands	Our assessment at ecological sites is described in section 5.4 of this decision document. We are satisfied that there will not be a significant impact.
Dorset Wildlife Trust have not been informed about the Application.	We considered that we did not need to consult with Dorset Wildlife Trust on the Application documents. We are satisfied with the way that we have considered impacts on ecological sites and wildlife, as set out in section 5.4 of this decision document.
Comments about noise impacts	
Concern over noise from fans	The noise assessment undertaken by the Applicant considered potential noise sources at the installation, including fans. We audited the Applicant's noise assessment. We are satisfied that there will not be a significant impact from noise. See section 6.5.5 for further details.
Concern over noise from traffic and loading/ off loading waste	Waste deliveries will typically only occur during daytime periods. The Applicant's noise assessment included on-site vehicle movements and we are satisfied that there will not be a significant impact.
Concern that the acoustic assessment is incomplete	The Applicant submitted a revised noise assessment that contained details of the noise sources. We audited the Applicant's noise assessment. We are satisfied that there will not be a significant impact from noise. See section 6.5.5 for further details.
Concern about the impact of noise at night	We audited the Applicant's noise assessment, which considered night-time impacts. We are satisfied that there will not be a significant impact from noise. See section 6.5.5 for further details.

Concern that monitoring locations are not representative of background noise levels	We audited the Applicant's noise assessment, including the chosen monitoring locations. We are satisfied that the Applicant identified the nearest NSR's to the installation. See section 6.5.5 for further details.
Concern that the noise assessment doesn't include for an actual baseline study of noise levels throughout day and night.	While a baseline survey wasn't included in the original NIA dated September 2020, the subsequent NIAs submitted (dated May 2021 and October 2023) did include a baseline survey in line with British Standard 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound. We consider that the consultant's unattended sound survey and subsequent BS 4142 noise impact assessment is representative of daytime (07.00 – 23.00) and night-time (23.00 – 07.00) periods at the nearest noise sensitive receptors. We audited the Applicant's noise assessment and consider it is conservative and suitable to support the environmental permit application. See section 6.5.5 for further details.
Concerns about vibrations generated by the operation of the site.	We are satisfied that vibration will not be a significant issue.
Comments about odour impacts	
Concern that the odour assessment is not fit for purpose	We are satisfied that the proposed control measures will prevent any significant emissions of odour from the site. Section 6.5.4 has further details. The odour management plan is required to be frequently reviewed by the operator and updated if required. Odour condition 3.4.2 will require the implementation of an odour management plan if deemed necessary by the Environment Agency. If required, this could ultimately require changes to be made on site if it is deemed that improvements are necessary.
Concern that receptors have not been considered fully in the odour assessment	We are satisfied with the receptors considered in the assessment and we consider that the proposed measures will prevent significant pollution from odour. We are satisfied that there will not be a significant impact from odour, further details are in section 6.5.4 of this decision document. The Bibby Stockholm is considered to be an additional sensitive receptor and as such it needed to be taken into consideration during determination. The operator provided an updated Odour Mitigation Strategy which considered the barge in response to our

	Schedule 5 Notice dated 08/09/2023. We are satisfied there will not be an unacceptable impact at this receptor.
Odour modelling and monitoring should be undertaken Acceptable odour units (OU) levels have not been considered	Whilst odour modelling and monitoring has its role, our approach is to impose operational controls which should prevent odour occurring in the first place, rather than setting OU limits in the permit. Our view is that odour modelling (including an assessment of OUs) and monitoring is not required in this case. We will use Permit conditions 3.4.1 and 3.4.2 to control and regulate odour. We are satisfied that odour modelling is not required to allow us to assess the application and that our standard odour condition will allow effective regulation of the site and prevent odour pollution
Concern that the odour assessment does not consider all potential sources of odour	We are satisfied that potential sources of odour from the installation have been considered in the Application. 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.
Concern over odour impacts during shut-down	The Applicant described measures in the Application to minimise the potential for odour during periods of shut-down. These operating techniques are incorporated into Table S1.2 of the permit. We are satisfied that the measures are appropriate. See section 6.5.4 for further details. In addition, odour condition 3.3.2 will require the implementation of an odour management plan if deemed necessary by the Environment Agency. If required, this could ultimately require changes to be made on site if it is deemed that improvements are necessary.
Comments about waste types	
Concerns how plastic waste is managed	We are satisfied that the plastics within the waste stream can be burned whilst complying with the permit emission limits. Waste types and quantities are specified in Table S2.2 of the permit. Only one EWC code is included: 19 12 10 *combustible waste (refuse derived fuel (RDF)).* Although it is likely that the RDF will contain some plastics, most plastics should be separated at source. Waste acceptance criteria will prevent separately collected plastic unless contaminated. Other measures such as bunker management, combustion control

	and emission limits will provide sufficient control to ensure that any plastic in the waste will not cause significant pollution or harm.
Concern over the types of waste and where they come from.	The Operator will have waste pre-acceptance and waste acceptance procedures to ensure that only waste authorised by the Permit is received and burned. The Permit does not control where the waste comes from because that falls outside the scope of this permit determination. Waste types are specified in table S2.2 of the Permit. We are satisfied that these wastes are suitable for burning at the Installation, further details are in section 4.3.6 of this decision document. We are satisfied that the operating techniques will ensure that emission limits can be met, the emission limits apply at all times whatever wastes are being burned.
Concern about incinerator capacity and its effect on waste recovery and recycling activities. Also concern that there will be insufficient waste feedstock available in the future	It is argued that as the quantity of residual waste reduces over the lifetime of the installation, the need to maximise efficiency by maintaining the incinerator at full capacity will suppress waste recovery and recycling initiatives, which are higher up the waste hierarchy. The capacity of the incinerator is primarily a matter for the Applicant designed to meet the waste disposal needs of the local authority. The proposed facility forms part of an integrated waste management strategy; any material arriving at the facility will be residual waste arisings following upstream waste segregation, recovery and recycling initiatives. The shape and content of this strategy is a matter for the local authority. The incinerator is one element in that strategy, and the Permit will ensure that it can be operated without giving rise to significant pollution or harm to human health. In any event Permit conditions will prohibit the burning of any separately collected or recovered waste streams, unless contaminated and recovery is not practicable.
Comments about BAT, emission limits and control measures	
Concern that the BAT assessment is not sufficient	We have assessed documents submitted in support of the application, including the BAT assessment. Our view is that the assessment is sufficient and that the measures proposed by the Applicant are BAT. This is explained in detail in section 6 of this decision document.
Filters will not capture all particles.	Our view is that bag filters are BAT. Filter bags provide particulate abatement from the fabric itself. In addition, particulate removal also occurs via a three-dimensional dust

	cake which is maintained on the surface of the filter membrane by controlling the bag cleaning process and the pressure drop through the fabric filter. The membranes have very small pores which in combination with the filter cake which accumulates on the bag filters provide effective abatement of particulates. Research has shown the removal efficiency is very high even for smaller particles. See section 5.3.3 of this decision document for further details
Comments about other issues	
Claim that landfill is a better environmental option than incineration.	The Applicant has not applied to operate a landfill site, the Application is for an incineration plant and we have to assess whether what they propose is acceptable. Our assessment of BAT is set out in section 6 of this decision document.
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 requirements (as set out in the BREF and BAT conclusions). See section 6 of this DD for more details.
The proposal does not satisfactorily demonstrate carbon neutrality, or reduction in overall carbon emissions.	The way we have considered global warming as part of the BAT assessment is discussed in section 6.3. The proposal does not need to demonstrate carbon neutrality or an overall reduction in.
Carbon capture and storage should be used.	We require combustion plants that generate 300 MW or more electricity to be carbon capture ready. This Installation is well below this level and carbon capture is not appropriate at this scale.
Concern over the impact of light pollution	Pollution from light is primarily a concern for considering visual impacts and as such generally covered by the planning process. In any event light pollution is not likely to have a significant effect on health or the environment.
Concern that flooding of the causeway would block access and lead to a build up of waste (RDF and bottom ash)	Temporary restriction of access to the site caused by occasional flooding, or other blockage, of the road network is not expected to have a significant effect on waste management at the site. Also, although not covered by this permit, the Applicant has also proposed transfer of waste to and from site via ship, which would avoid the use of the causeway.
The proposed incinerator would not divert waste from landfill as Dorset already sends its waste for incineration.	This is outside the scope of this determination. Local waste management arrangements are a matter for the local authority.
Incineration is not a sustainable solution to manage household waste	It is argued that Incineration is not an environmentally sustainable technology. At

	this time however, mass burn incineration is permissible under the EPR and can be considered BAT, subject to the appropriate assessments being made.
Concern over emissions from traffic	We have reviewed all background concentrations, with particular focus on recorded values presented in the Annual Status Report for Weymouth & Portland local authority, and Defra UK Air website. These measured values include emissions from traffic and shipping. Following our review of the background and check modelling, although we do not agree with the consultant's absolute numerical predictions, we agree with their conclusions. Movement of traffic to and from the Installation is outside of our remit but will normally be an issue for the planning authority to consider. Our consideration is whether the emissions from traffic could affect the prevailing pollutant background levels which could be a consideration where there are established high background concentrations contributing to poor air quality. In this case the small increase in pollutants from traffic would not affect the background levels to the point where it would affect the conclusions of the air quality assessment. Vehicle movements within the Installation boundary are considered within the remit of the Environmental Permit. However, the emissions from this limited area are highly unlikely to be significant and will not affect the conclusions of the air quality impact assessment.
Poor environmental risk assessment	We have assessed documents submitted in support of the application, including the environmental risk assessment. We are satisfied with the quality of those documents. 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.
Concerns that ash will enter the water during loading onto ships	The permit does not cover the loading of incinerator bottom ash (IBA) onto boats. The bottom ash will be loaded onto road vehicles within an enclosed ash handling/storage area for transport off-site for treatment. The storage and transfer of IBA outside of the installation boundary has not been considered as part of this determination. The Permit does not control how IBA is used once it leaves the site although transport and subsequent use will be covered by duty of care, and other relevant, legislation.

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 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.
Concerns that incinerators reduce waste recycling	We have to assess the environmental impacts of what is proposed which is an activity that can be authorised under EPR. Wider issues of waste policy are outside our remit.
Concerns about impacts on historical sites, including changes in setting	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.
Concerns about discharges of process waters to sea	The only discharge to surface water permitted is discharge of uncontaminated runoff, via retention interceptor and swales, to Balaclava Bay (east) and/or Portland Harbour.
Operation of an incinerator is inconsistent with the declaration of a climate and ecological emergency by local councils	We have to assess the environmental impacts of what is proposed which is an activity that can be authorised under EPR.
Concern over emissions to sewer	Water will be re-used at the site and there will be an occasional discharge to sewer in the event that there is an excess of process water. Any discharges to sewer from the installation are likely to be small and infrequent. We are satisfied that this occasional discharge will not be significant or harmful. See section 6.5.2 for further details. Emissions to sewer from an installation can only be made with the consent of a sewerage undertaker, who will only accept waste water

	they are satisfied they can deal with appropriately.
Concern about the storage of chemicals and raw materials	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. Key measures proposed by the Applicant to control fugitive emissions are covered in section 6.5.3 of this document. Based upon the information in the application we are satisfied that appropriate measures will be in place to prevent and /or minimise fugitive emissions.
Concerns about water use, including that water use at the installation may result in negative impacts on the area	Mains water is used at the site and no abstraction takes place therefore there will be no direct environmental impact in relation to the water being obtained. Through the permitting process we assess whether an operator is efficient with resources and minimises emissions. The ERF has been designed to minimise use of potable water. The main use of water at the plant will be to make up the water for the boilers. Other water consuming processes include the wet ash conveyor and the SNCR injection nozzles. The application sets out the following points in relation to water use: • Most of the steam used in the turbine boiler will be recycled as condensate. • Where practicable, waste waters generated from the process would be reused/recycled within the process. • Water from washdown will be discharged into a settlement tank prior to re-use in the ash quench system. We consider these measures are adequate to minimise water use on the installation. The operator will be required to report on water use and review environmental performance as part of their Environmental Management System.
Concerns over the release of microplastics	We are satisfied that there will not be a significant issue with emissions from the Installation. Bag filters will be fitted to provide particulate abatement. The membranes have very small pores which in combination with the filter cake which accumulates on the bag filters provide effective abatement of particulates.
Comments about monitoring	

Comments about how the emissions will be monitored	The Permit requires continuous monitoring for emissions to air of particulates, oxides of nitrogen, sulphur dioxide, carbon monoxide, total organic carbon, hydrogen chloride and ammonia. Other substances are required to be monitored quarterly or bi-annually. These requirements are in line with the IED and current BREF. 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. We are satisfied that the monitoring requirements in the Permit are appropriate.
Ambient air monitors should be placed nearby	Ambient air monitoring around operating incinerators is not a reliable method of establishing the impact as it does not identify the source of the emissions. We consider it is better to use air dispersion modelling to predict the impact based on the highest allowed emissions (emission limit values). We have audited the modelling and we are satisfied that it is suitable for assessing the impact from the Installation. The Permit requires monitoring to be carried out to ensure that the emission limits values that were used in the modelling are met.
Automatic monitoring should be carried out	The Permit requires continuous monitoring for emissions to air of particulates, oxides of nitrogen, sulphur dioxide, carbon monoxide, total organic carbon, hydrogen chloride and ammonia. Other substances are required to be monitored quarterly or bi-annually. These requirements are in line with the IED, current BREF and we consider these measures to be appropriate. 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. The plant has to shut down if not operating to required standards. 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. We are satisfied that the monitoring requirements in the Permit are appropriate.
How will discharges to sewer and water be monitored	There will be an occasional discharge to sewer in the event that there is an excess of process water. We are satisfied that this occasional discharge will not be significant or harmful. Discharges to sewer will be in accordance with a Trade Effluent Consent secured from the local sewerage undertaker. Trade Effluent Consents typically include

	discharge limits and monitoring requirements which the operator would be required to comply with. The only emission to surface water allowed under the Permit will be uncontaminated rainwater run-off emitted to either to Balaclava Bay (east) and/or Portland Harbour. There are no limits or monitoring requirements associated with the discharge. The water discharge will be inspected during Environment Agency compliance visits to the site to ensure only uncontaminated water is being discharged.
Concern that 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 as important because: • There is now a wide variety of standards for monitoring, covering CEMs, periodic monitoring, and quality assurance. • We have MCERTS for CEMs and test labs. • We have EN 14181 for quality assurance of CEMs. • We require CEMs and test labs to be accredited to MCERTS and all the applicable standards. • We carry out audits of operators' provisions for monitoring and audit the monitoring results. However, we still do check monitoring where it is considered appropriate. Furthermore, as well as auditing operators' provisions for monitoring, and how they apply the monitoring requirements of the permit, we also regularly audit test laboratories.
Comments about residues	
Concern about the treatment of incinerator bottom ash	The Application proposes that bottom ash will be transported off-site to a suitably permitted waste treatment facility for recovery/disposal. There will be no bottom ash treatment undertaken at the installation.
Concern over the transport of ash over large distances for further treatment	Movement of traffic external to the installation is not within our remit.
Concern that the ash will be toxic	Bottom ash is normally classed as non-hazardous waste. A sampling protocol will be developed to ensure that the sampling and hazardous testing is done properly. Pre-operational condition (PO3) requires that the protocol is in place and approved
Comments about accident prevention	
Concern about how an accident would be managed.	The Applicant provided an accident risk assessment in the Application. An accident

	management plan will also form part of their environmental management system that is subject to Pre-operational condition PO1. COMAH legislation covers sites that pose the highest accident risks and these sites would have major accident plans. This Installation is not subject to COMAH regulations due to not meeting any of the COMAH thresholds.
Concern about access to the site by emergency services in the event the causeway is flooded and narrow roads restricting access	We have assessed the Applicant's proposals, including accident prevention and fires. Although it is not possible to address every eventuality, we are satisfied that they adequately cover what we consider to be realistic scenarios. Generally, consideration of the local road network, including access via the causeway, are not part of the Installation and so vehicle movements on these roads are outside our remit for control within the Environmental Permit. However, given the coastal location of the installation we consider that there will be other potential ways for emergency services to access the site in the event road access is not available.
Additional risk in the event of an accident posed by presence of naval nuclear vessels in the port	We have to assess the environmental impacts of what is proposed and whether this is an activity that can be authorised under EPR. The type of vessels that may or may not use the port do not affect that.
Receptors have only been considered in 1km in the FPP	This is in line with our web guidance on Fire Prevention Plans, which states that Applicants must have plans showing all sensitive receptors within a 1km radius of your site that could be affected by a fire.
Concern was expressed about some specific accident scenarios including: • Concern over the risk of explosion. • Concern over extreme events such as war, terrorism or earthquake. • Concern over site security and sabotage.	Our view is that there is not a significant risk of explosion from incineration plants. Based on information provided in the Application, we are satisfied that the site will be secure. We have assessed the Applicant's proposals, including accident prevention and fires. We are satisfied that they adequately cover what we consider to be realistic scenarios. We would not expect to see extreme events such as war, terrorism or earthquake included in an accident management plan due to very low risk of them occurring.
Concern about the potential for steam leaks	The occurrence of malfunctions will be minimised by the Operator's preventative maintenance programme which will be included within the Environmental Management System. Section 4.3.2 of the decision document states that we are

	satisfied that an appropriate Environmental Management system (EMS) will be in place. Information in the Application confirmed that the EMS would meet the requirements of our guidance. PO1 of the Permit requires the EMS to be in place. The Applicant has not submitted an Accident Management Plan (AMP). However, an AMP will form part of the EMS and must be in place prior to commissioning as required by a pre-operational condition (PO1). See section 4.3.4 of this decision document for further information. Condition 4.3.1 requires the Operator to notify the EA in the event of any accident from the operation of the installation which may significantly affect the environment, or any breach of any permit condition.
Comments about the Applicant	
Concern about who the operator of the site will be, if they will be the sole operator and if the operator were to change in the future.	We consider that the operator has provided adequate evidence to show that they will be competent and the legal operator of the regulated facility. See additional information in section 4.3 of this decision document Any future change in the legal operator of the installation would require a permit transfer application by the operator and proposed operator and assessment by the Environment Agency, this would include an assessment of operator competency
Concern that the applicant's website contains inaccurate or misleading.	We are not responsible for the content of the Applicant's website.
Comments about energy efficiency/recovery	
Concern over the energy efficiency	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 and that energy will be recovered as far as practicable. Section 4.3.7 of this decision document has further details.
Concerns that energy supply will not benefit the local area or national grid	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. Generated electricity will be used on-site with the excess exported to the National Grid. The Applicant has also assessed the possibility of supplying power to the local area and has identified the adjacent port as a potential receiver. The Applicant assessed the possibility of supplying heat to the local area. The conclusion was that provision will be made
Concern that the plant will not operate as combined heat and power (CHP).	

	for connection to a CHP scheme to provide further energy recovery by the export of heat, if any potential heat users become available in the future. Section 4.3.7 of this decision document has further details.
Comments about regulation	
Concern over whether the Environment Agency will investigate complaints.	If we receive any complaint, we will assess the complaint and investigate it as appropriate.

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

Brief summary of issues raised:	**Summary of action taken / how this has been covered**
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 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.
Concerns that an incinerator should not be located in or adjacent to a deprived area	
Concerns about the visual impact	Visual impacts are generally covered by the planning process. We have considered specific concerns about visual impacts of the plume and light pollution above.
Comments about vehicle access to the installation and traffic movements on local roads, including an increase in traffic.	Movement of traffic to and from the Installation is a relevant consideration for the grant of planning permission but does not form part of the Environmental Permit decision making process. 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. We have considered specific concerns about road access with regards to waste stockpiles and access in the event of an emergency above.
The incinerator is not in line with the local waste plan	We have to assess the environmental impacts of what is proposed and whether this is an activity that can be authorised under

	EPR. Wider issues of waste policy are outside our remit.
Concerns that the installation is not in line with local development plans and policies.	Location and development plans are primarily a land use planning issue. 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.
Dorset Council already has a contract with another incinerator	We have to assess the environmental impacts of what is proposed and whether this is an activity that can be authorised under EPR. Wider issues of waste policy are outside our remit. It is argued that as the quantity of residual waste reduces over the lifetime of the installation, the need to maximise efficiency by maintaining the incinerator at full capacity will suppress waste recovery and recycling initiatives, which are higher up the waste hierarchy. The capacity of the incinerator is primarily a matter for the Applicant designed to meet the waste disposal needs of the local authority. The proposed facility forms part of an integrated waste management strategy; any material arriving at the facility will be residual waste arisings following upstream waste segregation, recovery and recycling initiatives. The shape and content of this strategy is a matter for the local authority. The incinerator is one element in that strategy, and the Permit will ensure that it can be operated without giving rise to significant pollution or harm to human health. In any event Permit conditions will prohibit the burning of any separately collected or recovered waste streams, unless contaminated and recovery is not practicable.
Am incinerator is not needed as Dorset already has high levels of recycling	
Concerns that waste will be imported from outside Dorset.	It is argued that diminishing supplies of residual waste from the surrounding area over the lifetime of the installation will result in the importation of waste from outside the area, sub-region or country. This is similar to the point above on the potential impact on local recycling and is not a consideration for this permit application.
Concerns about waste types sourced from outside the UK	
Concerns the incinerator will not contribute to the local economy or job market.	This is not within our remit.
Concern provision of a new footpath is not adequate mitigation	This is not within the remit of the permit application and is a consideration for planning permission.