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

Consultation on our decision document recording our decision-making process

The Permit Number is:	EPR/SP3234HY
The Applicant / Operator is:	Peel Energy Limited
The Installation is located at:	Trafford Boulevard Manchester

Consultation commences on: 30 May 2012
Consultation ends on: 11 July 2012

What this document is about

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

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

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

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

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

Preliminary information and use of terms

We gave the application the reference number EPR/SP3234HY/A001. We refer to the application as "the **Application**" in this document in order to be consistent.

The number we propose to give to the permit is EPR/SP3234HY. We refer to the proposed permit as "the **Permit**" in this document.

The Application was duly made on 14 January 2011.

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

Peel Energy Limited's proposed facility is located on land adjacent to the Manchester Ship Canal and the M60 motorway, Trafford Boulevard, Manchester. We refer to this as "the **Installation**" in this document.

How this document is structured

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Glossary of acronyms used in this document

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

APC	Air Pollution Control
BAT	Best Available Technique(s)
BAT-AEL	BAT Associated Emission Level
BREF	BAT Reference Note
CEM	Continuous emissions monitor
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)
I-TEF	Toxic Equivalent Factors set out in Annex I of WID
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)
LHB	Local Health Board
LOI	Loss on Ignition
MBT	Mechanical biological treatment
MSW	Municipal Solid Waste
MWI	Municipal waste incinerator
NOx	Oxides of nitrogen (NO plus NO_2 expressed as NO_2)
Opra	Operator Performance Risk Appraisal
PAH	Polycyclic aromatic hydrocarbons
PC	Process Contribution
PCB	Polychlorinated biphenyls
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
SED	Solvent Emissions Directive (1999/13/EC)
SCR	Selective catalytic reduction
SGN	Sector guidance note
SNCR	Selective non-catalytic reduction
SPA(s)	Special Protection Area(s)
SS	Sewage sludge
SSSI(s)	Site(s) of Special Scientific Interest
SWMA	Specified waste management activity
TDI	Tolerable daily intake
TEF	Toxic Equivalent Factors
TGN	Technical guidance note
TOC	Total Organic Carbon
UHV	Upper heating value –also termed gross calorific value
UN_ECE	United Nations Environmental Commission for Europe
US EPA	United States Environmental Protection Agency

WFD	Waste Framework Directive (2008/98/EC)
WHO	World Health Organisation
WID	Waste Incineration Directive (2000/76/EC)

1 Our proposed decision

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

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

This Application is to operate an Installation which is subject principally to the Integrated Pollution Prevention and Control Directive (IPPCD) and the Waste Incineration Directive (WID).

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

2 How we reached our decision

The Applicant held pre-application discussions with the Environment Agency, the Environment Agency's notes from these meetings have been placed on the public register and where relevant been used in assessing the Application.

The Application was duly made on 14 January 2011. 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. 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 IPPCD, which applies to the Installation and the Application. We have also taken into account our obligations under the Local Democracy, Economic Development and Construction Act 2009 (particularly Section 23). This requires us, where

we consider it appropriate, to take such steps as we consider appropriate to secure the involvement of representatives of interested persons in the exercise of our functions, by providing them with information, consulting them or involving them in any other way. In this case, our consultation already satisfies the Act's requirements.

We advertised the Application by a notice placed on our website, which contained all the information required by the IPPCD, including telling people where and when they could see a copy of the Application. We also placed an advertisement in the Stretford and Urmston Messenger and the Salford Advertiser on 27 January 2011.

We placed a paper copy of the Application and all other documents relevant to our determination (see below) on our Public Register and also sent a copy to Trafford Metropolitan Borough Council, Pollution and Licensing, Talbot Road, Stretford, Manchester, M32 0TH, for its own Public Register. Anyone wishing to see these documents could do so and arrange for copies to be made. Electronic copies of the Application documents could also be viewed during this initial consultation at:

- Davyhulme Library, Hayeswater Road, Davyhulme, M41 7BL
- Access Trafford Contact Centre, Sale Waterside, Sale, M33 7ZF
- Eccles Gateway, 28 Barton Lane, Eccles M30 0TU
- Stretford Library, Kingsway, Stretford, M32 8AP
- Urmston Library, Golden Way, Urmston, M41 0NA

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

- Trafford Council (Environmental Health/Planning Department)
- Salford Council (Environmental Health/Planning Department)
- Food Standards Agency (FSA)
- Salford Primary Care Trust (PCT)
- Trafford Primary Care Trust (PCT)
- Health & Safety Executive (HSE)
- National Grid
- United Utilities
- Barton Aerodrome

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. We attended a Public surgery which was held by the Applicant 9 and 10 December 2010 at the JJB Soccer Drome in Trafford and we published a press release 27 January 2011. 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. We have taken all relevant representations into consideration in reaching our draft 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 follows:

Notice Dated	Response received
8 February 2011	18 March 2011
16 December 2011	27 January 2012

A copy of each information notice was placed on our public register and sent to Trafford Council for inclusion on its register, as was the response when received.

In addition to our information notices, we received additional information during the determination.

The Applicant sent us some additional information in response to the AQMAU reports as follows:

Additional Information sent	In response to
11 May 2011 (Ref: S1100-0011-0021AMW)	AQMAU report (Ref: C704, dated 21/03/11)
18 January 2012 (Ref: S1100-0420-0051RSS)	AQMAU report (Ref:AQMAU-C748/776-RP02), dated 23/08/11)
2 March 2012 Email from Fichtner	To clarify abnormal emissions

A copy of this information was also placed on our public register and sent to Trafford Council for inclusion on its register.

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

3 The legal framework

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

- an *installation* for the purposes of the IPPCD;
- a *waste co-incineration plant* as described *by* the WID;
- an *operation* covered by the WFD, because it processes waste; and
- subject to aspects of other relevant legislation which also have to be addressed.

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

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

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

4 The Installation

4.1 Description of the Installation and related issues

4.1.1 The permitted activities

The Installation is subject to the EPR because it carries out an activity listed in Part 2 of Schedule 1 to the EPR:

- Section 1.1 A(1)(a) – burning any fuel manufactured from, or comprising, any other waste, in an appliance with a rated thermal input of 50 or more megawatts.

Following current Agency guidance the combustion activity is classified as a co-incineration plant which means that the WID definition ”co-incineration plant” is relevant and includes:

> *“the site and the entire plant including all co- incineration lines, waste reception, storage, on-site pre-treatment facilities, waste-, fuel and air-supply systems, boiler, facilities for the treatment of exhaust gases, on-site facilities for treatment or storage of residues and waste water, stack devices and systems for controlling incineration operations, recording and monitoring incineration conditions.”*

Many activities which would normally be categorised as “directly associated activities” for EPR purposes (see below), such as air pollution control plant, and the ash storage bunker, are therefore included in the listed activity description.

An installation also comprises a “directly associated activity”, which at this Installation includes the generation of electricity using a steam turbine. This is

one installation, because the co-incineration plant and the steam turbine are successive steps in an integrated activity.

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

4.1.2 The Site

This permit is to authorise energy recovery from waste, which comprises predominantly waste wood. It will be located on land adjacent to the M60 motorway and the Manchester Ship Canal at National Grid Reference E375319, N396751. It lies 1km to the west of the Trafford centre and 2km to the west of Trafford. Urmston lies 1.5km to the south east and the nearest dwellings lie around 0.5km away to the south west on the other side of the existing sewage works.

Emissions to atmosphere will be released via a 44.23 metre high stack and in order to protect the adjacent air quality management area (AQMA), emissions of oxides of nitrogen will be controlled to well below the statutory limits.

Manchester Mosses and Rixton Clay pits are Special Areas of Conservation (SAC) located within 10km of the Installation. Foxhill Glen, Davyhulme Millenium Nature Reserve (adjacent to Davyhulme Sewage Works) and the Bridgewater Canal are local wildlife sites located within 2km of the Installation.

There will be no releases of process effluents to water from the Installation. Uncontaminated surface water run off from the site will be collected in a sustainable surface water drainage system and discharged via an interceptor to the Manchester Ship Canal.

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

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

4.1.3 What the Installation does

The Applicant has described the facility as ‘renewable’ energy from waste. However our view is that for the purposes of WID and EPR, the Installation is a co-incinerator because the level of energy recovery from the waste is more than 0.8MW/tonne.

Waste Delivery and Storage
Biomass fuel will be delivered to the plant in covered road vehicles, which are first weighed before proceeding to the fuel reception and loading hall. The development will also allow for delivery via ship from the Manchester Ship Canal at the northern site boundary, with a barge mooring point to be constructed. The plant will also be capable of receiving a small amount of

Solid Recovered Fuel (SRF), delivered in covered road vehicles and tipped into a dedicated area of the fuel reception hall.

Checks will be made on the paperwork accompanying each delivery to ensure that only waste wood and SRF for which the plant has been designed will be accepted. The SRF and waste wood will be observed by the reception hall operator as it is tipped into dedicated storage areas to ensure the SRF and waste wood are acceptable. Any unacceptable waste will be rejected and stored in a designated area in the tipping hall. The Environmental Management System (EMS) will include procedures to control the inspection, storage and onward disposal of unacceptable waste. Certain wastes will require specific action for safe storage and handling.

The fuel reception hall will be a fully enclosed building, storing some fuel and feeding the enclosed conveyer which transfers fuel to the fuel store. Small amounts of SRF can be blended with wood fuel in the reception hall before the blended fuel is transferred to the fuel store.

Waste Charging

The fuel store will hold seven days of fuel with the plant operating at 100% of its capacity. Fuel is then transferred from the fuel store to the combustion plant feed system via a completely enclosed external conveyer. The fuel is then transported via conveyors to a buffer silo from where it is discharged via a screw feed and further conveyors to the boiler feed dosing unit.

The waste charging and feeding systems will be interlocked to prevent waste charging when the furnace temperature is below 850°C, both during start up and if the temperature falls below 850°C during operation. It will also be interlocked to prevent waste charging if the emissions to atmosphere are in excess of an emission limit value due to disturbance or failures of the abatement equipment.

Combustion Process

The hearth, a mechanical moving grate design, ensures continuous mixing of the fuel and hence promotes good combustion. The fuel is moved mechanically by means of reciprocating or rotating grate elements from the feed end, through a drying zone, a main combustion zone and, finally, a burn out zone.

Auxiliary low NOx burners operating on low sulphur gas oil will be fitted for start-up sequencing and to maintain temperatures above 850°C for two seconds. The oxygen concentration and temperature are carefully controlled to ensure complete combustion and minimise dioxin emissions.

The plant will employ a dry bottom ash system which consists of sliding grates installed below the boiler furnace. The sliding grates will open to allow ash to fall into an enclosed area. On a regular basis the ash will be dug-out and transferred into an enclosed container for transfer off-site as waste (see ash handling paragraph below).

Energy Recovery
Hot gases from the combustion process will pass through a series of heat exchangers and superheaters to recover heat and finally through an economiser. The steam generated in the boilers will be fed to a steam turbine which will generate electricity.

Gas Cleaning
Nitrogen oxides (NOx) abatement will be achieved by the use of selective non-catalytic reduction (SNCR). This will be based on the injection of ammonia into the furnace chambers before the boilers.

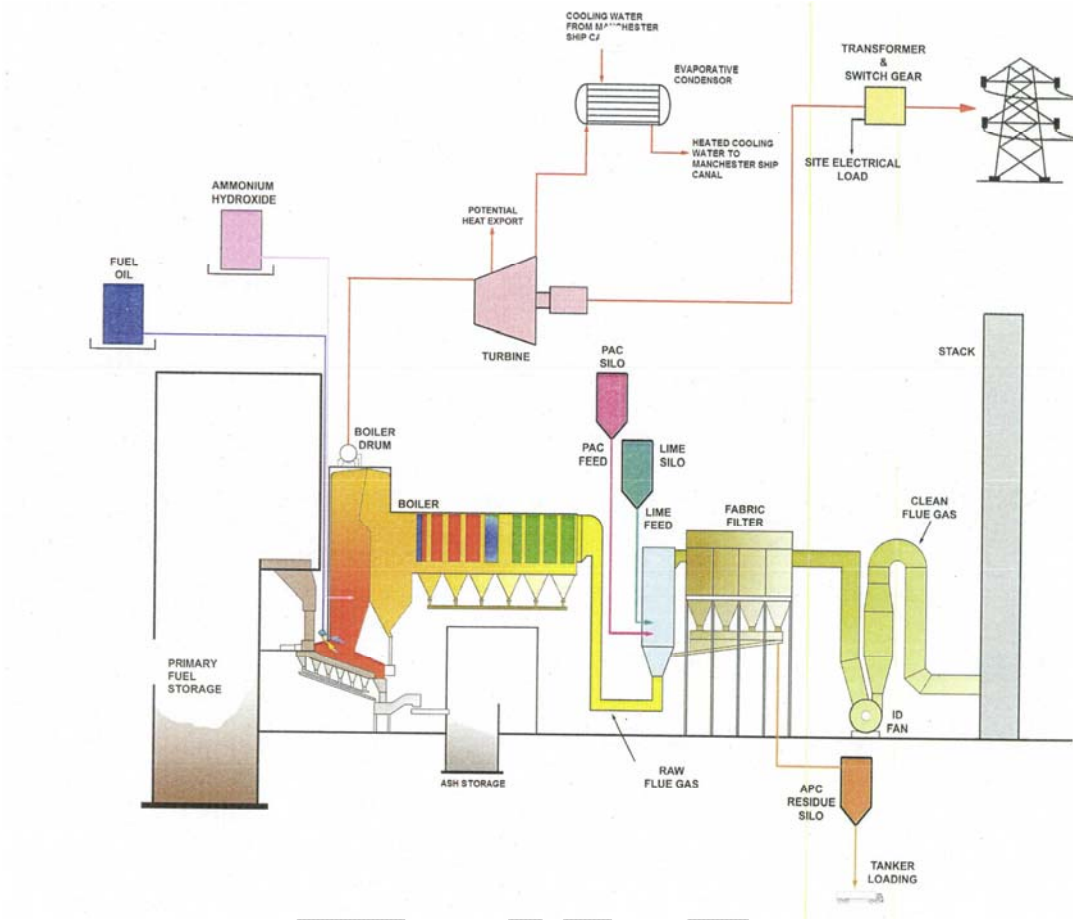
Flue gases pass from the boiler to the gas cleaning equipment. The gas will enter a reaction duct where dry hydrated lime reacts with and neutralises the acid gases. Activated carbon will be injected into the duct preceding the bag filter to adsorb (primarily) dioxins, other volatile organic compounds (VOCs), mercury and other trace metals.

Bag filters will be used to remove the fine ash plus excess and spent lime and carbon as the gases pass through the bag filter fabric. These Air Pollution Control (APC) Residues will fall into a collection hopper and are then conveyed to a storage silo.

The cleaned gas will then discharge to atmosphere via a 44.23 metre high stack.

Ash Handling
The bottom ash and boiler ash will be collected and combined within the building. Bottom ash is the material which falls off the end of the grate, whereas boiler ash is the fine ash which drops out of the flue gas stream in the boiler before entering the flue gas treatment system. These ash streams will be combined and transferred off-site as waste.

The Applicant is investigating options for the recovery of the bottom ash at any facilities in the local area.



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

Waste throughput, Tonnes/line	200,000 tonnes/annum	22.5 tonnes/hour
Waste processed	Waste wood and virgin wood (95%) SRF (5%)	
Number of lines	1	
Furnace technology	Grate	
Auxiliary Fuel	Fuel Oil	
Acid gas abatement	Dry	hydrated lime
NOx abatement	SNCR	Ammonia
Reagent consumption	Auxiliary Fuel: 180 tonnes/annum Ammonia: 1,300 tonnes/annum Lime: 875 tonnes/annum Activated carbon: 140 tonnes/annum Process water: 60,000 tonnes/annum	
Flue gas recirculation	No	
Dioxin abatement	Activated carbon	
Stack	Height, 44.23 m	Diameter, 1.85 m
Flue gas	Flow, 41.6 Nm^3/s	Velocity, 18 m/s
Electricity generated	22.5 MWe	180,000MWh
Electricity exported	20 MWe	160,000 MWh

4.1.4 Key Issues in the Determination

The key issues arising during this determination were as follows:

- NO_2 emissions; there are already elevated levels of NO_2 and an adjacent AQMA.
- Justification for achieving the unusually low NO_2 concentration using SNCR.
- The use of the chemistry module in the air dispersion modelling.

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 proposed installation will be located on land adjacent to the M60 motorway and the Manchester Ship Canal (National Grid Reference E375319, N396751). It lies 1km to the west of the Trafford centre and 2km to the west of Trafford. Urmston lies 1.5km to the south east and the nearest dwellings lie around 0.5km away to the south west on the other side of the existing sewage works.

There have been a number of potentially contaminative activities in the immediate vicinity of the site which have included a sewage works comprising storm water filter beds, bacteria beds and grit drying beds. It is regarded that areas of the site may have been subject to the tipping of waste products or residues from the adjacent sewage works. In addition, a variety of processes have operated on the sewage works site which are likely to have involved excavation, burial of past processes and deposition of surplus materials.

A previous ground investigation undertaken to the south of the site by United Utilities indicated that there were elevated levels of lead, total cyanide, benzene, polyaromatic hydrocarbons (PAH) and total petroleum hydrocarbons (TPH) compounds in the made ground.

The desktop study provided with the Application recommended the following:

It is possible that contamination is present on the site due to adjacent activities (sewerage works) and the presence of made ground on the site. A ground investigation has therefore been recommended for the site, with sampling and contamination testing followed by risk assessment as required.

In our capacity as a statutory consultee for the Planning Application we recommended the inclusion of the following condition in any planning approval (Our Reference: SO/2010/108351/01-L01, dated 31 December 2010):

Condition

Prior to the commencement of development approved by this planning permission (or such other date or stage in development as may be agreed in writing with the Local Planning Authority), the following components of a scheme to deal with the risks associated with contamination of the site shall each be submitted to and approved, in writing, by the local planning authority:

1) A preliminary risk assessment which has identified:
- all previous uses
- potential contaminants associated with those uses
- a conceptual model of the site indicating sources, pathways and receptors
- potentially unacceptable risks arising from contamination at the site.

2) A site investigation scheme, based on (1) to provide information for a detailed assessment of the risk to all receptors that may be affected, including those off site.

3) The site investigation results and the detailed risk assessment (2) and, based on these, an options appraisal and remediation strategy giving full details of the remediation measures required and how they are to be undertaken.

4) A verification plan providing details of the data that will be collected in order to demonstrate that the works set out in (3) are complete and identifying any requirements for longer-term monitoring of pollutant linkages, maintenance and arrangements for contingency action.

Any changes to these components require the express consent of the local planning authority. The scheme shall be implemented as approved.

Reason

To ensure the protection of controlled waters form potential land contamination.

4.2.2 <u>proposed site design: potentially polluting substances and prevention measures</u>

A 'Fugitive Emissions Risk Assessment and Management Plan' was provided in Annex 4 (Environmental Risk Assessment) of the Application. This assessment addressed the hazards associated with site activities with the potential to cause harm and how the risk will be managed. The Applicant concluded that the overall risk was insignificant after the implementation of the necessary control measures.

An 'Accidents Risk Assessment and Management Plan' was also provided in Annex 4 (Environmental Risk Assessment) of the Application. This assessment addressed the hazards associated with site activities with the

potential to cause harm and how the risk will be managed. The Applicant concluded that the overall risk was not significant after the implementation of the necessary control measures.

The Applicant confirmed in their response to a further information notice (notice dated 8 February 2011, response dated 23 March 2011) that all of the storage facilities would be designed in accordance with the latest Environment Agency guidelines, with particular regard to pollution prevention guidelines (PPG) PPG1 (General guide to prevention of pollution), PPG 2 (Above ground storage tanks) and PPG26 (Storage and handling of drums and intermediate bulk containers).

The Applicant also identified within section 1.3.6 of the SCR that 'it is possible that contamination is present on site due to adjacent activities and the presence of made ground on site' and concluded that a ground investigation has been recommended for the site and associated risk assessment'. Section 1.6 of the SCR states this work will be undertaken prior to permit issue. We have set a pre-operational condition to ensure that the scope of the investigation is agreed before commissioning of the Installation commences.

The use of infiltration sustainable urban drainage system (SUDS) devices has been suggested throughout the environmental statement. Whilst in general the use of these devices are encouraged they should not be used on contaminated land where they could cause the mobilisation of existing pollutants to groundwater. For this reason further details of the surface water drainage scheme should be provided once intrusive site investigations have been completed.

We agree with the Applicants assessment and have set a pre-operational conditions to ensure the protection of controlled waters and land.

4.2.3 Closure and decommissioning

Having considered the information submitted in the Application, we are satisfied that the appropriate measures will be in place for the closure and decommissioning of the Installation, as referred to in section 2.10 of the Application. A pre-operational condition requires the Operator to have an Environmental Management System in place before the Installation is operational, which would include a site closure plan.

The Operator has to satisfy us, if it wants to surrender the Permit, that the necessary measures have been taken, both to avoid any pollution risk resulting from the operation of the Installation, and to return the site to a satisfactory state, having regard to the state of the site before the Installation was put into operation. 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 complied with.

4.3 Operation of the Installation – general issues

4.3.1 Administrative issues

The Applicant is the sole operator of the Installation.

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

The incineration of waste is not a specified waste management activity (SWMA). The Environment Agency has considered whether any of the other activities taking place at the Installation are SWMAs and is satisfied that none are taking place.

We are satisfied that the Applicant's submitted Opra profile is accurate. The Opra score associated with this profile was 112.

The Opra score will be used as the basis for subsistence and other charging, in accordance with our Opra 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 they expect to be certified under ISO14001 and that it will be in place before the start of normal operations. We require the EMS to be in place prior to the commencement of commissioning (before the start of normal operation). 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 Installation is operational. An improvement condition is included requiring the Operator to report progress gaining accreditation of its EMS.

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

4.3.3 Site security

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

4.3.4 Accident management

The Applicant has not submitted an Accident Management Plan. However, having considered the other information submitted in the Application, we are satisfied that appropriate measures will be in place to ensure that accidents that may cause pollution are prevented but that, if they should occur, their consequences are minimised. An Accident Management Plan will form part of the 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 Installation in accordance with the following documents contained in the Application:

Description	Parts Included	Justification
The Application	EP Application Supporting Information (issue number 3 dated 11/01/11): **Sections** 1 (Overview); 2.3 (Monitoring Methods); 2.6 (WID requirements); 2.7 (Energy Efficiency). Annex 4 – Environmental Risk Assessment	To ensure that the following items are described or identified: ▪ 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, water vapour and pressure at Air Release sampling points ▪ alternative arrangements for CO, TOC and dust monitoring to make use of the relevant WID abnormal operation condition during CEM failure

Response to our Schedule 5 Notice (08 February 2011) dated 18 March 2011	Response to section 3.3 (bag filters for particulate control)	To ensure that the bag filters are BAT.
Response to our Schedule 5 Notice (16 December 2011) dated 27 January 2012	Response to section 2 (System design to meet NO_x and NH_3 emission limits)	To ensure that the lower NO_x limit is met without NH_3 unacceptable slip.

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

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

Fuel	**Specification**	**Justification**
Fuel Oil	< 0.1% sulphur content	As required by the Sulphur Content of Liquid Fuels Regulations.

Article 4(4) of the WID requires that the Permit must list explicitly the categories of waste which may be treated. The Application contains a list of those wastes coded by the European Waste Catalogue (EWC) number, which the Applicant will accept in the waste streams entering the plant and which the plant is capable of burning in an environmentally acceptable way. We have specified the permitted waste types, descriptions and where appropriate quantities which can be accepted at the Installation in Table S2.2.

The design fuel mix for the wood reported in the Application is a minimum of 95% of the total fuel combusted. SRF will be no more than 5% of the total fuel mix. This equates to 10,000 tonnes of SRF (waste codes 19 02 10 and 19 12 10). We have specified this quantity in Table S2.2.

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

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

We have limited the capacity of the Installation to 200,000 tonnes per year, although the actual throughput is expected to be 180,000 tonnes per year.

180,000 tonnes per year is based on the Installation operating 8,000 hours per year at a nominal capacity of 22.5 tonnes per hour. We have further restricted the operation of the plant by limiting the throughput of SRF to 10,000 tonnes per year as outlined above. The SRF would be limited in any event as the Application is for a wood fired biomass power station.

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

4.3.7 Energy efficiency

(i) Consideration of energy efficiency

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

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

2. The extent to which the Installation meets the requirements of Article 6(6) of the WID, 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 Installation are relevant considerations in the determination of BAT for the Installation, including the Global Warming Potential of the different options. This aspect is covered in the BAT assessment which we explain in section 6 of this Decision Document.

(ii) Use of energy within, and generated by the Installation

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

The Application details a number of measures that will be implemented at the Installation in order to increase its energy efficiency. These include the following:

Good maintenance and housekeeping regimes across the whole plant;

Plant condition monitoring will be carried out on a regular basis. This will ensure, amongst other things, that motors are operating efficiently, insulation and cladding are not damaged and that there are no significant leaks;

Operators will be trained in energy awareness and will be encouraged to identify opportunities for energy efficiency improvements;

An energy efficiency plan will be built into the operation and maintenance procedures of the plant ensuring maximum, practical, sustainable, safe and controllable electricity generation;

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

The response to Item 2.2 (of the information notice date 8 February 2011) states that the specific energy consumption, a measure of total energy consumed per unit of waste processed, will be 111 kWh/tonne. The Installation capacity is 200,000 tonnes/annum.

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

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 average installation electrical demand to generally below 150 kWh/tonne waste with a net CV of 10.4 MJ/kg. The Net CV in this case is expected to be 11.41 MJ/kg. Taking account of the difference in net CV, the specific energy consumption is in line with that set out above.

(iii) Generation of energy within the Installation - Compliance with Article 6(6) of the WID

Article 6(6) of the WID requires that heat "*shall be recovered as far as practicable*". The Government's guidance on the WID (WID EPR Guidance, March 2010) lists the following hierarchy of heat recovery options, with (e) as the least preferred option and the optimum being a combination of the other four options:

a) use of waste heat from boiler water cooling system
b) use of a boiler for steam generation or electricity generation
c) use of exhaust steam for process heating or CHP schemes
d) internal heat exchange for primary air heating and/or flue gas reheating
e) no heat recovery.

The Installation will generate electricity only and has been specified to maximise electrical output with little or no use of waste heat. The Environment Agency's relevant technical guidance note, SGN EPR S5.01, states that using indicative BAT for municipal waste incineration, where electricity only is generated, will mean that 5-9 MW of electricity should be

recoverable per 100,000 tonnes per annum of waste burning capacity. The Sankey diagram in section 2.7 of the Application supporting information shows 22.5 MW of electricity produced for an annual burn of 200,000 tonnes, which represents 11.25 MW per 100,000 tonnes per annum of waste burned. The Installation is therefore above the indicative BAT range, which we would expect given the higher CV of the wood waste.

The SGN and the WID both require that, as well as maximising the primary use of heat to generate electricity; waste heat should be recovered as far as practicable, i.e. by identifying and utilising opportunities for Combined Heat and Power (CHP) and district heating. Additional information was requested on this matter at the duly making stage during which time the Applicant confirmed at this stage no contact had been made. This information was requested again in our further information notice dated 8 February 2011. In their response the Applicant confirmed that a study had been commissioned with a number of potential commercial and industrial receptors being identified. The use of waste heat appears to be practical and the Applicant intends to develop its use.

The location of the Installation largely determines the extent to which waste heat can be utilised, and this is a matter for the planning authority. The Applicant has identified opportunities, although there are no firm commitments at this stage. There is provision within the design of the steam turbine to extract low-grade steam for a district heating scheme. Establishing a district heating network to supply local users would involve significant technical, financial and planning challenges. The Applicant has suggested that without planning permission, it is not practical to enter into such commitments, but will keep the situation under review.

We consider that the additional permit conditions will ensure that the Installation will recover heat as far as practicable, and therefore that the requirements of Article 6(6) are met, insofar as the Environment Agency's remit under the EPR is concerned.

(iv) 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 4. The following parameters are required to be reported:

- total electrical energy generated;
- electrical energy exported;
- electrical energy imported;
- total energy usage.

These parameters, together with the total fuel burned per year, will enable the Environment Agency to monitor energy efficiency at the Installation and take action if at any stage the energy efficiency is not considered acceptable.

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

4.3.8 Efficient use of raw materials

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

The Operator is required to report with respect to raw material usage under condition 4.2 and Schedule 4, including consumption of lime, activated carbon and ammonia used per tonne of waste burned. This will enable the Environment Agency to assess whether there have been any changes in the efficiency of the air pollution control plant, and the operation of the SNCR to abate NO_x. These are the most significant raw materials that will be used at the Installation, other than the waste feed itself (addressed elsewhere). The efficiency of the use of auxiliary fuel will be tracked separately as part of the energy reporting requirement under condition 4.2.1. Optimising reagent dosage for air abatement systems and minimising the use of auxiliary fuels is further considered in the section on BAT.

It is proposed that water for the Installation will be supplied by a combination of towns water and water abstracted from the Manchester Ship Canal. This will be addressed by a separate water abstraction Licence Application to be submitted to the Environment Agency. By using water from the Manchester Ship Canal, the Installation will minimise potable water consumption. Water usage will also be minimised by the use of trigger controls on all wash hoses and waste water will be collected and used in the bottom ash quenching system.

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

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

The first objective is to avoid producing waste at all. Waste production will be avoided by achieving a high degree of burnout of the ash in the furnace, which results in a material that is both reduced in volume and in chemical reactivity. Condition 3.1.4 and associated Table S3.5 specify limits for total organic carbon (TOC) of <3% in bottom ash. Compliance with this limit will demonstrate that good combustion control and waste burnout is being achieved in the furnaces and waste generation is being avoided where practicable.

Most bottom ash is likely to be classified as non-hazardous waste. However, the ash is classified on the European List of Wastes as a "mirror entry", which means it is a hazardous waste if it possesses a hazardous property. Monitoring of incinerator ash will be carried out to ensure it is appropriately classified and its subsequent use or disposal controlled.

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 treatment.

In order to ensure that the bottom ash and APC residues are adequately characterised and sent to appropriate disposal or recovery facilities, a pre-operational condition requires the Operator to provide a written plan for approval detailing the ash sampling protocols. Table S3.5 requires the Operator to carry out an ongoing programme of monitoring.

The Application proposes that, where possible, bottom ash will be transported to a suitable recycling facility, from where it could be re-used. The Applicant is currently investigating options for the use of bottom ash.

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

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

5. Minimising the Installation's environmental impact

Regulated activities can present different types of risk to the environment, including: odour, noise and vibration, accidents, fugitive emissions to air and water, releases to air, discharges to ground or groundwater, global warming potential and generation of waste. Consideration may also have to be given to Photochemical Ozone Creation Potential (POCP) and the effect of emissions being deposited onto land (where there are ecological receptors). All these factors are discussed in this and other sections of this document.

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

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 Installation on human health and the environment and what measures we are requiring to ensure a high level of protection.

5.1 Assessment Methodology

5.1.1 Application of Environment Agency 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 you need detailed air modelling
- 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.

Screen Out Insignificant Emissions

Once short-term and long-term PCs have been calculated (either by dispersion factors or modelling), 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, Environment Agency policy 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.

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 1% threshold is one hundredth of the standard and 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 10% threshold is one tenth of the standard and provides a substantial safety margin to protect health and the environment.

Decide Whether Detailed Modelling is Needed

Where an emission cannot be screened out as insignificant as a PC through applying the H1 Guidance, it does not mean it will necessarily be significant; a detailed modelling of emissions, long-term, short-term or both, should be carried out taking into account the state of the environment before the Installation operates where:

- local receptors may be sensitive to emissions;
- released substances fall under an Air Quality Management Plan;
- the long term Predicted Environmental Concentration (PEC) which is equal to the sum of the background concentration in the absence of the Installation and the process contribution, exceeds 70% of the appropriate long term standard;
- the short-term Process Contribution exceeds 20% of the headroom, which is the appropriate short term standard minus twice the long-term background concentration.

5.1.2 Applying the Guidance to the Application

Where the modelling indicates that the emission is insignificant by the above criteria, and we agree with that assessment, we accept the Applicant's proposals without further justification, because it follows that any improvement that could be achieved by employing alternate techniques would also be insignificant.

We review the Applicant's detailed modelling to confirm whether or not we agree with the applicant's conclusions with respect to H1 screening. For those

pollutants where the $PEC_{long\ term}$ exceeds 70% of an EQS or the $PC_{short\ term}$ exceeds 20% of the headroom between an EQS and the background concentration, we determine whether exceedences of EQS are likely. This is done through detailed audit and review of the Applicant's impact assessment taking headroom and modelling uncertainties into account. Where exceedences are identified, we may require the Applicant to go beyond what would normally be considered BAT for the Installation in order to reduce releases from the Installation to ensure that there is no significant pollution or risk to human health. Whether or not exceedences are considered likely, the application is subject to the requirement to operate in accordance with BAT.

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.

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 Sites of Special Scientific Interest (SSSIs), Special Areas of Conservation (SACs) or Special Protection Areas (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, we consider that emissions **would** cause significant pollution, we would refuse the Application.

5.1.3 Estimating total impact of emissions

In this Application, the Applicant has carried out detailed air dispersion modelling. We have applied the H1 criteria above to the model outputs. We are satisfied that emissions at the permitted limits would ensure a high level of protection for human health and the environment in any event. In Section 6 of this document, we explain how we have determined whether the Applicant's proposals are the Best Available Techniques for this Installation taking into consideration the above assessment.

5.2 Air Quality Assessment

5.2.1 Assessment of Air Dispersion Modelling Outputs

The Applicant assessed the Installation's potential emissions to air against the relevant air quality standards, and potential impact upon local habitat sites and human health. These assessments predicted the potential effects on local air quality from the Installation's stack emissions using the ADMS 4 dispersion model, which is one of the commonly used computer models for regulatory dispersion modelling. The model used 5 years of meteorological data collected from Manchester Airport (2000 to 2004, ceased to operate in 2004) and Woodford (2004 to 2007, next closest weather station). The land surrounding the site is flat, so the effects of the local terrain on dispersion have automatically been taken into account.

The concentrations reported in the assessments were the maximum ground level concentrations with the exception of particulate and NO_2. For these parameters the maximum NO_2 concentration at a receptor was used for both the long and short-term assessments and the maximum concentration at a receptor for the particulate short-term assessment.

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

- First, they assumed that the ELVs in the Permit would be those in the WID (except for the daily average NO_x, where a lower limit of 125 mg/m^3 was used instead of the WID limit of 200 mg/m^3).
- Second, and conservatively, they assumed that the Installation operates continuously at the WID emission limit values i.e. the maximum permitted emissions under the WID, (except for NO_x, where it is assumed that the Installation operates continuously at the lower limit of 125 mg/m^3, see above).

The way in which the Applicant used the dispersion model, its selection of input 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. We expressed a number of reservations with the way in which the modelling work was done which resulted in us requesting additional information from the Applicant which we received electronically 11 May 2011 (see Recommendations and Conclusions below).

We have also audited the air quality and human health impact assessment and agree that the conclusions drawn in the reports were acceptable.

5.2.2 Our Recommendations/Conclusions (AQMAU reports C704 and C748/776-RP02) and AQMAU Response to Memorandum (S1100-0420-0051RSS)

Impact from NO_2/Chemistry module

The Applicant predicts a maximum process contribution at the worst affected residential receptor (in the AQMA) of 1.7% of the AQS and so cannot be screened out as insignificant. This is based on a conservative conversion rate of 70% of NO to NO_2.

The Applicant used the chemistry module in the ADMS modelling software with the aim of more accurately estimating the conversion rate to NO_2. They claim this results in the process contribution being screened out as insignificant (<1% of the AQS) at the worst affected residential receptor. There was however provision of limited information and justification for its use and further information was provided by the Applicant to explore the applicability of this approach (Refer to AQMAU report C748/776-RP02).

We have not accepted their use of the chemistry module due to limitations in the representativness of the background data presented by the Applicant. The conservative conversion rate of NO to NO_2 of 70% remains valid in this

instance, with the process contribution being slightly above the screening out threshold for insignificance at 1.7% of the AQS.

Impact from Benzo(a)pyrene (BaP)
The BaP was not screened out as being insignificant based on an emission rate of 10% of the total polycyclic aromatic hydrocarbons (PAHs). The Applicant provided further information on the emission rate used to determine the impact associated with the release of BaP.

The concentration used in the air dispersion modelling was 0.002 mg/m^3; however the Applicant subsequently used actual data collected from the Environment Agency's public register. This was collected for WID facilities and the maximum concentration was 0.00011 mg/m^3. This is significantly lower than that used in the model and is 0.99% of the AQS (0.25 ng/m^3) at the point of maximum ground level concentration. It is therefore screened out as being insignificant. The Applicant confirmed that the WID data used was from municipal waste plants as there was no data available for wood burning plants; however this concentration was only 5.5% of the emissions level used in the air quality assessment, so the air quality assessment is conservative.

Impact at Habitats
The Manchester Mosses and Rixton Clay Pits (SACs) consist of multiple, widely separated sites; however the Applicant had only considered the impact at one location for each of the SACs. Further assessment was provided to include each part of the SAC, refer to Section 5.4 of this document.

Additional information was provided assessing the critical loads for acid and nitrogen deposition at the SAC and non-statutory sites. The deposition was below 1% and we agreed with this conclusion, refer to Section 5.4 of this document.

The Applicant's modelling predictions are summarised in the tables below (concentrations figures reported in µg/m^3):

5.2.2 Long-term impact of emissions to air

Pollutant [Note 2]	EQS / EAL	Back-ground Conc	Process Contribution (PC)	PC as % of EQS / EAL	Predicted Environmental Concentration (PEC) [Note 6]	PEC as % EQS / EAL
NO_2	40	36.30 [Note 9]	0.69 [Note 7]	1.70	37.00	92.50
Particulate matter (PM_{10})	40	-	0.08 [Note 7]	0.20	-	-
HF	16	-	0.02 [Note 8]	0.12	-	-
VOCs	2.25 [Note 1]	0.18 [Note 9]	0.23 [Note 8]	10.22	0.41	18.22
As	0.003	0.00081	0.00125	41.66	0.00206	68.66

	[Note 4]	[Note 9]	[Note 10]			
Sb	5 [Note 11]	-	0.00125 [Note 10]	0.025	-	-
Cd	0.005	0.00017 [Note 9]	0.00059 [Note 10]	11.80	0.00076	15.2
Cr	5	-	0.00125 [Note 10]	0.03	-	-
Cr (VI)	0.0002	0.000035 [Note 13]	0.0000875 [Note 10]	43.75 [Note 12]	0.0001225	61.25
Co	0.2	-	0.00125 [Note 10]	0.63	-	-
Cu	10	-	0.00125 [Note 10]	0.01	-	-
Pb	0.25	-	0.00125 [Note 10]	0.50	-	-
Mn	150	-	0.00125 [Note 10]	0.00083	-	-
Hg	0.25	-	0.00117 [Note 10]	0.47	-	-
Ni	0.02 [Note 3]	0.0015 [Note 9]	0.00125 [Note 10]	6.25	0.00275	13.75
Tl	1	-	0.00059 [Note 10]	0.06	-	-
V	5	-	0.00125 [Note 10]	0.03	-	-

Note 1 This is assumed to be all 1,3-butadiene.

Note 2 For the metals, each of the nine metals in Group 3 have been taken as one-ninth of the combined limit.

Note 3 EC target value (total content in the PM_{10} fraction)

Note 4 EAL (total content in the PM_{10} fraction)

Note 5 Refer to section 5.2.5 below.

Note 6 PEC is not required for those pollutants where the PC<1% EQS/EAL.

Note 7 Table 4.9 Air Quality Assessment report

Note 8 Table 4.7 Air Quality Assessment report

Note 9 Table 3.13 Air Quality Assessment report

Note 10 Table 4.11 Air Quality Assessment Report

Note 11 The Applicant used an EAL of 5,000 µg/m^3 in their assessment, we have corrected the assessment using an EAL of 5 µg/m^3

Note 12 The Applicant's calculation of 4.37% was corrected to 43.75%

Note 13 The background for Chromium in Table 3.13, multiplied by 0.7% (page 33 of the report)

5.2.3 Short-term impact of emissions to air

Pollutant [Note 2]	EQS / EAL	Back-ground Conc [Note 1]	Process Contribution (PC)	PC as % of EQS / EAL	Predicted Environmental Concentration (PEC) [Note 3]	PEC as % EQS / EAL
NO_2	200	-	9.58 [Note 4]	4.79	-	-
Particulate matter (PM_{10})	50	-	0.31 [Note 4]	0.62	-	-
SO_2 (15-minute mean)	266	4.3 [Note 6]	34.7 [Note 5]	13.05	39.00	14.66
SO_2 (hourly average)	350	-	31.35 [Note 5]	8.96	-	-
SO_2 (daily average)	125	4.3 [Note 6]	18.16 [Note 5]	14.52	22.46	17.97
CO (8 hour running mean)	10,000	-	30.8 [Note 5]	0.31	-	-
HCl	750	-	7.59 [Note 5]	1.01	-	-
HF	160	-	0.76 [Note 5]	0.48	-	-
Sb	150	-	0.042 [Note 7]	0.03	-	-
Cr	150	-	0.042 [Note 7]	0.03	-	-
Co	6		0.042 [Note 7]	0.7	-	-
Cu	200	-	0.042 [Note 7]	0.02	-	-
Mn	1,500	-	0.042 [Note 7]	0.00	-	-
Hg	7.5	-	0.038 [Note 7]	0.5	-	-
Tl	30	-	0.019 [Note 7]	0.06	-	-
V	1	-	0.042 [Note 7]	4.20	-	-

Note 1 For the assessment of short-term impacts the PEC is determined by adding twice the long term background concentration to the short tem process contribution.

Note 2 For the metals, each of the nine metals in Group 3 have been taken as one-ninth of the combined limit.

Note 3 PEC is not required for those pollutants where the PC<10% EQS/EAL.

Note 4 Table 4.9 Air Quality Assessment report

Note 5 Table 4.7 Air Quality Assessment report

Note 6 Table 3.13 Air Quality Assessment report

Note 7 Table 4.11 Air Quality Assessment Report

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 EQS/EAL.

Long-term <1% **AND** Short-term <10%
Particulate matter (PM_{10})
HF
CO
HCl
Sb, Cr, Co, Cu, Pb, Mn, Hg, Tl and V

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

Also from the table above none of the emissions (except NO_2) not screened out as insignificant can be considered to have the potential to give rise to significant pollution in that the predicted environmental concentration is no more than 70% of the long-term EQS/EAL and the Process Contribution is less than 20% of the short-term EQS/EAL headroom. 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.

Regarding NO_2, we have considered whether the emissions will have the potential to give rise to significant pollution. The concentration from the process is only 2% of the background concentration, so if there were to be a breach of the air quality standard the Installation would not be a significant contributor to this, refer to Section 5.6.1 of this document.

Paragraphs 4.46 to 4.59 of the DEFRA guidance for Part A(1) Installations sets out the requirements for EQS's. Paragraphs 4.48 and 4.54 are as follows:

Para. 4.48. *In setting environmental permit conditions, the regulator must first consider whether any Community EQS is being or may be breached. If so, the regulator will have to set ELVs accordingly, based on how far the installation is responsible for the breach and the likelihood of remedial action elsewhere. This may require ELVs which are even tighter than those which the use of BAT can generally meet.*

Para. 4.54. *Where an existing installation makes only a minor contribution to a breach of a Community EQS that is caused mainly by other, non-IPPC sources, ELVs for the installation should reflect that and would generally be expected not to differ significantly from those which would apply regardless of the applicability of the Community EQS. It will be much more important for the regulator to use whatever other powers it has to control the main sources of the breach.*

With respect to NO_2, we have carefully scrutinised the Applicant's proposals to ensure that they are applying the Best Available Techniques to prevent and minimise its release. Additional measures will also be included in the process design to control the emissions to a level significantly below that required by the WID. This is reported in section 6 of this document.

5.2.4 Assessment of emissions of PM_{10} and $PM_{2.5}$

The impact on air quality from particulate emissions has been assessed against EQS for PM_{10} (particles of 10 microns and smaller) and $PM_{2.5}$ (particles of 2.5 microns and smaller). For PM_{10}, the EU EQS are a long-term annual average of 40 $\mu g/m^3$ and a short-term daily average of 50 $\mu g/m^3$. For $PM_{2.5}$ the EU EQS of 25 $\mu g/m^3$ 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 EQS is shown in the table below – all concentrations are shown as $\mu g/m^3$. The assessment assumes that **all** particulate emissions are present as PM_{10} for the PM_{10} assessment and as $PM_{2.5}$ for the $PM_{2.5}$ assessment.

Pollutant	EQS / EAL	Process Contribution (PC)	PC as % of EQS / EAL
PM_{10}	40	0.08	0.2
	50	0.31	0.62
$PM_{2.5}$	25	0.08	0.32

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

- It assumes that the plant emits particulates continuously at the WID limit of 10 mg/m^3 for total dust. Whereas actual emissions from similar plant are normally in the range 1 to 5 mg/m^3.
- It assumes all particulates emitted are below either 10 microns (PM_{10}) or 2.5 microns ($PM_{2.5}$), when some are expected to be larger.

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

The above assessment shows that the predicted process contribution for emissions of PM_{10} is below 1% of the long-term EQS and below 10% of the short-term EQS and so can be considered insignificant.

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

There is currently no emission limit prescribed nor any continuous emissions monitor for particulate matter specifically in the $PM_{1.0}$ 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.

5.2.5 Assessment of Emission of Metals

The Applicant has assessed the impact of metal emissions to air as for other substances by making the conservative assumption that emissions occur continuously at the WID limits; and then using air dispersion modelling comparing their impact against the relevant EQS / EAL in the H1 guidance.

WID sets three limits for metal emissions:

- An emission limit value of 0.05 mg/m^3 for mercury and its compounds.
- An aggregate emission limit value of 0.05 mg/m^3 for cadmium and thallium and their compounds.
- An aggregate emission limit of 0.5 mg/m^3 for antimony, arsenic, lead, chromium, cobalt, copper, manganese, nickel and vanadium and their compounds.

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 WID emission limits for metals along with the Application of BAT also ensures that these requirements are met.

Where WID sets an aggregate limit, the Applicant's assessment assumes that each metal is emitted as the proportion of metals in its group (e.g. one ninth of the limit for each of the group 3 metals). In practice, this approach should be considered conservative when considering the "actual emission data from a representative number of waste incineration plant in the UK".

Notwithstanding this, the Applicant's assessment finds that emissions of Sb, Cr, Co, Cu, Pb, Mn, Hg, Tl and V would be insignificant. For those metals not insignificant by this test, the PEC of Cd, Cr(VI) and Ni would be below 70% of the EQS / EAL.

The PEC for long-term emissions of As is approaching 70% of the long-term standard at 68.66%. There is a theoretical risk of the relevant EQS / EAL being exceeded and this is further examined in the table below.

Of the metal emissions assessed, lead is the only metal subject to an EU EQS of 0.25 µg/m^3 whereas arsenic, cadmium and nickel are subject to EU target values of 0.006 µg/m^3, 0.005 µg/m^3 and 0.02 µg/m^3 by 31 December 2012.

However these are very much worst case assumptions and unlikely to be representative of actual emissions. The Applicant expected the concentration of metal emissions to be similar to those from a municipal waste incinerators.

The Applicant also obtained arsenic emissions data from two similar combustion plants in the UK that operate on virgin and waste wood:

Stevens Croft at Lockerbie – concentrations ranging from 14.1 µg/Nm^3 and 28.6 µg/Nm^3.

Wilton 10 - concentrations ranging from 3.91 µg/Nm^3 and 40.47 µg/Nm^3.

These concentrations are lower than the modelled arsenic concentration of 55 µg/Nm^3.

We have considered whether a less conservative approach would be valid.

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. These guidelines have been incorporated as EALs in the revised H1 Guidance issued by the Environment Agency in 2010.

We have used the arsenic emissions data reported above to model the predicted impact at the point of maximum ground level concentration. The table below shows the assessment using this more representative data.

Concentration figures reported in µg/m^3.

Revised Emissions Data						
Pollutant	EAL	PC	PC as % EAL	Background Conc.	PEC	PEC as % EAL
Arsenic (worst case)	0.003	0.00104	34.67	0.00081	0.0018	61.66
Arsenic (average)	0.003	0.00057	19.00		0.00138	46.00

This shows that emissions of arsenic are unlikely to give rise to significant pollution.

The Installation has been assessed as meeting BAT for control of emissions to air, see section 6 of this document. The Environment Agency's experience of regulating incineration plant is that emissions of individual metals are substantially below the aggregate limits set in WID. It is therefore our

judgement that this theoretical risk is highly unlikely to be realised. An Improvement condition requires the Applicant to reassess the impact of emissions to air of metals based on actual monitoring data from the first year of operation to confirm this judgement, in which case no further action is required.

In the event that the assessment were to indicate a risk of an EU EQS being exceeded, the Environment Agency would consider the need to specify an emission limit value for an individual metal or seek beyond BAT improvements to the abatement technology employed.

5.2.6 Consideration of the Potentially Significant Impact from NO_2

The assessment is based on a daily average ELV of 125 mg/m^3 rather than the WID limit of 200 mg/m^3.

We have not accepted the use of the chemistry module to assess the conversion rate of NO to NO_2, which means that the process contribution is 1.7% of the AQS at the worst affected residential receptor in the AQMA. This is only slightly above the 'insignificance' level and so could not reasonably be considered significant taking modelling uncertainties into account.

The concentration of NO_2 from the process is only 2% of the background concentration in the AQMA and so if there was any exceedance of the EQS the contribution from this process would not be significant. Given this small contribution we would not consider it practical or reasonable to expect the Applicant to go beyond what is considered BAT for the control of NO_2.

Our assessment of BAT is detailed 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 waste incineration directive (WID), the waste framework directive (WFD), integrated pollution prevention and control directive (IPPC) and air quality directive (AQD)

The main conditions in an EfW permit are based on the requirements of the IPPCD. Further specific conditions have been introduced to ensure compliance with the requirements of the WID. The aim of WID is to prevent or to limit as far as practicable negative effects on the environment, in particular pollution by emissions into air, soil, surface water and groundwater, and the

resulting risks to human health, from the incineration and co-incineration of waste. WID achieves this aim by "setting stringent operational conditions, technical requirements and emission limit values". The requirements of the IPPCD include the use of BAT, which may in some circumstances dictate tighter emission limits and controls than the WID. The assessment of BAT for this Installation is detailed in section 6 of this document.

ii) Environmental Impact Assessment

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

iii) Expert Scientific Opinion

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 drafted 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 uptake 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 uptake.

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 uptake 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 uptake.

COMEAP developed a methodology applicable to the results of time series epidemiological studies which allows calculation of the public health impact of exposure to the classical air pollutants (NO_2, SO_2 and particulates) in terms of the numbers of "deaths brought forward" and the "number of hospital admissions for respiratory disease brought forward or additional". 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, SO_2 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 (often the PCT response would incorporate HPA advice). 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 locally 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. The results showed that the predicted daily intake of dioxins resulting from emissions from the proposed Installation at the point of maximum impact were below the recommended TDI levels. The methodology is based on worst case assumptions, with the plant operating continuously at the maximum emission limits allowed under the WID. In practise, this will not be the case and actual emissions will be less than the limits.

Receptor	adult	child
Maximum impact [Note 1]	0.02% [Note 2]	0.13% [Note 2]

Note 1 Tables 7.7 and 7.8 of the Air Quality Assessment Report

Note 2 % of the TDI limit (Calculated maximum daily intake of dioxins by local receptors resulting from the operation of the proposed facility)

The FSA has reported that recent 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 0.9pg WHO-TEQ/kg bodyweight. The additional TDI 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 EN 13284-1. This method requires that the filter efficiency must be at least 99.5 % on a test aerosol with a mean particle diameter of 0.3 µm, at the maximum flow rate anticipated. The filter efficiency for larger particles will be at least as high as this. This means that particulate monitoring data effectively captures everything above 0.3 µm and much of what is smaller. It is not expected that particles smaller than 0.3 µm will contribute significantly to the mass release rate / concentration of particulates because of their very small mass, even if present. This means that emissions monitoring data can be relied upon to measure the true mass emission rate of particulates.

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

The HPA addresses the issue of the health effects of particulates in their September 2009 statement 'The Impact on Health of Emissions to Air from

Municipal Incinerators'. It refers to the coefficients linking PM_{10} and $PM_{2.5}$ with effects on health derived by the Committee on the Medical Effects of Air Pollutants (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 $\mu g/m^3$ would result in an increase in life expectancy of 20 days for people born in 2008." However, "The Committee stresses the need for careful interpretation of these metrics to avoid incorrect inferences being drawn – they are valid representations of population aggregate or average effects, but they can be misleading when interpreted as reflecting the experience of individuals."

The HPA also point out that in 2007 incinerators contributed 0.02% to ambient ground level PM_{10} levels compared with 18% for road traffic and 22% for industry in general. 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 PM_{10}. It goes on to say that PM_{10} includes and exceeds $PM_{2.5}$ which in turn includes and exceeds $PM_{0.1}$.

This is consistent with the assessment of this application which shows emissions of PM_{10} 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 Installation

We have assessed the health effects from the operation of this Installation in relation to the above (sections 5.3.1 to 5.3.3). 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 NO_2 (short-term), particulate matter (PM_{10}), hydrogen fluoride, hydrogen chloride, carbon monoxide, Sb, Cr, Co, Cu, Pb, Mn, Hg, Tl and V have all indicated that the Installation emissions screen out as insignificant; where the impact of emissions of NO_2 (long-term), SO_2 (short-term), TOC, As, Cd and Ni 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, with the exception of NO_2 (Refer to Section 5.2.6 of this document).

The Environment Agency has reviewed the methodology employed by the Applicant to carry out the health impact assessment.

We have expressed a number of minor concerns with the way in which the modelling work has been done. We are satisfied, however that dioxin and furan emissions are not likely to contribute significantly to any exceedences of the TDI.

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 facility will not pose a significant carcinogenic or non-carcinogenic risk to human health. The local Primary Care Trusts (Salford and Trafford PCT) were consulted on the Application and concluded that they had no significant concerns regarding the risk to the health of humans from the Installation. The Food Standards Agency (FSA) was also consulted during the Permit determination process. Details of the responses provided by the PCT 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 facility are unlikely to have an impact upon human health.

5.4 Impact on Habitats sites and local wildlife sites

5.4.1 Sites Considered

The following Habitats, classified as Special Areas of Conservation (SAC), are located within 10km of the installation:

- Manchester Mosses (5km west of the Installation) – this site contains examples of degraded raised bogs that are still capable of natural regeneration.

- Rixton Clay Pits (9.7km south west of the Installation) – great crested newts are known to occur in at least 20 ponds across the site.

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

The following non-statutory local wildlife sites were located within 2km of the Installation:

- Foxhill Glen (1.2km west of the Installation)
- Davyhulme Millenium Nature Reserve, adjacent to Davyhulme Sewage Works (1km south west of the Installation)
- Bridgewater Canal (1.7km east of the Installation)

5.4.2 Habitats Assessment

The Applicant's Habitats assessment was reviewed by the Environment Agency's technical specialists for modelling, air quality, conservation and ecology technical services, who agreed with the assessment's conclusions; however they did identify some data gaps for which we sought further clarification. This included additional assessment at the SAC where more than one location required assessment due to the site consisting of multiple, widely separated sites (consists of Risley Moss SSSI, Holcroft Moss SSSI and Astley and Bedford Mosses SSSI). An assessment of acid and nitrogen deposition was also required.

Concentrations in the Tables below are reported in $\mu g/m^3$.

Manchester Mosses – Emissions to Air

Pollutant	Critical Level	Process Contribution (PC) [Note 2]	PC as % of EQS / EAL
NO_2 (annual mean)	30	0.06	0.2
NO_2 (daily mean)	75	1.02	1.36
SO_2 (annual mean)	10 [Note 1]	0.03	0.3
SO_2 (annual mean)	20	0.03	0.15
HF (daily mean)	5	0.01	0.2
HF (weekly mean)	0.5	0.01	2
NH_3 (annual mean)	1 [Note 1]	0.01	1
NH_3 (annual mean)	3	0.01	0.33

Note 1 Annual mean where lichens & bryophytes are an important part of the ecosystem's integrity.

Note 2 Table 4.13 Air Quality Assessment report

The impact at the Manchester Mosses from emissions to air are screened out as being insignificant.

Manchester Mosses – Nitrogen Deposition

Site	Predicted Deposition kgN/he/yr		Critical Load kgN/he/yr	Percentage Contribution	
	Max	Average		Max	Average
Manchester Mosses	0.0065	0.0043	5	0.13	0.09
Risley Moss SSSI	0.0023	0.0019	5	0.05	0.04
Holcroft SSSI	0.0034	0.0024	5	0.07	0.05
Astley & Bedford Mosses SSSI	0.0054	0.0033	5	0.11	0.07

Note Results from Table 5 in Report S1100-0011-0021AMW (additional information sent 11 May 2011 in response to AQMAU report C704)

The impact at the Manchester Mosses from nitrogen deposition are screened out as being insignificant.

Manchester Mosses – Acid Deposition

Site	Worst Year			Average		
	Acid N keq/he/yr	Acid S keq/he/yr	% Critical Load Function	Acid N keq/he/yr	Acid S keq/he/yr	% Critical Load Function
Manchester Mosses	0.00046	0.00308	1.28	0.00031	0.00202	0.84
Risley Moss SSSI	0.00016	0.00108	0.45	0.00014	0.00091	0.38
Holcroft SSSI	0.00024	0.00163	0.68	0.00017	0.00116	0.48
Astley & Bedford Mosses SSSI	0.00038	0.00255	1.06	0.00024	0.00158	0.66

Note Results from Table 6 in Report S1100-0011-0021AMW (additional information sent 11 May 2011 in response to AQMAU report C704)

For the worst case year, the contribution to acid deposition is slightly greater than 1% of the critical load function at the Manchester Mosses SAC and the Astley and Bedford Mosses SSSI; however, for the other four years of weather data, the contribution is well below 1%. This calculation assumes that the Installation will operate at the emission limits and so represents an absolute worst case scenario.

Rixton Clay Pits – Emissions to Air

Pollutant	Critical Level	Process Contribution (PC) [Note 2]	PC as % of EQS / EAL
NO_2 (annual mean)	30	0.02	0.07
NO_2 (daily mean)	75	0.56	0.75
SO_2 (annual mean)	10 [Note 1]	0.01	0.10
SO_2 (annual mean)	20	0.01	0.05
HF (daily mean)	5	0.00	0.00
HF (weekly mean)	0.5	0.00	0.00
NH_3 (annual mean)	1 [Note 1]	0.00	0.00
NH_3 (annual mean)	3	0.00	0.00

Note 1 Annual mean where lichens & bryophytes are an important part of the ecosystem's integrity.

Note 2 Table 4.13 Air Quality Assessment report

The impact at the Rixton Clay Pits from emissions to air are screened out as being insignificant.

The impact from deposition was not undertaken for the newt sites at Rixton Clay Pits as they are not sensitive to deposition.

We sent an Appendix 11 screening assessment to Natural England for consultation and they agreed that the Installation was not likely to have a significant effect on the interest features of the SACs.

5.4.3 Assessment of Non-Statutory Wildlife Sites

The Applicant's assessment of the wildlife 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 site(s).

Foxhill Glen

Pollutant	Critical Level	Back-ground Conc	Process Contribution (PC) [Note 3]	PC as % of EQS / EAL	Predicted Environmental Concentration (PEC)	PEC as % EQS / EAL
NO_2 (annual mean)	30	-	0.29	0.97	-	-
NO_2 (daily mean)	75	-	4.77	6.36	-	-
SO_2 (annual mean)	20 [Note 1]	-	0.12	0.6	-	-
HF (daily mean)	5	-	0.04	0.8	-	-
HF (weekly mean)	0.5	-	0.04	8	-	-
NH_3 (annual mean)	1 [Note 1]	1.44 [Note 2]	0.02	2	1.46	146
NH_3 (annual mean)	3	-	0.02	0.66	-	-

Note 1 Critical level from Air Pollution Information System (APIS) website.

Note 2 Background concentration from APIS website.
Note 3 Table 4.13 Air Quality Assessment Report

Davyhulme Millenium Nature Reserve (adjacent to Davyhulme Sewage Works)

Pollutant	Critical Level	Back-ground Conc	Process Contribution (PC) [Note 4]	PC as % of EQS / EAL	Predicted Environmental Concentration (PEC)	PEC as % EQS / EAL
NO_2 (annual mean)	30	36.3 [Note 5]	0.45	1.5	36.75	122.5
NO_2 (daily mean)	75	-	7.32	9.76	-	-
SO_2 (annual mean)	20 [Note 1]	-	0.18	0.9	-	-
HF (daily mean)	5	-	0.06	1.2	-	-
HF (weekly mean)	0.5	[Note 2]	0.06	12	-	-
NH_3 (annual mean)	1 [Note 1]	1.4 [Note 3]	0.04	4	1.44	144
NH_3 (annual mean)	3	1.4 [Note 3]	0.04	1.33	1.44	48

Note 1 Critical level from Air Pollution Information System (APIS) website.

Note 2 Background concentration unknown.

Note 3 Background concentration from APIS website.

Note 4 Table 4.13 Air Quality Assessment report

Note 5 Table 3.13 Air Quality Assessment report

Bridgewater Canal

Pollutant	Critical Level	Process Contribution (PC) [Note 2]	PC as % of EQS / EAL
NO_2 (annual mean)	30	0.12	0.4
NO_2 (daily mean)	75	2.42	3.23
SO_2 (annual mean)	10 [Note 1]	0.05	0.5
SO_2 (annual mean)	20	0.05	0.25
HF (daily mean)	5	0.02	0.4
HF (weekly mean)	0.5	0.02	4
NH_3 (annual mean)	1 [Note 1]	0.01	1
NH_3 (annual mean)	3	0.01	0.33

Note 1 Critical level from Air Pollution Information System (APIS) website.

Note 2 Table 4.13 Air Quality Assessment report

The impact at Foxhill Glen and Davyhulme Millenium Nature Reserve can be summarised as follows:

Despite the fact that the Critical Load is already exceeded for NH_3 (Foxhill Glen) and NO_2 and NH_3 (Davyhulme Millenium Nature Reserve), the incremental increase attributable to emissions from the proposed Installation is small. Given this small contribution from the Installation and the conservative nature of the assessment, it is likely that the emissions could be considered insignificant.

The Applicant's Habitats assessment was reviewed by the Environment Agency's technical specialist for conservation and ecology technical services, who agreed with the assessment's conclusions, that the impact of the Installation's emissions upon the SACs and local wildlife sites would be insignificant.

5.5 Impact of abnormal operations

WID (Article 6(3)(c)) requires that waste shall cease to be fed to the Installation 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. Not withstanding this, WID (Article 13(3)) allows for the continued feeding of waste under abnormal operating conditions – this is a recognition that the emissions during transient states (e.g. start-up, 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. WID Article 13

sets criteria for determining what is an abnormal operation and sets some limits regarding duration and extent of the abnormal operation which aim to ensure that the overall environmental impact is so minimised.

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 (<1% of total operating hours). As such, 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.

WID abnormal operations are defined as any technically unavoidable stoppages, disturbances, or failures of the abatement plant or the measurement devices, during which the concentrations in the discharges into air may exceed the normal emission limit values.

For incineration plant, WID sets backstop limits for particulates, CO and TOC which must continue to be met. 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. It should be remembered that these backstop limits do not apply to co-incineration plants.

In making an assessment of abnormal operations a worst case scenario has been assumed with complete failure of the abatement system as follows:

- Dioxin emissions of 10 ng/m^3 (100 x limit)
- NOx emissions of 600 mg/m^3 (1.5 x short-term limit)
- Particulate emissions of 150 mg/m^3 (5 x short-term limit)
- SO_2 emissions of 211 mg/m^3 (emission calculated from the concentration in the fuel)
- HCl emissions of 108 mg/m^3 (emission calculated from the concentration in the fuel)
- Metals 2.5 mg/m^3 (5 x limit)

For dioxins the WID emission limit has been multiplied by a factor of 100 to assess the effect. This is equivalent to saying that the activated carbon injection is at least 99% efficient in abating emissions of dioxins.

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

Concentration figures reported in mg/m^3.

Pollutant	Half hourly max	Abnormal emission
NO_2	400	600
Particulate matter (PM_{10})	30	150
SO_2	200	211 [Note 2]
HCl	60	108 [Note 2]
Cd and Tl	0.05	0.25
Sb, As, Pb, Cr, Co, Cu, Mn, Ni and V	0.5	2.5

Note 1 The dioxin assessment wasn't included; however if we consider worst case scenario with the release at 100 times the limit, this would still be significantly below the TDI, see below.

Note 2 Concentrations from additional information sent 2 March 2012 to clarify abnormal emissions.

This is a worst case scenario in that WID 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 of the short-term environmental impact is summarised in the table below.

Concentration figures reported in µg/m^3.

		Predicted Impact-WID limits			Predicted Impact-Abnormal Operation		
Pollutant	EQS / EAL	Process Contribution (PC)	PC as % of EQS / EAL	PEC as % of EQS / EAL	Process Contribution (PC)	PC as % of EQS / EAL	PEC as % of EQS / EAL
NO_2	200	9.58	4.79	-	14.37	7.19	-
Particulate matter (PM_{10})	50	0.31	0.62	-	1.55	3.10	-
SO_2	266	34.7	13.05	14.66	36.6	13.76	16.99
HCl	750	7.59	1.00	-	13.66	1.82	-
Cd and Tl	1.5	0.019	1.27	-	0.095	6.33	-
Sb, As,	1	0.042	4.22	-	0.21	21.00	28.6

Pb, Cr, Co, Cu, Mn, Ni and V [Note 2]							

Note 1 For the assessment of short-term impacts the PEC is determined by adding twice the long term background concentration to the short tem process contribution.

Note 2 EAL of 1 µg/m^3 for vanadium

This is considered to be a highly conservative assessment as it assumes that the abnormal emissions coincide with the worst case meteorological conditions.

Even with these highly conservative factors, there are no predicted exceedances of air quality standards.

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.

Short-term <10%
NO_2
Particulate matter (PM_{10})
HCl
Cd and Tl

For SO_2 and metal emissions, the PC is less than 20% of the headroom. For this emission we require the Applicant to apply BAT, and this is considered in section 6.

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/m^3 for the maximum period of abnormal operation, this would result in a 70% increase in the TDI reported in section 5.3.2. In these circumstances the TDI would be 0.034% of the TDI for adults, which will still not pose a risk to human health.

5.6 Other Considerations

5.6.1 Air Quality Management Area (AQMA)

Maximum Impact at a Residential Receptor

The proposed plant is approximately 300 m from the edge of an AQMA which has been declared because of likely exceedences of the annual mean for NO_2 of 40 µg/m^3. The Applicant has reviewed the monitoring results from the

various continuous and diffusion tube monitoring locations in the area and chosen to use results from the Salford Eccles continuous monitor (2.8 km to the north-east) for the background NO_2 level. The annual mean for the last three years of data (2007 to 2009) was averaged to give a background value of 36.3 µg/m^3 and thus a headroom of 3.7 µg/m^3. However, we note that the annual mean measured with this device in 2009 was 39.3 µg/m^3.

Background Source Salford Eccles	Back-ground Conc	EQS	Process Contribution (PC)	PC as % of EQS / EAL	Predicted Environmental Concentration (PEC)	PEC as % EQS / EAL
Average 2007-2009 [Note 1]	36.3	40	0.69	1.70	37.00	92.50
2009 [Note 2]	39.3	40	0.69	1.70	39.99	99.97

Note 1 Table 3.13 of the Air Quality Assessment Report

Note 2 Table 3.1 of the Air Quality Assessment Report

The NO_2 process contribution at the point of maximum impact (Tindall Street) was used and is less than 2% of the averaged background concentration at this location. Given the conservative nature of the modelling even taking account of the higher background figure we do not consider it would cause an exceedance of the EQS in the AQMA at this location.

Impact at Stroma Gardens

We also refer to the results from a diffusion tube that is located much closer to the M60 and thought to be more representative of the air quality in the vicinity of Stroma Gardens in the AQMA. This was noted by the Applicant but not commented on or used (Salford City Council tube no. SA 34 at 673 Liverpool Road, close to the junction of the M60 and A57, and approximately 1 km to the north-east of the proposed plant). The annual means measured here have been over 60 µg/m^3 for four of the five years between 2005 to 2009. The diffusion tube is mounted less than 1 m from the façade of a residential property.

Background Source 637 Liverpool Road	Back-ground Conc	EQS	Process Contribution (PC)	PC as % of EQS / EAL
Average 2005-2009 [Note 1]	62	40	0.36 [Note 2]	0.9

Note 1 Table 3.7 of the Air Quality Assessment Report

Note 2 Table 4.9 of the Air Quality Assessment Report

The process contribution at the nearest dwelling in Stroma Gardens was used in this case and is only 0.6% of this background concentration. In any event, at this location, the emissions are actually screened out as being insignificant. The contribution from the process would have a negligible contribution to the exceedance of the EQS.

There are also several future additional sources of NO_2 under consideration (see Section 5.6.2 below), which will add to NO_2 concentrations in the local area:

- increased traffic associated with the new Port Salford facilities;
- the Carrington I and II power stations;
- Partington Paper Mill; and
- gas engines at the Davyhulme Wastewater Works.

When considering the impact of the Installation on the AQMA, it needs to be considered in the wider context of the other sources which are also contributing and thus impacting on the air quality. As previously mentioned, at the point of maximum impact (residential receptor) the concentration of NO_2 from the Installation is less than 2% of the averaged background concentration at this location. We concluded that given the conservative nature of the modelling even taking account of the higher background figure that we did not consider it would cause an exceedance of the EQS in the AQMA at this location.

We also need to consider the conservative nature of the tools which lead us to our findings which are more likely to over predict than under predict the impact and that our 1% insignificance test is a tool for screening out impacts and not a tool for testing significance.

We have already set an unusually low limit for NO_2 and actual emissions are almost certain to be below this emission limit in practice. 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. The assessment undertaken is therefore a “worst-case” scenario.

Given the small contribution from the Installation we would not consider it practical or reasonable to expect the Applicant to go beyond what is considered BAT for the control of NO_2; however we have set an unusually low daily average limit for NO_2 of 125 mg/m^3, refer to Section 6.6 below.

5.6.2 Cumulative Impact

This assessment has focussed on nitrogen dioxide, due to the presence of the AQMAs and because nitrogen dioxide is released by all of the consented developments considered below.

Carrington I and II Power Stations

The impact of the planned gas-fired power stations in Carrington was considered in the planning application for Carrington II. The dispersion modelling carried out for the planning application and reported in the Environmental Statement included both Carrington I and Carrington II.

The combined impact of these two power stations in the Trafford AQMA and the Salford AQMA was stated to be 0.13 µg/m^3 and 0.14 µg/m^3 respectively, when the effect of atmospheric chemistry is taken into account.

Back-ground Conc	EQS	Process Contribution (PC)	PC as % of EQS / EAL
36.3	40	0.27	0.68

These combined concentrations are <1% of the AQS and so would be screened out as being insignificant. Section 6 (1) of the Air Quality Assessment Report confirms that if these concentrations are added to the predicted contribution in each AQMA from the Installation, which is no more than 0.4 µg/m^3, and the background concentration of 36.3 µg/m^3, the total predicted concentration is 36.97 µg/m^3, which is below the air quality objective.

United Utilities

We also audited the air quality modelling which was submitted as part of a separate EP application for new combustion plant at its Davyhulme treatment works. This information can be found on the public register under Application number EPR/HP3931LJ/V005.

We concluded that the proposed changes were predicted to result in a rise in annual mean NO_2 concentrations of between 1 and 2% of the AQS in a residential area within the AQMA. Given the conservative nature of the modelling we consider the new plant would have a negligible contribution to any exceedance of the EQS in the AQMA at this location.

Port Salford and Salford Reds Stadium

The impact of these two developments was considered in the planning application and final Environmental Statement for the Port Salford development. The concern was the impact of additional or rerouted traffic.

Section 6 (3) of the Air Quality Assessment Report concludes that these developments would not lead to any amendments to the existing AQMA. While there would be increases of 12 % at one location, increases of 5-6 % at the affected locations were more common. The highest impacts were predicted to occur along Liverpool Road and it can be seen from Figure 6 in Appendix C of the Air Quality Report, that the impact of the biomass plant on Liverpool Road is less than 0.3 $\mu g/m^3$. Taking the most affected receptor from the Port Salford AQMA, which is Liverpool Road to the east of the M60, the concentration was predicted to increase from 45.5 $\mu g/m^3$ to 51.2 $\mu g/m^3$. The biomass plant is predicted to add less than 0.3 $\mu g/m^3$ to this concentration, which is 0.6 % of the predicted concentration so it would have a negligible contribution to the exceedance of the EQS.

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6. Application of Best Available Techniques

6.1 Scope of Consideration

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

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

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

  NO_2
  SO_2
  VOCs
  As
  Cd
  Ni

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

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

WID on the other hand is based on setting mandatory emission limit values. Although the WID 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. As the WID itself states, its limits are "*a necessary but not sufficient condition*" for compliance with the requirements of the IPPCD, which also applies to this Installation. The IPPCD requires that emissions should be prevented or minimised, so it may be possible and desirable to achieve emissions below WID limits.

Even if the WID 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, WID limits is therefore a "worst-case" scenario.

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

6.1.1 Consideration of Furnace Type

The prime function of the furnace is to achieve maximum combustion of the waste. The WID requires that the plant (furnace in this context) should be designed to deliver its requirements. The main requirements of the WID 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 NOx as the furnace choice could have an effect on the amount of unabated NOx produced
- energy consumption – whole plant, waste preparation, effect on GWP
- Need, if any, for further processing of residues to comply with TOC
- Costs

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 leaks and higher complexity	TOC 0.5 % to 3 %	Slightly higher capital cost than air-cooled

Technique	Key waste characteristics and suitability	Throughput per line	Advantages	Disadvantages / Limitations of use	Bottom Ash Quality	Cost
Rotary Kiln	Can accept liquids and pastes solid feeds more limited than grate (owing to refractory damage) often applied to hazardous Wastes	<10 t/h	Very well proven with broad range of wastes and good burn out even of HW	Throughputs lower than grates	TOC <3 %	Higher specific cost due to reduced capacity
Fluid bed - bubbling	Only finely divided consistent wastes. Limited use for raw MSW often applied to sludges	1 to 10 t/h	Good mixing Fly ashes of good leaching quality	Careful operation required to avoid clogging bed. Higher fly ash quantities.	TOC <3 %	FGT cost may be lower. Costs of waste preparation
Fluid bed - circulating	Only finely divided consistent wastes. Limited use for raw MSW, often applied to sludges / RDF.	1 to 20 t/h most used above 10 t/h	Greater fuel flexibility than BFB Fly ashes of good leaching quality	Cyclone required to conserve bed material Higher fly ash quantities	TOC <3 %	FGT cost may be lower. Costs of preparation.
Oscillating furnace	MSW / heterogeneous wastes	1 – 10 t/h	Robust Low maintenance	-higher thermal loss than with grate furnace	TOC 0.5 – 3 %	Similar to other technologies

			Long history Low NOX level Low LOI of bottom ash	- LCV under 15 G/t		

Technique	**Key waste characteristics and suitability**	**Throughput per line**	**Advantages**	**Disadvantages / Limitations of use**	**Bottom Ash Quality**	**Cost**
Pulsed hearth	Only higher CV waste (LCV >20 GJ/t) mainly used for clinical wastes	<7 t/h	can deal with liquids and powders	bed agitation may be lower	Dependent on waste type	Higher specific cost due to 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
Gasific-ation - fixed bed	- mixed plastic wastes other similar consistent streams	1 to 20 t/h	-low leaching residue good burnout if oxygen blown syngas available -Reduced oxidation of	- limited waste feed - not full combustion - high skill level tar in raw gas - less widely proven	-Low leaching bottom ash good	High operation/ maintenance costs

	gasification less widely used/proven than incineration		recyclable metals		burnout with oxygen	

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	~ 5 t/h (short drum) 5 – 10 t/h	no oxidation of metals no combustion	- limited wastes process control and	- dependent on process temperature	High pre-treatment, operation and

	shredder residues/plastics pyrolysis is less widely used/proven than incineration	(medium drum)	energy for metals/inert in reactor acid neutralisation possible syngas available	engineering critical high skill req. not widely proven need market for syngas	residue produced requires further processing sometimes combustion	capital costs

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

- Moving Grate Furnace
- Rotary Kiln
- Fluidised Bed

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.

Consideration of emissions to air, global warming potential, raw material consumption, waste produced and the 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 proven for this fuel and that the rotary kiln would have a greater impact on the global warming potential.

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 WID for the air emission of TOC/CO and the TOC on bottom ash.

Boiler Design

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

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

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 WID for the air emission of TOC/CO and the TOC on bottom ash.

6.2 BAT and emissions control

The prime function of flue gas treatment is to reduce the concentration of pollutants in the exhaust gas as far as practicable. The techniques which are described as BAT individually are targeted to remove specific pollutants, but the BREF notes that there is benefit from considering the 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.

The Technical Guidance Note points to a range of technologies being BAT subject to circumstances of the Installation.

6.2.1 Particulate Matter

Particulate matter				
Technique	**Advantages**	**Disadvantages**	**Optimisation**	**Defined as BAT in BREF or TGN for:**
Bag / Fabric filters (BF)	Reliable abatement of particulate 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 BAT on its own. Liquid effluent produced	Require reheat to prevent visible plume and dew point problems.	Where scrubbing required for other pollutants
Ceramic filters	High temperature applications Smaller plant.	May "blind" more than fabric filters		Small plant. High temperature gas cleaning required.
Electrostatic precipitators	Low pressure gradient. Use with BF may reduce the energy consumption of the induced draft fan.	Not BAT on their own.		When used with other particulate abatement plant

The Applicant proposes to use fabric filters for the abatement of particulate matter. Fabric filters provide reliable abatement of particulate matter to below 5 mg/m^3 and are BAT for most installations. In their response to the notice for further information (notice dated 8 February 2011, response dated 18 March 2011) the Applicant proposed 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.

6.2.2 Oxides of Nitrogen

Oxides of Nitrogen : Primary Measures				
Technique	**Advantages**	**Disadvantages**	**Optimisation**	**Defined as BAT in BREF or TGN for:**
Low NOx burners	Reduces NOx at source		Start-up, supplementary firing.	Where auxiliary burners required.
Starved air systems	Reduce CO simultaneously.			Pyrolysis, Gasification systems.

Optimise primary and secondary air injection				All plant.
Flue Gas Recirculation (FGR)	Reduces the consumption of reagents used for secondary NOx control. May increase overall energy recovery	Some applications experience corrosion problems.		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

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.

The Application stated that FGR was not proposed. This method can potentially reduce the consumption of reagents for secondary NO_x control and can increase overall energy recovery, although in some applications there can be corrosion problems. Additional information was requested to justify this omission in our further information notice dated 08 February 2011. The Applicant confirmed that many factors are responsible for the design of a combustion system and that it was not appropriate to discard a system just because FGR did not form part of that solution. When the Application was submitted a technology provider had not been chosen; however if the chosen technology supplier has an established track record of using this technique and can demonstrate the benefits, in terms of energy efficiency and environmental performance then FGR will be included.

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/m^3 and can be applied to all plant, it is generally more expensive than SNCR and requires reheating of the waste gas stream which reduces energy efficiency, periodic replacement of the catalysts also produces a hazardous waste. SNCR can typically reduce NO_x levels to between 150 and 180 mg/m^3; it relies on an optimum temperature of around 900^oC and sufficient retention time for reduction. SNCR is more likely to have higher levels of ammonia slip. The technique can be applied to all plant unless lower NO_x releases are required for local environmental protection. Urea or ammonia can be used as the reagent with either technique, urea is somewhat easier to handle than ammonia and has a wider operating temperature window, but tends to result in higher emissions of N_2O. 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 ammonia dosing for NO_x abatement. This system is required to achieve a daily average limit of 125 mg/m^3 which is significantly lower than the WID daily limit of 200 mg/m^3, and lower than that typically achieved by currently permitted incinerators using the same abatement technique. We required further information to clarify and justify how this lower limit would be achieved with SNCR technology.

Further information was requested in our notice dated 8 February 2011. In their response the Applicant provided monitoring data from other reference plants; however we did not consider that the design and technology was

comparable with the proposed Installation and further information was requested in another Notice dated 16 December 2011.

In their response to this Notice, the Applicant clarified the use of SNCR and that the selected technology provider would be required to guarantee the emission limits. It was confirmed that the lower emissions of oxides of nitrogen would be achieved by the following measures:

- Injection of combustion air in a staged manner, determined by computational fluid dynamics (CFD);
- Location of the ammonia nozzles optimised using CFD;
- Combustion chamber designed to increase the time that combustion gases spend at the optimum SNCR reaction temperature;
- Reduction of thermal NOx by lower levels of oxygen in the combustion chamber.

The Applicant approached a number of boiler suppliers with the aim of providing a sufficient level of confidence that the lower NO_x limit was achievable. It was also stated that 'although boiler suppliers are confident that the emission limits can be achieved, they have not been required to provide combustion plants with guaranteed emission limits at these levels.'

MVV Umwelt
A paper was provided by MVV Umwelt which explained how SNCR has a narrow temperature window for an optimum reaction. Optimisation is achieved by multiple ammonia injection points so that the injection rates can be varied based on the local temperature at each nozzle. This means that as the boiler load and the temperature profile varies, the ammonia is still injected under optimum temperature conditions.

Aalborg Energie Technik (AET)
AET have a number of reference plants across Europe, which includes the Western Bio-Energy wood fired power station in Wales. They achieve lower NO_x emissions by the bespoke design of the secondary combustion air injection systems, supported by ammonia injection and sometimes FGR.

Babcock & Wilcox Volund
Babcock & Wilcox Volund explained that NO_x generation is highly dependant on the oxygen concentration in the boiler. The consistent nature of the fuel in a waste wood plant means that the facility can be controlled more stably than a MWI even at lower flue gas oxygen concentrations. This stability allows a wood plant to control to lower oxygen concentrations which leads to a reduction in temperature hotspots and reduced NO_x generation.

A letter of support was also provided stating that SNCR reduction would be around 60%, with an ammonia slip of 10 mg/Nm^3. As such a limit of 125 mg/Nm^3 at 11% oxygen should be achievable.

The Applicant also carried out a cost / benefit study of the alternative techniques.

In order for a direct comparison to be made, the costs are presented as annualised costs, with the capital investment and financing costs spread over a 30 year lifetime with a rate of return of 9%, using the method recommended in Annex (k) to Technical Guidance Note EPR-H1. This is shown in the tables below.

The Applicant presented the PC at the point of maximum impact (not the maximum impact at a sensitive receptor, which is 0.69 µg/m^3) and assumed a 65% reduction for SNCR and an 80% reduction for SCR. The background value of 36.3 µg/m^3 was used in the calculation of PEC.

Technology	Total Annualised Cost [Note 2]	PC µg/m^3 (long term) [Note 1]	PC % EQS [Note 1]	PEC µg/m^3 (long term) [Note 1]	PEC % EQS [Note 1]
SCR	£748,121	1.1	2.75	37.4	93.50
SNCR	£192,575	1.97	4.9	38.27	95.68

Note 1 Table 3.2 of the BAT Assessment Report
Note 2 Table 3.5 of the BAT Assessment Report

In Section 3.4 of the BAT Assessment Report, the Applicant calculated that SCR would abate an additional 66 tonnes of NO_x, which gives an effective cost of £8,440 per additional tonne of NOx abated. When taken with the additional contribution to climate change (an additional 1715 tonnes of CO_2 per year using SCR), they did not consider that the additional cost was justified by the reduction in environmental impact. Given the conservative nature of the modelling we do not consider the contribution from the Installation would cause an exceedance of the EQS using either technique.

We have also presented the PC at the point of maximum impact in the AQMA using the same assumptions:

Technology	Total Annualised Cost	PC µg/m^3 (long term)	PC % EQS	PEC µg/m^3 (long term)	PEC % EQS
SCR	£748,121	0.38	0.95	36.68	91.7
SNCR	£192,575	0.69	1.7	37.00	92.50

We can conclude that the additional reduction in NO_2 in the AQMA achieved by using SCR is negligible. Given the conservative nature of the modelling we do not consider the contribution from the Installation would cause an exceedance of the EQS using either technique.

They conclude that SCR is not BAT in this case, and SNCR is BAT for the Installation. The Applicant has justified the use of ammonia as the reagent on the basis of the climate change impacts associated with the use of urea due to the higher release of nitrous oxide (N_2O).

The amount of ammonia used for NO_x abatement will need to be optimised to maximise NO_x reduction and minimise NH_3 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 NH_3 and N_2O emissions every 6 months.

Based on the additional information provided and the figures reported above, we are satisfied that the proposed technology will be capable of achieving the lower NO_2 limit and is BAT for the Installation.

6.2.3 Acid Gases, SO_x, HCl and HF

Acid gases and halogens : Primary Measures				
Technique	**Advantages**	**Disadvantages**	**Optimisation**	**Defined as BAT in BREF or TGN for:**
Low sulphur fuel, (< 0.1%S)	Reduces SOx at source		Start-up, supplementary firing.	Where auxiliary fuel required.
Management of problem 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 Lower energy use Higher reliability	Higher solid residue production Reagent consumption controlled only by input rate		All plant
Semi-dry	Medium reaction rates Reagent delivery may be varied by concentration and input rate	Higher solid waste residues		
Reagent	Highest	Corrosive		HWIs

Type: Sodium Hydroxide	removal rates Low solid waste production	material ETP sludge for disposal		
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.
- Management of wastes

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 8 of WID, 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.

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. Semi-dry systems may require plume reheat, which would reduce energy recovery.

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 normally significant in environmental terms.

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.

6.2.4 Carbon monoxide and volatile organic compounds (VOCs)

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

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

6.2.5 Dioxins and furans

Dioxins and furans				
Technique	**Advantages**	**Disadvantages**	**Optimisation**	**Defined as BAT in BREF or TGN for:**
Optimise combustion control	All measures will increase oxidation of these species.		Covered in section on furnace selection	All plants
Avoid *de novo* synthesis			Covered in boiler design	All plant
Effective Particulate matter removal			Covered in section on particulate matter	All plant
Activated Carbon injection	Can be combined with acid gas absorber or fed separately.	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 WID combustion conditions on 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 the acid gas concentration in the exhaust. Therefore, separate feed of activated carbon would normally be considered BAT unless the feed was relatively constant. Effective

control of acid gas emissions also assists in the control of dioxin releases.

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

6.2.6 Metals

Metals				
Technique	**Advantages**	**Disadvantages**	**Optimisation**	**Defined as BAT in BREF or TGN for:**
Effective Particulate matter removal			Covered in section on particulate matter	All plant
Activated Carbon injection for mercury recovery	Can be combined with acid gas absorber or fed separately.	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, mercury if present will be so 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 the acid gas concentration in the exhaust. Therefore, separate feed of activated carbon would normally be considered BAT unless the feed was relatively constant.

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

6.3 BAT and global warming potential

This section summarises the assessment of greenhouse gas impacts which has been made in the determination of this Permit. Emissions of carbon

dioxide (CO_2) and other greenhouse gases differ from those of other pollutants in that, except at gross levels, they have no localised environmental impact. Their impact is at a global level and in terms of climate change. Nonetheless, CO_2 is clearly a pollutant for IPPCD purposes.

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

The major source of greenhouse gas emissions from the Installation is however CO_2 from the combustion of waste; however a significant proportion of the fuel will be derived from biodegradable materials. CO_2 released from the combustion of biomass is not considered to contribute as much to global warming, since this carbon has been recently extracted from the atmosphere via photosynthesis. 95% of the waste to be combusted will be of biogenic origin. There will also be CO_2 emissions from the burning of support fuels at start up, shut down and should it be necessary to maintain combustion temperatures. BAT for greenhouse gas emissions is to maximise energy recovery and efficiency.

The electricity that is generated by the Installation will result in a reduction in emissions of CO_2 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 CO_2 offset for the net amount of electricity exported from the Installation (refer to the Greenhouse Gas Assessment Report).

They calculated that (Section 1.3 of the Greenhouse Gas Report):

- A total of 19,270 tonnes of carbon dioxide equivalent would be released from non-biogenic fuel burned at the Installation.
- 160,000 MWh of power would be exported, displacing a total of 96,640 tonnes of carbon dioxide; and
- Hence, there is a net decrease in carbon dioxide emissions of 77,370 tonnes per annum.

The Installation is not subject to the Greenhouse Gas Emissions Trading Scheme Regulations 2003; therefore it is a requirement of IPPCD 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

- CO_2 emissions from the burning of the waste;
- CO_2 emissions from burning auxiliary or supplementary fuels;
- CO_2 emissions associated with electrical energy drawn from the public supply:
- N_2O from the de-NOx process.
  Note: Ammonia has no direct GWP effect

On the credit side

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

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 of non-biogenic waste. This is constant for all options considered in the BAT assessment and this would also be the case if they had considered the release of carbon dioxide from the waste biomass.

The differences in the GWP of the options in the BAT appraisal arise from small differences in energy recovery and in the amount of N_2O emitted.

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

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

6.4 BAT and POPs

International action on Persistent Organic pollutants (POPs) is required under the UN's Stockholm Convention, which entered into force in 2004 and has been signed by 151 nations. 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 co-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. This is logical, not least because 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 a combination of IPPC and WID requirements. That would, as required by the IPPC Directive, 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 POPs should be controlled by imposing emission limits (e.g. 0.1 ng/m^3 for MWIs) and using BAT for incineration. UN Economic Commission for Europe (Executive Body for the Convention) (ECE-EB) produced BAT guidance for the parties to the Convention in 2009. This document considers various control techniques and concludes that primary measures involving management of feed material by reducing halogenated substances are not technically effective. This is not surprising because halogenated wastes still need to be disposed of and POPs can be generated from relatively low concentrations of halogens. In summary, the successful control techniques for waste incinerators listed in the ECE-EB BAT are:

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

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

We believe that the Permit ensures that the formation and release of POPs will be prevented or minimised. As we explain above, high-temperature incineration is one of the prescribed methods for destroying POPs. The requirements of the Stockholm Convention in relation to unintentionally-produced POPs are delivered through the IPPCD and the WID, which require the use of BAT to prevent or, where that is not possible, minimise all harmful emissions, including POPs.

The release of **dioxins and furans** to air is required by the WID to be assessed against the I-TEQ (International Toxic Equivalence) limit of 0.1 ng/m^3. Further development of the understanding of the harm caused by dioxins has resulted in the World Health Organisation (WHO) producing updated factors to calculate the WHO-TEQ value. Certain **PCBs** have structures which make them behave like dioxins (dioxin-like PCBs), and these also have toxic equivalence factors defined by WHO to make them capable of being considered together with dioxins. The UK's independent health advisory committee, the Committee on Toxicity of Chemicals in Food, Consumer Products and the Environment (COT) has adopted WHO-TEQ values for both dioxins and dioxin-like PCBs in their review of Tolerable Daily Intake (TDI) criteria. The Government is of the opinion that, in addition to the requirements of the WID, 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. The Secretary of State has directed regulators to require 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 WID. We are confident that the measures taken to control the release of dioxins will also control the releases of dioxin-like PCBs and PAHs. Section 5 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 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]

Pentchlorobenzene (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 will also minimise the release of HCB, PCB and PeCB.

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

6.5 Other Emissions to the Environment

6.5.1 Emissions to water

There will be no process emissions to water from the Installation. Uncontaminated rainwater from surface water run-off from buildings and areas of hardstanding will be discharged to the Manchester Ship Canal via an interceptor.

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

6.5.2 Emissions to sewer

There will be one process emission to sewer from the Installation. This will be cooling water from the proposed cooling system. Make-up water for the cooling system will be abstracted from the Manchester Ship Canal. Abstraction will be subject to authorisation from the Environment Agency and the Manchester Ship Canal. This water would be treated with chemicals to prevent scaling and algae growth, together with a biocide for legionella prevention and a small amount of acid for pH control.

To maintain the cooling water quality, some of the water from the cooling system will be released to sewer (subject to obtaining a trade effluent consent) under controlled conditions ("blowdown").

The release of chloride and sulphate to sewer was assessed as being insignificant using the Environment Agency H1 methodology.

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

6.5.3 Fugitive emissions

The WID 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 8(7) 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 diesel and ammonia will take place within areas of concrete hardstanding. 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 hardstanding 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 site drainage system. The drainage system will be fitted with an emergency shut-off valve, which will automatically close shut, in the event of a fire alarm. This will prevent any water discharges from leaving the Installation.

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

6.5.4 Odour

Odour is not expected to be a problem since there will be minimal amounts of SRF stored on site and it will be relatively dry and non-odorous.

Waste accepted at the Installation will be delivered in covered vehicles or within containers and bulk storage of waste will only occur in the Installation's enclosed waste reception hall.

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 minimise odour and prevent pollution from odour.

6.5.5 Noise and vibration

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.

We required additional information to assess this report which we requested in our further information notice dated 8 February 2011.

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 minimise noise and vibration and prevent pollution from noise and vibration.

6.6 Setting ELVs and other Permit conditions

6.6.1 Translating BAT into Permit conditions

The use of WID limits for air dispersion modelling sets the worst case scenario. If this shows emissions are insignificant then we accept that the Applicant's proposals are BAT, and that there is no justification to reduce ELVs below WID levels 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.

(i) Local factors

We have considered the proximity of the Installation to the AQMA declared for NO_2, in Section 5.6 of this document. We have also considered the controls in place to prevent and minimise emissions of NO_2 in Section 6.2.2.

Regarding the technology proposed, we have not required the Applicant to go beyond what is BAT for this type of facility; however we have set an unusually low daily average limit for NO_2 of 125 mg/m^3 (WID daily limit is 200 mg/m^3) due to the adjacent AQMA. We accept that this limit will be achievable based on the bespoke design of the air and ammonia injection systems. The consistent nature of the feedstock will also assist with better control of the furnace conditions.

(ii) National and European EQSs

There is some evidence that there is no headroom for NO_2 levels in the AQMA (refer to Section 5.6 of this document). To limit any exceedance of the NO_2 AQS we have set an unusually low daily average limit for NO_2 of 125 mg/m^3.

(iii) Global Warming

CO_2 is an inevitable product of the combustion of waste. The amount of CO_2 emitted will be essentially determined by the quantity and characteristics of

waste being incinerated, which are already subject to conditions in the Permit. It is therefore inappropriate to set an emission limit value for CO_2, which could do more than recognise what is going to be emitted. The gas is not therefore targeted as a key pollutant under the IPPC Directive or under the Waste Incineration Directive, e.g. it is not included in Annex III to the IPPCD, which lists the main polluting substances that are to be considered when setting emission limit values (ELVs) in Permits.

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

(iv) Commissioning

We have set a Pre-Operational condition requiring a commissioning plan that includes, 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. This plan shall be used to determine whether it will be necessary to set any additional ELVs for these phases.

Commissioning cannot commence until approval is received from the Environment Agency.

6.7 Monitoring

6.7.1 Monitoring during normal operations

We have decided that monitoring should be carried out for the parameters listed in tables S3.1 to S3.5 in Schedule 3 using the methods and to the frequencies specified in those tables. These monitoring requirements have been imposed in order to demonstrate compliance with emission limit values and to enable correction of measured concentration of substances to the appropriate reference conditions; to gather information about the performance of the SNCR system; to deliver the EPR requirement that dioxin-like PCBs and PAHs should be monitored and to deliver the requirements of WID 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.

Monitoring of N_2O and ammonia have been set as a requirement of the permit to demonstrate the optimum environmental performance of the NO_x abatement process and to check compliance with the ammonia limit. We did not consider it necessary to include an additional annual tonnage limit for NO_x (modelling was based on 90% plant availability instead of the more conservative 8,760 hours) because this would add no benefit. By imposing the lower NO_x limit and limiting the annual throughput of waste, the necessary control measures are already in place.

In addition an improvement condition requires an exercise be carried out to determine the size distribution of the particles emitted from the stacks to identify the fractions in the PM_{10}, $PM_{2.5}$ and $PM_{1.0}$ ranges. This reflects the latest scientific research which indicates that very fine particles have the most potential to adversely affect health. This is a standard improvement condition being imposed on all incinerators in order to gather information on the contribution of waste incineration generally to emissions of very fine particles.

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

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

The Operator 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 WID abnormal operating conditions apply.

6.7.3 Continuous emissions monitoring for dioxins and mercury

The WID specifies manual extractive sampling for mercury and dioxin monitoring. However, Article 11(13) of the WID requires that "The Commission, acting in accordance with the procedure laid down in Article 17, shall decide, as soon as appropriate measurement techniques are available within the Community, the date from which continuous measurements of the air emission limit values for heavy metals, dioxins and furans shall be carried out in accordance with Annex III". 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 WID. 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 WID'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 WID. 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.

6.8 Reporting

We have specified the reporting requirements in Schedule 4 of the Permit either to meet the reporting requirements set out in the WID, or to ensure data

is reported to enable timely review by the Environment Agency to ensure compliance with permit conditions and to monitor the efficiency of material use and energy recovery at the Installation.

7 Other legal requirements

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

7.1 The EPR 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 – **IPPC Directive**

We address the requirements of the IPPCD in the body of this document above.

There is one requirement not addressed above, which is that contained in Article 9(2) IPPCD. Article 9(2) of the IPPC Directive requires that "In the case of a new installation or a substantial change where Article 4 of Directive 85/337/EC applies, any relevant information obtained or conclusion arrived at pursuant to articles 5, 6 and 7 of that Directive shall be taken into account for the purposes of granting an environmental 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 the Trafford Planning Authority to recommend planning permission in their report dated 10 November 2011.
- The reasons for the refusal of planning permission.
- The response of the Environment Agency to the local planning authority in its role as consultee to the planning process.

We have reviewed the reasons given for the refusal of planning permission and specifically whether this conclusion is based on information given in the Environmental Statement. The reasons given were as follows:

Reason 1

The proposed development of a facility which involves the incineration of biomass fuels would, by reason of its scale of operation, presence and location, have a detrimental impact upon the vitality and attractiveness of, and the self-confidence of communities within, the nearby established areas of Davyhulme, Flixton and Urmston and would thereby prejudice the continuing regeneration and improvement of these areas which have been identified by the Council as being in need of investment. The proposal would therefore be contrary to Policy WD5 of the Revised Trafford Unitary Development Plan.

Reason 2

The proposed development raises significant concerns amongst nearby communities that, on the basis of publicly available and respectable scientific evidence about possible adverse impacts of the incineration of biomass waste, it would contribute to a substantial reduction in air quality in an area which is already designated an Air Quality Management Area. As a result there is a widely held objective perception substantiated by independent objective scientific evidence that the development poses an unacceptable risk to the health and safety of those communities. Government guidance as set out in Planning Policy Statement 23 Planning and Pollution Control states that the objective perception of unacceptable risk to the health and safety of the public arising from a proposed development is a material consideration which should be taken into account when determining a planning application. The nature and extent of the perceptions held by people living in nearby communities with regard to the risk to health and safety arising from the proposed development is such that it has considerable weight when considered against the proposal and requires that the proposal should be refused.

We are satisfied that these matters are mainly matters of planning policy and have addressed the impact on air quality and the AQMA in the main body of this document. The Government's Planning Policy Statements Nos. 10 and 23 make it clear that the pollution control and planning regimes are intended to be complementary and should avoid duplication. Planning considers wider issues such as visual amenity and perceived impacts from a development where as Environmental Permitting is concerned with a detailed assessment of the effects of any emissions. The guidance mentioned above from PPS 23 is specific to planning.

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

The Environment Agency has also carried out its own consultation on the Environmental Permitting Application which includes the Environmental Statement submitted to the local planning authority. The results of our consultation are described in Annex 4 of this decision document.

7.1.2 Schedule 9 to the EPR 2010 – **Waste Framework Directive**

As the Installation 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.

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.

Also that we 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 relate to hazardous waste so Article 18 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 13 to the EPR 2010 – **Waste Incineration Directive**

We address the WID in detail in Annex 1 to this document.

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

To the extent that it authorises the 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 Installation are permitted. The Permit also requires material storage areas to be designed and maintained to a high standard to prevent accidental releases.

7.1.5 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.

The Environment Agency has published such a document and this Application is being consulted upon in line with our public participation statement, as well as with the Environment Agency's RGS6 on Sites of High Public Interest, which addresses specifically extended consultation arrangements for determinations where public interest is particularly high. This satisfies the requirements of the Public Participation Directive.

Our draft decision in this case has been reached following a programme of extended public consultation, 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 Installation on local wildlife sites within 2km 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 Installation.

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 / Countryside Council for Wales in relation to any permit that is likely to damage SSSIs.

There is no SSSI within 2km which could be affected by the Installation.

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 Installation 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 THE WASTE INCINERATION DIRECTIVE

WID Article	Requirement	Delivered by
4(3)	Measurement techniques for emissions into the air comply with Annex III.	See below on compliance with Article 11.
4(4)	Compliance with any applicable requirement of directives on: Urban Waste Water Treatment, the IPPC, Air Quality Framework, Dangerous Substances, Landfill.	Landfill Directive is not relevant to this Installation. Relevant requirements of all other directives are delivered via EPR.
4(4)(a)	List explicitly the categories of waste that may be treated; using the European Waste Catalogue ("EWC") including information on the quantity of waste where appropriate.	Condition 2.3.3 and Table S2.2 in Schedule 2 of the Permit.
4(4)(b)	Permit shall include the total waste incinerating capacity of the plant.	Condition 2.3.3 and Table S2.2 in Schedule 2 of the Permit.
4(4)(c)	Specify the sampling and measurement procedures used to satisfy the obligations imposed for periodic measurements of each air and water pollutant.	Conditions 3.5.1 and Tables S3.1, S3.1(a), S3.2, S3.3 and S3.4. also compliance with Articles 10 and 11.
5(1)	Take all necessary precautions concerning delivery and reception of wastes, to prevent or minimise pollution.	- EPR require prevent or minimise pollution. –The Application supporting information defines how this will be carried out. - Conditions 2.3.1, 2.3.3, 3.2, 3.3 and 3.4.
5(2)	Determine the mass of each category of wastes, if possible according to the EWC, prior to accepting the waste.	The Application supporting information describes procedures for the reception and monitoring of incoming waste.

WID Article	Requirement	Delivered by
6(1)	(a) Slag and bottom ash to have Total Organic Carbon (TOC) is < 3% or loss on ignition (LOI) is < 5%. (b) Flue gas to be raised to a temperature of 850ºC for two seconds, as measured at representative point of the combustion chamber. (c) 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.	(a) Condition 3.5.1 and Table S3.5. (b) Table S3.4. (c) Condition 2.3.7.
6(2)	Flue gas to be raised to a temperature of 850ºC for two seconds, as measured at representative point of the combustion chamber.	Conditions 3.5.1, 2.3.7 and Table S3.4. The Application specifies measurement point.
6(3)	Automatic waste feed prevention: (a) at start up until the specified temperature has been reached or if this temperature is not maintained; (b) when the CEMs show that ELVs are exceeded due to disturbances or failure of abatement.	Condition 2.3.6
6(4)	Different conditions than those in 6(1) may be authorised.	No such conditions have been allowed.
6(5)	Emissions to air do not give rise to significant ground level pollution, in particular, through exhaust of gases through a stack.	Emissions and their ground-level impacts are discussed in the body of this document.
6(6)	Any heat generated from the process shall be recovered as far as practicable.	(a) The plant will generate electricity. (b)Operator to review the available heat recovery options prior to commissioning (Pre-operational condition) and then every 2 years (Condition 1.3. 3).
6(7)	Relates to the feeding of infectious clinical waste into the furnace.	No infectious clinical waste will be burnt.
6(8)	Management of the Installation to be in the hands of a natural person who is competent to manage it.	Conditions 1.1.1 to 1.1.3 and 2.3.1 of the Permit fulfil this

		requirement.
7(1)	Incineration plants to comply with the ELVs in Annex V.	Not relevant.

WID Article	Requirement	Delivered by
7(2)	Co-incineration plants to comply with the ELVs determined according to or set out in Annex II.	Conditions 3.1.1 and 3.1.2 and Table S3.1
7(3)	Measured ELVs to be standardised in accordance with Article 11.	Schedule 6 details this standardisation requirement.
7(4)	Relates to co-incineration of untreated mixed municipal waste.	Not relevant.
8(1) – 8(6)	All relate to conditions for water discharges from the cleaning of exhaust gases.	There are no such discharges as condition 3.1.1 prohibits this.
8(7)	(a) Prevention of unauthorised and accidental release of any polluting substances into soil, surface water or groundwater. (b) Storage capacity for contaminated rainwater run-off from the site or for contaminated water from spillage or fire-fighting.	The Application explains the measures to be in place for achieving the directive requirements.
9	(a) Residues to be minimised in their amount and harmfulness, and recycled where appropriate. (b) Prevent dispersal of dry residues and dust during transport and storage. (c) Test residues for their physical and chemical characteristics and polluting potential including heavy metal content (soluble fraction).	(a)Conditions 1.4.1 and 3.5.1. (b) Conditions 1.4.1, 2.3.1 and 3.2.1 (c) Condition 3.5.1 and pre-operational condition
10(1) and 10(2)	Measurement equipment shall be installed and techniques used to monitor the incineration process, and that the measurement requirements shall be laid down in Permits.	condition 3.5.1, and tables S3.1 and S3.1(a), (emissions to air), and table S3.4, (process monitoring requirements).
10(3)	Installation and functioning of CEMs for emissions to air and water to be subjected to regular control, testing and calibration.	Condition 3.5.3, and tables S3.1, S3.1(a), and S3.4.
10(4)	Sampling points to be specified in Permit.	Tables S3.1, S3.1(a) and S3.4.
10(5)	Periodic measurements to air and	Tables S3.1, S3.1(a),

	water to comply with Annex III, points 1 and 2.	and S3.4 specify the standards to be used.

WID Article	Requirement	Delivered by
11(2)	Continuous measurement of NO_x, CO, total dust, TOC, HCl, and SO_2 and periodic measurement of HF, heavy metals, dioxins and furans plus the measurement of combustion chamber temperature and concentration of O_2, pressure, temperature and water content of the exhaust gases.	Condition 3.5.1 and tables S3.1, S3.1(a) and S3.4.
11(3)	Verify the residence time and minimum temperature as well as oxygen content of exhaust gases.	Improvement condition in table S1.3.
11(4)	Periodic rather than continuous measurement of HF if HCl is abated and limit values not exceeded.	Condition 3.1.2 and table S3.1
11(6)	Conditional option of periodic measurement for HCl, HF and SO_2 instead of CEMs.	Option not applied except for HF as per Article 11(4) above.
11(7)	Reduction in the monitoring frequency for heavy metals, dioxins and furans under certain conditions, provided the criteria in article 17 of WID are available.	Not applied as no such criteria available.
11(8)	Sets out reference conditions for standardisation of measurements.	Schedule 6 sets the same reference conditions.
11(9)	Recording and reporting requirements.	Section 4 and Schedules 4 and 5.
11(10)	Sets out criteria for compliance with ELVs in Annex V.	Condition 3.1.2 and tables S3.1, S3.1(a) and S3.4
11(11)	Specifies when ELVs apply, how averages are calculated (including the use of Annex III) and how many values can be discarded.	Condition 3.5.5 and table S3.1.
11(12)	Average values for HCl, SO_2 and HF to be determined as per Articles 10(2), 10(4) and Annex III.	See Articles 10(2), 10(4) and 11(11) above.
11(14) to 11(16)	Addresses the monitoring of waste water from the cleaning of exhaust gases.	There are no such releases from the Installation.
11(17)	Competent authorities to be informed if ELVs are exceeded	Condition 4.3.1
12(2)	An annual report on plant operation and monitoring for all plants burning more than 2 tonne/hour waste.	Condition 4.2.2

WID Article	Requirement	Delivered by
13(1)	Specify maximum period of unavoidable stoppages, disturbances or failures of purification or CEMs, during which air or water ELVs may be exceeded.	Conditions 2.3.6 to 2.3.9
13(2)	Cease the feed of waste in the event of a breakdown.	Condition 2.3.10.
13(3)	Limits the maximum period under 13(1) above to 4 hours uninterrupted duration in any one instance, and with a maximum cumulative limit of 60 hours per year	Condition 2.3.10.
13(4)	Limits on dust (150 mg/m3), CO and TOC not to be exceeded.	Condition 2.3.6 and Table S3.1(a).

ANNEX 2: Pre-Operational Conditions

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

Reference	Pre-operational measures
PO1	Prior to the commencement of commissioning, the Operator shall send a summary of the site Environment Management System (EMS) to the Environment Agency and 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 – Getting the basics right. The documents and procedures set out in the EMS shall form the written management system referenced in condition 1.1.1 (a) of the permit.
PO2	Prior to the commencement of commissioning, the Operator shall send a report to the Environment Agency which will contain a comprehensive review of the options available for utilising the heat generated by the combustion 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.
PO3	After completion of furnace design and at least three calendar months before any furnace operation, the operator shall provide a report summarising the results of the computer fluid dynamics (CFD) used to assist with the design characteristics of the combustion chamber. The report shall demonstrate how the system has been designed to achieve the daily average oxides of nitrogen (NO_x) air emission limit of 125 mg/m^3 and shall include but not necessarily be limited to: • Optimisation of the combustion air injection system; • Location and optimisation of the ammonia injection nozzles; • Combustion chamber design to optimise the SNCR reaction temperature.

PO4	Prior to the commencement of commissioning, the Operator shall submit to the Environment Agency for approval a protocol for the sampling and testing of bottom ash for the purposes of assessing its hazard status. Sampling and testing shall be carried out in accordance with the protocol as approved.
PO5	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.
PO6	Prior to the commencement of commissioning the Operator shall provide a written plan detailing an intrusive investigation to validate the findings of the desktop study provided with the Application. The plan shall be used to validate the environmental setting, the pollution history and provide baseline ground condition data and shall include but not necessarily be limited to: • Sampling of the Manchester Ship Canal (upstream and downstream); • Installation of gas and groundwater monitoring wells; • Chemical analysis of soil and groundwater, to include metals and dioxins; • Ongoing gas and groundwater monitoring. The investigation shall be carried out in accordance with the written plan as approved.
PO7	Prior to the commencement of commissioning the operator shall provide a site plan clearly showing the drainage and site surfacing at the installation.

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 accreditation of the system by an external body or if appropriate submit a schedule by which the EMS will be subject to accreditation.	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 emission point A1, identifying the fractions within the PM_{10}, $PM_{2.5}$ and $PM_{1.0}$ 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 installation. The report shall summarise the environmental performance of the plant as installed against the design parameters set out in the Application. The report shall also include a review of the performance of the facility against the conditions of this permit and details of procedures developed during commissioning for achieving and demonstrating compliance with permit conditions.	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.
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 (N_2O) and ammonia (NH_3) emissions. The report shall include an assessment of the level of NO_x ,N_2O and NH_3 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 As, Cd, Cr(VI) and Ni. The assessment shall predict the impact of each metal against the relevant EQS/EAL through the use of emissions monitoring data during the first year of operation and air dispersion modelling. A report on the assessment shall be made to the Environment Agency.	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,	Initial calibration report to be submitted to the Agency within 3 months of completion of commissioning. Full summary

	specifically the requirements of QAL1, QAL2 and QAL3.	evidence compliance report to be submitted within 18 months of commissioning.

ANNEX 4: Consultation Reponses

A) Advertising and Consultation on the Application

The Application has been advertised and consulted upon in accordance with the Environment Agency's Public Participation Statement. The way in which this has been carried out along with the results of our consultation and how we have taken consultation responses into account in reaching our draft decision is summarised in this Annex. Copies of 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 27 January 2011 to 24 February 2011 and in the Salford Advertiser and the Stretford and Urmston Messenger on 27 January 2011. Copies of the Application were placed on the Environment Agency Public Register and the Trafford Metropolitan Borough Council Public Register at Pollution and Licensing, Talbot Road, Stretford, Manchester, M32 0TH.

Additionally, electronic copies of the Application were placed at:

- Davyhulme Library, Hayeswater Road, Davyhulme, M41 7BL
- Access Trafford Contact Centre, Sale Waterside, Sale, M33 7ZF
- Eccles Gateway, 28 Barton Lane, Eccles M30 0TU
- Stretford Library, Kingsway, Stretford, M32 8AP
- Urmston Library, Golden Way, Urmston, M41 0NA

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

- Trafford Council (Environmental Health)/ (Planning Department)
- Salford Council (Environmental Health)/Planning Department)
- Food Standards Agency (FSA)
- Salford Primary Care Trust (PCT)
- Trafford Primary Care Trust (PCT)
- Health & Safety Executive (HSE)
- National Grid
- United Utilities
- Barton Aerodrome

1) Consultation Responses from Statutory and Non-Statutory Bodies

Response received from **Trafford City Council**, Public Protection Service, Public Protection Manager, response dated 21 April 2011.	
Brief summary of issues raised:	Summary of action taken / how this has been covered
Emissions of Oxides of Nitrogen and Ammonia The air quality assessment relies on achieving an unusually low emission concentration of oxides of nitrogen (due to location) and there is uncertainty over the ammonia emissions from meeting this demanding emission limit.	
An emission limit for ammonia should be specified in any permit.	An emission limit of 10 mg/m^3 has been set in Table S3.1 of the permit.
The demanding emission limit for oxides of nitrogen should be specified in any permit.	An emission limit of 125 mg/m^3 has been set in Table S3.1 of the permit.
Background levels of Nitrogen Dioxide and Cumulative impacts	
The combined contribution of nitrogen dioxide due to emissions from the facility and other permitted developments (biogas generators at Davyhulme wastewater treatment works and Nexen coal bed methane plant) would be above 1% of the air quality standard within the AQMA. The majority of the contribution is from the other permitted developments).	Noted, see Section 5 of this document for our assessment of the issue.
Metals including Arsenic	
It is reasonable to expect that arsenic may account for a higher proportion of metals emissions than that assumed in the air quality study because the proposed facility is likely to burn wood treated with arsenic. An emission limit for arsenic should be specified in any permit.	Our assessment of arsenic is detailed in Section 5.2.5 of this document. We have set an improvement condition to assess the impact based on actual monitoring data.

Poly Aromatic Hydrocarbons (PAH) in emissions Any permit should specify the values specified in the Environmental Statement (0.002mg/m^3).	The Applicant provided further information which resulted in emissions being screened out as insignificant (refer to Section 5.2.2 of this document). On this basis we have not considered it necessary to set a limit.

Response received from **Salford City Council**, Regulatory Services, Technical Support Officer, sent electronically 21 January 2011.	
Brief summary of issues raised:	Summary of action taken / how this has been covered
We cannot make any comments regarding an Environmental Permit on the land adjacent to the Manchester Ship Canal/Barton Bridge as this is not covered within the Salford City Council boundary, therefore we do not hold records of any planning applications/enforcements, nor are we aware of any noise related issues.	No action required.

Response received from **Salford City Council**, Senior Environmental Health Officer, received electronically 9 February 2011.	
Brief summary of issues raised:	Summary of action taken / how this has been covered
A noise condition in respect to a noise limit from the plant at night time to be -5dB of the lowest L90 where t= 5 minutes. The noise report currently has a – 5 dB on the background noise for the night time however the time is over a 1 hour period. The report also comments that if there is characteristic noise tone, hum etc this is to be -10dB of the back ground noise. Again can this be reported against the lowest L90 T = 5minutes not an hourly average.	We have not set a condition because our assessment (report reference C704B) concludes that we have conservatively tested sensitivity to the lowest measured hourly night-time L_{A90} and there is no positive indication that there will be pollution from noise.

Response received from **Salford City Council**, Air Quality comments, received electronically 9 March 2011, dated 11 February 2011.	
Brief summary of issues raised:	Summary of action taken / how this has been covered
The effect of Barton Bridge on the plume.	Distant structures such as the Barton Bridge are too remote to affect the

	impact assessment conclusions.
Model sensitivity and uncertainty.	We are satisfied that these points have been addressed adequately.
Stack modelling is reconfirmed.	An improvement condition has been set to validate the modelling results.
Real time monitoring of nitrogen dioxide, nitric oxide and particulate.	The WID requires continuous monitoring of oxides of nitrogen and particulate from the stack (Refer to Section 6.7 of this document).
Emissions are reported annually to Salford.	The permit requires quarterly reporting. Emissions data from our regulated sites is located at the relevant Public Registers.
Health impact assessment to include PM_{10}.	Refer to Section 5.2.4 of this document for the PM_{10} health impact assessment.
Risk assessment to be remodelled with the Eccles PAH results.	Refer to Section 5.2.2 of this document.
Include the emissions from the combustion plant at United Utilities.	Noted, see Section 5 of this document for our assessment of the issue.

Response Received from **Salford Primary Care Trust**, associate Director of Health Protection, letter dated 3 March 2011. We received the same comments from **Trafford Primary Care Trust**, Environmental Public Health Scientist, letter dated 25 February 2011.	
Brief summary of issues raised:	Summary of action taken / how this has been covered
We need to be satisfied that consumption of eggs from home reared chickens at nearby residential gardens is unlikely. If there is a potential for this, then this pathway should additionally be considered in the risk assessment	Our assessment of dioxins confirmed that there would be no issues from this exposure route.
We were advised to check the cumulative impacts from nearby facilities, such as Carrington I and II Power Stations and Port Salford.	Refer to Section 5.6.2 of this document.
It was recommended that the EMS was in accordance with ISO 14001	An improvement condition/pre-op has been set to address this concern.
Recommend that an assessment is undertaken using actual emissions once operational as the assessment provided was based on predicted emissions.	An improvement condition has been set to assess the impact using real data.

Response Received from **Natural England**, Lead Advisor, Land Use Operations Team, letter dated 14 June 2011.	
Brief summary of issues raised:	Summary of action taken / how this has been covered
They agreed that the Installation was not likely to have a significant effect on the interest features of the SACs.	No action required.

Response Received from **Food Standards Agency**, Environmental & Process Contaminants Department, email sent 23 February 2012.	
Brief summary of issues raised:	Summary of action taken / how this has been covered
The waste wood could contain lead (e.g. from paint) and arsenic (historic antifouling agents).	Our assessment of emissions to air and the human health risk assessment is detailed in Sections 5.2 and 5.3 of this document. More specifically, emissions of lead were screened out as being insignificant in Section 5.2. Our detailed assessment of arsenic is in Section 5.2.5 of this document.
Organochlorine based wood preservatives could significantly increase the amount of dioxin formation.	Our assessment of dioxins is detailed in section 5.3.2 of this document. The results showed that the predicted daily intake of dioxins resulting from emissions at the point of maximum impact were below the recommended TDI levels.
Questioned whether the abatement system could deal with these substances and what controls there would be on the waste wood feedstock.	Our assessment of the abatement system is detailed in Section 6.2 of this document. We are satisfied that the necessary controls are in place. Section 4.3.6 of this document details the controls in place for the waste feedstock.
Recommended that the intrusive investigation is carried out and includes measurement of dioxins in the suite of contaminants.	This requirement has been secured by the inclusion of a pre-operational condition.

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 PPS23 / Planning Policy Wales 2002. It says that the planning and pollution control systems are separate but complementary. We are only able to take into account those issues, which fall within the scope of the Environmental Permitting Regulations. The way in which we have done that is set out in section 3 below.

a) Representations from Local MPs and Councillors

Representations were received from the following MPs:

Kate Green (Stretford and Urmston);
Barbara Keeley (Worsley and Eccles South);
Graham Brady (Altrincham and Sale West).

and the following Councillors:

David Acton (Trafford);
Mike Cordingley (Gorse Hill);
Joanne Harding (Urmston);
Dolores O' Sullivan (Trafford);
Kevin Proctor (Urmston);
Tom Ross (Stretford).

They raised the following issues:

Brief summary of issues raised	**Summary of action taken / how this has been covered**
Contacted by over 500 residents whose concerns included the emissions from the plant, health problems, monitoring of the process, height of the chimney stack and the effect of the plant on local amenities.	For our assessment of emissions from the plant refer to Sections 5.2 and 5.3 of this document. For monitoring of the process refer to our response below. Regarding local amenities, refer to Section 3 below (Location of the Installation).
Assurances were	If a Permit is issued we then start a continued assessment of the

Brief summary of issues raised	Summary of action taken / how this has been covered
required regarding monitoring of the facility and that we regulate in a robust manner.	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. - We undertake auditing to check compliance with permit conditions (e.g. energy efficiency, accident prevention, noise and odour). - 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.
Informed by representatives of a local support group (GREAT) that 'real time' emissions data would be available via the internet.	The Applicant will be encouraged to investigate the possibility of linking the monitoring from the CEMs to a website.
A number of residents were concerned that the plant will not use BAT and that the technology would not remove particles which could adversely impact their health.	Our assessment of BAT and particulate matter is detailed in Sections 5.2.4, 5.3.3 and 6 of this document.
Concerned about noise and also the vibrations from the extra traffic.	Our assessment of noise is detailed in Section 6.5.5 of this document. Traffic movements are not relevant to the permitting process, refer to Section 3 below.
Concerned about the spillage of toxic waste from vehicles.	Permit conditions would control the storage and movement of ash within the Installation. Duty of Care requirements will apply to the transportation of waste to and from the site.
Concerned about arsenic and dioxin	Our assessment of arsenic and dioxin emissions is detailed in Section 5 of this document.

Brief summary of issues raised	Summary of action taken / how this has been covered
emissions.	
Concerned about the future protection of public health due to the Government's decision to abolish and reform public health bodies (such as the HPA). Concerned that the health impact assessment was not thorough.	The abolishment of public health bodies is not a matter for consideration under the EP Regulations. Regarding the Health Impact Assessment, refer to Section 5.3.4 of this document.

b) Representations from Community and Other Organisations

In some cases the issues raised were the same as those in section a) above. Where this is the case we have not repeated in this section.

Representations were received from the Breathe Clean Air Group (BCAG) as follows.

Brief summary of issues raised	Summary of action taken / how this has been covered
A report was provided which they state was conducted and provided by '*an individual who has worked in the stack testing industry for over 10 years. He is qualified to MCERTS Level 2, with all four technical endorsements*.' Report - Monitoring of Ambient Pollutants, Davyhulme, January 2011	
The group were concerned about the results of the air quality tests in this report, particularly, 1, 3 butadiene, oxides of nitrogen, PM_{10} and $PM_{2.5}$, heavy metals and carbon monoxide, which were reported to be above the local and national limits. There were also concerns about the incombination effect with the methane plant and	We reviewed this report and found many inaccuracies and discrepancies which brought into question the conclusions drawn and the validity of the report. These included the instrument not being fit for purpose (recommended for stacks and not ambient monitoring), limited survey period, potential issues with the gas plots, incorrect measurement and reporting of NO_x and NO_2 and issues with the measurement of particulate.

Brief summary of issues raised	Summary of action taken / how this has been covered
gas engines on the adjoining site. A second study of local ambient nitrogen dioxide was undertaken with the provision of a report for monitoring during the period 31 July to 30 August 2011. BCAG pointed out the limitations of this report (e.g. comparison with the annual average AQS with survey only conducted over 30 days) but highlighted that it was a good indicator of poor air quality. The author wished to remain anonymous.	We are satisfied that we have fully considered impacts on air quality as we have described in the main body of this document.
Several other submissions from BCAG were made as follows:	

Brief summary of issues raised	Summary of action taken / how this has been covered
<u>BCAG submitted a report by the American Lung Association</u> This report raised general concerns about biomass being a significant source of pollution and not energy efficient.	Our assessment of pollution and energy efficiency is detailed in Sections 5 and 4.3.7 of this document.
<u>BCAG response to the Planning Application (76153/FULL/2010)</u> A lot of the issues raised were relevant to the Planning process and we are only able to take into account those issues, which fall within the scope of the Environmental Permitting Regulations (Refer to section 3 below). Those matters relevant to the Environmental Permitting Regulations were as follows:	
Concerned about the impact from greenhouse gases.	Our assessment is detailed in Section 6.3 of this document.
Information from Veolia has shown that baghouse filter collection efficiency is 95-99% for PM_{10}, 65-70% for $PM_{2.5}$ and only 5-30% for particles smaller than 2.5 microns, implying that particles less than $PM_{2.5}$ would be released in enormous quantities.	Our assessment is detailed in Section 5.3.3 of this document.
Concerned that the facility will lead to a breach of the EU target reduction values for $PM_{2.5}$. The target values are 25ug/m^3 by 2010 and 20ug/m^3 by 2015.	Refer to Section 5.2.4 of this document.
Incineration is not BAT; plasma gasification is an alternative and produces no harmful emissions.	Refer to section 3 of this Annex for the Use of Alternative Technologies.
Concerned about the impact on habitats, specifically the Manchester	Our responsibilities relating to habitats is detailed in Sections 5.4.2, 7.2 and 7.3 of this document.

Brief summary of issues raised	Summary of action taken / how this has been covered
Ship Canal (wildlife corridor) and Rixton Claypits and the loss of species (e.g. bats, birds, great crested newts). Reference was also made to Davyhulme Millenium Nature Reserve.	Regarding the nature reserve, we identified Davyhulme wildlife site within the screening distance of 2km and this is included in our habitats assessment.
Concerned that if biomass does become unsustainable as a feedstock other types of fuel would be burnt (MSW, increased SRF).	Regarding feedstock, any changes would require a variation to the Permit which would include an impact assessment of the emissions from the facility. Furthermore (although not directly relevant to our consideration under the regulations) the government encourages biomass power stations through the Renewables Obligation. This is dependant upon the bioenergy content of the fuel being at least 90%. SRF is only partly derived from biomass and so has a low bioenergy content, which means that the Installation could only take a small percentage of SRF before becoming ineligible for the renewables benefit.
Concerned that the waste wood would contain VOCs (and if chlorine containing), could produce dioxins and PCBs. In addition, pollution from heavy metals due to nails, staples and old lead paint.	Refer to Section 6.2 of this document.
Concerned about the visible impact of the plume.	The visibility is minimal from well managed, modern incinerators.
Concerned about the toxicity of incinerator bottom ash.	Our assessment of bottom ash is detailed in Section 4.3.9 of this document.
Questioned the calculations used to derive the number of homes that the electricity could provide for.	This is based on the level of energy used by the average residential dwelling per annum; however the regulations require energy to be recovered as far as is practicable and our consideration of this is given in Section 4.3.7 of this document.
Wanted more detail about the use of waste heat.	Refer to Section 4.3.7 of this document.
Questioned whether the biomass is actually carbon neutral.	Refer to section 6.3 of this document.
Concerned about the in combination effects from the two gas fired power	Refer to Section 5.6.2 of this document.

Brief summary of issues raised	Summary of action taken / how this has been covered
stations and the paper mill in Carrington. Also concerned about the additional emissions from five gas generators at the sewage works and a methane plant (by Nexon).	
Questioned the oxygen content in the stack gas being as low as 6% and suggested an average of around 15%.	Operating at 6% oxygen is the norm for such plants as it provides sufficient excess air for complete combustion. Operating at 15% oxygen (i.e. adding 2.5 times more air than needed) would increase heat losses and decrease plant efficiency. In any case, compliance with permit limits on CO and TOC will ensure that combustion is complete.
If a permit is granted it was questioned whether there would be a responsibility to monitor environmental and health impacts once operational. If any additional impacts were identified, that mitigation measures would be required to reduce the impact to an acceptable level.	Conditions in the Permit ensure that this is carried out. Permit condition 4.2.2 requires a review of the results of the monitoring and an assessment to include an interpretive review of that data. In addition to this, an Improvement Condition requires a report on the commissioning of the Installation to include a summary of the environmental performance of the plant as installed against the design parameters set out in the Application. This will include a review of the performance of the facility against the conditions of the permit. Our regulation of the site will be ongoing and dynamic and if issues are found in the future appropriate action will be required.
Questioned the reliability of the HPA's position statement on incineration.	This matter should be addressed with them directly.
<u>BCAG provided a report on the health effects of waste incinerators</u> (4th Report of the British Society for Ecological Medicine (BSEM) Second Edition June 2008)	The HPA reviewed a report made in 2005 (Refer to Section 5.3 of this document) and found no need to change their position statement on the health impacts from well managed modern incinerators. The matter of this 2008 report should be addressed directly with the HPA.
<u>BCAG provided articles on the health risks associated with biomass plants</u>	

Brief summary of issues raised	Summary of action taken / how this has been covered
These were provided to raise awareness about how other NHS boards are responding to biomass plant proposals. NHS Tayside raised serious concerns over possible health risks related to the proposed biomass plant planned for Dundee's docks area.	We consulted with Salford and Trafford PCT. Their comments are detailed in Annex 4 of this document.
Concerned that the emission limits for releases to air could be increased (Reference to increased limits at the UK's largest biomass-fired power station planned for Port Talbot, Wales).	With the exception of NO_2, the limits for all parameters are set at the WID limit so no increase can be authorised. NO_2 is set below the WID limit and whilst any Application would be assessed on its merits, it is unlikely that an increase could be authorised based on the current air quality in the vicinity of the Installation.
<u>BCAG responded to the Fichtner Report (Issued October 2011, BreatheClean AirGroupR2)</u> This report was provided in response to the Fichtner report (Further clarification with respect to Chapter 12 (Air Quality) of the submitted Environmental Statement). This report was submitted to Trafford Metropolitan Borough Council to address concerns raised about the environmental impact of the facility. Concerns were raised about the report lacking credible facts, using examples that are not comparable and questionable letters of support and validation.	The Applicant provided us with further information in their report dated 27 January 2012. There was sufficient detail in this report to justify the proposed unusually low NO_2 emission limit.
<u>BCAG responded to the Fichtner response to the Environment Agency Schedule 5 Notice dated 16 December 2012. Fichtner response dated 27 January 2012.</u>	

Brief summary of issues raised	Summary of action taken / how this has been covered
Concerned whether the 125mg/Nm^3 limit for NO_2 can actually be achieved. This is based on unverified claims by private companies who supply biomass boilers and the LCPD BREF.	Achieving the low NO_x concentration is discussed above in Section 6.2.2 of this document.
Concerned that no monitoring data has been included for comparable facilities.	Boiler suppliers are confident that the NO_2 emission limit can be achieved; however there is a lack of comparable data because they have not been required to provide plants with this lower limit. The Applicant provided NO_2 emissions data from the Western Bioenergy Plant, where NO_2 concentrations are being achieved without any secondary abatement measures (see below).
Reference was made to emissions from the Western Bioenergy Plant exceeding the 200 mg/m^3 WID limit. The 2009 data was reported to demonstrate that low levels of NO_x were achievable; however it was stated that the 2010 figures showed NO_x levels at 216mg/m^3 and in our report we state that the increase is due to more waste wood being burnt in the plant.	The reported figure, for compliance purposes, is calculated by subtraction of the measurement uncertainty (permit condition 3.5.5). The reported figure would then be 172.8 (216 mg/m^3 x 0.8) which is compliant with the WID limit. Notwithstanding this, this NO_x concentration is achieved without any secondary abatement measures (SNCR/SCR).
Concerned about the risk of accidents particularly through spontaneous combustion and dust explosion. Reference was made to a fire at a biomass fuel storage facility at the Port of Tyne (South Shields) where a fire started deep within the stockpile of compressed timber pellets covering an area of 100,000m^3. Reference was also made to some other dust explosions at wood pellet facilities, which included Tilbury Power Station.	An accident management plan will be required as part of the site's EMS. The Applicant will also consult with local fire officers (Section 2.1.4.3 of the Application Supporting information) to ensure that fire fighting measures are designed with particular attention paid to the fuel reception and storage building. The use of a grate means that there will be no milling, therefore thermal stability is unlikely to be an issue. Controls will be in place for bio-stability which include the size of storage piles and the storage duration.
That according to the Department for Energy and Climate Change (DECC), electricity only biomass	The Directive requires Member States to promote the use of renewable energy heating and cooling systems. Plants that generate electricity only

Brief summary of issues raised	Summary of action taken / how this has been covered
power stations are only 25% efficient. This contradicts the EU Renewable Energy Directive under which biomass conversion of at least 70% efficiency should be supported (Article 13(6), EU Renewable Energy Directive). Concerned that the demand for waste wood is soon expected to exceed the supply, resulting in the most polluted wood being burned and higher proportions of virgin wood.	cannot achieve 70% efficiency. As discussed in section 4.3.7, we have asked the applicant to investigate potential for heat use. Permit conditions also make it mandatory for this to be done on a continued basis. This is primarily a matter for the local authority; however the Permit will ensure that it can be operated without giving rise to significant pollution or harm to human health.
<u>BCAG provided a report from a paediatrician on the health effects of burning biomass</u> This report compared the emissions from the burning of biomass and coal, more specifically emissions of CO_2 and global warming. Concerned about the assumption that the biomass is carbon neutral.	The issues raised in this report are covered by the explanations given in Section c) below (Emissions and monitoring).

c) <u>Representations from Individual Members of the Public</u>

Approximately 220 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:

Issues Raised	Environment Agency Response
Emissions & monitoring Concerned about achieving the unusually low NO_x concentration of 125mg/m^3, with guarantees based on the fuel specification. Concerned that this specification may change over the 25 year lifetime of the facility and subsequently this limit may not be met. Concerned that the ambient air	Achieving the low NO_x concentration is discussed above in Section 6.2.2 of this document. Emission limits are binding and not dependent on fuel specification We consider background NO_x concentrations

monitoring data is not representative of the local area and suggested that monitoring should be undertaken closer to the facility and the M60 motorway.	in Section 5.6.1 of this document.
Concerned that metals background data was from a monitoring station located 11km away from the Installation.	There are only a limited number of monitoring stations in the country and the one used was at a roadside site at junction 4 of the M56. Our assessment of the data did not identify any issues with respect to the location.
Suggested that we should carry out monitoring of the ambient air at Davyhulme otherwise we are neglecting our duty to human health and the environment. This should be carried out before we make our decision.	Our assessment of ambient levels of NO_2 are detailed in Section 5.6.1 of this document. 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. By way of illustration – the daily limit for particulates is 10 mg/m^3 – the maximum impact of particulates is predicted to be 0.08 $\mu g/m^3$, which is more than 100,000 times smaller than the emission. It is also less than the natural variation particulate levels in the environment from other sources, e.g. traffic. Therefore any impact that the site might have would therefore be undetectable through ambient air quality monitoring.
Questioned the accuracy of roadside monitoring of NO_x using the diffusion tube method.	This is the responsibility of the local authority so any concerns should be raised with them.
One response claimed that in 2010 we stated that bag filters allow about 90% of $PM_{1.0}$ and 35% of $PM_{2.5}$ into the air.	This was based on some information supplied in an application. However, actual performance of bag filters is much better. A European Commission's science alert report issued on 2 February 2012, reported actual measurement of ultrafine particles on a waste to energy plant where the bag filters were shown to capture more than 99.99% of such particles.
Concerned that Peels Air Quality Statement is based on emissions of	Our assessment of $PM_{2.5}$ is detailed in Section 5.2.4 of this document and assumes

$PM_{2.5}$ being calculated as one third of the PM_{10}.	that all particulate is present as $PM_{2.5}$.
Concerned that filters will not prevent particulate matter below PM_{10} being emitted to atmosphere and that the emissions from the plant will contain mainly PM1.0 with some $PM_{2.5}$ which are not monitored in this area.	Refer to sections 5.2.4 and 5.3.3 of this document. Also note above where we report published information showing >99.99% capture efficiency
In breach of EC Air Quality directive 2008 (transposed into UK law June 2010) due to the already massive grounding of $PM_{2.5}$ and $PM_{1.0}$ in this area.	Refer to sections 5.2 and 5.2.4 of this document. The process contribution of the plant is less than 1% of EU EQS
Questioned whether the monitoring system would be fit for purpose and that monitoring would be undertaken during normal operating conditions, which is not representative of real emissions.	Refer to Section 6.7, which includes monitoring requirements under abnormal conditions.
Concerned about any other wastes that could be burned which will increase the hazardous emissions.	Section 4.3.6 of this document details the wastes that the Installation will be permitted to accept.
Concerned that the Environment Agency has already identified burning biomass produces more particulate matter than fossil fuel.	Regarding burning of biomass, a document was provided with this representation (Air Pollution: Action in a Changing Climate, published by DEFRA). This document confirms that wood fuel tends to emit a lower mass of particles than coal and often less than fuel oil but in comparison with natural gas, PM_{10} emissions from wood can be 10 - 100 times higher, based on emissions from current low emission boiler plants. Our assessment of particulate emissions is detailed in Section 5 of this document.
Concerned about the in combination effects with emissions from: the methane plant; five gas engines at Davyhulme; Paper mill, power stations and Shell at Carrington; Another incinerator (proposed at Trafford Park); M60 motorway;	For an assessment of in-combination effects, refer to Section 5.6.2 of this document. Regarding in combination effects with other incinerators, our modelling experience indicates that incinerators greater than 2km apart have insignificant in-combination effects on the environment between them if it is assumed that the emission levels of both incinerators are at the WID limits.

Industry at Trafford Park; Proposed Salford Free Port (worldwide container business); Red Bull Stadium (soon to be built); and The Trafford Centre.	This is a worst case situation as the incinerators would be expected to be operated at levels less than the limit to ensure consistent adherence to the limit. It is our conclusion therefore that any in-combination effects between the Barton incinerator and any other are insignificant.
Concerned about the interaction of emissions (gases and ultrafine particles) with those from other activities.	Regarding interaction of emissions, our assessment (Sections 5.2 and 5.3) does not consider interaction and the PCT raised no concerns with respect to this matter.
Reference made to a report by Dr Dick Van Steenis concerning the health impact over a seven mile radius.	For health impact assessment, please refer to Section 5.3 of this document.
Concerned that toxic pollution and particulates will be trapped in the Manchester basin.	Our assessment of emissions to air is detailed in Section 5.2 of this document.
Concerned about testing of emissions and that point measurements are only required twice a year (potential to miss dioxin peaks).	Refer to Section 6.7 of this document. Furthermore, control measures (e.g. fabric filters for heavy metals and carbon for mercury and dioxins) and system design (e.g. boiler design) ensure prevention and/or minimisation.
We should refuse the Application as Trafford is an Air Quality Management Area (AQMA).	In regulating industry we aim to ensure that no regulated installation contributes significantly to an exceedance of the air quality standards (limits and targets) that have been set by the EU and UK government. These standards are determined by expert panels on the basis of evidence from medical and scientific reports. We also consult with health experts.
Concerned that we allow particulate limits of 10 to 30mg/m^3 and not 1 to 5mg/m^3 as stated in the BREF.	Refer to Section 6.6 of this document. As we note in section 5.2.4 above, our experience is in line with the figures quoted by BREF.
Concerned that there is a high risk for system failure resulting in increased emissions.	For a discussion on system failure and increased emissions, refer to Sections 4.3.2 and 5.5 of this document.
Concerned that CEMS are allowed to	Section 5.5 of this document contains an

be off line for up to four hours and 60 hours a year without having to inform us.	assessment of such failures. The permit requires the operator to report such events to us.
Concerned about the effect of carbon dioxide releases on climate change. Stated that wood burning biomass plants emit 50% more CO_2 than existing coal plants and 330% more CO_2 than a new natural gas plant (www.maforests.org).	Wood is a renewable energy source whilst coal and gas are finite sources. Wood fuel is therefore regarded as carbon neutral. Our assessment of carbon dioxide and climate change is detailed in Section 6.3 of this document.
Concerned about the grounding of pollution during cold weather.	We can confirm that the Applicant has assessed the impact of the emissions taking into account the local features using representative weather data and we have verified this assessment in Section 5.2 of this document.
Concerned about inadequate monitoring of sub-micron particles and recommended electron microscopy.	Our requirements for monitoring of particulate are set out in Section 5.3.3 of this document.
Concerned about the conclusions drawn in the Applicant's Air Quality Assessment, given the claims made in the report entitled 'Monitoring of Ambient Pollutants, Davyhulme' and comments provided in report reference TB/Q035/2011/R3177, dated 12 May 2011.	Our assessment of the 'Monitoring of Ambient Pollutants, Davyhulme' report is detailed in Appendix 1 of the AQMAU report (Refer to AQMAU report reference C704 on the Public Register). This report should also be referred to for the points raised in report reference TB/Q035/2011/R3177.
Concerned about the use of the meteorological data in the Applicant's Air Quality Assessment, which only covered wind direction with no consideration of the effects of barometric pressure, inversions or precipitation. The Ship Canal is also a natural corridor for strong winds dispersing pollutants to Manchester and Liverpool.	Although the air dispersion modelling report overtly discusses wind rose patterns, it also implicitly takes account of all relevant meteorological data via the modelling files. These have hourly data for wind speed, direction, cloud cover, precipitation, temperature and relative humidity.
Concerned about the inclusion of buildings in the Applicant's Air Quality Assessment, which did not take into account the M60 motorway bridge or the Chill factor ski slope.	Buildings and distant structures such as the Barton Bridge and the Chill Factor slope are too remote to affect the impact assessment conclusions (Refer to AQMAU report reference C704 on the Public Register)

Concerned about the use of modelling and suggested that validation monitoring and analysis is undertaken to prove the impact.	For the use of modelling, refer to Section 5 of this document. Conditions in the permit require monitoring results to be reviewed and assessed.
Questioned the functionality of the abatement system given that the stack is located furthest from the AQMA.	The abatement system, stack location and our assessment of emissions control is set out in section 6.2 of this document. The layout arrangement was chosen by the Applicant based on their assessment of dispersion and the impact at sensitive receptors.
Questioned the height of the stack being only at 45 metres (Peel's Ince biomass plant is 85m).	Regarding the height of the stack, the impact assessment is detailed in Section 5.2 of this document and is based on a stack height of 44.23m.
Concerned that smoke from the stack could cause road accidents due to its height and close proximity to the M60 motorway.	Based on experience of existing plants operating to the limits set in this permit and given the results of our assessment of the air dispersion modelling, it is considered highly unlikely that smoke would be an issue.
Concerned about carcinogens in the dust emissions from the Plevin plant and that the Environment Agency were conducting tests to determine the volume of the smaller particles.	The dust emissions from Plevins are associated with fugitive releases from the storage of waste wood. Storage and charging of waste wood will be fully enclosed as detailed in Section 4.1.3 of this document. Dust emissions from the combustion process have been screened out as being insignificant.

Location	
Concerned that it is a residential area (520m from houses) and near to over 20 schools, numerous nurseries, a hospital, a farm, children's play parks, playing fields, golf clubs etc. It is also next to a busy motorway, sewage works, Trafford Centre, ski centre and fitness venues.	Our responsibilities are explained in Section 3 of this Annex (Location of the Installation).
500 houses are to be built 500 yards away.	We consulted with the local planning authority and they did not raise any concerns.
There is a wildlife park nearby, with 22 species of butterflies, ducks and rare birds. The Millenium Nature Reserve is only 300 yards away. There are priority species (great crested newt and water vole) within 2km.	Refer to Sections 5.4 and 7 of this document for our obligations and assessment of habitats sites.
Concerned about the risk of fire at the facility given it's proximity to a methane plant.	The operator will be required to have an accident management plan in place as detailed in Section 4.3.4 of this document.
Government guidelines suggest that large biomass plants should not be built close to urban development and only in rural locations if there is no gas-line.	Regarding the government guidelines, a document was provided with this representation [Biomass and Air Quality Guidance for local Authorities – produced by environmental protection UK and the local Authorities Coordinators of Regulatory Services (LACORS)]. The key messages for local planning policies were as follows: • To meet the 2020 targets for renewable energy, the UK needs to increase very substantially the amount of renewable heat generated, and biomass heat is one of the key technologies; • The potential conflicts between these goals and air quality can be avoided through the use of high quality, low emission plant. The replacement of old coal and oil fired plant with high quality wood fired plant located off the gas grid and away from densely populated urban areas may actually benefit air quality. In urban areas or where an Air Quality Management Area has been

	declared, we would expect biomass heat deployment to be less common and larger (and therefore cleaner) biomass units to be more prevalent. • Encouraging the use of larger plant, for example in conjunction with the development of heat networks, will result in a system where air quality emissions are easier to control than from a larger number of small plant'. The Applicant's proposal would fall under the definition of larger plant with lower emissions. Our assessment of emissions is detailed in Section 5 of this document. Furthermore, in order to maximise the Installations sustainability and primary function, its location needs to be within an area of high energy and heat demand. The urban character of the area provides the receptors necessary to receive the energy and heat.
Health Concerned that even a minimal health risk is too much.	Our assessment and methodology are detailed in Sections 5.2 and 5.3 of this document.
Want an assurance that the Environment Agency protect the people and not the polluter.	We will only issue a permit if we are sure that the plant will be designed, constructed and operated in a way that will not significantly pollute the environment or harm human health.
Reference was also made to a response given on behalf of Charles Hendry (Minister of State) which quoted '*it is clearly not possible to rule out adverse health effects completely*.'	The Minister's response is consistent with the advice given by the Health Protection Agency, which is set out in Section 5.3 of this document.
Stated that emissions will kill over 3000 people in Manchester per year (75,000 over 25 years). Questioned whether we want to be prosecuted for issuing a permit to murder/kill/maim people.	We consulted PCT and they have not voiced any such concerns. Also refer to sections 5.2 and 5.3 of this document.
$PM_{2.5}$ and $PM_{1.0}$ will be spread some 10 miles downwind effecting Eccles,	Our assessment is detailed in Section 5.2.4 of this document.

Manchester centre, Urmston, Cheadle and other suburbs.	
$PM_{2.5}$ are already at 133% in Urmston and up to 199% in parts of Salford.	Particulate releases from the Installation have been screened out as being insignificant.
An article was provided on the health and environmental effects associated with particulate matter.	We have consulted with Natural England and the HPA and they have not raised any concerns regarding this matter.
Stated that the incineration of waste causes a shortening of lifespan up to 11 years, by increasing a range of diseases (low birth weight, birth defects, mortality, heart attacks, strokes and cancers).	Our assessment is detailed in Section 5.3 of this document.
Reference was made to The Government's Current 2007 Air Quality Strategy and that particulate matter reduces life expectancy by around seven to eight months.	Our assessment of the health impact from particulate emissions is detailed in Section 5.2 of this document.
Concerns about heavy metals, PAHs and dioxins causing health and mental issues, defects and cancers.	Our assessment is detailed in Sections 5.2 and 5.3 of this document.
Concerned that we allow exceedances due to malfunction which will harm human health.	Our assessment of abnormal emissions is detailed in Section 5.5 of this document.
Suggested that incinerator operatives have blood tests for dioxins, furans and heavy metals to confirm no adverse risks.	For human health risk assessment, refer to section 5.3 of this document. An environmental permit cannot require blood tests for employees.
Concerned that there have been no long term health studies carried out in the UK by either the Department Of Health or the HPA.	For studies on health risks, refer to section 5.3 of this document.
A local doctor has written to his patients quoting that 'cardiovascular disease remains the biggest killer in Trafford. Early mortality rates for Cardiovascular Disease in Trafford are 8% above the national average. Another article in the Daily Mail	We consulted with Trafford and Salford PCT and they did not raise any of these concerns. Their comments are detailed in Annex 4 of this document.

(research from Manchester University) states that cancer is man made through environment and what you eat.	
Concerned about the impact of dioxins on the local allotments and pollutants entering the food chain.	Our assessment is set out in Section 5.3 of this document. We also consulted with the FSA as detailed in Annex 4 of this document.
Concerned that Trafford Council have not carried out their own Health Impact Assessment.	Our assessment is detailed in Section 5.3.4 of this document. We are not responsible for assessments carried out by other bodies.
Reference was made to an article which had appeared in the national press regarding a study being considered by the Health Protection Agency into the potential effects on birth outcomes.	We are aware of the potential study and will be providing data on emissions from municipal waste incinerators should the study proceed. The HPA have advised us that this study does not alter their current position statement.
Concerned that mercury is a toxic chemical known to cause severe birth defects and neurological disorders.	Our assessment is set out in section 5.2 of this document. We also consulted with the Trafford and Salford PCT.
Concerned about the health effects associated with emissions of arsenic. Reference was made to our report titled 'A review of the toxicity of arsenic in air' (Science Report – SC020104/SR4)	Our assessment is set out in Section 5.2 of this document. Notwithstanding this, additional controls are in place to limit hazardous substances in the wastes being accepted as they are not included in the list of waste codes that the Installation is permitted to accept.
Consideration should be given to a Judicial Review (against the government) that has been lodged by the environmental group Clientearth. This is for failing to protect people's health from toxic levels of pollution. Davyhulme already exceeds the nitrogen dioxide legal limit.	We have considered the impacts from nitrogen dioxide as described in the main body of this document and are satisfied that there will be no significant impact on human health.
Concerned about the health effects from particulate matter. Articles were provided raising concerns about a number of health effects which included cancers, children's diseases and alzheimers.	Our assessment is set out in section 5.2 of this document. We also consulted with the Trafford and Salford PCT.

Other submissions were made raising concerns about health issues which included:	
Infant deaths and the Ironbridge power station;	We have consulted with Trafford and Salford PCT.
Health effects from Coinbrook incinerator;	
Questioned the validity of the DEFRA 2004 report on Health Effects from Waste Management and concerned that the HPA 2009 position statement had drawn much of its substance from this report.	The HPA is the expert body on public health and as such it is their responsibility to take the balanced view in respect of the evidence on health. Our role is then to act on their advice.
Questioned whether the HPA had checked vital evidence about health effects from incinerators and challenged their statement that 'Incinerators pose little or negligible risk to health.'	Any concerns about DEFRA and the HPA should be raised with them directly.
Concerned about the formation of dioxins due to low combustion temperatures and the '*out-of-date*' bag filtration system. A dioxin fact sheet was provided and concerns were raised about dioxins entering the food chain.	The controls in place for dioxins and particulate are detailed in Sections 6.1.1, 6.2.1 and 6.2.5 of this document. We also consulted with the FSA, refer to Section 1) of this Annex.
Operation	
Concerned about the systems in place to check the wastes accepted. Of particular concern were wastes from a local landfill site where wastes are to be removed for a development (near Barton Swing Bridge) and commercial and industrial waste.	The permit will specify what wastes can be accepted by the Operator. Also refer to section 4.3.6 of this document.
To properly incinerate a temperature of 1,250^{o}C is required.	We have no reason to believe that the quoted temperature is necessary for the type of waste being permitted. Temperature requirements have been set as specified in the WID.
Questioned describing the plant as a biomass plant given that the public do	Biomass is the generic term used to describe any fuel derived from organic matter.

not consider waste wood to be true biomass.	
Concerned about the statement in the Fichtner report (Further clarification with respect to Chapter 12….) about waste wood generating more corrosive flue gases that lead to increased boiler maintenance. Also concerned about the requirement for reactive maintenance, indicating general failures as the plant ages.	The context of these statements was in relation to the reduced number of operational hours when compared to a facility burning virgin wood. The Installation will have an EMS in place to ensure that the appropriate management systems are in place for maintenance requirements.
Concerned about what solid recovered fuel (SRF) actually contains.	SRFs are produced from non hazardous waste. The input waste can be production specific waste, municipal solid waste, industrial waste, commercial waste, construction and demolition waste, sewage sludge etc. A well defined system is in place for its classification and specification, BSEN 15359:2011. It is a tool to enable efficient trading of SRF which should help to promote their acceptability on the fuel market and increasing the public trust.
Concerned about the sustainability criteria of the biomass and asked for provision of this criteria. Reference was also made to a Public Inquiry which is to take place in May 2012 on the Forth Energy's application for a biomass energy plant in Grangemouth. It was stated that this will be the first biomass inquiry in the UK to look at sustainability.	Our duties under EPR, WID and WFD are to ensure that energy is recovered as far as practicable (WID) with a high level of efficiency (WFD). We also consider emissions of CO_2. These are all set out in Sections 4.3.7, 6.3 and 7.1.2 of this document. Also, the Government are applying sustainability criteria to biomass combustion as part of the system for paying Renewables Obligation Certificates (ROCs). Payment of ROCs is regulated by Ofgem, and the applicant will have to satisfy Ofgem that these sustainability criteria are being met in order to receive these payments. Waste biomass is exempt from these sustainability criteria.
Concerned about the odour arising from the external storage of biomass. Reference was made to Peel being responsible for odours arising from the storage of wood chip in Chatham, Kent prior to its export to Sweden to	Regarding odours from storage, the operations will be fully enclosed, refer to Sections 4.1.3 and 6.5.4 of this document.

be burnt in a similar facility.	
Concerned that there were limited details on the design of the incineration unit.	Our assessment is based on whether the equipment proposed is BAT and does not focus in on the detailed design. However, a condition in the permit requires the operator to submit details of the combustion plant before operations start.
Concerned about who would be responsible for the operation of the facility.	The permit specifies who will be the operator of the facility. Regarding the operation 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 Installation is operational. An improvement condition is included requiring the Operator to report progress gaining accreditation of its EMS. The Agency would also undertaken regular inspections to audit monitoring operation, maintenance, monitoring arrangements etc. Should there be non-compliance, this will be dealt with in accordance with the Environment Agency's Enforcement and Prosecution Policy.
In breach of November 2008 EC directive on waste (transposed into UK law December 2010).	Regarding the EC directive on waste, refer to section 7 of this document.
Concerned that the process of burning wood cannot comply with the Regulations. A report was provided for the Beaver Wood Energy biomass project in new England.	Our assessment against the relevant Regulations is set out in the main body of this document.

Technology	
The technology is not BAT for biomass and moving grate is an old and inefficient technology.	Our assessment is detailed in Section 6 of this document.
No confirmation on the type of abatement technology that will be used for NO_x	The Application and further information received includes details of the proposed abatement technology for NO_x. Our assessment of this information is detailed in Section 6.2.2 of this document.
Consultation	
Concerned that we raised no objection to the planning application despite the fact that our consultation had not started.	Our response to the Planning Application confirms that an Environmental Permit would be needed for the operation of the Installation. We undertake our detailed assessment of the impact of the Installation on sensitive receptors during our Permit determination process as detailed in this document. Also, refer to Section 3 of this Annex for matters relevant to an Application for Planning Permission.
Concerned about our attendance at the Applicant's consultation evening in December 2010. This was construed as us backing them from an early stage.	We were invited by the Applicant to attend this event and saw this as an opportunity to brief the public on our role in a resourceful and financially efficient manner.
Regarding our acknowledgement letter (in which we say that a permit cannot be refused solely on the grounds of local opposition), the government have stated that they want local decisions to be made more by local people.	Regarding local decisions, we are required to carry out our assessment in accordance with the EP Regulations. Our responsibilities are set out in the main body of this document. Local decisions are a matter for council decision-makers.
Questioned whether there would be consultation opportunities to discuss the permit Application.	Regarding our consultation requirements, refer to Section 2 of this document

Noise	
Concerned that noise is already frequently heard at night from the sewage works.	Our assessment of noise is detailed in Section 6.5.5 of this document. Also refer to the response from Salford City Council in Annex 4 of this document.
Concerned that the noise testing was not independent and that the location of monitoring equipment was not representative.	Noise and Vibration Consultants Limited (NVC) state the background noise survey was carried out in accordance with BS 4142 and BS 7445. Any masking from the garden fence would reduce the background noise level resulting in a more conservative assessment. We have tested sensitivity to the lowest measured hourly L_{A90} in our audit and there is no positive indication that complaints are likely.
That we are required to consider vibrations from the additional traffic as part of our assessment.	Regarding vibrations from traffic, Under the Environmental Permitting Regulations (EPR) it is the applicant's responsibility to consider the impact from noise and vibration from additional on-site traffic movements (e.g. from deliveries etc). Noise and vibration assessment from additional off-site traffic is considered under EPR only in as much as it might contribute to additional background levels. Other aspects of off-site traffic noise are a consideration in planning control.

d) Written Representations Made at The Drop-In Event

To be completed

3) Matters on which the public may comment which may be more relevant to an application for Planning Permission

Location of the Installation: Decisions over land use are matters for the planning system. The location of the Installation is a relevant consideration for Environmental Permitting, but only in so far as its potential to have an adverse environmental impact on communities or sensitive environmental receptors. The environmental impact is assessed as part of the determination process and has been reported upon in the main body of this document.

Vehicle access to the Installation and traffic movements: These are relevant considerations for the grant of planning permission, but do not form part of the Environmental Permit decision making process except where there are established high background concentrations contributing to poor air quality

and the increased level of traffic might be significant in these limited circumstances.

Flood Risk: The Environment Agency provides advice and guidance to the local planning authority on flood risk in our consultation response to the local planning authority. Our advice on these matters is normally accepted by both Applicant and Planning Authority. When making permitting decisions, flood risk is still a relevant consideration, but only in so far as it is taken into account in the accident management plan and that appropriate measures are in place to prevent pollution in the event of a credible flooding incident.

The Use of Alternate 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.

It is important to draw a distinction between Sustainability Appraisal and Best Practicable Environmental Option (BPEO) and BAT. In Planning Policy Statement 10 (PPS10) (Planning for Sustainable Waste Management) Sustainability Appraisal forms part of the decision making process which should be applied so as to shape planning strategies that support the Government's planning objectives for waste management. Thus Sustainability Appraisal is an important part of plan formation and planning decisions are made by reference to planning policies. BPEO forms a similar function in Wales. BAT assessment is a technical appraisal that the proposed technique is the best available for the protection of the environment as a whole.

Light Pollution: Light pollution is a matter for the planning system.