Determination of an Application for a PPC Permit under the Pollution Prevention and Control (England and Wales) Regulations 2000 (SI 2000 No.1973)

Decision document recording the decision-making process

Note: all references to the “PPC Regulations” are to the Pollution Prevention and Control (England and Wales) Regulations 2000 (SI 2000 No.1973), as amended.

Administrative details

Duly made application date	16/05/07
Permit number (the “Permit”)	ZP3535MW
Applicant (the “Applicant”)	Hudol Thermal Ltd
Address/location of installation (the “Installation”)	Unit 15 Capital Valley Industrial Estate Rhymney Caerphilly NP22 5PT
Name of Authorising Officer	M Jenkins

Contents

INTRODUCTION

Purpose of this document

The decision document explains how the Applicant's Permit Application has been determined and why the specific conditions in the Permit have been imposed. It is a record of the decision-making process to show how all relevant factors and legislative requirements have been taken into account.

The permit contains many conditions taken from our standard non-landfill PPC permit template (version 3). We developed these conditions in consultation with industry having regard to the legal requirements of the PPC regulations and other relevant legislation. This decision document does not include an explanation for these standard conditions. Where they are imposed we have considered the application and accepted the details are sufficient and satisfactory to control that aspect of the operation. This decision document does however, provide an explanation for the use of alternate conditions where our permit template provides for two or more options. Emission and monitoring compliance levels and any additional conditions that have been imposed in order to take installation-specific factors into account are also explained

Summary of the decision

We have decided to grant a permit for the operator, subject to the conditions in the permit. Where the permit includes standard conditions (see above), these have been considered to be appropriate for the installation, in particular in ensuring that all appropriate measures will be taken against pollution and that no significant pollution will be caused. We consider in reaching that decision we have taken into account all relevant considerations and legal requirements and that the permit will ensure that all appropriate measures will be taken against pollution and that no significant pollution will be caused.

We have carefully considered the applicable requirements of the Waste Incineration Directive (WID) and is satisfied that the Permit ensures that these will be complied with. The requirements of the WID and the way in which these have been complied with are set out in Part D.

All emission limits and operational controls are considered to represent the use of BAT. It is not considered that any site specific circumstances require the imposition of standards that are stricter than those associated with BAT, except where this has been necessary to comply with WID.

We consider that in reaching our decision we have taken into account all relevant considerations and legal requirements and that the permit will ensure that all appropriate measures will be taken against pollution and that the operation of the installation will not cause any significant pollution or harm to human health.

Part A – General Issues

A1 Administration

This section includes administrative information relating to the application and information about the applicant and the installation.

The application was duly made on 16/05/07.

The operator has not made a claim for commercial confidentiality. We have not received any information in relation to this application that appears to be confidential in relation to any party.

The application was advertised and consulted in accordance with the regulations. Details of the advertising and consultation are on the public register. Any responses received are summarised in Annex 1. We have taken these into consideration as described in Annex 1 when determining the application.

The requirements of PPD do apply to this application. The draft determination was consulted upon as required by the public participation directive (PPD). We received responses as summarised in Annex 1. We have taken these into consideration as described in Annex 1 in finalising our determination.

A2 Description of the installation

A brief description of the installation is in the introductory note to the permit.

A3 Operator competence

We are satisfied that the applicant (now the operator) is the person who will have control over the operation of the installation after the grant of the permit. We are satisfied that they will be able to operate the installation so as to comply with the conditions we have included in the permit

A management system will be in place that includes training staff of the regulatory implications of the permit. The Operator is a legal entity as a Limited Company.

A4 Requirements for SWMAs

The operator has replied to application question B7.1 stating that the installation does not contain an SWMA and we agree with this assessment.

A5 EPOPRA profile

We are satisfied that the EPOPRA profile submitted with the application remains accurate following the determination of the application

The EPOPRA of 123 score will be used as the basis for subsistence and other charging. In accordance with our EPOPRA Scheme however, the operator's EPOPRA profile for the installation may change over time.

PART B : THE INSTALLATION AND ITS MANAGEMENT

B1 General Management

Permit condition 1.1

Based upon the information submitted in the application, we are satisfied that appropriate management systems and management structures are in place for this installation and that sufficient financial, technical and manpower resources are available to the operator to ensure compliance with all the permit conditions.

B2 Accident management plan

Permit Condition 1.2

Based upon the information submitted in the application, we are not fully satisfied that appropriate measures are in place to ensure that accidents that may cause pollution are minimised.

An assessment of the firewater hazards has not been carried out. The Operator stated in the application that this would be in place by 01/01/08. This has been set as a pre-operational condition.

Storage capacity has not been provided for contaminated rainwater or firewater run off. The facility to test and treat these waters before discharge does not exist. The Operator has stated in the application that this will be in place by 01/01/08. This has been set as a pre-operational condition.

We are satisfied with the other aspects of the Accident Management Plan.

B3 Energy efficiency

Permit condition 1.3

Based upon the information submitted in the application, we are satisfied that appropriate measures are in place to ensure that energy is used efficiently**.**

The Operator confirmed that the basic energy requirements from section 2.7.1 and 2.7.2 of the sector guidance note will in place. Energy recovery, global warming potential and further energy efficiency measures are discussed in section C7 of this document.

B4 Efficient use of raw materials

Permit condition 1.4

Based upon the information submitted in the application we are satisfied that the appropriate measures are in place to ensure the efficient use of raw materials and water.

B5 Avoidance, recovery and disposal of wastes produced by the activities

Permit condition 1.5

Based on the information submitted in the application we are satisfied that the appropriate measures are in place such that waste production will be avoided as far as possible, and where waste is produced it will be recovered unless technically and economically impossible. We are satisfied that the operator's justification for their proposed waste disposal option shows that such waste that does arise from the installation that can not be recovered will be disposed of using a disposal method that avoids or reduces any impact on the environment.

If soils are used in the process, clean soil will be left as a residue. This will be sent as inert cover to landfill. Oily sludges will produce a residue that will be disposed of. This will be sent to landfill. Residue from biomass will be sent to landfill, but the Operator plans to look into uses by the construction industry. Standard condition1.5.1 requires regular reviews of waste disposal and recovery options. The Operator confirmed that residues would be stored in sealed containers and only compatible residues would be stored together. Laboratory testing will be carried out to confirm the nature of the residue. A pre-operational condition has been set for the operator to confirm that this is in place.

B6 Site Security

Permit condition 1.6

Based upon the information submitted in the application, we are satisfied that appropriate infrastructure and procedures are in place to ensure that site remains secure.

B7 Multiple operator installations

Permit condition 1.7

This is not a multi-operator installation

B8 The permitted activities

Permit condition 2.1

The primary purpose of the installation is generation of energy. The installation is therefore a co-incinerator.

We have determined that the installation comprises the following activities listed in Part 1 of Schedule 1 to the PPC Regulations and the following directly associated activities.

Listed activity
Section 1.1 Part A(1)(b)(iii). Burning any fuel manufactured from, or comprising, any other waste in an appliance with a rated thermal input of 3 megawatts or more but less than 50 megawatts unless the activity is carried out as
part of a Part A(2) or B activity—
For this installation this is Pyrolysis and gasification of oily sludges, oil contaminated soils and biomass and combustion of the produced syngas in a several gas burners and/or gas engines. This includes the operation of abatement equipment.

Directly associated activity
Storage and handling of wastes generated by the process

The activities comprise a single installation because they are all steps in carrying out the listed activity.

B9 The site

Permit condition 2.2

The operator has provided a plan which we consider is satisfactory, showing the site of the installation and its extent. A plan is included in the permit at Schedule 2, and the operator is required to carry on the permitted activities within the site boundary.

Part C : Operations and releases

C1 Operating techniques

Permit condition 2.3/table S1.2

We have specified that the applicant must operate his installation in accordance with the following descriptions in his application. The table shows the parts of the application that have been included. Certain parts of the application have been excluded. The exclusions are to the operator making changes to several parts of the application.

Description	Parts Included and Omitted	Justification
Application, received on 16/05/07	Sections B2.1, B2.2 and B2.10.15 of the application form excluding sections B2.1.22, B2.1.23, B2.1.27.	These sections describe operating techniques. B2.1.22 and 23 refer to the waste control procedure which was revised later. B2.1.27 states that the hazardous waste requirements of the WID do not apply. This is not correct and the operator later corrected this statement
Response to schedule 4 notice received on 06/02/08	Process description REF HUPPC.04 (Rev 1 January 2008), excluding mention of exporting gas. Waste control procedure REF HU PPC.03 (Rev 1 January 2008) (excluding references to bulk storage) Sections 2.3.5 and 2.9 of Non technical summary REF HU PPC.01 (Rev 1 January 2008). The response to questions 7, 8, and 11.	Sections describe operating techniques. Operator later confirmed that gas will not be exported and bulk storage will not take place.
Response to schedule 4 notice received on 15/04/08	Response to items 3 and 4	Sections describe operating techniques
Further information received on 12/05/08	Information on phased development of the installation , excluding the use of the thermal oxidiser and the run time period during period 1	Sections describe operating techniques. The thermal oxidiser will not be used, the operator later stated that a selective catalytic reduction system would be used
Further information received on 05/06/08	Section 2.2	Sections describe operating techniques
Further information received on 25/07/08	Sections 8, 9, 10, 13, and 14 (ii)	Sections describe operating techniques
Further information received on 01/08/08	Section headed question 5	Describes operating techniques
Further information received on 14/08/08	Information about reviewing the use of CHP annually	Incorporating this requires the operator to review the sue of CHP annually

Permit condition 2.3/Table S3.1

We have specified the permitted waste types, descriptions and quantities, which can be accepted at the installation in tables S3.2.

We are satisfied that the operator can accept these waste because the Operator wishes to carry out trials on a wide range of wastes. This will allow them to determine the appropriate operating techniques for each waste stream.

C2 Off-site conditions

Permit condition 2.4

Based on the information submitted in the application, we consider that it is not necessary to impose any off-site conditions.

C3 Improvement Conditions

Permit condition 2.5

Based in the information in the application we consider that we need to set improvement conditions. These are listed in annex 2- justifications for these are provided at the relevant section of the decision document.

C4 Pre-operation conditions

Permit condition 2.6

Based on the information on the application, we consider that we need to impose the following pre-operational conditions.

Number	Condition	Justification
1	The Operator shall confirm in writing to the Environment Agency that a site closure plan is in place that meets the requirements set out in section 2.11 of Environment Agency Guidance Note S5.01.	See section C5
2	The Operator shall confirm in writing to the Environment Agency that an assessment of the risk from firewater run-off has been carried out and that a procedure to store and test contaminated rainwater or firewater before discharge is in place.	See section B2
3	The operator shall confirm in writing to the Environment Agency that a procedure is in place to cover recovery or disposal of gasification residues. The procedure shall include: • Methods to ensure that incompatible residues are not combined either in the gasifier or for storage; • Methods to ensure that each residue has an appropriate recovery or disposal route	See section B5

The above will need to be completed before the installation can be brought into operation.

C5 Closure and decommissioning

Permit condition 2.7

Based upon the information submitted in the application we are not fully satisfied that the appropriate measures are in place for the closure and decommissioning of the installation.

The application stated that a decommissioning plan would be in place by 01/01/08. A pre-operational condition has been set to confirm that a site closure plan is in place.

C6 Site protection and monitoring programme

Permit condition 2.8

The applicant has provided a site report the main elements are summarised below.

The installation is located in the Capital Valley Industrial Estate near Rhymney. The installation is bordered by industrial units, a road and railway line. The nearest houses are ~350m south east of the installation.

Made ground is present across the site. The material comprises of building rubble, ash and slag.
The site is underlain by Devensian age Till. These deposits are clay dominated with some bands of sand and gravel.
The superficial deposits are underlain by Carboniferous age Middle Coal Measures. These comprise a sequence of mudstones, siltstones and sandstones. A number of coal seams occur within the sequence.

The installation is located on a minor aquifer with soils of low leaching potential.
The nearest surface water feature is the River Rhymni, ~100m away.

The installation is covered with concrete hardstanding. There is no evidence of spillage and the surface is free of cracks or open joints.

The installation has previously been used as a manufacturing and storage area. Previous uses have been an iron works and engineering works.

The site report concluded that there is little possibility of pollution from the installation. We agree with this conclusion because:
There is no subsurface pipework at the installation.
A design quality assurance and inspection programme of impervious surfaces and containment kerbs will be in place for all areas.
Reception and waste storage areas have an impervious surface, sealed construction joints, spill containment kerbs and bunding. The treatment area has an impervious surface, sealed construction joints and spill containment kerb. The quarantine area has an impervious surface, spill containment kerbs, sealed construction joints and bunding.
Storage containers are used. Measures including inspection and replacement of damaged drums. Clear labelling and a procedure to deal will damaged drums will be used.
All storage areas are located away from sensitive receptors and in lose proximity to the treatment area. All waste storage will be inside the installation building on a painted concrete bunded area. All waste will be delivered and stored in containers. Inspections of storage areas will be carried out daily.

Bulk storage vessels are located on an impervious surface that is resistant to the material being stored with sealed construction joints, a bunded area. The bund will be 100% of the largest vessel or 25% of the total (whichever is the largest).

We consider that this report adequately describes the condition of the site and in particular identifies any substance in, on or under the land that may constitute a pollution risk.

To ensure the continued effectiveness of pollution prevention measures to protect the land we are requiring the operator to implement and operate a Site Protection and Monitoring Programme, the design of which must be reported to the Agency within two months from the date of permit issue.

C7 Emissions to water, air or land.

Permit condition 3.1

We have reviewed the techniques used by the operator and compared these with the relevant guidance notes.

Indicative BAT is set out in guidance note S5.01.

The installation is classed as a co-incinerator. The primary purpose is the generation of energy.

Section	Operator proposal	Assessment of BAT
Incoming waste and raw material management	Loads will be weighed when they arrive at the installation. Waste will be stored in a bunded area with a impermeable concrete floor. Pre treatment to create a consistent feed stock is not carried out. However the type of waste added to the gasification unit is controlled in order to control the amount of syn gas produced	These procedures meet indicative BAT
Hazardous waste management	Pre acceptance procedures will in place. These will require the provision of information and representative samples of the waste. These procedures will be designed to avoid the delivery of unsuitable wastes. The following will be determined: ▪ The nature of the process producing the waste; ▪ The composition (chemicals present and individual concentrations) of the waste will be determined; ▪ Samples taken and analysed;	

	▪ For a new waste enquiry, a comprehensive characterisation will be carried out to identify if it is suitable for treatment; ▪ The quantity of waste; ▪ The form of the waste; ▪ Hazards associated with the waste; ▪ Sample storage and preservation techniques. Waste acceptance On arrival the waste will be: ▪ Weighed ▪ Not accepted if sufficient storage capacity does not exist ▪ Documents will be checked ▪ Check labelling ▪ Visually inspected ▪ Reject damaged containers ▪ Sampled, checked and tested ▪ Samples will be kept for a minimum for two days after the waste has been removed or treated ▪ Sampling will identify consistency with pre-acceptance information and the proposed treatment method Waste that is identified to contain incompatible substances will be sent to a quarantine area. Waste will be delivered and stored in containers. They will be stored in a building on a concrete surfaced bunded area. Storage areas will be located away from sensitive receptors in a secure area. Daily inspections of containers will be undertaken and records kept. Although the application states that bulking up will take place, no bulk storage will be carried out. Because the process is described as demonstration kit, processing will be on a batch basis so no bulking will be required. This was confirmed in the schedule 4 response received on 15th April 2008.	The procedures are BAT. Bulking up is not appropriate because the Operator wants to trial individual batches of material is their process.
Gasification	The syn gas is in a contained	Containment of the syn gas is

	system. The syn gas will be passed through a filter and water scrubber to remove impurities before combustion. Waste will be passed through a pre-heating unit and fed into the gasification unit. The pre-heating unit delivers the waste to the gasifier at an elevated uniform temperature. Waste then passes down through the gasifier by gravity. Hot vanes set at angles control the speed of movement. Syn gas is produced and is extracted from the gasification chamber. Syn gas will be returned to burners. The combustion gases will be passed round an outer chamber thus heating the gasification chamber. The combustion gases will then be emitted to atmosphere via a stack. To aid control a secondary energy input mechanism will be used. Sand heated to a specific temperature will be added to the gasification unit via a hopper. This will form a hot flowing bed that will prevent materials in the waste from adhering to the plates. The hot sand will be recycled.	BAT. Cleaning of the syn gas prior to combustion is BAT. Gasification is BAT for treatment of waste. (see options discussion) The syn gas will be used to heat the gasifier, this is BAT. Further details are provided below.
Energy recovery	The installation will operate in four phases <u>Phase 1</u> 200kg/hr no gas engines <u>Phase 2</u> 1 1MW engine <u>Phase 3</u> 2 1MW engines <u>Phase 4</u> 3 1MW engines	The BAT assessment of the phased approach is covered below this table under the heading 'BAT for energy efficiency and global warming potential'.
Oxygen content	The Operator will monitor the exhaust gases for oxygen content	Measurement of the oxygen content is BAT.

Combustion control		The techniques described in the technical guidance note relate to direct incineration and are not applicable to this installation. In this process the waste is not combusted, it is the resultant gas that is combusted.
Control of emissions to air	The operator stated: ▪ The aim of the proposed system is to prevent the formation of pollutants during the treatment process to avoid the need for removal of pollutants. ▪ The syn gas is cooled to remove residual tar and then cleaned by filtration and by passing through a water scrubber. ▪ After cleaning the gas will contain methane, carbon dioxide, carbon monoxide, hydrogen and low levels of ethane. The gases are fast burning and when mixed with the correct amount of air, burn to produce carbon dioxide and water. ▪ The syn gas will be combusted in high efficiency low NOx burners that will give emissions well within the WID limits. ▪ Strict waste acceptance procedures will limit the acceptance of chlorinated compounds will at the facility. ▪ There is no abatement of particulates after the combustion of the syn gas. ▪ There is no abatement of acid gases after the combustion of the syn gas.	There is no abatement for the combustion gases from the burners. The Operator states that they are relying on primary measures such a low NOx burners and controlling the combustion conditions. The emission of NOx will be <80mg/m^3. This is well below the WID limit of 200mg/m^3. The NOx controls are BAT.. Further details on GWP are provided below under the heading of 'BAT for energy efficiency and global warming potential'. Limiting halogens in the waste will limit the formation of acid gases. Acid gases will be removed from the syn gas by cooling and then passing through a water scrubber. The emissions quoted by the Operator of acid gases are low (zero for HCl and HF and 15mg/m^3 for SO_2. The controls are BAT. There is no post combustion particulate abatement. The SGN describes fabric filtration to levels below 5mg/m3 as BAT. Filtration and scrubbing of the syn gas before combustion will remove some solid matter and the Operator has committed to emitting below 5mg/m^3. The particulate controls are therefore BAT. Limiting halogens in the waste will limit the emission of dioxins. The control measure for dioxins is BAT. No specific controls are

		mentioned for metals. However filtration is described as BAT in the sector guidance note. Filtration of the syn gas is carried out and this is therefore BAT.
Carbon dioxide		See discussion on global warming below
Abatement of point source emissions to surface water and sewer	The application states that there are no emissions to surface water or sewer. Surface water run off is described as being shown on site plan HUPPC.D05.	Emission of clean surface water is BAT.
Point source emissions to groundwater	There are no point source emissions to groundwater	
Fugitive emissions to air	The Operator states that there are no sources of fugitive emissions to air.	Fugitive emissions are likely to be low. The process is carried out in a building. The gasification is carried out in a sealed system to prevent emissions of syn gas. This will be dependant on the detailed design of the gasification system. A note will be placed in the handover document to the area team, to highlight the need to check for fugitive releases of syn gas on compliance inspections.
Fugitive emissions to surface water, sewer or groundwater	There is no subsurface pipework at the installation. A design quality assurance and inspection programme of impervious surfaces and containment kerbs will be in place for all areas. Reception and waste storage areas have an impervious surface, sealed construction joints, spill containment kerbs and bunding. The treatment area	The measures are BAT

	has an impervious surface, sealed construction joints and spill containment kerb. The quarantine area has an impervious surface, spill containment kerbs, sealed construction joints and bunding. Storage containers are used. Measures including inspection and replacement of damaged drums. Clear labelling and a procedure to deal will damaged drums will be used. All storage areas are located away from sensitive receptors and in lose proximity to the treatment area. All waste storage will be inside the installation building on a painted concrete bunded area. All waste will be delivered and stored in containers. Inspections of storage areas will be carried out daily. Bulk storage vessels are located on an impervious surface that is resistant to the material being stored with sealed construction joints, a bunded area. The bund will be 100% of the largest vessel or 25% of the total (whichever is the largest).	
Odour	The process is described as having little potential to cause annoyance from odour. Air in the building will be drawn into the burner intakes. This will create a slight negative pressure on the building and will negate any slight odours that may escape from the waste containers. The gasification system is sealed to prevent escape of gas. The syn gas is then combusted.	The controls should prevent emissions of odour, particularly as the process is entirely contained within a building and syn gas is combusted before it is emitted to air. However the operator will be required to confirm this during commissioning. Therefore an improvement condition has been set to provide this information within 3 months of the start of commissioning.
Noise	The thermal treatment equipment is quiet and does not have many moving parts. The process is contained within a building.	The controls should prevent emissions of noise, particularly as the process is entirely contained within a building. However the operator will be required to confirm this during commissioning. Therefore an improvement condition has been set to provide this information within 6 months of the start of commissioning.

Section	Operator proposal	Assessment against the WID
Article 4 • Heat generated will be recovered as far as is practical. • Residues will be minimised • The disposal of residues will be in accordance with national and community legislation	• The syn gas will be combusted. The combustion heat will be used to heat the gasification process. After the initial period gas engines will be used to generate electricity from excess syn gas. • The amount of residue produced is a small portion of ash. • Licensed facilities and contractors will be used	The techniques meet the requirements of WID. The applicant has looked at CHP however at this time the supply to the local area is not viable. This is because the facility, although being commercially sized, is being used to develop the process. As such material will be processed in batches specific to potential clients requirements. As such the applicant stated that they could not guarantee the delivery of CHP. As the facility develops they hope in the future to be able to supply CHP to neighbouring industries on the Capital Valley Eco Park and they will review the situation on an annual basis. The above statement from the operator has been incorporated as an operating technique in table S1.1 of the permit
Article 5 (delivery and reception of waste)	When waste is delivered, the Operator will check whether sample analysis has been carried out. If it has not, a sample will be obtained from the provider and compared to the written information. On arrival loads will be weighed and inspected. The supplied specification will include physical and chemical composition, hazard characteristics and handling precautions, compatibility issues and information specifying the original waste producer and process. Wastes will be sampled for checking against the supplied specification. Wastes will be rejected if they do not meet the pre-acceptance description.	The measures proposed by the Operator meet the requirements set out in Article 5 of the WID
Article 6 (operating conditions)	The residue from the process will have a total organic carbon content of <3%.	The Operating techniques meet the requirements of article 6.

	Syngas produced from the process will be combusted in gas burners. The temperature in the gas burners will be at least 1200^{o}C. The residence time will be 3 to 4 seconds. An automated system will prevent waste feed if the temperature in the combustion chambers drop below 1200^{o}C. This is in excess of the 1100oC required for WID compliance. The system burners are fed automatically with LPG. LPG is available to ensure that the burners work at the optimum temperature. When the gas engines are operating they will burn at a temperature of 1100^{o}C for just less than 2 seconds	Under article 6(4) we have granted a derogation for residence time in the engines. The WID emission limits will still be met. Further detail is given below this table.
Article 7 (Air emission limit values)	Very low emissions are quoted in the application. Nitrogen dioxide is particularly low at 80mg/m^{3} at 11% oxygen.	We determined that the emissions from low NOx burners at 3% oxygen could be in the range of 200mg/m^{3}, so at 11% oxygen this equates to 110mg/m^{3}. The Operators figures are therefore realistic.
Article 8 (Emissions to water)	Water scrubber used. This water will be sent for off site disposal.	This water is from cleaning of the syn gas. It is not from cleaning of exhaust gas and so the requirements of article 8 do not apply.
Article 9 (Residues)	The amount and composition of residue is dependant on the type of waste fed into the unit. Testing will be carried out on residues to confirm the nature.	The Operator had not made a proposal to reduce the amount of residue as much as possible. However the combination of pyrolysis and gasification with steam injection will limit the amount of residue produced. We also accept that the amount and composition of the residue will be dependant on the waste feed. The measures are BAT.
Article 10 (Control and monitoring)		Standard permit condition requires the operator to submit a report on calibration of the monitoring equipment.
Article 11 (Measurement	Continuous measurement of	Complies with WID. For

requirements)	NOx, CO, HCl, HF and SO2. Periodic monitoring of heavy metals, dioxins and furans and polycyclic aromatic hydrocarbons	periodic monitoring the frequency has been set in the permit in line with the WID requirements. .

Derogation under Article 6(4)

The Operator requested a derogation for residence time for combustion of the syn gas in the gas engines. The Operator stated that the temperature in the engines would be 1100^{o}C with a residence time of just less than 2 seconds. We agreed to grant the derogation for the following reasons:

- The requirements of the WID will be met. Emissions to air will meet and in some cased be much lower than the limits set in annex V of the WID;
- The WID emissions limit for dioxins and furans will be met;
- A residence time of 2 seconds is not achievable in gas engines;
- The use of gas engines to recover energy from the syn gas is BAT because generating energy from waste will reduce emissions from fossil fuel combustion elsewhere.

The Operator also carried out a BAT assessment of their technique against other techniques for treating the waste. This was originally carried out for oily sludge and soil wastes. However the operator later confirmed that the assessment was valid for the complete waste list submitted on 05/06/08.

Technique	**Disadvantages**	**Advantages**	**Relative cost**
Incineration (with heat recovery)	▪ Direct combustion of soil is not as energy efficient. Excess heat used to raise steam only ▪ Emissions are random and difficult to control ▪ A high level of abatement is required	▪ Proven technology with low maintenance	High capital and high treatment costs
Incineration (without heat recovery)	▪ Direct combustion of soil or liquid is not efficient ▪ No energy recovery ▪ High level of abatement is required	▪ Old technology with low maintenance	High capital and treatment costs
Soil/sludge washing	▪ No central facilities available. Establishment of facilities only viable with large land reclamation schemes ▪ System not suitable for fine grained oily sludges ▪ Extracted pollutant has to be disposed of	▪ Some of the soil's natural organic content will be retained	Low capital and treatment costs
Bioremediation	▪ Seasonal process that is not effective in autumn and winter ▪ The effectiveness is highly dependant on the chemical composition of the waste	▪ Low cost	Low cost

	and the presence of suitable microbes ▪ The effectiveness is dependant on the soil matrix ▪ It cannot be used with very high organic content wastes ▪ Time constraint		
Landfill	▪ Potential for Long term environmental problems ▪ Not a long term solution due to lack of suitable sites ▪ Impact from transporting waste over large distances due to shortage of suitable sites	▪ Low technology option ▪ Availability	Medium cost to waste generator
Low temperature thermal desorption	▪ Extracted pollutants require disposal ▪ Treated soil or sludge has residual contamination ▪ No suitable facilities available	▪ Suitable only for volatile organic compounds	Low capital cost and medium cost of disposal
Gasification	▪ Higher level of maintenance than incineration ▪ Scientific control required over the process	▪ Suitable for a wide range of organic materials ▪ All organic pollutants are removed leaving a clean inert residue ▪ Gas can be cleaned both as a syn gas and as combustion product ▪ Gas can be used to produce power ▪ Combustion parameters can be closely controlled to prevent formation of pollutants	Medium capital cost and medium cost of disposal

BAT for energy efficiency and global Warming Potential.

The applicant has proposed a phased approach for the installation.

Phase 1

During this phase small amounts of wastes will be used in the system. Gas engines will not be installed at this point. Produced syn gas will be combusted in a series of 8 low NOx burners. The combustion gases will be used to heat the gasification unit. It is intended to run the system at a waste throughput of between 150kg/hr to 200kg/hr. At this throughput the system will be self sufficient with the syn gas being used to heat the gasification unit and minimal excess syn gas produced. During this phase the throughput will be kept low and excess syn gas will be avoided. The applicant has not proposed to install gas engines because during the first phase. The purpose of the first phase is to determine the optimum operating systems that yields the highest energy recovery value. In subsequent phases, engines will be installed to generate electricity from excess syn gas. To run efficiently the engines will require a consistent gas quality and energy density in order for the engine to be finely tuned to yield maximum energy recovery. The engines can be detuned to operate on a wide range of gas quality but this drops their efficiency. The

more consistent the syn gas, the finer the engine can be tuned. It is not feasible to retune the engines for every type of waste so during phase 1 the operational parameters that give the best quality of syn gas for a range of wastes will be determined. This means that during phase 1 some amount of energy recovery is being given up in the short term so that a system being run at maximum energy recovery in the long term.

This first phase has been limited by permit conditions to 8 months from permit issue and to an operation of 8 hours in any 24 hour period. This ensure that phase 1 is a development period and ensure that the Operator moves onto the next phase where more energy recovery will be maximised.

Phases 2, 3 and 4

The Operator plans to increase the throughput of the wastes. Biomass and oily sludges will be gasified. The CV of the wastes will be ~21MJ/Kg. The throughput in period 2 will be 1 tonne per hour. A 1MW gas engine will be installed to generate 1MW of electricity. In period 3 the throughput will be increased to 2 tonnes per hour. A second 1MW gas engine will be installed to generate 2MW of electricity in total. In period 4 the throughput will be increased to 3 tonnes per hour. A third 1MW gas engine will be installed to generate 3MW of electricity in total. Reports on the installation performance will be required at the end of each phase.

The Operator provided an assessment of energy efficiency and global warming potential for operation during phase 4.
The Operator compared gasification, incineration and landfill. They concluded that the amount of carbon dioxide produced from each process would be approximately the same and be related to the amount of carbon in the waste. The Operator provided figures for biomass and hydrocarbon wastes. They stated that gasification and incineration would produce 2.7 tonnes of CO_2 per tonne of hydrocarbon waste and 1.57 tonnes of CO_2 per tonne of waste. The Operator concluded that landfill would have a higher global warming potential due to the emission of methane which has a global warning potential 25 times greater than carbon dioxide. The Operator then looked at the indirect impact (indirect impact means that fossil fuels will not need to be burnt because energy is being recovered from the waste. Therefore the more energy that is recovered, the greater the indirect saving). Their justification was that each tonne of waste contains 3.3MW of energy. During gasification the gross energy in the gas will be the same as the solid from which it is derived. The energy used to form the gas is subtracted to give a net energy of 3MW. If the gas is then used in a gas engine or turbine with an efficiency of 45%, each tonne of biomass would produce 1.35MW of electricity. Incinerators have an efficiency of 60% and therefore each tonne of biomass would be converted into 1.9MW of heat in the form of steam. If the steam is used in a turbine with 45% efficiency this would give 0.85MW of electricity.

The Environment Agency carried out further calculations of energy efficiency. The throughput during period 4 will be 3 tonnes (3000kg) per hour using a waste with a CV of 21MJ/Kg. There amount of energy available is therefore 3000 x 21 = 63000 MJ/hour. This is equivalent to 17.5MJ/s or 17.5MW. The Operator proposes to generate 3MW of electricity. This is a similar efficiency to a municipal waste incinerator (MWI) that has an efficiency of ~18-20%. Other gasification plant followed by combustion of the syn gas in an engine have claimed to achieve an efficiency of about 22% when treating biomass with a CV of about 20MJ/Kg. Although the figures provide by the applicant are a little lower then those for a MWI or another gasification process they are not significantly lower. It should also be noted that the figures are estimates because the installation is not yet operating and then the figure of 22% was also an estimate for an installation that is not yet operating. The Agency calculated the indirect CO_2 saving. For the calculation natural gas was assumed to be the fuel source. The H1 methodology was used to calculate the annual mass of CO_2. The full scale plant (period 4) is planned to generate electricity at a rate of 3MW. With continuous operation this would mean 26280MWh generated in one year. If natural gas was used this would generate 4993 tonnes of CO_2. The installation would therefore have an indirect saving of 4993 tonnes of CO_2. An improved efficiency of 20% would mean an indirect saving of 5874 tonnes. This is a difference of 880 tonnes of CO_2 and is deemed to be insignificant.

The applicant has looked at CHP however at this time the supply to the local area is not viable. This is because the facility, although being commercially sized, is being used to develop the process. As such material will be processed in batches specific to potential clients requirements. As such the applicant stated that they could not guarantee the delivery of CHP. As the facility develops they hope in the future to be able to supply CHP to neighbouring industries on the Capital Valley Eco Park and they will review the situation on an annual basis.

The above statement from the operator has been incorporated as an operating technique in table S1.1 of the permit

The Operator has proposed the use of selective catalytic reduction (SCR). This will minimise the emissions of oxides of nitrogen. The alternative of selective non catalytic reduction (SNCR) produces more nitrous oxide than SCR. Nitrous oxide is a potent greenhouse gas so SCR is considered to be BAT in terms of global warming for this installation. The small amount of N2O that will be produced by the SCR system is offset by the reduction in the emissions of oxides of nitrogen. The applicant estimates a 95% reduction from 750mg/m3 to about 41mg/m3. Without the SCR system the WID limits would not be met. With the SCR system an emission much lower than the WID limit will be achieved.

We have reviewed emissions

Substance	Reference period	Emission Conc.(mg/	WID emission	Comments

		m^3)	limit (mg/m^3)	
Total dust	Daily average	5	10	
	Half hourly average	5	30	
Total organic carbon	Daily average	5	10	
	Half hourly average	5	20	
Hydrogen chloride	Daily average	No Cl in waste	10	
	Half hourly average		60	
Hydrogen fluoride	Daily average	No F in waste	1	
	Half hourly average		4	
Sulphur dioxide	Daily average	15	50	
	Half hourly average	14	200	
Nitrogen monoxide and nitrogen dioxide expressed as NO_2	Daily average	80	200	
	Half hourly average	80	400	
Total of cadmium and thallium expressed as Cd and Tl	30 mins to 8 hrs	0.05	0.05	
Mercury and its compounds expressed as Hg	30 mins to 8 hrs	0.05	0.05	
Total of Sb, As, Pb, Cr, Co, Cu, Mn, Ni and V expressed as the elements	30 mins to 8 hrs	0.5	0.5	
Dioxins and furans	30 mins to 8 hrs	$0.1ng/m^3$	$0.1ng/m^3$	
Carbon monoxide	Daily average	$5mg/m^3$	50	
	95% of 10 minute averages or		150	
	100% of half hourly averaged in 24 hrs		100	

We have also reviewed the operator's assessment of the environmental impact of emissions from the installation. The assessment shows that, applying the conservative criteria in H1 emissions of carbon monoxide and environmentally insignificant. Emissions of nitrogen dioxide, sulphur dioxide and particulates are not insignificant. The Operator carried out dispersion modelling for these substances and for metals and dioxins and furans. The modelling results are summarised as follows. The Operator had not considered all the relevant benchmarks, so we have added some rows for comparison against EU target limits and where applicable The results given below are the maximum in the modelled grid. The application also contains results at sensitive receptors. The results at receptors are lower then those given below:

Long term affects (Annual means)

Substance	Emission concentration (mg/m^3)	Environmental benchmark		PC ($\mu g/m^3$)	% of benchmark	Background ($\mu g/m^3$)	PEC ($\mu g/m^3$)	% of benchmark
		Type	Level ($\mu g/m^3$)					
Oxides of nitrogen as NO_2	80	EU limit from 2010 and AQS from 2005	40	9.6	24	14	23.6	59
Sulphur	15	EAL	50	2.48	4.96	3	5.48	10.96

dioxide								
Particulate (PM10)	5	EU limit 2005 and AQS 2004	40	0.6	1.5	19	19.6	
		AQS 2010	20	0.6	3.0	19*	19.6	98
Total organic carbon VOC	5	EU limit 2010	5	0.002	0.04			
Cadmium	0.05	EAL	0.005	0.006	120	0.0002	0.0062	124
		EU target 2012	0.005	0.006	120	0.0002	0.0062	124
Thallium	0.05	EAL	1	0.006	0.6	-	-	-
Mercury	0.05	EAL	0.25	0.006	2.4	0.0005	0.0065	2.6
Arsenic	0.5	EAL	0.2	0.06	30.2	0.0009	0.061	30.6
		EU target 2012	0.006	0.06	1000	0.0009	0.061	1016
Cobalt	0.5	EAL	0.2	0.06	30.1	0.0035	0.064	31.9
Chromium	0.5	EAL	5	0.06	1.2	0.0035	0.064	1.3
Copper	0.5	EAL	10	0.06	0.6	0.0066		
Iron	0.5	EAL	10	0.06	0.6			
Manganese	0.5	EAL	1	0.06	6	0.0047	0.065	6.5
Nickel	0.5	EU target	0.002	0.06	3000	0.0261	0.086	8.6
		EAL	1	0.06	0.02			
Lead	0.5	EU limit 2005	0.5	0.06	3	0.0132	0.07	14.6
		AQS end 2008	0.25	0.06	24	0.0132	0.0732	29
Selenium	0.5	EAL	1	0.06	6	-	-	-
Vanadium	0.5	EAL	5	0.06	1.7	0.002	0.062	1.2
Dioxins and furans	0.01	-	-	$1.21x10^{-7}$	-	$2.6x10^{-8}$	$1.476x10^{-7}$	

*** PM_{10} - from background maps the background is predicted to be 14.5µg/m^3 by 2010. The PEC would therefore be 76.5% of the EU limit in 2010.**

Short term (reference period stated in table)

Substance	Emission concentration (mg/m^3)	Environmental benchmark			PC (µg/m^3)	% of benchmark	Background (µg/m^3)	PEC (µg/m^3)	% of benchmark
		Type	period	Level (µg/m^3)					
Oxides of nitrogen as NO_2	80	EU limit 2010 and AQS end 2009	1 hour mean	200	50.3	25.2	28	78.3	39.2
Sulphur dioxide	15	AQS 2005	15 minute mean	266	9.9	3.7	6	15.9	6
		EU limit 2005 and AQS 2004	1 hour mean	350	9.4	2.7	6	15.4	4.4
		EU limit 2005 and AQS	24 hour mean	125	6.2	5	6	12.2	9.8

		2004							
Particulate (PM10)	5	EU limit 2005 and AQS 2004	24 hour mean	50	1.6	3.4	38	39.7	79
Carbon monoxide	5	EU limit 2005	8 hour mean	10mg/m^3	0.001	0.0			
Cadmium	0.05	EAL	1 hour mean	1.5	0.017	1.13	0.0003	0.017	1.13
Thallium	0.05	EAL	1 hour mean	30	0.017	0.06			
Mercury	0.05	EAL	1 hour mean	3	0.017	0.57	0.0023	0.019	0.63
Arsenic	0.5	EAL	1 hour mean	15	0.168	1.12	0.0027	0.171	1.14
Cobalt	0.5	EAL	1 hour mean	6	0.168	2.8			
Chromium	0.5	EAL	1 hour mean	150	0.168	0.112	0.0069	0.1749	0.117
Copper	0.5	EAL	1 hour mean	200	0.168	0.084	0.0255	0.19	0.10
Iron	0.5	EAL	1 hour mean	200	0.168	0.084			
Manganese	0.5	EAL	1 hour mean	1500	0.168	0.01	0.0094	0.1774	0.01
Nickel	0.5	EAL	1 hour mean	300	0.168	0.06	0.0521	0.2201	0.07
Lead	0.5	EAL	1 hour mean	260	0.168	0.06	0.0264	0.1944	0.07
Selenium	0.5	EAL	1 hour mean	30	0.168	0.56			
Vanadium	0.5	EAL	1 hour mean	60	0.168	0.28	0.0038	0.1718	0.286

The dispersion modelling was assessed by the Environment Agency's Air Quality and Assessment Unit (AQMAU). A report was produced by AQMAU. A copy of this report is attached in Annex 3 of this document.

The modelling showed that there would not be a breech of any air quality objective. The above table shows that the 2012 EU target values for arsenic, cadmium and zinc could be breeched. However the modelling was checked by the Environment Agency's air quality modelling and assessment unit (AQAMU). AQMAU checks confirmed that based the WID emission limit values and the stack emission parameters supplied by the applicant, emission rates should be lower than those modelled by the Operator, resulting in exceedances of the Target Values not being likely. Also the WID emission limits are for a group of metals. The Operator has assumed that each metal would be emitted at the limit, whereas in reality the emission of an individual metal would be less than the limit value. The modelling showed that the particulate 2010 annual EU limit would be close to being breeched. However the contribution from this installation is a small contributor with the background level being 95% of the 2010 EU limit. Also from the 'air quality archive background maps' the background is predicted to be 14.5µg/m^3 by 2010. The PEC would therefore be 76.5% of the EU limit in 2010.

The Operator did not model emissions of Hydrogen chloride (HCl) or hydrogen fluoride (HF) and stated that chlorinated wastes or fluorinated wastes would not be accepted at the installation. As a matter of caution, the

Environment Agency extrapolated the Operator's modelling to show what the ground level concentrations of hydrogen chloride and hydrogen fluoride would be if emitted at the WID limits.

Substance	Long Term Process contribution (ug/m^3)	% of long term EAL	Short term process contribution (ug/m^3)	% short term EAL
Hydrogen chloride	1.7	8.5%	29.7	3.7
Hydrogen fluoride	0.17	No EAL	0.66	0.27

- The applicant did not carry out modelling at the two Special Areas of Conservation within 10km of the installation:
- Usk Bat Sites / Safleodd Ystlumod Wysg , Special Area of Conservation, 8.6km;
- Aberbargoed Grasslands, Special Area of Conservation, 8.7km.

The Agency used the AQMAU screening tool to estimate the ground level concentrations of pollutants at these sites. This showed that the concentration of substances was insignificant at <1% of the EQS. NO2 was 0.02% of the EQS.

Dioxin health risk assessment

The Operator carried out a dioxin health risk assessment based on Risk assessment of dioxin releases from municipal waste incineration processes', HMIP 1996. The assessment showed that the maximum ground level concentration of dioxins from the installation would not lead to people exceeding the tolerable daily intake for dioxins and furans.

The following substances have been identified as being emitted in significant quantities and ELVs or equivalent parameters or technical measures based on BAT have been set for those substances under permit conditions.

As a co-incinerator the WID requires that daily average limits are set. Half hourly limits have been set because the applicant had committed to meeting or bettering the half hourly limits and short term limits are required to control the short term impact from the installation. We decided that BAT for this installation was to set daily and half hourly average limits.

HCl and HF

An emission of hydrogen fluoride at the WID emission limits will be environmentally insignificant so the emission limit has been set at the WID limit.

For hydrogen chloride the impact would be insignificant (process contribution <1% of the EAL) if it was emitted at a long term average of $1mg/m^3$ and short term of $16mg/m^3$. Therefore as the operator had committed to very low emissions due to the absence of chlorine or fluorine in the wastes, $1mg/m^3$

and 16 mg/m^3 reflect the use of BAT for this installation and were set as emission limits.

Oxides of nitrogen

The impact assessment showed that the there would not be a breech of an air quality objective based on an emission of 80mg/m^3. The assessment by AQMAU also showed that an objective would not be breeched if it was emitted at the WID limit. BAT for the installation is capable of achieving lower emissions that the WID limit so lower limit were set. The Operator was given a small amount of head room over their proposed emission of 80mg/m^3. A daily average of 90mg/m^3 has been set with a half hourly average of 100mg/m^3. The short term limit is slightly higher to allow for small short term spikes. When the gas engines are operating there is the potential for higher emissions of oxides of nitrogen. However the emission of oxides of nitrogen will be abated using SCR. The Operator expects that this may result in lower emissions than when just running the low NOx burners maybe as low at 41mg/m^3. However the emission limit has been set at 90mg/m^3 to include the burners and /or the engines. Again there may be scope to lower the limit in the future if abated emissions are as low as 412mg/m^3.

Sulphur dioxide

The impact assessment showed that the there would not be a breech of an air quality objective based on an emission of 15mg/m^3. The assessment by AQMAU also showed that an objective would not be breeched if it was emitted at the WID limit. BAT for the installation is capable of achieving lower emissions that the WID limit so lower limit were set. The Operator was given a small amount of head room over their proposed emission of 15mg/m^3. A daily average of 20mg/m^3 was set with a half hourly average of 30mg/m^3. The short term limit is slightly higher to allow for small short term spikes.

Carbon monoxide

The impact assessment showed that the there would not be a breech of an air quality objective based on an emission of 5mg/m^3. The assessment by AQMAU also showed that an objective would not be breeched if it was emitted at the WID limit. BAT for the installation is capable of achieving lower emissions that the WID limit so lower limit were set. The Operator was given some head room over their proposed emission of 5mg/m^3. A daily average of 10mg/m^3 was set with a half hourly average of 15mg/m^3. The short term limit is slightly higher to allow for small short term spikes.

Volatile organic compounds

BAT for the installation is capable of achieving lower emissions that the WID limit so lower limit were set. The Operator was given some head room over their proposed emission of 5mg/m^3. A daily average of 7mg/m^3 was set with a half hourly average of 10mg/m^3. The short term limit is slightly higher to allow for small short term spikes.

Total dust

The impact assessment showed that the there would not be a breech of an air quality objective based on an emission of 5mg/m^3. The assessment by AQMAU also showed that an objective would not be breeched if it was emitted at the WID limit. BAT for the installation is capable of achieving lower emissions that the WID limit so lower limit were set. The Operator was given a small amount of head room over their proposed emission of 5mg/m^3. A daily average of 7mg/m^3 was set with a half hourly average of 10mg/m^3. The short term limit is slightly higher to allow for small short term spikes.

Metals

Emission limits were set at the WID limits. The modelling had shown that EALs would not be breeched at these levels except for the EU targets for cadmium, arsenic and nickel. The AQMAU audit of the modelling showed that there would not be a breech.

Dioxins and furans

The operator will limit the amount of chlorinated waste used at the facility. However there is not enough information available to be able to set a lower emission limit than the WID limit. The WID limit was used as the ELV. The dioxin health risk assessment showed that an emission at this level would not lead to people being exposed to a level that would result in an exceedance of the tolerable daily intake from dioxins and furans. Once the installation is operating there may be scope to lower the ELV. A note will be placed in the handover note to this affect.

Carbon dioxide

See discussion under heading BAT for energy efficiency and global Warming Potential.

As the installation is not subject to the Greenhouse Gas Emissions Trading Scheme Regulations 2003, consideration has been given to the setting of equivalent parameters or technical measures for CO_2. As the primary purpose of the plant is the disposal of waste by gasification, combustion of the syn gas and the recovery of energy; the overall quantity of CO_2 emitted as a result of the operation of the installation (both directly and indirectly) will be determined by the capacity of the plant and the efficiency of the energy recovery process. Thus provided energy is recovered efficiently, there are no additional equivalent technical measures that can be imposed that do not run counter to the purpose of the plant.

Other Emissions

We accept the operator's proposals for BAT relating to the environmentally insignificant emissions (carbon monoxide) but have reviewed the proposals relating to emissions identified as priorities for control.

Emissions to water

Article 8 requires waste water from the cleaning of exhaust gases to be subject to emission limits set out in annex IV. In this installation, the syn gas will be passed through a water scrubber. The syn gas is not exhaust gas and therefore the requirements of article 8 do not apply. The disposal of this waste stream will be controlled by permit condition 1.5.1. Although article 8 does not apply we believe that monitoring of this waste stream is required. This is to gather information on the composition of the waste. The applicant had confirmed that the levels of the substances listed in annex IV of the WID would be less then the limits given in that section. Improvement condition 5 was set to confirm this over a range of operating scenarios. Monitoring was also set in table S4.5 to carry out monitoring before changing the disposal route.

We consider that the BAT for the installation are capable of achieving better environmental performance than that the indicative emission levels given in the TGN and in WID. We consider that the emission limits included in the permit reflect the BAT for the installation.

It is considered that the ELVs/ equivalent parameters or technical measures described above will ensure that significant pollution of the environment is prevented and a high level of protection for the environment secured.

C8 Fugitive emissions of substances

Permit condition 3.3

Based upon the information we are satisfied that the appropriate measures are in place to prevent fugitive emissions.

C9 Conditions relating to Odour

Permit condition 3.4

Based upon the information in the application we are satisfied that the appropriate measures are in place to prevent annoyance from odour.

The process and storage of wastes will be carried out inside the process building. The building is described as being under a slight negative pressure which should ensure that odours do not escape. The Operator will be required to submit a report to the Agency on the commissioning of the installation. Confirmation of the impact from odour will be included as part of this report. This requirement has been set as improvement condition 1.

C10 Noise and vibration

Permit condition 3.5

Based upon the information in the application we are satisfied that the appropriate measures are in place to prevent annoyance from noise and vibration.

C11 Monitoring

Permit condition 3.6

We have decided that monitoring should be carried out for the parameters listed in tables S4.1 in schedule 4 using the methods and to the frequencies specified in those tables. These monitoring requirements have been imposed in order to establish compliance with emission limit values.

Based on the information in the application we are satisfied that the operator's techniques, personnel and equipment have either MCERTS certification or MCERTS accreditation as appropriate.

Process monitoring has been set in table S4.4 and residue monitoring in table S5.5.

C13 Reporting

We have specified reporting as specified in Schedule 5 for the following reasons:

To allow the Environment Agency to monitor the emissions and process monitoring data.

C14 Miscellaneous

Part D : Other legal requirements

Habitats issues.

There are no Sites of Special Scientific Interest within 2km of the installation.

The following habitat sites are within 10km of the installation:

- Usk Bat Sites / Safleodd Ystlumod Wysg , Special Area of Conservation, 8.6km;
- Aberbargoed Grasslands, Special Area of Conservation, 8.7km.

The installation will not have an adverse affect on these European sites. An HR01 was sent to Natural England.

APPLICATION OF THE WASTE INCINERATION DIRECTIVE

1 Introduction

1.1 The WID has been transposed into domestic law by (inter alia) the Waste Incineration (England and Wales) Regulations 2002 (SI 2002 No. 2980) (the "WI Regulations"). These WI Regulations use the PPC regime as the vehicle for delivering the technical requirements of the WID. The Secretary of State has also issued a Direction to regulators under the PPC Regulations requiring the Agency to include WID requirements in PPC permits for "*waste incineration installations*".

1.2 This installation is a co-incineration plant as defined by the WID and therefore must comply with the requirements.

Under the transitional provisions set out in the WI Regulations the operations on the site qualified as a "new" installation for WID purposes.

1.3 Paragraph 1B of Part 1 of Schedule 4 to the PPC Regulations requires a PPC application relating to "*waste incineration installation*" to contain a description of the measures which are envisaged to guarantee in respect of that installation that –

(a) the plant is designed, equipped and will be operated in such a manner that the relevant requirements of the WID are met, taking into account the categories of waste to be incinerated;

(b) the heat generated during the incineration process is recovered as far as practicable (for example through combined heat and power, the generating of process steam or district heating);

(c) the residues will be minimised in their amount and harmfulness and recycled where appropriate;

(d) the disposal of the residues which cannot be prevented, reduced or recycled will be carried out in conformity with national and Community legislation; and

(e) the proposed measurement techniques for emissions into the air comply with Annex III of the WID and, as regards water, comply with paragraphs 1 and 2 of that Annex.

1.4 This Appendix considers each of these requirements in turn and shows how they have been addressed in the Permit. The Agency is satisfied that, when waste is burnt in the Installation, the requirements of the PPC Regulations and the WID will be complied with.

2 Requirements of the WID

2.1 Article 1 - Objectives

2.1.1 Article 1 sets out the aims of the WID. These are:

> "*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 of waste*".

2.1.2 The Agency considers that the conditions in the Permit, discussed in the main body of this document, achieve these aims.

2.2 Article 2 - Scope

2.2.1 It is clear that the Installation, when burning the wastes described in the application, is subject to the WID.

2.3 Article 4 - Application and permit

2.3.1 Article 4 requires that a waste incineration installation must obtain a permit, and sets out the details which must be included in an application, and conditions for granting a permit, which have been carried over directly into Schedule 4 of the PPC Regulations (see above). The Agency is satisfied that these requirements are complied with and has therefore issued the Permit to the Applicant.

2.3.2 The Article 4 requirements are:

(a) the application must show that the proposed measurement techniques for emissions into the air comply with Annex III and, as regards water, comply with Annex III paragraphs 1 and 2. This is now a specific requirement of the PPC Regulations (see paragraph 1.4 above). Detailed consideration of this point follows at paragraphs 2.9.1 to 2.9.5.

(b) the Permit must comply with any applicable requirement laid down in the Urban Waste Water Treatment Directive (the "UWWTD"), the IPPC Directive, the Air Quality Framework Directive (the "AQFD"), the Dangerous Substances Directive (the "DSD") and the Landfill Directive (the "LFD"). Of these, the IPPC Directive's requirements are delivered via PPC, as are the applicable requirements of the UWWTD, the AQFD and the DSD. The LFD is not relevant to the Installation.

(c) the Permit must list explicitly the categories of waste that may be treated, using the categories set out in the European Waste Catalogue ("EWC") and contain information on the quantity of waste where appropriate. Condition 2.3.3 and Schedule 3 of the Permit list the types of wastes that are permitted to be burnt at the Installation and provide the EWC numbers.

(d) the Permit shall include the total waste incinerating capacity of the plant. Condition 2.3.3 and schedule 3 of the Permit contain this information.

(e) the Permit shall specify the sampling and measurement procedures used to satisfy the obligations imposed for periodic measurements of each air and water pollutant. Condition 3.1.1 and 2.10.4 and schedule 4 of the Permit fulfil this requirement, and specific monitoring conditions are discussed below at section 2.9.

2.3.3 Article 4(7) also requires the competent authority to carry out periodic reviews (and updates as appropriate) of permits. Periodic reviews are already built into the PPC regime.

2.3.4 Finally, Article 4(9) requires the competent authority to take enforcement action against breaches of permit conditions. The WID requirements are Permit conditions, and the Agency will take any appropriate enforcement action using its powers under the PPC Regulations and in line with its published Enforcement and Prosecution Policy.

2.4 Article 5 - Delivery and reception of waste

2.4.1 Article 5 requires all necessary precautions to be taken concerning delivery and reception of wastes, in order to prevent or minimise pollution. The PPC regulations require installations to be operated in order to prevent or minimise pollution. Section 2.1 of the Application defines how this will be carried out at the Installation and condition 2.3.1 requires that appropriate measures are taken. Incoming wastes are required to be monitored by conditions 2.3.3 and 2.3.4, and other conditions throughout the Permit ensure that the wastes are stored in order to prevent pollution of air, groundwater, soil and surface water as well as odours and noise (condition 3.3.1 sets out the waste storage requirements in the Permit). Article 5(2) requires that the operator determine the mass of each category of wastes, if possible according to the EWC, prior to accepting the waste. The appropriate section of the application is incorporated into the permit (condition 2.3.1) to require that wastes are categorised on arrival at the plant.

For installations burning hazardous waste where the waste is only generated on site. For hazardous wastes, Article 5(3) requires the Applicant to have available information about the waste for the purpose of verifying compliance with the permit, about its suitability for the process, and about the hazardous characteristics of the waste, the substances with which it cannot be mixed and precautions for handling the waste. This requirement may be exempted by the Regulator under Article 5(5) where an Operator is burning waste generated by himself at the place of generation of the waste provided that the requirements of the WID are met. The Agency is satisfied that the requirements of the WID are met by compliance with the conditions of this Permit and that the Operator has sufficient information about the wastes to be burnt to operate in compliance with the conditions of the Permit, and therefore is not setting any specific conditions to require compliance with Article 5(3).

2.5 Article 6 - Operating Conditions

2.5.1 Article 6(1) sets out requirements for incineration plants such as refuse derived fuel incinerators. It states that such plants should be:

a) Operated in order to achieve a level of incineration such that the slag and bottom ashes Total Organic Carbon (TOC) is less than 3% or their loss on ignition of the dry weight of the material is less than 5%.

b) Designed, equipped, built and operated in such a way that the gas resulting from the incineration of waste is raised, after the last injection of combustion air, in a controlled and homogeneous fashion and even under the most unfavourable conditions, to a temperature of 850 ^{o}C for two seconds, as measured near the inner wall or at another representative point of the combustion chamber. If hazardous wastes with a content of more than 1% of halogenated organic substances, expressed as chlorine, are incinerated, the required temperature is 1100 ^{o}C.

2.5.2 a) Condition 3.1.5 and Table S4.5 ensure that the Installation is operated such that the loss on ignition of the dry weight of the material, of bottom ash, is less than 5%.
b) (i)Condition 2.1.7 limits the charging of waste into the incinerator to periods of normal operation, when operating temperatures will be in excess of 850 °C after the last injection of combustion air except during start-up where the waste feed may

commence once a bed temperature of 85 (this is equivalent to a of ~800°C)OR for existing incinerator plants that will not meet the WID required temperature.
b) (i)Condition 2.3.8 limits charging of waste into the incinerator to periods of normal operation, when operating temperatures will be in excess of 850°C. This is an acceptable temperature under the Directive.
b) (ii) Section 2.1 of the Application provides a statement confirming compliance with the minimum 2-second residence time at 850 °C of the gases from the combustion of waste after the last injection of combustion air. b) (ii) Section 2.1 of the Application provides a statement confirming the minimum 2-second residence time at 1200oC

2.5.3 Article 6(3) requires incineration plant to operate a system to prevent using waste as a feedstock during start-up and shut-down, whenever the temperature fails to meet the required levels, or when the CEMs show exceedences due to disturbances or failure of abatement. This requirement is addressed by conditions 2.3.8. and 2.3.12.

2.5.4 Article 6(4) provides that different operating conditions (residence time and temperature) may be authorised, provided that the conditions of the Directive are met. Derogation from the operating requirements is allowed only when, the mass and the organic content of the slag and bottom ashes from the incinerator will be no more than that, which would have been expected, if the operating conditions had been the same as those without the derogation. A derogation has been granted for the gas engines. Section C7 of this document provides more information.

2.5.5 Article 6(5) requires incineration plant to be designed, equipped, built and operated to ensure that emissions to air do not give rise to significant ground level pollution. Emissions to air and their ground-level impact are discussed in the body of this document, and the Agency is satisfied that the WID requirement is fulfilled.

2.5.6 Article 6(6) requires that any heat generated from the process shall be recovered as far as is practicable. As described in section C7 of this document the heat generated by incineration of waste is to be used directly in the process to heat the gasifier and to produce electricity through the use of gas engines. The Agency considers that Article 6(6) is satisfied.

2.5.7 Article 6(8) requires management of the Installation to be in the hands of a natural person who is competent to manage it. Condition 1.1.1 of the Permit fulfils this requirement.

2.6 Article 7 - Air emission limit values

2.6.1 Article 7(2) requires co-incineration plants to be designed, equipped, built and operated to comply with the ELVs in Annex II. The Applicant has proposed to operate the incinerator to comply with the Annex V requirements. Conditions 2.3.8 and 2.3.12 require the Applicant to comply with ELVs as laid out in Annex V.

2.6.1 Article 7(3) requires the results of measurements made to verify compliance with the ELVs to be standardised in accordance with Article 11. Schedule 7 details this standardisation requirement (Article 11 compliance is considered further below).

2.6.2 Article 7(5) gives Member States the option of setting ELVs for PAHs. It is the UK's position that there is insufficient monitoring data on the release of PAHs from "*waste incineration plants*", on which to base such limits or even to decide such a limit is required. Nevertheless, in the Pollution Prevention and Control (Waste Incineration Directive) (England and Wales) Direction 2002, the Secretary of State directed regulators to monitor PAHs and to report the results with the same frequency as for dioxins and dioxin-like PCBs. The Government's guidance on the WID specifies a priority list of PAHs for monitoring. Consequently, periodic monitoring of PAHs (as specified in the guidance) has been required, at the same frequency as for dioxins and dioxin-like PCBs, in schedule 4 of the Permit.

2.7 Article 8 - Water discharges from the cleaning of exhaust gases

2.7.1 Article 8(1) to (6) addresses conditions for water discharges from the cleaning of exhaust gases. There will be no discharges of such water from the Installation, and therefore the provisions of the Article are not relevant.

2.7.2 Article 8(7) requires that incineration plant sites shall be designed to prevent the unauthorised and accidental release of any polluting substances into soil, surface water or groundwater. Article 8(7) also requires that storage capacity be provided for contaminated rainwater run-off from the site or for contaminated water from spillage or fire-fighting operations. The storage capacity shall be adequate to ensure that such waters can be tested and treated before discharge where necessary.

Surface water run-off is contained. The Government's guidance on the WID specifies that for existing plants to demonstrate compliance with the storage requirements for contaminated water of Article 8(7) the following aspects of the installation should be assessed:

a) *Use of BAT to avoid rainwater contamination*
b) *Average peak rainfall rate*
c) *Existing drainage capabilities and concerns*
d) *Adequacy of fire detection and prevention measures*
e) *Use of BAT for spill prevention and containment*
f) *Cost of additional provision*
g) *Sensitivity of the receiving medium*
h) *Availability of additional off-site holding capacity*
i) *Ability to test and treat before discharge*
j)

Sections 2.3 *management*, 2.8 *accidents* 2.10 *monitoring* and the H1 assessment of the original PPC Application and further information address these areas.

2.8 Article 9 – Residues

2.8.1 Article 9 requires residues from incineration plants to be minimised in their amount and harmfulness, and residues to be recycled where appropriate. The operator confirmed that they would comply with this.

2.8.2 Article 9 also requires dry residues and dust to be transported to prevent dispersal into the environment. Condition 1.5.1 ensures that this requirement is complied with.

2.8.3 Article 9 requires residues from incineration plants to be tested (as appropriate) for their physical and chemical characteristics and their polluting potential concerning their soluble fraction. Table S4.5 requires the Applicant to analyse the bottom ash and material from filtration of syn gas, The Agency therefore considers that Article 9 is satisfied.

2.9 Article 10 - Control and monitoring

2.9.1 Articles 10 and 11 and Annex III of WID define the specific monitoring provisions required to be given effect in conditions of the Permit.

2.9.2 Article 10(1) and (2) require simply that measurement equipment and techniques shall be installed and used to monitor the incineration process, and that the measurement requirements shall be laid down in permits. These requirements are covered in schedule 4, and the conditions in Section 3.6 of the Permit, which the Agency considers fulfil the WID requirements.

2.9.3 Article 10(3) requires CEM for emissions to air and water to be subjected to regular control, testing and calibration. These requirements are addressed in schedule 4 requiring monitoring to be carried out in accordance with CEN, ISO, BS national, international methods or Agency guidance. Agency Monitoring Guidance Note M2 defines what is required in an annual surveillance test.

2.9.4 Article 10(4) requires sampling points to be specified in permits. Schedule 4 address this issue.

2.9.5 Article 10(5) requires periodic measurements to air and water to comply with Annex III, points 1 and 2. The requirement in point 1, for measurements to be carried out representatively. Point 2 requires that measurement methods and calibration of CEMs must be to CEN standards, or ISO, international or national standards if CEN standards are not available. These requirements are addressed by condition 3.6.3, requiring the use of certified equipment and accredited personnel to be employed for all emissions monitoring. The Agency considers that the Permit therefore delivers all the relevant requirements of the WID in this respect.

2.10 Article 11 – Measurement requirements

2.10.1 Article 11(2) sets out the air pollutant measurements that are required to be carried out, in accordance with Annex III. Continuous emissions monitoring of NOx, CO, total dust, TOC, HCl and SO_2 and periodic measurement of HF, heavy metals, dioxins and furans measurement requirements are delivered by Condition 3.6.1 and schedule 4. In addition, Article 11(2) requires the process parameters of: temperature at a representative point of the combustion chamber, concentration of O_2, pressure, temperature and water content of the exhaust gases to be monitored. Condition 3.6.1 and schedule 4 deliver these monitoring requirements.

2.10.2 Article 11(6) provides the option of periodic measurement for HCl, HF and SO_2 instead of CEMs. The Operator has not taken this option.

2.10.3 Article 11(7) allows the competent authority to permit a reduction in the monitoring frequency for heavy metals, dioxins and furans under certain conditions, provided the criteria in article 17 of WID are available. No such criteria have been set under article 17, hence no such reduction has been allowed in this permit. Monitoring frequencies are specified by Table 2.2.2.

2.10.4 Article 11(8) sets out reference conditions for incineration. The specific reference conditions for the incinerator are contained within schedule 7.

2.10.5 The recording and reporting requirements in Article 11(9) for measurements are delivered by schedule 4 of the permit.

2.10.6 Article 11(10) sets out the compliance criteria for ELVs in accordance with Annex V. These are delivered by conditions 3.6.1 and schedule 4 of the permit.

2.10.7 Article 11(11) provides that, for incineration, daily average monitoring results from CEMs are to be generated from half-hourly averages, and that no more that 5 half-hourly averages can be discarded each day due to malfunction. In addition no more than 10 daily averages per year can be disregarded in this way. These requirements are contained within schedules 4 and 7 of the permit.

2.10.8 Article 11(11) also requires that the half-hourly averages (used as above) are determined after subtracting the 95% confidence intervals defined in Annex III. This requirement is specified in schedule 4 of the permit.

2.10.9 Article 11(12) requires that periodic measurement conditions shall be laid down in accordance with Annex III. Annex III compliance has been referred to in schedule 4.

2.10.10 Article 11(13) provides that the European Commission shall set a date from which continuous measurement of ELVs for heavy metals, dioxins and furans shall be carried out. This is to be done once appropriate techniques are available within the Community. Although equipment for continuous sampling of dioxins and furans is now available, its fitness for purpose is still being established, and the Commission has not as yet acted pursuant to Article 11(13). The Agency will continue to monitor technical and policy developments and include any requirements as they are imposed.

The Agency therefore considers that the Permit complies with the applicable requirements of Article 11.

2.11 Article 12 - Access to information and public participation

2.11.1 Article 12(1) requires applications for new permits for incineration plants to be made available for public inspection at one or more locations. WID has been transposed in the UK via the PPC regime, which provides for public consultation on permit applications. Details of the public consultation can be found in Appendix 1 of the main body of this document. The Permit is also available on the public registers. The Agency considers that the consultation and information requirements of the WID have been fully complied with.

2.11.2 Article 12(2) requires that, for plant with a normal capacity of two tonnes or more per hour, an annual report on plant operation and monitoring is also made available. Condition 4.1.4 of the Permit fulfills this requirement by requiring an annual report which will be placed on the public register.

2.12 Article 13 - Abnormal operating conditions

2.12.1 Article 13(1) requires conditions to be included in permits laying down the maximum period of technically unavoidable stoppages, disturbances or failures of purification or measurement devices, during which discharges to air and water may exceed the ELVs. Condition 2.3.12 put a limit on such periods of abnormal operation.

2.12.2 Article 13(2) requires the Applicant to cease the feed of waste in the event of a breakdown. This requirement is contained within condition 2.3.12.

2.12.3 Article 13(3) limits abnormal operation, when ELVs may be exceeded when using wastes as fuel, up to 4 hours uninterrupted duration. It also imposes a maximum cumulative limit on periods of abnormal operation when using wastes as fuel, of 60 hours per year. These requirements are delivered by condition 2.3.12.

3 Conclusion

The Agency has carefully considered the applicable requirements of the WID, and is satisfied that the Permit ensures that these will be complied with.

ANNEX 1 : CONSULTEE AND PUBLIC RESPONSES

Advertising and statutory consultation

Summary of responses to advertising and statutory consultation and the way in which we have taken these into account in the determination process:

Brief summary of issues raised	Response received from	Summary of actions taken or show how this has been covered
1. Ensure that a residence time of at least 3 seconds is used. 2. Use continuous monitoring 3. confirm that emissions including odour are acceptable 4. Ensure that good housekeeping is used to control emissions from contaminated soils 5. Carry out a noise survey once operating	Caerphilly Local Health Board	1. A residence time of at least 2 seconds will be used. This is in line with the Waste Incineration Directive and is considered to be BAT. A derogation has been granted for the engines (see section C7). 2. Continuous monitoring will be used for NO2, SO2, dust, HCL, HF and VOCs. Periodic monitoring is set for dioxins. The monitoring meets the requirements of WID and is BAT for this installation. 3. The Operator will be required to submit a report on the commissioning and will include an assessment of emissions including odour and noise. The only source of odours emissions will be fugitive as emissions from the stack will be from the burners so methane will be destroyed. The gasification process is a sealed unit to prevent emissions of the syn gas prior to combustion. 4. Soils will be stored in inside the building. The Operator states that the building will be under negative pressure. Standard permit conditions and inspections will ensure that good housekeeping is maintained. 5. See item 3.

1. There have been historic and current problems with noise from the industrial estate. Request that the applicant carry out an assessment of noise to include deliveries. The assessment needs to consider daytime and nightime noise	Caerphilly Borough Council	1. The process will be carried out inside a building. It has few moving parts and should have little impact from noise. However the Operator has not considered noise from deliveries. Noise form the surrounding roads are planning issues.

PPD : Consultation of Draft Determination

Summary of responses received on the draft determination and the way in which we have been taken these into account in the determination process:

Brief summary of issues raised	**Response received from**	**Summary of actions taken or show how this has been covered**
No responses were received		

ANNEX 2 Improvement conditions

Ref no	Condition	Date	Reason

IP1	The operator shall submit a report on the operation during the first development phase. The report shall include: • a review of the results of the monitoring and assessment carried out in accordance with this permit against the relevant assumptions, parameters and results in the assessment of the impact of the emissions submitted with the application; • details of the amount of excess syn gas combusted • a review of how operations have complied with permit conditions 2.3.15 to 2.3.18.	Within 6 months from completion of commissioning	To confirm the information supplied in the application
IP2	The operator shall submit a report on the operation of the plant during the second phase. • a review of the results of the monitoring and assessment carried out in accordance with this permit against the relevant assumptions, parameters and results in the assessment of the impact of the emissions submitted with the application	Within 2 months from first operating the first gas engine	To confirm the information supplied in the application
IP3	The operator shall submit a report on the operation during the third phase. The report shall include: • a review of the results of the monitoring and assessment carried out in accordance with this permit against the relevant assumptions, parameters and results in the assessment of the impact of the emissions submitted with the	Within 2 months from first operating the second gas engine	To confirm the information supplied in the application

	application.		
IP4	The operator shall submit a report on the operation during the fourth phase. The report shall include: • a review of the results of the monitoring and assessment carried out in accordance with this permit against the relevant assumptions, parameters and results in the assessment of the impact of the emissions submitted with the application; • A review of the energy efficiency and recovery information provided in the application.	Within 2 months from first operating the third gas engine	To confirm the information supplied in the application
IP5	The Operator shall carry out monitoring of the aqueous residue from the syn gas scrubbing. The monitoring shall be for the substance listed in annex IV of the waste incineration directive and shall be carried out over a range of operating scenarios. The operator shall submit a report detailing the monitoring results to the Environment Agency.	23/10/09	The Operator stated that this waste stream would have a composition within WID annex IV limits. This monitoring will confirm this.

Annex 3 AQMAU report

Audit of Air Quality Assessment for the PPC Permit Application ZP3535MW, Hudol Thermal Limited, Rhymney Organic Regeneration Facility

1.0 General Comments

1.1 Mark Jones of the National Permitting Service, Warrington asked the Air Quality Modelling and Assessment Unit (AQMAU) to audit the Air Impact Assessment submitted by Hudol Thermal Limited in support of a PPC application number ZP3535MW.

1.2 The consultant ExCAL Limited carried out atmospheric dispersion modelling on behalf of the applicant (Hudol Thermal Ltd) using ADMS 4. The consultant has produced a report entitled Hudol Thermal Limited, Rhymney Organic Regeneration Facility PPC Permit Application ZP3535MW Air Quality Assessment, January 2008 (Air Impact Assessment). ExCAL states in Section 6.0 of the report that "the impact of the atmospheric emissions from the proposed plant on the environment and local community or the general population will be negligible".

1.3 AQMAU has audited the ExCAL Air Impact Assessment and concludes that there are several aspects of the ExCAL assessment that were not carried out satisfactorily. Of main concern is the representation of buildings. A major building between the main building and units 5 and 6 apparent in plans submitted in the applicant modelling report have not been modelled by ExCAL.

1.4 AQMAU has carried out it's own dispersion modelling using the building configuration in the ExCAL modelling files and has established that without the missing building, exceedences of air quality objectives (AQO) or EU target values are not likely. AQMAU derived emission rates from the applicant's proposed concentrations and from Waste Incineration Directive (WID) emission limit values (ELVs). If, however, the applicant established that this building is present, additional modelling is required to determine whether the building affect dispersion.

1.5 In addition to the above, the applicant did not complete a proper risk assessment of the impact of dioxins and furans on human health or of the impact of the proposed emissions on local sites designated for the protection of natural habitats.

1.6 Details of the issues raised by are detailed in Paragraphs 2.1 to 2.9 below.

2.0 Detailed Comments

2.1 It is not clear from the ExCAL modelling files and reports how the emission limits at the stack were derived. The operator claims that they were derived from ELVs that are apparently lower than WID ELVs for nitrogen oxides (NOx), carbon monoxide (CO), sulphur dioxide (SO_2) and carbon monoxide (CO) but not for cadmium, arsenic and other metals.

2.2 ExCAL modelling used meteorological data that was amalgamated from 5-years of annual sequential data. This approach is not recommended because AQO are based on annual statistics and combined meteorological data may not correctly take inter-annual variability into account.

2.3 The receptor grid resolution used by the consultant was lower than would be recommended by AQMAU at over 60 metres for a stack height of 13.8 metres.

2.4 AQMAU observed that ExCAL predicted hourly concentrations that are lower than annual means for the same substance (Tables 7 with respect to NOx and SO_2). This is physically incorrect and does not provide confidence in the ExCAL predictions.

2.5 The consultant used the 15-minute mean averaging time output option within ADMS to model one of the short-term SO_2 objectives. This method is not recommended by AQMAU.

2.6 ExCAL assessed modelling predictions for metals such as Arsenic and Nickel against the H1 Environmental Assessment Levels (EALs) rather than their respective more recent EU Target Values. In addition, HCl modelling was not assessed against the recent Expert Panel on Air Quality Standards Guideline (EPAQS) and CO was assessed against the old AQO as a running mean rather than the maximum daily 8-hour mean.

2.7 ExCAL predicted maximum concentrations on the modelling grid for Cadmium, Arsenic and Nickel that exceed their respective EU target values. AQMAU checks, however confirmed that based the WID emission limit values and the stack emission parameters supplied by the applicant, emission rates should be lower than those modelled by ExCAL, resulting in exceedences of the Target Values not being likely.

2.8 ExCAL did not carry out an assessment of the impact of the proposed emissions on local sites designated for the protection of natural habitats.

2.9 Section 5.3.1 of the report states that it is unlikely that "human intake will exceed the WHO recommended Tolerable Daily Intake. No evidence is presented in the report to suggest that proper health risk assessment in the impact of dioxins and furans was carried out by ExCAL to substantiate their claim.

Air Quality Modelling and Assessment Unit
The Environment Agency
19th May 2008

The above AQMAU report identified a number of inadequacies in the modelling. However the report also shows that they were not sufficient to change the conclusion of the report. The Operator provided revised modelling on 25/07/08 because the emission point had moved. The revised modelling results are given in section C7. AQMAU ran test. This showed that the conclusion of the above report were not changed.

Aqmau audited the applicants dioxin health risk assessment. The following comments were made:

1. It is not clear how ExCAL carried out the assessment as they have presented no workings and no details of the input parameters (such as dioxin congener profile) used for the assessment.

2. ExCAL predicted intakes of 1.104 pg I-TEQ kg.bw-1 for adults, 1.77 pg I-TEQ kg.bw-1 for children and 8.67 pg I-TEQ kg.bw-1 for Infants. They state that these values are calculated the same way as described above and are all well within the TID value of

10 pg I-TEQ kg.bw-1. The Tolerable Daily Intake quoted however is incorrect. The correct value is 2.0 pg(TEQ)/kg.bw/year.

3. In their original modelling the applicant used a concentration that is higher than the WID ELV for dioxins and furans. Their predicted concentrations are therefore are singificantly higher than those calculated by AQMAU using the WID ELV for dioxins and furans. ExCALs human health assessment based on those predictions are therefore not valid.

4. AQMAU carried out some check modelling based on the maximum predicted ground level concentration and based on the WID ELV and using the dioxin congener profile published in the HMIP report. The predictions are below the correct TDI value of 2.0 pg(TEQ)/kg.bw/year for adult, child and infant receptors.

5. despite the errors in the ExCAL assessment, we support their view that the TDI is not likely to be exceeded.

6. It should also be noted that the assessment is based on the highly conservative assumption that all foods and water are sourced from the location of modelled maximum impact from the proposed plant.