

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

Application date and Agency reference ("the Permit Application") **29 August 2003,**
Mold Chemicals (Alyn Works)

Permit number (the "Permit") **BU2349**

Applicant (the "Applicant") **Synthite Limited**

Address/location of installation (the "Installation")]
Mold Chemicals (Alyn Works)
Denbigh Road
Mold
Flintshire
CH7 1BT

Name of Account Officer **Ian L Oakes**

Signature of Account Officer:

Signature of Authorising Officer:

All relevant documents have been sent to the IPPC Public Registers

Purpose of this document

The Decision Document ("DD") 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.

It should be noted that the Permit contains many conditions taken from the Agency's standard PPC Permit template. These standard conditions were developed by the Agency 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, but does provide an explanation and justification for the emission limit values (ELVs), the choices made between optional standard conditions and for additional conditions which have been imposed in order to take installation-specific factors into account.

Summary of the decision

A Permit for the Applicant to operate the Installation has been granted by the Agency, subject to the conditions set out in the Permit. Where the Permit includes standard Agency Permit 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. The Agency considers that in its decision to issue the Permit and in the conditions included therein, it has taken into account all relevant considerations and legal requirements.

Description of the Permitted Installation

The installation Mold Chemicals (Alyn Works) comprises Synthite Limited as the major component and original site operator since 1950, and making up the integrated stationary technical unit is Dynea (UK) Limited which has operated on the site since 1995. The site is located near Rhyd-y-goleu to the north west of Mold, Flintshire and has been industrial for over 200 years through cotton milling then tinplating prior to chemical manufacture. The site is roughly triangular in shape and bounded to the south and west by the A541 Denbigh Road; to the north by the River Alyn (which ultimately flows into the River Dee) and to the east a recreational area developed by Flintshire County Council. The site is approximately 4 hectares.

Synthite primarily manufactures formaldehyde from methanol via separate silver catalyst and mixed iron and molybdenum oxide (mixed oxide) processes. The silver catalyst process is one of oxidation/dehydrogenation of a rich methanol/air mixture to produce formaldehyde, hydrogen, carbon monoxide and water. The reaction products are quenched and exit gases scrubbed to leave hydrogen and carbon monoxide gas, which is burned in a gas boiler. The silver process is capable of producing a strong formaldehyde solution of up to 82% for paraformaldehyde powder/prill production in addition to the standard formalin product of 50-55%. The mixed oxide process oxidises a lean methanol/air mixture to produce a solution of up to 57% formaldehyde and water. Heat is recovered via a heat transfer fluid and condenser to generate steam for on site use. The exit gas stream containing low levels of formaldehyde, methanol, dimethyl ether and carbon monoxide are oxidised in a Noble metal catalyst emission control system to carbon dioxide and water.

Synthite also produces formaldehyde derivatives such as triazines, hemiacetals, formals, resole acetate, chemical blends such as urea in water and paraformaldehyde in butanol and polymer emulsions as well as ammonium salts of organic acids. The most environmentally significant chemicals stored are formaldehyde, methanol, ammonia, acrylic acid and the mixed oxide process heat transfer fluid (70% biphenyl ether and 30% biphenyl).

There are 18 point source emission points of which 14 are abated. Those not abated are the

exit gas boiler stack, the three gas fired boilers' stack and the methanol storage tanks (2). A combination of abatement technologies are being employed the selection of which is dependent on the chemical and physical nature of the emission and include catalytic oxidation, combustion, wet scrubbing, filtration and adsorption.

Synthite discharges trade effluent from a secondary effluent treatment plant to Welsh Water Mold Wastewater Treatment Works which discharges into a tributary of the River Alyn. Synthite abstracts water from two boreholes in order to provide site flood protection and cooling water. Used cooling water is sent for effluent treatment, the unused/untreated water is sent directly to the River Alyn (70000 tonnes per annum for each). In addition, surface water runoff from adjacent fields and Denbigh Road is collected in Parry's Ditch and pumped into the same River Alyn discharge line. Running approximately west to east at a depth of 4 – 5 metres (similar level to River Alyn) is an underground culvert, a relic of historical site activities. The culvert has been capped at both ends within the site and acts as a general site drain for surface water soakaway and may still receive old drains. Ingress by groundwater is reduced by the borehole regime. The culvert is stone lined except along its base and is pumped out via lagoons to the effluent treatment plant to prevent site flooding (35000 tonnes per annum). Groundwater sensitivity is assessed as moderate due to the presence of two minor aquifers beneath the site. There are no direct or indirect emissions from the installation to groundwater of List I or II substances either directly or indirectly, as set out in the Groundwater Regulations 1998. There are significant areas of unmade ground on the site particularly along the River Alyn boundary and the potential for soakaway contamination to groundwater/River Alyn exists. A concrete barrier wall 2 – 3 metre deep constructed in 1993/4, between the site and the River Alyn on the northern boundary is considered to offer improved protection as has been the improvements in bunding and increased hardstanding particularly in the Agricultural Products Yard.

A Climate Change Agreement has been held with the Chemical Industry Association since August 2001. Under normal operating conditions three of the four boilers on site are on hot standby (natural gas fuelled), with the fourth burning the silver catalyst process exit gas containing hydrogen. The mixed oxide process is also a net exporter of steam. The total annual water usage is approximately 210000 tonnes. Process wastes are segregated into liquid and solid waste streams and stored in two bunded waste compounds.

Dynea primarily manufactures urea, melamine and phenol formaldehyde resins and operates separately under PPC permit BU2322. Dynea is however, supplied with raw material formaldehyde, steam and provision for surface water management and weak effluent treatment by Synthite.

Under the Control of Major Accident Hazards Regulations 1999 (COMAH) Synthite is classified as a Higher Tier and Dynea a Lower Tier site and collectively as a Domino site.

Glossary of terms used in this Decision Document

"*Application*" means the application for this Permit, together with any response to a Notice served under Schedule 4 to the PPC Regulations, and any other written information provided by the Operator for consideration in the determination of the Permit.

"*Applicant*" means... **Synthite Limited**

"*Operator*" means... **Synthite Limited**

PART A – ADMINISTRATIVE INFORMATION RELATING TO THE APPLICATION AND INFORMATION ABOUT THE APPLICANT

The Agency's determination procedure

A1 "Duly made" check on Application received

The Application was not duly made as submitted on 29 August 2003 for the following reason: agreement sought over EP0PRA v.1 profile (refer to Section A6.1 OPRA profile).

Upon receipt of the correct EOPRA v.1 charge the Application was determined to be duly made on 3 October 2003.

A2 Consultation on the Application

The Application was advertised by the Applicant according to the requirements of Part 1 of Schedule 4 to the PPC Regulations on 8 October 2003 in The London Gazette and The Evening Leader.

The Agency sent copies of the Application to the following statutory consultees in accordance with Part 2 of Schedule 4 to the PPC Regulations:

- Andrew Gunnion, Public Health Director, Flintshire local Health Board.
- Andrew Fuller, Pollution Control Manager, Flintshire County Council.
- Ms Louise Dickinson, Food Standards Agency.
- Craig Grimshaw, Trade Effluent Officer.
- HM Principle Inspector, HSE Wales, Government Buildings.
- Mr Russel Lang, Environmental Division, National Assembly for Wales.
- Countryside Council for Wales, Victoria House.

The Agency did not send copies of the Application to any non-statutory consultees.

A3 Consideration of consultation responses

Responses were received from the following statutory consultees:

- Countryside Council for Wales, Victoria House.
- Andrew Gunnion, Public Health Director, Flintshire local Health Board.
- Peter Samuel, Welsh Assembly Government.

No responses were received from members of the public during the determination period.

All responses have been considered by the Agency in determining the Application. The ways in which material responses have been taken into account are summarised in the appendix to this document.

Consultation within the Agency with respect to determination

The draft permit/decision document peer review 9 August 2004 (S. McFarlane) and the audit of the draft permit 19 August (S. Holbrook) were duly considered as part of the determination process.

A4 Matters of commercial confidentiality or national security

The Operator has made no claim for commercial confidentiality and the Agency has not received any information in relation to this Application which appears to be confidential in relation to any party. There are no matters involving national security.

A5 Further information requirements

The Application was deemed duly made by the Agency, but further information was required in order for the Agency to be able to determine the Application. Further information was requested from the Applicant by notice/letter as follows: reports in relation to groundwater, environmental risk assessment, formaldehyde emissions modelling and noise, flow diagrams, Phase 1A Site Report, raw materials, identification of hazards and assessment of risk, emergency response and on - site plan and progress in the development of an environmental management system.

The response to the notice was received from the Applicant on 24 June 2004 and additional information in support of the Application on 6 August and 1 September 2004. These were placed on the public register, and have been taken into consideration by the Agency in making its determination. It was not considered necessary to forward additional information to the consultees beyond satisfying material responses (refer to A3 and the appendix to this document).

A6 The Applicant

The Agency is satisfied that the Applicant (now the Operator) is the person who will have control over the operation of part of the Installation after the grant of the Permit, and that the Operator will be able to operate part of the Installation so as to comply with the conditions that have been included in the Permit.

A6.1 OPRA profile

The Agency was not satisfied with the original OPRA profile submitted and consequently the Application was not Duly Made on the 29 August 2003. The original submission was based on complexities of 2As, 2Cs, 1D plus emissions/location/operating performance to yield a score of 216 and attract a charge of £35640. This was reviewed with the operator and amended to complexities of 2As, 2Bs, 5Cs, 1D plus emissions etc., to yield a score of 366 and a charge of £60,390. The Application was Duly Made on the 3 October 2003.

The Agency is satisfied that the revised EOPRA v.1 profile submitted with the Application is accurate for the purposes of the determination of the Application. However, EOPRA v.2 will be used as the basis for subsistence and other charging, and for all other relevant purposes at the commencement of the Permit. In accordance with the Agency's OPRA Scheme however, the Operator's OPRA profile for part of the installation may change over time.

PART B – THE INSTALLATION AND ITS MANAGEMENT

B1 Permit Section 1.1.1 - The permitted activities

The principal listed activities at the Installation falls within the activity description in Section 4.1 Part A(1)(a)(ii), (A)(1)(a)(iv), A(1)(a)(viii) and Section 4.2(A)(1)(a)(iv) of Part 1 of Schedule 1. The Agency considers that this constitutes the “stationary technical unit”.

The Agency considers that the following activities are directly associated with the stationary technical unit and therefore form part of the Installation:

- Steam raising plant <20MW
- Effluent treatment system
- Maintenance and engineering workshop
- Quality control laboratories
- Packed product storage
- Water abstraction and use

The stationary technical unit and its directly-associated activities described above, together constitute part of the Installation operated by Synthite.

Some of the activities in the Installation are carried out by a different operator. Their name and Permit Number are noted in the Permit's Introductory Note. The principal listed activities covered by this Permit are covered by the descriptions in Section 4.1 Part A(1)(a)(ii), (A)(1)(a)(iv), A(1)(a)(viii) and Section 4.2(A)(1)(a)(iv) along with the above listed directly-associated activities.

B2 Permit Condition 1.1.2 – Identification of exempt waste activities

This is a standard condition of all Permits but it is understood that it is not the Operator's intention to undertake any waste activities which are exempt from Waste Management Licensing (ie. activities listed in Schedule 3 of the Waste Management Licensing Regulations 1994) on the same site, which are not part of the Installation.

B3 Permit Section 1.2 - Site plan

The Applicant has provided a plan which the Agency considers is satisfactory for showing the site of the Installation and its extent including the location of the Installation on that site. This plan is included in the Permit as Schedule 5, and the Operator is required to carry on the Permitted activities within the site boundary.

The Installation is the area shown in red on the IPPC Permit Areas drawing (Drawing MAP 3 Extract - Mold Chemicals (Alyn Works)) at Schedule 5 and is within the area edged in dark blue which represents the extent of the site. The extent of the Installation covered by this Permit and the extent of the Installation covered by the Permit of the other operator is identified on the drawing (Dynea (UK) Limited is identified by black hatching with Synthite Limited making up the remainder of the Installation). The activities authorised activities under condition 1.1.1 shall not extend beyond the areas indicated on the drawing, with the exception of groundwater abstraction by Synthite from Borehole B (identified in red).

B4 Permit section 1.5 - Minor operational changes; (Changes allowed within the scope of this Permit)

The Permit constrains the Operator to operate the activities subject to the limits and conditions in the Permit. However the Operator may make minor changes as defined within the Application by notifying the Agency in writing under Conditions 1.5.1 -1.5.4. The Installation is in the Chemical Industry sector and the Application contains a Multi-product Protocol for allowing changes of product within the Permitted installation. This Protocol provides the framework for compliance with the Conditions in Section 1.5. The Protocol document is contained within the Application as part of Section 2.1 - In Process Controls as Appendix 2.1 (B) – 'Multipurpose' Protocol.

B5 Permit section 2.11 - Closure and decommissioning; (Prevention of deterioration of the site)

The Applicant has provided a Site Report as required by paragraph 1 of Part 1 of Schedule 4 to the Regulations (augmented through response 1 of the Schedule 4 Notice).

Babtie Group was commissioned in April 2003 to undertake a Phase 1A Site Survey of Mold Chemicals (Alyn Works) operated by Synthite Limited and Dynea(UK) Limited. This entailed a desk - based study and site inspection to assess the likelihood of any surface and sub - surface ground contamination from historical and current uses. The main elements of the Report are: site history, current operations and associated hazards, overview of site drainage and effluent disposal, recorded incidents, previous ground investigations, environmental conditions (solid and superficial geology, hydrogeology and hydrology), site observations, identification of potential contamination sources and receptors, conclusions and recommendations.

The guidance used in the preparation of the report was the Environment Agency document 'Guidance on the Preparation of a Site Report in an IPPC Permit Applications (August 2000)'. The Agency policy changed as of 22 August 2003 to reduce the emphasis on intrusive testing prior to determination of Permit in favour of a post Permit issue, production of a Site Protection and Monitoring Programme. The Site Report along with supplementary information was considered to be sufficiently comprehensive to enable a review against the new policy due to the absence of intrusive testing and a submission date of 29 August 2003.

The site has been industrial for 200 years starting with a cotton mill, then a tinplate works and has been operated by Synthite since 1950. The site is bounded to the north by the River Alyn (which runs west to east) and partly lies within the historic floodplain. It has historic contamination particularly formaldehyde and some metals (e.g. copper, zinc), a high water table hence susceptible to flooding, and a capped (within site) underground culvert acting as a site drain which is pumped to the effluent treatment plant. Site flooding is controlled by pumping from 2 boreholes one on site and one off site close the adjoining Denbigh road on the south west side. These are pumped directly to the River Alyn (except for 327m³ used as cooling water and sent to effluent treatment plant). Additionally, there is Parry's Ditch, which runs from the adjacent fields on the southern side under Denbigh Road and under the site and is intercepted just inside the installation boundary (front car park area) by an underground chamber. This chamber is pumped to the River Alyn in conjunction with the excess borehole groundwater through a common outfall. The ditch provides drainage for off site surface water. The site has good air emission control and little waste. Consequently, the biggest issue is groundwater susceptibility through historic contamination or spillage on unmade ground of which there are significant areas.

A concrete barrier wall was constructed in 1993/4 along the northern boundary of the site to protect the River Alyn. The base of the barrier wall is approximately 2 to 3 metres below ground level and understood to be keyed into clay.

Groundwater sensitivity is assessed as moderate due to the presence of two minor aquifers beneath the site. The risk of potential contaminants impacting groundwater is considered moderate. The sensitivity of the River Alyn is classed as moderate to high due to the River quality being of the order of moderate to good and the fact that it is a tributary of the River Dee (drinking water for 2 million people).

The Agency considers that this report plus supplementary information adequately describes the condition of the site albeit the information is dated and light on detail with respect to ground contamination species and extent e.g.

- Aspinwall & Company (1995): Groundwater Survey of the Alyn Works Site.
- Aspinwall & Company (1996): Alyn Works Site Evaluation of Pumping Tests.
- AEA Technology (1996): Environmental Risk Assessment for IPC Processes Undertaken at Synthite Ltd.

The referenced AEA Technology 1996 Report: Environmental Risk Assessment for IPC Processes Undertaken at Synthite Ltd., Alyn Works Mold identifies the three main routes to groundwater contamination as soakaways, culvert and the lagoons. The report concludes that 'the risk to the River Alyn was estimated as tolerable (but not negligible), and certainly less than for atmospheric releases. It is thought that the construction of the northern barrier wall has greatly reduced the overall risk to the Alyn (and the River Dee)'.

Since this report the total oxidation formaldehyde plant has been shutdown (1997) and has been replaced with the Perstorp mixed oxide process and with it a significant improvement in process emissions to air. Hence, the report at 8 years old is out of date with respect to air emissions at least and needs to be updated.

Site Reporting will be further addressed as part of the SPMP (Technical Guidance Note IPPC H7: Guidance on the Protection of Land under the PPC Regime: Application Site Report and Site Protection and Monitoring Programme).

With reference to Application Section 2.11 – Closure. The original total oxidation formaldehyde process was shutdown in 1997 and replaced by the mixed oxide process 'Perstorp' plant. The Application states that sufficient funds shall be allocated to de-contaminate, disassemble and remove the plant from site though as yet no specific date has been agreed. In the Agricultural products Area it is planned to decommission several Agricultural Products storage tanks and relocate the reactive chemistry processes to the Chemical process Plant Building. Again, the Application states that sufficient funds shall be allocated though no specific date has been agreed. The Applications goes on to state 'before both projects go ahead the green design and decommissioning principles described in the further information section below will be adopted'. Refer to page 104 of Application. Synthite has a site closure plan referenced as HSE Plan: Demolition/Decommissioning of Plant and Storage Tanks.

Further information, as described below, will be collected via the Improvement Programme: (review of, and improvements in) containment of surface water, subsurface storage, culvert, surfacing, soakaways, bunding arrangements, lagoon integrity, spill containment, storage of hazardous materials, storage and segregation of wastes. In addition, the 7 on site boreholes used to monitor groundwater depth will have environmental monitoring introduced with respect to formaldehyde (refer to permit condition 2.10.2 and Table 2.10.1).

B6 Permit Section 2.12 - Multiple Operator installations

The Applicant has submitted proposals for techniques and measures to ensure that the joint operation of the installation is conducted in a satisfactory manner. These are to be found in Table 2.12.1 of the Application.

The proposals are consistent with those of the other operator on the installation and indicate a suitable level of co-operation and co-ordination.

Management

B7 Permit Section 1.3 - Overarching Management Condition

Condition 1.3.1 in the Permit is a standard condition but, based upon the information submitted in the Application the Agency is satisfied that appropriate management systems and management structures are in place for this Installation, and that sufficient financial, technical and manpower resource is available to the Operator to ensure compliance with all the Permit conditions.

The Operator does not currently have an externally certified Environmental Management System and was asked to provide a response to a Schedule 4 Notice for Information (dated 1 June 2004) Item 7 'Submit a statement as to Synthite's progress to date in developing an Environmental Management System'. The response was as follows: 'The company is negotiating with consultants to produce a program of work to achieve a management system capable of ISO14001 registration by identifying areas for assistance following a gap analysis of current and standard practices. The project should be completed by summer 2005'. Synthite's Application Section 6 Proposed Improvement Programme supports this statement in that a third of the 20 proposed improvements are directly associated with achieving ISO14001. Development of a certified EMS will form part of the improvement programme.

B8 Permit Section 2.3 - Management

B8.1 Staffing and Training

The information provided in response to Questions in Section 2.3 of the Application indicates that the installation is operated by an adequate number of staff (e.g. Appendix 2.3 – Management, Management Organogram) who are suitably trained and supervised (e.g. Safety Management System Manual - contains key responsibilities for management and supervisory levels and copies are in senior manager's offices/control rooms etc). Appropriate written operating instructions are available (e.g. Application Table 2.3.1 Operations and Maintenance & Accidents/incidents/non conformance), and a system is in place for the recording of staff training (SMS Procedure SHE 5.2 Training).

However, in Table 2.3.1 Competence and Training the answer to 4 of 7 questions is no, including the 'awareness of the regulatory implications of the Permit for the activity and their work activities'. The Operator clarifies thus ' There has been no specific assessment of environmental training needs, the organisation has an SMS Procedure SHE 5.2 Training. This will be extended to include environmental training'.

This situation may have stemmed from the fact that the Operator is a Higher Tier/Domino COMAH site and that a great deal of time and resources have been focused on safety, producing a professional Safety Report and supporting systems.

The responses highlight the need for an improvement in awareness and training with respect to environmental matters. The drive to ISO14001 will be fundamental in addressing the awareness and purpose of PPC. Training will be included in the Operators improvement programme to run

in parallel with the process of developing an EMS. Due to the inadequacies in training, BAT will be achieved through compliance with the improvement requirement.

B8.2 Operation and Maintenance

The information provided in response to Questions in Section 2.3 of the Application indicates that the installation is operated and maintained in compliance with the Conditions in the Permit.

The Operator has a formal paper – based (moving to computerised) maintenance system which includes maintenance planning, programmed preventative maintenance, breakdown history and recording of all maintenance done. Information is provided in Table 2.3.1 of the Application.

B8.3 Incidents and Complaints

The information provided in response to Questions in Section 2.3 of the Application indicates that there is a suitable incident/complaint logging and response system in place. Information is provided in Table 2.3.1 of the Application.

PART C: DETERMINATION OF PERMIT CONDITIONS

C1. Operating conditions and BAT determination

C1.1 Permit Section 2.1 In-Process controls – the Applicant's proposed techniques

Responses to questions 2.1 and 2.2 given in the Application, multi – product protocol and Schedule 4 Notice covering in-process controls and emissions control (pages 8 – 55 and appendices, and responses 2 and 3 respectively) and additional information are satisfactory.

It has not been deemed necessary to incorporate any in-process controls into the permit.

C1.2 General summary of the aspects considered in determining BAT for the installation

Synthite is a Higher Tier, Dynea Lower Tier and an overall 'DOMINO' site as classified under the Control Of Major Accident Hazards Regulations 1999 and as such is heavily regulated for intrinsic equipment and site safety and the potential for Major Accidents To The Environment (MATTE) scenarios. The Safety Report is lodged with the Competent Authorities (Agency, HSE) though not in the Public Domain following 9/11. Though not directly related to this BAT determination it can be taken as complimentary and supportive of the measures required to reduce environmental impacts to a minimum.

The abatement systems as described in Section 2.2 Emissions control and Abatement of the Application are considered to be BAT.

With respect to emissions to air (Section 2.2.1 Point source emissions to air). Abatement methodologies include wet scrubbing, adsorption with activated carbon, wet scrubbing and adsorption, filtration, combustion and catalytic oxidation. The bulk methanol storage tanks' vents (evaporative losses/vapour displacement) could be abated, 'wet scrubbing can be used' as indicated in Section 2.1.2.4 Formaldehyde of Sector Guidance note IPPC S4.01. The argument for not abating the tanks is that they are at ambient temperature and thus do not require it, this needs to be explored further. Hence, the feasibility of abating the methanol tanks will be subject to an improvement programme requirement. N.B., The formaldehyde storage tanks, which have to be kept at 55C to prevent polymerisation, are extracted to the Exit Gas Boiler.

The emission limit values (ELVs) to air have undergone a detailed review in the light of the H1 submission (annual averages) and have been significantly reduced in many cases (covered in emissions to air). Additional information was submitted 1 September 2004 outlining a change of use for 1 emission point (refer to C2.1). This change has been accommodated within the permit.

Synthite's main processes are for the manufacture of formaldehyde detailed in Sections 1.1.2 Formaldehyde Production by the Silver Process and 1.13 Formaldehyde Production by the Mixed Oxide Process in Appendix 2.1 (A) of the Application. With reference to Section 2.1.2.4 Formaldehyde of Sector Guidance note IPPC S4.01 the following appraisal of BAT was undertaken.

With reference to the Silver Process, the absorber tail gas has hydrogen as the major component with carbon monoxide/dioxide, nitrogen, formaldehyde and related organic compounds and is deemed to be BAT if the tail gases are subject to thermal destruction as is the case with the Exit Gas Boiler. However, start ups and shut downs result in some direct exhaust to atmosphere. Start ups result in approximately 2 hours to atmosphere whilst the catalyst banks come on stream/up to temperature and the exit gas oxygen level drops to below

2%. Scheduled maintenance shutdowns occur approximately 3 - 4 times a year. The time venting to atmosphere is very small relative to operational time and thus considered satisfactory. This exit gas provides all the energy requirements for the site under normal operating conditions with the remaining 3 natural gas boilers (gas oil back up) on hot standby (95% of time). The Mixed Oxide Process 'Perstorp' is considered BAT provided the exhaust stream is destroyed by a thermal catalytic control system, which is the case. This process is a net exporter of steam used to balance the site energy requirements. Provisions for condensing steam is available as the final site safety/energy balance safeguard (forced air heat exchanger, 6 t/hr).

The Formaldehyde Derivatives plant is a batch operation for the manufacture of triazines, hemiacetals, resole acetates and formals and fully supported by documented operating procedures. Various blending activities and emulsion production is also carried out. Vessel over pressurisation is protected via bursting disks and pressure relief valves (see below), which vent into a dump tank. The Agricultural Products plant manufactures inorganic ammonium salts, the chemistry of reaction being that of aqueous ammonia and organic acids. Additionally, 35% formaldehyde is blended with a propriety acidic compound and packed off into either IBCs or Bulk ISO Tank. A multi - product protocol Appendix 2.1 (B) (mis - named as multipurpose protocol) has been submitted and deemed satisfactory. The site also produces a range of products from paraformaldehyde manufactured by spray cooling and drying of 80% formaldehyde from the Silver Plant to produce prills. Further drying and/or grinding is carried out on small quantities.

Over pressurisation safety systems such as rupture discs and pressure relief valves have been designed with the consideration of two phase flow. Abatement of pressure relief systems is considered unsafe due to the possibility of back pressure resulting in further emissions. Calculations are available for both formaldehyde plants. Temperature sensors have been installed on the vent side of the Mixed Oxide plant, which automatically shuts the plant down at a predetermined temperature. Pressure sensors have been installed on the vent side of the emulsion reaction vessel rupture discs to indicate venting and automatically shuts down the plant. Considered to be BAT.

Liquid ring seal pumps are designed with circulating seal liquor, which can be blended back into the process. Receiver vessels are installed between the process and the vacuum source to ensure that process gases are adequately scrubbed prior to reaching the vacuum source. In recent years dry vacuum pumps have been utilised and are maintained by the manufacturer. Magnetically driven pumps are used which are electronically wired to dry protection devices, which automatically prevent dry running or pressurisation of pipework. Centrifugal pumps are widely used, the shafts are mechanically sealed and subject to a routine maintenance programme (for some duties back to back mechanical seals are employed). For smaller duties, peristaltic pumps are used with tubing compatible to the material being pumped. Agitator shafts are sealed with mechanical seals, the material of construction appropriate for the duty of the vessel in question. A variety of valves are used appropriate to the duty and include ball, plug, glandless and bellows/diaphragm and subject to routine maintenance. Corrosion of plant is considered insignificant with the material of construction cited as stainless steel. Considered to be BAT.

Nitrogen is used to inert reaction vessels for the processing of flammable materials. The displaced vapour is treated via plant LEV systems, which feed into the plant abatement system. Due to plant design fugitive emissions within plant buildings are extremely small. All LEV systems feed directly into abatement plant in both the paraformaldehyde and formaldehyde Derivatives buildings. Considered to be BAT.

With respect to reducing wastewater from batch reactor wash down a comprehensive study has been undertaken and where possible reaction vessels are dedicated to specific products. Where vessels are used for multi - product manufacture wherever possible campaigning is used and where possible cleaning liquors are blended back. Pipework is minimised to prevent hold up and

three way plug valves used where possible. Shell and tube condensers are widely used and where possible carbon black condensers have been installed as replacements. Raw materials are introduced to vessels via dip pipes or are bottom charged. A number of separation activities are carried out in the Silver Process plant and techniques are regularly reviewed with the aim of minimising emissions. In the Formaldehyde Derivatives plant a number of crude products are manufactured where purification is outsourced. Environmental issues are at the forefront of preliminary design discussions for all new and extensions of existing plants with cited examples being the Mixed Oxide, Ammonium Salt and Emulsion plants. Hazop/Hazan studies are carried out on all new plant to effectively identify and characterise all potential releases and all plant equipment is designed to the highest environmental standards. Considered to be BAT.

An area where significant improvements are required in order to meet the requirements of BAT under Section 2.3 is the provision of an externally certified ISO14001 EMS (refer Schedule 4 Response 7) and the provision of adequate training in environmental matters. As is the introduction and use of environmental parameters to track performance of the Installation under Section 2.1.7. These have been acknowledged by the operator, included in their proposed improvement programme and will feature as improvement programme requirements.

With reference to S4.01 Section 2.2.2 Point source emissions to surface water and sewer (2.2.2.1 General, 2.2.2.2 Water Collection and 2.2.2.3 Treatment methods).

There is the potential for the contamination of groundwater due to significant areas of unmade ground and soakaways. The site is prone to flooding from surface run off originating off/on site either directly or from resultant rising groundwater. The site has managed this with the agreement of the Agency under IPC by abstraction from two boreholes, an underground end capped culvert and Parry's Ditch at the southern site boundary sump. Up to a maximum of 327m³ of borehole water is used for cooling and sent to the effluent treatment plant (ETP) with a maximum balance including Parry's Ditch of 700m³ to the River Alyn. The site has historic ground contamination most significantly by formaldehyde. However, the data with regards to degree and distribution is dated (mid 1990s, refer Schedule 4 Response 2 for reports) and limited, as is on site monitoring. Efforts have made to protect the River Alyn by construction of a 2 – 3 metre deep concrete barrier wall (along the northern boundary) into sub strata clay. Also the removal of surface drains into the River Alyn and process drains into the underground culvert and the capture of Parry's Ditch to a sump. These provisions require further works if to be considered BAT. To achieve BAT the following criteria will be included in the improvement programme requirements e.g. review of, and improvements in: containment of surface water, subsurface storage, culvert, surfacing, soakaways, bunding arrangements, lagoon integrity, spill containment, storage of hazardous materials, storage and segregation of wastes. In addition, the 7 site boreholes used to monitor groundwater depth will have environmental monitoring introduced with respect to formaldehyde.

The site will submit a Site Monitoring and Protection Programme within 2 months of issue of Permit as part of the permitting process.

BAT would dictate that emissions to the Alyn should be 'environmentally protective' and modelling has been undertaken by the Agency to determine whether existing ELVs for discharge to controlled water are adequate (covered in emissions to controlled water). Consequently, the formaldehyde ELV has been reduced from 0.5 to 0.25 mg/l and an ammonia ELV of 5 mg/l introduced. However, to put this into context the H1 submission indicated an actual value below the detectable limit of 0.05 mg/l for formaldehyde and thus no immediate threat to groundwater or surface water is anticipated.

No List I/II substances are discharged to groundwater either directly or indirectly.

Synthite operates the Installation's biological activated sludge ETP and accepts responsibility for the treatment of surface water from Dynea and certain segregated process effluents but only after testing and by agreement. Effluents that are not deemed acceptable are treated by a third

party. The ETP discharges to sewer to Welsh Water Mold Wastewater Treatment Works, which in turn discharges to the River Alyn downstream of Synthite. Synthite segregates strong and weak process effluents/surface water/culvert pumping/cooling water etc which are balanced prior to primary and secondary effluent treatment to a maximum discharge volume of 300 m³/day. The ETP is considered to be BAT for discharge to sewer.

Mold Wastewater Treatment Works has historically been capable of achieving formaldehyde discharges below 0.5 mg/l (from limited Agency data). However, in Q12004 values in the range 2 - 10 mg/l have been detected. A modelling exercise has been undertaken of the River Alyn by the Agency. This has shown that in the worst case (5% of the time) there is a 600% deterioration in water quality (at a 1 : 1 dilution) due to Mold Works. N.B., In summer some stretches of the River Alyn upstream of Synthite can run dry. The borehole abstraction and discharge to the River Alyn by Synthite is seen as a useful source of river flow.

By comparison Synthite's Application (Table 3.2.2.1) indicates an annual average (tested 3 times a week) to sewer levels of formaldehyde and methanol of 6 mg/l and 13 mg/l respectively. N.B., However, from limited data, Agency snap sampling of the effluent to sewer has shown instantaneous levels of formaldehyde as high as 50 mg/l (ELV 100 mg/l).

The high levels discharged by the Mold works are variable and considered highly unusual as the treatment works is expected to be capable of digesting up to 100 mg/l of formaldehyde and methanol readily (as they are simple molecules and easily oxidised). Consequently, to date formaldehyde has not figured in Welsh Water's discharge consent. The Agency is planning to carry out continuous monitoring of the discharge from Synthite but the results will not be available until later in the year post determination. Investigations thus far have not identified any route cause(s). Also increased monitoring of Mold works discharge is being undertaken. So far Welsh Water have not been able to explain the fall in treatment capability at the works. Welsh Water is currently in breach of its discharge consent by virtue of discharging a none listed substance and the Agency is considering what action to take and what discharge consent to enforce.

With respect to appraising ELVs for formaldehyde and methanol it has not been possible to use the existing modelling of the impact on the River Alyn of a 'poorly operating' sewerage treatment works to help determine what future ELVs should be. Hence, the 99%tile values for 2003 have been used to give an indication of Synthite's ETP discharge to sewer capability. This has indicated that a 60% reduction in formaldehyde and methanol ELVs to 40 mg/l is a sensible position for the permit, which can be reviewed in the light of further information as it becomes available.

The improvement programme will include a reappraisal of Synthite's ETP in relation to BAT and an investigation into the potential for effluent to bypass the ETP to sewer.

No odour or noise complaints have been received in the past two years so no extra conditions to achieve BAT are deemed necessary. Each day (Monday to Friday) a subjective assessment of odour is made around the site and boundary. This is recorded in a site environmental logbook. Records are kept of wind direction and speed, presence of any noxious odours and any background odours (e.g. farming activities). A review of noise will be undertaken to update the noise survey of 1996 as part of the improvement programme requirements.

With respect to Section 2.8 Accidents, the Application is not BAT with respect to 'identify the hazards' and 'assess the risks' and 'identify the techniques necessary to reduce the risks'. The company's position is clarified by Schedule 4 Response 5 'The company has a procedure for basic assessing impacts of its operations..... The company recognises that this process could be improved with respect to environmental issues and will be looking to reassess the procedures and improve the systems'. This will be included in the improvement programme requirements.

With respect to Section 2.10 Monitoring none of the testing methodologies are MCERTS (S4.01 2.10.4 Monitoring Standards) and therefore not considered BAT and thus Synthite is not able to meet condition 2.10.7 on issue of permit. Thus, MCERTS accreditation is subject to an improvement programme requirement (taken from Suggested Improvement Conditions for the Organic Chemicals Sector 25 July 2003 – Item (11.1)) in order to give the operator time to implement a programme. There is no continuous monitoring of the main formaldehyde plants' emissions and this is viewed as none Indicative BAT under Section 2.10.1 (abatement plant performance). The emissions monitoring regimes and techniques used for the formaldehyde plants and an update of the ENTEC (1997): Atmospheric Impact Assessment of Formaldehyde Emissions using latest generation models (such as ADMS 3.1, Aermod) will be subject to the improvement programme.

An impact assessment has been provided as required under Section 4.1. The operator concluded that 'the site could not cause a significant adverse environmental impact on any European Habitats Sites or SSSIs'. This is borne out by the habitat assessment (HR01) as required by the regulations and is covered in detail in Section C4.2 under Habitats Regulations.

It is concluded that Synthite does not cause any significant pollution and should be able to meet the requirements of the PPC regulations where deficiencies have been highlighted within the lifetime of the improvement programme.

C2. Justification for ELVs or equivalent technical parameters set for specific emissions

The following emission limit values (or "equivalent measures" or "technical parameters") have been included in the Permit for the reasons described:

C2.1 Permit section 2.2.1 - Emissions to air

The abatement systems as described in Section 2.2 Emissions control and Abatement of the Application (Section 2.2.1 Point source emissions to air) are considered to be BAT (refer to Sections C1.2 for a general summary and BAT and C4.2 for air dispersion/H1 assessment for HR01).

Refer to the Emission Limit Value Table below for the determination of new ELVs under PPC. The actual air emission values submitted under Table 3.2.1 of the Application are the basis for H1 modelling and are quoted as average annual figures based on 4 quarterly results (column 3). These values have been divided by the current Emission Limit Values (ELVs) under IPC and expressed as a percentage (column 5). The actual emission values (and % of IPC ELVs) were compared with BAT emission values from S4.01 Table 3.1 quoted as daily averages from continuous monitoring (column 6) where available. The proposed PPC ELVs, to be submitted in the Permit (column 7) have been justified in the comment section (column 8).

It is recognised that an average of four quarterly results is not the same as daily averages from continuous monitoring, but as no continuous monitoring has been undertaken at Synthite exact like for like comparisons have not been possible. The BAT for formaldehyde for Resin manufacture of 2 mg/m³ is considered over ambitious for full - scale formaldehyde manufacture (cf Benzene 5 mg/m³). Therefore 5 mg/m³ has been maintained/proposed.

AIR ELVs		Table 3.2.1 'Normal Conc.' for			BAT		Comments
Release Points	Substance	H1 Tool	IPC ELV	Table 3.2.1 H1 Tool/ IPC ELV	Table 3.1 S4.01	Proposed	
		mg/m3	mg/m3	%	mg/m3	ELVs	
		ANNUAL			DAILY	mg/m3	
		Average (Quarterly)			Average (Continuous)		
							NB: Percent of IPC ELV = Table 3.2.1 for H1 / IPC ELV x 100 BDL Below Detectable Limit IPR Improvement Programme Req'ment
A1 (A1) *	Dimethylamine	-	-	-	10	5	Scrubber, as per A8
A2 (AA1)	Ammonia	1	15	7	10	10	BAT, scrubber, 7 Percent
A3 (AA2)	Propionic Acid	BDL	80	BDL	75 As C	10	BDL, storage vent, activated carbon
A4 (AA4)	Formic Acid	BDL	80	BDL	75 As C	10	BDL, storage vent, activated carbon
A5 (AA12)	Ammonia	BDL	15	BDL	10	10	BDL, storage vent, activated carbon
A5 (AA12)	Formic & Propionic	BDL	80	BDL	75 As C	10	BDL, storage vent, activated carbon
A6 (AA13)	Ammonia	BDL	15	BDL	10	10	BDL, storage vent, activated carbon
A6 (AA13)	Formic Acid	BDL	80	BDL	75 As C	10	BDL, storage vent, activated carbon
A7 (CA1)	Acrylamide	BDL	20	BDL	5	5	BAT, scrubber, BDL
A7 (CA1)	Acrylic Acid	1.64	20	8	-	5	8 Percent of IPC ELV, as per Acrylamide
A7 (CA1)	Ammonia	1.31	15	9	10	10	BAT, as per Amines, 9 Percent
A7 (CA1)	Sulphur Dioxide	1.3	300	<1	50-100	50	BAT, 50 for wet scrubbing, <1 Percent
A7 (CA1)	n-decane	4.63	80	6	75 As C	20	6 Percent of IPC ELV
A8 (CA2)	Formaldehyde	1.2	10	12	2 Resins	5	Scrubber, consistency, 12 Percent
A8 (CA2)	Methanol	17.7	80	22	75 As C	40	22 Percent of IPC ELV
A8 (CA2)	Dimethylamine	0.63	5	13	10	5	No change
A9 (CA3)	n-decane	BDL	80	BDL	75 As C	10	BDL, storage vent, activated carbon
A10 (FA2)	Formaldehyde	2	5	40	2 Resins	5	No change, fabric filter, consistency
A10 (FA2)	Methanol	0.7	1	70	-	1	No change, high percentage of ELV
A11 (FA3)	Ammonia	1	15	7	10	10	BAT, scrubber, 7 Percent of IPC ELV
A11 (FA3)	Formaldehyde	3.93	5	79	2 Resins	5	No change, consistency, high percentage
A11 (FA3)	Methanol	0.5	1	50	-	1	No change, high percentage
A12 (FA5)	Formaldehyde	2.6	5	52	2 Resins	5	No change, consistency, high percentage
A12 (FA5)	Methanol	2	5	40	-	5	No change, fabric filter, high percentage
A13 (FA8)	Methanol	0.026kg/hr	1.0kg/hr	3	-	0.5kg/hr	Halved, 3 percent, IPR (no abatement)
A14 (FA9)	Methanol	0.026kg/hr	1.0kg/hr	3	-	0.5kg/hr	Halved, 3 percent, IPR (no abatement)
A15 (FA12)	Formaldehyde	4.8	5	96	2 Resins	5	No change, consistency, high percentage
A15 (FA12)	Methanol	1.3	5	26	-	5	No change, scrubber, high percentage
A16 (FA15)	Formaldehyde	0.3	20	2	2 Resins	5	Consistency, 2 percent
A16 (FA15)	Methanol	9	80	11	75 As C	40	11 percent
A16 (FA15)	Nitrogen Dioxide	1.2	300	<1	50-200	50	BAT, <1 Percent
A17 (FA16)	Nitrogen Dioxide	61	200	31	50-200	150	BAT, gas fired boilers
A18 (FA24)	Formaldehyde	3.5	5	70	2	5	No change consistency, high percentage
A18 (FA24)	Methanol	7.8	20	39	-	20	No change, high percentage

Note: * No data available as a change in use resulting from additional information submitted 1 September, as follows:

'As the result of a change brought about by the decommissioning of the Ammonium Sulphate Plant originally described in the above application, the 4x 125 Te GRP storage tanks in the Ammonium Salt Bund are to be removed and will initially be replaced by 2 x 90 m³ 316 S.Steel tanks.

Furthermore, the new tanks will be used for the storage of Triazine products from the adjacent formaldehyde derivatives plant which will reduce the need to transfer them internally to the other end of the site.

The Triazine products' properties are described in the application and product specifications require no free formaldehyde be present, with a just a small excess of amine.
It is thus our intention to abate the expected very low air emission from the storage ullage with the existing acid dosed scrubber from the decommissioned ammonium salts plant (also described in the application) and this is BAT for amine emissions.

I would suggest that the scrubbed emission be designated A1 from the same emission point reference as before and that the substance monitored be Amines expressed as Dimethylamine as in emission point A8 (formerly CA2) described in the application and draft permit.

In terms of changes to information in the original application, p26 (Sec. 2.2.1) point 14 – Scrubber liquor – should now read "Phosphoric acid and Water solution" and point 16 – Treatment method – should now read "Via Site Effluent Treatment Plant."

C2.2 Permit Conditions 2.2.2.3 - 2.2.2.6 - Emissions to water (other than sewer)

With reference to Section C1.2, the outcome of the modelling work is copied below. The recommendations have been incorporated into the Permit with the exception of pH, which has been left unchanged at 6 – 8.5 (as opposed to 6 – 9).

SYNTHITE MODELLING – 6th July 2004

BACKGROUND

Current limits on permit for discharge release point FW 1 into the River Alyn at SJ 2319 6501

Parameter	Limit
PH maximum	8.5
PH minimum	6
BOD	10 mg/l
Suspended Solids	20 mg/l
Formaldehyde	0.5 mg/l
Daily volume	700 m ³
Hourly volume	30 m ³
Temperature	25°C

River Data

Flows in River Alyn at SJ 23068 65091

Mean flow = 967 l/s Q95 = 38 l/s

Summer flow = 392 l/s Q95 = 38 l/s

Winter flow = 1733 l/s Q95 = 38 l/s

Quality

No appropriate upstream data.

For BOD and ammonia – defaulted to RE 2

For Formaldehyde – 10% of the EQS

- ♦ 5 ug/l AA
- ♦ 50 ug/l MAC (95%ile)
- ♦ CoV = 1 (as per DS policy G7.4.1)

Discharge Data

Flows

Maximum hourly volume = 30000 litres

Maximum instantaneous rate calculated = 8.3 l/s

Mean flow = 8.3 l/s SD = 2.74 l/s (CoV = 0.33)

Quality

Lack of effluent discharge data. Used arbitrary figures partly based on single sample available.
More importantly calculated using agreed CoV

BOD = 0.33

Ammonia = 1.0

Formaldehyde (under DS) where limited effluent data – used CoV = 0.5

RESULTS

Based on MEAN flows

	Upstream Quality	<u>Indicative Consent Limit</u>		
		No Deterioration	10% Deterioration	To class / EQS boundary
BOD	3.25 mg/l (90%ile)	6.5 mg/l	13 mg/l	23 mg/l
Ammonia	0.43 mg/l (90%ile)	1 mg/l	2.75 mg/l	7 mg/l
Formaldehyde	0.5 ug/l AA	0.001 mg/l	0.003 mg/l	0.2 mg/l
	5 ug/l (95%ile)	0.01 mg/l	0.02 mg/l	0.6 mg/l

Based on SUMMER flows

	Upstream Quality	<u>Indicative Consent Limit</u>		
		No Deterioration	10% Deterioration	To class / EQS boundary
BOD	3.25 mg/l (90%ile)	6 mg/l	13 mg/l	20 mg/l
Ammonia	0.425 mg/l (90%ile)	1 mg/l	2 mg/l	5.75 mg/l
Formaldehyde	0.5 ug/l AA	0.001 mg/l	0.002 mg/l	0.175 mg/l
	5 ug/l (95%ile)	0.01 mg/l	0.02 mg/l	0.5 mg/l **

** this limit takes the river Alyn to the EQS boundary. However the discharge from Mold STW downstream may also contain formaldehyde, and so allowance should be made in the river for this additional loading. After discussion with Jo Evans, would propose to take the downstream impact to the midpoint of the EQS ie 25 ug/l as MAC (95%ile). This gives a consent limit of 0.27 mg/l – round down to 0.25 mg/l.

Summary

Limits based on Mean flows

- ♦ BOD 23 mg/l
- ♦ Ammonia 7 mg/l

- ◆ Formaldehyde 0.6 mg/l

Limits based on Summer flows

- ◆ BOD 20 mg/l
- ◆ Ammonia 5.75 mg/l
- ◆ Formaldehyde 0.5 mg/l

Plus

- ◆ pH 6 – 9

Conclusion

Based on the above modelling, the following conclusions have been reached

pH - This limit should be changed to a range from 6 – 9. This is the standard range used for consents, based on the Freshwater Fish Directive (FWFD). The Alyn is not a Freshwater Fish Directive stretch however it discharges into the river Dee that is designated as such.

BOD - The current limit of 10 mg/l is considered environmentally-protective

TSS - The current limit of 20 mg/l is considered environmentally-protective

Ammonia - If a limit were to be imposed, propose 5 mg/l to be environmentally-protective

Formaldehyde - The current limit of 0.5 mg/l is not considered environmentally-protective. Propose limit of 0.25 mg/l.

Temperature - The current limit of 25°C is considered environmentally-protective.

C2.3 Permit section 2.2.2.7 - 2.2.2.10 - Emissions to sewer

Refer to Section C1.2, With respect to appraising ELVs for formaldehyde and methanol it has not been possible to use the recent Agency modelling of the impact on the River Alyn of a 'poorly operating' sewerage treatment works to help determine what the future ELVs should be. Hence, the 99%tile values for 2003 have been used to give an indication of Synthite's ETP discharge to sewer capability. This has indicated that a 60% reduction in formaldehyde and methanol ELVs to 40 mg/l is a sensible position for the permit, which can be reviewed in the light of further information. The 99%tiles were 17 and 32 mg/l for formaldehyde and methanol respectively. The 99%tiles indicate that a further reduction is possible but the Agency (water) considers that Synthite may be reporting consistently low numbers though based on limited snap data indicating values of formaldehyde as high as 50 mg/l. Welsh Water are currently (week 1 - August) autosampling Synthite's discharge to sewer for formaldehyde which should confirm (or conflict with) Synthite's numbers. With respect to other parameters, the 99%tiles for ammonia and total suspended solids are at the ELVs already. Chemical oxygen demand though offers sufficient headroom to reduce from 2000 to 1500 mg/l. The grease and oil ELV has been reduced from 100 to 10 mg/l based on the 'trace' levels reported.

The 99%tile data for 2003 below is supplied by Synthite. The current modelling of the River Alyn has been included for completeness.

2003 data effluent to sewer

	pH	Formaldehyde	Methanol	Ammonia	COD	SOLIDS
MAX	7.6	26	79	24	800	396
MIN	6.5	0	0	0	125	2
AVERAGE	7.2	5.3	13	8.7	361.4	226.3
80th percentile	7	8	0	13	505	341
95th percentile	7.6	12	16	21	586	376
98th percentile	7.6	12.5	24.1	23.5	680	388
99th percentile	7.6	16.9	31.8	24	713	396

Values of ppm	Numbers less than formaldehyde	Numbers less than methanol	Numbers less than ammonia	Numbers less than COD	Numbers less than Solid	Values of ppm
1	26	114	1	0	1	10
2	9	1	0	0	1	20
4	24	0	26	0	5	40
8	41	0	49	0	11	80
12	21	1	22	0	4	100
15	1	1	9	9	15	150
20	1	2	8	11	18	200
30	1	3	9	26	23	300
50	0	1	0	28	46	400
60	0	0	0	24	0	500
70	0	0	0	20	0	600
80	0	1	0	4	0	700
90	0	0	0	2	0	800
100	0	0	0	0	0	1000
	0	0	0	0	0	

C2.4 Permit section 2.2.3 - Emissions to groundwater

There are no direct emissions to groundwater and no List I/II substances discharged to groundwater indirectly. The standard Permit conditions are set.

N.B., With reference to Section C1.2, there is the potential for the contamination of groundwater due to significant areas of unmade ground and soakaways etc.

To ensure that BAT is maintained the following criteria will be included in the improvement programme requirements e.g. review of and improvements in: containment of surface water, subsurface storage, culvert, surfacing, soakaways, bunding arrangements, lagoon integrity, spill containment, storage of hazardous materials, storage and segregation of wastes. In addition, the 7 site boreholes used to monitor groundwater depth will have environmental monitoring introduced with respect to formaldehyde.

C2.5 Permit section 2.2.6 - Odour

On consideration of the Application and from its previous knowledge of the operation of the installation, the Agency considers that the activities carried out at the installation are inherently non-odorous and the Agency therefore considers that the standard Condition 2.2.6.1 is appropriate and sufficient.

N.B., With reference to Section C1.2, no odour complaints have been received in the past two years so no extra conditions to achieve BAT are deemed necessary. Each day (Monday to Friday) a subjective assessment of odour is made around the site and boundary. This is recorded in a site environmental logbook. Records are kept of wind direction and speed, presence of any noxious odours and any background odours (e.g. farming activities).

C2.6 Permit section 2.2.7 - Emissions to land

As per C2.4

There are no direct emissions to land. The standard Permit conditions are set.

N.B., With reference to Section C1.2, there is the potential for the contamination of groundwater due to significant areas of unmade ground and soakaways etc.

To ensure that BAT is maintained the following criteria will be included in the improvement programme requirements e.g. review of and improvements in: containment of surface water, subsurface storage, culvert, surfacing, soakaways, bunding arrangements, lagoon integrity, spill containment, storage of hazardous materials, storage and segregation of wastes. In addition, the 7 site boreholes used to monitor groundwater depth will have environmental monitoring introduced with respect to formaldehyde.

C2.7 Permit section 2.9 - Noise (and vibration)

On consideration of the Application and further information provided by the Applicant and from its previous knowledge of the operation of the installation, the Agency considers that the activities carried out at the installation do not inherently generate much noise or vibration, and the Agency therefore considers that the standard condition 2.9.1 is appropriate and sufficient.

N.B., With reference to Section C1.2, no noise complaints have been received in the past two years. However, a review of noise will be undertaken to update the noise survey of 1996 as part of the improvement programme requirements.

C2.8 Permit section 2.13 - Transfer to effluent treatment plant

With reference to Section C1.2, Synthite operates the Installation's biological activated sludge ETP and accepts responsibility for the treatment of surface water from Dynea and certain segregated process effluents but only after testing and by agreement. Effluents that are not deemed acceptable are treated by a third party.

The transfers to effluent are not controlled under this part of the permit, it is the final discharge of the treated effluent that has limits controlled by the Permit (refer Section C2.3).

C3. Other BAT considerations – (where not covered in general section above)

C3.1 Permit section 2.4 - Efficient use of raw materials

The Agency has assessed the proposals set out in the Application Section 2.4.1 Raw Materials Selection and Schedule 4 Response 4, and that they are satisfactory and the standard Conditions 2.4.1.1-3 are sufficient and appropriate regard having been given to minimising their use and to ensuring that materials with the lowest practicable environmental impact are used.

C3.2 Permit section 2.5 - Waste storage and handling

The Agency considers that the Applicant has appropriate measures in place for the storage and handling of waste to prevent releases during normal operations and to minimise the potential for accidental releases. The standard Permit Conditions 2.5.1 is considered to be appropriate and sufficient for the Permit to be issued. However further requirements in respect of waste storage and handling have been included in the improvement programme.

C3.3 Permit section 2.6 - Waste recovery or disposal

The Agency has considered the proposals in the Application for the avoidance of waste production and in respect of such waste as is produced, its potential recovery. (See Sections 2.5 and 2.6 of the Application). The Agency is satisfied that the proposals show that waste production will be avoided as far as possible, and where produced will be recovered insofar as that is technically and economically possible. The Agency is further satisfied that the proposals show that the installation will be operated in such a way that waste which is unable to be recovered can be disposed of so as to avoid or reduce impact on the environment. Standard Conditions 2.6.1 – 2.6.3 (2.6.4 does not apply – receipt of waste) are considered to be appropriate and sufficient for the Permit to be issued.

The operator has not carried out a BPEO assessment of the disposal of some or all of its wastes, this is a requirement of condition 2.6.2 and is included in the improvement programme.

C3.4 Permit section 2.7 - Energy efficiency

The Agency has considered the information in the Application in respect of energy efficiency, including that for the Applicant's energy management system. (See Section 2.7 of the Application). The Agency is satisfied that at the commencement of the Permit, the installation should be operated in an energy efficient manner, and that Standard Conditions 2.7.1 – 2.7.3 are appropriate and sufficient.

The Agency has noted that this installation is subject to a Climate Change Agreement (Appendix 2.7 of Application - Copy of CCA agreement).

In respect of Condition 2.7.1, the Operator is required to report energy usage as the total natural gas used by the boilers (and fuel oil should it be used), the electricity imported from the national grid and the energy generated by the Exit Gas Boiler and through Catalytic Steam Generation.

C3.5 Permit section 2.8 - Accident prevention and control

With reference to Section C1.2 (Section 2.8 Accidents).

The Agency has considered the accident management plan submitted under Section 2.8 of the Application and considers that BAT must be reviewed with respect to 'identify the hazards' and 'assess the risks' and 'identify the techniques necessary to reduce the risks'. The company's position is clarified by Schedule 4 Response 5 'The company has a procedure for basic assessing impacts of its operations..... The company recognises that this process could be improved with respect to environmental issues and will be looking to reassess the procedures and improve the systems'. To be included in the improvement programme.

Standard Condition 2.8.1 in the Permit is appropriate and sufficient to ensure that the necessary measures will be taken to prevent accidents and to limit their consequences.

The Agency has taken into account that the site is subject to COMAH and considers that Standard Condition 2.8.1 is consistent with, and does not conflict with, any obligations on the Operator under those Regulations.

C4. Other legal requirements relevant to the determination of the Application and to the setting of ELVs and other conditions of the Permit

C4.1 Waste Management Licensing Regulations 1994

These regulations are not relevant to this Permit.

C4.2 The Conservation (Natural Habitats etc) Regulations 1994

The continued use of BAT by the Applicant in operating the installation will meet the requirements of these Regulations. Sites of interest within 10 km of the installation

- Alyn Valley Woods / Coedwigoedd Dyffryn Alun SAC (candidate).
- Deeside and Buckley Newt Sites SAC (candidate).
- Halkyn Mountain / Mynydd Helygain SAC (candidate).
- Berwyn a Mynyddoedd De Clwyd / Berwyn.
- South Clwyd Mountains SAC (candidate).
- Dee Estuary SPA, pSAC, RAMSAR (1, 5, 6).

The issues being considered under the Habitats Regulations are the emissions of Formaldehyde and Nitrogen Dioxide to air and the emissions of Formaldehyde and Ammonia to water. Refer to the following impact assessment prepared for the HR01 submission to CCW.

Impact Assessment

Emissions to Air

Application of the IPPC H1 screening tool Sections 3.3.1 and 3.3.2 were used to screen the total emissions to air as a function of process contribution (PC) as a proportion of the environment assessment level (EAL) for both long and short term effects.

Substance	Long Term				Short Term				Annual Release (Tonnes)
	PC (ug/m ³)	EAL (ug/m ³)	% PC of EAL	> 1% of EAL	PC (ug/m ³)	EAL (ug/m ³)	% PC of EAL	> 10% of EAL	
Formaldehyde	0.65	5	13.0000	Yes	15	100	15.0000	Yes	0.42599
Nitrogen Dioxide	0.424	40	1.060000	Yes	16.4	200	8.200000	No	4.5328

Those emissions with a PC<1% of EAL were not taken forward for assessment under IPPC H1 screening tool Section 3.3.3 which is used to 'identify need for detailed modelling of emissions to air'. Formaldehyde and Nitrogen dioxide qualified under this guidance, though Nitrogen Dioxide was marginal. The guidance given for application of detailed modelling was that for long term effects the predicted environmental concentration (PEC) defined as the sum of background concentration and PC should not be greater than 70% of the EAL. For short term effects the PC should not be greater than 20% of the EAL minus background.

Substance	Long Term				Short term	
	Air Bkgd conc. (ug/m3)	PC (ug/m3)	% PC of Headroom (EAL-Bkgd)	PEC (ug/m3)	% PEC of EAL	PC (ug/m3)
						% PC of Headroom (EAL-Bkgd)

Formaldehyde	2.7	0.650	28.3	3.35	67.0	15*	15.4
Nitrogen Dioxide	21	0.424	2.23	21.5	53.7	16.4	10.4
Benchmark					<70%		<20%

*14ug/m3 wrongly input, correct value 15ug/m3.

For Nitrogen Dioxide the short and long term effects are not considered significant. The modelling of Formaldehyde 'All Terrain Dispersion Model or ATDM' was independently undertaken in 1997 and generated a figure of 14ug/m3 for the PC, which compares well with H1 at 15ug/m3. The ATDM used worst case emission scenarios, which are double normal production levels. H1 is equally generous. The ATDM concluded that under worst case scenarios that the short term emission limits would not be exceeded under all weather conditions. Taking this modelling into account and the fact that the Formaldehyde emissions are within guidelines for 3.3.3, and that the nearest receptor SAC Wales Boundaries is over 3 km away (Dee Estuary over 7 km), the emissions predicted for both short and long term effects are not considered significant.

Emissions To Controlled Water and Sewer

Controlled Water

Synthite under Abstraction License No. 24/67/8/51/G (variation 2) is allowed to abstract water from two boreholes off site, with a maximum of 327m3/day being used as cooling water and the balance discharged to the River Alyn. In addition, excess surface water from the adjacent fields/ Denbigh Road is pumped via the same discharge point in the River Alyn via Parry's Ditch. The total discharge to the River Alyn is limited to 700m3/day. There is the potential for the borehole water to be contaminated with Formaldehyde and Ammonia from present/historical on site activities through surface seepage to groundwater. Application Table 2.2.2.3 states that no Formaldehyde has been detected at a detection limit of 0.05mg/l (tested weekly). Consequently, the process contribution is not considered significant against an EAL 5ug/l. Formaldehyde is used as the target molecule as it is expected to be in a much higher concentration than Ammonia. However, the potential exists for 'breakout' of these contaminants through groundwater to the River Alyn. To date there is no evidence of this but as a precautionary step the borehole discharge emission limit value for Formaldehyde is to be reduced from 0.5 to 0.25 mg/l based on modelling which indicates that this level is considered 'environmentally protective'. Again, as a precautionary measure, an 'environmentally protective' ammonia emission limit value of 5 mg/l is to be proposed.

To minimise 'breakout' from site surface water seepage through unmade ground, water is pumped out of the capped underground culvert and sent to the site effluent treatment plant. Synthite does not discharge any List I or II substances to groundwater either directly or indirectly.

Synthite is a Higher Tier COMAH site, Dynea Lower Tier and classified overall as a 'Domino' site under the Control of Major Accident Hazards Regulations 1999. In the event of a major on-site spillage incident there is the possibility albeit remote that the Dee/Dee Estuary could be affected (18.7km from site, pathway River Alyn). However, the likelihood of such an event is considered low and there is sufficient evidence to suggest that adequate controls are in place to effectively mitigate. This information is available in the COMAH Safety Report.

In summary, emissions to controlled waters are not considered significant.

Sewer

All process, cooling, surface and culvert extracted waters are treated by the on site effluent treatment plant. The plant utilises primary, secondary but not tertiary treatment. The ETP discharges under consent to the Welsh Water Mold Industrial Estate Sewerage Effluent Treatment Plant, which discharges to the River Alyn. As a precautionary measure, and in consultation with Welsh Water the emission limit value for formaldehyde to sewer is to be revised down.

C4.3 CROW

These regulations are not relevant to this Permit.

C4.4 Dangerous Substances Directive

The continued use of BAT by the Applicant in operating the installation will meet the requirements of this Directive.

N.B., The Directive applies by virtue of the mixed oxide process heat transfer fluid (70% biphenyl ether and 30% biphenyl) with biphenyl listed under Table A3.2: Statutory Environmental Quality Standards for List II Substances (Water Quality Consenting Guidance Appendices Dangerous Substances in Discharges to Surface Waters reference 46_02 V.3).

C4.5 Solvent Emissions Directive

The Solvent Emissions Directive does not apply.

C4.6 Groundwater Regulations 1998

The continued use of BAT by the applicant in operating the installation will meet the requirements of these Regulations.

There are no direct emissions to groundwater and no List I/II substances discharged to groundwater indirectly. (Refer C2.4 Emissions to Groundwater and C2.6 Emissions to Land).

C4.7 Environment Act 1995 – Section 4 (Pursuit of Sustainable Development)

The continued use of BAT by the Applicant in operating the installation will meet the requirements of this Act.

C4.8 Environment Act 1995 – Section 7 (Pursuit of Conservation Objectives)

The continued use of BAT by the Applicant in operating the installation will meet the requirements of this Act.

C4.9 Human Rights Act 1998

In discharging its duties, the Agency takes into account the implications of the Human Rights Act 1998, which implements certain parts of the European Convention on Human Rights into law in England and Wales. The Act seeks to protect individuals and companies from unjustified interference from public bodies with certain protected rights. There are a number of provisions of the Convention which have been considered in relation to this application.

Article 2 – “the right to life”

The Agency has carefully considered all the relevant data and consulted with Flintshire Local Health Board and the Food Standards Agency and has concluded that emissions from the installation do not pose a significant risk to public health.

Article 6 – “the right to a fair trial”

The Agency considers that no third party's civil rights or obligations are determined by its decision to grant the applicant a PPC permit. However, without prejudice to this view, the Agency is in any case satisfied that affected groups and individuals have had a sufficient opportunity to have their representations considered during the determination process. The Agency considered all responses up to the date of its decision.

Article 8 – “the right to respect for private and family life” and First Protocol – Article 1 “peaceful enjoyment of possessions and right not to be deprived of them except in the public interest and in accordance with the law”

The Agency considers that the operation of the installation in accordance with the conditions in the permit will not engage these Convention rights so far as the public is concerned. Without prejudice to this view, the Agency is satisfied that in issuing this PPC permit it has complied with the legal framework established in the Pollution Prevention and Control (England and Wales) Regulations 2000, which were made under the Pollution Prevention and Control Act 1999. This legislation balances the rights of an Operator to carry on their business against the public interest that this proposal is properly regulated and does not cause significant environmental harm. The Agency has carried out its statutory duty under the above Regulations in the determination of this application.

Summary

The Agency considers that there is unlikely to be any identifiable interference with Article 2, 6, 8, of First Protocol Article 1 rights as a result of this permit being granted. No other rights protected by the Human Rights Act 1998 are considered likely to be infringed by the permit, or the Agency's determination process.

The continued use of BAT by the Applicant in operating the installation will meet the requirements of this Act.

C4.10 Relevant Secretary of State Directions

There are no Secretary of State Directions made under the Pollution Prevention and Control (England and Wales) Regulations 2000, as amended, which are relevant to the determination of this application.

C5 Other conditions included in the Permit

C5.1 Permit section 1.4 - The Improvement Programme

The Improvement Conditions described below have been imposed on the Operator for the reasons given in the table below.

Ref	Requirement	Due date	Justification
1	The operator shall review the performance of the ETP including an investigation into the potential for effluent to bypass to sewer and the balancing of weak and strong liquors. The operator shall submit a report of the findings to the Agency.	31/03/05	On going investigation into high discharges of formaldehyde from Welsh Water Mold Sewerage Works to the River Alyn.
2	The operator shall re-designate the air emission points A1-A18 as per Table 2.2.1, and discharge to sewer as S1 and to surface water as W1. The operator shall submit to the Agency an updated site diagram identifying all 20 points.	31/03/05	Update of monitoring reporting requirements.
3	The operator shall undertake a study of the feasibility of abating the methanol storage tanks at points A13 and A14 (formerly FA8 and FA9). The operator shall submit a report of the findings to the Agency.	30/06/05	Sector Guidance Note IPPC S4.01 Section 2.1.2.4 BAT
4	The operator shall implement a programme of work to establish an EMS having regard to BS EN ISO14001:1996. The operator shall report to the Agency.	30/06/05	Section 2.3 BAT
5	The operator shall review the provision of MCERTS accreditation for the monitoring equipment, personnel and organisations employed for the emissions monitoring programme in condition 2.10.1 and propose a timetable for achieving this standard for any elements that are not MCERTS certified.	30/06/05	None MCERTS (S4.01 2.10.4 Monitoring Standards), not BAT, unable to meet condition 2.10.7. MCERTS requires time to implement (see 23).
6	The operator shall establish environmental competency and awareness training, to run in parallel with the development of a certified EMS. The operator shall submit a report to the Agency.	30/06/05	Section 2.3 BAT
7	The operator shall develop a series of environmental key performance indicators. These parameters will require the agreement of the Agency whereupon revised Schedules 3 & 4 will be issued.	30/06/05	Use of environmental parameters to track performance of the Installation under Section 2.1.7 and condition 4.1.3
8	The operator shall review the provision for 'identifying the hazards', 'assessing the risks' and 'identifying the techniques necessary to reduce the risks' for all activities, which impact on the environment. The operator shall submit a report of the findings to the Agency.	30/06/05	With respect to Section 2.8 Accidents, the Agency considers that BAT must be reviewed with respect to 'identify the hazards' and 'assess the risks' and 'identify the techniques necessary to reduce the risks'.
9	The operator shall undertake a review of the integrity of subsurface storage tanks and associated pipework and recommend improvements where necessary. The operator shall submit a report of the findings to the Agency.	30/09/05	Prevention of fugitives to groundwater.
10	The operator shall undertake formaldehyde emissions modelling to a 'new generation model' standard. The operator shall submit a report of the findings to the Agency for verification.	30/09/05	Last site formaldehyde emissions modelling was carried out in 1997 to standard ADTM and requires updating to validate HR01 and to determine whether off site monitoring is required.
11	The operator shall review all hazardous	30/09/05	Spill prevention particularly to

	material handling procedures and storage areas. The operator shall submit a report of the findings to the Agency.		land and potentially groundwater.
12	The operator shall develop a documented waste segregation, storage, handling and disposal system. The operator shall submit a report to the Agency.	30/09/05	Spill prevention particularly to land and potentially groundwater.
13	The operator shall review and recommend improvements to the integrity and use of the site culvert, in order to reduce potential fugitive emissions. The operator shall submit a report of the findings to the Agency.	30/09/05	Prevention of fugitives to groundwater.
14	The operator shall undertake a review and recommend improvements to all of the site surfacing and bunding arrangements. To include spill containment, 'old' lagoon integrity, containment of surface water and soakaways. The operator shall submit a report of the findings to the Agency.	31/12/05	Prevention of fugitives to groundwater.
15	The operator shall undertake a review of the connection to sealed drainage of process plant, equipment and associated areas and establish a timetable for the improvement or replacement of drainage. The operator shall submit a report of the findings to the Agency.	31/12/05	Prevention of fugitives to groundwater.
16	The operator shall undertake a review of all on/off loading activities and recommend improvements in order to identify further reductions in fugitive VOC emissions. The operator shall submit a report of the findings to the Agency.	31/03/06	Reduction in fugitive VOC emissions
17	The operator shall undertake a site noise survey to standard BS4142. The operator shall submit a report of the findings to the Agency.	31/03/06	Last noise survey was carried out in 1996 and needs to be updated (also recommended by Flintshire Local Health Authority).
18	The operator shall submit a programme and timetable to the Agency for the decommissioning of equipment identified in section 2.11 of the Application as the redundant Total Oxidation Formaldehyde Plant and Agricultural Products storage tanks and any associated equipment.	31/03/06	Potential for pollution incidents.
19	The operator shall re-route the tanker loading emissions of formalin from point A15 (formerly FA12) through to the Exit Gas Boiler. The operator shall submit a report to the Agency.	31/03/06	Can use the emissions as fuel and eliminates the need to wet scrub
20	The operator shall develop a programme and timetable for the introduction of continuous monitoring of VOC emissions to air for the Silver and Mixed Oxide formaldehyde plants (at stack emission points A16 and A18). The operator shall submit a report of the findings to the Agency.	30/06/06	None Indicative BAT under Section 2.10.1 S4.01 (abatement plant performance).
21	The operator shall attain a third party certified EMS having regard to BS EN ISO14001:1996	31/12/06	Section 2.3 BAT

C5.2 Permit section 1.6 - Pre-operational conditions

The Agency considers that the circumstances do not require the imposition of any pre-operational Conditions. This is an existing installation.

C5.3 Permit section 1.7 - Off-site Conditions (including Off-site monitoring)

An off-site Condition has been imposed in order to monitor the downstream formaldehyde level and pH in the River Alyn at monitoring point SJ 2363 6487 as per Table 2.10.1 (prior to the discharge from Welsh Water Mold Sewerage Treatment Works).

C5.4 Permit section 2.10 - On-site monitoring

The Agency has decided that emissions monitoring should be carried out for the parameters listed in Tables 2.2.2, 2.2.5 and 2.2.8, using the methods and to the frequencies it has specified in those Tables. (See Condition 2.10.1.) These monitoring requirements have been imposed in order to ensure satisfactory operation of the processes including abatement equipment and demonstrate that emissions have an insignificant impact on the environment.

In addition, environmental and other monitoring requirements have been set by the Agency in Condition 2.10.2 (see also C5.3) to maintain an on – going programme of monitoring the local water courses and groundwater to ensure that Synthite's operations have no impact on the surrounding aquatic environment.

Monitoring to be undertaken by Synthite. Synthite is not currently MCERTS accredited and thus not able to meet condition 2.10.7 on issue of permit. MCERTS accreditation is subject to an improvement programme requirement in order to give the operator time to implement a programme (refer C1.2).

Although it is not generally considered BAT to use Gastec tubes for compliance monitoring, as all such monitoring is subject to improvement conditions requiring MCERTS, then it is considered site specific BAT to retain use of tubes until then. This will mean monitoring methods are only changed once and comparisons with previous monitoring results can continue until then.

C5.5 Permit section 3. - Records

The Agency considers that the standard condition requirements are appropriate and sufficient for the Permit.

C5.6 Permit section 4. - Reporting

The Agency considers that the standard condition requirements are appropriate and sufficient for the Permit.

C5.7 Permit section 5. - Notifications

The Agency considers that the standard condition requirements are appropriate and sufficient for the Permit.

C6. Other principal considerations taken into account in the determination process

C6.1 Significant releases to air for the chemical industry

The installation has not been identified as a significant contributor

C6.2 Substances of Potential Environmental Significance

Acrylic acid was identified as a substance requiring consideration. However, as the material is stored in 200 kg drums the total quantity of 25 tonnes raw material inventory becomes less significant with respect to potential environmental harm (inventory supplied under Schedule 4 Response 4).

C6.3 Direct Toxicity Assessment

A direct toxicity assessment was not deemed necessary.

APPENDIX – Consultee responses

Summary of consultation responses received and the way in which they have been taken in to account in the determination process:

Response received from consultees	Brief summary of issues raised	Summary of actions taken or show how this has been covered
Countryside Council for Wales	Requested HR01 including Dee Estuary. Accepting that 'unlikely to impact directly'. a). Requested copy of AEA Technology Ltd Report 1996. b). – f). Questions generally regarding flooding and containment of contaminated waste/open storage of Agricultural products, drainage of culvert, effectiveness of barrier wall to prevent run off, and use of 'old lagoon'. g). Recommendation for site survey work to establish further areas of historical and recent contamination.	HR01 submitted. Copy of report sent. Issues duly considered during Determination, formulation of the Improvement Programme and HR01. Refer to response letter dated 10 August 2004. Issue for SPMP.
Welsh Assembly Government	Typing error on page 102 of Application (Dynea). a). Requested copies of Appendix 4 site drainage and activity plans (omitted from Application). b). Table 1 page 25 of Babbie Phase 1 Report Headed Main Containment Groups and Probable locations – Textile Works and Dye Works. Q: Is it really considered likely that anthrax spores might be found in some locations on this site when past history of the site was a cotton mill followed by a tinplate works?	Refer to response letter dated 18 August 2004.
Flintshire Local Health Board	Recommendations -EMS should include awareness & competency. -Repeat noise survey. -Off site monitoring for formaldehyde to confirm predicted modelled results.	Issues duly considered during Determination, Improvement Programme and HR01. To repeat noise survey to BS4142 and BAT. To repeat dispersion modelling to ADMS 3.1 then consider if external monitoring is warranted.

