

Determination of an Application for an Environmental Permit under the Environmental Permitting (England & Wales) Regulations 2010

Decision document recording our decision-making process

The Permit Number is: EPR/NP3034CG
The Applicant / Operator is: AmeyCespa Limited
The Regulated Facility is located at: Allerton Park, Knaresborough

What this document is about

This is a decision document, which accompanies a Permit.

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

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

Preliminary information and use of terms

We gave the application the reference number EPR/NP3034CG/A001. We refer to the application as “the **Application**” in this document in order to be consistent.

The number we have given to the permit is EPR/NP3034CG. We refer to the proposed permit as “the **Permit**” in this document.

The Application was duly made on 27 June 2012.

The Applicant is AmeyCespa Limited. We refer to AmeyCespa as “the **Applicant**” in this document. Where we are talking about what would happen after the Permit is granted, we call AmeyCespa “the **Operator**”.

AmeyCespa's proposed facility is located at Allerton Park Quarry, Knaresborough, North Yorkshire, HG5 0SD. We refer to this as the "Regulated Facility" in this document.

How this document is structured

- Glossary of acronyms
- Our proposed decision
- How we reached our decision
- The legal framework
- The Regulated Facility
 - o Description of the Regulated Facility and general issues
 - o The site and its protection
 - o Operation of the Regulated Facility – general issues
- Minimising the Regulated Facility's environmental impact
 - o Assessment Methodology
 - o Assessment of Impact on Air Quality
 - o Human health risk assessment
 - o Impact on Habitats sites, SSSIs and non-statutory conservation sites
 - o Impact of abnormal operations
- Application of Best Available Techniques
 - o Scope of Consideration
 - o Incineration technology and control measures
 - o BAT and POPs (Incineration)
 - o Anaerobic Digestion technology and control measures
 - o Other Emissions to the Environment
 - o Setting ELVs and other Permit conditions
 - o Monitoring
 - o Reporting
- Other legal requirements
 - o The EPR 2010 (as amended) and related Directives
 - o National primary legislation
 - o National secondary legislation
 - o Other relevant legal requirements
- Annexes
 - o Application of Chapter IV of the Industrial Emissions Directive
 - o Pre-Operational Conditions
 - o Improvement Conditions
 - o Consultation Responses

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.)

AD	Anaerobic Digestion
APC	Air Pollution Control
BAT	Best Available Technique(s)
BAT-AEL	BAT Associated Emission Level
BREF	BAT Reference Note
C & I	Commercial and Industrial
CEM	Continuous emissions monitor
CFD	Computerised fluid dynamics
CHP	Combined heat and power
COMEAP	Committee on the Medical Effects of Air Pollution
CROW	Countryside and rights of way Act 2000
CV	Calorific value
DAA	Directly associated activity – Additional activities necessary to be carried out to allow the principal activity to be carried out
DD	Decision document
EAL	Environmental assessment level
EIAD	Environmental Impact Assessment Directive (85/337/EEC)
ELV	Emission limit value
EMAS	EU Eco Management and Audit Scheme
EMS	Environmental Management System
EPR	Environmental Permitting (England and Wales) Regulations 2010 (SI 2010 No. 675) as amended
EQS	Environmental quality standard
EU-EQS	European Union Environmental Quality Standard
EWC	European waste catalogue
FSA	Food Standards Agency
GWP	Global Warming Potential
HHRAP	Human Health Risk Assessment Protocol
HMIP	Her Majesty's Inspectorate of Pollution
HPA	Health Protection Agency
HRA	Human Rights Act 1998
HW	Hazardous waste

HWI	Hazardous waste incinerator
IBA	Incinerator Bottom Ash
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)
LCV	Lower calorific value – also termed net calorific value
LfD	Landfill Directive (1999/31/EC)
LOI	Loss on Ignition
MBT	Mechanical biological treatment
MT	Mechanical Treatment
MSW	Municipal Solid Waste
MWI	Municipal waste incinerator
NOx	Oxides of nitrogen (NO plus NO ₂ expressed as NO ₂)
NYWAG	North Yorkshire Waste Action Group
Opra	Operator Performance Risk Appraisal
PAH	Polycyclic aromatic hydrocarbons
PC	Process Contribution
PCB	Polychlorinated biphenyls
PCT	Primary Care Trust
PEC	Predicted Environmental Concentration
POP(s)	Persistent organic pollutant(s)
PPS	Public participation statement
PR	Public register
PXDD	Poly-halogenated di-benzo-p-dioxins
PXB	Poly-halogenated byphenyls
PXDF	Poly-halogenated di-benzo furans
RDF	Refuse derived fuel
RGS	Regulatory Guidance Series
SAC	Special Area of Conservation
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
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 supersede by IED

1 Our proposed decision

We have decided to grant the Permit to the Applicant. This will allow it to operate the facility, 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 a facility which is subject principally to the Industrial Emissions Directive (IED).

The Permit contains many conditions taken from our standard Environmental Permit template including the relevant Annexes. We developed these conditions in consultation with industry, having regard to the legal requirements of the Environmental Permitting Regulations (EPR) and other relevant legislation. This document does not therefore include an explanation for these standard conditions. Where they are included in the Permit, we have considered the Application and accepted the details are sufficient and satisfactory to make the standard condition appropriate. This document does, however, provide an explanation of our use of “tailor-made” or installation-specific conditions, or where our Permit template provides two or more options.

2 How we reached our decision

The Application was received prior to the implementation of the IED in the UK. The Application documents therefore largely reference the requirements of the former Integrated Pollution Prevention and Control (IPPC) and Waste Incineration (WID) Directives. The IED substantially incorporates the provisions of both these predecessor Directives and so these references within the Application documents have been read across to the equivalent provisions in the IED. The Regulated Facility will be permitted as a new installation under the IED.

The Application was duly made on 27 June 2012. 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.

We carried out consultation on the Application in accordance with the EPR, our statutory PPS and our own RGS Note 6 for Determinations involving Sites of High Public Interest (SHPI). 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 Regulated Facility 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 IPPCD, including telling people where and when they could see a copy of the Application. We also placed an advertisement in the Harrogate Advertiser Series 19 July 2012:

- The Harrogate Advertiser
- Knaresborough Post
- Pateley Bridge & Nidderdale Herald
- Ripon Gazette and Boroughbridge Herald
- Wetherby, Boston Spa & Tadcaster News

We placed a paper copy of the Application and all other documents relevant to our determination (see below) on our Public Register at Phoenix House, Global Avenue, Leeds, LS11 8PG and we also sent a copy to Harrogate Borough Council, Springfield House, Kings Road, Harrogate, HG1 5NX for its own Public Register. Anyone wishing to see these documents could do so and arrange for copies to be made. The Applicant also provided a number of copies of the Application on CD which were also made accessible from the Public Registers.

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

- North Yorkshire County Council (NYCC) Planning Department
- NYCC Environmental Health
- Harrogate Borough Council Planning
- Harrogate Borough Council Environmental Health
- Health Protection Agency (HPA)
- North Yorkshire and York Primary Care Trust (PCT)
- Food Standards Agency (FSA)
- Health & Safety Executive (HSE)
- North Yorkshire Fire & Rescue Service

These are bodies whose expertise, democratic accountability and/or local knowledge make it appropriate for us to seek their views directly.

In addition to our advertising the Application, we undertook a programme of extended public consultation. Public surgeries were held at Knaresborough

Allerton Waste Recovery Park	Page 8 of 225	EPR-NP3034CG-A001
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House 2 August 2012, written comments were also accepted by the Environment Agency well 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 of this document. We have taken all relevant representations into consideration in reaching our determination.

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 as detailed below. A copy of each information notice was placed on our public register and sent to Harrogate Borough Council for inclusion on its register, as were the responses when received.

In addition to our information notices, we received additional information during the determination. We requested information/clarification 18 January 2013 regarding the information notice that we received in December 2012. We received the Applicants response 28 January 2013. We made a copy of this information available to the public in the same way as the responses to our information notices.

Further Information requested / received	Response received
Notice dated 23 August 2012	Received electronically 6 September 2012: • Air Quality Assessment Consolidation • Confirmation of abnormal emissions
Resubmission of Noise Assessment and modelling files	Received electronically 12 October 2012
Notice dated 27 September 2012	Received electronically 17 October 2012: • Odour Management Plan
Notice dated 9 November 2012	Received electronically 10 December 2012: • BAT assessment for the facility as a whole • BAT for treatment of AD digestate • Recommendations for clarification from our odour audit
Email sent 18 January 2013 requesting information/clarification of Notice received 10 December 2012	Received electronically 28 January 2013

Having carefully considered the Application and all other relevant information, our draft decision was put before the public and other interested parties in the form of a draft Permit, together with the draft explanatory decision document. The consultation ran from 7 May 2013 to 4 June 2013. As a result of this stage in the process, the public were provided with all the information that was relevant to our determination, including the original Application and additional information obtained subsequently, and the public have had two separate opportunities to comment on the Application and its determination. Once again, we have considered all relevant representations we received in response to this final consultation and have amended this explanatory document as appropriate to explain how we have done this, in publishing our final decision.

A summary of the consultation responses and how we have taken into account all relevant representations is shown in Annex 4 section B).

3 The legal framework

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

- *two listed activities* as described by the IED, one of which is a *waste incineration plant*;
- *two operations* 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, in granting the Permit, it will ensure that the operation of the Regulated Facility 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 Regulated Facility

4.1 Description of the Regulated Facility and related issues

In this document we use the term Regulated Facility to refer to both listed activities. Generally we do refer to both listed activities (Regulated Facility), except where we specify we are only referring to one of them, in which case we refer to the relevant activity.

The Regulated Facility will comprise of two listed activities which will share some common facilities.

- Incineration of Waste
- Anaerobic Digestion (AD)

They will also have dedicated directly associated activities (DAA).

4.1.1 Incineration of Waste

The two incineration lines are subject to the EPR because they carry out an activity listed in Part 2 of Schedule 1 to the EPR:

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

The IED definition of “waste incineration plants” and “waste co-incineration plants” in Article 42 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, such as air pollution control plant, are therefore included in the listed activity description.

We consider the Mechanical Treatment (MT) plant falls within the scope of the definition of the waste incineration plant as it is a process for the pre-treatment of waste. The MT plant also provides the AD plant with organic waste. This means that it has a technical connection to both of the listed activities. However; as the MT plant primarily serves the incineration activity we consider it falls within the description of the incineration plant and does not need to be separately listed as a DAA.

The ash processing plant also falls within the scope of the definition of waste incineration plant as it is a process for the treatment and storage of residues. Consequently it is included in the incineration listed activity.

The incineration activity also comprises a number of other “directly associated activities”, which are the generation of electricity using a steam turbine and the back-up generator. These components are successive steps in an integrated activity.

Together, these listed and directly associated activities comprise the incineration activity.

4.1.2 Anaerobic Digestion (AD)

The Environmental Permitting Regulations (EPR) have been amended to implement the Industrial Emissions Directive (IED). This means that the AD plant will now be an activity listed in Part 2 of Schedule 1 to the EPR as follows:

- Section 5.4 Part A(1)(b)(i) – Recovery or a mix of recovery and disposal of non-hazardous waste with a capacity exceeding 75 tonnes per day (or 100 tonnes per day if the only waste treatment activity is anaerobic digestion) involving the following activities, and excluding activities covered by Council Directive 91/271/EEC—
(i) biological treatment.

The AD activity also comprises a number of “directly associated activities”, the two gas engines and biogas emergency flare. These components are successive steps in an integrated activity.

The MT plant will also provide organic waste to the AD plant which means that it has a technical connection to it and it would normally be listed as a DAA of it. However, as described above, the majority of material from the MT plant goes to the incineration activity and as such the MT plant can be considered to fall within the description of waste incineration plant. We have therefore not included it as a separate DAA to the AD plant.

Together, these listed and directly associated activities comprise the AD plant.

4.1.3 The Site

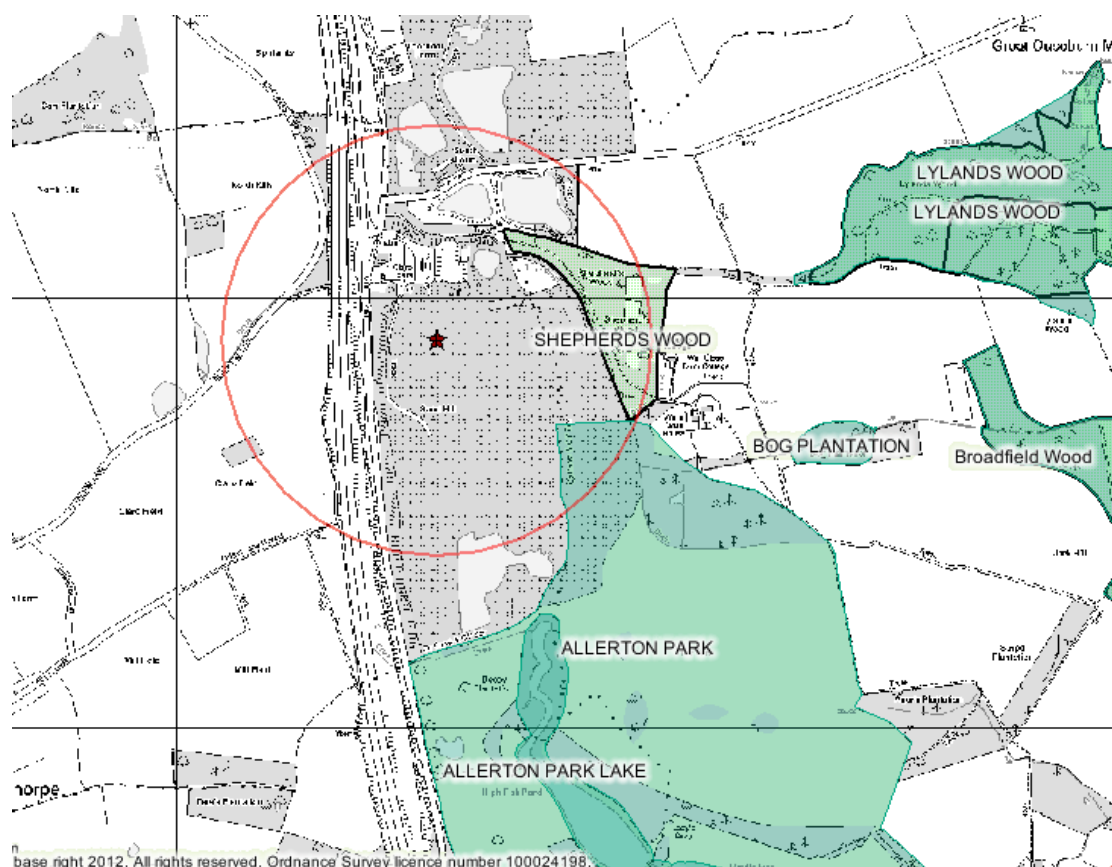
The Regulated Facility is located in the Allerton Park area of Yorkshire at national grid reference 440600, 459900. It is in a predominantly rural setting, with a few homes and agricultural premises with 1 km. These receptors are located mainly alongside the A168 which connects with the A1(M).

The nearest settlements are at Arkendale approximately 1.6 km to the north-west, Whixley about 3.9 km to the south-east, Coneythorpe & Claretton 1.6 km to the south-west and Marton cum Grafton approximately 3.2 km to the north-east.

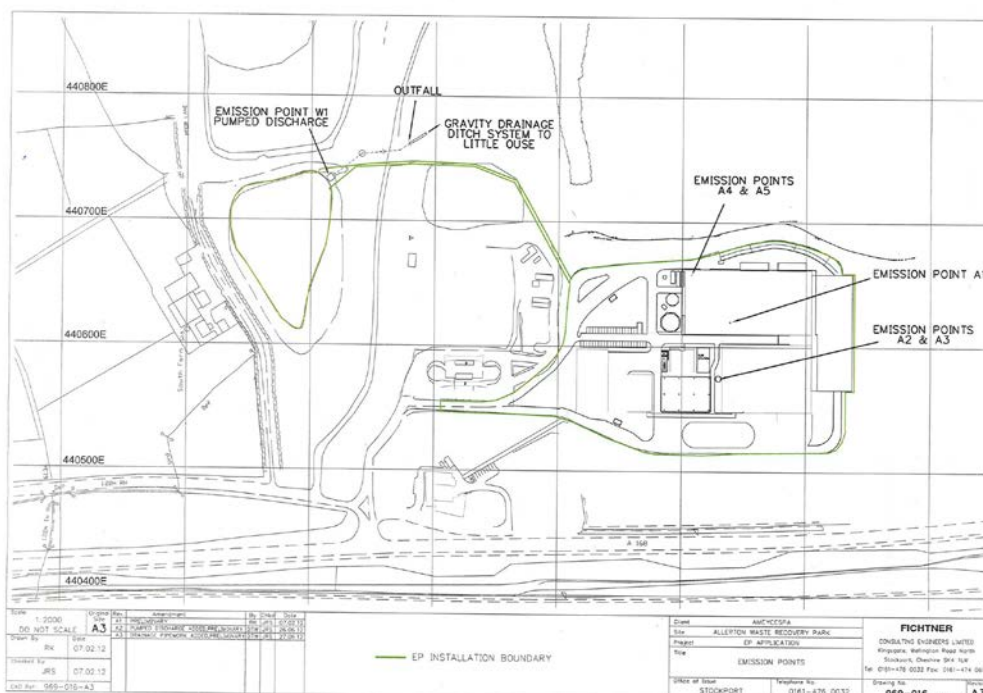
Allerton Waste Recovery Park	Page 13 of 225	EPR-NP3034CG-A001
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The Kirk Deighton Special Area of Conservation (SAC) is located 9.8 km from the facility and there are also several local wildlife and conservation sites located within 2 km of the facility.



The Applicant submitted a plan which we consider is satisfactory, showing the site of the facility 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 given below at 4.2.

4.1.4 What the Regulated Facility does

The Applicant has described the facility as a Waste Recovery Park. It will comprise of two listed activities, with their respective directly associated activities (see above).

The Regulated Facility will recover energy from waste and is expected to require approximately 3.7 MWe of electricity to operate with the remaining (28.4 MWe-3.7 MWe) **24.7 MWe** being available for export to the national grid.

a) Mechanical Treatment (MT) (Part of Incineration Activity)

This will process up to 262,080 tonnes per annum (tpa) of MSW. It will enable additional fractions of recyclates to be extracted from the residual MSW. In addition it will extract up to 40,000 tonnes of organic waste per annum which will be transferred to the Anaerobic Digestion (AD) activity.

It will utilise a series of physical separation techniques: Waste reception; bulky trommel; sorting cabin; shredder; organic trommel; densimetric separators and ballistic separators.

The tipping and MT halls will be maintained under a slight negative pressure to control odour, dust and litter. This will generally be achieved by drawing air for combustion in the incineration plant. During periods when the incineration plant is not operational the negative pressure will be achieved by an air

extraction system in the MT building which will be released via a bag filter system and a 28 metre stack at emission point A1.

The key features of the MT can be summarised as follows:

Waste throughput,	262,080 tonnes/annum	Based on 12 hour/6 day week basis
Waste processed	Residual MSW	
Waste to incinerator	Up to 206,080 tonnes/annum	
Recyclates	Up to 12,000 tonnes/annum	
Organic waste to AD plant	Up to 40,000 tonnes/annum	
Residual heavy material for disposal	4,000 tonnes/annum	

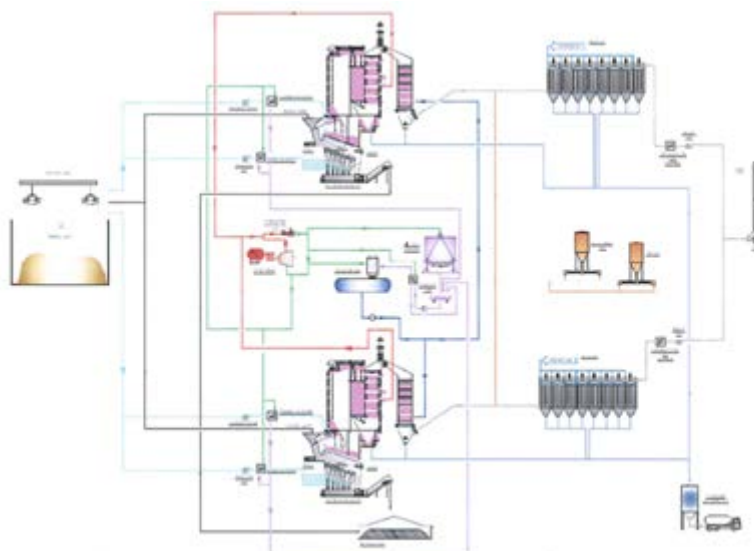
b) Incineration

The incinerator will have a capacity of up to 320,000 tpa. It will operate two lines, employ a mechanical moving grate and combust the residual waste from the MT and AD plants along with some commercial and industrial (C&I) waste. Some of the incoming waste streams which do not require pre-treatment by the MT process will be fed directly to the incinerator.

Approximately **27.3 MWe** of electricity will be generated by a steam turbine which is fed by the steam generating boilers located at the exit of the flue gas from the main combustion chamber. Some of the electricity will be used at the facility, with the remainder exported to the national grid.

Exhaust gases from incineration will be treated by an air pollution control system that will consist of Selective Non-Catalytic Reduction (SNCR) for oxides of nitrogen, dry lime (for acid gases), activated carbon (for dioxins, furans and mercury) and a multi-compartment fabric filter (for particulate matter, which will include metals and dioxins and furans).

Emissions from incineration will be released via a single 70 metre high stack containing two flues (emission points A2 and A3).



The key features of the incineration activity can be summarised as follows:

Waste throughput, Tonnes/line	320,000 tonnes/annum	Each line is 20 tonnes/hour
Waste processed	Residual MSW: Waste from MT: up to 206,080 tonnes/annum AD Digestate sludge: up to 39,070 tonnes/annum C & I waste: up to 74,850 tonnes/annum	
Number of lines	2	
Furnace technology	Grate	
Auxiliary Fuel	Gas Oil	
Acid gas abatement	Dry	hydrated lime
NOx abatement	SNCR	Urea
Flue gas recirculation	No	
Dioxin abatement	Activated carbon	
Stack	Height, 70 m	Combined internal stack diameter, 2.5 m
Flue gas	Flow, 60.7 Nm ³ /s	Velocity, 15 m/s
Electricity generated	27.3 MWe	218,400 MWh
Electricity used at facility	3.7 MWe	
Electricity exported	23.6 MWe	188,800 MWh
Total electricity exported, including AD (see below)	24.7 MWe	197,600 MWh
Waste heat use	Preheat combustion air	

c) The Ash Processing Facility (Part of Incineration Activity)

This will treat the incinerator bottom ash and boiler ash from incineration. It will allow for the pre-treatment, treatment and storage of the anticipated 50,000 tpa of bottom ash that will be produced. Each of these facilities is equipped with concrete hard standing and located within an enclosed building.

The purpose of this processing plant is to produce an aggregate that can be used in the construction industry. Processing involves mechanical treatment and maturation, with maturation taking two to four weeks.

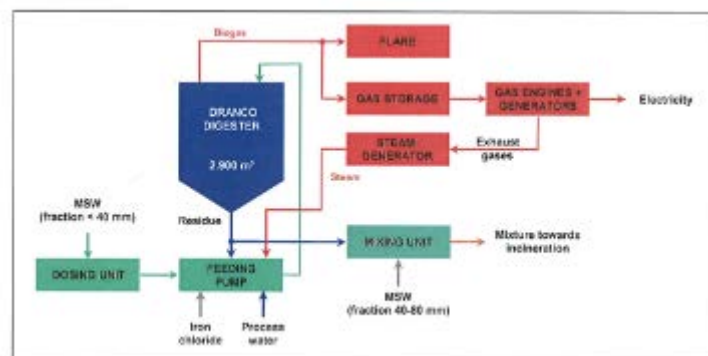
d) Anaerobic Digestion (AD)

The AD plant will primarily process the organic fraction extracted from the incoming residual MSW from the MT plant. There may be situations where the anaerobic digester would need to be fed directly with incoming waste not processed by the MT plant. This could be due either to a lack of organic material from the MT process, or to the availability of other wastes which do not require pre-treatment.

The biogas from the anaerobic digesters will be combusted in two gas engines to generate approximately **1.1 MWe** of electricity, which will be exported to the national grid. The Applicant proposes that the digestate from the AD plant will be combusted in the incinerator.

Exhaust gases from the two AD gas engines will be released via two 26 metre high stacks at emission points A4 and A5. The Applicant proposes that the emissions to air will comply with the emission limits for landfill gas engines.

There will be a flare (emission point A6) for use in emergency situations. The Applicant proposes that routine monitoring will not be required as it has been designed to meet the requirements for landfill gas flares.



The key features of the AD activity can be summarised as follows:

Waste throughput,	40,000 tonnes/annum	Design capacity 9.1 tonnes/hour, based on receiving waste for 4,400 hours each year and continuous operation
Waste processed	Low grade organic material primarily from the MT plant	
Output	39,070 tonnes/annum (tpa) digestate sludge to incinerator to be combusted as refuse derived fuel (RDF).	
	39,070 tonnes/annum comprises: Waste output=29,418 tonnes/annum and Raw materials=9,652 tonnes/annum (see below) Raw materials: Steam=8,087 tonnes/annum Water=1,125 tonnes/annum Iron chloride=440 tonnes/annum	
Number of gas engines	2	
Gas Engine Stacks	2 x 26 metres	
Emergency Flare	Designed to meet requirements of landfill gas flare	
Electricity generated/exported	1.1 MWe	
Waste heat use	Heat will be recovered from the exhaust gases of the gas engines using a steam boiler to maintain the digester temperature.	

4.1.5 Key Issues in the Determination

The key issues arising during this determination were:

- The emissions to air from the Regulated Facility and their impact on human health and the environment.
- The application of BAT to the Regulated Facility as a whole.
- The application of BAT to the Anaerobic Digestion (AD) plant.

We describe how we determined these issues in the relevant sections of this document.

4.2 The site and its protection

4.2.1 Site setting, layout and history

The Allerton Waste Recovery Park is located in the Allerton Park area of Yorkshire at National Grid Reference 440600, 459900.

The A168 marks the western site boundary and the south and eastern boundaries are bounded by the landfill. Moor Lane runs to the north of the site. The A168 runs north/south and connects with the A1(M) in the north, at Junction 48 (Boroughbridge), and in the south with the A59 and the A1(M) at Junction 47 (see map in Section 4.1.3 above).

The site is in a predominantly rural setting; with a few homes and agricultural premises within 1 km. Mostly these properties are located alongside the A168 and within the Allerton Park Estate. The nearest neighbours include:

- Claro House (which will be converted to create a Visitor and Education Centre and office facility);
- South Farm (approximately 400 m to the north);
- Walls House Close (approximately 700 m to the east); and
- Ninevah (approximately 1 km to the north).

The nearest settlements are at Arkendale, approximately 1.6 km to the north-west, Whixley about 3.9 km to the south-east, Coneythorpe & Clareton 1.6 km to the south west and Marton cum Grafton approximately 3.2 km to the north-east.

Historical land use searches show the land associated with this Application was undeveloped until after 1974. From the historical maps it is identified that the land proposed for the facility was used as farm land, with the area of land being divided into fields.

In the 2002 historical maps, the area of land has been developed as a quarry for sand and gravels.

There is one landfill site within 1000 m of the site. This is located approximately 500 m south of the proposed facility.

4.2.2 proposed site design: potentially polluting substances and prevention measures

An Environmental Risk Assessment was carried out following our Horizontal Guidance Note H1. This was included within Annex 4 of the Application supporting information. The assessment considered all potential sources of ground and surface water pollution that could occur due to fugitive emissions from the facility or from accidents occurring at the facility. The risk

assessment also detailed any mitigation measures that would be employed to reduce the frequency or impact of these events.

This assessment identified that the development would require the storage of various chemicals, which could pose a risk to the ground and groundwater during normal operation. All process areas, loading/unloading, materials handling areas and roadways will be covered in concrete and/or tarmac hard standing. It is therefore not regarded that there will be any risk of ground/groundwater contamination during normal operation of the facility.

The assessment concluded that for land, groundwater and surface water, the residual impacts of the facility would be insignificant provided the recommended mitigation measures are employed. It concluded that the Regulated Facility would pose little risk of pollution.

Article 22(2) of the IED requires the Applicant to provide a baseline report containing at least the information set out in paragraphs (a) and (b) of the Article before starting operation. The Applicant has submitted a site condition report which includes a report on the baseline conditions as required by Article 22. We have reviewed that report and consider that it adequately describes the condition of the soil and groundwater prior to the start of operations.

Substantial volumes of waste will be stored and treated on site. It is possible that leachate may form, particularly in the waste bunker, if there is an:

- operational or engineering failure; and/or
- an accident.

The Application assumes that engineering operational measures will be adequate to prevent pollution of groundwater at the site.

The purpose of this plant is to treat large volumes of putrescible waste that inherently pose a pollution risk to controlled waters. During such operations accidents are possible even when they are initially assessed to be unlikely. Monitoring is key to establishing the impact of any future pollution incidents.

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

A Pre-operational condition also requires the Operator to have an approved protocol in place for the periodic monitoring of soil and ground water during the operational lifetime of the Regulated Facility before it comes into service.

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 facility, as referred to in Section 2.10 of the

Application. A Pre-operational condition requires the Operator to have an Environmental Management System (EMS) in place before the Regulated Facility is operational, which would 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 account both the baseline conditions and the site's current or approved future use. To do this, the Operator has to apply to us for surrender, which we will not grant unless and until we are satisfied that these requirements have been met.

4.3 Operation of the Regulated Facility – general issues

4.3.1 Administrative issues

The Applicant is the sole Operator of the Regulated Facility.

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

The AD activity taking place at the facility is a 'relevant waste operation' as defined by the EPR. This means that planning permission needs to be in place prior to a Permit being issued. Planning permission has been granted with details provided in Section 7 of this document.

We have amended the Applicant's Opra profile that was submitted with the application to take account of changes to the Regulations that have occurred during the determination process. As a result the Opra score has decreased from 302 to 289 and will be used as the basis for subsistence and other charging, in accordance with our Charging Scheme. Opra is the Environment Agency's method of ensuring application and subsistence fees are appropriate and proportionate for the level of regulation required.

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 ISO 14001. A pre-operational condition 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 facility is operational. An improvement condition is included requiring the Operator to report progress towards gaining certification of its EMS.

Under the IED the AD activity is classified as a relevant waste operation which means that the Operator will be required to comply with an approved competence scheme. Permit condition 1.1.4 will require compliance with this

scheme and a pre-operational condition requires the Operator to provide evidence of this.

We are satisfied that appropriate management systems and management structures will be in place for this facility, 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 EMS and must be in place prior to commissioning as required by a pre-operational condition.

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 Regulated Facility in accordance with the following documents contained in the Application:

Description	Parts Included	Justification
The Application EPR/NP3034CG/A001 Received 27/06/12	Application Supporting Information: Section 1.3.1 – Mechanical Treatment Plant Section 1.3.2 – Anaerobic Digestion Plant Section 1.3.3 – Biogas Combustion Plant Section 1.3.4 - Energy from Waste Plant (incinerator) Section 1.3.5 – Incinerator Bottom Ash Processing	Operation of the Regulated Facility. Operation of the incinerator includes the following: ▪ the incineration capacity ▪ the waste feed cessation system ▪ start-up and shut-down ▪ temperature monitoring in the combustion chamber ▪ energy recovery from the installation ▪ temperature, oxygen,
Allerton Waste Recovery Park	Page 23 of 225	EPR-NP3034CG-A001

	Facility Section 1.3.6 – Installation Wide Issues Section 2.8 – Waste Recovery and Disposal Section 3 - Waste Incineration Directive (IED)	water vapour and pressure at Air Release sampling points - alternative arrangements for CO, TOC and dust monitoring to make use of the relevant abnormal operations condition during CEM failure - ash and residues will be stored and transported in a manner that prevents fugitive dust releases
Resubmitted Noise Impact Assessment. Received 12/10/12	Part 7 – Noise and Vibration Mitigation	To ensure that the necessary measures are in place to prevent/minimise noise

The details set out above describe the techniques that will be used for the operation of the Regulated Facility 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 fuel for the auxiliary burners and some ancillary operations:

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

The Applicant has proposed to use gas oil as a supplementary fuel due to the intermittent nature of its requirement.

a) Mechanical Treatment (MT) waste feed

The Application contains a list of those wastes to be treated in the MT plant in the Application Supporting information in Table 2.4. They are coded by the European Waste Catalogue (EWC) number, which the Applicant will accept in the waste streams entering the plant and which the plant is capable of processing in an environmentally acceptable way. We have specified the permitted waste types, descriptions and where appropriate quantities which can be processed in Table S2.2.

The output from the MT facility will feed waste to the incinerator and the AD plant; however it forms part of the incineration activity as detailed above. This

Allerton Waste Recovery Park	Page 24 of 225	EPR-NP3034CG-A001
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means that the incinerator can also directly accept some of the wastes listed in Table S2.2.

The capacity has been limited as set out in the Table below based on the design capacity.

b) Incinerator waste feed

Article 45(1) of the IED requires that the Permit must list explicitly the categories of waste which may be treated. The Application contains a list of those wastes in the Application Supporting information in Table 2.5. They are coded by the European Waste Catalogue (EWC) number, which the Applicant will accept in the waste streams entering the plant and which the plant is capable of burning in an environmentally acceptable way. We have specified the permitted waste types, descriptions and where appropriate quantities which can be accepted at the incinerator in Table S2.4.

The incinerator will accept waste from the MT and AD plants. However, some of the incoming waste streams which do not require pre-treatment by the MT process will be fed directly to the incinerator.

This means that the incinerator can also directly accept most of the wastes listed in Table S2.2 for the MT plant thus avoiding duplication of waste codes in these tables. It will not be permitted to accept waste codes from Table S2.2 that could be extracted as recyclates from the residual MSW: 15 01 04, 15 01 07, 19 10 01, 19 10 02, 20 01 02 and 20 01 40.

We requested additional information from the Applicant for the burning of digestate from the AD plant. The Applicant acknowledged that digestate from some AD plants can be spread on land and used to condition soil, where it meets the requirements of PAS: 110. In this case, the organic waste will have been extracted from residual household waste in the MT plant and not from a source segregated biodegradable waste stream. This means that it will not achieve the 'end of waste' criteria for digestate, i.e. that it cannot meet the PAS 110 standard and therefore that waste management controls will continue to apply to the digestate. The standard waste hierarchy condition in the permit will ensure that this is kept under review.

Our full assessment of this is detailed in Section 6.5.1 of this document. Given the constraints described above, we have accepted that this method is acceptable.

Table S2.4 for the wastes to be incinerated is slightly different to those wastes applied for with the following wastes not included because they have no calorific value.

- glass (20 01 02),
- metals (20 01 40)
- soil and stones (20 02 02)

We are satisfied that the Applicant can accept the wastes contained in Table S2.4 of the Permit because: -

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

The Installation will take residual waste i.e. that which is not separately collected or otherwise recovered, recycled or composted. Waste codes for separately collected fractions of waste are included in the list of permitted wastes, but Permit condition 2.3.3 (c) only allows waste to be accepted if having been separately collected for recycling, it is subsequently unsuitable for recovery.

The capacity has been limited as set out in the Table below based on the design capacity.

c) Anaerobic Digestion (AD) waste feed

The Application contains a list of those wastes to be treated in the AD plant in the Application Supporting information in Table 2.6. They are coded by the European Waste Catalogue (EWC) number, which the Applicant will accept in the waste streams entering the plant and which the plant is capable of processing in an environmentally acceptable way. We have specified the permitted waste types, descriptions and where appropriate quantities which can be processed in Table S2.3.

The capacity has been limited as set out in the Table below based on the design capacity.

We have limited the capacity of the Regulated Facility as follows:

Operation	Mechanical Treatment	Incineration	Anaerobic Digestion
Nominal capacity tpa	262,080	320,000	40,000
Hours per year	-	8,000	4,400 (accept waste), continuous operation 8,400
Tonnes per hour	12 hour/6 day week basis	20 each line	9.1

The Regulated Facility will be designed, constructed and operated using BAT for the incineration and anaerobic digestion of the permitted wastes. We are satisfied that the operating and abatement techniques are BAT for treatment of 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 Regulated Facility which are normal aspects of all EPR permit determinations. This issue is dealt with in this section.
2. The extent to which the incineration plant meets the requirements of Article 50(5) of the IED, which requires that heat "*shall be recovered as far as practicable*". This issue is covered in this section.
3. The combustion efficiency and energy utilisation of different design options for the Regulated Facility are relevant considerations in the determination of BAT for the Regulated Facility, including the Global Warming Potential of the different options. This aspect is covered in the BAT assessment in section 6 of this Decision Document.

(ii) Use of energy within the Regulated Facility

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 Regulated Facility.

The Application details a number of measures that will be implemented at the Regulated Facility in order to increase its energy efficiency, such as high efficiency motors, high efficiency variable speed drives, high standards of cladding and insulation etc. The AD and associated combustion plant will be designed to achieve a high thermal efficiency, which will include the recovery of heat and optimising the performance of the gas engines. The incineration plant will also be designed to achieve a high thermal efficiency, which will include economisers, super-heaters and preheating of combustion air.

a) Incineration

The Application states that the specific energy consumption of the incineration plant, a measure of total energy consumed per unit of waste processed, will be 97.5 kWh/tonne. The installation capacity is 320,000 tpa.

Data from the BREF for Municipal Waste Incinerators shows that the range of specific energy consumptions is as in the table below.

Allerton Waste Recovery Park	Page 27 of 225	EPR-NP3034CG-A001
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MSWI plant size range (t/yr)	Process energy demand (kWh/t waste input)
Up to 150,000	300 – 700
150,000 – 250,000	150 – 500
More than 250,000	60 – 200

The BREF says that it is BAT to reduce the average installation electrical demand to generally below 150 kWh/tonne of waste with an LCV of 10.4 MJ/kg. The LCV in this case is expected to be 9.0 MJ/kg. Taking account of the difference in LCV, the specific energy consumption in the Application is in line with that set out above.

b) Anaerobic Digestion (AD)

Section 3.22 of the BREF for Waste treatment industries gives the electrical use per tonne of waste for Anaerobic Digestion plant as 50-55 kWh/tonne MSW. The Application states that the specific energy consumption of the AD will be 63 kWh/tonne. This is higher than that quoted in the BREF, which the Applicant explains may be due to them including pre and post treatment in their calculations. Pre-treatment takes place in the MT plant with the removal of organic fraction with post treatment being the transfer and mixing of the digestate with the output from the MT. The BREF is not clear whether the benchmark includes pre and post treatment, but does state that estimates concerning the utilisation of electricity by the plant vary a great deal.

The Applicant provided us with additional information which is summarised as follows:

The parasitic load of the AD facility excluding pre and post treatment will be approximately 0.2 MW.

This equates to 1,600 MWh, based on 8000 hours per annum.

The AD facility will process approximately 40,000 tpa.

On this basis the specific energy consumption (excluding pre and post treatment will be 40 kWh/tonne.

Taking the above into consideration the specific energy consumption (excluding pre and post treatment) compares reasonably favourably with the BREF benchmark.

(iii) a) Generation of energy from the Incinerator - Compliance with Article 50(5) of the IED

Article 50(5) of the IED requires that heat “*shall be recovered as far as practicable*”.

The Chapter IV IED requirements are specific to the incineration plant. Chapter IV of the IED does not apply to the AD plant. Articles 1 to 27 of IED

however still do apply to the AD plant and Article 11(f) requires that energy is used efficiently, which is considered in other parts of this section.

Our draft CHP Ready Guidance (Dec 2012) 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 where a plant generates electricity only, it is BAT to recover 0.4 – 0.65 MWh/tonne of waste (based on LCV of 10.4 MJ/kg). 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 incinerator will generate electricity only and has been specified to maximise electrical output with little or no use of waste heat. The Sankey diagram provided in Appendix F of the Application shows 27.3 MWe of electricity produced for an annual burn of 320,000 tonnes, which represents 8.53 MWe per 100,000 tonnes/yr of waste burned (0.68 MWh/tonne of waste). The incinerator is therefore at the top end of the indicative BAT range.

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

Our draft CHP 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.

The location of the incinerator largely determines the extent to which waste heat can be utilised, and this is a matter for the planning authority. The Applicant stated that there are very few potential heat users in the vicinity; however the steam turbine will be designed with pass-outs to allow process steam to be extracted when required. These pass-outs could be adapted in the future to supply heat to local users of for space heating purposes. 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.

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

iii) b) Generation of energy from the combustion of Biogas

The AD plant will produce a constant supply of gas to be combusted in the biogas combustion plant. The combustion plant will utilise reciprocating gas engine technology. The Waste Treatment Industries BREF states that biogas engines offer good energy efficiency when burning biogas with electrical efficiency conversion rates of between 25% and 36%. In addition the biogas engines exhausts will be used to generate low pressure steam for the AD plant. The BREF acknowledges that this can increase the overall conversion efficiency to between 65% and 85%.

We agree that the proposals for the use of gas engines for the generation of electricity from the biogas are BAT for a standalone AD plant. However from the data in the Application, AD with combustion of the digestate has a level of energy recovery that would be achieved by simply burning all the waste in the incineration plant.

We consider that whilst there is no overall benefit in energy efficiency it does deliver future flexibility as detailed in Section 6 of this document.

(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 incinerator is achieving a high level of energy recovery. Where municipal waste incinerators can achieve an R1 factor of 0.65 or above, the plant will be considered to be a 'recovery activity' for the purposes of the Waste Framework Directive.

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

(v) Permit conditions concerning energy efficiency

A Pre-operational condition 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 (incineration and AD);
- electrical energy exported;
- total energy usage;
- waste heat used by the facility;
- the total MSW, C & I burned per year, and the total waste digested.

This will enable the Environment Agency to monitor energy recovery efficiency at the Regulated Facility 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 Regulated Facility.

4.3.8 Efficient use of raw materials

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

The Operator is required to report with respect to raw material usage under condition 4.2 and Schedule 5, including consumption of lime, activated carbon and urea used per tonne of waste burned and iron chloride per tonne of waste digested. 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 Regulated Facility, other than the waste feed itself (addressed elsewhere). The efficiency of the use of auxiliary fuel will be tracked separately as part of the energy reporting requirement under condition 4.2.1. Optimising reagent dosage for air abatement systems and minimising the use of auxiliary fuels is further considered in the section on BAT.

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

This requirement addresses wastes produced at the Regulated Facility and does not apply to the waste being treated there. The principal waste streams the Regulated Facility will produce are:

- incinerator bottom ash (IBA);
- air pollution control (APC) residues;
- recyclable materials from the MT plant; and
- AD digestate.

The first objective is to avoid producing waste at all. Waste production from incineration will be avoided by achieving a high degree of burnout of the ash in the furnace, which results in a material that is both reduced in volume and in chemical reactivity. Condition 3.1.5 and associated Table S3.4 specify limits for loss on ignition (LOI) of <5% in bottom ash. Compliance with this limit will demonstrate that good combustion control and waste burnout is being achieved in the furnaces and waste generation is being avoided where practicable.

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. The IBA will be processed at the facility for export as reclaimed aggregate.

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.

In order to ensure that the IBA and APC residues are adequately characterised, a pre-operational condition requires the Operator to provide a written plan for approval detailing the ash sampling protocols. Table S3.4 requires the Operator to carry out an ongoing programme of monitoring.

The Application states that metal fractions will be recovered from the bottom ash by the use of a magnetic separator and sent for recycling.

Recyclables (ferrous and non-ferrous metals, plastics, paper and card) from the MT plant will be baled and exported from the facility as segregated streams for off-site recycling.

Generation of AD digestate sludge will be minimised in the first instance by the feed from the MT process. The MT feed to the digester will be high in biodegradable content and will be well mixed to improve the digestion process. The digester will be operated with a high solids content with an average retention time of around 20-25 days which will further minimise digestate sludge production.

The digestate produced will be mixed with waste from the MT plant and burnt in the incinerator. The Applicant considered other options for the treatment of digestate further up the waste hierarchy, which were recovery by the landspreading of the digestate or the digestate liquor. They concluded that this was not possible because neither would be suitable for landspreading. Our assessment of this is provided in Section 6.5 of this document. The

standard waste hierarchy condition in the permit will ensure that is kept under review.

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 Regulated Facility that cannot be recovered will be disposed of using a method that minimises any impact on the environment. Standard condition 1.4.1 will ensure that this position is maintained.

5. Minimising the Regulated Facility'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. 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 a Regulated Facility of this kind, the principal emissions are those to air, although we also consider those to land and water.

This section of the document explains how we have approached the critical issue of assessing the likely impact of the emissions to air from the Regulated Facility 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 H1 Guidance

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 Horizontal Guidance Note H1 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 your emissions

The H1 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 guidance 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. The Applicant has the choice to use either method.

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 Quality Standards (EQS) referred to as “benchmarks” in the H1 Guidance.

Where an EU EQS exists, the relevant standard is the EU EQS. Where an EU EQS does not exist, our guidance sets out a National EQS (also referred to as Environmental Assessment Level - EAL) which has been derived to provide a similar level of protection to Human Health and the Environment as the EU EQS levels. In a very small number of cases, e.g. for emissions of Lead, the National EQS is more stringent than the EU EQS. In such cases, we use the National EQS standard for our assessment.

National EQSs do not have the same legal status as EU EQSs, and there is no explicit requirement to impose stricter conditions than BAT in order to comply with a national EQS. However, national EQSs are a standard for harm and any significant contribution to a breach is likely to be unacceptable.

PCs are considered **Insignificant** if:

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

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

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

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

- spatial and temporal conditions mean that short term process contributions are transient and limited in comparison with long term process contributions;
- the proposed 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 EQS 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 exceedence of an EU EQS is identified, we may require the Applicant to go beyond what would normally be considered BAT for the Regulated Facility or refuse the application. 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 is set out in their Air Quality Assessment in Annex 5 of the Application. The assessment comprises:

- An H1 screening assessment of emissions to air from the operation of the Regulated Facility.
- Dispersion modelling of emissions to air from the operation of the regulated Facility.
- A study of the impact of emissions on nearby sensitive habitat / conservation sites.
- Annex 5 of the Application also includes dispersion modelling of odour impacts from the Regulated Facility.

This section of the decision document deals primarily with the dispersion modelling of emissions to air from the Regulated Facility and its impact on local air quality. The impact on conservation sites is considered in section 5.4 and odour impacts in Section 6.6.4.

The Applicant has assessed the Regulated Facility'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 facilities emissions using the ADMS 4.2 dispersion model, which is a commonly used computer model for regulatory dispersion modelling. The model used five years of meteorological data collected from two different weather stations, Linton-on-Ouse (2004 to 2008) and Church Fenton (2003 to 2007). The impact of the terrain

surrounding the site upon plume dispersion was considered in the dispersion modelling.

For the incinerator 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 46(2) of the IED. These substances are:
 - o Oxides of nitrogen (NO_x), expressed as NO₂
 - o Particulate matter
 - o Carbon Monoxide (CO)
 - o Sulphur dioxide (SO₂)
 - o Hydrogen chloride (HCl)
 - o Hydrogen fluoride (HF)
 - o Metals (Cadmium, Thallium, Mercury, Antimony, Arsenic, Lead, Chromium, Cobalt, Copper, Manganese, Nickel and Vanadium)
 - o Polychlorinated dibenzo-para-dioxins and polychlorinated dibenzo furans (referred to as dioxins and furans)
 - o Volatile Organic Compounds
- Second, they assumed that the Installation operates continuously at the relevant long-term or short-term emission limit values, i.e. the maximum permitted emission rate (except for emissions of arsenic and chromium, which are considered in Section 5.2.2.2 of this document).

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

The Applicant has used background air quality monitoring data from the Enviro Site Study to augment the data available from local authority monitoring. This data is summarised in the Application and has been used by the Applicant to establish some of the background (or existing) air quality against which to measure the potential impact of the Regulated Facility.

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 (AQMAU report ref C921a (C954)). The output from the model has then been used to inform further assessment of health impacts and impact on habitats and conservation sites.

Meteorological data

The Applicant used meteorological data observed at both Church Fenton (25 km from the site) and Linton-on-Ouse (9 km from the site). Local residents and the North Yorkshire Waste Action Group (NYWAG) raised concerns over

very localised meteorological conditions in the Allerton area. Our experience indicates that the Applicant's data would be expected to provide representative meteorological conditions for the dispersion modelling software.

Despite this, we ran our own Numerical Weather Prediction data centred on the proposed plant to test whether specific modelled data affects the Applicant's conclusions. Numerical Weather Prediction (NWP) forms the basis of most of the forecasting services provided by the United Kingdom Meteorological Office (Met Office). The numerical models used to produce these forecasts are developed within the Unified Model (UM) system. The current version of the met office Unified Model is known as UM5. NWP can be generated for any UK grid reference. Using NWP data should take into account local scale differences in parameters such as wind direction and flow. As such modelling with these data should identify major differences due to distance from the observed data used by the Applicant.

NYWAG and other residents also raised concerns that the meteorological data used by the Applicant did not take into account atmospheric temperature gradients, inversions and other complex effects said to be due to local terrain. Extracting NWP equivalent to observational surface data does not contain thermal profile data but the ADMS has the capability to model elevated inversion layers. Despite this, due to terrain gradients of greater than 1:3 in the vicinity of the plant, we considered the use of alternative modelling software (Lakes Calpuff View).

Alternative Modelling Software

Calpuff models dispersion through a 3-dimensional meteorological wind field. Lakes states that "The US EPA (United States Environmental Protection Agency) recommends Calpuff for modelling near-field impacts in situations which involve: complex terrain stagnation, inversion, recirculation, and fumigation conditions as well as costal interaction effects such as coastal fumigation."

If by using this data, conclusions relating to predicted pollution from any pollutant are changed, we would recommend the Applicant addresses our concerns by using more representative meteorological data.

The US EPA states that the "Calpuff modelling system may be applied on a case-by case basis for air quality estimates in such complex non-steady-state meteorological conditions". The US EPA gives examples of these non-steady-state meteorological conditions. As an example: "Inversion break-up fumigation occurs when a plume (or multiple plumes) is emitted into a stable layer of air and that layer is subsequently mixed to the ground through convective transfer of heat from the surface or because of advection to less stable surroundings. Fumigation may cause excessively high concentrations but is usually rather short-lived at a given receptor."

Note however that although CALPUFF is capable of modelling these complex

functions and has been considered due to the potential effect of complex terrain, local receptors are within 1km of the plant. Such short-range modelling is likely to be at the limit of CALPUFFs ability to make predictions with a reasonable degree of confidence.

We generated three dimensional meteorological data covering a wide grid across the Vale of York and generated by the UM5 model. Measured vertically profiled data is not available to the spatial and temporal resolution needed to undertake this kind of assessment. We made these predictions in order to determine whether or not the Applicant's predictions were robust in taking these complex conditions into account.

Linked to this, NYWAG also raised many concerns about modelling uncertainties due to meteorological conditions and other matters inherent to the dispersion model selected (ADMS). We checked modelling predictions also specific to this location using an alternative Gaussian model (Breeze AERMOD Version 7). Unlike CALPUFF this software uses similar principles to ADMS but can be used in addition in order to understand whether likely modelling uncertainties are significant.

The Applicant modelled the effect of building downwash from five on-site buildings. Site buildings are likely to have an affect on dispersion through additional downwash and lead to increased modelling uncertainties. Checks on downwash were made using ADMS, AERMOD and CALPUFF.

We utilised the precautionary principle by deriving the maximum predictions from all three models to check whether the Applicant's screening assessment could be considered protective as a reasonable worst-case.

Our conclusions were unchanged and we recommended that the Applicant's model was fit-for-purpose.

Overall 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 figures shown indicate the predicted peak ground level exposure to pollutants in ambient air, or where indicated the most impacted receptor. Whilst we have used the Applicant's modelling predictions in the table below, we have made our own simple verification calculation of the percentage process contribution and predicted environmental concentration. 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.

The assessment predictions have been considered as follows:

- Incineration ONLY including key pollutants
- AD Gas Engines ONLY
- Combined Impacts (Incineration and AD Gas Engines)

5.2.2 Assessment of Incineration ONLY including key pollutants

Incineration (ONLY) - Long-Term Impact Assessment of Emissions to Air

Pollutant	EQS / EAL	Back-ground Conc Note 7	Process Contribution (PC) Note 2	PC as % of EQS / EAL	Predicted Environmental Concentration (PEC)	PEC as % EQS / EAL
NO ₂	40	32.20	1.60	4.00	33.8	84.50
NO ₂ Note 8	40	32.20	1.50 Note 3	3.75	33.7	84.25
Particulate matter (PM ₁₀) Note 9	40	-	0.11	0.28	-	-
Particulate matter (PM _{2.5})	25	-	0.04	0.16	-	-
HF	16	-	0.01	0.06	-	-
VOCs	5 Note 4	0.23	0.1	2.00	0.33	6.60
VOCs	2.25 Note 4	0.18	0.1	4.44	0.28	12.44
Hg	0.25	-	0.0006	0.24	-	-
Cd Note 5	0.005	0.0015	0.0003	6.00	0.002	40.00
Tl Note 5	1	-	0.0003	0.03	-	-
As Note 6	0.003	0.0025	0.0006	20.00	0.0031	103.33
Sb Note 6	5	-	0.0006	0.01	-	-
Pb Note 6	0.25	-	0.0006	0.24	-	-
Cr Note 6	5	-	0.0006	0.01	-	-
Cr (VI)	0.0002	0.0024 Note 10	0.000004 Note 11	2.00	0.0013	650
Co Note 6	0.2	-	0.0006	0.30	-	-
Cu Note 6	10	-	0.0006	0.01	-	-
Mn Note 6	0.15	-	0.0006	4.00	-	-
Ni Note 6	0.02	0.008	0.0006	3.00	0.0086	43.00
V Note 6	5	-	0.0006	0.01	-	-

Note 1	All the above concentration figures are in $\mu\text{g}/\text{m}^3$
Note 2	PCs reported in Tables 10.21 and 10.22 of the Air Quality Assessment in Annex 5 of the Application. Detailed metals results are in Table 10.26.
Note 3	Max PC at a sensitive receptor reported in Table 10.23 of the Air Quality Assessment.
Note 4	The applicant used the EQS for benzene ($5 \mu\text{g}/\text{m}^3$); we have also assessed using the stricter EQS for 1, 3-butadiene ($2.25 \mu\text{g}/\text{m}^3$).
Note 5	Emissions of cadmium and thallium have been taken as half of the combined limit.
Note 6	Emissions of each of the nine metals have been taken as one-ninth of the combined limit.
Note 7	Background concentrations in Table 10.14 of the Air Quality Assessment.
Note 8	Maximum impact at a receptor (Walls Close House).
Note 9	Point of maximum impact and also maximum impact at a receptor (Walls Close House).
Note 10	20% of Cr background reported in Table 10.14 of the Air Quality Assessment.
Note 11	Refer to Section 5.2.3 below.

Incineration (ONLY) - Short-Term Impact Assessment of Emissions to Air

Pollutant	EQS / EAL	Back-ground Conc	Process Contribution (PC) ^{Note 2}	PC as % of EQS / EAL	Predicted Environmental Concentration (PEC)	PEC as % EQS / EAL
NO ₂	200	-	13.10	6.55	-	-
SO ₂ (15-minute mean)	266	-	10.00	3.76	-	-
SO ₂ (hourly average)	350	-	9.30	2.66	-	-
SO ₂ (daily average)	125	-	5.3	4.24	-	-
Particulate matter (PM ₁₀) ^{Note 9}	50	-	0.4	0.80	-	-
CO (8 hour running mean)	10,000	-	37.5	0.38	-	-
HCl	750	-	2.1	0.28	-	-
HF	160	-	0.2	0.13	-	-
Hg	7.5	-	0.01	0.13	-	-
Tl ^{Note 3}	30	-	0.005	0.02	-	-
Sb ^{Note 4}	150	-	0.012	0.01	-	-
Cr ^{Note 4}	150	-	0.012	0.01	-	-
Co ^{Note 4}	6	-	0.012	0.20	-	-
Cu ^{Note 4}	200	-	0.012	0.01	-	-
Mn ^{Note 4}	1,500	-	0.012	0.00	-	-
V ^{Note 4}	1	-	0.012	1.20	-	-

Note 1	All the above concentration figures are in $\mu\text{g}/\text{m}^3$
Note 2	PCs reported in Tables 10.21 and 10.22 of the Air Quality Assessment in Annex 5 of the Application. Detailed metals results are in Table 10.26.
Note 3	Emissions of thallium have been taken as half of the combined limit.
Note 4	Emissions of each of the nine metals have been taken as one-ninth of the combined limit.

(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 EQS/EAL and <10% of the short term EAQ/EAL.

Incineration (ONLY) INSIGNIFICANT - Long-term <1% AND Short-term <10%
Particulate matter PM ₁₀ & PM _{2.5}
SO ₂
CO
HCl & HF
Hg
Tl
Sb, Pb, Cr, Co, Cu, Mn & V (based on 1/9 th of the combined limit)

Therefore, generally, 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 EQS/EAL

Incineration (ONLY) Not considered to have the Potential for SIGNIFICANT Pollution PEC < 100% EQS/EAL
NO ₂
VOCs
Cd & 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. Notwithstanding this, we have set an improvement condition requiring an assessment of the impact of Cd & Ni using actual emissions monitoring data. This improvement condition also includes As and Cr (see below).

(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 EQS/EAL.

Incineration ONLY Potential to give rise to Pollution PEC> 100% of the long term EQS/EAL As & Cr (VI)

For these emissions, the Applicant has argued that the process contribution to the Predicted Environmental Concentration is negligible. Our further consideration of the risk is detailed in Section 5.2.2.2 below.

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

We have also carefully considered whether additional measures are required above what would normally be considered BAT in order to prevent significant pollution and further consideration of additional measures to address the pollution risk from these substances is set out in section 5.2.2.2 below.

5.2.2.1 Consideration of key pollutants from Incineration

(i) Nitrogen dioxide (NO₂)

The impact on air quality from NO₂ emissions has been assessed against the EU EQS of 40 µg/m³ as a long term annual average and a short term hourly average of 200 µg/m³. The model assumes a 70% NO_x to NO₂ 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 EU EQS and therefore cannot be screened out as insignificant. Even so, from the table above, the emission is not expected to result in the EU EQS being exceeded. The peak short term PC is screened out as being insignificant (<10% of the EU EQS).

(ii) Assessment of emissions of PM₁₀ and PM_{2.5}

The impact on air quality from particulate emissions has been assessed against EQS for PM₁₀ (particles of 10 microns and smaller) and PM_{2.5} (particles of 2.5 microns and smaller). For PM₁₀, the EU EQS are a long term annual average of 40 µg/m³ and a short term daily average of 50 µg/m³. For PM_{2.5} the EU EQS of 25 µg/m³ as a long-term annual average to be achieved by 2010 as a Target Value and by 2015 as a Limit Value.

The Applicant's predicted impact of the Installation against these EQSs is shown in the tables above. The assessment assumes that **all** particulate emissions are present as PM₁₀ for the PM₁₀ assessment and that **all** particulate emissions are present as PM_{2.5} for the PM_{2.5} assessment.

Pollutant	EQS / EAL	Back-ground Conc	Process Contribution (PC)	PC as % of EQS / EAL	Predicted Environmental Concentration (PEC)	PEC as % EQS / EAL
PM ₁₀	40 LT	-	0.11	0.28	-	-
	50 ST	-	0.40	0.80	-	-
PM _{2.5}	25 LT	-	0.04	0.16	-	-

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 in the range 1 to 5 mg/m³.
- It assumes all particulates emitted are below either 10 microns (PM₁₀) 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 PM₁₀ is below 1% of the long term EQS and below 10% of the short term EQS and so can be considered insignificant. Therefore, generally, 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 Environmental Quality Objective. Therefore the Environment Agency concludes that particulate emissions from the Installation, including emissions of PM₁₀ 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 PM₁₀ 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 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.

(iii) Acid gases, SO₂, 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 EQS/EAL. There is no long term EQS/EAL for HCl. HF has 2 assessment criteria – a 1-hr EAL and a monthly EAL – the process contribution is <1% of the monthly EAL and so the emission is insignificant if the monthly EAL is interpreted as representing a long term EAL.

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

Emissions of SO₂ can also be screened out as insignificant in that the short term process contribution is also <10% of each of the three short term EU EQS values. Therefore, generally, we consider the Applicant's proposals for preventing and minimising the emissions of these substances to be BAT for the Installation.

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

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

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

The Applicant has used the EQS for 1, 3 butadiene for their assessment of the impact of VOC. This is based on 1, 3 butadiene having the lowest EQS of organic species likely to be present in VOC (other than PAH, PCBs, dioxins and furans).

The Applicant has also used the EQS for benzo[a]pyrene (BaP) for their assessment of the impact of PAH with the point of maximum impact being 8.8% of the EQS (Table 10.22 Air Quality Assessment). We agree that the use of the BaP EQS is sufficiently precautionary.

There is no EAL 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

Whilst all emissions cannot be screened out as insignificant, the Applicant's modelling shows that the Installation is unlikely to result in a breach of the EAL. The Applicant is required to prevent, minimise and control PAH and VOC emissions using the best available techniques, this is considered further

in Section 6 and we consider the proposals to be BAT. We are satisfied that PAH and VOC emissions will not result in significant pollution.

5.2.2.2 Assessment of Emission of Metals from Incineration

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

Annex VI of IED sets three limits for metal emissions:

- An emission limit value of 0.05 mg/m³ for mercury and its compounds (formerly WID group 1 metal).
- An aggregate emission limit value of 0.05 mg/m³ for cadmium and thallium and their compounds (formerly WID group 2 metals).
- An aggregate emission limit of 0.5 mg/m³ for antimony, arsenic, lead, chromium, cobalt, copper, manganese, nickel and vanadium and their compounds (formerly 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.

Where Annex VI of IED sets an aggregate limit, the Applicant's assessment assumes that for cadmium and thallium each metal is emitted at half of the aggregate limit value and for the other metals that each metal is emitted as the proportion of metals in its group (i.e. one ninth of the limit for each of the group 3 metals). Historical data for Municipal Waste Incinerators indicates that 1/9th of the limit is an over estimate of actual emissions, and so we are satisfied that the Applicant's proposal is reasonable in this context.

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

- Mercury,
- thallium,
- antimony, lead, chromium, cobalt, copper, manganese and vanadium and their compounds;

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

- Cadmium, and
- nickel

This left emissions of:

- Arsenic, and
- chromium (VI)

requiring further assessment. This means that for emissions of these metals, the assessment predicts that an exceedence of the relevant EAL could occur. For all other metals, the Applicant has concluded that exceedences of the EAL for those metals are not likely to occur.

The 2009 report of the Expert Panel on Air Quality Standards (EPAQS) – “Guidelines for Metal and Metalloids in Ambient Air for the Protection of Human Health”, sets new ambient air quality guidelines for arsenic, nickel and chromium (VI). These guidelines have been incorporated as EALs in the revised H1 Guidance issued by the Environment Agency in 2010.

Chromium (VI)

Chromium (VI) is not specifically referenced in Annex VI of IED, which includes only total chromium as one of the nine Group 3 metals, the impact of which has been assessed above. The EPAQS guidelines refer only to that portion of the metal emissions contained within PM₁₀ in ambient air. The new guideline for chromium (VI) is 0.2 ng/m³ (0.0002 µg/m³).

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. We have considered the concentration of total chromium and chromium (VI) in the APC residues collected upstream of the emission point for existing Municipal Waste Incinerators and have assumed these to be similar to the particulate matter released from the emission point. This data shows that the mean chromium (VI) emission concentration (based on the bag dust ratio) is 3.5×10^{-5} mg/m³ (max 1.3×10^{-4}).

The Applicant has assumed that 0.7% of chromium is chromium (VI) in Table 10.26 of their air quality report. This equates to a chromium (VI) emission concentration of 4×10^{-4} mg/m³ which remains a conservative assumption. This equates to a PC of 0.000004 µg/m³ (0.004 ng/m³).

There is little data available on the background levels of chromium (VI); so we have assumed this to be 20% of the total chromium background level, 20% is the typical value of chromium (VI) in total chromium reported in the environment in the EPAQS Guidelines.

The background for chromium is reported to be 12 ng/m³ (0.012 µg/m³) in Table 10.14 of the Air Quality Assessment. The background for chromium (VI) is calculated to be 0.0024 µg/m³.

The Applicant has used the above data to model the predicted chromium (VI) impact. The PC is predicted as 2% of the guideline.

Pollutant	EQS / EAL	Back-ground Conc	Process Contribution (PC)	PC as % of EQS / EAL	Predicted Environmental Concentration (PEC)	PEC as % EQS / EAL
Cr (VI)	0.0002	0.0024	0.000004	2.00	0.0024	1200
		0.00014	0.000004	2.00	0.00014	70

The Applicant's assessment shows that background levels are such that the EAL for chromium (VI) is already exceeded and the PC from the incinerator would only make a negligible increase to chromium (VI) levels.

However, the EPAQS report suggests that there is a degree of uncertainty around background concentrations of metals and the proportion of chromium (VI) in background chromium.

This Installation is located in a rural area and the background levels of total chromium proposed in the EPAQS report are 0.2 to 0.7 ng/m³. Therefore we have also used this information on rural background levels. Assuming that chromium (VI) is 20% of this, then the background levels are 0.04 to 0.14 ng/m³ (0.00004 µg/m³ to 0.00014 µg/m³). Based on this data an exceedance of the EAL is unlikely, as shown in the table above.

The Installation has been assessed as meeting BAT for control of metal emissions to air, see section 6 of this document. Notwithstanding this, we have set an improvement condition requiring an assessment of the impact using actual emissions monitoring data for total chromium.

Arsenic

For arsenic, the Applicant has stated in Para 10.11.38 of the Air Quality Assessment that the highest arsenic concentration emitted from a MSW incinerator is 0.003 mg/m³. If this emission is used instead of 0.055 mg/m³ (based on the assumption that arsenic is released at one-ninth of the emission limit of 0.5 mg/m³), then the predicted contribution reduces to 0.000034 µg/m³, which is at 1% of the EAL and so can be considered insignificant.

Notwithstanding this, the EPAQS report sets out information on background levels of arsenic. This Installation is located in a rural area and the background levels proposed in the EPAQS report are 0.1 to 0.4 ng/m³ (0.0001 mg/m³ to 0.0004 µg/m³). Based on this data an exceedance of the EAL is unlikely.

Pollutant	EQS / EAL	Back-ground Conc	Process Contribution (PC)	PC as % of EQS / EAL	Predicted Environmental Concentration (PEC)	PEC as % EQS / EAL
As	0.003	0.0025	0.0006	20.00	0.0031	103.33
		0.0004	0.0006	20.00	0.001	33.33
		-	0.000034	1.00	-	-

The Installation has been assessed as meeting BAT for control of metal emissions to air, see section 6 of this document. Notwithstanding this, we have set an improvement condition requiring an assessment of the impact using actual emissions monitoring data.

5.2.3 Consideration of the AD gas engines ONLY

The air impact assessment and the dispersion modelling were based upon the ELVs in the standard rules permit SR2010No15 for an anaerobic digestion activity.

The Applicant's modelling predictions for the AD gas engines at the point of maximum impact are summarised in the tables.

AD Gas Engines (ONLY) - Long-Term Impact Assessment of Emissions to Air

Pollutant	EQS / EAL	Back-ground Conc Note 3	Process Contribution (PC) Note 2	PC as % of EQS / EAL	Predicted Environmental Concentration (PEC)	PEC as % EQS / EAL
NO ₂	40	32.2	3.50	8.75	35.70	89.25
VOCs (as benzene)	5	0.23	0.75	15.00	0.98	19.60
VOCs (as 1,3-butadiene)	2.25	0.18	0.75	33.33	0.93	41.33

Note 1 All the above concentration figures are in µg/m³

Note 2 PCs reported in Table 7.1 of the Air Quality Assessment Consolidation of the Application.

Note 3 Background concentrations in Table 7.1 of the Air Quality Assessment Consolidation of the Application.

AD Gas Engines (ONLY) - Short-Term Impact Assessment of Emissions to Air

Pollutant	EQS / EAL	Back-ground Conc Note 3	Process Contribution (PC) Note 2	PC as % of EQS / EAL	Predicted Environmental Concentration (PEC)	PEC as % EQS / EAL
NO ₂	200	64.40	25.83	12.92	90.23	45.12
SO ₂ (15-minute mean)	266	4.8	64.78	24.35	69.58	26.16
SO ₂ (hourly average)	350	4.8	51.31	14.66	56.11	16.03
SO ₂ (daily average)	125	4.8	20.85	16.68	25.65	20.52
CO (8 hour running mean)	10,000	-	138.82	1.39	-	-

Note 1 All the above concentration figures are in µg/m³

Note 2 PCs reported in Table 7.1 of the Air Quality Assessment Consolidation of the Application.

Note 3 Background concentrations in Table 7.1 of the Air Quality Assessment Consolidation of the Application.

(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 EQS/EAL and <10% of the short term EAQ/EAL.

AD gas engines ONLY		
INSIGNIFICANT - Short-term <10		
CO		

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

(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% of the long term EQS/EAL.

AD gas engines ONLY Not considered to have the Potential for SIGNIFICANT Pollution PEC< 100% of the long term EQS/EAL
NO ₂
SO ₂
VOCs

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.

5.2.4 Consideration of the combined Impacts for key pollutants (Incineration and AD gas engines)

We asked the Applicant to provide an assessment of the combined impact from the Regulated Facility (Report: Air Quality Assessment Consolidation – S0969-0440-0016RSS). The Applicant's modelling predictions for normal operation of the incinerator and AD gas engines at the most impacted receptors are summarised in the tables. The combined PCs are actually lower in some cases as the predictions for the impacts of incineration only and AD only are based on the point of maximum impact (unless otherwise stated). The predictions for CO are based on the point of maximum impact from the gas engine only:

Incineration and AD Gas Engines - Long-Term Impact Assessment of Emissions to Air

Pollutant	EQS / EAL	Back-ground Conc Note 3	Combined Process Contribution (PC) Note 2	PC as % of EQS / EAL	Predicted Environmental Concentration (PEC)	PEC as % EQS / EAL
NO ₂	40	32.2	1.92	4.80	34.12	85.30
VOCs (as benzene)	5	0.23	0.2	4.00	0.43	8.60
VOCs (as 1,3-butadiene)	2.25	0.18	0.2	8.88	0.38	16.88

Note 1 All the above concentration figures are in µg/m³

Note 2 PCs reported in Tables 9.2 and 9.8 of the Air Quality Assessment Consolidation of the Application.

Note 3 Background concentrations in Table 10.14 of the Air Quality Assessment.

Incineration and AD Gas Engines - Short-Term Impact Assessment of Emissions to Air

Pollutant	EQS / EAL	Back-ground Conc Note 3	Combined Process Contribution (PC) Note 2	PC as % of EQS / EAL	Predicted Environmental Concentration (PEC)	PEC as % EQS / EAL
NO ₂	200	-	12.11	6.06	-	-
SO ₂ (15-minute mean)	266	-	12.08	4.54	-	-
SO ₂ (hourly average)	350	-	10.69	3.05	-	-
SO ₂ (daily average)	125	-	5.99	4.79	-	-
CO (8 hour running mean)	10,000	-	138.82 Note 3	1.39	-	-

Note 1 All the above concentration figures are in µg/m³

Note 2 PCs reported in Tables 7.1, 9.3, 9.4, 9.5, 9.6 and 9.7 of the Air Quality Assessment Consolidation of the Application.

Note 3 PC from gas engine only.

(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 EQS/EAL and <10% of the short term EAQ/EAL.

Combined Incineration and AD gas engines INSIGNIFICANT - Short-term <10% SO₂ and CO
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Therefore, generally, we consider the Applicant's proposals for preventing and minimising the emissions of these substances to be BAT for the Regulated Facility.

(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% of the long term EQS/EAL.

Combined Incineration and AD gas engines Not considered to have the Potential for SIGNIFICANT Pollution PEC< 100% of the long term EQS/EAL		
NO ₂		
VOCs		

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.

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 air quality directive (AQD)

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 include the application of BAT, which may in some circumstances dictate tighter emission limits and controls than those set out in Chapter IV of IED on waste incineration and co-incineration plants. The assessment of BAT for this Regulated Facility 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 a Regulated Facility 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 Regulated Facility on human health and the environment and any measures we are requiring to ensure a high level of protection.

iii) **Expert Scientific Opinion**

We take account of the views of national and international expert bodies. Following is a summary of some of the publications which we have considered (in no particular order).

An independent review of evidence on the health effects of municipal waste incinerators was published by **DEFRA** in 2004. It concluded that there was no convincing link between the emissions from MSW incinerators and adverse effects on public health in terms of cancer, respiratory disease or birth defects. On air quality effects, the report concluded “Waste incinerators contribute to local air pollution. This contribution, however, is usually a small proportion of existing background levels which is not detectable through environmental monitoring (for example, by comparing upwind and downwind levels of airborne pollutants or substances deposited to land). In some cases, waste incinerator facilities may make a more detectable contribution to air pollution. Because current MSW incinerators are located predominantly in urban areas, effects on air quality are likely to be so small as to be undetectable in practice.”

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

Policy Advice from Government also points out that the minimal risk from modern incinerators. Paragraph 22 (Chapter 5) of WS2007 says that “research carried out to date has revealed no credible evidence of adverse health outcomes for those living near incinerators.” It points out that “the relevant health effects, mainly cancers, have long incubation times. But the research that is available shows an absence of symptoms relating to exposures twenty or more years ago when emissions from incinerators were much greater than is now the case.” **Paragraph 30 of PPS10** explains that “modern, appropriately located, well run and well regulated waste management facilities should pose little risk to public health.”

The **Committee on Carcinogenicity of Chemicals in Food, Consumer Products and the Environment (CoC)** issued a statement in 2000 which said that “any potential risk of cancer due to residency (for periods in excess of 10 years) near to municipal solid waste incinerators was exceedingly low and probably not measurable by the most modern epidemiological techniques.” In 2009, CoC considered six further relevant epidemiological papers that had been published since the 2000 statement, and concluded that

“there is no need to change the advice given in the previous statement in 2000 but that the situation should be kept under review”.

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

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

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

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

pollutants from incinerators and observed health effects. Lack of evidence of such relationships might mean that adverse health effects did not occur, but it could mean that such relationships might not be detectable using available methods and sources.”

The **British Society for Ecological Medicine (BSEM)** published a report in **2005** on the health effects associated with incineration and concluded that “Large studies have shown higher rates of adult and childhood cancer and also birth defects around municipal waste incinerators: the results are consistent with the associations being causal. A number of smaller epidemiological studies support this interpretation and suggest that the range of illnesses produced by incinerators may be much wider. Incinerator emissions are a major source of fine particulates, of toxic metals and of more than 200 organic chemicals, including known carcinogens, mutagens, and hormone disrupters. Emissions also contain other unidentified compounds whose potential for harm is as yet unknown, as was once the case with dioxins. Abatement equipment in modern incinerators merely transfers the toxic load, notably that of dioxins and heavy metals, from airborne emissions to the fly ash. This fly ash is light, readily windborne and mostly of low particle size. It represents a considerable and poorly understood health hazard.”

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

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

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

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

iv) Health Risk Models

Comparing the results of air dispersion modelling as part of the H1 Environmental Impact assessment against European and national air quality standards effectively makes a health risk assessment for those pollutants for which a standard has been derived. These air quality standards have been developed primarily in order to protect human health via known intake mechanisms, such as inhalation and ingestion. Some pollutants, such as dioxins and furans, 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.

Dioxin Intake Models: Two models are available to predict the dioxin 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 are HHRAP and the HMIP model.

HHRAP has been developed by the US EPA to calculate the human body intake of a range of carcinogenic pollutants and to determine the mathematic quantitative risk in probabilistic terms. In the UK, in common with other European Countries, we consider a threshold dose below which the likelihood of an adverse effect is regarded as being very low or effectively zero. The HMIP model uses a similar approach to the HHRAP model, but does not attempt to predict probabilistic risk. Either model can however be used to make comparisons with the TDI.

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

In addition to an assessment of risk from dioxins and furans, the HHRAP model enables a risk assessment from human intake of a range of heavy metals. The HMIP report does not consider metals. In principle, the respective EQS for these metals are protective of human health. It is not therefore necessary to model the human body intake.

COMEAP developed a methodology based on the results of time series epidemiological studies which allows calculation of the public health impact of exposure to the classical air pollutants (NO₂, SO₂ and particulates) in terms of the numbers of “deaths brought forward” and the “number of hospital admissions for respiratory disease brought forward or additional”. COMEAP has issued a statement expressing some reservations about the applicability of applying its methodology to small affected areas. Those concerns generally relate to the fact that the exposure-response coefficients used in the COMEAP report derive from studies of whole urban populations where the air pollution climate may differ from that around a new industrial installation. COMEAP identified a number of factors and assumptions that would contribute to the uncertainty of the estimates. These were summarised in the Defra review as below:

- Assumption that the spatial distribution of the air pollutants considered is the same in the area under study as in those areas, usually cities or large towns, in which the studies which generated the coefficients were undertaken.
- Assumption that the temporal pattern of pollutant concentrations in the area under study is similar to that in the areas in which the studies which generated the coefficients were undertaken (i.e. urban areas).
- It should be recognised that a difference in the pattern of socio-economic conditions between the areas to be studied and the reference areas could lead to inaccuracy in the predicted level of effects.
- In the same way, a difference in the pattern of personal exposures between the areas to be studied and the reference areas will affect the accuracy of the predictions of effects.

The use of the COMEAP methodology is not generally recommended for modelling the human health impacts of individual installations. However it may have limited applicability where emissions of NO_x, SO₂ and particulates cannot be screened out as insignificant in an H1 Environmental Impact assessment, there are high ambient background levels of these pollutants and we are advised that its use was appropriate by our public health consultees.

Our recommended approach is therefore the use of the H1 assessment methodology comparison for most pollutants (including metals) and dioxin intake models using either the HHRA or HMIP models as described above for dioxins and furans. Where an alternative approach is adopted for dioxins, we check the predictions ourselves using the HMIP methodology.

v) Consultations

As part of our normal procedures for the determination of a permit application, we would consult the PCT, FSA and in some cases HPA. In this case the PCT also consulted with the HPA. 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 and Furans

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

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

The results of the Applicant's assessment of dioxin intake are detailed in the table below. (worst – case results for each category are shown). The results showed that the predicted daily intake of dioxins at all receptors, resulting from emissions from the proposed Installation, were significantly below the recommended TDI levels.

They predict the contribution of the incinerator to the COT TDI is 6% for the farmer receptors and less than 0.1% for the residential receptors. Due to the rural nature of the location, farming activities are extensive with residential exposure within the immediate vicinity being limited. The exposure scenarios represent a very much worse case, i.e. that it is based upon an individual exposed for a life-time to the effects of the highest predicted airborne concentrations and consuming mostly locally grown food.

Receptor Note 2	adult	child
Farmer North 1	0.081	0.12
Farmer North 2	0.036	0.054
Farmer South 1	0.041	0.06
Farmer South 2	0.020	0.029
Resident Allerton 1	0.00046	0.0014
Resident Allerton 2	0.00042	0.0013
Resident Coneythorpe/Clareton	0.00042	0.0014

Note 1 Calculated maximum daily intake of dioxins by local receptors resulting from the operation of the proposed facility (I-TEQ/ kg-BW/day)

Note 2 Refer to Table 12.6 of the Application Human Health Assessment. For the resident receptors there were 13 in total. We have included those with the highest daily intakes.

Our check modelling is relatively consistent with the Applicant's predictions and it also confirms that intake is not likely to be any greater than the Applicant's predictions. Given the conservative nature of the assessment and the controls in place to prevent and minimise their release, emissions of dioxins and furans from the proposed Installation are unlikely to have an impact upon human health.

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. 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 ($\text{PM}_{0.1}$). 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 addresses the issue of the health effects of particulates in their September 2009 statement 'The Impact on Health of Emissions to Air from

Municipal Incinerators'. It refers to the coefficients linking PM₁₀ and PM_{2.5} with effects on health derived by COMEAP and goes on to say that if these coefficients are applied to small increases in concentrations produced, locally, by incinerators; the estimated effects on health are likely to be small. The HPA notes that the coefficients that allow the use of number concentrations in impact calculations have not yet been defined because the national experts have not judged that the evidence is sufficient to do so. This is an area being kept under review by COMEAP.

In December 2010, COMEAP published a report on The Mortality Effects of Long-Term Exposure to Particulate Air Pollution in the United Kingdom. It says that "a policy which aims to reduce the annual average concentration of PM_{2.5} by 1 µg/m³ would result in an increase in life expectancy of 20 days for people born in 2008." However, "The Committee stresses the need for careful interpretation of these metrics to avoid incorrect inferences being drawn – they are valid representations of population aggregate or average effects, but they can be misleading when interpreted as reflecting the experience of individuals."

The HPA also point out that in 2007 incinerators contributed 0.02% to ambient ground level PM₁₀ levels compared with 18% for road traffic and 22% for industry in general. The HPA note that in a sample collected in a day at a typical urban area the proportion of PM_{0.1} is around 5-10% of PM₁₀. It goes on to say that PM₁₀ includes and exceeds PM_{2.5} which in turn includes and exceeds PM_{0.1}.

This is consistent with the assessment of this Application which shows emissions of PM₁₀ to air to be insignificant.

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 Incinerator

We have assessed the health effects from the operation of the Regulated Facility with a key focus on the effects from the incinerator in relation to the above (sections 5.3.1 to 5.3.3). We have applied the relevant requirements of the National and European legislation in imposing the Permit conditions. We are satisfied that compliance with these conditions will ensure protection of the environment and human health.

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

In carrying out air dispersion modelling as part of the H1 Environmental Impact assessment and comparing the predicted environmental concentrations with European and National air quality standards, the Applicant has effectively made a health risk assessment for many pollutants. These air quality standards have been developed primarily in order to protect human health.

The Applicant's assessment of the impact from the following pollutants have all indicated that the emissions from the Regulated Facility screen out as insignificant: Particulate matter PM₁₀ & PM_{2.5}, SO₂, CO, HCl, HF, Hg, TI, Sb, Pb, Cr, Co, Cu, Mn and V.

Where the impact of emissions of pollutants have not been screened out as insignificant, the assessment still shows that the predicted environmental concentrations are well within air quality standards or environmental action levels for the following pollutants: NO₂, VOCs, Cd and Ni.

The impact of emissions of arsenic and chromium (VI) have the potential to give rise to pollution in that the PEC could exceed 100% of the long-term EQS. Our assessment of the impact from arsenic and chromium (VI) is detailed in Section 5.2.2.2 above. We have reassessed the predicted impact. For arsenic the predicted contribution reduces to 1% of the EAL, when we take into account actual emissions from current incineration plant and so can be considered insignificant. For chromium (VI) the PEC reduces below 100% when we consider the background levels for rural areas as set out in the EPAQS report.

The Environment Agency has reviewed the methodology employed by the Applicant to carry out the health impact assessment. Our detailed assessment is in our report C921a (C954) which was placed on the Public Register.

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 airborne concentrations and consuming mostly locally grown food), it was concluded that the operation of the proposed Installation will not pose a significant carcinogenic or non-carcinogenic risk to human health.

The local Primary Care Trust were consulted on the Application and concluded that they had no significant concerns regarding the risk to the health of humans from the Regulated Facility. The Food Standards Agency was also consulted during the permit determination process and it concluded that it is unlikely that there will be any unacceptable effects on the human food chain as a result of the operations of the incinerator. Details of the responses provided by the HPA and FSA to the consultation on this Application can be found in Annex 4.

The Environment Agency is therefore satisfied that the Applicant's conclusions presented above are soundly based and we conclude that the potential emissions of pollutants including dioxins, furans and metals from the

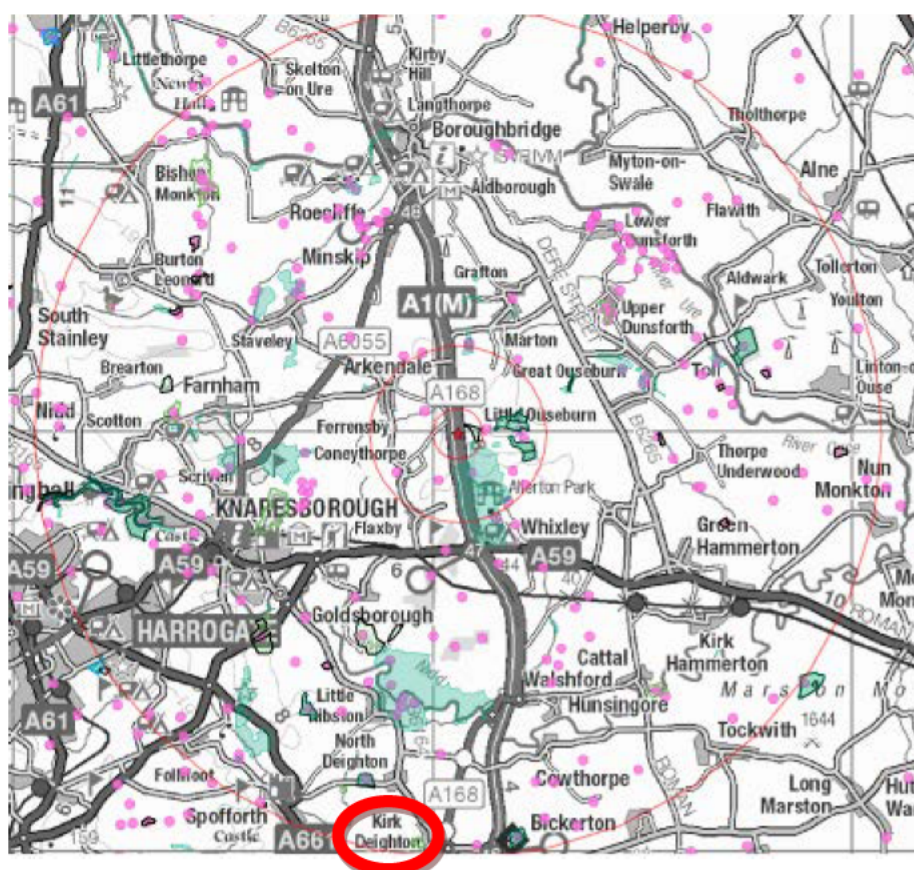
proposed Regulated Facility are unlikely to have an impact upon human health.

5.4 Impact on Habitats sites, SSSIs and non-statutory conservation sites

5.4.1 Sites Considered

The following Habitats site is located within the screening distance of 10 km of the Regulated Facility:

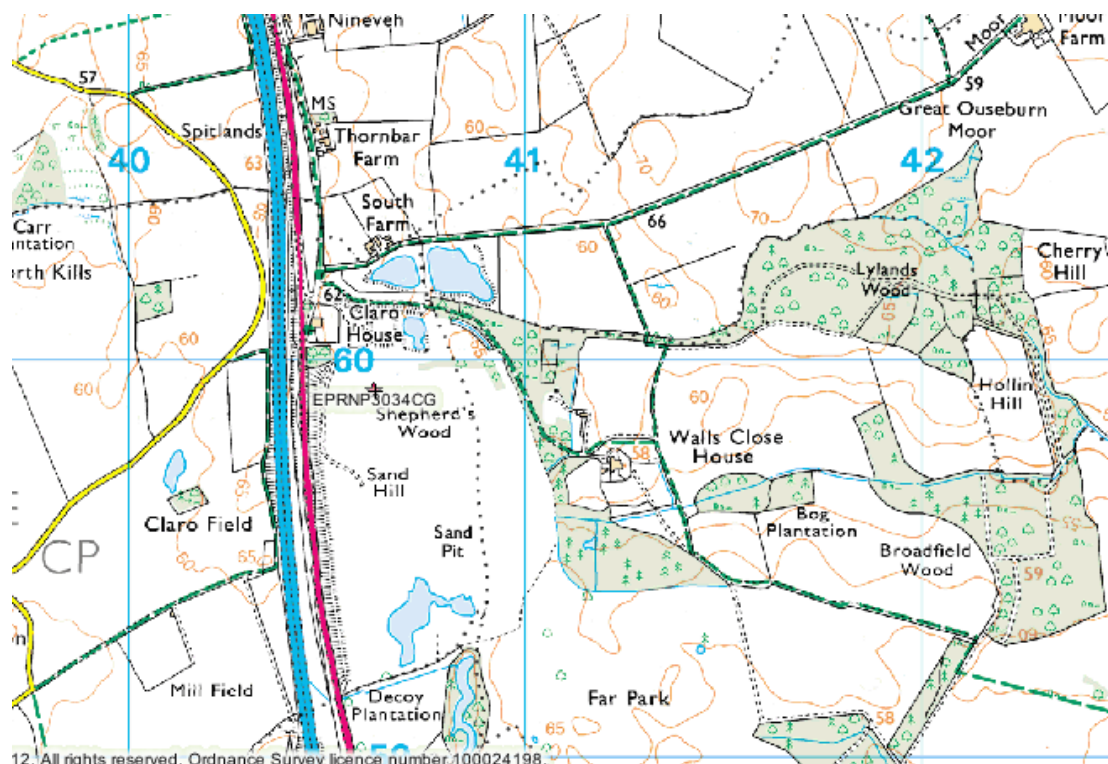
- Special Area of Conservation – Kirk Deighton (9.8 km from site)



There are no Sites of Special Scientific Interest within the screening distance of 2 km of the proposed Regulated Facility.

The following non-statutory local wildlife and conservation sites are located within the screening distance of 2 km of the Regulated Facility:

Ecological Receptor	Classification
Shepherds Wood	Sites of Importance for Nature Conservation (SINC)
Bog Plantation	
Allerton Park Lakes	
Shepherds Wood	Ancient Woodland
Lylands Wood	
Broadfield Wood	



5.4.2 Habitats Assessment

The Applicant's Habitats assessment for the SAC 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.

We also completed an Appendix 11 Habitats Assessment for the SAC which was sent to Natural England for consultation and they agreed that the Regulated Facility was not likely to have a significant effect on the interest features of the SAC.

Kirk Deighton

Incinerator and AD Gas Engines – Long-Term Impact Assessment of Emissions to Air

Pollutant	EQS / EAL	Back-ground Conc	Process Contribution (PC)	PC as % of EQS / EAL	Predicted Environmental Concentration (PEC)	PEC as % EQS / EAL
NO ₂ Note 2	30	-	0.05	0.17	-	-
SO ₂ Note 6	10	-	0.01	0.10	-	-
NH ₃ Note 4	3 Note 3	-	0.002	0.06	-	-
HF Note 5	<0.5 Weekly mean	-	0.001	<0.20	-	-

Note 1 All the above concentration figures are in µg/m³
Note 2 Table 9.10 of the Air Quality Assessment Consolidation
Note 3 Table 4.2 of the Air Quality Assessment Consolidation, confirms that the habitats don't contain sensitive lichen communities.
Note 4 Table 6.14 of the Air Quality Assessment Consolidation
Note 5 Table 6.15 of the Air Quality Assessment Consolidation
Note 6 Table 9.11 of the Air Quality Assessment Consolidation

Kirk Deighton

Incinerator and AD Gas Engines – Short-Term Impact Assessment of Emissions to Air

Pollutant	EQS / EAL	Back-ground Conc	Process Contribution (PC)	PC as % of EQS / EAL	Predicted Environmental Concentration (PEC)	PEC as % EQS / EAL
NO ₂ Note 2	75	-	1.97	2.63	-	-
HF Note 3	<5 Daily mean	-	0.004	0.08	-	-

Note 1 All the above concentration figures are in µg/m³
Note 2 Table 9.10 of the Air Quality Assessment Consolidation
Note 3 Table 6.15 of the Air Quality Assessment Consolidation

The cumulative impact from the Regulated Facility is less than 1% of the long-term and less than 10% of the short-term critical levels. The impact at Kirk Deighton from emissions to air are screened out as being insignificant.

Kirk Deighton
Nitrogen Deposition

Critical Load kgN/hr/yr		PC Deposition kgN/hr/yr	Percentage Contribution	
Lower	Upper		Lower	Upper
Note 1	Note 1	0.016 ^{Note 2}	-	-

Note 1 Para 9.2.3.1 of the Air Quality Assessment Consolidation - No critical load as no habitats identified that are sensitive to nitrogen deposition

Note 2 Table AD.4 of the Air Quality Assessment Consolidation

Kirk Deighton
Acid Deposition

Critical Load kgN/hr/yr		PC Deposition keq/ha/yr		Percentage Contribution	
Lower	Upper	N	S	Lower	Upper
Note 1	Note 1			-	-
		0.00114 Note 5	0.00167 Note 5		

Note 1 Para 9.2.3.1 of the Air Quality Assessment Consolidation - No critical load as no habitats identified that are sensitive to acid deposition

Note 2 Table AD.5 of the Air Quality Assessment Consolidation

There was no critical load data for Kirk Deighton SAC (see Note 1 above).

5.4.3 Assessment of Non-Statutory Sites

The Applicant's assessment of the non-statutory sites 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 feature(s) of the protected sites. The Applicant's assessment is summarised below.

Shepherds Wood

Incinerator and AD Gas Engines – Long-Term Impact Assessment of Emissions to Air

Pollutant	EQS / EAL	Back-ground Conc	Process Contribution (PC)	PC as % of EQS / EAL	Predicted Environmental Concentration (PEC)	PEC as % EQS / EAL
NO ₂ Note 2	30	18.00	3.17	10.57	21.17	70.57
SO ₂ Note 7	20	2.60	1.27	6.35	3.87	19.35
NH ₃ Note 4	3 Note 3	3.60 Note 5	0.104	3.47	3.70	123.33
HF Note 6	<0.5 Weekly mean	2.35 Note 5	0.039	7.80	2.39	478.00

- Note 1 All the above concentration figures are in µg/m³
- Note 2 Tables 9.10 to 9.12 of the Air Quality Assessment Consolidation
- Note 3 Table 4.2 of the Air Quality Assessment Consolidation, confirms that the habitats don't contain sensitive lichen communities.
- Note 4 Table 6.14 of the Air Quality Assessment Consolidation
- Note 5 Table 6.16 of the Air Quality Assessment Consolidation
- Note 6 Table 6.15 of the Air Quality Assessment Consolidation
- Note 7 Table 9.11 of the Air Quality Assessment Consolidation

Shepherds Wood

Incinerator and AD Gas Engines – Short-Term Impact Assessment of Emissions to Air

Pollutant	EQS / EAL	Back-ground Conc	Process Contribution (PC)	PC as % of EQS / EAL	Predicted Environmental Concentration (PEC)	PEC as % EQS / EAL
NO ₂ Note 2	75	36.00 Note 3	22.87	30.49	58.87	78.49
HF Note 4	<5 Daily mean	-	0.11	2.20	-	-

- Note 1 All the above concentration figures are in µg/m³
- Note 2 Tables 9.10 to 9.12 of the Air Quality Assessment Consolidation
- Note 3 Background is 2 x long-term background of 18.00 µg/m³
- Note 4 Table 6.15 of the Air Quality Assessment Consolidation

Consideration of background levels is required which means that the critical level is exceeded for NH₃ and HF. This exceedance is due to the background level already exceeding the critical level. The process contribution from the Regulated Facility is acceptable taking expected modelling uncertainties into account.

Our assessment is based on a worst case scenario and we conclude that the air emissions from the Regulated Facility are not likely to have a significant impact on Shepherds Wood.

Shepherds Wood
Nitrogen Deposition

Critical Load kgN/hr/yr		PC Deposition kgN/hr/yr	Percentage Contribution	
Lower	Upper		Lower	Upper
10 ^{Note 1}	20 ^{Note 1}	1.424 ^{Note 1}	14.24	7.12

Note 1 Table AD.4 of the Air Quality Assessment Consolidation

Background Kg/N/hr/yr	Critical Load kgN/hr/yr		PEC Deposition kgN/hr/yr	Percentage Contribution	
	Lower	Upper		Lower	Upper
50.54 ^{Note 1}	10	20	51.96	519.60	259.80

Note 1 Table AD.4 of the Air Quality Assessment Consolidation

Shepherds Wood
Acid Deposition

PC Deposition keq/ha/yr		PC Percentage of Lower Critical Load	Background keq/ha/yr		Background Percentage of Lower Critical Load	PEC Percentage of Lower Critical Load
N	S		N	S		
0.102	0.301	23.397	3.61	0.36	608.50	406.50

Note 1 Table AD.5 of the Air Quality Assessment Consolidation

Consideration of background levels is required which means that the critical loads are exceeded for both nitrogen and acid deposition. This exceedance is due to the background level already exceeding the critical load. The process contribution from the Regulated Facility is small compared to the background.

Our assessment is based on a worst case scenario and we conclude that deposition from the Regulated Facility is not likely to have a significant impact on Shepherds Wood.

Bog Plantation

Incinerator and AD Gas Engines – Long-Term Impact Assessment of Emissions to Air

Pollutant	EQS / EAL	Back-ground Conc	Process Contribution (PC)	PC as % of EQS / EAL	Predicted Environmental Concentration (PEC)	PEC as % EQS / EAL
NO ₂ Note 2	30	10.20	1.57	5.23	11.77	39.23
SO ₂ Note 7	20	2.60	0.52	2.60	3.12	15.60
NH ₃ Note 4	3 Note 3	3.60 Note 5	0.064	2.13	3.66	122.00
HF Note 6	<0.5 Weekly mean	2.35 Note 5	0.021	4.20	2.37	474.00

Note 1	All the above concentration figures are in µg/m ³
Note 2	Tables 9.10 to 9.12 of the Air Quality Assessment Consolidation
Note 3	Table 4.2 of the Air Quality Assessment Consolidation, confirms that the habitats don't contain sensitive lichen communities.
Note 4	Table 6.14 of the Air Quality Assessment Consolidation
Note 5	Table 6.16 of the Air Quality Assessment Consolidation
Note 6	Table 6.15 of the Air Quality Assessment Consolidation
Note 7	Table 9.11 of the Air Quality Assessment Consolidation

Bog Plantation

Incinerator and AD Gas Engines – Short-Term Impact Assessment of Emissions to Air

Pollutant	EQS / EAL	Back-ground Conc	Process Contribution (PC)	PC as % of EQS / EAL	Predicted Environmental Concentration (PEC)	PEC as % EQS / EAL
NO ₂ Note 2	75	20.40 Note 3	14.13	18.84	34.53	46.04
HF Note 4	<5 Daily mean	-	0.061	1.22	-	-

Note 1	All the above concentration figures are in µg/m ³
Note 2	Tables 9.10 to 9.12 of the Air Quality Assessment Consolidation
Note 3	Background is 2 x long-term background of 10.20 µg/m ³
Note 4	Table 6.15 of the Air Quality Assessment Consolidation

Consideration of background levels is required which means that the critical level is exceeded for NH₃ and HF. This exceedance is due to the background level already exceeding the critical level. The process contribution from the Regulated Facility is negligible.

Our assessment is based on a worst case scenario and we conclude that the air emissions from the Regulated Facility are not likely to have a significant impact on the Bog Plantation.

Bog Plantation
Nitrogen Deposition

Critical Load kgN/hr/yr		PC Deposition kgN/hr/yr	Percentage Contribution	
Lower	Upper		Lower	Upper
10 ^{Note 1}	20 ^{Note 1}	0.768 ^{Note 1}	7.68	3.84

Note 1 Table AD.4 of the Air Quality Assessment Consolidation

Background KgN/hr/yr	Critical Load kgN/hr/yr		PEC Deposition kgN/hr/yr	Percentage Contribution	
	Lower	Upper		Lower	Upper
43.4 ^{Note 1}	10	20	44.168	441.68	220.84

Note 1 Table AD.4 of the Air Quality Assessment Consolidation

Bog Plantation
Acid Deposition

PC Deposition keq/ha/yr		PC Percentage of Lower Critical Load	Background keq/ha/yr		Background Percentage of Lower Critical Load	PEC Percentage of Lower Critical Load
N	S		N	S		
0.0549	0.122	8.600	3.10	0.34	480.30	392.40

Note 1 Table AD.5 of the Air Quality Assessment Consolidation

Consideration of background levels is required which means that the critical loads are exceeded for both nitrogen and acid deposition. This exceedance is due to the background level already exceeding the critical load. The process contribution from the Regulated Facility is small compared to the background.

Our assessment is based on a worst case scenario and we conclude that deposition from the Regulated Facility is not likely to have a significant impact on the bog plantation.

Allerton Park Lakes
Incinerator and AD Gas Engines – Long-Term Impact Assessment of Emissions to Air

Pollutant	EQS / EAL	Back-ground Conc	Process Contribution (PC)	PC as % of EQS / EAL	Predicted Environmental Concentration (PEC)	PEC as % EQS / EAL
NO ₂ Note 2	30	10.20	0.72	2.40	10.92	36.40
SO ₂ Note 7	20	2.60	0.23	1.15	2.83	14.15
NH ₃ Note 4	3 Note 3	3.60 Note 5	0.031	1.03	3.63	121.00
HF Note 6	<0.5 Weekly mean	2.35 Note 5	0.016	3.2	2.37	474.00

Note 1 All the above concentration figures are in µg/m³
 Note 2 Tables 9.10 to 9.12 of the Air Quality Assessment Consolidation
 Note 3 Table 4.2 of the Air Quality Assessment Consolidation, confirms that the habitats don't contain sensitive lichen communities.
 Note 4 Table 6.14 of the Air Quality Assessment Consolidation
 Note 5 Table 6.16 of the Air Quality Assessment Consolidation
 Note 6 Table 6.15 of the Air Quality Assessment Consolidation
 Note 7 Table 9.11 of the Air Quality Assessment Consolidation

Allerton Park Lakes
Incinerator and AD Gas Engines – Short-Term Impact Assessment of Emissions to Air

Pollutant	EQS / EAL	Back-ground Conc	Process Contribution (PC)	PC as % of EQS / EAL	Predicted Environmental Concentration (PEC)	PEC as % EQS / EAL
NO ₂ Note 2	75	20.40 Note 3	7.85	10.47	28.25	37.66
HF Note 4	<5 Daily mean	-	0.032	0.64	-	-

Note 1 All the above concentration figures are in µg/m³
 Note 2 Tables 9.10 to 9.12 of the Air Quality Assessment Consolidation
 Note 3 Background is 2 x long-term background of 10.20 µg/m³
 Note 4 Table 6.15 of the Air Quality Assessment Consolidation

Consideration of background levels is required which means that the critical level is exceeded for NH₃ and HF. This exceedance is due to the background level already exceeding the critical level. The process contribution from the Regulated Facility is negligible.

Our assessment is based on a worst case scenario and we conclude that the air emissions from the Regulated Facility are not likely to have a significant impact on Allerton Park Lakes.

Allerton Park Lakes
Nitrogen Deposition

Critical Load kgN/hr/yr		PC Deposition kgN/hr/yr	Percentage Contribution	
Lower	Upper		Lower	Upper
10 ^{Note 1}	20 ^{Note 1}	0.357 ^{Note 1}	3.570	1.785

Note 1 Table AD.4 of the Air Quality Assessment Consolidation

Background KgN/hr/yr	Critical Load kgN/hr/yr		PEC Deposition kgN/hr/yr	Percentage Contribution	
	Lower	Upper		Lower	Upper
43.4 ^{Note 1}	10	20	43.757	437.57	218.785

Note 1 Table AD.4 of the Air Quality Assessment Consolidation

Allerton Park Lakes
Acid Deposition

PC Deposition keq/ha/yr		PC Percentage of Lower Critical Load	Background keq/ha/yr		Background Percentage of Lower Critical Load	PEC Percentage of Lower Critical Load
N	S		N	S		
0.0255	0.0537	9.004	3.10	0.34	1156.50	1047.10

Note 1 Table AD.5 of the Air Quality Assessment Consolidation

Consideration of background levels is required which means that the critical loads are exceeded for both nitrogen and acid deposition. This exceedance is due to the background level already exceeding the critical load. The process contribution from the facility is small compared to the background.

Our assessment is based on a worst case scenario and we conclude that deposition from the facility is not likely to have a significant impact on Allerton Park Lakes.

Lylands Wood

Incinerator and AD Gas Engines – Long-Term Impact Assessment of Emissions to Air

Pollutant	EQS / EAL	Back-ground Conc	Process Contribution (PC)	PC as % of EQS / EAL	Predicted Environmental Concentration (PEC)	PEC as % EQS / EAL
NO ₂ Note 2	30	10.40	1.25	4.17	11.65	38.83
SO ₂ Note 7	20	2.60	0.40	2.00	3.00	15.00
NH ₃ Note 4	3 Note 3	3.60 Note 5	0.081	2.70	3.68	122.66
HF Note 6	<0.5 Weekly mean	2.35 Note 5	0.016	3.2	2.37	474.00

- Note 1 All the above concentration figures are in µg/m³
- Note 2 Tables 9.10 to 9.12 of the Air Quality Assessment Consolidation
- Note 3 Table 4.2 of the Air Quality Assessment Consolidation, confirms that the habitats don't contain sensitive lichen communities.
- Note 4 Table 6.14 of the Air Quality Assessment Consolidation
- Note 5 Table 6.16 of the Air Quality Assessment Consolidation
- Note 6 Table 6.15 of the Air Quality Assessment Consolidation
- Note 7 Table 9.11 of the Air Quality Assessment Consolidation

Lylands Wood

Incinerator and AD Gas Engines – Short-Term Impact Assessment of Emissions to Air

Pollutant	EQS / EAL	Back-ground Conc	Process Contribution (PC)	PC as % of EQS / EAL	Predicted Environmental Concentration (PEC)	PEC as % EQS / EAL
NO ₂ Note 2	75	20.80 Note 3	10.03	13.37	30.83	41.11
HF Note 4	<5 Daily mean	-	0.037	0.74	-	-

- Note 1 All the above concentration figures are in µg/m³
- Note 2 Tables 9.10 to 9.12 of the Air Quality Assessment Consolidation
- Note 3 Background is 2 x long-term background of 10.40 µg/m³
- Note 4 Table 6.15 of the Air Quality Assessment Consolidation

Consideration of background levels is required which means that the critical level is exceeded for NH₃ and HF. This exceedance is due to the background level already exceeding the critical level. The process contribution from the facility is negligible.

Our assessment is based on a worst case scenario and we conclude that the air emissions from the facility are not likely to have a significant impact on Lylands Wood.

Lylands Wood
Nitrogen Deposition

Critical Load kgN/hr/yr		PC Deposition kgN/hr/yr	Percentage Contribution	
Lower	Upper		Lower	Upper
10 ^{Note 1}	20 ^{Note 1}	0.622 ^{Note 1}	6.22	3.11

Note 1 Table AD.4 of the Air Quality Assessment Consolidation

Background Kg/N/hr/yr	Critical Load kgN/hr/yr		PEC Deposition kgN/hr/yr	Percentage Contribution	
	Lower	Upper		Lower	Upper
50.54 ^{Note 1}	10	20	51.162	511.62	255.81

Note 1 Table AD.4 of the Air Quality Assessment Consolidation

Lylands Wood
Acid Deposition

PC Deposition keq/ha/yr		PC Percentage of Lower Critical Load	Background keq/ha/yr		Background Percentage of Lower Critical Load	PEC Percentage of Lower Critical Load
N	S		N	S		
0.0444	0.0938	6.608	3.61	0.36	608.50	518.40

Note 1 Table AD.5 of the Air Quality Assessment Consolidation

Consideration of background levels is required which means that the critical loads are exceeded for both nitrogen and acid deposition. This exceedance is due to the background level already exceeding the critical load. The process contribution from the facility is small compared to the background.

Our assessment is based on a worst case scenario and we conclude that deposition from the facility is not likely to have a significant impact on Lylands Wood.

Broadfield Wood

Incinerator and AD Gas Engines – Long-Term Impact Assessment of Emissions to Air

Pollutant	EQS / EAL	Back-ground Conc	Process Contribution (PC)	PC as % of EQS / EAL	Predicted Environmental Concentration (PEC)	PEC as % EQS / EAL
NO ₂ Note 2	30	8.60	1.01	3.37	9.61	32.03
SO ₂ Note 7	20	2.60	0.34	1.70	2.94	14.70
NH ₃ Note 4	3 Note 3	2.90 Note 5	0.041	1.37	2.94	98.00
HF Note 6	<0.5 Weekly mean	2.35 Note 5	0.014	3.2	2.36	472.00

- Note 1 All the above concentration figures are in µg/m³
- Note 2 Tables 9.10 to 9.12 of the Air Quality Assessment Consolidation
- Note 3 Table 4.2 of the Air Quality Assessment Consolidation, confirms that the habitats don't contain sensitive lichen communities.
- Note 4 Table 6.14 of the Air Quality Assessment Consolidation
- Note 5 Table 6.16 of the Air Quality Assessment Consolidation
- Note 6 Table 6.15 of the Air Quality Assessment Consolidation
- Note 7 Table 9.11 of the Air Quality Assessment Consolidation

Broadfield Wood

Incinerator and AD Gas Engines – Short-Term Impact Assessment of Emissions to Air

Pollutant	EQS / EAL	Back-ground Conc	Process Contribution (PC)	PC as % of EQS / EAL	Predicted Environmental Concentration (PEC)	PEC as % EQS / EAL
NO ₂ Note 2	75	17.20 Note 3	9.64	12.85	26.84	35.79
HF Note 4	<5 Daily mean	-	0.036	0.72	-	-

- Note 1 All the above concentration figures are in µg/m³
- Note 2 Tables 9.10 to 9.12 of the Air Quality Assessment Consolidation
- Note 3 Background is 2 x long-term background of 8.60 µg/m³
- Note 4 Table 6.15 of the Air Quality Assessment Consolidation

Consideration of background levels is required which means that the critical level is exceeded for HF. This exceedance is due to the background level already exceeding the critical level. The process contribution from the facility is negligible.

Our assessment is based on a worst case scenario and we conclude that the air emissions from the facility are not likely to have a significant impact on Broadfield Wood.

Broadfield Wood
Nitrogen Deposition

Critical Load kgN/hr/yr		PC Deposition kgN/hr/yr	Percentage Contribution	
Lower	Upper		Lower	Upper
10 ^{Note 1}	20 ^{Note 1}	0.496 ^{Note 1}	4.96	2.48

Note 1 Table AD.4 of the Air Quality Assessment Consolidation

Background KgN/hr/yr	Critical Load kgN/hr/yr		PEC Deposition kgN/hr/yr	Percentage Contribution	
	Lower	Upper		Lower	Upper
43.40 ^{Note 1}	10	20	43.896	438.96	219.48

Note 1 Table AD.4 of the Air Quality Assessment Consolidation

Broadfield Wood
Acid Deposition

PC Deposition keq/ha/yr		PC Percentage of Lower Critical Load	Background keq/ha/yr		Background Percentage of Lower Critical Load	PEC Percentage of Lower Critical Load
N	S		N	S		
0.0354	0.0795	5.595	3.10	0.34	480.30	417.00

Note 1 Table AD.5 of the Air Quality Assessment Consolidation

Consideration of background levels is required which means that the critical loads are exceeded for both nitrogen and acid deposition. This exceedance is due to the background level already exceeding the critical load. The process contribution from the facility is small compared to the background.

Our assessment is based on a worst case scenario and we conclude that deposition from the facility is not likely to have a significant impact on Broadfield Wood.

5.5 Impact of abnormal operations - Incineration

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, even when the waste feed is stopped through the exceedance of an ELV or in the case of a breakdown. 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).

Given that 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 EQS. For the most part therefore consideration of abnormal operations is limited to consideration of its impact on short term EQSs.

In making an assessment of abnormal operations the following worst case scenario has been assumed (Table 1 of the Air Quality Addendum: Abnormal Emissions):

- Dioxin emissions of 10 ng/m^3 (100 x normal)
- Mercury emissions of 5 mg/m^3 (100 x normal)
- NO_x emissions of 500 mg/m^3 (1.25 x normal)
- Particulate (including metals) emissions of 150 mg/m^3 (5 x normal)
- SO₂ emissions of 450 mg/m^3 (2.25 x normal)
- HCl emissions of 900 mg/m^3 (15 x normal)
- HF emissions of 90 mg/m^3 (22.5 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. It is also worth noting that the results are for the point of maximum impact and not a sensitive receptor where the relevant standards apply.

Pollutant	EQS / EAL	Back-ground Conc	Process Contribution (PC) Note 3	PC as % of EQS / EAL	Predicted Environmental Concentration (PEC) Note 2	PEC as a % EQS/EAL
NO ₂	200	32.20	35.50	17.75	99.90	49.95
Particulate matter (PM ₁₀)	50	29.70	6.00	12.00	65.40	130.80
SO ₂ (15-minute mean)	266	2.40	90	33.83	94.80	35.64
HCl	750	0.56	180	24.00	181.12	24.15
HF	160	-	18	11.25	-	-
Sb	150	-	0.01163	0.008	-	-
Cr	150	0.012	0.05267	0.035	-	-
Cu	200	0.366	0.01982	0.01	-	-
Mn	1,500	0.057	0.1197	0.008	-	-
Hg	7.5	0.0005	1.00	13.33	1.0005	13.34
V	1	0.00325	0.00101	0.101	-	-
	Impact at ELV pg/m ³	Impact Abnormal emission pg/m ³	% increase			
Dioxins Note 4	0.0158	0.03	67.81			

Note 1 All the above concentration figures are in µg/m³

Note 2 For the assessment of short term impacts the PEC is determined by adding twice the long term background concentration to the short term process contribution.

Note 3 Table 3 of the Air Quality Addendum: Abnormal Emissions

Note 4 Table 5 of the Air Quality Addendum: Abnormal Emissions

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

INSIGNIFICANT – Short-term <10% EQS/EAL		
Sb, Cr, Cu, Mn, V		

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

PEC < 100% EQS/EAL	
	NO ₂
	SO ₂
	HCl
	Hg

The predicted environmental concentration of particulates has the potential to give rise to pollution; however background levels contribute significantly to this. The PC from the incinerator is only just above the insignificant screening criteria at 12% of the EQS.

We don't think there is a real likelihood of the particulate EQS being exceeded. The EQS is a 24 hour standard with the maximum permissible period of abnormal operation being four hours of operation.

We have not assessed the impact of abnormal operations against long term EQSs for the reasons set out above. Except that if dioxin emissions were at 10 ng/m³ for the maximum period of abnormal operation, this would result in the increase shown above and would not result in an exceedance of the dioxin TDI.

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 the Regulated Facility.

Firstly we address the Regulated Facility as a whole comprising of two listed activities before going on to consider each listed activity separately, incineration followed by AD.

6.1.1 The Regulated Facility comprising two listed activities (Incineration and AD)

We address BAT for the Regulated Facility as a whole by comparing the options of incineration only (one listed activity) with incineration and AD (two listed activities).

We firstly consider BAT and global warming potential for the two options:

6.1.2 BAT and global warming potential for the Regulated Facility

This section summarises the assessment of greenhouse gas impacts which has been made in the determination of this Permit. Emissions of carbon dioxide (CO₂) and other greenhouse gases differ from those of other pollutants in that, except at gross levels, they have no localised environmental impact. Their impact is at a global level and in terms of climate change. Nonetheless, CO₂ is clearly a pollutant for IED purposes.

The principal greenhouse gas emitted is CO₂, but the incineration plant also emits small amounts of N₂O arising from the operation of secondary NO_x abatement. N₂O has a global warming potential 310 times that of CO₂. The Applicant will therefore be required to optimise the performance of the secondary NO_x abatement system to ensure its GWP impact is minimised.

The major source of greenhouse gas emissions from the Regulated Facility is however CO₂ from the combustion of waste. There will also be CO₂ emissions from the AD process and 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 Regulated Facility will displace emissions of CO₂ elsewhere in the UK, as virgin fossil fuels will not be burnt to create the same electricity. The Applicant has therefore included within its GWP calculations a CO₂ offset for the net amount of electricity exported from the facility.

The Greenhouse Gas Assessment in Appendix G of the Application provides details of the CO₂ offset as shown below. Whilst there may be some discrepancies in the figures, they do not materially impact on conclusions.

Incineration and AD (two listed activities)

- The plant emits 136,800 tonnes of carbon dioxide (CO₂)/annum;
- 0.691 tonnes of CO₂/MWh of electricity produced for export;
- 197,920 MWh of power exported displacing around 109,940 tonnes of CO₂;
- Net CO₂ contribution of 26,850 tonnes/annum

Incineration ONLY (one listed activity)

- The plant emits 136,800 tonnes of carbon dioxide (CO₂)/annum;
- 0.68 tonnes of CO₂/MWh of electricity produced for export;
- 201,180 MWh of power exported displacing around 111,750 tonnes of CO₂;
- Net CO₂ contribution of 25,070 tonnes/annum

The incinerator and AD option has slightly higher net emissions of CO₂ than incineration only. This is considered further below.

We then consider BAT for a range of environmental performance criteria for the two options:

6.1.3 BAT and environmental performance criteria for the Regulated Facility

The Applicant provided us with additional information in support of their proposed option in their Schedule 5 response that we received 10 December 2012. Additional clarification was also provided electronically 28 January 2013.

The Applicant's assessment considered a range of environmental performance criteria for the two options:

- Air emissions
- Photochemical Ozone Creation Potential
- Global Warming Potential (see detailed assessment above)
- Power exported
- Raw materials
- Waste Streams
- Costs

On balance, we consider that the Incineration ONLY option has the best overall environmental performance. However; the difference between the two options is small; for example, the power exported is 2% less for the proposed option of incineration and AD.

The proposed option of two listed activities, incineration and AD, has been chosen by the Applicant for a number of reasons which include:

- Future flexibility to treat source segregated organic waste with the subsequent recovery of the digestate by landspreading.
- Potential to use the biogas for other purposes as the market develops.
- The option without AD would result in a slightly larger incinerator.
- Electricity produced from AD qualifies for Renewable Obligation Certificate payments (ROCs), whereas electricity produced from incineration does not.

Taking all relevant factors into account, the difference between the two options is small. They consider that this small difference is more than offset by the other benefits of the proposed option set out above.

The subsidies available in the electricity market are not a relevant consideration for our decision making.

Overall, we consider that the difference in environmental impact between the two options is insignificant, therefore we are satisfied that the Applicant's proposals are BAT for this site.

6.2 Incineration technology and Control measures

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

NO₂
VOCs
Cd
Ni
As
Cr (VI)

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

Chapter IV of the IED specifies a set of maximum emission limit values. Although these limits are designed to be stringent, and to provide a high level

of environmental protection, they do not necessarily reflect what can be achieved by new plant. Article 14(3) of the IED says that BAT conclusions shall be the reference for setting the permit conditions, so it may be possible and desirable to achieve emissions below the limits referenced in Chapter IV.

Even if the Chapter IV limits are appropriate, operational controls complement the emission limits and should generally result in emissions below the maximum allowed; whilst the limits themselves provide headroom to allow for unavoidable process fluctuations. Actual emissions are therefore almost certain to be below emission limits in practice, because any Operator who sought to operate its Installation continually at the maximum permitted level would almost inevitably breach those limits regularly, simply by virtue of normal fluctuations in plant performance, resulting in enforcement action (including potentially prosecution) being taken. Assessments based on, say, Chapter IV limits are therefore “worst-case” scenarios.

Should the Installation, once in operation, emit at rates significantly below the limits included in the Permit, we will consider tightening ELVs appropriately. We are, however, satisfied that emissions at the permitted limits would ensure a high level of protection for human health and the environment in any event.

6.2.1 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 Waste Incineration BREF elaborates the furnace selection criteria as:

- the use of a furnace (including secondary combustion chamber) dimensions that are large enough to provide for an effective combination of gas residence time and temperature such that combustion reactions may approach completion and result in low and stable CO and TOC emissions to air and low TOC in residues.
- use of a combination of furnace design, operation and waste throughput rate that provides sufficient agitation and residence time of the waste in the furnace at sufficiently high temperatures.
- The use of furnace design that, as far as possible, physically retain the waste within the combustion chamber (e.g. grate bar spacing) to allow its complete combustion.

The BREF also provides a comparison of combustion and thermal treatment technologies and factors affecting their applicability and operational suitability used in EU and for all types of wastes. 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 NO_x as the furnace choice could have an effect on the amount of unabated NO_x produced
- energy consumption – whole plant, waste preparation, effect on GWP
- Need, if any, for further processing of residues to comply with TOC
- Costs

Comparison of thermal treatment technologies

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 treatable better Combustion control possible.	As air-cooled grates but: risk of grate damaging ☐ ☐ high leaks and complexity	TOC 0.5 % to 3 %	Slightly higher capital cost than air-cooled

	used for clinical wastes				waste type	reduced capacity
Stepped and static hearths	Only higher CV waste (LCV >20 GJ/t) Mainly used for clinical wastes	No information	Can deal with liquids and powders	Bed agitation may be lower	Dependent on waste type	Higher specific cost due to reduced capacity
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	1 to 20 t/h	-low leaching residue ☐ ☐ ☐ good burnout in 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 operation/ 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	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 pre-treatment costs high
Gasification - fluid bed	- mixed plastic wastes ☐☐ shredded MSW ☐☐ shredder residues ☐☐☐ sludges ☐☐ metal rich wastes ☐☐ other similar consistent streams ☐ less widely used/proven than incineration	5 – 20 t/h	-temperatures e.g. for Al recovery ☐☐ separation of 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 req. ☐☐ not widely proven ☐☐ need market for syngas	- dependent on process temperature ☐ residue produced requires further processing e.g. combustion	High pre-treatment, operation and capital costs

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

- Moving Grate Furnace
- Rotary Kiln
- Fluidised Bed

Consideration of global warming potential, raw material consumption, waste produced and the operating costs were considered for each option.

The moving grate was considered to be BAT for this Installation. It was considered that fluidised bed technology was not as reliable as the grate for this type of fuel and that the rotary kiln would require an additional incineration line which would impact significantly on the operational costs.

The Applicant has proposed to use a furnace technology comprising a mechanical moving grate. The fuel is moved mechanically by means of reciprocating or rotating grate elements from the feed end, through the drying zone, a main combustion zone and, finally a burn out zone, all of which are identified in the tables above as being considered BAT in the BREF or TGN for this type of waste feed.

The Applicant proposes to use low sulphur fuel oil as support fuel for start-up, shut down and for the auxiliary burners. The choice of support fuel is based on it being the cleanest non waste fuel available. Natural gas was considered but it is not available within the immediate vicinity of the site.

6.2.2 Boiler Design

In accordance with our Technical Guidance Note, S5.01, the Applicant has confirmed that the boiler design will include features to minimise the potential for reformation of dioxins within the de-novo synthesis range. These are as follows:

- 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.

We have considered the assessments made by the Applicant and agree that the furnace technology chosen represents BAT. We believe that, based on the information gathered by the BREF process, the chosen technology will achieve the requirements of the IED for the air emission of TOC/CO and the TOC on bottom ash.

6.3 BAT and emissions control for the Incineration Plant

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 FGT 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 (FGT) systems as:

- type of waste, its composition and variation
- type of combustion process, and its size
- flue-gas flow and temperature
- flue-gas content, size and rate of fluctuations in composition
- 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
- release of noise.

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

6.3.1 Particulate Matter

Particulate matter				
Technique	Advantages	Disadvantages	Optimisation	Defined as BAT in BREF or TGN for:
Bag / Fabric filters (BF)	Reliable abatement of particulate matter to below 5mg/m ³	Max temp 250°C	Multiple compartments Bag burst detectors	Most plants
Wet scrubbing	May reduce acid gases simultaneously.	Not normally BAT. Liquid effluent produced	Require reheat to prevent visible plume and dew point problems.	Where scrubbing required for other pollutants
Ceramic filters	High temperature	May more "blind" than		Small plant.

	applications Smaller plant.	fabric filters		High temperature gas cleaning required.
Electrostatic precipitators	Low pressure gradient. Use with BF may reduce the energy consumption of the induced draft fan.	Not normally BAT.		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/m³ 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 assessed as insignificant, and so the Environment Agency agrees that the Applicant's proposed technique is BAT for the Installation.

6.3.2 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.		All plant unless impractical in design (needs to be demonstrated)

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 < 70mg/ m ³ Reduces CO, VOC, dioxins	Expensive. Re-heat required – reduces plant efficiency		All plant
Selective non-catalytic reduction (SNCR)	NOx emissions typically 150 - 180mg/m ³	Relies on an optimum temperature around 900 °C, and sufficient retention time for reduction May lead to Ammonia slip	Port injection location	All plant unless lower NOx release required for local environmental protection.
Reagent Type: Ammonia	Likely to be BAT Lower nitrous oxide formation	More difficult to handle Narrower temperature window		All plant

Reagent Type: Urea	Likely to be BAT			All plant
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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 another primary measure; however this has **not** been proposed:

- Flue gas recirculation – this technique reduces the consumption of reagents for secondary NO_x control and can increase overall energy recovery, although in some applications there can be corrosion problems.

The Applicant confirmed that some grate suppliers have focussed on reducing NO_x generation through the control of primary and secondary air and the grate design. The proposed counter flow furnace with several secondary air injections will then contribute to reduce the NO_x generation.

We recognise the NO_x reduction measures associated with the tight control of the primary and secondary air and given that FGR can cause corrosion problems; we are satisfied that their proposal not to include FGR is BAT.

There are two recognised techniques for secondary measures to reduce NO_x. These are Selective Catalytic Reduction (SCR) and Selective Non-Catalytic Reduction (SNCR). For each technique, there is a choice of urea or ammonia reagent.

SCR can reduce NO_x levels to below 70 mg/m³ 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. SNCR can typically reduce NO_x levels to between 150 and 180 mg/m³; it relies on an optimum temperature of around 900 deg 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 N₂O. Either reagent is BAT, and the use of one over the other is not normally significant in environmental terms.

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

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

Parameter Long-term	SNCR	SCR
Process Contribution (PC) µg/m ³	1.60	0.41
Background µg/m ³	32.20	32.20
Predicted Environmental Contribution (PEC) µg/m ³	33.80	32.61
EQS µg/m ³	40	40
PC as % EQS	4.00	1.03
PEC as % EQS	84.50	81.53
NO _x abated (tpa)	260	480
Total annualised cost	£360,000	£1,700,000
Cost of NO _x removal £/tonne	£1,385	£3,542

Based on the figures above the Applicant considers that the additional cost of SCR over SNCR is not justified by the reduction in environmental impact. Thus SCR is not BAT in this case, and SNCR is BAT for the Installation. The Applicant has justified the use of urea as the reagent on the basis of the climate change impacts of ammonia solution are regarded as being more significant than the any health and safety issues associated with the handling and storage of urea. The Environment Agency agrees with this assessment.

The amount of urea used for NO_x abatement will need to be optimised to maximise NO_x reduction and minimise NH₃ slip. An improvement condition requires the Operator to report to the Environment Agency on optimising the performance of the NO_x abatement system. The Operator is also required to monitor and report on NH₃ and N₂O emissions every 6 months.

6.3.3 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 SO _x 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		Plants with high acid gas and metal components in exhaust gas – HWIs
Dry	Low water use Reagent consumption may be reduced by recycling in plant	Higher solid residue production Reagent consumption controlled only by input rate		All plant

	Lower energy use Higher reliability			
Semi-dry	Medium reaction rates Reagent delivery may be varied by concentration and input rate	Higher solid waste residues		All plant
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 low sulphur fuel oil as the support fuel on the basis of it being the cleanest non waste fuel available because natural gas is not available within the immediate vicinity of the site. 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 three recognised techniques for secondary measures to reduce acid gases. These are wet, dry and semi-dry. 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 therefore considered dry and semi-dry methods of secondary measures for acid gas abatement. Either 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. Either reagent is BAT, and the use of one over the other is not significant in environmental terms in this case.

In this case, the Applicant proposes to use the dry scrubbing system using lime, which has a reduced impact on climate change and uses less water. The performance of both options are very similar. The Environment Agency is satisfied that this is BAT.

6.3.4 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

6.3.5 Dioxins and furans (and Other POPs)

Dioxins and furans				
Technique	Advantages	Disadvantages	Optimisation	Defined as BAT in BREF or TGN for:
Optimise combustion control	All measures will increase oxidation of these species.		Covered in section on furnace selection	All plants
Avoid <i>de novo</i> synthesis			Covered in boiler design	All plant
Effective Particulate matter removal			Covered in section on particulate matter	All plant
Activated Carbon injection	Can be combined with acid gas absorber or fed separately.	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.

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

- optimisation of combustion control including the maintenance of permit conditions on combustion temperature and residence time, which has been considered in 6.1.1 above;
- avoidance of *de novo* synthesis, which has been covered in the consideration of boiler design;
- the effective removal of particulate matter, which has been considered in 6.2.1 above;

- injection of activated carbon. This can be combined with the acid gas reagent or dosed separately. Where the feed is combined, the combined feed rate will be controlled by the acid gas concentration in the exhaust. Therefore, separate feed of activated carbon would normally be considered BAT unless the feed was relatively constant. Effective control of acid gas emissions also assists in the control of dioxin releases.

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

6.3.6 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.	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.

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 also dosing of activated carbon into the exhaust gas stream. This can be combined with the acid gas reagent or dosed separately. Where the feed is combined, the combined feed rate will be controlled by the acid gas concentration in the exhaust. Therefore, separate feed of activated carbon would normally be considered BAT unless the feed was relatively constant.

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

6.3.7 BAT and global warming potential (Incinerator)

This section summarises the assessment of greenhouse gas impacts which has been made in the determination of this Permit. Emissions of carbon dioxide (CO₂) and other greenhouse gases differ from those of other pollutants in that, except at gross levels, they have no localised environmental impact. Their impact is at a global level and in terms of climate change. Nonetheless, CO₂ is clearly a pollutant for IED purposes.

The principal greenhouse gas emitted is CO₂, but the plant also emits small amounts N₂O arising from the operation of secondary NO_x abatement. N₂O has a global warming potential 310 times that of CO₂. The Applicant will therefore be required to optimise the performance of the secondary NO_x abatement system to ensure its GWP impact is minimised.

The major source of greenhouse gas emissions from the Installation is however CO₂ from the combustion of waste. There will also be CO₂ emissions from the burning of support fuels at start up, shut down and should it be necessary to maintain combustion temperatures. BAT for greenhouse gas emissions is to maximise energy recovery and efficiency.

The electricity that is generated by the Installation will result in a reduction in emissions of CO₂ elsewhere in the UK, as virgin fossil fuels will not be burnt to create the same electricity. The Applicant has therefore included within their GWP calculations a CO₂ offset for the net amount of electricity exported from the Installation.

The Greenhouse Gas assessment in Appendix G of the Application provides details of the CO₂ offset as shown in Section 6.1.2 above. The net emissions from the incinerator ONLY are 26,850 tonnes/annum. At this level emissions cannot be characterised as insignificant.

The Installation is not subject to the Greenhouse Gas Emissions Trading Scheme Regulations 2003; therefore it is a requirement of IED to investigate how emissions of greenhouse gases emitted from the Installation might be prevented or minimised.

The Applicant has considered GWP as part of their BAT options appraisal. There are a number of areas in which a difference can be made to the GWP of the Installation, e.g. The Applicant's BAT options appraisal compared SCR and SNCR methods of secondary NO_x abatement. In summary: the following factors influence the GWP of the facility:-

On the debit side

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

On the credit side

- CO₂ saved from the export of electricity to the public supply by displacement of burning of virgin fuels;
- CO₂ saved from the use of waste heat by displacement of burning of virgin fuels.

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.

The Applicant's assessment shows that the GWP of the plant is dominated by the emissions of carbon dioxide that are released as a result of waste combustion. This is constant for all options considered in the BAT assessment.

The differences in the GWP of the options in the BAT appraisal arise from small differences in energy recovery and in the amount of N₂O emitted.

Taking all these factors into account, the Operator's assessment shows that incineration is the preferred option is best in terms of GWP (See Sections 6.1.2 and 6.1.3 above).

6.4 BAT and POPs (Incinerator)

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 (850/2004), 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 significantly to modify existing facilities using processes that release chemicals listed in Annex III, without prejudice to Council Directive 1996/61/EC, 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.”

The 1998 Protocol to the Convention recommended that unintentionally produced should be controlled by imposing emission limits (e.g. 0.1 ng/m³ 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°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°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/m³.

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/m³. 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. EPR requires that, in addition to the requirements of the IED, the WHO-TEQ values for both dioxins and dioxin-like PCBs should be specified for monitoring and 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. EPR requires monitoring of a range of PAHs and dioxin-like PCBs in waste incineration Permits 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 identified by Defra in the Environmental Permitting Guidance on the IED. We are confident that the measures taken to control the release of dioxins will also control the releases of dioxin-like PCBs and PAHs. Sections 5.1 to 5.3 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 Anaerobic Digestion (AD) Plant and Control Measures

Firstly we address the treatment options for the digestate produced by the AD plant. We then go on to consider control measures for the emissions from the gas engines.

6.5.1 Digestate from the AD plant

The Applicant acknowledged that digestate from some AD plants can be spread on land and used to condition soil, where it meets the requirements of PAS: 110. In this case, the organic waste will have been extracted from residual household waste in the MT plant and not from a source segregated biodegradable waste stream. This means that it will not achieve the 'end of waste' criteria for digestate, i.e. that it cannot meet the PAS 110 standard and therefore that waste management controls will apply.

Consideration was also given to dewatering the digestate and landspreading the liquor, which was again discounted on the grounds given above.

The Applicant then went on to consider landspreading on non-agricultural land under a waste exemption to confer benefit. This was also discounted based on the wide range of wastes that will be accepted at the facility rendering the digestate unsuitable.

They concluded that burning of the digestate with energy recovery was considered BAT for the facility. Given the constraints described above, we agree with this conclusion. However this assessment does prompt the question as to whether the AD plant is actually conferring any benefit in comparison with simply incinerating the waste feed to the AD plant. This is considered in Section 6.1.

Based on the current waste streams being treated we are satisfied that the Applicant has explored the possible recovery options for the digestate. However; should source segregated biodegradable waste streams become available in the future such that the digestate is able to meet the PAS 110 standard, then we will expect the Operator to apply this material to landspreading rather than to incineration in order to comply with the requirements of the Waste Framework Directive. The permit will require this to be kept under review.

6.5.2 Emissions Control

Emissions of NO_x, CO and VOCs in the exhaust gases will be minimised by controlling combustion conditions and emissions of SO₂ will be controlled by the use of low sulphur fuels.

We agree that the proposals for emissions abatement from the gas engine exhausts are BAT.

6.6 Other Emissions to the Environment

6.6.1 Emissions to water

Petrol/oil separators and catch pits have been incorporated into the drainage design for areas of hard standing, to limit siltation within the system, particularly in the attenuation pond. All uncontaminated rainwater will be collected in the attenuation pond. Water from this pond will be transferred to a water pit/tank for storage prior to use in the process water systems. Water from the pond will be discharged via local tertiary and secondary watercourses to the Little Ouse. There will be an isolating valve at the pumping station end which will be manually operated. There will be a monitoring point located following the pump house and prior to the discharge point.

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.

6.6.2 Emissions to sewer

There will be no emissions to sewer from the facility.

6.6.3 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 contaminated water of Article 46(5) must be arranged.

The facility will be supplied with fuel oil and all chemicals will be stored in an appropriate manner incorporating the use of bunding and other measures (such as acid and alkali resistant coatings) to ensure appropriate containment. The potential for accidents, and associated environmental impacts, is therefore limited.

Tanker off-loading of will take place within areas of concrete hard standing. The storage tanks will be bunded at 110% of the tank capacity and the offloading point will be fully contained with the appropriate capacity to contain any spills during delivery.

All external areas of hard standing will be provided with curbed containment, to prevent any potential spills from causing pollution of the ground / groundwater.

In the event of a fire, the fire fighting water will be collected in the bunker for the tipping hall. For other areas it will be collected through the separate process water drains, into a water collection system designed for process water recycling in normal operating conditions.

Fire fighting water from the MT and AD plants will be collected through the process water drains into the AD process water tank.

Ash processing will take place within an enclosed building equipped with concrete hardstanding.

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

6.6.4 Odour

An odour management plan (OMP) was provided with the Application because of the potential for odour from the AD plant. It did not contain sufficient detail and failed to address some fundamental points. An OMP was provided in response to a further information request and approval of this plan will be required before the AD plant can operate.

The processing areas are fully enclosed with fast acting doors and kept under a slight negative pressure by drawing combustion air for the incinerator from the MT processing area.

It is the Applicant's intention to draw especially odorous air out of the MT building to be used as combustion air in the incineration plant, rather than use the odour control stack which releases via a bag filter at the air emission point A1. This stack will be used for general air from less odorous areas of the building and for the period prior to the incineration plant being constructed and once the incinerator is operational, during maintenance activities.

The parts of the AD process with the potential for waste or digestate to be open to the air are contained within the MT processing area and so odours will be handled as described above.

We assessed the Applicant's odour dispersion modelling (AQMAU report reference C921a (C954a) and agreed with their conclusion that there would be no reasonable cause for annoyance at the boundary of the Regulated Facility.

Our agreement was based on clarification of the following:

- volume flow at 22 m³/s (clarification provided in email from Applicant received 12 October 2012)

- how this flow is appropriate to allow the number of air exchanges in the areas being extracted.

In their Schedule 5 response received 10 December 2012, the Applicant confirmed that the air exchange rate of 1.2 air changes per hour was considered adequate based on the building capacity of >10,000m³. They also confirmed that approval of the ventilation systems would be included in the commissioning plan which has been secured by the inclusion of an improvement condition.

The Applicant's modelling was based on emissions from the 28 m odour control stack (A1) assuming continuous operation of the extraction for the year. This is a conservative assumption and should represent a very much worst case scenario because it is the Applicant's intention to just use this stack for less odorous air or when the incinerator is not operational (see above).

The highest predicted odour ground level concentration (Tables 10.38 and 10.39 of the Air Quality Assessment, Chapter 10) and the odour concentration at the most impacted sensitive receptor (Para 10.13.20 of the Air Quality Assessment, Chapter 10) are shown in the Table below and compared with the odour criterion for annoyance of 1.5 ouE/m³.

Location	Highest 98 th Percentile of hourly means (ouE/m ³)	% of the criterion for annoyance (1.5 ouE/m ³)
Point of maximum impact	1.3	88
South Farm	0.56	37

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.

6.6.5 Noise and vibration

The Applicant concluded that an assessment using the principles of BS:4142 (*Method for rating industrial noise affecting mixed residential and industrial areas*) found predicted Rating Levels to be below background noise assessment levels during the day and night time assessment periods, representing an impact of less than marginal significance.

The Application contained a noise impact assessment which identified local noise sensitive receptors, potential sources of noise at the proposed plant and noise attenuation measures. Measurements were taken of the prevailing ambient noise levels to produce a baseline noise survey and an assessment was carried out in accordance with BS4142 to compare the predicted plant rating noise levels with the established background levels.

Although we did not agree technically with all aspects of the assessment, we agreed that the predicted noise levels at sensitive receptors due to day and night time operations was likely to be less than marginal significance, in accordance with BS:4142. Our findings are detailed in our report ref AQMAU_C921b_Rp01 which was made available on the public register.

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

6.7 Setting ELVs and other Permit conditions

6.7.1 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.

Incineration Plant

At the time of writing of this document, no BAT conclusions have been published for waste incineration or co-incineration.

The use of 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 Chapter IV limits in these circumstances.

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).

We have set the ELVs at the IED Annex VI levels as we do not consider it practical or reasonable to expect the Applicant to go beyond what is considered BAT for the control of NO₂, As, Cr (VI), Cd, Ni and VOCs.

Gas Engines

The air dispersion modelling was based on emission concentrations taken from the Standard rules permit for anaerobic digestion:

SR2010No15 for an 'Anaerobic digestion facility including use of the resultant biogas.'

Table 10.33 of the Air Quality Assessment shows that for NO₂, the maximum impact at a sensitive receptor is only 1.4% of the long-term EQS and 1.85% of the short-term EQS. The results for the other pollutants were similar.

We have set the ELVs at the levels in SR2010No15 as we do not consider it practical or reasonable to expect the Applicant to go beyond what is considered BAT for the control of NO₂ and VOCs.

Flare stack

The flare stack will normally only be required to operate when the CHP gas engines are not in use for routine maintenance and are unavailable to use the biogas produced by the digester. It will operate for less than 10% of the year so limits are not required in accordance with our Technical Guidance Note for monitoring enclosed landfill gas flares, LFTGN05. Notwithstanding this, the Standard rules permit SR2010No15 does not set limits based on its use for short periods during breakdown or maintenance of the facility.

(i) Local factors

We have considered the complex meteorological data associated with the Vale of York as detailed in Section 5.2 of this document.

We would not consider it practical or reasonable to expect the Applicant to go beyond what is considered BAT for the control of NO₂, As, Cr (VI), Cd, Ni and VOCs.

(ii) National and European EQSs

We do not expect emissions from the Regulated Facility to cause an exceedance of an EQS. In view of this, Article 18 of IED does not require any tighter conditions than we have already applied.

(iii) Global Warming

CO₂ is an inevitable product of the combustion of waste. The amount of CO₂ emitted will be essentially determined by the quantity and characteristics of waste being incinerated, which are already subject to conditions in the Permit. It is therefore inappropriate to set an emission limit value for CO₂, which could do no more than recognise what is going to be emitted. The gas is not therefore targeted as a key pollutant under Annex II of 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 CO₂. However, provided energy is recovered efficiently (see Section 4.3.7 above), there are no additional equivalent technical measures (beyond those relating to the quantity and characteristics of the waste) that can be imposed that do not run counter to the primary purpose of the plant, which is the recovery of energy from waste. Controls in the form of

restrictions on the volume and type of waste that can be accepted at the Installation and permit conditions relating to energy efficiency effectively apply equivalent technical measures to limit CO₂ emissions.

(iv) Commissioning

The Application refers to commissioning and the validation of combustion conditions for the incineration plant. We have secured this by setting a pre-operational condition.

We have also set a pre-operational condition requiring a commissioning plan for all the new activities (A1 to A6) including timelines for completion. The commissioning plan will include the expected actual emissions (rather than the permitted 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.

6.8 Monitoring

6.8.1 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;
- to enable correction of measured concentration of substances to the appropriate reference conditions;
- to gather information about the performance of the SNCR system;
- to deliver the EPR requirement that dioxin-like PCBs and PAHs should be monitored;
- 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.

6.8.2 Monitoring under abnormal operations arising from the failure of the incinerator installed CEMS

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

6.8.3 Continuous emissions monitoring for dioxins and mercury

Chapter IV of IED specifies manual extractive sampling for heavy metals and dioxin monitoring. However, Article 48(5) of the IED enables The Commission to act through delegated, authority to set the date from which continuous measurements of the air emission limit values for heavy metals, dioxins and furans shall be carried out, as soon as appropriate measurement techniques are available within the Community. No such decision has yet been made by the Commission.

The Environment Agency has reviewed the applicability of continuous sampling and monitoring techniques to the Installation.

Recent advances in mercury monitoring techniques have allowed standards to be developed for continuous mercury monitoring, including both vapour-phase and particulate mercury. There is a standard which can apply to CEMS which measure mercury (EN 15267-3) and standards to certify CEMS for mercury, which are EN 15267-1 and EN 15267-3. Furthermore, there is an MCERTS-certified CEM which has been used in trials in the UK and which has been verified on-site using many parallel reference tests as specified using the steps outlined in EN 14181.

In the case of dioxins, equipment is available for taking a sample for an extended period (several weeks), but the sample must then be analysed in the conventional way. However, the continuous sampling systems do not meet the requirements of BS EN 1948 which is the standard for dioxin analysis. BS EN 1948 requires traversing the sampler across the duct and collecting parts of the sample at various points across the duct to ensure that all of the gas phase is sampled proportionately, in case there are variations in gas flow rate or composition resulting in a non-homogeneous gas flow. This requirement is particularly important where suspended solids are present in the gas, and dioxins are often associated with suspended solid particles. Continuous samplers are currently designed for operation at one or two fixed sampling points within the duct, and traverses are not carried out automatically. Using such samplers, more information could be obtained about the variation with time of the dioxin measurement, but the measured results could be systematically higher or lower than those obtained by the approved standard method which is the reference technique required to demonstrate compliance with the limit specified in the IED. The lack of a primary reference method (e.g. involving a reference gas of known concentration of dioxin) prohibits any

one approach being considered more accurate than another. Because compliance with the IED's requirements is an essential element of EPR regulation, we have set emission limits for dioxins in the permit based on the use of BS EN 1948 and the manual sampling method remains the only acceptable way to monitor dioxins for the purpose of regulation.

For either continuous monitoring of mercury or continuous sampling of dioxins to be used for regulatory purposes, an emission limit value would need to be devised which is applicable to continuous monitoring. Such limits for mercury and dioxins have not been set by the European Commission. Use of a manual sample train is the only technique which fulfils the requirements of the IED. At the present time, it is considered that in view of the predicted low levels of mercury and dioxin emission it is not justifiable to require the Operator to install additionally continuous monitoring or sampling devices for these substances.

In accordance with its legal requirement to do so, the Environment Agency reviews the development of new methods and standards and their performance in industrial applications. In particular the Environment Agency considers continuous sampling systems for dioxins to have promise as a potential means of improving process control and obtaining more accurate mass emission estimates.

6.9 Reporting

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

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 2010 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 2010 – 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 (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 take into consideration 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 North Yorkshire County Council to grant planning permission in their report dated 30 October 2012. This decision was subject to the outcome of consultation with the Secretary of State due to the development not complying with all of the provisions in the development plan.
- The Secretary of State decided not to call the application in.

- The report and decision notice of the local planning authority accompanying the recommendation of planning permission.
- The response of the Environment Agency to the local planning authority in its role as consultee to the planning process.

From 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 2010 – Waste Framework Directive

As the facility involves the treatment of waste, it is carrying out a *waste operation* for the purposes of the EPR 2010, and the requirements of Schedule 9 therefore apply. This means that we must exercise our functions so as to ensure implementation of certain articles of the WFD.

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

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

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

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

Article 23(1) requires the permit to specify:

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

These are all covered by permit conditions.

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

We consider that the intended method of waste treatment is acceptable from the point of view of environmental protection so Article 23(3) does not apply. Energy efficiency is dealt with elsewhere in this document but we consider the conditions of the permit ensure that the recovery of energy take place with a high level of energy efficiency in accordance with Article 23(4).

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

7.1.3 Schedule 22 to the EPR 2010 – Groundwater, Water Framework and Groundwater Daughter Directives

To the extent that it might lead to a discharge of pollutants to groundwater (a “groundwater activity” under the EPR 2010), 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 Regulated Facility 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 59 of the EPR 2010 requires the Environment Agency to prepare and publish a statement of its policies for complying with its public participation duties. We have published our public participation statement.

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

Our decision in this case has been reached following a programme of extended public consultation, both on the original application and later, separately, on the draft permit and a draft decision document. The way in which this has been done is set out in Section 2. 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 7 (Pursuit of Conservation Objectives)

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.

We have considered the impact of the Regulated Facility on local wildlife sites within 2 km which are not designated as either European Sites or SSSIs. We are satisfied that no additional conditions are required.

(iii) 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.

7.2.2 **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.

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

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

7.2.4 Wildlife and Countryside Act 1981

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

There are no SSSIs within the 2 km screening distance.

7.2.5 Natural Environment and Rural Communities Act 2006

Section 40 of this Act requires us to have regard, so far as is consistent with the proper exercise of our functions, to the purpose of conserving biodiversity. We have done so and consider that no different or additional conditions in the Permit are required.

7.3 National secondary legislation

7.3.1 The Conservation of Natural Habitats and Species Regulations 2010

We have assessed the Application in accordance with guidance agreed jointly with Natural England and concluded that there will be no likely significant effect on any European Site.

We consulted Natural England by means of an Appendix 11 assessment, and they agreed with our conclusion, that the operation of the facility would not have a likely significant effect on the interest features of protected sites.

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

7.3.2 Water Framework Directive Regulations 2003

Consideration has been given to whether any additional requirements should be imposed in terms of the Environment Agency's duty under regulation 3 to secure the requirements of the Water Framework Directive through (inter alia) EP permits, but it is felt that existing conditions are sufficient in this regard and no other appropriate requirements have been identified.

7.3.3 The Persistent Organic Pollutants Regulations 2007

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

7.4 Other relevant legal requirements

7.4.1 Duty to Involve

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

The way in which the Environment Agency has consulted with the public and other interested parties is set out in Section 2 of this document. The way in which we have taken account of the representations we have received is set out in Annex 4. Our public consultation duties are also set out in the EP Regulations, and our statutory Public Participation Statement, which implement the requirements of the Public Participation Directive. In addition to meeting our consultation responsibilities, we have also taken account of our guidance in Environment Agency Guidance Note RGS6 and the Environment Agency's Building Trust with Communities toolkit.

ANNEX 1: 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 2.3.3(a) and Tables S2.2 and S2.4 in Schedule 3 of the Permit.
45(1)(b)	The permit shall include the total waste incinerating or co-incinerating capacity of the plant.	Condition 2.3.3(a) and Tables S2.2 and S2.4 in Schedule 3 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) & S3.2 in Schedule 3 of the Permit.
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 3.3.1 to 3.3.5 and Tables S3.1, S3.1(a), S3.2, S3.3 and S3.4 in Schedule 3 of the Permit.
45(1)(f)	The permit shall include the maximum permissible period of unavoidable stoppages, disturbances or failures of the purification devices or the measurement devices, during which the emissions into the air and the discharges of waste water may exceed the prescribed emission limit values.	Conditions 2.3.10 and 2.3.11.
46(1)	Waste gases shall be discharged in a controlled way by means of a stack the height of which is calculated in such a way as to safeguard human health and the environment.	Condition 2.3.1(a) and Table S1.2 of Schedule 1 of the Permit.
46(2)	Emission into air shall not exceed the emission limit values set out in part of Annex VI.	Conditions 3.1.1 and 3.1.2 and Tables S3.1 and S3.1(a).
46(5)	Prevention of unauthorised and accidental release of any polluting	Condition 2.3.1(a) and Table S1.2 of
Allerton Waste Recovery Park	Page 119 of 225	EPR-NP3034CG-A001

IED Article	Requirement	Delivered by
	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.	Schedule 1 of the Permit.
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.	Conditions 2.3.9 and 2.3.10
47	In the event of breakdown, reduce or close down operations as soon as practicable. Limits on dust (150 mg/m ³), CO and TOC not to be exceeded during this period.	Condition 2.3.10
48(1)	Monitoring of emissions is carried out in accordance with Parts 6 and 7 of Annex VI.	Conditions 3.3.1 to 3.3.5. 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 3.3.3 and 3.3.4.
48(3)	The competent authority shall determine the location of sampling or measurement points to be used for monitoring of emissions.	Tables S3.1, S3.1(a), S3.2 and S3.3
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
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.	Condition 3.3.5 (b) to (e)
50(1)	Slag and bottom ash to have Total Organic Carbon (TOC) < 3% or loss	Condition 3.3.1 and Table S3.4 of
Allerton Waste Recovery Park	Page 120 of 225	EPR-NP3034CG-A001

IED Article	Requirement	Delivered by
	on ignition (LOI) < 5%.	Schedule 3 of the Permit.
50(2)	Flue gas to be raised to a temperature of 850°C for two seconds, as measured at representative point of the combustion chamber.	Condition 2.3.6 (a) and pre-operational condition PO06.
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 2.3.7
50(4)(a)	Automatic shut off to prevent waste feed if at start up until the specified temperature has been reached.	Condition 2.3.6(a)
50(4)(b)	Automatic shut off to prevent waste feed if the combustion temperature is not maintained.	Condition 2.3.6(a)
50(4)(c)	Automatic shut to prevent waste feed if the CEMs show that ELVs are exceeded due to disturbances or failure of waste cleaning devices.	Condition 2.3.6(b), and (c) and (d)
50(5)	Any heat generated from the process shall be recovered as far as practicable.	Conditions 1.2.1 to 1.2.3 and pre-operation condition PO2.
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.
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 met.	No such conditions Have been included.
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 included.
52(1)	Take all necessary precautions concerning delivery and reception of Wastes, to prevent or minimise pollution.	Conditions 2.3.1, 2.3.3, 3.2, 3.3, 3.4 and 3.5.
52(2)	Determine the mass of each category of wastes, if possible	Condition 2.3.3(a) and Tables S2.2 and S2.4

IED Article	Requirement	Delivered by
	according to the EWC, prior to accepting the waste.	in Schedule 2 of the Permit.
53(1)	Residues to be minimised in their amount and harmfulness, and recycled where appropriate.	Conditions 1.4.1 and 1.4.2
53(2)	Prevent dispersal of dry residues and dust during transport and storage.	conditions 1.4.1 2.3.1(a) and 3.2.1.
53(3)	Test residues for their physical and chemical characteristics and polluting potential including heavy metal content (soluble fraction).	Condition 3.3.1, Table S3.4 and pre-operational condition PO03.
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.	Conditions 4.2.2 and 4.2.3

ANNEX 2: Pre-Operational Conditions

Based on the information on the Application, we consider that we 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 Regulated Facility.

Reference	Pre-operational measures
PO01	Prior to the commencement of commissioning, the Operator shall send a summary of the site Environment Management System (EMS) to the Environment Agency and make available for inspection all documents and procedures which form part of the EMS. The EMS shall be developed in line with the requirements set out in Section 1 of How to comply with your environmental permit. The documents and procedures set out in the EMS shall form the written management system referenced in condition 1.1.1 (a) of the permit.
PO02	Prior to the commencement of commissioning, of the incineration process, the Operator shall send a report to the Environment Agency which will contain a comprehensive review of the options available for utilising the heat generated 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 waste heat and shall provide a timetable for their implementation.
PO03	Prior to the commencement of commissioning of the incineration process, the Operator shall submit to the Environment Agency for approval a protocol for the sampling and testing of incinerator bottom ash for the purposes of assessing its hazard status. Sampling and testing shall be carried out in accordance with the protocol as approved.
PO04	Prior to the commencement of commissioning, the Operator shall provide a written commissioning plan, including timelines for completion, for approval by the Environment Agency. The commissioning plan shall include the expected emissions to the environment during the different stages of commissioning, the expected durations of commissioning activities and the actions to be taken to protect the environment and report to the Environment Agency in the event that actual emissions exceed expected emissions. Commissioning shall be carried out in accordance with the commissioning plan as approved.
PO05	Prior to the commencement of commissioning, the Operator shall submit a written report to the Agency 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 Environment Agency.
PO06	After completion of furnace design and at least three calendar months before any furnace operation; the operator shall submit a written report to the Agency of the details of the computational fluid dynamic (CFD) modelling. The report shall demonstrate whether the design combustion conditions comply with the residence time and temperature requirements as defined by the Waste Incineration Directive.

PO07	Prior to the commencement of commissioning, the Operator shall submit a report on the baseline conditions of soil and groundwater at the regulated facility. 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.
PO08	Prior to the commencement of commissioning the Operator shall submit the written protocol referenced in condition 3.2.4 for the monitoring of soil and groundwater for approval by the Environment Agency. The protocol shall demonstrate how the Operator will meet the requirements of Articles 14(1)(b), 14(1)(e) and 16(2) of the IED. The procedure shall be implemented in accordance with the written approval from the Environment Agency.
PO09	Prior to the commencement of commissioning, the Operator shall send evidence that they comply with the requirements of an approved competence scheme in accordance with condition 1.1.4 of this permit. The requirements are set out in Section 2 of How to comply with your environmental permit.
PO10	Prior to the commencement of commissioning of the anaerobic digestion (AD) plant, the Operator shall submit an Odour Management Plan (OMP) for approval by the Environment Agency in accordance with our H4 Odour Management Guidance. The AD plant shall be operated in accordance with the OMP as approved.

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.

Reference	Improvement measure	Completion date
IC1	The Operator shall submit a written report to the Environment Agency on the implementation of its Environmental Management System 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 subject to certification.	Within 12 months of the date on which waste is first burnt.
IC2	The Operator shall submit a written proposal to the Environment Agency to carry out tests to determine the size distribution of the particulate matter in the exhaust gas emissions to air from air emission points A2 and A3, identifying the fractions within the PM ₁₀ , and PM _{2.5} ranges. The proposal shall include a timetable for approval by the Environment Agency to carry out such tests and produce a report on the results. On receipt of written agreement by the Environment Agency to the proposal and the timetable, the Operator shall carry out the tests and submit to the Environment Agency a report on the results.	Within 6 months of the completion of commissioning.
IC3	The Operator shall submit a written report to the Environment Agency on the commissioning of the Regulated Facility. 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.	Within 4 months of the completion of commissioning.
IC4	The Operator shall carry out checks to verify the residence time, minimum temperature and oxygen content of the exhaust gases in the furnace whilst operating under the anticipated most unfavourable operating conditions. The results shall be submitted in writing to the Environment Agency.	Within 4 months of the completion of commissioning.

Reference	Improvement measure	Completion date
IC5	The Operator shall submit a written report to the Environment Agency describing the performance and optimisation of the Selective Non Catalytic Reduction (SNCR) system and combustion settings to minimise oxides of nitrogen (NO_x) emissions within the emission limit values described in this permit with the minimisation of nitrous oxide emissions. The report shall include an assessment of the level of NO_x and N₂O emissions that can be achieved under optimum operating conditions. The report shall also provide details of the optimisation (including dosing rates) for the control of acid gases and dioxins.	Within 4 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, Cd, Ni, As and Cr. A report on the assessment shall be made to the Environment Agency. Emissions monitoring data obtained during the first year of operation shall be used to compare the actual emissions with those assumed in the impact assessment submitted with the Application. An assessment shall be made of the impact of each metal against the relevant EQS/EAL. In the event that the assessment shows that an EQS/EAL could be exceeded, the report shall include proposals for further investigative work.	15 months from commencement of operations
IC7	The Operator shall submit a written summary report to the Agency to confirm by the results of calibration and verification testing that the performance of Continuous Emission Monitors for parameters as specified in Table S3.1 and Table S3.1(a) complies with the requirements of BS EN 14181, specifically the requirements of QAL1, QAL2 and QAL3.	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 commissioning.

ANNEX 4: Consultation Responses

A) Advertising and Consultation on the Application

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

The Application was advertised on the Environment Agency website from 19 July to 31 August 2012 and in the Harrogate Advertiser Series (The Harrogate Advertiser, Knaresborough Post, Pateley Bridge & Nidderdale Herald, Ripon Gazette and Boroughbridge Herald, Wetherby, Boston Spa & Tadcaster News) on 19 July 2012. Copies of the Application were placed in the Environment Agency Public Register at Phoenix House in Leeds and at Harrogate Borough Council Public Register at Springfield House. The Applicant also provided a number of copies of the Application on CD which were also made accessible from the Public Registers.

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

- North Yorkshire County Council (NYCC) Planning Department
- NYCC Environmental Health
- Harrogate Borough Council Planning Department
- Harrogate Borough Council Environmental Health
- Health Protection Agency (HPA)
- North Yorkshire and York Primary Care Trust (PCT)
- Food Standards Agency (FSA)
- Health & Safety Executive (HSE)
- North Yorkshire Fire & Rescue Service

1) Consultation Responses from Statutory and Non-Statutory Bodies

Response Received from Health & Safety Executive , Acting H.M. Principal Inspector of Health & Safety, letter dated 10 July 2012	
Brief summary of issues raised:	Summary of action taken / how this has been covered
No comments	No action required

Response Received from Harrogate Borough Council , Deputy Team Leader, Planning Development Control, sent electronically 23 July 2012	
Brief summary of issues raised:	Summary of action taken / how this has been covered
No planning observation, the planning application will be determined by the	No action required

County Council	
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Response Received from Harrogate Borough Council , Area Environmental Health Officer, Environmental Protection, sent electronically 15 August 2012	
Brief summary of issues raised:	Summary of action taken / how this has been covered
No statutory noise nuisance complaints.	No action required
Not aware of any local noise initiatives; however the Highways Agency may have some in place due to the A1(M).	No action required
Specific points that would require attention are noise, dust, contaminated land and air quality.	These points are addressed by specific permit conditions: Noise: 3.5.1 and 3.5.2 Dust: 3.2.1 and 3.2.2 Contaminated land: PO07, PO08, 3.2.4 and 4.1.1

Response Received from NYCC , Senior Planning Policy Officer, Business and Environmental Services, letter dated 12 September 2012	
Brief summary of issues raised:	Summary of action taken / how this has been covered
Confirmed that the planning application (reference NY/2011/0328/ENV) was yet to be determined with the earliest anticipated date for a report to the Planning Regulatory Functions Committee being 23 October 2012.	The planning and permitting regimes are separate. We have a duty to determine Applications made to us. In certain cases the Regulations preclude the grant of a permit before a relevant planning permission is in place, which is relevant to the AD plant. Planning permission has since been granted.
It was noted that the EP installation boundary on Drawing No. 969-015-A1 was more limited in area than the planning application boundary as shown on Drawing No. 3223-01 (PL)09B. Advised to ensure that all areas and ancillary development have been included within the permitting process where they are relevant. In particular with respect to the land to the east of the mechanical treatment facility and tipping hall and the adjacent landfill site currently operated by FCC Environmental.	A plan is included in Schedule 7 of the Permit and the Operator will be required to carry out the permitted activities in this area.
No statutory noise nuisance complaints.	No action required
Not aware of any local noise initiatives; however the Highways	No action required

Agency may have some in place due to the A1(M).	
Specific points that would require attention are noise, dust, contaminated land and air quality.	See above

Response Received from NYCC , Senior Planning Policy Officer, Business and Environmental Services, letter dated 13 September 2012	
Brief summary of issues raised:	Summary of action taken / how this has been covered
Advised that Harrogate Borough Council were the relevant authority for environmental health matters.	We consulted as appropriate, see above.
Provision of the completed planning and statutory nuisance form. Advised to seek clarification from Harrogate Borough Council on noise related matters.	This has been undertaken, see above.
Planning permissions were provided for Allerton Park Quarry and landfill operations.	No action required

Response Received from Health Protection Agency , Environmental Public Health Scientist, letter dated 15 October 2012	
Brief summary of issues raised:	Summary of action taken / how this has been covered
That the Application did not detail how APC residue would be managed to prevent fugitive emissions prior to being removed from the site to a hazardous waste disposal facility.	Table A3 of the Application Environmental Risk Assessment confirms that the APC residue discharge point will be located inside the main building. A negative pressure will be maintained to prevent releases into the atmosphere.
Recommended that adequate mitigation measures are in place to control potential fugitive emissions of the residue.	There will also be training in transfer practices and transfer systems will be contained. Outdoor surfaces will be impervious and there will be controlled drainage in areas where residues are stored.

Response Received from Food Standards Agency , Policy Lead, Environmental Contaminants in Food, electronically 7 February 2013	
Brief summary of issues raised:	Summary of action taken / how this has been covered
Inadequacies with the HHRA model assumptions: As regards dioxins, the background contribution from dioxin-like PCBs was ignored.	We acknowledged their lack of consideration of the contribution from PCBs in our assessment and concluded that not including PCBs in their

There was no assessment of compliance with dioxin limits in food. Incorrect use of I-TEQ instead of WHO-TEQ (1998 at the time of writing, although there are new limits based on 2005 WHO-TEFs, set out in Commission Regulation 1259/2011).	calculation was likely to be low risk and does not affect our overall conclusion. We don't consider this necessary to determine the environmental impact from the site. This consideration is something that is within the remit of the FSA. Where we have made check calculations, the predicted additional contributions to the threshold values in the EC regulation is extremely low. Furthermore, where we have compared I-TEF based predictions with WHO-TEF based predictions the sensitivity is small. We therefore consider this to be low risk.
From previous experience and based on the scale of the operation, as long as it is operated to be WID-compliant, we would not expect it to have an unacceptable impact on local food production. However (and assuming that the project goes ahead), in the event that there are difficulties during commissioning or operation leading to non-compliances for dioxins and/or heavy metals, urgent investigations would need to be conducted to ensure that there had been no impact on food safety or regulatory compliance.	We ensure that permits contain conditions which require the Installation to be well-run and we regulate the Installation to ensure compliance with such permit conditions. The Permit will require the Operator to report and assess any non-compliances.

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 paragraph 122 of the National Planning Policy Framework. 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. The way in which we have done that is set out in Section 2 below.

a) Representation from Killinghall Parish Council

A Representation was received raising the following issues:

Brief summary of issues raised	Summary of action taken / how this has been covered
Health	
That the temperature inversions and lingering fog associated with the area will have a serious impact on the health of residents.	We take the view that ADMS modelling is sufficient to cover this. Our findings are detailed in Section 5 of this document.
Waste	
With the encouragement of domestic recycling the amount of waste for landfill is reducing considerably.	The future availability of waste is not a matter for consideration under the EPR.
Questioned if hazardous waste is to be treated how would it be transported.	The facility is not permitted to accept hazardous waste.
Traffic	
Questioned how the waste from commercial producers would be transported and the impact caused by traffic.	Off-site traffic 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 levels contributing to poor air quality and the increased level of emission from traffic might be significant in these limited circumstances but that is not the case here. On-site noise has been considered in the noise impact assessment and is detailed in Section 6.6.5 of this document.
That the construction would require transportation by road of building materials.	
Noise and odour from the congested roads.	
The additional traffic will increase atmospheric pollution.	

b) Representations from Community and Other Organisations

Representations were received from North Yorkshire Waste Action Group (NYWAG), who raised the following issues:

Brief summary of issues raised		Summary of action taken / how this has been covered	
2: Q6: Other Information 2.1 Sustainability			
The UN's Brundtland Commission and resolution 42/187 of the United Nations General Assembly defined Sustainable development as 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs.' That the facility would not meet this definition because its use would cause harm by emitting substances harmful to man, wildlife or the environment and damage the Council's ability to increase recycling to anywhere near to best practice. It would also cause irreversible environmental damage (e.g. climate change) as well as damaging human health (especially vulnerable are babies and young children, the future generation whose interests a sustainable development would protect)."		Human Health Impacts are considered in the HHRA and the assessment against EQS detailed in Section 5 of this document. Ecological Impacts have been assessed against critical levels and critical loads also detailed in Section 5 of this document. The assessments were reviewed in full and were found to be satisfactory. The facility will not cause significant pollution of the environment or harm to human health.	
The facility would not meet the sustainable development definition with destruction of valuable resources that could have been re-used or recycled.		Our test in EPR and IED is of meeting BAT. The process has been designed to ensure that only residual waste is accepted. The facility will provide a safety net or 'final polish' to ensure that any recyclable materials are removed from the residual waste stream. 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	
Allerton Waste Recovery Park	Page 132 of 225	EPR-NP3034CG-A001	

	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.	
It would also cause irreversible environmental damage (e.g. climate change) as well as damaging human health.	Our assessments are detailed in Section 5 of this document.	
2.2 Integrated Solution		
Questioned why the mechanical pre-treatment plant is recovering such a small amount of MSW before it goes into the AD and incinerator.	The purpose of the MT plant is to enable additional fractions of recyclates to be extracted from the residual MSW. Neither the AD plant nor the incinerator will be permitted to accept recyclable waste streams other than those which are unsuitable for recovery which will be subsequently incinerated.	
Questioned why so much non-combustible waste is going into the incinerator and why so much recoverable waste is being burnt.	Section 4.3.6 of this document details the wastes that the facility will be permitted to accept. We have not included all of the waste codes that were applied for, with the removal of the following codes: 20 01 02 glass 20 01 40 metals 20 02 02 soil and stones Regarding the burning of recoverable waste, see above.	
Questioned why the anaerobic digester doesn't produce useful product and that the digestate is burnt, driving waste further down the waste hierarchy.	The AD plant will be processing the organic waste which has been extracted from residual household waste. This means that currently it will not achieve the 'end of waste' criteria for digestate. The waste hierarchy will continue to apply to the digestate produced so if it becomes practicable in the future it can be recovered.	
Questioned why C & I and all of the Household Waste Recycling Centre (HWRC) waste goes straight into the EfW without any effort to recycle, contrary to the waste hierarchy which should reduce environmental impact.	The facility will take residual waste i.e. that which is not separately collected or otherwise recovered, recycled or composted. Refer to Section 4.3.6 of this document. It is acknowledged that the proposal doesn't include these streams for treatment in the MT	
Allerton Waste Recovery Park	Page 133 of 225	EPR-NP3034CG-A001

	plant; however the producers of the waste should have applied the waste hierarchy already and notwithstanding this, the MT plant will be permitted to accept these waste streams.
That the facility is poorly designed and operated from the standpoint of reducing greenhouse gas (GHG) emissions, because it manages waste further down the waste hierarchy than is necessary and due to the technology choice (incineration is the worst alternative to landfill).	Our assessment of BAT for the technology choice is set out in Section 6 of this document. The waste hierarchy will be applied to waste produced by the facility and our assessment of this is set out in Section 4.3.9 of this document. The facility will only accept residual waste.
That it will generate more pollution in terms of carbon emissions than landfill does.	Our assessment of BAT and the global warming potential is set out in Section 6 of this document.
Because the facility is integrated it is unjustifiable that just 'like with 'like' methodologies are compared. It should be compared with other plant of the same generic type, i.e. other integrated systems of waste management such as thermal MBT.	The Applicant has applied for a particular type of facility and the regulations do not require this to be compared with all other potential waste management technologies. They are required to demonstrate that their chosen option is BAT. Our assessment of this is set out in Section 6 of this document.
That both the mechanical treatment and AD elements perform badly against other plant of the same general type. Moreover the incinerator has no market for heat so it is a disposal rather than a recovery activity (R1 below the threshold).	Our assessment of BAT is set out in Section 6 of this document. Our assessment of energy efficiency in Section 4.3.7 details our assessment of energy generation. Electricity will be generated for export.
That the AD plant seems to be an add on and will be accepting waste that isn't biodegradable (e.g. white electrical goods).	Section 4.3.6 of this document details the wastes that the Regulated Facility will be permitted to accept. The AD plant will only be permitted to accept wastes that are biodegradable. Our assessment of BAT for the AD plant is set out in Section 6 of this document.

2.3 Waste Hierarchy and the European Dimension

Reference was made to a seminar (European Federation of Waste Management and Environmental Services – FEAD) where the importance of moving waste up the waste hierarchy was emphasised and that member states should produce waste prevention plans. It was also said that ' <i>member states such as Germany and Denmark which are heavily reliant on incineration need to change their focus too, by</i>	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
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sending more waste for recycling and composting. Concerned that in granting a permit there will be over capacity both regionally and nationally.

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.

2.4 Consequences of Over Capacity

That NYCC waste projection figures include a new waste stream called 'trade waste' whose origins and composition is not specified. Concerned that a substantial part of the feedstock could now be different from that in the permit application. In consequence the mix of pollutants emitted could be significantly different which means that the pollutant numbers are subject to uncertainty and probable upward revision.

The facility will only be permitted to accept those wastes authorised by the Permit and our assessment of this is set out in Section 4.3.6 of this document.

Impact assessments consider the plant at maximum capacity and maximum emissions so represent a very much worse case.

We have checked the model input data on behalf of the public and can confirm that it is based on the plant operating at 100% capacity and at maximum ELVs. For those pollutants where emissions data has been used, we have confirmed that the data used is reasonably precautionary.

There may not be sufficient waste to run the incinerator at full capacity all the time which could lead to operation under sub-optimal conditions enhancing the emissions produced.

We have determined the Application on the basis that the incineration capacity is likely to be utilised. The incinerator is not expected to run for long periods under 'sub-optimal' conditions. Operation under 'sub-optimal' conditions is likely to lead to a reduction in the mass of pollutants emitted as well as a reduction in the efflux velocity. Under normal circumstances ground level concentrations would be expected to fall as a result, although, because of the reduced dispersion, not pro rata with the reduction in pollutant emissions. It is very unlikely (although not impossible) that ground level concentrations would increase slightly as a result. However, with the exception of As and Cr (VI) all modelled values for maximum ground level concentration are unlikely to give rise to significant pollution. Our additional assessment of As and Cr (VI) indicates that an exceedance of the EAL is unlikely and that they will not give rise to

	significant pollution. The modelled values are based on the very conservative assumption that the Installation will emit pollutants at maximum ELVs. Experience with similar incinerators suggests that emissions will usually be well within the limits.
That the modelling should take into account the range of uncertainty arising from different waste streams and the Precautionary Principle should be applied when considering the model output. Judgements on acceptability and stack height should be based on the upper end of the plausible range of emissions.	The precautionary principle has no application in this case: Precautionary Principle: 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, (Response to British Society for Ecological Medicine Report, “The Health Effects of Waste Incinerators) say 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” The assessment of the impact of emissions to air is based on maximum/worst case emissions.

3: Q3: Human Health Part 1

Human Health: Emissions to Air; Modelling and Data

Notwithstanding the views of the HPA, there is a substantial body of scientific opinion showing that there are reasonable grounds for concern about potentially dangerous effects of incinerator emissions on human health, with babies and young children being amongst the most vulnerable.	The HPA is the body charged by government with responsibilities in this area.
In discussing human health, the extent of scientific uncertainty renders it essential to take account of the Precautionary Principle which is	The precautionary principle has no application in this case, see above.

enshrined in European Law.		
That the flaws and deficiencies in the data and analysis result in the understating of the magnitude of the emissions and consequently understate the resultant health impacts.		We have checked the model input data on behalf of the public and can confirm that it is based on the plant operating at 100% capacity and at maximum ELVs. Our assessment is detailed in Section 5 of this document. The impacts are conservative rather than being understated.
3.1 Emissions and Dispersion Models		
Concerns that PCB and other pollutants are not considered in the HHRA with respect to health effects as endocrine disrupters.		This is correct. Following USEPA methodology, we have made some calculations to determine whether or not the Applicant should be undertaking this modelling. Our checks indicate that the risk is sufficiently low not to ask the Applicant to undertake a PCB assessment.
That because of the 'Trade Waste' the amounts and range of pollutants will be different and perhaps higher than those from an equivalent facility burning MSW.		The impact assessment considers the plant at maximum capacity and maximum emissions and so it represents a very much worst case. The plant will only be permitted to burn those wastes that we are satisfied it can burn safely.
Deficiencies in the way that they have derived background pollutant values, selection of weather data to represent local conditions (complexities in the Vale of York area).		We take the view that ADMS modelling is sufficient to cover this. However we have also used CALPUFF to consider complex terrain effects where the gradient is >1:3. NWP data has also been used to check the validity of the observed met data used by the Applicant. Our findings are detailed in Section 5 of this document.
The use of EPUK guidelines to discount those cases where using EPR-H1 shows incinerator emissions to be 'not insignificant.' This methodology is false in the case of particles.		We have required the Applicant to assess the impact against statutory EQS and where no statutory EQS are present other references such as WHO and EPAQS etc. following the H1 methodology. These are considered sufficient to ensure health protection.
A failure to acknowledge that modelling is subject to error at various points and that we should take account of them, applying the Precautionary Principle as mandated by European law. Sources of error include:		NYWAG is correct that the Applicant has not developed arguments considering modelling uncertainties. This would be expected in cases where we consider the uncertainties likely to be exceptionally high. This is not considered to be the case here. However our checks using alternative data and software indicates that the Applicants assessment might not be a worst case but at the upper range, their conclusions are robust.
- Inadequate spatial resolution and spatial coverage together with inadequate representation of buildings.		Building configuration has been checked and although closest receptors are likely to be affected by greater modelling uncertainties than elsewhere, our checks indicate that conclusions are robust.
Allerton Waste Recovery Park	Page 137 of 225	EPR-NP3034CG-A001

- Local meteorological conditions are complex and not well presented in a grid of 4.5km by 4.5km - Uncertainties in the mix of wastes and hence compositions and quantity of pollutants emitted.	See above comments. Modelling at peak flow and at maximum permitted ELVs is likely to be conservative as a screening assessment.
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3.2 Technical Context

Concerned that ultrafine particles (PM _{0.1} and below) are not separately covered by the regulations and as such there is scope for undue health risks. Reference was made to the Air quality in Europe – 2011 report and the views of Professor C V Howard.	We have assessed against all relevant assessment criteria. PM ₁₀ and PM _{2.5} assessments include all fractions below that particle size and so will include ultrafine particles with predicted impacts being insignificant.
Concerned that ‘synergy’ is ignored, which arises from the combination of substances that can cause toxicity even when the individual chemicals are at a level considered to be safe. Also the toxic effects of cosynergism (where two agents enhance the toxicity of each other) and potentiation (when one agent with no toxicity enhances the toxicity of the other). Synergy in all its forms and hormesis mean that standards set for individual substances may not be adequate to minimise risk. Add this to the fact that incinerators emit hundreds of pollutants, deficiencies in the methodology and the stricter standards imposed by the US EPA and WHO, it is then vital to invoke the Precautionary Principle.	Assessments have been made to the relevant health based assessment criteria. We have consulted with the HPA and PCT. Their response is detailed in this Annex and they have not raised any concerns with respect to these matters. The precautionary principle has no application in this case, see above.
Reference was made to papers which have found that the cancer risk from dioxins appeared to follow a hormetic pattern whereby toxicity increases at very low doses.	The HPA and PCT responses are detailed in this Annex and they have not raised any concerns with respect to these matters. Our assessment of health impacts and dioxins is set out in section 5.3.4 of this document where we conclude that the proposed facility will not pose a significant carcinogenic or non-carcinogenic risk to public health.
Questioned the claim in the application that <i>‘the potential health impact of exposure to these pollutants can be assessed by comparison of predicted</i>	Assessments have been made to the relevant health based assessment criteria. Air quality standards are set independently of the Environment Agency and are set to be

<i>exposure concentrations with air quality standards set for the protection of human health.'</i> This was questioned because standards tend to relate to what is technologically achievable rather than necessary from a health point of view.	protective of human health.	
3.3 Atmospheric Dispersion Models		
State that "There are a variety of models which attempt to represent the physical reality of dispersion but they do not agree with each other (e.g. Tran, BRE). This introduces an element of uncertainty into the results from any given model; a factor of 2 on pollutant levels in the air appears perfectly possible. This should be taken into account when setting conditions such as stack height."	A factor of 2 is likely for short-term emissions and lower for long-term (e.g. validation documents). Intra-model sensitivity carried out by AQMAU and validation documents informs a judgement on likely uncertainties. Assessments are carried out as a worst-case at max ELVs (see above). Taking likely modelling uncertainties into account does not affect predictions or change conclusions.	
3.4 Data and Methodology		
Dispersion models require wind and data on the pollutants which are both subject to uncertainty.	We take the view that ADMS modelling is sufficient to cover this. However we have also used NWP data to check the validity of the observed met data used by the Applicant.	
That the variability in typical background measurements for dioxins, VOCs and PAHs leads to error in the impact assessments.	Variation in background data is acknowledged but variations will not change conclusions. The applicant predicts a maximum process contribution from the incinerator and gas engines of 0.2ug/m3. If this were assumed to be 100% benzene or 100% 1, 3 butadiene (i.e. VOC with the lowest EAL) it would represent a PCs of 4 and 8.88% compared to respective EALs. Our check modelling agrees that this is likely to be a worst-case prediction. The applicant selected background concentrations from the Defra background maps. These maps have a grid resolution of 1km and as such are likely to be representative of a regional distribution but might not include some specific locations of elevated VOCs such as roadsides. The Local Authority has not raised any concerns over potential exceedences of VOC but conservatively assuming VOCs are as high as a major population centre like Leeds, does not affect the conclusions that exceedences are unlikely. For dioxins, the HHRA considers the whole dietary intake and is compared to the TDI and	
Allerton Waste Recovery Park	Page 139 of 225	EPR-NP3034CG-A001

	still predicts a PC of less than 1% of the TDI which would be insignificant. Our check modelling is consistent with this (even with the contribution of PCBs). Elevated dioxin/furan/PCB ingestion in the diet as a background or baseline will not change this conclusion.	
That particulates are only measured for PM ₁₀ , the least dangerous fraction. The use of city centre background data from Leeds and York was inappropriate for a rural area, more specifically dioxins (Table 10.4 Chapter 10).	The values selected for the impact assessment are conservative for the purpose of screening assessments so can be used in this context. Alternative background values would not affect conclusions. Assessment is also made against PM _{2.5} target values.	
Background values in Table 10.14 were unconvincing which is then subsequently used to assess the 'significance' of emissions.	We have checked the values used in the context of available data and advise that they have taken a reasonably precautionary approach.	
Questioned the use of weather data covering 10 years supposedly representative of the Vale of York area and that it came from two different sites neither of which provided a full 10 year run.	10 years of data is not specified by our guidance. Our checks indicate that any deviations are not likely to affect conclusions.	
The Applicant's claim that the 2007 Linton-on-Ouse weather data was the worst case weather data for the long term nitrogen dioxide ground level concentrations rather implies that the weather at the two weather stations may not be well-correlated."	Our checks using alternative met data and software indicates that any deviations are not likely to affect conclusions.	
That dioxins/furans,PAHs and metals which are present in small quantities but are bio-accumulative and so have the potential to cause effects through long term, cumulative exposure. These are typically evaluated over a lifetime, generally taken as 70 years.	The assessment method has considered lifetime exposure and bioaccumulation in the food chain model HHRAP.	
That while it is probably true the probability of individual high-end exposure estimates converging on one individual is extremely low, that is not the point; even for an incinerator that fully meets European emissions standards, the calculated risks based on epidemiological evidence is unacceptable high	There is no widely accepted evidence supporting this view. The HHRAP modelling and our audit of it confirms the HPAs general response that compliance with the dioxin ELV will ensure a worst case intake that is low compared to the TDI. The HPA is undertaking a project to compare health data with dispersion modelling around UK incinerators. The output from this will inform any future advice from the HPA.	
Indicate their view that epidemiology would be a more appropriate approach to determine impact from such plant.	Our assessment of the impact has been made to the relevant health based criteria and is set out in Section 5 of this document.	
Allerton Waste Recovery Park	Page 140 of 225	EPR-NP3034CG-A001

	The HPA are undertaking a project to compare health data with dispersion modelling (see above).		
3.5 Data Input and Associated Uncertainties			
Questioned the accuracy of the emissions data being fed into the model and that some of it derives from data from other incinerators. Questioned how representative the data would be based on the monitoring location since chemical processes take place that are not captured. Suggested that these chemical processes may result in:	We have checked the model input data on behalf of the public and can confirm that it is based on the plant operating at 100% capacity and at maximum permissible ELVs. For those pollutants where emissions data has been used (Cr (VI) and arsenic), we have confirmed that the data used is reasonably precautionary.		
- NOx abatement may actually increase PM_{2.5} in the stack, - Post combustion re-synthesis of dioxins.	The PM _{2.5} assessment conservatively assumes that all the particulate emissions are as PM _{2.5} and predictions are still insignificant.		
	Whilst this is possible, the dioxin monitoring position is well downstream of this and will capture any higher concentrations due to re-synthesis.		
That it was unlikely that the emissions data would include periods of sub-optimal running or for processes that take place after the monitoring equipment.	Considered through abnormal operations modelling. Also, reduced plant operation will result in poorer dispersion but with a lower mass release at maximum ELVs which will compensate for this.		
3.6 Inadequate Scope of the Model			
Concern over poor model usage e.g. spatial resolution and topographical data.	We have checked their model input data and have re-run their model using our own terrain and met data as well as scrutinising the resolution etc. We are satisfied that the model has been run appropriately in this case.		
Challenged the Applicant's assertion that peak impacts occur within the 3km grid.	We have checked this using a range of met data and modelling software and found it to be robust.		
That the grid resolution for the stack heights is too coarse.	We have also checked this and are satisfied their modelling is robust. 1.5 x the stack height is considered appropriate. Lower stack heights from the gas plant are not likely to be affected by this.		
Concern about the impacts over a wider area in local towns where exposure would be greater.	Although more people will potentially be exposed the predicted impacts at those nearby towns will be 'insignificant' and therefore not of concern.		
Concern about the approach to modelling buildings and that buildings <1/3 of stack height are not considered.	This approach is justified by scientific study. The buildings that will have an effect on downwash are included in the model.		
They "contend that these grid spacing	We have reviewed the Applicant's input		
Allerton Waste Recovery Park	Page 141 of 225	EPR-NP3034CG-A001	

and assumptions made in the representation of buildings and the area covered by the model are all inadequate and could therefore lead to misleading results.”	parameters and have undertaken our own checks with sensitivity analysis to various input parameters and functions. We are satisfied as a result that the Applicant's modelling is robust.
That modelling predictions are only given for NO ₂ with an assurance that other pollutants follow a similar trend.	NO ₂ impacts are most significant, but the Applicant has given predictions for all relevant pollutants.
3.7 Inadequate Representation of Meteorological Conditions	
That local ‘Met’ conditions are not well represented in a grid of only 4.5 km by 4.5 km due to the complex conditions in the Vale of York.	The CALPUFF modelling used a much wider grid of up to 50 km. Using 3D met data in this way does not affect their conclusions. Note the potential uncertainties in CALPUFF modelling due to the very short-range to receptors.
3.8 Implications of Weather Patterns in the Vale of York	
Concerned about specific weather patterns in the Vale of York – effect on short-term and long-term impacts.	See above comments.
3.9 Implications of Modelling Uncertainty	
Concerned that stack height analysis only considered NO ₂ . That there is no hard evidence that the lower stack height can be justified given the increased ground level concentrations associated with the complex local conditions.	NO ₂ is the most sensitive statutory pollutant and so for the point-of-view of pushing for additional control measures, this is the most appropriate pollutant. The stack height is compliant with the regulations, which require waste gases from waste incineration plants to 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. Also refer to Annex 1 IED Article 46(1) in this document.
That pollutants could be trapped under the thermal inversion layer for some days means that they would accumulate under this layer rather than be dispersed as assumed in dispersion modelling.	ADMS modelling can consider elevated inversions. However using 3-D met data in CALPUFF can provide alternative checks on this. These checks do not affect the conclusions of the modelling.
3.10 Sub-Optimal Operation	
That emissions are higher during start-up and shut-down, with evidence provided for dioxin levels.	Abnormal operation assessment has been completed. Refer to Section 5.5 of this document. The impact from dioxins is cumulative over a lifetime exposure so the short-term peaks during start-up and shut-down would not be significant.
That an allowance of a factor of 2 should be allowed for annual averages for planned and unplanned outages.	There is no justification or evidence to support this. Intra-model sensitivity carried out by AQMAU and validation documents informs a judgement on likely uncertainties. Assessments

	are carried out as a worst-case at max ELVs (see above). Taking likely modelling uncertainties into account they are not likely to affect predictions and do not change conclusions.
That the effect on the daily dose over a period of start-up and shut-down is much more dramatic.	See comment above.
That this suggests that the stack height should be substantially increased with application of the Precautionary principle.	See comment above on stack height.
3.11 Baseline Conditions	
That it dates back to 2001 and the sites used aren't representative of a rural area.	We have checked the values used in the context of available data and advise that they have taken a reasonably precautionary approach.
That the measurements from the air quality survey commissioned in 2007 were probably reasonably representative.	Acknowledged, this data has been used in the assessment in conjunction with local authority monitoring data.
4: Q3: Human Health Part 2: Airborne Pollution: Flaws in Results	
4.1 Oxides of Nitrogen	
That the assessment failed to take into account NO ₂ conversion.	Modelling is undertaken at the IED ELVs assuming a conservative oxidation/conversion of NO ₂ : 35% short-term and 70% long-term
4.2 Particulate Matter	
Secondary particulate and aerosols produced after the APC equipment not included in the input data.	Once in the environment, the emission contribution to secondary particles is likely to be small and long-range, so we do not consider it necessary to include them. Aerosols from secondary particles from this type of plant will be small compared to background pollution and those from the major power sector.
Information from Veolia that bag house filter collection efficiency was 95-99% PM ₁₀ , 65-70% for PM _{2.5} and only 5-30% for PM _{<2.5} , with virtually none of the ultrafine particles PM _{0.1} being removed.	Both past and current research suggests that fabric filters are highly efficient at removing all sizes of particulate matter, including ultrafine particles, from the exhaust gases emitted from incinerators. Published data from research work spanning over 30 years suggests that the collection efficiency for all size of particles is not less than 99% and can be higher than 99.995%, even for nano-particles.
Concerned about the health implications associated with particulate and that heavy metals, dioxins and other chemicals will adhere to the surface of	AQS are generally considered protective of human health. With respect to particulates, the UK Government uses exposure reduction to PM _{2.5} to protect the public. The Applicant's

particulate increasing their toxicity. That these facts would tend to invalidate AQSs based purely on particulate rather than taking account of the toxins they carry into the body.	assessment assumes PM _{2.5} represents 33% of the total dust emissions and predict insignificance compared to PM _{2.5} target value. They present little evidence to justify this distribution but even assuming 100% of the dust limit is PM _{2.5} , pollution or harm to human health is not likely. Also refer to the HPA response on health implications.
4.3 VOCs	
That VOCs comprise a variety of elements but only benzene and 1, 3-butadiene are considered. There are risks associated with a range of VOCs and the Precautionary Principle means allowance should be made for these risks.	The assessment is hugely conservative. The two criteria (benzene and 1, 3-butadiene) are the lowest EALs available for VOCs and assessment against these is therefore precautionary.
5: Q3: Human Health Part 3: Conclusions on Modelling and Airborne Emissions	
That parameters such as the stack height are probably in error and should be recalculated.	We are satisfied that there are no errors. The stack height proposed is predicted not to cause significant pollution.
Serious concerns about background levels of particulates and NO _x and their interpretation.	We have checked the values used in the context of available data and advise that they have taken a reasonable approach.
Background data showed significant variation and some inappropriate sites were included.	See above
That the weather data used was not representative of the Vale of York.	See above
6: Q3: Human Health Part 4: Critique of Analysis	
That the HHRA uses the output from the dispersion model which is subject to the flaws listed above.	Our checks confirm the HHRA assessment to be conservative in its approach and assumptions made.
That the particulate AQS was not protective of health and that the methodology for particulate did not include the various forms of synergy. Also didn't address how particulates facilitate the entry of other pollutants into the respiratory tract.	AQS are generally considered protective of human health. With respect to particulates, the UK Government uses exposure reduction to PM _{2.5} to protect the public. The Applicant's assessment assumes PM _{2.5} represents 33% of the total dust emissions and predict insignificance compared to the PM _{2.5} target value. They present little evidence to justify this distribution but even assuming 100% of the particulate limit, pollution or harm to human health is not likely. Also refer to the HPA response on health implications detailed in this Annex.
That it is wrongly claimed that a cumulative impact assessment of dioxin emissions from the EfW with other sources is not required.	The predicted impact is small as a worst case compared to the TDI. Combining the predictions with background exposure would be effectively double-counting as the impact from

	other sources are reflected in the background level. The HPA has been consulted on the Application – refer to their response.
That the assessment is not worst case because in reality the risks are spread across a large population, not just a relatively small population in the immediate vicinity.	The HHRA takes a worst-case exposure to individuals as a screening approach. Given that predictions are insignificant, they will be even lower elsewhere and are therefore not a cause for concern using the H1 criteria.
Concerns over bio-accumulative nature of the pollutants.	The HHRA took into account exposure for a 70 year life time and was still low compared to the COT-TDI for lifetime exposure. The TDI was set to be protective against carcinogenic and mutagenic effects of dioxins etc.
6.1 Methodological Flaws	
Concerns over the methodology used in the HHRA – food chain not considered.	HHRA considers bioaccumulation and uptake through the food chain and it is highly conservative.
Concerns about cardiovascular disease and other similar diseases due to dioxin emissions.	Refer to HPA response. We consider advice from health experts. Assessments have been made compared to health-based criteria.
Concerns over uncertainties in food chain modelling due to a large number of assumptions.	The Applicant has taken this into account by making conservative assumptions over intake and therefore represents a conservative assessment rather than a definitive prediction.
Reiterated concerns over the conceptual model that greater exposure will be relevant further afield.	The HHRA takes a worst-case exposure to individuals as a screening approach. Given that predictions are insignificant, they will be even lower elsewhere and are therefore not cause for concern using the H1 criteria.
Concern over the impact on breast fed infants.	The TDI exposure is not strictly comparable as the time period for breastfeeding is limited. The Applicant predicts the dioxin intake for infants through breast milk in Table 4.15 and predicts a peak intake of less than the TDI. Note that this value represents the highest daily intake for the infant and as such is not directly comparable with the TDI that is based on a lifetime exposure. The HPA make specific statements on infant intake “that, although intakes of dioxins and dioxin-like PCBs by breast-fed babies are higher than is desirable, encouragement of breast-feeding should continue on the basis of convincing evidence of the benefits of human milk to the overall health and development of the infant”. COT refers to studies on foetal impact in http://www.food.gov.uk/multimedia/pdfs/cot-diox-epi.pdf and provides a lay summary of how the TDI was set in

	full.pdf
Concern that contaminated agricultural products will be distributed widely and so impacts elsewhere have not been considered.	Worst-case impacts have been made assuming all diet is sourced from the most impacted area. This is highly conservative resulting in "insignificant" predictions. Dietary intake elsewhere will be substantially lower and cannot be worse than the screening assessment predictions.
Concern over particulates and breast milk.	See comments above.
6.2: The HHRAP Approach	
Concern that default parameters in the HHRAP assessment will not be representative locally.	Our modelling checks and calculations confirm that parameters used are likely to represent worst-case values.
Concern that drinking water was excluded as a source as well as the dermal pathway.	Dermal pathway can be considered using the EAs CLEA model. Assessments made at other similar sites using CLEA indicates that the contribution via the dermal pathway is a very minor part of intake and need not be considered here. Our checks demonstrated that drinking water also has a minor contribution to a total that is likely to be insignificant as a worst case.
Concern that certain pathways are not considered e.g. mutton and root crops.	It is correct that HHRAP uses beef as the whole proportion of red meat intake. This can be used as a surrogate for mutton intake as bioaccumulation is based on proportion of intake through the grain, silage and foraging feedstuffs. The home-grown beef dietary intake for a farmer in HHRAP is based on 90g/day every day for life.
Concern that only a limited number of what they call 'Compounds of Potential Concern' (COPCs) were considered (dioxins, furans, metals, PAHs).	Assessments have been made to the relevant health based assessment criteria. The HPA and PCT responses are detailed in this Annex and they have not raised any concerns with respect to these matters.
That the PAH assessment does not consider human exposure through all routes.	PAH assessment is based on the BAP Target value. There are no other exposure standards for these substances. The COT-TDI does not include the contribution from PAHs and so cannot be realistically taken into account in this way.
6.3: Identification and Summary of Key Impacts	
6.3.1: Non-Cancer Risks	
That it is not clear how the HHRAP model takes into account non-cancer risks.	In the UK we do not use the risk criteria in HHRAP. We compare the total predicted intake with the threshold TDI that is set based on risk potency. This is only one of the assessments that we do, we also compare air emissions with

	the relevant EQS and EALs which are protective of human health.
That the HHRAP does not take into account the carcinogenic effects of PAHs.	BaP is used as a marker and compared to the target value that is set for the protection of human health. This is considered to be protective.
That dispersion models do not take into account particle size distribution of dioxins and furans.	The model assumed a particle size distribution that is considered conservative and consistent with that expected for bag-filter emissions.
That the HHRAP does not consider organochlorines.	Correct, but the TDI does not contain the contribution from organochlorines but considers other chlorinated hydrocarbons such as dioxins, furans and PCBs.
That HHRAP predictions underestimate impacts.	The assessment against the TDI does not under predict impacts. It is in fact based on conservative assumptions that result in worst-case predictions that can be considered screening values.
6.3.2 Cancer Risks	
Several concerns raised about the carcinogenic risk predictions.	These values are not relevant to UK assessment. Comparisons are made against the TDI as a protective threshold.
6.3.3 Dietary Intake of Trace Metals	
Concern over the thallium intake predictions.	Metals concentration-based EALs are protective of human intake by reference doses with the exception of some metals like thallium that has no current USEPA reference dose or UK TDI for it. The Applicant's assessment compared thallium against the 1998 dose that has subsequently been removed. The intake would not be considered to cause any significant health risks.
6.3.4 Comparison of Dioxin/Furan Exposure with UK and the WHO Tolerable Daily Intakes	
Concern over the farmer dioxin intake predictions compared to the TDI.	The exposure is 6% of the TDI as detailed in Section 5.3.2 of this document. It is well below a level of concern, but not insignificant.
7:Q1: Prevention of Emissions	
Questioned why electrostatic precipitators weren't being used in addition to the bag filters to improve particulate removal and act as a back up.	Our detailed assessment of particulate abatement is detailed in Section 6 of this document. Emissions of particulate have been assessed as having an insignificant impact using bag filters so we agree that they are BAT.
Questioned the height of the stack and that it should be set at a height to meet future regulations.	The stack height proposed is predicted not to cause significant pollution.
Questioned the assessment of abnormal operation and suggested dual instrumentation to act as a back up.	Abnormal operations have been considered and are satisfactory. The Applicant proposes to have a back-up CEMs.

That flue gas desulphurisation be used to reduce SO ₂ emissions.	Our detailed assessment of SO ₂ abatement is detailed in Section 6 of this document. Emissions of SO ₂ have been assessed as having an insignificant impact so we agree that the proposals are BAT.		
7.1: Inadequate Monitoring			
Concerned that not all substances are monitored continuously e.g. dioxins, PAH.	The monitoring undertaken is compliant with the IED and is detailed in Section 6.8 of this document.		
That the Applicant's proposal in their Planning Application to monitor ambient air for the first 12 months of operation was inadequate. Suggested monitoring over the life time of the facility and by an independent organisation.	Emissions are measured at source – i.e. in the chimney stack. There is no provision in the permit for monitoring of ambient air quality, because the impact is too low to be measured in this way.		
7.2: Noise			
Concerns were raised about noise from the proposed facility.	We have undertaken a detailed assessment of the noise impact assessment as detailed in Section 6.6.5 of this document. We are satisfied that the appropriate measures will be in place.		
7.3: Odour			
Concerns that the stack is too low due to temperature inversions affecting odour impact.	Conditions in the Permit will control odour impact from the facility.		
8: Q2: Harm to the Environment			
8.1 Overview			
That the technology is the worst alternative to landfill from a climate change stand point and so runs counter to the UK's national and international commitments.	Our assessment of BAT is set out in Section 6 of this document. The Use of Alternative Technologies: 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). The Environment Agency is aware that a number of proposals are coming forward for other ways of dealing with waste streams such as pyrolysis and mechanical / biological treatment. At this time however, mass burn incineration at this scale can still be considered BAT, subject to the appropriate assessments being made. Anaerobic digestion is most suitable for high moisture content biodegradable wastes such as food and agricultural wastes, and can be applied where there is separate collection of these waste streams. Anaerobic digestion is not however appropriate for mixed municipal waste. Some technologies such as plasma arc gasification are currently considered not to meet the		
Allerton Waste Recovery Park	Page 148 of 225	EPR-NP3034CG-A001	

	definition of 'availability' due to their very limited application worldwide.	
Excessive impacts on habitats (including birds and animals) through acidification, eutrophication, heavy metals, POPs and bio-accumulation.	The Applicant has assessed the impacts and we are satisfied that they do not exceed the relevant assessment criteria.	
That pollution in water courses can enter into aquifers.	Our assessment is detailed in Section 6.6 of this document and we are satisfied that the appropriate measures will be in place.	
8.2 Climate Change		
Flaws in the WRATE model used to examine GHG emissions and that it underestimates the benefits of MBT and misleadingly suggests incineration is superior.	The WRATE model is not relevant to the determination of the Application under the EPR. Our assessment of greenhouse gases is detailed in Section 6 of this document.	
That thermal efficiencies used are questionable	Our assessment of energy recovery and efficiency is detailed in Section 4.3.7 of this document.	
That the Applicant has compared incineration with landfill instead of taking account of other integrated waste management systems e.g. thermal MBT.	The Applicant has applied for a particular type of facility and the regulations do not require this to be compared with all other potential waste management technologies.	
That electricity only incinerators emit 33% more fossil CO ₂ than a gas power station, but 40% less than a coal power station. Predictions were made for 2020 based on advanced technologies with electricity only incinerators emitting 78% more fossil CO ₂ than gas power stations and only around 5% less than a coal power station.	Our assessment of carbon dioxide and climate change is detailed in Section 6 of this document. However, it should be noted that this is a waste management facility and not a power station.	
8.3 Damage to Ecosystems		
That according to the European Environment Agency in their 2011 report problems arising from air pollution include: - effects on human health by exposure to air or intake of pollutants. - Acidification/eutrophication of ecosystems - Damage to crops, forests and plants due to exposure to ground level ozone - Toxicity and bioaccumulation of heavy metals and POPs - Effects on climate (not just greenhouse effect)	The Applicant has assessed the relevant impacts and we are satisfied that they do not exceed relevant assessment criteria.	
Allerton Waste Recovery Park	Page 149 of 225	EPR-NP3034CG-A001

- Reduction of atmospheric visibility - Damage to materials and cultural heritage - Ozone formation, acidifying and eutrophying air pollutants, aerosols, VOCs, PAHs, POPs, particulates and heavy metals.	
9: Q4: Harm to the Environment – Local Factors	
9.1: Wildlife and Water	
That some sites had not been considered.	The Applicant has assessed the relevant sites within the relevant screening criteria as detailed in Section 5.4 of this document.
Deposition of particulate in Ouse Gill Beck harming the ecosystem including otters.	The only discharge will be uncontaminated surface water from the attenuation pond. Any aerial deposition of particulate matter will be insignificant.
Otters are classified as a European protected species.	Otters were not identified as a protected/priority species within the relevant screening distances; however the Permit will protect the environment as a whole which will include local wildlife.
9.2: Aquifers and Water Supply	
That pollutants in the aquifer will be mobile and could render it unsuitable for future extraction.	Our assessment is detailed in Section 6.6 of this document and we are satisfied that the appropriate measures will be in place to protect groundwater.
That it is not acceptable to use mains potable water as a back up on site as it would risk the availability to householders	The use of mains water will be minimised by the use of rainwater from the roads and roofs. It will be collected in the attenuation pond for use in the process. It would be the responsibility of the water supplier to place any limits on its usage.
That the permit should require that the storage of water on site is sufficient to meet the site demands during periods of low rainfall or drought and the potable supply be interruptible to protect householders.	See comment above.
That there should be no off site drainage of the attenuation pond due to pollution risk.	The attenuation pond will contain uncontaminated surface water with the discharge being controlled by conditions in the permit.
9.4: Damage to Materials and Buildings	
Damage caused by corrosion and erosion from acid gases and particulate matter.	There is no assessment criteria for this; however the predicted acid deposition contribution is small compared to existing background levels at nearby towns.
Consideration only given to buildings within 3 km.	See comment above

9.5: Harm During Construction and Decommissioning	
Concerned about noise during construction.	Noise during construction is not controlled under the EPR. This is a relevant consideration under the Planning process.
Concerned that the closure and decommissioning details do not give sufficient detail to judge whether or not they would avoid any pollution risk.	This will form part of the sites EMS. A pre-operational and improvement condition are in place to ensure that the appropriate measures will be in place.
That demolition was liable to produce more dust and that parts of the plant would be contaminated with toxic materials.	This activity will be controlled by the site closure plan which will form part of the sites EMS.
9.5: Incinerator Bottom Ash (IBA)	
Controversy over whether or not it is hazardous and represents an environmental risk.	IBA is normally 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 a dangerous substance. It is the responsibility of the producer to characterise the IBA as hazardous or non-hazardous which is controlled by other legislation and not covered by the Permit.
Concerns about the ecotoxicity dependant on the view taken on difficult to identify zinc and lead compounds. Testing of this should be conditioned in any permit.	See comment above. Eco-toxicity is one of the tests for hazardous nature.
Leaching of hazardous/toxic materials from both the waste and IBA.	Appropriate storage and containment measures will be in place for their storage.
Questioned what happens to the water that is used for dust suppression during IBA processing.	IBA Processing will be undertaken within an enclosed building to prevent dust emissions. To enable the maturation of the bottom ash, the piles will be sprayed with water, which will also prevent dust emissions. Run-off leachate from maturation will be contained within separate drainage within the IBA Processing area, and re-used for maturation.
That it is essential (not optional) that measures are taken to ensure the health and safety of workers by the incorporation of an air extraction plant into the design of the IBA processing building.	This is a matter for the Health & Safety Executive (HSE) who are responsible for the regulation of such matters. We have consulted with the HSE as part of our determination process. That an extraction plant has not been proposed is indicative of IBA processing being inherently a none dusty operation.
9.6: Fly Ash	
That dioxins are sorbed onto the fly-ash and that slow de novo synthesis of dioxins also occurs on its surface. The	The process is designed to capture and contain fly-ash; however if this were to take place then the dioxin monitoring undertaken would include

dioxins then slowly desorb into the flue gases.	this component.
That there is a trade off between air pollution produced and the toxicity of the IBA.	The environmental impact is detailed in Section 4.3.9 of this document.
9.7: Traffic Noise	
Concerns raised about traffic noise.	Off-site HGV noise is a relevant consideration for the grant of planning permission, but does not form part of the Environmental Permit decision making process. On-site noise has been considered in the noise impact assessment and is detailed in Section 6.6.5 of this document.
10: Accident Prevention / Limiting Their Consequences	
10.1: Transport	
Traffic accident involving fly ash/APC which despite being a low probability would have a high impact.	Permit conditions would control the storage and movement of ash within the facility. Duty of Care requirements will apply to the transportation of waste to and from the site.
That sheeting/covering of lorry loads was insufficient and that a more secure enclosure was required.	Hazardous APC residues will be removed by enclosed tankers.
That consideration should be given to the possibility of accidents involving HGVs on site, which would contribute to road safety outside the site.	Accidents on site will be covered by an accident management plan which will form part of the sites EMS. This is detailed in Section 4.3.2 of this document.
10.2: Operational Safety	
That there should be a risk register assessing the probability and consequences of major risks and a contingency plan which sets out clearly what the operatives must do.	See comment above
11: Q6 (Part 2): Additional Observations	
That we wrote to the Applicant asking for them to send us a revised site condition report due to further site investigations that had been undertaken. That the Applicant replied to us (letter and response 270612.IC) confirming that there would be further site investigations carried out before construction but would not be undertaken until a permit was issued. They suggested that we include a pre-operational condition for a revised site condition report.	Our assessment of the site condition report is detailed in Section 4.2.2 of this document. We have set some additional control measures based on this assessment. We have also included the requirement for an updated site condition report to incorporate the baseline data and the results of other investigative works undertaken.

That based on the above, it is not acceptable to issue a permit until the revised site condition report is received.

A complaint was received from the North Yorkshire Waste Action Group (NYWAG) about the lack of openness, honesty and transparency seen in the Application from the Applicant based on the issues tabulated below.

Brief summary of issues raised	Summary of action taken / how this has been covered
That in the Applicant's assessment of health effects they have tried to mimic the US EPA HHRAP using a Canadian model called IRAP, without suitable validation for UK conditions.	We have assessed the HHRA and have concluded that the Applicant's assessment can be used as a basis for permit determination and we agree with their conclusions.
That the applicant fails to make clear that the modelling process is not precise and that there are many errors and uncertainties that affect the results and may in some cases invalidate them entirely.	See comments above
That they fail to give proper attention to Chapter 10 (Air Quality Section) of their Planning Permission, which is key to arguments around air dispersion modelling and health and environmental impacts. It is unacceptable that it has not been made available or even cross referenced. Because of this they fail to include the limitations of the data as follows: - Use of inappropriate weather data; - inadequate representation of meteorological complexities of the Vale of York; - derivation of pollutant background concentrations; - inadequate spatial resolution, spatial coverage and representation of buildings; - failure to make adequate allowance for periods of suboptimal operation; - failure to discuss uncertainties in the mix of waste with the composition almost certainly being different from that in the model especially as the	We address the suggested limitations in our comments above.

composition of 'Trade Waste' is unknown. - failure to consider interactions between pollutants	
We were asked to reach a judgement over whether or not it is right and proper to reach a judgement on an Environmental Permit based on such flawed evidence.	Providing the Applicant can prove that the facility meets all the legal requirements, including environmental, technological and health requirements, then we are legally obliged to issue a Permit. We are satisfied that the information submitted to us is sufficient to reach our decision.
It was asked that we withhold consideration of the Application until this matter is resolved.	We have a duty to determine Applications made to us in a timely manner. See comment above.

Supplementary comments were received from the NYWAG which consisted of several reports. They confirmed that the focus of the objection was on the Applicant's supplement on Capacity and Climate Change. The submission also included three reports written by Eunomia research and consulting, which were described as supporting documents. Eunomia's work was commissioned by the Parish Council's Group.

The Applicant produced a response to Eunomia dated 26 September 2012 which was submitted as part of the Planning process. This report responded to some of the key criticisms of the assumptions in the WRATE reports and has been used to address some of the comments raised below.

Brief summary of issues raised	Summary of action taken / how this has been covered
Climate Change, dated 19 September 2012. Waste availability and overcapacity	
That the facility will be a third bigger than needed and more than twice as big as necessary by the end of the 25 year contract.	This is not a matter for consideration under the EPR.
That within 13 years NYCC will be running short of household waste. While NYCC think they can make up the shortfall with trade waste this is a risky strategy and that smaller less risky options should be considered.	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
Allerton Waste Recovery Park	Page 154 of 225 EPR-NP3034CG-A001

	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.	
This will change the feedstock and so emissions will be different.	Any changes to permitted waste types or emission limits would require a variation to the Permit which would include an impact assessment of the emissions from the facility. The current assessment is based on worst case with 100% capacity and at IED ELVs.	
That because of the uncertainty in waste composition the base data on which air dispersion modelling rests is highly uncertain.	See comment above	
That the need to rely on trade waste means that the scheme will not enable NYCC to achieve the 50% recycling target by 2020.	This is not a matter for consideration under the EPR.	
That the facility would lead to the destruction of valuable resources that could have been re-used or recycled.	Under Schedule 9, paragraph 4 of the EPR, we only apply the waste hierarchy to waste generated by a waste operation. Whilst we may have wider responsibilities under the Waste (England & Wales) Regulations 2011 to ensure other producers apply the hierarchy to waste they generate that is a separate issue. It is a commercial risk if an Operator builds a plant they cannot then get the fuel to operate.	
Climate change		
That incineration is the worst alternative to landfill with nearly all the carbon in the waste being emitted as CO ₂ .	Our assessment is detailed in Section 6.3 of this document.	
That it was essential to consider the merits of various alternatives to landfill to arrive at a proper perspective.	See above for the Use of Alternative Technologies.	
Flaws in the WRATE model mean that it under estimates the benefits of MBT as alternatives to landfill and to incineration for reducing GHG emissions and misleadingly suggests that incineration is	The WRATE model is not relevant to the determination of the Application under the EPR. Our assessment of greenhouse gases is detailed in Section 6.3 of this document.	
Allerton Waste Recovery Park	Page 155 of 225	EPR-NP3034CG-A001

superior to other approaches.	
That the methodology is flawed and their assumptions unrealistic e.g. use of 2006 municipal waste data, high non-ferrous recycling rate, climate change benefits of electricity generation, contaminated feedstock in the AD plant causing lower energy recovery and operational issues.	See comment above

Eunomia Report WRATE Analysis of Allerton Waste Recovery Park, dated 6 September 2012

The study was to review the WRATE modelling undertaken by the Consultant (Fichtner) on behalf of the Applicant. This was provided in the Application for planning consent.

Key findings

Lack of information on model assumptions making it difficult to replicate and verify analyses.	The WRATE model is not relevant to the determination of the Application under the EPR.
Waste composition is not representative of current residual waste and even less accurate with regard to representation of the waste throughout the duration of the contract.	The Applicant confirmed that the waste composition used was based on the collections authority's predictions, with 2015/16 being the base year in the WRATE model. The waste composition was based on local data and local recycling plans. The permit does not control the exact composition of the waste to be burnt but controls the mixture of the permitted waste types that can be burnt safely.
Assumptions for metal recovery (particularly non-ferrous) from both sorting and incineration processes are optimistic. This then over estimates the avoided CO ₂ emissions via use of recovered metals.	The Applicant confirmed that their assumption was based on operational experience and was consistent with guarantees provided by technology providers, which are generally 85-90% for ferrous metals and 85% for non-ferrous metals.
The level of assumed energy recovery via AD is optimistic.	Our assessment of energy efficiency is detailed in Section 4.3.7 of this document.
Use of a highly contaminated feedstock in a digester is likely to result in adverse operational issues.	The permit lists the types of wastes which can be accepted and safely processed by the AD plant.
Performance is unlikely to be representative due to the anticipated decarbonisation of the electricity grid.	The GWP calculation is based on current electricity generating practices. Future policy in this area is uncertain, but it is recognised that decarbonisation of the electricity supply will have an impact on the GWP figures. However at the present time, we are satisfied that the GWP calculations are appropriate.

A future scenario was modelled using a more probable future electricity grid mix and a more likely residual waste composition. This approach performed worse than landfill in terms of GWP.	Our assessment is detailed in Section 6 of this document.
This future scenario also performed significantly worse than other established MBT solutions in terms of GWP.	See comment above
That the AD/incineration approach does not perform discernibly better than an incineration only solution.	Acknowledged, our assessment of this is set out in Section 6 of this document.
That Fichtner do not claim that any of the three published WRATE reports represents a full options appraisal suggesting that these reports should not be presented as evidence within the consenting process.	This is not relevant to the Environmental Permitting process.

Eunomia Report Review of Waste Availability Modelling for the Allerton Waste Recovery Park, dated 6 September 2012		
That waste would need to be diverted away from the facility to ensure that recycling targets are met (50% by 2020 and 70% by 2040).	The process has been designed to ensure that only the 'true' residual waste is subject to treatment further down the waste hierarchy. Kerbside recycling will still take place, with the facility providing a safety net or 'final polish' to ensure that any recyclable materials are removed from the residual waste stream prior to further waste management, further down the waste hierarchy. It is a fundamental part of the recycling process.	
That some of the commercial waste would not be local authority collected (LAC) and so would not form part of the guaranteed minimum tonnage (GMT).	The permit controls the waste types that the facility is permitted to accept. The source of the waste is matter for consideration under the planning process.	
That there are no guarantees that gate rates will be commercially competitive.	This is not relevant to the Environmental Permitting process.	
That they will be competing directly with a range of UK and overseas treatment capacity, along with existing landfills.	This is not relevant to the Environmental Permitting process.	
That the facility presents a significant financial risk due to	It is a commercial risk if an Operator builds a plant they cannot then get the fuel to operate.	
Allerton Waste Recovery Park	Page 157 of 225	EPR-NP3034CG-A001

the future shortfall in waste and is oversized for the LAC waste in the local area.	
That consideration should be given to MBT which offers the flexibility of sending SRF to spare thermal treatment capacity in the UK and member states.	The Applicant has applied for a particular type of facility and the regulations do not require this to be compared with all other potential waste management technologies.
Eunomia Report Summary Report: Analysis of the Allerton Waste Recovery Park, dated 14 September 2012	
Waste Flow modelling Study, key findings	
The key findings are covered above	
Climate Change Impacts Study, key findings	
Most of the key findings are covered above.	
That the facility performs at least as badly as landfill and far worse than both MBT (dual fuel solution) and MBT (bio-stabilisation solution).	The Applicant has applied for a particular type of facility and the regulations do not require this to be compared with all other potential waste management technologies. They are required to demonstrate that their chosen option is BAT. Our assessment of this is set out in Section 6 of this document.
That the MT/AD incineration approach does not perform discernibly better than an incineration only solution. Thus the inclusion of both MT and AD appears, at best, to offer very limited environmental benefit.	Acknowledged, our assessment of this is set out in Section 6 of this document. MT is to remove recyclable and organic materials from the residual waste stream to ensure that the waste being burnt is 'true' residual waste.
That the Applicant does not claim that any of the WRATE reports represents a full options appraisal, suggesting that they should not be presented as evidence within the consenting process that the proposal is environmentally sound.	This is not relevant to the Environmental Permitting process.

A submission was made on the health effects associated with nano-particles.
Most of the issues raised are covered in Section c) below.

Brief summary of issues raised	Summary of action taken / how this has been covered
That it is impossible to justify increasing the levels of particulates further by building incinerators or any other major source of PM _{2.5} .	The HPA point out that in 2007 incinerators contributed 0.02% to ambient ground level PM ₁₀ and that PM _{0.1} is around 5-10% of PM ₁₀ . The impact from emissions of PM ₁₀ and PM _{2.5}

	have been screened out as being insignificant as detailed in Sections 5.2.2 and 5.3.3 of this document.
That we should refuse the permission as there is no need for the plant and cheaper alternatives exist.	Neither of these issues are relevant to our determination. Providing the Applicant can prove that the facility meets all the legal requirements, including environmental, technological and health requirements, then we are legally obliged to issue a Permit.

A submission was made on 'Further Implications of Overcapacity'. We have already addressed 'over capacity' in our comments above.

A submission was made dated 27 January 2013 commenting on the Applicant's Schedule 5 response that we received December 2012. Some of the issues are already covered above. Only those issues additional to those already considered are listed below:

Brief summary of issues raised	Summary of action taken / how this has been covered	
BAT Appraisal of the Facility		
That the Applicant claims that there are no emissions to water is wrong because pollutants in the air enter water through run off and leachates (e.g. from ash).	There are no direct emissions to water. Our assessment of emissions to air is set out in Section 5 of this document.	
That the noise assessment is inadequate because it does not take account of frequency and duration. It also needs to be compared with other waste management technologies.	Our assessment of noise is set out in Section 6.6.5. The method for rating industrial noise affecting mixed residential and industrial areas includes correcting noise levels for duration and character. The assessment of noise does not require them to compare the levels to other waste management technologies.	
That the Applicant's claim about the facility being designed to provide a flexible long-term waste management solution is misleading because: - has a 25-30 year contract; - non-biodegradable material entering the AD plant will cause operational issues and impact on energy recovery; - claims that different markets may be found for biogas or that the organic	 - the length of the contract is not a matter for consideration under the EPR; - permit conditions will control the waste that can be accepted at the AD plant and the maintenance systems that will be in place; - The Applicant has included this information to demonstrate the	
Allerton Waste Recovery Park	Page 159 of 225	EPR-NP3034CG-A001

residue might be suitable for landspreading are of no relevance.	potential future options that may become available for the AD plant.
It is misleading because the Applicant only compares two options (Option 1-MT, AD and EfW and Option 2-MT and EfW) and that by ignoring better options e.g. MBT, the chosen option is made to look reasonable.	See above for 'the Use of Alternative Technologies'
BAT Assessment for the Recovery/Disposal of Digestate	
That the assessment should have considered a wider range of possibilities for example ethanol production.	Whilst there may be other possibilities for its use, they may not be considered to meet the definition of 'availability' due to their limited application worldwide. In any event, the Operator will be required to apply the waste hierarchy to the digestate produced.
Moisture Content of the Various Waste Streams	
Questioned why for different waste types the moisture was identical for the three waste streams, MSW, HWRC and C&I. That they are collected and stored in different circumstances so unlikely that each will pick up the same amount of moisture.	The Applicant acknowledged that the moisture content will be different between waste loads dependant on a range of factors, including how it has been stored. However they consider that the data presented is representative of the average moisture content of the individual elements within the total waste stream.
That the moisture data is presented as being representative throughout the projected life of the facility, when the storage arrangements could change over time.	The Applicant confirmed that the projected waste arising data was produced by NYCC which considers the waste arising over the lifetime of the contract.
That better data is required which includes an informed analysis of likely future changes in the composition of each waste stream as well as taking account of the changing proportions of each waste stream within the total waste to be treated.	The Applicant confirmed that a worst case scenario for moisture had been considered with the inclusion of organic waste within the residual waste stream. If separate collection of this organic waste stream is undertaken in the future then the moisture content would reduce.
That a range of potential data values should be assessed and the least favourable be fully evaluated as required under the Precautionary Principle.	The precautionary principle has no application in this case (see above). The least favourable moisture content has been considered (see above).
Organic Mass Reduction Achieved by the AD Plant	
Questioned the differences with the waste materials given under Section 2.2 and Section 2.3.	The data in Section 2.2 represents the moisture content of the range of wastes that could be accepted at the facility. The data in Section 2.3 is representative of the components which may be present in the feed from the MT plant to the AD plant.

That the mass losses for paper, putrescibles and miscellaneous combustibles are presented without justification and that no consideration has been given to changing proportions as waste streams and compositions change over time. That a scheme for the recycling of paper and cardboard is likely to impact the future availability of these streams and questioned the relevance of the data in the face of such initiatives.	We are satisfied that the incinerator will be capable of burning the range of wastes set out in the waste tables. It is a commercial risk for an Operator if they cannot get sufficient waste to operate the Regulated Facility. The permit restricts the waste types and emissions and they cannot be changed without a formal variation so any change will not affect the environmental impact from the plant.
Conclusion	
That we should follow up these serious omissions	We were not fully satisfied that the information addressed all our points and requested additional information and clarification. Our assessment of this is detailed in Section 6 of this document.
That the facility does not represent BAT and an Environmental Permit should be refused.	Our assessment of BAT is set out in Section 6 of this document.

Submissions were made dated 11 February 2013 and 31 March 2013.

Brief summary of issues raised	Summary of action taken / how this has been covered
Articles were provided on the failings of a mechanical biological treatment (MBT) plant in Cambridgeshire which was operated by the Applicant. Concerns raised about the safety culture and reliability of the Applicant.	We are satisfied that the problems at the MBT plant were not due to Operator competence and we have no safety or environmental concerns with respect to these matters.

A submission was made dated 8 March 2013 commenting on waste, minerals and environmental harm. Some of the issues are already covered above. Only those issues additional to those already considered are listed below:

Brief summary of issues raised	Summary of action taken / how this has been covered
That we should take into account the “minerals” part of the Minerals and Waste Core Strategy that North Yorkshire County Council (NYCC) should but do not currently have. That we should take a holistic approach to considering an Environmental Permit by considering the need for landfill as part of ongoing	The Minerals and Waste Core Strategy is a matter for the Local Planning Authority to consider when considering the planning application.

minerals extraction in the county and therefore take account of technology approaches such as Mechanical Biological Treatment (MBT) + landfill that better match this requirement.	
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A submission was made dated 20 March 2013 commenting on the Environmental Impact Statement.

Brief summary of issues raised	Summary of action taken / how this has been covered
That it was incomplete because the Applicant claims that the incinerator is CHP ready and that they will seek a market for the heat. This is despite the fact that considerable landscape disruption would be necessary which is not mentioned in the Statement. It was stated that <i>'Due to its geographical location, any such market for the heat would involve a pipeline of some 5 to 10 kms in length and it is highly likely that this would involve tunnelling under the A1M and the A168 and/or other major roads.'</i>	Decisions over land use are matters for the planning system. The location of the installation is a relevant consideration for Environmental Permitting, but only in so far as it's 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. The plant will be designed so that CHP can be supplied if a user is identified. Any other regulatory issues, such as planning would need to be assessed and addressed when a user was found. Energy efficiency is considered in section 4.3.7 of this document.

c) Representations from Individual Members of the Public

A total of 70 responses were received from individual members of the public. These raised many of the same issues as previously addressed. Only those issues additional to those already considered are listed below:

Brief summary of issues raised	Summary of action taken / how this has been covered
Health	
That the health effects of the gaseous emissions are unknown (including dioxins, furans and heavy metals).	Assessments have been made against the relevant health based criteria as detailed in Section 5 of this document.
That the Applicant has not demonstrated that there will be no harm	Our checks confirm that the HHRA is conservative in its approach and
Allerton Waste Recovery Park	Page 162 of 225
EPR-NP3034CG-A001	

to human health.	assumptions made.	
Questioned what consideration had been given to the United States Environmental Protection Agency Report 26/8/2010 on Persistent, Bioaccumulative and Toxic (PBT) chemical programme on dioxins and furans.	Assessments have been made to the relevant health based assessment criteria. The HPA is the body charged by government with responsibilities in this area. We consult with the HPA and they have not raised any concerns with respect to this matter.	
Evidence from America that incineration cannot be carried out safely, with many plants being closed due to failure to prevent particles escaping into the atmosphere.	The facility would be regulated in accordance with the EPR and IED which ensure that the necessary controls and safety measures will be in place. Our assessment of particulate control is detailed in Section 6.3.1 of this document. What another regulator does is a matter for them and will be based on the facts of a given case.	
That proper tests should be carried out on humans of all ages because most tests are carried out on young male students and so are not representative.	This is not a matter for consideration under the EPR.	
That there is little recent research into waste from incinerators and that the 2004 DEFRA report is outdated.	The HPA published updates in 2009 and 2010. They are undertaking a project to compare health data with dispersion modelling around UK incinerators. The output from this will inform whether there are any changes in the current generic advice from the HPA but in the meantime they have restated their position as per the 2004 report.	
Reports showing evidence of increases in birth defects and adult cancers around incinerators e.g. BSEM report on the health effects of waste incinerators and a French study from Michela Franchini and others.	The HPA have reviewed research undertaken to examine links between emissions from incinerators and effects on health. Their position statement that the damage to health from modern, well regulated municipal waste incinerators is likely to be small, if detectable, remains unchanged.	
A report commissioned by the HPA remains unpublished.	See comment above	
That until the results of the new study commissioned by the HPA are known the Precautionary Principle should be applied and any further permissions for such plants refused.	The approach is precautionary, based on maximum capacity and IED Annex IV ELVs. Also see comments above that explain the precautionary principle has no application to this determination. In the meantime the HPA have restated their position as per the 2004 report.	
That the Applicant argue that the	The HPA have reviewed research	
Allerton Waste Recovery Park	Page 163 of 225	EPR-NP3034CG-A001

pollution will be no worse than fumes from cars but that research at the University of Southern California (USC) shows links between air pollution and human health with damage of brain cells.	undertaken to examine links between emissions from incinerators and effects on health. Their position statement that the damage to health from modern, well regulated municipal waste incinerators is likely to be small, if detectable, remains unchanged.	
That USC research has shown that nano-particles produce brain health consequences.	The HPA have reviewed research undertaken to examine links between emissions from incinerators and effects on health. Their position statement that the damage to health from modern, well regulated municipal waste incinerators is likely to be small, if detectable, remains unchanged.	
Questioned whether locally grown vegetables would be safe and that the assessment should cover a much wider area.	The Applicants HHRA considers this exposure route for the relevant determinands and is based on conservative assumptions. Our assessment of this is set out in Section 5.3 of this document.	
That pollution in the food chain didn't consider exposure to food crops such as oil seed rape, barley and wheat.	The assessment is based on conservative assumptions and we are in agreement with the conclusions made. We also consulted with the FSA	
That assessment of food chain pollution over a year does not address long term effects.	Our checks confirmed that the HHRA was conservative in its approach and assumptions made. It took into account exposure for a 70 year life time which is longer than the plant will be operational.	
That the health impact cannot be assessed by comparing predicted exposure concentrations with air quality standards and that the mix of pollutants should be considered.	If this is with reference to synergistic effects, the HPA did not raise any concerns with respect to this matter. Air quality standards have been developed primarily in order to protect human health and our recommended approach is to compare the concentration of pollutants with these standards. These standards do not exist for mixtures of pollutants. Our assessment methodology provides a substantial safety margin to protect health.	
Air Emissions		
Concerned about CO ₂ , nano-particles and other pollutants.	Whilst incinerators contribute to local air pollution, this contribution is usually a small proportion of existing background levels. Our assessment of CO₂ is set out in Section 6 of this document. The HPA point out that in 2007 incinerators	
Allerton Waste Recovery Park	Page 164 of 225	EPR-NP3034CG-A001

	contributed 0.02% to ambient ground level PM₁₀ and that PM_{0.1} is around 5-10% of PM₁₀. The impact from emissions of PM₁₀ and PM_{2.5} have been screened out as being insignificant as detailed in Sections 5.2.4 and 5.3.3 of this document.
Concerned that the bag filtration system will not capture nano-particles.	Both past and current research suggests that fabric filters are highly efficient at removing all sizes of particulate matter, including nano-particles, from the exhaust gases emitted from incinerators. Published data from research work spanning over 30 years suggests that the collection efficiency for all size of particles is not less than 99% and can be higher than 99.995%, even for nano-particles. Notwithstanding this, the impact from PM₁₀ and PM_{2.5} has actually been screened out as being insignificant under worst case operating conditions. We are therefore satisfied that the health of the public will not be put at risk by such emissions, (see Section 5.2.2.1 of this document). The filters will have multiple compartments with bag burst detection to minimise the release in the event of a bag rupture and the sites EMS will include the necessary maintenance requirements.
That the facility would be subject to the CO₂ emissions trading scheme (exception for MSW) because energy is produced.	The facility would not be subject to this scheme (see Section 6 of this document).
That there is no nationwide strategy which takes into account climate change and total emissions.	This is not a matter for consideration under the EPR.
That this application is contrary to NYCC policies on climate change.	This is not a matter for consideration under the EPR.
That any contribution to pollution is too much.	We carried out our assessment in accordance with DEFRA guidance. Our approach is detailed in Section 5 of this document.
That the Application runs counter to climate change concerns.	Our assessment under the EPR is detailed in Section 6 of this document.

That we provide evidence that PM _{2.5} will not exceed 0.03%.	Our approach to assessing the impact is set out in Section 5 of this document. Our assessment of PM _{2.5} is detailed in Section 5.2.2.1 and is screened out as being insignificant at 0.16% of the EU EQS target value.
That we prove that the technology does not increase the dioxins released.	The regulations require compliance with the dioxin limit and our assessment of impact is based on this limit. Our assessment of the proposed technology is detailed in Section 6.3.5 of this document.
Asked if we could guarantee that there would be no dioxins emitted from the stack.	See comment above
Concerned about pollutants entering the food chain.	See comments above
That agricultural crops would be damaged due to ground level ozones.	There is no assessment criteria for this; however given the small contribution from the facility to background levels it would be considered unlikely that it would contribute significantly to any increase in the ground level ozone.
That there is a grade 1 listed building adjacent to the facility and that the damage to buildings should be assessed over a wider distance than 3km (e.g. York Minster, Ripon Cathedral and Fountains Abbey).	There is no assessment criteria for this; however the predicted acid deposition contribution is small compared to existing background at nearby towns.
Questioned why 'real time' monitoring information would not be available to the public.	This is not a regulatory requirement; however it may be encouraged under some circumstances.
Concerned about emissions monitoring and how self regulation has failed historically.	If a Permit is issued we then start a continued assessment of the plant operations and its environmental performance in a number of ways: - Operators must monitor emissions at given times and report the results to us. - We regularly inspect Installations (announced and unannounced), review monitoring techniques and assess monitoring results to measure the performance of the plant. - We undertake auditing of operator monitoring. - Operators must inform us within 24 hours of any breach of the emissions limits, followed by a fuller report of the size of the release, its impact and how they propose to avoid this happening in the future.

	- Operators monitoring results are placed on the public registers. - We will take appropriate enforcement action and/or prosecute depending on the seriousness of any breach.
That dioxins and PAH can reform post thermal oxidisation and are only monitored periodically. This means that concentrations can be 11-14 times higher than at the furnace outlet where the measurements are taken.	The plant will be designed to minimise this effect. Exhaust gases will pass through the exhaust gas cleaning systems in particular activated carbon addition and bag filters which will remove dioxins formed post combustion. The dioxin monitoring position will be in the final exhaust stack.
That rail transportation should be used to deliver the waste to reduce air pollution.	This is not a matter for consideration under the EPR. If relevant, it could be considered as part of the planning process.
That the plant is designed to meet the WID, but that it is likely that in the future there may be stricter controls on air emissions (e.g. USA).	The facility will be required to comply with all relevant regulations during its operational life which will include compliance with any future changes.
Concerned about elevated emissions due to failure of abatement equipment with no failsafe mechanism or built-in redundancy. The back-up instrumentation appears to have no built-in redundancy.	See comment above If the back-up instrument fails then this would necessitate a shut down.
That the monitoring for PM _{<2.5} is not effective.	The Permit requires the operator to measure total particulate matter (TPM), which includes all sizes of particles, including those 2.5 microns and smaller.
That the plume will deposit on Marton cum Grafton primary school (one mile to the north / north east) due to the prevailing south westerly winds.	Our assessment included the point of maximum impact which did not predict any exceedance of EQS/EALs. The impact was less at the most impacted sensitive receptors which were nearer to the Regulated Facility than the school.
The impact on Marton Carr, a SSSI, which holds crested newts and other protected species.	Marton Carr is outside the 2 km screening distance for SSSIs. We are satisfied that the impact on more distant sites will not be of any significance.
Monitoring	
Monitoring is basic with no back-up position.	There will be a back-up CEMs in place.
Too much reliance on self-monitoring with infrequent independent checks proposed by the Environment Agency. That we admit that in best we would check annually but in practise it could be less than this.	See comment above. The frequency of such visits is based on environmental risk and is also set out in Article 23 of the IED.
That emissions monitoring is not	Continuous monitoring will be included for

continuous.	particulate, TOC, HCl, CO, SO ₂ and NO ₂ , as required by Annex VI of the IED.
That ambient air and soil/vegetation monitoring should be undertaken to get a true picture.	Emissions are measured at source – i.e. in the chimney stack. There is no provision in the Permit for monitoring of ambient air quality or soils/vegetation, because the impact is too low to be measured in this way.
How emissions from the landfill will be monitored such that attributable emissions from the facility can be identified.	The permit will include conditions to establish baseline ground and groundwater conditions prior to operation. Details are included in Section 4.2.2 of this document.
Water Emissions	
Concerned about groundwater pollution (aquifer) and damage to the lakes at Allerton castle.	Our assessment is detailed in Section 6.6 of this document and we are satisfied that the appropriate measures will be in place.
Impact	
That if there is any potential for harm to come to human or animal life, agricultural or greenbelt land, that we must not issue a Permit.	Providing the Applicant can prove that the facility meets all the legal requirements, including environmental, technological and health requirements, then we are legally obliged to issue a Permit. We are satisfied that there will be no significant pollution of the environment or harm to human health.
Impact at a new hotel development less than a mile away.	Our assessment included the point of maximum impact which did not predict any exceedance of EQS/EALs.
Adverse impact on protected wildlife species (red kites, buzzards, badgers, otters, roe deer, wagtails, owls etc).	Our screening did not identify any protected or priority species but the controls imposed in any permit will protect the wider environment and wildlife within it.
Impact on historic sites and areas of natural beauty.	We have assessed against all the relevant criteria as detailed in Section 5.4 of this document.
That the Applicant's assessment is incomplete because it only looks at the immediate locale and emissions would contribute to ecological damage and damage to materials over a wider area.	Consideration of impacts further afield are taken into account as worst case impacts are presented at receptors and further afield any impact would be less. All relevant ecological receptors have been considered.
That it is not acceptable to confine the study to residential areas within 3 km of the facility or to ignore the sale of local agricultural produce which will spread effects over a much wider area.	Predictions further afield are as expected substantially lower and screen out as insignificant compared to peak impacts within 3km.
That air pollution accelerates degradation of buildings, works of art and archaeological treasures through corrosion or erosion (caused by acidifying and oxidising) and soiling	There is no assessment criteria for this; however the predicted acid deposition contribution is small compared to existing background levels at nearby towns and impacts further afield are substantially lower.

(particulates). That the Applicant is wrong to limit consideration of this threat to a 3 km radius.		
Cumulative impacts with other similar proposals not assessed.	Other similar proposals are too distant to have a cumulative impact.	
No assessment of the impact on Westwood (Westview on OS maps) a domestic property located on the edge of Marton Carr. The property has a borehole and breeds lambs and pigs for meat, chickens and ducks for eggs and has a productive vegetable plot.	The HHRA takes a worst-case exposure to individuals as a screening approach. Given that predictions are insignificant, they will be even lower at other locations and therefore not a cause for concern.	
Waste		
That we consider how flexible the facility would be to cope with differing quantities of waste in the future.	We are satisfied that the incinerator can accept and safely burn the wastes included in the Permit waste tables.	
As recycling increases waste will need to be imported.	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 or sub-region. 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 arising 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.	
That there is no nationwide strategy for recycling projections.	This is not a matter for consideration under the EPR.	
That the Applicants wants to leave the options open to accept hazardous waste and that we should prohibit this.	Any changes would require a variation to the Permit which would include an impact assessment of the emissions from the facility. The Permit does not authorise the acceptance of hazardous waste.	
That more commercial waste will be used to feed the incinerator releasing toxic products.	Limits are placed on the total amount of waste and the types of waste by reference to the EWC codes that can be accepted and ELVs for releases to air are set in the Permit which must be complied with.	
Operation		
Allerton Waste Recovery Park	Page 169 of 225	EPR-NP3034CG-A001

That only 5% of the total waste input will be recycled.	See comments above	
That the company has little experience of incineration.	Article 50(7) of IED requires that a waste incineration plant is operated and controlled by a natural person who is competent to manage the plant and this is implemented by permit conditions 1.1.1 to 1.1.3. The permit also specifies who will be the Operator of the facility. When we assess operator competence for a facility of this nature a key requirement is that they will have an Environmental Management System (EMS) in place. The EMS covers the design and installation of suitable equipment, operation and maintenance, accidents, training of staff and operating instructions. A pre-operational condition 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 Regulated Facility is operational. An improvement condition is included requiring the Operator to report progress gaining accreditation of its EMS.	
Questioned where the cooling water would be sourced.	The incineration plant will be equipped with an air cooled condenser (ACC) which does not require large volumes of water. The water system has been designed so the use of potable water is minimised.	
That the performance of the incinerator will deteriorate with time.	Maintenance requirements will be covered by the sites EMS, see above comment. Emission limits will apply for the life of the incinerator.	
That the processing of incinerator bottom ash will generate large quantities of toxic dust. Questioned what would happen to the contaminated water resulting from the water sprays used to control this dust. Also questioned what would happen to the toxic residue of the bottom ash.	Run-off leachate from maturation of the bottom ash will be contained within separate drainage within the IBA Processing area, and re-used for maturation. Any hazardous residues/wastes produced by this process will be disposed of or recovered at a suitably permitted facility.	
Technology		
That the technology is out dated and will be so for 25 years.	The regulations require the technology to be BAT. Section 6 of this document sets out our assessment of BAT for the proposed facility.	
That a case for the selected technology	A case for the selected technology was	
Allerton Waste Recovery Park	Page 170 of 225	EPR-NP3034CG-A001

has not been made.	provided in the BAT assessment which was provided with the Application. Additional information was also provided during our determination process. Our assessment of this information is provided in Section 6 of this document.	
That the facility should be compared to technologies like thermal MBT as they are also integrated systems and that such a comparison would show that it is a bad system and that a permit should be refused.	See above for the Use of Alternative Technologies.	
That a case to prevent or minimise emissions has not been made.	Our assessment of the Applicant's proposals for BAT and emissions control is addressed in Section 6.2 of this document.	
That a case demonstrating that the activity will not cause harm to human health or the environment has not been made.	Our assessment of the Applicant's proposals for minimising the facilities environmental and human health impact is addressed in Section 5 of this document.	
That the monitoring standards are outdated, with reference to German standards.	The monitoring standards are specified in the Permit with MCERTS certification or accreditation required.	
That north Yorkshire has sufficient disused quarries capable of accepting landfill for 500 + years which could then benefit from carbon capture and renewable energy from methane gas.	This is not a matter for consideration under the EPR.	
Energy Efficiency		
Questioned what will happen with the waste heat and would it be released to the atmosphere.	The incineration plant will operate an air cooled condenser (ACC) to remove the residual heat from the spent steam output from the electricity generating plant. This will be released to atmosphere.	
That 45% of the energy generated will be wasted due to the location of the facility.	Decisions over land use are matters for the planning system. The location of the installation is a relevant consideration for Environmental Permitting, but only in so far as it's 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. Energy efficiency is considered in section	
Allerton Waste Recovery Park	Page 171 of 225	EPR-NP3034CG-A001

	4.3.7 of this document.
Planning	
Questions were raised about NYCC ability to judge the Planning application in a fair and unbiased way. Suggested that it should be assessed through a full public inquiry by an independent planning inspector.	This is not a matter for consideration under the EPR.
That the proposal is contrary to local, regional and national/EU policies.	We have taken into account all considerations relevant to the permitting process, in reaching our decision.
A link was provided to the NYWAG 72 page Planning objection report dated 27 August (http://www.northyorks.gov.uk/CHttpHandler.ashx?id=19755&p=0)	This document reviewed the Applicant's Supplementary Planning Statement and accompanying material. NYWAG provided detailed comments on the permit Application which we have addressed in this Annex (see above).
A link was also provided for the Green Hammerton Parish Council Planning objection letter dated 25 August 2012. (http://www.northyorks.gov.uk/CHttpHandler.ashx?id=19752&p=0)	This letter was an objection from Green Hammerton Parish Council to the Planning proposal. Those matters relevant to the EP process have been addressed in this Annex.
Odours	
Concerned about nuisance odours from ammonia.	Our assessment of odour is detailed in Section 6.6.4 of this document. Ammonia emissions are associated with the incineration process and it is highly unlikely that they will be a source of odour.
Concerned about rotting materials that can be stored for up to 14 days and the frequency of the opening of roller shutter doors.	An OMP will be in place to ensure that the appropriate measures are in place.
Noise	
Concerned about pollution from noise.	Our assessment of noise is detailed in Section 6.6.5 of this document. We are satisfied that the appropriate measures will be in place.
Miscellaneous	
That we are nearing over capacity for incinerators so this one is not necessary. That there will be spare capacity at the Hartlepool and Ferrybridge facilities.	Overcapacity is not relevant to our determination.
That it will harm the economy and harm commitment to sustainability.	Economic issues are not matters for consideration under the EPR. Sustainability is addressed in Section 7 of

	this document (Section 4 of the Environmental Act 1995).
That there has been no proper public consultation.	We have carried out a full public consultation as detailed in Section 2 of this document. We have accepted written responses well beyond the formal consultation period.
That it has been made as difficult as possible for non-technically minded people to put their views forward.	We held a public drop-in event with the purpose of explaining our assessment of the Application, the permitting process and how members of the public can take part in this.
Concerned that the only other incinerator built by AmeyCespa is in Andorra which is not in the EU and so not subject to the same regulations.	If a Permit is granted it will deliver the relevant legal requirements, in particular of IED. The Operator will be required to comply with the conditions of the Permit.
Concerned that the Environment Agency officer assessing the Application will not be local and so not familiar with the site.	There are close links between national permitting and the Area office, including the PPC officer involved with the pre-application discussions.
That we cannot rely on a single contract with NYCC/CYC as justification for a facility of this size. Details of the contract are not publicly available.	This is not a matter for consideration under the EPR.

d) Representations Made at The Drop-In Event

The drop-in event was attended by a mixture of local residents and business community potentially impacted by the proposed facility. Written representations have been included above.

B) Advertising and Consultation on the Draft Decision

This section reports on the outcome of the public consultation on our draft decision carried out between 7 May and 4 June 2013 and the public drop-in event held on 13 May 2013 at Knaresborough House.

We also sent our draft decision document and draft permit to Statutory and Non-Statutory Bodies which are listed in Section A) of this Annex.

In some cases the issues raised in the consultation were the same as those raised previously and already reported in section A) of this Annex. Where this is the case, the Environment Agency response has not been repeated and reference should be made to section A) for an explanation of the particular concerns or issues.

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

a) Consultation Responses from Statutory and Non-Statutory Bodies

Response Received from Harrogate Borough Council , Planning Services, Department of Development Services, sent electronically 23 May 2013	
Brief summary of issues raised:	Summary of action taken / how this has been covered
No observations to make	No action required

Response Received from North Yorkshire County Council , Senior Planning Policy Officer, sent electronically 20 June 2013	
Brief summary of issues raised:	Summary of action taken / how this has been covered
That the draft permit refers to the exhaust gases from the two AD gas engines being released via <u>two</u> 26 metre high stacks. Paragraph 1.7.35 of the Planning Statement, submitted to NYCC (taken into account in the determination of Planning Permission C6/500/63/Q/CMA dated 14 February 2013), states that 'the biogas engines have a <u>single stack</u> associated within them for exhaust emissions'. However, Paragraph 1.3.3.5 of the Permit Application Supporting Information (dated 22 March 2012) refers to the exhaust gases passing through two flues (labelled as emission points A4 and A5 on the permit). Confirmation was received that it is <u>two flues</u> within a single stack 26 metres in height, which means there are two proposed emission points adjacent to each other, located within the same stack/structure.	No action required, there are two emission points, A4 and A5 from two flues within a single stack.
An application for judicial review of the decision made by the County Council has been placed before the courts and dates for both a hearing to decide whether a judicial review should be granted and for a judicial review have been set for July 2013.	This matter is not relevant to the permitting process under the EPR. We have a statutory duty to determine the application made to us and do not consider the outcome of the judicial review will affect our determination.

b) Representations from Councillors and Local Parishes

Response Received from Clerk to the Hopperton Parish , sent electronically 22 May 2013	
Brief summary of issues raised:	Summary of action taken / how this has been covered
Visually the chimney stack is not in keeping with the local rural surroundings.	Visual impact is a matter for consideration under the Planning system. Our requirements under the EPR are to ensure that the stack height is compliant with these regulations, which require waste gases from waste incineration plants to 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. Also refer to Annex 1 IED Article 46(1) in this document.
Other concerns and issues raised	An explanation of the other concerns and issues raised are covered in Section A above.

Response Received from the Local Councillor for Minskip	
Brief summary of issues raised:	Summary of action taken / how this has been covered
An explanation of some particular concerns and issues was requested.	An explanation of the particular concerns and issues raised are covered in Section A) above and no further explanation is considered necessary.

Response Received from the Councillor Andrew Willoughby	
Brief summary of issues raised:	Summary of action taken / how this has been covered
That it was difficult to see any value to the consultation on the draft decision on such a complex issue presented through such lengthy documents.	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 the 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.

Response Received from the Chairman Parishes group against the facility	
Brief summary of issues raised:	Summary of action taken / how this has been covered
That the lack in attendance at the drop in event was due to a lack of signage and advertising and the change of date at short notice.	Signage/Advertising All of the documentation relating to our "minded to" decision was placed on our website. We wrote, on more than one occasion, to every individual or organisation who had previously expressed an interest in the first round of

	consultations. This involved nearly four hundred letters and e-mails. The letters gave details of where to find the documents and where and when the public drop-in would take place. The relevant parish councils also received these letters. We issued a media briefing to relevant contacts across Yorkshire. This involved twelve newspapers and eight TV/radio stations. As regards the lack of signage, we do not believe this omission would have prevented anyone who was sufficiently interested from turning up, but we do agree Environment Agency signs, outside of the building, would have been beneficial for those intending to visit the drop-in meeting. Changing the date We indicated in a conversation, on 17 April, we were looking at 14 May to hold the drop-in meeting. This date was dependent on the availability of the venue. The chosen date of 13 May was the only one available. This date was then indicated in the letters and newsletters sent on 30 April and 7 May, which we also quoted in our media briefing.
That the environment will be affected by light pollution.	This primarily relates to visual amenity which is addressed through the planning regime.
The possibility of rodent infestation and flies and other flying disease carriers.	The Permit requires the implementation of an EMS before operation can commence. This will require procedures to be in place which will include those for the suitable storage of waste.
Concerned about the Applicant being able to top up with toxic waste.	The Permit does not allow hazardous wastes to be treated at the facility. If the Applicant wanted to change the range of permitted wastes, to include hazardous wastes, then they would have to apply to vary the Permit. This would fall into the category of what we call a "substantial variation" and we would carry out a full public consultation before reaching a decision.
That the venue was not the best choice and that Marton cum Grafton Hall would have been the ideal venue.	We cannot comment on whether Marton-cum-Grafton Hall would have been a better venue. We used Knaresborough Hall for the first stage of the consultation in August 2012, and more than a hundred people attended. We are not aware of any adverse comments about the choice of location on that occasion, either from those who attended or those who chose not to. We are satisfied Knaresborough hall was a suitable venue.

c) Representations from Community and Other Organisations

Representations were received from North Yorkshire Waste Action Group (NYWAG). Some of the issues raised were the same as those raised previously and already reported in section A) of this Annex. Where this is the case, the Environment Agency response has not been repeated and reference should be made to section A) for an explanation of the particular concerns or issues.

Incinerator Ash: Environmental Permit Conditions - May 2013	
Brief summary of issues raised:	Summary of action taken / how this has been covered
2.1: Eco-Toxicity and Environmental Permit Conditions	
Given the financial incentive to sell the treated IBA the only way to ensure safety both on and off-site would be to require: • Frequent and regular independent sampling for eco-toxicity; • The whole ash batch should be treated as hazardous if the sample tested is eco-toxic. That this should be conditioned in the Permit to be undertaken at frequent intervals (at least daily but preferably more often)	It is the responsibility of the producer to characterise the IBA as hazardous or non-hazardous which is controlled by other legislation and not covered by the Permit. Where waste produced on site is sent to a waste operation, condition 2.3.4 requires the operator to provide specific information to the recipient. Eco-toxicity is one of the tests for hazardous nature. See also pre-op condition PO 03
2.2: Leaching and Environmental Permit Conditions	
That a suitable monitoring regime and management plan should be conditioned in the Permit to cover likely problems from leaching and include failure of the bunding.	A pre-operational condition in the Permit addresses the monitoring of soil and groundwater. Appropriate storage and containment measures will be in place for their storage and an accident management plan will form part of the sites EMS.
Fly ash / APC residues	
That all handling of fly ash and APC residues take place under sealed conditions.	See comment above in response to the HPA in Section A) of this Annex.
That fly ash and APC residues handling facilities have adequate secondary containment.	We are satisfied that ash and residues will be stored and transported in a manner that prevents fugitive dust releases.
That loading of fly ash and APC residues onto vehicles takes place in a contained environment with an air locking system.	See comment above in response to the HPA in Section A) of this Annex.

That all vehicles handling fly ash and APC residues carry it in sealed containers. That the condition in the draft permit isn't stringent enough as it could be met by sealing the ash in plastic bags. The Permit should specify the nature of the container which should be sufficiently strong to withstand an accident.	The Application confirms that APC residues will be removed by enclosed tankers. We have secured this by the incorporation of Section 2.8 of the Application Supporting Information (Waste Recovery and Disposal) into Table S1.2 of the Permit.
That there is a gyratory road/traffic system designed to minimise traffic accidents on-site.	Accidents on site will be covered by an accident management plan which will form part of the sites EMS. This is detailed in Sections 4.3.2 and 4.3.4 of this document. The purpose of the accident management plan is to identify potential accidents, put in place any necessary measures to minimise the chances of them happening and have plans in place to minimise the effects if the worst occurs. Any additional controls for on-site traffic will depend upon the risks identified and will be set out in this plan.
That there are appropriate speed limits to be policed by speed cameras (sites as agreed with the Environment Agency) with any breach being treated as an infringement of the Permit.	See comment above

Chimney Height - May 2013		
Brief summary of issues raised:	Summary of action taken / how this has been covered	
Some of the issues raised were the same as those raised previously and already reported in section A) of this Annex and in the AQMAU report C921a (C954). Where this is the case we have listed the issue, but reference should be made to section A) for an explanation.		
Amey Cespa's Results		
At this point it is worth considering AmeyCespa's sensitivity analysis on stack height and their reasoning. They did not, of course, take into account the modelling uncertainty arising from the fact that other advanced models produce different answers nor the implications of sub-optimal operation (see later), nor did they consider other uncertainties in	Stack height analysis using NO ₂ annual impacts is an appropriate approach as NO ₂ is the most sensitive EU EQS to potential exceedence. EU EQS have the highest order of protection. The stack height assessment itself did not explicitly take modelling uncertainty into account but their detailed assessments at the proposed height did which we have commented on already.	
Allerton Waste Recovery Park	Page 178 of 225	EPR-NP3034CG-A001

the input data etc that we have not attempted to quantify. Thus their sensitivity analysis falls some way short of being a true sensitivity analysis.		
AmeyCespa's results (unfortunately and perhaps misleadingly only given for NO ₂) show that increasing the stack height from 40m to 70m reduces the ground impact of the long term Process Contribution (PC) by 4.8µg/m ³ , an 80% reduction in the total concentration or 12% of the AQO of 40µg/m ³ . The impact on the annual average PEC is much smaller as the facility will only make a small contribution to the background concentration of NO ₂ . They found an increase in stack height has a similar effect on the peak contribution of the plant to the 99.79th percentile of hourly means. An increase from 40m to 70m leads to a reduction in the PC of 35.2µg/m ³ , a reduction of 73% of the total concentration or 17% of the AQO of 200µg/m ³ . According to AmeyCespa, increasing the stack above 70m results in the short term PC from the facility being considered insignificant under the EA criterion while lesser stack heights mean that it is "not insignificant".	At a stack height of 70m the impact is not screened out as being insignificant; however the predicted impacts relate to the peak location on the modelling grid which is in a location where the background NO ₂ is not elevated.	
We find this argument unconvincing; it is merely a sophistic word-play to argue away effects that are nonetheless real. It would be better to choose a stack height that produces insignificant effects against the EA criteria and imperceptible ones against the EPUK criteria. After all. It is a simple matter to increase the stack height even if raising it from 70m to 80m only reduces the PC by 1.5% of the AQO.	See comment above There is no suggestion that the protective level of 40µg/m ³ will be exceeded as a result of this proposal. In fact the predicted impact from the incinerator stack alone (taking modelling uncertainties into account) is only marginally above the "insignificance" threshold and could not be regarded as significant.	
Implications of Modelling Uncertainty		
Modelling uncertainty is a systematic (as opposed to random) error and offers a measure of the extent to which models fail to represent the	We have taken modelling uncertainty into account in our review of the applicant's modelling assessment. Model Validation studies, comparing predicted values with measured data for long-	
Allerton Waste Recovery Park	Page 179 of 225	EPR-NP3034CG-A001

physical reality as well as being a measure of the difference between models. It also implies that there are risks in reliance on just one model.

term averages, typically perform within approximately +/-30%. In our review of the Application, we undertook sensitivity modelling for a range of model parameters (such as terrain, buildings, meteorological data). We also used alternative modelling software (AERMOD and CALPUFF) as well as ADMS software used by the Applicant. In doing so we have established that predicted impacts are unlikely to be any greater than those presented by the Applicant and hence using them for determination applies the "precautionary principle."

As a result of our checks, we are satisfied that the Applicant's air quality and abnormal operations assessments can be used as a basis for permit determination. We do not agree with the absolute numerical values given in their reports, but can agree that any differences are not likely to affect the Applicant's conclusions.

Our Calpuff predictions for this specific case give higher short-term and long-term predictions at many sensitive receptors than the peak predictions using ADMS or Aermom. As an example, for some receptors, the increase in long-term predictions using Calpuff can be a factor of 2 (double). However, the increase in predicted concentrations is not significant enough to change our conclusions taking modelling uncertainties into account.

Any differences in predictions using the three models (Calpuff, AERMOD and ADMS) do not affect conclusions using the highest of all models in our check calculations. We therefore accept that the Applicant's model is fit-for-purpose and alternative meteorological data to check specific local conditions is not necessary in this case. Note that with the exception of their assessment for Cr (VI) and arsenic, assessments were made assuming emissions at the maximum IED ELVs and is therefore conservative in that respect. Modelling uncertainties are not likely to affect conclusions.

We have included details of this in Section 5.2 of this document.

We carried out check modelling for human intake

	of dioxins and furans using empirical calculations based on both HHRAP and “Risk Assessment of Dioxin releases from Municipal Waste Incinerators” ¹¹ (HMIP 1996). Making conservative assumptions about dietary intake and following default screening parameters, our checks are relatively consistent with the Applicant’s predictions. Our checks also confirm that intake is not likely to be any greater than those predicted by the Applicant.	
It is clear from the extensive epidemiological evidence reviewed in our Chapter on Health Risks (submitted in response to the EA’s second consultation) that they extend far beyond the area covered by the air dispersion model. While the model’s primary purpose was to assess chimney height and the consequences for people in the immediate vicinity, failure to model over an area which covers, at the very least, Harrogate and York would appear to suggest that neither the EA nor AmeyCespa have properly considered the health risks in this wider area and beyond. The lower risks to each individual are offset by the much greater number of individuals so producing a risk of morbidity and mortality spread among the population, consistent with findings reported in the Health Risks chapter.	We have already commented on the impacts further afield. With respect to the purpose of the model, in the context of the Application the purpose was primarily to make predictions of the likely impacts as part of the impact assessment.	
Synergy and Potentiation		
When faced with phenomena that are difficult to quantify, it is unethical simply to ignore them or pretend that they do not exist. Instead, one must accept that these phenomena are real and must be accounted for in an empirical and approximate manner. The correct regulatory response is to factor in a significant safety margin.	Health related exposure standards have a margin of safety built in. Also refer to the HPA response for health related implications.	
Human Rights		
Failure to increase chimney height in response to the arguments presented above would be a dereliction of the EA’s duty of care. Moreover, we contend that it would constitute a	We have assessed the predicted impacts based on a 70m stack height and we are satisfied that taking modelling uncertainties into account and applying a precautionary approach, that the emissions will not result in significant pollution or	
Allerton Waste Recovery Park	Page 181 of 225	EPR-NP3034CG-A001

breach of Article 2, Right to Life, of the European Convention on Human Rights (ECHR).	harm to human health.
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Memorandum submitted by Professor J C Dearden (Waste 69)	
Brief summary of issues raised:	Summary of action taken / how this has been covered
A paper was submitted setting out concerns about waste incineration in general and that England places too much emphasis on incineration as a means of waste disposal.	
That incineration uses much more energy and produces much more carbon dioxide than does recycling.	Incineration is not an alternative to recycling. The facility will provide a safety net or 'final polish' to ensure that recyclable materials are removed from the residual waste stream. The process has been designed to ensure that only residual waste is incinerated.
That atmospheric pollution (including dioxins) is better than it was 10 years ago, but still worse than claimed.	Our assessment of the impact from atmospheric pollution is detailed in Section 5 of this document and is based on a worst case scenario of the plant operating at 100% capacity and at maximum ELVs.
That the damage to fetuses and infants is much greater than it is to adults and is grossly underestimated.	Foetuses and infants are more vulnerable and as detailed above; our assessments of the impact on human health are based on a worst case scenario.
That the Precautionary Principle needs to be applied more rigorously.	See "The Precautionary Principle and Adverse Health Effects from Incinerator Emissions May 2013" below.

Comments on Draft Decision Document - May 2013	
Brief summary of issues raised:	Summary of action taken / how this has been covered
Consultation Process	
The Draft Decision Documents section on consultation in the " <i>How we reached our decision</i> " section is self-congratulatory in tone. However, to date this self-congratulation is not justifiable. The whole point of consultation is that it is a two-way process but we can find no evidence whatsoever that the Environment Agency have taken on board any comment submitted by opponents of the AWRP scheme such as ourselves. It is to be hoped that comments received in this second round of consultation are taken more	We have considered all the issues raised by those who responded to our consultations. How we addressed responses to the first round of consultation on the AWRP scheme is explained in Annex 4 Part A) 2) of this document. When considering responses from members of the public and other bodies, we will consider to what extent the issues raised fall within the scope of the legislation under which the decision is made.

seriously and not simply dismissed.		
The 20 day deadline for consultation is too short and should be extended. The EA should extend this in view of the length and complexity of the Draft Permit and Draft Decision Document.	We have consulted the public extensively, in line with our statement on public participation which has included a second round of consultation on the draft Permit and decision document. This enabled the public to consider the decision the Agency was “minded to” take, and to make comments on a fully informed basis. Again, all these comments have been carefully considered in reaching our final decision as summarised in this Annex. We accept written comments up until the point when we reach our final decision which in this case has extended beyond the consultation date.	
In view of the fact that the Environment Agency has not properly engaged in a two-way consultation process also failed in its Duty to Involve (Section 7.4.1 of the Draft Decision Document).	We believe the public consultations we have carried out have been comprehensive and entirely consistent with our policies and legal obligations. Once we become aware that an Application is likely to be of high public interest, we seek to identify those who are potentially most affected or who have a significant interest in the issue by virtue of their position in the community. This ensures our efforts to engage with the public are targeted wisely. Our local officers have attended a number of meetings with parish councillors, NYWAG representatives and other members of the public over the past two years. Many of these have been at Marton-cum-Grafton or Arkendale. Furthermore, ongoing dialogue has been maintained with nominated representatives. Also see comments above on consultation.	
The Legal Framework		
The legal framework is up to date but laws change over time. This needs to be recognised and the draft Permit written in such a way that Conditions and Schedules therein can be changed unilaterally by the Environment Agency.	Regulation 34(1) of the EPR requires the regulator to periodically review environmental permits but does not stipulate a timescale for this. We review permits at regular intervals and this is primarily done by sector for consistency. During this review the Permit will be amended as necessary to reflect developments in BAT for the type of facility. In addition to this, we also take into account any changes in law and implement any necessary changes to Permits as a result of this.	
Allerton Waste Recovery Park	Page 183 of 225	EPR-NP3034CG-A001

Key Issues in the Determination			
We accept that the key issues arising during this determination were: • The emissions to air from the Regulated Facility and their impact on human health and the environment • The application of BAT to the Regulated Facility as a whole • The application of BAT to the Anaerobic Digestion (AD) plant		Acknowledged	
However, we contend that the health risks in connection with the regulated facility have not been properly taken into account both because of the EA's failure to take account of a wide range of evidence that contradicts the HPA's views and the EA's failure to follow the Precautionary Principle as demanded by EU law. We further note that various aspects of the AWRP appear to breach the European Convention on Human Rights, an issue that has been raised with the European Commission. Much of this is discussed in accompanying documents from NYWAG and others.		Whilst the HPA is the body charged by government with responsibilities in this area, we have had regard to the various other views submitted to us. Regarding the Precautionary Principle, see "The Precautionary Principle and Adverse Health Effects from Incinerator Emissions May 2013" below. Regarding Human Rights, see "Violation of European Convention on Human Rights - May 2013" below.	
We further contend that the EA's application of BAT to the Regulated Facility as a whole and to the EfW and Anaerobic Digestion (AD) plant separately is inappropriate (at least in some areas), as set out below.		See BAT sections below	
Minimising the Regulated Facility's Environmental Impact (?)			
The use of air dispersion models is subject to errors of various types including errors in the input data (unless it is deliberately falsified, this will be a mix of random errors and systematic errors such as using weather data from an inappropriate site) errors in the model itself (which can be seen in projections from differences between results from different models but not otherwise detectable from modelling) and errors in interpretation. In addition to these errors, there are different interpretations concerning the		See comments above in Sections A 2) b) and Section B c).	
Allerton Waste Recovery Park		Page 184 of 225	EPR-NP3034CG-A001

magnitude of the health risks (the dose-response relationship). If one actually takes into account “all of the expert opinion available”, it is not possible to agree with the HPA’s conclusion “<i>While it is not possible to rule out adverse health effects from modern, well regulated municipal waste incinerators with complete certainty, any potential damage to the health of those living close-by is likely to be very small, if detectable</i>”		
In our view the input data to the model is unreliable and the EA Draft Decision Statement ignores the evidence which we previously presented. This but one example of many where consultation has been a sham (see above) since it would have been both easy and perfectly proper to obtain on-site data for a limited period for comparative purposes. Again, the assertion that the well known meteorological conditions in the Vale of York have no relevance is unjustifiable without seeking data and ensuring that the models used were able to recreate the actual conditions observed.	See comments above in Sections A 2) b) and Section B c).	
Even on the flawed modelling that Amey Cespa and the EA have used, allowance for the inherent uncertainties in data and modelling demonstrates that the chimney heights are too low. This is the subject of another chapter where the necessary height of the EFW incinerator chimney is estimated.	See comments above in Sections A 2) b) and Section B c).	
We remind you here that the Precautionary Principle must be used when the effect is known to exist but the magnitude of the effect is uncertain. In this case, one must take the worst case from the modelling results together with a reasonable estimate of the implications of the various uncertainties. Failure to do this would be contrary to the Precautionary Principle and therefore to EU law.	See comments above in Sections A 2) b) and Section B c) and below on “The Precautionary Principle and Adverse Health Effects from Incinerator Emissions May 2013”.	
Note that we are not disputing the use of dispersion modelling, merely the way in which they have been used.	See comments above in Sections A 2) b) and Section B c).	
Allerton Waste Recovery Park	Page 185 of 225	EPR-NP3034CG-A001

We consider that the interpretation of the modelling results are in error because: • There are very many more pollutants emitted than were modelled; • The modelling only looks at air dispersion but not at other processes (e.g. chemical reactions) that may affect composition and concentration; • The interpretation fails to take account of processes such as sensitisation, potentiation, synergy and hormesis. Since the Draft Decision document shows that the EA's Permitting Team have either made no attempt to understand these processes or have failed to do so, we have included scientific evidence as to their importance with our input to the Second Consultation. It is therefore vital that the EA re-interpret the position in the light of this new material and give renewed consideration to the fact that they are imposing unacceptable risks on local communities. It is also vital that the EA adopt a more critical approach to Amey Cespa's data instead of the passive acceptance indicated by so many sentence starting "<i>We accept...</i>"; after all we have shown (as have Eunomia) that Fichtner on behalf of Amey Cespa used misleading and unjustifiable assumptions to produce false claims on climate change. If they can do this, then why not check whether other data is so "selective".	See comments above in Sections A 2) b) and Section B c) and below on climate change.
If the EA still feel that they are justified in imposing AWRP on an unwilling community then we ask that they do at least increase chimney height in line with the evidence we have submitted and as required by the Precautionary Principle.	See comments above on "Chimney Height – May 2013" and below on "The Precautionary Principle and Adverse Health Effects from Incinerator Emissions May 2013".
On page 53 the Draft Decision	We are required to make our assessment and

Statement states that “<i>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.</i>” This begs the question of what is meant by “<i>a high level of protection of the environment taken as a whole</i>”. Manifestly, it is a lower level than would be achieved by imposing USA EPA standards and we have already offered evidence that scientific opinion is much more divided even in the UK than the EA recognise. We therefore offer further evidence to this effect in accompanying papers.	come to a decision within the scope of the applicable legislation. Our Legal framework is set out in Section 3 of this document. Article 1 of IED says that the rules it lays down are designed to achieve a high level of protection of the environment. The permit we propose to issue delivers the requirements of IED. Our comments on the accompanying papers are addressed separately.	
One consequence of taking account of the full range of scientific opinion both at home and overseas is that unlike the EA we do not believe that applying the “<i>relevant requirements of the National and European legislation in imposing the Permit conditions</i>” and compliance therewith “<i>will ensure protection of the environment and human health</i>”. If one actually takes into account “all of the expert opinion available”, it is not possible to agree with the HPA’s conclusion “<i>While it is not possible to rule out adverse health effects from modern, well regulated municipal waste incinerators with complete certainty, any potential damage to the health of those living close-by is likely to be very small, if detectable</i>”	Our conclusions and responses remain unchanged with respect to the protection of human health and the environment.	
Taken together, these facts show that <i>a high level of protection of the environment taken as a whole</i> is not achieved, most particularly in respect of human health. In part this is because reliance has been wrongly placed on so-called “worst case scenarios” that are not “worst case”. Another reason is that incineration is not BAT and that parts of the air pollution control system are not BAT. This is explored below. Worst case does not mean simply that emission limits are only just complied with, it includes failure to comply with them coupled with extensive periods of abnormal	Our conclusions and responses remain unchanged with respect to the protection of human health and the environment. At this time mass burn incineration at this scale can still be considered BAT, subject to the appropriate assessments being made. See comments on Alternative Technologies above. Our comments on the air pollution control system are included in the relevant section below.	
Allerton Waste Recovery Park	Page 187 of 225	EPR-NP3034CG-A001

operation.	
Abnormal Operations - Incineration	
The EA state (p77) that <i>“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). (Our emphasis)</i>	Acknowledged
This totally fails to take account of the fact that there is a world of difference between an abnormal operation that where emission limits are exceeded by 10% or so and another where they are exceeded by 1000%. Admittedly the latter would involve some kind of major failure but it is precisely this sort of thing that would constitute a “worst case” scenario and the EA should apply a realistic “worst case” scenario here as elsewhere.	The assessment is based on total failure of the abatement plant, representing a worst case scenario where the emissions are released unabated, with the exception of particulate where a backstop limit of 150 mg/m³ must be met (five times the limit of normal operation). In addition, ELVs for carbon monoxide and total organic carbon must be complied with at all times which ensures complete combustion.
The four hour period is wholly unacceptable in the case of any major exceedences of the limits (here we are talking of major failures leading to substantial exceedences of emission limits, rather than the conservative allegedly “worst case” scenario considered by the EA). If the EA is serious in protecting the public then more appropriate graded time limits should be applied, for example: • Emission up to 25% above the relevant limit or failure of the monitoring and backup monitoring system – 4 hours with 60 hour annual maximum (though continuous periods of more than 4 hours not allowed) • Emission from 25% to 100% above the relevant limit – 1 hour and	See comment above. Please also note the explanation for allowing such time limited exceedences given in Section 5.5 above.

contributing towards 60 hour annual maximum - Emission over 100% above the relevant limit – 10 minutes (i.e. shut down procedures must start immediately). The 60 hour annual maximum allowance would be considered as fully used - Any second emission incident in the over 100% category would result in automatic enforcement action commencing with automatic plant closure (a “two strikes and you are out” principle).	
The lack of any such regime would constitute a major failure of risk management.	See comment above
Application of Best Available Techniques	
We take the definition of BAT in EU Directive 96/61/EC Article 2.11 to apply here: "best available techniques" shall mean the most effective and advanced stage in the development of activities and their methods of operation which indicate the practical suitability of particular techniques for providing in principle the basis for emission limit values designed to prevent and, where that is not practicable, generally to reduce emissions and the impact on the environment as a whole: "techniques" shall include both the technology used and the way in which the installation is designed, built, maintained, operated and decommissioned, "available" techniques shall mean those developed on a scale which allows implementation in the relevant industrial sector, under economically and technically viable conditions, taking into consideration the costs and advantages, whether or	The definition of BAT is now defined in the IED, 2010/75/EU Article 3(10) as follows: 'best available techniques' means the most effective and advanced stage in the development of activities and their methods of operation which indicates the practical suitability of particular techniques for providing the basis for emission limit values and other permit conditions designed to prevent and, where that is not practicable, to reduce emissions and the impact on the environment as a whole: (a) 'techniques' includes both the technology used and the way in which the installation is designed, built, maintained, operated and decommissioned; (b) 'available techniques' means those developed on a scale which allows implementation in the relevant industrial sector, under economically and technically viable conditions, taking into consideration the costs and advantages, whether or not the techniques are used or produced inside the Member State in question, as long as they are reasonably accessible to the operator; (c) 'best' means most effective in achieving a

not the techniques are used or produced inside the Member State in question, as long as they are reasonably accessible to the operator, • "best" shall mean most effective in achieving a high general level of protection of the environment as a whole.	high general level of protection of the environment as a whole.
Examining AWRP against this definition shows that it falls short of BAT in a number of respects, both in the overall choice of technology and in the way in which those details are implemented.	See comments above and below on BAT.
We contend that where BAT is concerned with technologies to protect human health then failure to apply BAT in its most stringent form constitutes a breach of the European Convention on Human Rights under Article 2, Right to Life. Thus the Environment Agency and the Operator would be failing to take the best available methods of preventing harm and/or minimising risks of harm.	Having defined 'BAT' above, the EU Commission produces 'BAT reference document', resulting from the exchange of information organised pursuant to Article 13, drawn up for defined activities and describing, in particular, applied techniques, present emissions and consumption levels, techniques considered for the determination of best available techniques as well as BAT conclusions and any emerging techniques, giving special consideration to the criteria listed in Annex III. According to the extant BREF document, incineration is deemed to be BAT.
AWRP is not BAT	
We contend that the claim that incineration is BAT is false. Firstly, in respect of harmful emissions the evidence given in Annex 1 (<i>of this submission, see below</i>) shows that Materials Recovery, Biological Treatment (MRBT) is more flexible than EfW and has a number of key advantages both environmentally and technically. Assessed against seven environmental categories including climate change, water pollution, air pollution and human health impacts, the MRBT system was shown to be the best choice because it recovered the greatest amount of additional recyclables, stabilised the organic	We consider the technology offered here to be BAT, see comments on Alternative Technologies above. We have assessed the environmental and human health impacts, see comments above.

fraction of the residuals, reduced the amount of material to be disposed of in landfill, and minimised the negative environmental and public health impacts. Since it can help support high levels of landfill diversion, it is better able to achieve the aims of AWRP without having such severe environmental and health impacts. Given that there are other proven waste management technologies that are less harmful in terms of emissions than EfW incineration, the EfW incineration plant cannot be considered BAT.

Secondly, in respect of climate change (as detailed in Annex 2 *of this submission, see below*):

- The documents we submitted in response to the EA's first round of consultations showed that EfW incineration is the worst technology for greenhouse gas emissions with the possible exception of landfill. Incineration is the worst alternative to landfill from a climate change standpoint. It releases high levels of CO₂, with nearly all the carbon content in the waste being emitted as CO₂ to the atmosphere. Incineration is comparable in terms of CO₂ per unit of power to energy produced from coal and much more than from other fossil fuels. Moreover, there are errors in the Applicants calculations of CO₂ offsetting as set out in Annex 3. Far from offsetting CO₂ from other electricity generation, the use of the EfW incinerator actually increases overall carbon emissions⁴.
- The reports by Eunomia submitted in response to the EA's first round of consultations (which are referred to in the Draft Decision Document) showed that AWRP and, in particular its EfW incinerator are worse for greenhouse gas emissions than MBT.
- CO₂ emissions from the EfW

We have responded to this in Section A) 2 b) above.

incineration plant at AWRP are much higher than AmeyCespa claim (their results stem from unsupportable assumptions); incineration is the worst alternative to landfill in terms of greenhouse gas emissions whereas alternatives using MBT are much better. The AWRP plant is almost as bad as landfill even though it includes mechanical treatment and AD facilities. Its poor performance on climate change is in direct contradiction of the sustainability criteria set by the Brundtland Commission. The proposed AWRP would cause damage to the climate and run counter to national and international policy on climate change. The applicant has failed to take proper account of the load duration curve and the various types of plant that will be at the margin at different times. For much of the time this is not coal but some less carbon-intensive technology, as set out in Annex 3 of this submission, see below.		
Thus, AWRP is one of if not the worst technology choices for climate change (Further details justifying this view are given in Annex 2 of this submission, see below). Manifestly neither AWRP nor its EfW incinerator can be considered BAT.	See comments above and below on climate change.	
We recognise that the term BAT constitutes a moving target on practices, since developing societal values and advancing techniques may change what is currently regarded as "best available". We ask that the EA recognise this fact and revise their opinion that EfW incineration is BAT.	Our conclusions remain unchanged, see comments above on BAT.	
Incineration Technology and Control Measures		
There are a number of deficiencies in the emission control methods proposed which mean that they fall short of being BAT. They are:	-	
Lack of an Flue Gas Desulphurisation system; since the sulphur content of waste is essentially unknown and uncontrollable emissions need to be controlled not	Our assessment of BAT for acid gases (inc SO_x) is set out in Section 6.3.3 of this document. Dry lime scrubbing as proposed by the Applicant is listed as BAT in the Incineration BREF.	
Allerton Waste Recovery Park	Page 192 of 225	EPR-NP3034CG-A001

just at source by actively reducing them;		
• Lack of an electrostatic precipitator system (EPS). This is needed for two reasons: - o There is a risk that the bag filter system or some part thereof will fail; an EPS would provide backup and reduce the possibility of large quantities of particulate reaching the top of the chimney - o Particulates and the substances they carry are particularly dangerous, as is shown in our chapter on Health herewith. Thus using a secondary system in addition to the bag filter system would constitute a sensible approach as well as being consistent with the Precautionary Principle.	We have responded to this in Section A) 2 b) above (Prevention of Emissions), our conclusions remain unchanged.	
The basic problem is that the EA have considered whether each individual component represents BAT but not whether the Air Pollution Control system as a whole represents BAT. The reality is that it does not because the addition of other systems would reduce environmental damage and, in the case of EPS, minimise the risk connected with any catastrophic failure of all or part of the bag filter system.	We have assessed the individual components as described and are also satisfied that the air pollution controls as a whole are BAT.	
The need for this additional protection is enhanced by the fact that that particulate removal also contributes to reducing dioxin and metal emissions. EPS therefore also minimises the risk from dioxins as well as heavy metals that would arise from the breakdown of any systems for particulate control.	Multiple compartment filters will be used with burst bag detection to minimise the risk of increased particulate emissions in the event of bag rupture. Emissions of particulate have been assessed as insignificant so we do not require the Applicant to implement any additional control measures.	
We therefore contend that without EPS the APC system is not BAT.	See comments above	
We have noted above that what constitutes BAT varies over time as new technologies emerge and become proven. The Draft Decision Document does not recognise this truism nor, crucially, does it make any provision for tighter emission controls which could be imposed if the UK and	See comments above on permit review. We are legally required to review the development of new methods and standards and their performance in industrial applications. The facility will be required to comply with all relevant regulations during its operational life	
Allerton Waste Recovery Park	Page 193 of 225	EPR-NP3034CG-A001

EU were to catch up with international best practice (e.g. those imposed by America's EPA). This should be written into the Decision Document and the Permit (if one is issued) in a way that allows the EA to impose both more stringent conditions and further / alternative emission control technologies as they become BAT.	which will include compliance with any future changes.
As an example, there is no Flue Gas Decarbonisation system or provision for one. This is hardly surprising in the present state of such technology; while decarbonisation of fossil fuel based (and by extension waste-based) electricity production, is not a new technology, capturing large amounts of CO₂ at a power generation facility through a Carbon Capture System (CCS) in a commercially viable way and storing the CO₂ (on- or offshore) is still at an early stage. It therefore does not yet constitute BAT but may do so in the near future and almost certainly during the operational lifetime of AWRP. CCS can be defined as a system of technologies that integrates three stages: CO₂ capture, transport and geological storage. The different stages of CCS technology have already been proven for several decades. CO₂ is removed from gas streams in industry or separated and sold as a product. In the US and Canada, sequestered CO₂ is transported and injected into oil reservoirs for enhanced oil recovery. Despite the availability of the different technologies, an integrated CCS concept for power generation that can be applied on a large scale commercially is yet to be developed. In the upstream sector, one example of such an integrated operation is the Sleipner project in Norway. At the Statoil-operated Sleipner field on the Norwegian continental shelf, CO₂ from produced gas is captured and stored in a subsea aquifer. Emissions of more than 10 million tonnes of CO₂ to the atmosphere have been avoided since carbon capture started in 1996. Downstream, in the power sector, capturing large amounts of CO₂ poses a major technological challenge. The three principal capture technologies today are post-combustion, pre-combustion and oxy-fuel. Post-combustion involves scrubbing the CO₂ out of flue gases from the combustion process. Oxy-fuel involves combusting fuel in recycled flue gas enriched with oxygen to produce a CO₂-rich flue gas. Vattenfall's 30 MW Schwarze Pumpe oxy-fuel pilot capture plant in Germany started up in September 2008. Pre-combustion uses a gasification process followed by CO₂ separation to yield a hydrogen fuel gas. Pre-combustion CO₂ capture from an integrated gasification combined cycle (IGCC) power plant has yet to be demonstrated. (Source – as Footnote 6)	See comments above on BAT for acid gases.

Source: Does natural gas need a decarbonisation strategy? - The cases of the Netherlands and the UK, Floris van Foreest, NG 51, The Oxford Institute for Energy Studies, May 2011
(The Oxford Institute for Energy Studies is a recognised independent centre of the University of Oxford)

Greenhouse Gas Emissions

In section 2.1 and Annexes 2 and 3 we show that AWRP as an overall system and the EfW incinerator are the worst possible choices for greenhouse gas emissions with the possible exception of landfill. This conclusion is supported by the evidence we and others have previously submitted and by the reports from Eunomia that were submitted as part of the EA's first round of consultation. These reports refer to numerous other studies which reach the same conclusion and we ask that you read them as part of the evidence on climate change.

We are satisfied that we have considered those elements which are relevant under the EPR.

With the exception of N₂O, GHG emissions from AWRP cannot be mitigated and we show in Annex 3 that the offset calculations made by the Applicant are erroneous. Moreover, when considering the overall carbon budget one should also include CO₂ emissions resulting from the construction and decommissioning of AWRP and the transport infrastructure together with the emissions from mining and treating of the many recyclable resources it destroys. Thus the Applicant's figures are distorted both by making assumptions favourable to themselves (as revealed by Eunomia) and by not constructing a full carbon budget. It is disingenuous, to say the least, to claim offset for power generation while ignoring other elements of the carbon budget entirely.

Our consideration of CO₂ emissions are for the operational and decommissioning phases of the facility and do not include those emissions from construction, transport infrastructure, mining etc.

We are satisfied that we have considered those elements of the carbon budget relevant under the EPR.

The claim made that the waste heat saves CO₂ emissions from the burning of fossil fuels is disingenuous since there is no market for that

The use of waste heat is not included in the greenhouse gas assessment as it does not currently form part of the proposed scheme. The Permit requires the use of waste heat to be

waste heat. Moreover, the heat could have been supplied by renewable energy sources in which case there would be no saving.	actively reviewed. Waste heat will be used at the facility to pre-heat combustion air and to maintain the digester temperature which saves emissions from the burning of virgin fuels. This information is based on the current situation and not what future changes could bring.	
We firmly reject the claim that “ <i>the Operator’s assessment shows that incineration is the preferred option is best in terms of GWP</i> ” (Draft Decision Statement section 6.4, final paragraph). It is manifestly untrue, as should be clear from all the evidence we have submitted. Actually incineration is the worst option in terms of GWP.	Our conclusions remain unchanged with respect to these matters.	
Given the importance of climate change to the future of our planet, the predictions of the IPCC and other experts and the UK’s national and international commitments, it is wrong to choose a technology (incineration) which maximises the emission of greenhouse gases compared with other methods of treating residual waste. An Environmental Permit should be refused.	See comments above on BAT and Alternative Technologies.	
On page 109 the Draft Decision Document states that “ <i>We have therefore considered setting equivalent parameters or technical measures for CO₂. However, provided energy is recovered efficiently (see Section 4.3.7 above), there are no additional equivalent technical measures (beyond those relating to the quantity and characteristics of the waste) that can be imposed that do not run counter to the primary purpose of the plant, which is the recovery of energy from waste</i> ”.	Acknowledged	
To claim that the primary purpose of the plant is the recovery of energy from waste represents an astounding misconception. The primary purpose of the plant is made clear in the 04.09.2007 OJEU advertisement for	We have classified the plant as an incinerator under Section 5.1 Part A(1)(b) of the EPR. The definition is as follows: The incineration of non-hazardous waste in a waste incineration plant with a capacity	
Allerton Waste Recovery Park	Page 196 of 225	EPR-NP3034CG-A001

tenders which led to the proposal for the AWRP facility. (UK-Northallerton: refuse services 2007/S 169-208874). It made clear that the Private Sector Provider (PSP) “will be responsible for the treatment of residual municipal waste so as to attain statutory and non-statutory targets (particularly, but not limited to, the diversion of biodegradable municipal waste from landfill)”.	exceeding 3 tonnes per hour.	
There is absolutely no mention of energy production here; the primary purpose is treatment of residual municipal waste and NYCC have always placed great emphasis on the need to divert waste from landfill. Energy production is merely a by-product. CO ₂ may be an inevitable product of waste treatment but the <u>amount</u> of CO ₂ generated (EA’s p109) is technology dependent. One cannot justify the incinerator by pretending that its main purpose is generating energy from waste when it is a mere by-product.	Article 50(5) of the IED requires heat to be recovered as far as practicable and we are satisfied that the facility is compliant with this. Justification of the incineration technology is detailed in section 6 of this document and our conclusions remain unchanged.	
BAT and POPs (Incinerator)		
Section 6.4 in the Draft Decision document states that: “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 significantly to modify existing facilities using processes that release chemicals listed in Annex III, without prejudice to Council Directive 1996/61/EC, 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 ”.	Acknowledged	
Allerton Waste Recovery Park	Page 197 of 225	EPR-NP3034CG-A001

The text which we have highlighted in Bold holds the key. There are alternative techniques and processes such as the many variants of MBT which avoid the formation and release of these substances. The clear implication of this is that one of these processes rather than incineration is to be preferred. Incineration is not BAT nor should it be used.	See comments above on BAT and Alternative Technologies.	
Even if the EA is correct in saying that the formation of POPs will be minimised, this refers only to the perverse choice of incineration when <i>“to alternative processes, techniques or practices”</i> exist that do not produce POPs. This being the case, AWRP and its incinerator do not comply with <i>to comply with article 6(3) of the POPs Regulation</i>.	See comments above on BAT and Alternative Technologies. We have explained our position in section 6.4 of this document.	
Monitoring		
Our comments on the Draft Permit and elsewhere make it very clear that we consider monitoring to be too infrequent and insufficiently lax. A case in point is the monitoring of mercury. Having sent a page or so explaining that better systems now exist, the Draft Decision Document states: <i>“At the present time, it is considered that in view of the predicted low levels of mercury and dioxin emission it is not justifiable to require the Operator to install additionally continuous monitoring or sampling devices for these substances.”</i>	Our conclusions remain unchanged; we have not imposed a requirement to continuously monitor mercury and dioxins in line with the requirements of the IED. Our review of the applicability of continuous monitoring is detailed in Section 6.8.3 of this document.	
We disagree strongly with this excessively complacent opinion. There can be no reliable prediction of mercury emission levels because the operator does not know what the waste will contain, particularly the large tonnage that must necessarily be C&I or other non Local Authority – collected waste. (This is a consequence of the excessive capacity of AWRP which we have already pointed out.) Hence the	The impact from mercury has been assessed as being insignificant at the maximum permissible ELV. The impact assessment also considers the plant at maximum capacity and so it represents a very much worst case. The plant will only be permitted to burn those wastes that we are satisfied it can burn safely.	
Allerton Waste Recovery Park	Page 198 of 225	EPR-NP3034CG-A001

forecasts of mercury levels are of zero validity. Moreover, the additional monitoring equipment would enhance the ability to detect whether levels are low or not so the existing proposals are not BAT.		
The next paragraph displays a similar lack of commitment to improving monitoring or imposing better monitoring as technology develops. It says: <i>“In accordance with its legal requirement to do so, the Environment Agency reviews the development of new methods and standards and their performance in industrial applications. In particular the Environment Agency considers continuous sampling systems for dioxins to have promise as a potential means of improving process control and obtaining more accurate mass emission estimates”.</i>	-	
This is acceptable so far as it goes but totally lacks any commitment to install the continuous sampling systems as they become proven over the next few years. This means that the public will lack the BAT protection that we need. There must be a general statement in the Permit that allows the EA to unilaterally impose more up to date BAT technologies as they become available.	Should the European Commission set limits based on continuous methods and this became a requirement of the IED then we would be legally obliged to amend such Permits to include this. Our periodic BAT review of permits may also lead to changes.	
Sustainable Development and BAT		
The EA say that they are required to contribute towards achieving sustainable development, as considered appropriate by Ministers and set out in guidance issued to them. They cite the DEFRA Secretary of State’s <i>The Environment Agency’s Objectives and Contribution to Sustainable Development: Statutory Guidance (December 2002)</i> and say that this document “provides guidance to the Agency on such matters as the formulation of	Acknowledged	
Allerton Waste Recovery Park	Page 199 of 225	EPR-NP3034CG-A001

<i>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”.</i>		
We must accept this and the EA’s comment that In respect of regulation of industrial pollution through the EPR, the Guidance refers in particular to the objective of setting permit conditions <i>“in a consistent and proportionate fashion based on Best Available Techniques and taking into account all relevant matters...”</i> . We dispute the Environment Agency view considers that it has pursued the objectives set out in the Government’s guidance, where relevant, in that the EA has failed to apply BAT in a number of ways and at all levels from the macro downwards. Given the risks that apply to human health as recognised by internationally respected expert and the EPA in America (but not by the HPA) we do not consider that BAT has been applied in a <i>“consistent and proportionate fashion.”</i> We have therefore suggested above and elsewhere a number of modifications to the Permit which would constitute additional conditions that should be included in this Permit. These are needed to protect the public and to take account of the Section 4 duty.	See comments above on BAT and Sustainability.	
Schedule 9 to the EPR 2010 – Waste framework Directive		
Towards the top of page 115, the Draft Decision Document states <i>“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.”</i> And <i>“Energy efficiency is dealt with</i>	Acknowledged	
Allerton Waste Recovery Park	Page 200 of 225	EPR-NP3034CG-A001

<i>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)”.</i>	
Neither of these statements is true. It should be abundantly clear from all that we have written that the intended method of waste treatment is acceptable from the point of view of environmental protection the intended method of waste treatment is not acceptable from the point of view of environmental protection. This means that the decision to grant a Permit is also unacceptable and should be reversed. It also means that if the EA persist in granting a Permit despite all that has been said to them in consultation then Article 23(3) should apply.	Our conclusions remain unchanged with respect to these matters.
Equally, as we have already pointed out, the energy efficiency of waste incineration is remarkably low compared with other electricity generating technologies (e.g. CCGT at <i>circa</i> 50%). Therefore the pretence that <i>“the recovery of energy take place with a high level of energy efficiency in accordance with Article 23(4)”</i> is untenable.	The energy efficiency is in accordance with BAT for the incineration sector to which it is compared.
Human Rights	
A separate document submitted as part of this consultation shows that we consider that AWRP would breach the European Convention on Human Rights and that this matter has already been raised with the European Commission.	See comments below on “Violation of European Convention on Human Rights - May 2013”.
Annex 3: Improvement Conditions	
The EA’s Improvement Condition IC2 states that <i>“The Operator shall submit a written proposal to the Environment Agency to carry out tests to determine the size distribution of the particulate matter in the exhaust gas emissions</i>	Acknowledged

<i>to air from air emission points A2 and A3, identifying the fractions within the PM₁₀, and PM_{2.5} ranges. The proposal shall include a timetable for approval by the Environment Agency to carry out such tests and produce a report on the results.</i> <i>On receipt of written agreement by 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”</i>	
This is unacceptable because the most dangerous particles are the smallest and are present in disproportionately large numbers. Therefore size distribution should be carried out for smaller particles, looking in detail at the PM₁ and PM_{0.1} fractions in addition to PM₁₀ and PM_{2.5}. These size distributions should be carried out both in terms of particle size and particle mass. Moreover, given the role of particulates in carrying pollutants into the body, their chemical make-up should be ascertained in detail.	The smaller particles will be monitored but not as a separate fraction. Smaller particles (e.g. nano-particles) are particles with a diameter of less than 1 micron, although another definition only includes particles which are up to 0.1 microns in size. Nano-particles constitute the smallest fraction of the total particulate matter (TPM) emitted, and TPM will be monitored continuously. The methodology for measuring nano-particles specifically, is still at the research and development stage. Both past and current research however, suggests that fabric filters are highly efficient at removing all sizes of TPM, including nano-particles, from the exhaust gases emitted from incinerators. Published data from research work spanning over 30 years suggests that the collection efficiency for all size of particles is not less than 99% and can be higher than 99.995%, even for nano-particles.
Annex 1: MRBT ‘Better’ than EfW for Waste Disposal	
Reproduction of an article published in ZERO WASTE Europe, 14 May 2013	
A study was undertaken to determine the ‘best method for managing residual waste in order to reduce the harm and risks to public health and our environment’. The Materials Recovery, Biological Treatment (MRBT) system was shown to be the best choice because it recovered the greatest amount of additional recyclables, stabilised the organic fraction of the residuals, reduced the amount of material to be disposed of in landfill, and minimised	At this time mass burn incineration at this scale can still be considered BAT, subject to the appropriate assessments being made. Refer to Alternative Technologies above.

the negative environmental and public health impacts. Stated that: “This report is exactly what we need at the right time to help guide the debate on what to do with residuals once we reach high separate collection rates. Europe has over-invested in waste incineration and needs solutions that deliver environmental safety while still focusing on increasing recycling and reducing material consumption.	
This Annex contained hyperlinks to reports which were highlighted as also forming part of the evidence (see below).	
<u>the Global Alliance for Incinerator Alternatives (GAIA)</u> A new study commissioned by the Global Alliance for Incinerator Alternatives (GAIA) has found that incinerators operating in some EU states have the capacity to burn ‘more than the non-recyclable waste generated’ and warns that plans to increase incineration capacity pose an ‘environmental and an economic threat’.	We have already addressed overcapacity, see above.
<u>Defra withdrew £217.1 million of PFI funding</u> In a statement, Defra said: “We are investing £3.6 billion in 29 waste infrastructure projects. This will reduce the amount of waste sent to landfill, promote recycling and stimulate economic growth. We now expect to have sufficient infrastructure in England to enable the UK to meet the EU target of reducing waste sent to landfill. Consequently the decision has been taken not to fund the remaining three projects.” Defra added that the withdrawal of the funding “does not necessarily mean the three projects will stop”, and that the local authorities concerned must now make the	The Environment Agency is duty bound by law to continue with the determination process unless the Application is withdrawn by the Applicant. We had no such request from the Applicant.

decision “We will continue to provide commercial and technical advice to those projects that continue with their procurement process.”	
<u>2012 report by waste management consultancy Eunomia</u> Waste management consultancy Eunomia has today (29 November) published its biannual review into residual waste infrastructure, which shows that the UK will have almost seven million tonnes more capacity than residual waste needing treatment by 2015/16.	We have already addressed overcapacity, see above.
Annex 2: Climate Change	
The UK government is committed to reducing the UK’s greenhouse gas (GHG) emissions and must meet its target under the Kyoto Protocol. Indeed, the planning documents cited by AmeyCespa in Part 1 of their Planning Statement make it clear that reduction of GHG emissions is an important aspect of UK government policy. In addition, a number of local planning policies relate to climate change.	Acknowledged
Carbon dioxide (CO₂) and methane emissions make up over 98% of greenhouse gas (GHG) emissions from waste management, which contributes about 3% to total UK GHG emissions, largely made up of methane emissions from organic waste degrading in landfill. There are many alternatives to landfill, many of them further up the waste hierarchy than EfW incineration and it is now a legal requirement to operate according to the waste hierarchy. Even before the Waste (England and Wales) Regulations 2011 came into force, alternatives to landfill of biodegradable waste are commonly seen as having a major advantage over landfill. However, the extent of	We have addressed the legal requirements of the waste hierarchy as detailed in Sections 4.3.9 and 7.1.2 of this document.

such advantage depends greatly on the technology chosen even at the “other recovery” level in which incineration with energy recovery lies.		
Our objection to the Allerton Waste Recovery Park (AWRP) planning application on climate change grounds is to the so-called Energy from Waste (EfW) plant (actually a large incinerator with electricity generation). We favour re-use and recycling and therefore recognise the advantages that the mechanical treatment element of AWRP has from a global warming perspective. In addition, we do not object to the Anaerobic Digestion (AD) element of the proposed AWRP scheme from a global warming perspective.	See comments above on Climate Change.	
Most studies show that the advantage over landfill is markedly less for incineration than for any other technology. It must be appreciated that the apparently favourable results from studies carried out for the AWRP proposal using the WRATE model which purport to indicate that incineration is a good choice from a climate change standpoint are a consequence of known methodological flaws in the model.	Under the EPR the Applicant is not required to compare incineration with other available technologies. The Applicant has provided a BAT assessment for the type of incineration technology chosen as detailed in section 6 of this document. Also, see comments above on Climate Change.	
In reality, incineration is the worst alternative to landfill from a climate change standpoint. Incineration releases high levels of CO ₂ with nearly all the carbon content in the waste being emitted as CO ₂ to the atmosphere. For landfill, the amount of methane produced has over twice the global warming potential than that which would have been produced by incineration. However, incineration is comparable in terms of CO ₂ per unit of power to energy produced from fossil fuel. In addition, NO _x emissions include N ₂ O, another powerful greenhouse gas.	See comments above on Climate Change. In terms of CO ₂ per unit of power, this is a waste management facility and as such cannot be directly compared to a facility producing power from fossil fuel. N ₂ O emissions are considered in Section 6.3.2 of this document.	
Studies for the Greater London Authority using lifecycle assessment methods showed that the best	See comments above on Climate Change. The process has been designed to ensure that	
Allerton Waste Recovery Park	Page 205 of 225	EPR-NP3034CG-A001

performing waste management scenarios in terms of their greenhouse gas impact were those based on either mechanical biological treatment (MBT) followed by AD or on gasification followed by autoclave, coupled with hydrogen fuel cell technologies. Recycling, particularly of plastics, makes a considerable difference to greenhouse gas impacts by avoiding emissions from virgin manufacturing processes. By contrast, <i>scenarios using incineration were amongst the poorest performing and were considerably worse than the best performers.</i>	only the 'true' residual waste is subject to treatment further down the waste hierarchy, incinerated in this case. Kerbside recycling will still take place, with the facility providing a safety net or 'final polish' to ensure that recyclable materials are removed from the residual waste stream prior to incineration.
Other studies confirm that incineration is both the worst option for greenhouse gas emissions and the most expensive to implement. Waste prevention is the most beneficial option from a climate point of view, followed by reuse and recycling; while landfill and incineration are the worst options.	We have addressed the legal requirements of the waste hierarchy as detailed in Sections 4.3.9 and 7.1.2 of this document. We are legally obliged to consider the application made to us and not other totally different options. Also see comments above
The carbon dioxide emissions from AWRP and especially the EfW incineration plant are markedly higher than indicated by AmeyCespa in their planning application. Indeed, incineration is the worst alternative to landfill in terms of greenhouse gas emissions. EfW is in direct contradiction of the sustainability criteria set by the Brundtland Commission, a fact that is particularly serious when one considers the environmental damage that global warming is expected to cause and the potential that it brings for human conflict.	Our BAT assessment which includes global warming is detailed in Section 6 of this document. Our conclusions remain unchanged with respect to these matters.
The fact that incineration is actually a bad option from a climate change standpoint means that much of the material in AmeyCespa's Planning Statement pertaining to GHG and the alleged benefits of incineration is wrong. In reality incineration is uniquely damaging from a climate standpoint and NYWAG object to	See comments above

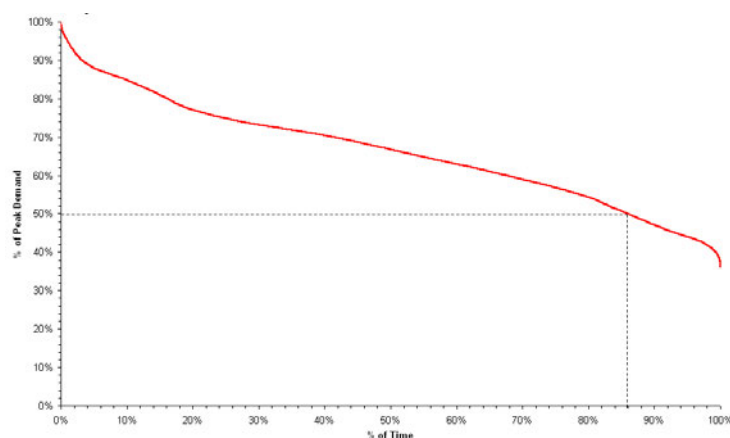
the proposed AWRP both for the damage that it would cause to the climate and because it runs counter to national and international policy on climate change.	
Choosing the worst alternative to landfill from a climate change perspective (i.e. incineration) would be in conflict with the UK's international commitments and government policy on climate change. Moreover, it would contravene planning policies PG13 and PG22. Planning permission for the EfW (incinerator) plant should therefore be refused.	The Planning and Environmental Permitting 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 which are detailed in this document.
Bearing in mind the UK's national and international commitments and the importance the Government attaches to GHG reduction, this means that the EfW plant within the AWRP proposal should be refused planning permission.	Refusal or a grant of planning permission is outside EPR and is for local planners.

Annex 3: Offsetting CO₂ Emissions

This Annex appeared to be responding to reports which were submitted as part of the Planning process concerning the WRATE assessment. The WRATE reports are not applicable to the Permitting process and were not submitted with the Permit Application.	
There are problems with the assumptions Amey Cespa make in considering offsetting of CO ₂ emissions. Firstly, the thermal efficiencies given for the various types of electricity generating technologies are open to question – for example the overall efficiency of CCGT plant is well above 50% ⁱ (typically 56-60%) against the 47% assumed in Appendix B4 while that of coal-fired plant is typically 33% ⁱⁱ , not the 35.7% assumed in Appendix B4. Secondly the electricity mixes assumed are not realistic; in particular an all-hydro mix is unobtainable bearing in mind England and Wales known paucity of hydro resources and equivalents such as a 60% nuclear / 40% renewables are unobtainable on a reasonable timescale while the	These are not relevant considerations for the permitting process under the EPR.

variable nature of renewables would present security of supply and grid stability problems in such a scenario. Also, the method of extrapolation to a “*decarbonised*” 2030 mix is overly simplistic and does not properly take account of the way that the load-duration curve (Figure 1) operates. Roughly, the order of plant on the grid is determined by its marginal operating costs which are strongly related to the fuel costs – thus the marginal costs of nuclear and renewable electricity generation are low while gas turbines and coal are high with CCGT intermediate. Hence nuclear and CCGT are base load while coal operates on generally lower load factors (fewer hours per year).

Figure 1: Annual GB Load-Duration Curve for 2005-8



Source: http://www.nationalgrid.com/uk/sys_06/chap2/images/fig2-4.gif

Plant at the margin at any time is determined by the market and this in turn influences the carbon intensity of the marginal plant. Since both the shape of the load-duration curve and total demand varies throughout the day and seasonally, different plant will sit at the margin at different times.

These are not relevant considerations for the permitting process under the EPR.

It is reasonable to assume that electricity from the EfW and AD plant at AWRP would displace the marginal plant among other electricity generators. For some of the time this

These are not relevant considerations for the permitting process under the EPR.

will be coal which is broadly comparable with incineration (as EfW) in terms of CO ₂ emissions but for much of the time it would replace generation sources that are less harmful in terms of greenhouse gas (GHG) emissions. Indeed, for some of the time (e.g. summer nights) it would displace nuclear plant that emits no CO ₂ .	
The fact that the AWRP EfW (incineration) plant would result in an increase in the overall CO ₂ emissions from the electricity sector means that AWRP runs counter to the UK's obligations and policy on GHG emissions.	See comments above

Comments on Draft Permit - May 2013	
Brief summary of issues raised:	Summary of action taken / how this has been covered
Introductory Note	
The EA's introductory note is for the most part descriptive but may need alteration to reflect changed Permit conditions or corrections in the design where it is not currently BAT or is otherwise unacceptable. In particular to reflect that:	See comments below
Chimney heights are, in our view, insufficient to ensure adequate dispersion of pollutants; if this view is accepted by the EA then they will need to be increased and this should be reflected here.	See our comments above on "Chimney Height – May 2013".
The Mechanical Treatment (MT) plant, as presently constituted appears unable to separate ferrous and non-ferrous metals (essential for recycling) and is therefore not BAT. The waste should pass through a sufficiently strong electromagnetic field to separate these metals and to remove additional ferrous metal.	Section 1.3.1 of the Application Supporting information confirms that a series of magnetic separators and eddy current separators are used to remove ferrous and non-ferrous metals respectively. The Introductory note was changed to include this information.
The bag filters in the EfW air pollution control system should be backed up by electrostatic	See our comments above on "Incineration Technology and Control Measures".

precipitators.		
The EfW is claimed to be CHP ready but this is not reflected in the descriptive material and nor is the fact that there is no currently market for the waste heat. There needs to be a statement of how the waste heat is to be disposed of and what environmental consequences this might have.		The Introductory note does not form part of the Legal permit. Its purpose is to provide a brief non-technical description of the facility. Permit conditions 1.2.2 and 1.2.3 secure CHP requirements. This document confirms that the incineration plant will operate an air cooled condenser (ACC) to remove the residual heat from the spent steam output from the electricity generating plant. This will be released to atmosphere.
The emissions from the flare to the two AD gas engines should be monitored whenever it is in operation (this differs from routine monitoring because the operation of the flare is intermittent and at irregular intervals)		The flare will operate for less than 10% of the year so monitoring is not required.
Water quality of water entering the Little Ouse should be monitored to ensure that the claim that it will not contain any pollutants is actually true.		The Permit secures this by only allowing uncontaminated surface water to be released from the facility and the Operator will be required to demonstrate compliance with this.
Some of the above will imply additional monitoring and therefore amendments to the Permit proper.		See comments above
Management Conditions		
At various points reviews reported to the EA are mentioned. We feel that the four year interval between reviews is unduly long in a rapidly moving field such as waste management and that the frequency of these reviews should be increased to every two years.		Regulation 34(1) of the EPR requires the regulator to periodically review environmental permits but does not stipulate a timescale for this. We review permits at regular intervals and this is principally done by sector for consistency. During this review the Permit will be updated as necessary to reflect developments in BAT for this type of facility. We will also take into account any changes in law and implement any necessary changes to permits as a result of this.
The purpose of the amendments suggested below is to improve health and safety standards and reduce environmental impact. We contend the fact that Amey Cespa has no UK experience of operating plant of this type coupled with the fact that they their parent company (Ferrovia) has		Regarding operational experience, see comments above in Section A 2) c) Operation, "That the company has little experience of incineration". Conditions are set in the Permit to protect human health and the environment.
Allerton Waste Recovery Park	Page 210 of 225	EPR-NP3034CG-A001

only got experience of one incinerator (in Andorra) means that risks are greater than they would be for a new plant of the same type operated by an experienced company with a proven good track record. A sensible approach to risk therefore demands that the conditions imposed should be both precise and stringent with the aim of maximising protection to the environment and to the public.	
General Management	
The language of the management conditions appears insufficiently precise and this raises a number of issues:	See comments below.
Para: 1.1.1 a) Who is to agree that the “<i>written management system</i>” is adequate and fit for purpose in ensuring safe operation that minimises emissions and risk to human health? (b) Who defines what constitutes “<i>sufficient competent persons and resources</i>”? At the very least both these points need clarifying and should be made subject to agreement by the EA both before operation commences and whenever an amendment is proposed.	a) We have set a condition requiring the operator to send us a summary of their sites EMS prior to operation. The site inspector will be responsible for approving this submission. b) This is set out in our guidance, specifically How to comply with your environmental permit. There must be enough competent staff to manage and operate activities without causing pollution. Staff should have clearly defined roles and responsibilities. The skills required for each post should be written down with records kept of how each individual in that post has gained those skills and how they are kept up to date with, for example, refresher training. Where appropriate, written instructions should be kept for the work as well.
Para 1.1.2 “<i>Records demonstrating compliance with condition 1.1.1 shall be maintained</i>” – add and subject to inspection by the EA.	We consider this condition to be appropriate because as regulators we carry out detailed audits to ensure compliance with permit conditions.
Para 1.1.3: This is necessary but not sufficient. Given the modern prevalence and convenience of IT, every PC and other computer system on site should offer “convenient access to a copy of it”. This would enhance convenience and safety at little cost (if any).	It is important that staff whose duties may have an environmental impact have access to the information they need to ensure that they act in a way that complies with the Permit. We consider that the condition in its current form is appropriate.
An additional management point is needed in order to protect both public	The permit requires any breaches to be notified to the Environment Agency without delay.

and the staff. The gist of it should be that: <i>All staff have the right without prejudice to their future employment or promotion prospects to report any breach of the Environmental Permit condition or breach of the management conditions direct to the Environment Agency</i> The aim of this condition is to protect whistleblowers and hence the public.	Future employment and promotion prospects are not matters for consideration under the EPR.	
Energy Efficiency		
To talk about taking “ <i>appropriate measures to ensure that energy is recovered with a high level of energy efficiency and energy is used efficiently in the activities</i> ” presumes that this is possible. This is not the case and re-wording is therefore necessary to reflect the reality that EfW plant of the type proposed are of intrinsically low energy efficiency compared with other methods of electricity generation (e.g. coal at upwards of 33%, CCGT at typically 50%). Better to demand that “ <i>energy is recovered with a high level of energy efficiency <u>for a plant of this type</u> ...</i> ”.	This Permit is for an incinerator so comparison with other methods of electricity generation is not relevant to the process. We compare energy recovery with the incineration benchmarks. We consider that the condition in its current form is appropriate.	
Operations		
Para 2.3.3 sets out conditions for waste to be accepted. We feel that para 2.3.3.(c) “for those wastes in table S2.4 having been separately collected for recycling, it is subsequently unsuitable for recovery” means that AWRP can accept wastes that it should not. It should be replaced with a condition that the facility cannot accept any waste that has been collected for recycling unless it has been demonstrated that it is in fact non-recyclable.	We are satisfied that the condition is suitably robust.	
Para 2.3.6 needs a further condition covering when waste shall not be charged, or shall cease to be charged to the waste incineration plant. This would cover circumstances when non-routine monitoring reveals problems.	It is not clear what is meant by non-routine monitoring; however we are satisfied that the condition is suitably robust. The conditions of the Permit need to be considered in their entirety. They implement the necessary controls which include waste types and operating techniques necessary for the protection of the environment	
Allerton Waste Recovery Park	Page 212 of 225	EPR-NP3034CG-A001

	and human health.	
Para 2.3.9 is insufficiently stringent. It should state that spare equipment for safety-critical and environmental protection must be kept on site with the inventory agreed by the EA. Only then can normal operation be restored as quickly as possible. Excuses like “ <i>it is on order</i> ” are not acceptable. Indeed, if items of failed equipment are not on site or obtainable within one hour then operation should cease.	We are satisfied that the conditions in place for abnormal operation are suitably robust.	
Para 2.3.10 is insufficiently stringent. Both the four hour period and the 60 hour cumulative period are too long because they fail to take account of the extent to which emission limits are exceeded. There is a world of difference between exceedences of a 5% and 1000%. This must be reflected in the limits given in this paragraph.	The assessment is based on total failure of the abatement plant, representing a worst case scenario where the emissions are released unabated, with the exception of particulate where a backstop limit of 150 mg/m³ must be met (five times the limit of normal operation). We consider that the condition in its current form is appropriate.	
Emissions and Monitoring		
We contend that the EA fails to provide for sufficient or sufficiently frequent monitoring. Thus we contend that more stringent conditions are needed.	The monitoring specified is in accordance with the IED and based on our assessments we have no reason to increase the frequency.	
Emissions of substances not controlled by emission limits		
As set out in our Chapter on Health Risks, there are many more substances emitted by incinerators than is generally recognised (a partial list is given in its Annex 3) and some of these are known to carry health risks. It is absurd to simply to say (as para 3.2.1 does “ <i>Emissions of substances not controlled by emission limits (excluding odour) shall not cause pollution. The operator shall not be taken to have breached this condition if appropriate measures, including, but not limited to, those specified in any approved emissions management plan, have been taken to prevent or where that is not practicable, to minimise, those emissions</i> ”. This condition, as it stands, amounts to little more than	The Permit conditions meet legal requirements and implement Government policy; we do not require data to be collected unless there is a clear and justifiable reason for doing so. The measures implemented will be in accordance with the relevant guidance and based on site specific circumstances.	
Allerton Waste Recovery Park	Page 213 of 225	EPR-NP3034CG-A001

pious hope.			
It is essential that the operator should proactively identify substances not controlled by emission limits so that they can ensure that they do not cause pollution. Once identified, emissions of these substances can be added to the approved emissions management plan. Identification of such emissions should therefore take place within 2 months of operation commencing and all emissions so identified included in the emissions management plan. Para 3.2.2 would then apply. A provision that emissions shall be reviewed at regular intervals (? annually) should be added.		All likely significant emissions have been identified and addressed. Also see comment above.	
Para 3.2.4 is insufficiently stringent and fails to set a baseline. It should read “The Operator shall carry out monitoring of groundwater <u>prior to construction and</u> at least once every 2 years thereafter; and of soil <u>prior to construction and</u> at least once every 3 years; to the protocol agreed in writing with the Environment Agency under PO08” (modifications underlined).		We have set a pre-operational condition requiring baseline data to be submitted. The frequency of monitoring during the operational life time of the facility will be based on the risks associated with the activity which in this case are sufficiently low not to warrant more frequent monitoring requirements.	
Monitoring			
There is much that is good in the EA's section 3.3 but the proposed monitoring regime falls down on a number of counts:		Noted	
It is too infrequent where there is no continuous monitoring, leaving communities open to unidentified excessive emissions and the concomitant risks. (For a more detailed exposition of the implications of infrequent monitoring see our comments on the Draft Decision Document).		The monitoring specified is in accordance with the IED, see comments above.	
Monitoring may be announced. Levels of emissions achieved under test conditions or when inspections occur by prior arrangements are likely to be far lower than under real life conditions. This was demonstrated in the United States in 1990 when the		We carry out detailed audits of the Operator's monitoring arrangements and monitoring results. Test labs are also regularly checked as part of their accreditation status. We are satisfied that our auditing coupled with the MCERTs scheme are sufficiently robust to	
Allerton Waste Recovery Park	Page 214 of 225	EPR-NP3034CG-A001	

EPA and Occupational Safety and Health Administration conducted 62 unannounced visits and no less than 69% of inspections led to summons for violations of regulations. This makes a strong case for making all visits unannounced.	ensure that monitoring results are accurate and reliable.	
The Environmental Permit should be modified to reflect these concerns.	We regularly inspect Installations (announced and unannounced) with unannounced site visits being generally based on environmental risk.	
Noise and Vibration		
Para 3.5.1 states “Emissions from the activities shall be free from noise and vibration at levels likely to cause pollution outside the site, as perceived by an authorised officer of the Environment Agency, unless the operator has used appropriate measures, including, but not limited to, those specified in any approved noise and vibration management plan to prevent or where that is not practicable to minimise the noise and vibration”. This begs a number of questions:	Acknowledged	
What criteria will the “authorised officer of the Environment Agency” use to judge whether noise and vibration levels are likely to cause pollution outside the site? Are they objective (instrument based) or do they rely on his/her subjective judgement? Neither is fully acceptable since instruments and any associated objective criteria do not take account of differences in human psychological or physiological response to noise or to its duration (all too likely to be continuous) while the perceptions of different EA officers may differ from one another and from those of the nearby residents.	Whatever the scale of the issue under investigation, the overall aim will be to define and carry out a structured investigation to obtain meaningful information relating to the source(s) of noise and to assess the impact. The investigation may necessitate sound level monitoring.	
Why should have taken a set of “appropriate measures, including, but not limited to, those specified in any approved noise and vibration management plan to prevent or where that is not practicable to minimise the noise and vibration”	The legislation requires Installations to be operated in such a way that all appropriate preventative measures are taken against noise, in particular through the application of BAT. In deciding what level of control constitutes BAT for a given Installation, a number of factors need to be considered and balanced. These include:	
Allerton Waste Recovery Park	Page 215 of 225	EPR-NP3034CG-A001

excuse the operator from facing enforcement action or prosecution by members of the public (including under the European Convention on Human Rights)? Surely the proper response is to take further preventative measures?	• costs and benefits • the technical characteristics of the Installation concerned • geographical location • local environmental conditions BAT, in a general sense or at sector level, will be set out in process- or sector-specific guidance. This guidance note covers <i>in generic terms</i> a range of abatement technologies, best practice and design features that could, taking the above site-specific criteria into account, form the basis of BAT for a range of situations. There may be certain situations where unpredicted issues are encountered that need to be dealt with as a key measure only once the activity has started to operate. Where this occurs, the Operator is required to submit a management plan or a revision of an existing plan, for approval and which will require them to operate in accordance with the plan. The plan may include further preventative measures. In some cases enforcement action may be necessary which could lead to prosecution and in some cases revocation of the Permit depending on the seriousness of any breach.	
The conditions in this section must be amended to reflect these concerns. They should state the criteria to be used; give local residents a say; and insist that in the event of a nuisance being identified then further remedial measures must be undertaken within an agreed timescale.	We are satisfied that the conditions deliver the legislative requirements.	
Records etc		
All records should be in a form accessible to the EA and (unless commercial considerations as agreed by the EA dictate otherwise) open to the public. Thus they should, among other things, be kept in a generally available IT format and records relating to emissions and health should be made available on the internet on a site notified to the EA and local councils.	The Permit requires all records to be kept on site so that they are available for inspection by the Environment Agency. The reports submitted to comply with the Permit are Public Register information. There is no legal requirement for records to be made available on the internet although in some cases we may encourage the Operator to do this.	
Para 3.4.1 does not define “without delay”. A stringent definition is	We are satisfied that the condition is suitably robust.	
Allerton Waste Recovery Park	Page 216 of 225	EPR-NP3034CG-A001

needed, for example “within five minutes”.	
Para 4.3.4 does not appear to cover the eventuality that a new operator takes over from Amey Cespa (e.g. through a takeover) or that the operator simply goes out of business or enters administration.	Any change in Operator would necessitate an Application to Transfer the permit to the new Operator. We would assess this Application with particular emphasis on the management system, competence and technical ability.
Schedules	
The various schedules may have to be amended were the EA to impose changes to ensure that the various parts of the Regulated Facility represent BAT. As an example, our comments on the Draft Decision Document argue that the air pollution control equipment should include electrostatic precipitation.	See comments above
Add requirements to Table S1.3 that:	-
The operator submit surveys of both soil and groundwater and how any contamination problems would be addressed C.f. P007	The Permit includes conditions to establish baseline ground and groundwater conditions prior to operation. Condition 3.2.4 also requires monitoring of groundwater and soil during the operational phase of the facility. Details are included in Section 4.2.2 and 4.2.3 of this document.
The operator to proactively identify substances not controlled by emission limits and to submit the results to the EA within two months of operations starting. Add the substances so identified to the approved emissions management plan.	See comments above
The operator to submit a management and staffing structure showing numbers on duty by time (e.g. by shift) and the minimum qualifications to be held by staff at each point in the structure.	This will form part of the sites EMS. A pre-operational and improvement condition are in place to ensure that the appropriate systems will be in place.
Incineration as at the proposed AWRP would cause harm by moving waste down the waste hierarchy, contrary to EU Directives and UK Government policy. Furthermore it destroys valuable resources with adverse economic consequences for	See comments above on the waste hierarchy.

a number of industries (Annex 1). Schedule 2 should ensure that so far as physically and technically possible no recyclable or compostable materials enter the incinerator. This is essential to ensure compliance with the waste hierarchy.		
This is especially important in relation to C&I waste. According to the North West of England C&I Waste Survey 2009 for the Environment Agency (Urban Mines), only 1.0% of C&I waste sent to landfill in the North West was considered to be " <i>not recyclable</i> " and " <i>...up to 97.5% of the C&I waste landfilled in the [North West] region could be recycled if the correct facilities and services were available</i> ". We have little doubt that a similar situation pertains in North Yorkshire and incineration will only perpetuate the destruction of valuable resources unless Schedule 2 is amended to preclude this.	See comments above on the waste hierarchy.	
Consideration should also be given to precluding fairly pure recyclable waste streams from entering the site, whether by altering Schedule 2 or in some other way.	The purpose of the MT plant is to enable additional fractions of recyclates to be extracted from the residual MSW. Neither the AD plant nor the incinerator will be permitted to accept recyclable waste streams other than those which are unsuitable for recovery which will be subsequently incinerated.	
Examples of materials which can enter the site but should not be incinerated include food waste (which ideally should be collected and treated separately), paper, glass, and metals. As an example, the following should not be allowed to be incinerated (though quite properly they can enter the mechanical treatment plant): 15 01 01 paper and cardboard packaging 15 01 03 wooden packaging 15 01 04 metallic packaging 15 01 07 glass packaging	The Permit does not authorise incineration of waste with EWC codes 15 01 04 and 15 01 07. Wastes with EWC codes 15 01 01 and 15 01 03 can only be incinerated if they are unsuitable for recovery.	
This is particularly important in the case of the paper industry due to very real concerns that the imminent over-capacity of EfW incineration in the UK	We acknowledge these concerns; however the Permit only authorises the incineration of paper if it is unsuitable for recovery.	
Allerton Waste Recovery Park	Page 218 of 225	EPR-NP3034CG-A001

will damage the industry. These concerns are set out in Annex 2 (<i>of this submission, see below</i>).	
In general, the Permit should make it very clear that waste is to be recycled whenever technically possible and that readily recyclable materials such as food waste, paper, glass, plastics and metals should not be allowed to enter the incinerator or only do so as a minute proportion of such materials entering the site. Failure to do this could be construed as a breach of the waste hierarchy.	The waste hierarchy is applied to the waste generated by the facility itself. Legislation is in place requiring the waste hierarchy to already have been applied to waste entering the facility. Also see comments above on the waste hierarchy.
We suggest that the principles enunciated above should lead to severe restrictions on or elimination of the following waste types entering the incinerator: 17 02 wood, glass and plastic 17 02 01 wood 17 02 03 Plastic 19 12 01 paper and cardboard 19 12 07 wood other than that mentioned in 19 12 06	The waste hierarchy will already have been applied to these waste types.
With the exception of items to be continuously monitored, we contend that the intervals between monitoring envisaged in Table S3.1 are unduly long (see discussion in our comments on the Draft Decision Statement). There should be quarterly monitoring for three years bi-annually thereafter, with the proviso that if any problems are detected then remedial measures be undertaken and monitoring will revert to quarterly.	The monitoring requirements are compliant with the IED and we have no justification to impose additional monitoring.
The monitoring envisaged in Table S3.4 appears incapable of establishing the eco-toxicity of IBA and this should be done on a regular basis (hourly if practicable) to prevent eco-toxic material being processed into aggregate or be treated as other than hazardous waste.	See comments above in Section B c) "Incinerator Ash: Environmental Permit Conditions – May 2013".
Finally, the reporting schedule envisaged in Table S4 is reasonable for routine operation but in addition there should be a parallel system of	Conditions in Section 4.3 (notifications) of the Permit secure this requirement.

exception reporting to ensure that departures from normal operation are brought immediately to the attention of the Environment Agency.		
And Finally		
As it stands the Draft Permit does not allow for future changes in legislation or environmental standards. This should, indeed must, be made possible. We suggest that the Permit should have a clause to the effect that: The Environment Agency reserves the right to vary this Permit to reflect future changes in European Union and/or national policy and legislation.	EPR Regulations say “The regulator must review an environmental permit in accordance with Article 21 of the Industrial Emissions Directive if any of the circumstances in that Article applies in relation to the Part A installation whose operation the permit authorises”.	
Annex 1: Incineration and Harm to Recycling Rates		
Advice from the European Commission and Audit Commission about reuse and recycling and incinerator over capacity.	See comments in Section A 2 b) on overcapacity.	
Concerns from industry representatives: Confederation of Paper Industries (CPI) stated that “ <i>Subsidies for Energy from Waste and large scale energy only biomass should be phased out as they put at risk supplies of the Paper Industry’s basic raw materials – recycled fibres and wood pulp</i> ” Anaerobic Digestion and Biogas Association stated that “ <i>Source-segregation and the treatment of organics through AD is the only way that we can recoup the value both of the energy and nutrients trapped in the food we throw away, as well as saving money. Incinerating valuable resources that can be recycled does not make environmental or economic sense in the long term. We are facing a period of economic difficulty that throws our short sighted attitudes to resource use into sharp relief. This is true of all our vital materials: paper, glass, metals, electrical components and food</i> ”	See comments above in section A 2 b) on Sustainability.	
Allerton Waste Recovery Park	Page 220 of 225	EPR-NP3034CG-A001

FEFCO, an umbrella organisation representing European associations of corrugated board manufacturers stated that “... <i>what we strongly object [to] is incineration of paper. Our raw material is far too valuable to be burned</i> ”	
Concerns raised by MPs showing that opinion is changing in favour of technologies other than incineration and the possibility to ban incineration of recyclable and compostable waste in Europe by 2020.	See comments above on BAT.
Annex 2: CPI Warns Paper Industry Could Lose Out To Energy from Waste	
Concerned that incineration overcapacity could limit recycling rates and put at risk the future availability of quality recycle recovered paper.	See comments above in section A 2 b) on Sustainability and over Capacity.
That large scale biomass plants would drive up the costs of wood and paper prices by competing for forestry products.	This isn't a matter for consideration under the EPR.

US EPA – Particle Pollution and Your Health	
Brief summary of issues raised:	Summary of action taken / how this has been covered
An article published by the United States Environmental Protection Agency (EPA) titled 'Particle Pollution and Your Health' was submitted setting out the risks to health from particle pollution.	We have undertaken a thorough assessment of the impact from particulate releases and have responded in detail to comments already raised on such matters.
That the risks are accepted as real by the US authorities that are rejected by the UK authorities.	See comment above

The Precautionary Principle and Adverse Health Effects from Incinerator Emissions May 2013	
Brief summary of issues raised:	Summary of action taken / how this has been covered
Under the law of the European Union, the application of the Precautionary Principle has been made a statutory requirement under such circumstances. It presupposes that potentially dangerous effects deriving from a phenomenon, product or	The information in the submission does not affect our decision. We acknowledge there is a range of scientific opinion; however we are satisfied that there will be no significant pollution to the environment or harm to human health. We have set out our position on the

process have been identified, and that scientific evaluation does not allow the risk to be determined with sufficient certainty. This is precisely the situation regarding the health risks associated with incineration in general and therefore the health risks associated with emissions from the AWRP EfW (incinerator) plant. We therefore contend that the Environment Agency is wrong to say that the Precautionary Principle does not apply in the case of incinerators (as it does in the Draft Decision Document) and that this is contrary to European Law. That we fail to recognise the breadth of respected scientific opinion from 'experts' other than the HPA. We ask that the Precautionary Principle be applied to all matters pertaining to human health in respect of the proposed AWRP and, in particular to the EfW (incinerator) plant.	precautionary principle in response to the consultation comments received on the Application in Section A 2) b) (subsection – Consequences of Overcapacity). In addition, it should be noted that the IED provides for the permitting of new waste incinerators. It would not do this if the EU considered the precautionary principle as a general proposition prevented waste incinerators obtaining a permit. Having assessed the Application in detail we are satisfied that the impact can be, and has been evaluated and that it is acceptable. The assessment is precautionary in its approach with the impact of emissions to air being based on maximum/worst case emissions. We have sent this detailed response/report to the HPA (now Public Health England) so that the research studies referenced can be considered by them as part of their ongoing evaluation of relevant information.
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Violation of European Convention on Human Rights - May 2013

Brief summary of issues raised:	Summary of action taken / how this has been covered
That the construction, operation and decommissioning of the facility would breach several Articles in the European Convention on Human Rights. Also included was a petition that a local resident had submitted to the European Commission setting out the various ways in which NYCC with AmeyCespa have breached his Human Rights.	As far as matters regulated by the Permit (that is emissions from the facility) are concerned, we do not consider they will give rise to any significant pollution of the environment or harm to human health. As such, and as explained in section 7.2.2 we do not consider that any convention rights are engaged.

Particulate Emissions and Health – Professor C. Vyvyan Howard – June 2009

Brief summary of issues raised:	Summary of action taken / how this has been covered
A paper was provided written by [REDACTED] on [REDACTED]	Whilst we are aware of ongoing research, having reviewed a variety of reports and taking into account the view of the HPA, we do not consider

'Particulate Emissions and Health.'	it changes our conclusions. The HPA recognises the effect of fine particles on public health. The HPA also recognises that the emissions of such particles from properly controlled modern waste incineration plants are at such low concentrations as to not produce measurable effects on human health.
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d) Representations from Individual Members of the Public

A total of seven responses were received from individual members of the public. These raised many of the same issues as previously addressed. Only those issues additional to those already considered are listed below:

Brief summary of issues raised		Summary of action taken / how this has been covered	
Health			
That we do little to protect the environment and are ignoring current research.		Providing the Applicant can prove that the facility meets all the legal requirements, including environmental, technological and health requirements, then we are legally obliged to issue a Permit. The HPA (now Public Health England) is the body charged by government with responsibilities in human health matters. They are undertaking a project to compare health data with dispersion modelling around UK incinerators. The output from this will inform whether there are any changes in the current generic advice from the HPA but in the meantime they have restated their position that while it is not possible to rule out adverse health effects from modern, well regulated municipal waste incinerators with complete certainty, any potential damage to the health of those living close-by is likely to be very small, if detectable.	
That it is not required, hence the withdrawal of Government Funding.		Recently the Department for Environment, Food and Rural Affairs (Defra) removed PFI (Public Finance Initiative) funding for this development. However, the Environment Agency is duty bound by law to continue with the determination process unless the Application is withdrawn by the applicant. We had no such request from the Applicant.	
That we should postpone the decision regarding the permit because North Yorkshire County Council (NYCC)		See comment above	
Allerton Waste Recovery Park	Page 224 of 225		EPR-NP3034CG-A001

and York City Councils are seeking a Judicial review of the withdrawal of PFI funding.	
That NYCC and York City Council are considering waste disposal proposals from Peel Environmental for a network of facilities across North Yorkshire.	We are duty bound by law to continue with the determination process unless the Application is withdrawn by the Applicant. The issue identified does not affect our decision relating to the acceptability or otherwise of the operation of this facility.
That the Councils are refusing to consider alternatives and that in the case of NYCC a particularly dogmatic stance appears to have been adopted.	The proposed facility forms part of an integrated waste management strategy; the shape and content of this strategy is a matter for the local authority.
A full Independent Review is needed due to the costs and the long term commitment for the developer.	These are not matters for consideration under the EPR. This Application is to operate a facility which is subject principally to the Industrial Emissions Directive (IED). Providing the Applicant can prove that the facility meets all the legal requirements, including environmental, technological and health requirements, then we are legally obliged to issue a Permit.

e) Representations Made at the Drop-In Event

The drop-in event was attended by seven people, who were a mixture of local residents, NYWAG and business community potentially impacted by the proposed facility. Written representations have been included above.
