

## Permitting Decisions- Bespoke Permit

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We have decided to grant the permit for Units 1-3 Jubilee Site operated by Duvelco Limited.

The permit number is EPR/WP3406BP.

The application is for a new bespoke polymer production facility with integrated recovery and re-use of solvents used in the process. The permit allows the operator to produce up to 95 tonnes per annum of polyimide polymers using batch processing.

We consider in reaching that decision we have taken into account all relevant considerations and legal requirements and that the permit will ensure that the appropriate level of environmental protection is provided.

### **Purpose of this document**

This decision document provides a record of the decision making process. It summarises the decision-making process to show how the main relevant factors have been taken into account.

Unless the decision document specifies otherwise we have accepted the applicant's proposals.

Read the permitting decisions in conjunction with the environmental permit.

### **Decision considerations**

#### **Confidential information**

A claim for commercial or industrial confidentiality has been made by the applicant. This claim has been made by the applicant.

We have accepted the claim for confidentiality.

The decision was taken in accordance with our guidance on confidentiality.

#### **Identifying confidential information**

We have not identified any other information provided as part of the application that we consider to be confidential.

The decision was taken in accordance with our guidance on confidentiality.

## **Consultation**

The consultation requirements were identified in accordance with the Environmental Permitting (England and Wales) Regulations (2016) and our public participation statement.

The application was publicised on the GOV.UK website. No responses were received.

We consulted the following organisations:

- Health and Safety Executive (HSE)
- Local Authority – Environmental Health

No responses were received.

## **Operator**

We are satisfied that the applicant (now the operator) is the person who will have control over the operation of the facility after the grant of the permit. The decision was taken in accordance with our guidance on legal operator for environmental permits.

## **The regulated facility**

We considered the extent and nature of the facility at the site in accordance with RGN2 'Understanding the meaning of regulated facility', Appendix 2 of RGN2 'Defining the scope of the installation' and Appendix 1 of RGN 2 'Interpretation of Schedule 1'.

The extent of the facility is defined in the site plan and in the permit. The activities are defined in table S1.1 of the permit.

During the Duly Making stage of the application assessment, we required the applicant (now the operator) to revise their original application to describe the proposed solvent recovery process as the following activity listed in Schedule 1 of the EPR:

- Section 5.3 Part A(1)(a)(v) Disposal or recovery of hazardous waste with a capacity exceeding 10 tonnes per day involving -solvent reclamation or regeneration

We made this decision based on:

- the limited description of the solvent recovery process in the original application documents;

- our observation that this process did not appear to be integrated with the batch production of polymers; and,
- the operator's confirmation that the proposed capacity of the process exceeds the threshold of 10 tonnes per day for consideration as a S5.3 hazardous waste activity.

We required the operator to submit details of operating techniques and provide assessments of these operating techniques against the following standards for BAT (Best Available Techniques) for waste treatment:

- the European BREF (BAT Reference Document) for Waste Treatment (WT BREF) and the associated BAT Conclusions for Waste Treatment (2018) (BATc WT); and,
- our Sector Guidance Note SGN 5.06 for the Recovery and Disposal of Hazardous and Non-hazardous Waste.

We also advised the operator to take into consideration the standards for BAT set out in the draft 2019 European BREF for Common Waste Gas Management and Treatment Systems in the Chemical Sector (WGC BREF).

We reviewed the operator's assessments and were satisfied that the proposed techniques met the aforementioned standards for BAT.

During the determination process, the operator developed and added more detail to the design of the facility including the design of the solvent recovery process. It became apparent to us that the proposed solvent recovery process is integrated with the batch production of polymers. The operator's responses to two Schedule 5 Notices issued 04/11/2020 and 15/12/2020 confirmed the integrated nature of the solvent recovery process through the following descriptions:

- direct feed pipelines take used solvent from the polymer production process to the two used solvent holding tanks;
- direct feed pipelines take used solvent from the holding tanks to the solvent recovery plant distillation units;
- the pumps which feed used solvent to the distillation units pumps are controlled by pumps installed in the used solvent holding tanks;
- the distillation units are operated in continuous mode through management of the used solvent feed rate from the used solvent holding tanks; and,
- the distillation unit is operated to manage the supply of recovered solvent to top-up the solvent feed tanks for the polymer production process.

We are satisfied that the proposed design and operation of the solvent recovery process is such that we can regard it as integrated to the polymer production process. We agree with the operator that the residues from the distillation process are waste and accept that the operator does not regard the unprocessed used solvent as waste.

We have decided that the solvent recovery activity is not a hazardous waste treatment activity and is a directly associated activity (DAA) to the polymer production activity.

The operator has committed to operate the solvent recovery activity to ensure emissions are minimised and meet standards equivalent to those set out in the BATc WT, SGN5.06 and the draft 2019 WGC BREF.

We are satisfied that the permitted activities do not meet the criteria to be considered a Solvent Emission Activity as defined in Schedule 14 of the EPR.

We are satisfied that the maximum quantities of hazardous substances permitted to be stored and used on the installation do not exceed the relevant thresholds for the installation to be considered a Tier 1 or Tier 2 site under the Control of Major Accident Hazards (COMAH) Regulations 2015.

## **The site**

The operator has provided plans which we consider to be satisfactory.

These show the extent of the site of the facility including the discharge points.

The plan is included in the permit.

## **Site condition report**

The operator has provided a description of the condition of the site, which we consider is satisfactory. The decision was taken in accordance with our guidance on site condition reports and baseline reporting under the Industrial Emissions Directive.

## **Nature conservation, landscape, heritage and protected species and habitat designations**

We have checked the location of the application to assess if it is within the screening distances we consider relevant for impacts on nature conservation, landscape, heritage and protected species and habitat designations. The application is within our screening distances for these designations.

There are no designated habitats directive sites within 10 km of the installation and no Sites of Special Scientific Interest (SSSI) located within 2 km of the installation. There are five Local Wildlife Sites (LWS) and one Local Nature Reserve (LNR) within 2 km of the site:

- Manorfields Pools & Trentside (LWS)
- Berryhill Ponds (LWS)
- Sneyd Green Meadows (LWS)

- Cromer Road (LWS)
- Berryhill Fields (LWS)
- Berryhill Fields (LNR)

The nearest site is Berryhill Ponds LWS with nearest approach 170 m southeast of the installation.

We have assessed the application and its potential to affect sites of nature conservation, landscape, heritage and protected species and habitat designations identified in the nature conservation screening report as part of the permitting process.

We consider that the application will not affect any site of nature conservation, landscape and heritage, and/or protected species or habitats identified.

We have not consulted Natural England.

The decision was taken in accordance with our guidance.

## **Environmental risk**

The operator's risk assessment is unsatisfactory and required additional Environment Agency assessment.

The operator has specifically committed to meeting the draft 2019 WGC BREF limit of 20 mg/m<sup>3</sup> for channelled emissions of total volatile organic carbon (TVOC) to air from the main process emission point A1. This limit is more stringent than the equivalent limit for waste treatment activities set out in the BATc WT of 30 mg/m<sup>3</sup>. We have included this limit in the permit as the operator has demonstrated that this is BAT for their facility.

The operator performed an assessment of emissions of the two Class B volatile organic compounds to be used as solvents in the polymer production activity. The solvents are used in the process and for cleaning the reaction vessels and are recovered for reuse using vacuum distillation technology within the integrated solvent recovery plant.

The operator's assessment used two worst case homologue substances to represent Solvent A and Solvent B in order to protect the commercial confidentiality of their production process. The homologues used were propan-2-ol to represent Solvent A and benzene to represent Solvent B.

We reviewed the operator's assessment and agreed that the homologues used in their assessment represent satisfactory worst case substitutes for the intrinsically low hazard Class B volatile organic compounds which will be used.

The operator’s assessment took into account likely worst case emission levels of each substance taking into account:

- the nature of the abatement plant (low temperature condensation followed by aqueous scrubbing and activated carbon); and,
- their commitment to meet the BAT-AEL for TVOC of 20 mg/m<sup>3</sup> in the draft 2019 WGC BREF.

The operator assessed Solvent A and Solvent B emissions at concentrations of 25 mg/m<sup>3</sup> and 2.8 mg/m<sup>3</sup> respectively which is equivalent to a TVOC of 17.6 mg/m<sup>3</sup> for the homologue substances. The operator’s assessment shows that emissions of Solvent A screen out as insignificant and emissions of Solvent B, whilst not insignificant, do not risk breaching air quality standards and require no further assessment.

The operator’s assessment did not take into account the worst worst case that either solvent may be emitted at the TVOC emission limit of 20 mg/m<sup>3</sup>. We therefore performed our own assessment of emissions at the permit TVOC emission limit.

In performing our assessment we used our published environmental assessment levels (EALs) for the actual substances and assumed the worst worst case emission of each substance at the TVOC limit of 20 mg/m<sup>3</sup>.

We used our H1 tool to perform this assessment using the methodology and our significance criteria for screening emissions as set out in our online guidance available from this link: [https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit\(17/12/2020\)](https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit(17/12/2020)). We have calculated the following long-term (LT) and short-term (ST) process contributions (PCs) and predicted environmental concentrations (PECs) as a percentage of the relevant environmental assessment levels (EALs) or headroom (assuming worst case background concentration is 50% of LT EAL).

To maintain confidentiality with respect to the identification of the two solvents we have presented the output of our assessment below without detailing the specific input data.

Table 1: Air Impacts H1 Stage 1 Screening Results

Solvent	LT PC as % of EAL	Does LT PC as % EAL exceed 1%	ST PC as % of EAL	Does ST PC as % EAL exceed 10%
A	<1	No	<10	No
B	<3	<b>Yes</b>	<10	No

Table 2: Air Impacts H1 Stage 2 Screening Results

Solvent	LT PEC as % of EAL	Does LT PEC as % EAL equal or exceed 70%	ST PC as % of headroom	Does ST PC as % headroom equal or exceed 20%
B	<60	No	<10	No

Our assessment demonstrates that at the TVOC emission limit of 20 mg/m<sup>3</sup>, emissions of solvent A screen out as insignificant and emissions of solvent B, whilst not insignificant, are unlikely to cause significant impact and do not require further assessment.

The assessment shows that, applying the conservative criteria in our guidance on environmental risk assessment all emissions may be screened out as environmentally insignificant with the exception of Solvent B.

## General operating techniques

We have reviewed the techniques used by the operator and compared these with the relevant guidance notes and we consider them to represent appropriate techniques for the facility.

The operating techniques that the applicant must use are specified in table S1.2 in the environmental permit.

## Operating techniques for emissions that do not screen out as insignificant

Emissions of one of the two Class B volatile organic compounds (category 2 flammable liquids) used as a solvent (Solvent B) cannot be screened out as insignificant when assessed at the ELV for TVOC set in the permit (20 mg/m<sup>3</sup>). We have assessed whether the proposed techniques are Best Available Techniques (BAT).

The operating techniques proposed to minimise emissions of TVOC from the installation are described in the following paragraphs.

The two Class B volatile organic compounds are stored in enclosed corrosion resistant stainless steel self bunded storage tanks (110% individual bund volume) with total maximum storage capacity 20 tonnes. The solvent storage tanks are filled with dip pipes to reduce excessive splashing and vapour generation. The tanks are also fitted with pressure relief valves rated to 56 mbar. Fumes are vented from the pressure relief valves to the facility exhaust emissions abatement

system. The solvent storage tanks are located in an ATEX zone with a leak detection system installed to detect any vapour leaks via Photoionization detector set to trigger an alarm if 10 % of LEL is exceeded. Storage tanks are fitted with overpressure alarms and are fitted with a closed loop vapour balancing system to minimise losses during the transfer of liquids. Tank connections are all welded and a planned preventative maintenance schedule is in place to identify potential losses of integrity. The storage tanks are located inside the factory and have barrier protection to prevent the possibility of impact.

The polymer production process is designed to prevent and minimise all emissions during normal and abnormal operations. The reaction vessels and transfer lines for the VOCs used are closed. Heating of the reaction vessels during the batch production process has the potential for over pressurisation. The applicant has described techniques to manage and minimise this risk including process design and process monitoring and control, including:

- vessels are fitted with pressure relief valves venting to the facility exhaust abatement system;
- solvent transfer lines are vented to the solvent storage tanks which are vented to the facility exhaust abatement system; and,
- localised extraction system routes process area air through the facility exhaust system.

Used Class B VOC solvents are transferred by way of closed loop lines to two used solvent storage tanks with a maximum 5 tonnes capacity for each tank. Used solvent is transferred by pump and closed lines from the used solvent storage tanks to the solvent recovery distillation units at a controlled rate to facilitate operation of the solvent recovery process in continuous mode. The vents of the used solvent storage tanks and transfer lines are into the facility exhaust abatement system.

Recovered solvent is returned by closed loop vented lines to the solvent storage tanks for re-use in the polymer production process. The lines are vented to the solvent storage tanks.

The integrated solvent recovery process is a continuous distillation process, consisting of two 1,200 litre vacuum distillation units. The process has a total capacity of 20 tonnes per 24 hours period and maximum annual processing capacity 2,800 tonnes, to recover solvents for re-use in the polymer production process. The permit limits the quantity of used solvent stored pending recovery to 10 tonnes at any one time as proposed by the operator. The solvent recovery distillation units are fully enclosed and any solvent fumes, including from vacuum pump emissions, are captured by cryogenic traps /condensation. Any excess and fugitive solvent emissions are collected by local exhaust ventilation hoods and routed to the facility exhaust abatement system.



Used solvent which is unsuitable for recovery on-site is stored as waste solvent in a bund within the building process area pending collection for off-site disposal/recovery. Residues from the solvent recovery process are included with this solvent waste inventory. The permit limits the maximum capacity for storage of waste solvent pending collection to 3,000 litres as proposed by the operator.

All process areas, including solvent storage, used solvent, solvent waste and other waste storage and materials handling areas are within the area of the factory building which is maintained under negative pressure during operational hours. Emissions to air from the reactors, the solvent reclamation plant, the solvent storage tanks, and the process area building air are abated in the facility exhaust abatement system before release from a single stack. Abatement is by wet scrubbing, using acidified water, followed by active carbon filtration to ensure emissions meet the permit emission limit value (ELV) for TVOC of 20 mg/m<sup>3</sup> which is equivalent to a total mass release of 0.212 kg/hour of total Class B VOCs (expressed as carbon).

The operator has committed to continuously monitoring the performance of the facility exhaust abatement system using infrared sensors located in the exhaust from the system. We have included this performance monitoring as a requirement within the permit.

In view of the nature of some of the raw materials used in polyimide production there is a risk that even low levels of emissions could be odorous. To minimise the risk of causing pollution from odour the permit requires the operator to manage the facility to the Odour Management Plan submitted with the application. This plan is included as an operating technique in Table S1.2 of the permit. Operating to the requirements of the Odour Management Plan adds additional controls to ensure the emissions of VOCs during normal operations remain below the ELV for TVOC.

The proposed techniques/ emission levels for emissions that do not screen out as insignificant are in line with the techniques and benchmark levels contained in the technical guidance and we consider them to represent appropriate techniques for the facility. The permit conditions enable compliance with relevant BAT reference documents (BREFs) and BAT Conclusions, and Emission Limit Values (ELVs) deliver compliance with BAT-Associated Emission Levels (AELs).

## **Operating techniques for emissions that screen out as insignificant**

Emissions of noise and one of the two Class B volatile organic compounds used as a solvent (Solvent A) have been screened out as insignificant, and so we agree that the applicant's proposed techniques are Best Available Techniques (BAT) for the installation.

We consider that the emission limits included in the installation permit reflect the BAT for the sector.

## **National Air Pollution Control Programme**

We have considered the National Air Pollution Control Programme as required by the National Emissions Ceilings Regulations 2018. By setting emission limit values in line with technical guidance we are minimising emissions to air. This will aid the delivery of national air quality targets. We do not consider that we need to include any additional conditions in this permit.

## **Odour management**

We have reviewed the odour management plan in accordance with our guidance on odour management.

We consider that the odour management plan is satisfactory and we approve this plan.

We have approved the odour management plan as we consider it to be appropriate measures based on information available to us at the current time. The applicant should not take our approval of this plan to mean that the measures in the plan are considered to cover every circumstance throughout the life of the permit.

The applicant should keep the plans under constant review and revise them annually or if necessary sooner if there have been complaints arising from operations on site or if circumstances change. This is in accordance with our guidance 'Control and monitor emissions for your environmental permit'.

The plan has been incorporated into the operating techniques S1.2.

## **Pre-operational conditions**

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

We have imposed pre-operational measure 1 requiring the operator to submit a commissioning plan to us for approval to ensure we understand the extent, duration and the potential emissions of the commissioning process.

We have imposed pre-operational measure 2 requiring the operator to validate the key assumptions made in the assessment of emissions to air for the facility. We have imposed this measure because the projected emissions concentrations are based on the assumptions that the techniques described in the application can limit emissions to these levels. We are satisfied that the techniques described will ensure the predicted levels are achievable however we have required the operator to deliver a validation report and to perform this validation

during commissioning. Including this pre-operational measure in the permit will ensure that the emissions to air associated with operating the facility are at levels which are insignificant with respect to the potential for impacts on human health and ecological receptors within our screening distances.

## **Improvement programme**

Based on the information on the application, we consider that we need to include an improvement programme.

We have imposed an improvement programme to ensure that the frequency of emissions monitoring continues to reflect BAT standards for this installation.

We have included an improvement condition in the permit (IC1) to allow the operator to justify a reduction in the frequency of monitoring emissions to air from the facility exhaust abatement system (stack reference A1). We anticipate that over the first 18 months of operation the operator will collate adequate MCERTS standard monitoring data to

- confirm that emissions are at or below the levels assessed in their H1 risk assessment;
- corroborate the reliability of the performance monitoring associated with the facilities exhaust abatement system in order to justify use of this method as a surrogate monitoring method; and
- to confirm the stability of emissions.

We anticipate that the collated data may be adequate for the operator to make a case to justify reducing the monitoring frequency in line with the standards for BAT for monitoring of TVOC emissions specified in the draft 2019 WGC BREF.

## **Emission Limits**

Emission Limit Values (ELVs) and/or equivalent parameters or technical measures based on Best Available Techniques (BAT) have been added for the following substances:

- TVOC; and,
- oil and grease.

The ELV for TVOC has been added for the abated emissions to air from the facility exhaust abatement system (stack reference point A1). Abated emissions from this source arise from all processes, storage/holding tanks, pressure relief valves (PRVs) and local exhaust ventilation (LEV) from all areas of negative pressure. The ELV set is described below:

- 20 mg/m<sup>3</sup>.

This is the BAT achievable emission limit (BAT-AEL) for TVOC of 20 mg/m<sup>3</sup> in the draft 2019 WGC BREF. This ELV has been applied without reference to the mass flow emission threshold of 200 g/h allowed in the draft 2019 WGC BREF as the operator has designed the polymer production process, the solvent recovery process and the facility exhaust abatement system to meet this limit. We have also taken into consideration that emissions of the Class B solvents at or below the mass flow emission threshold of 200 g/h may risk odour pollution. The ELV for TVOC set is more stringent than the equivalent BAT-AEL for waste solvent reclamation in the 2018 BAT Conclusions for Waste Treatment and is also more stringent than the benchmark emission limit for Class B VOCs set in our additional guidance for the chemicals sector:

- EPR 4.01 Guidance for the Production of Large Volume Inorganic Chemicals; and,
- EPR 4.02 Speciality Organic Chemicals Sector.

We have made this decision to ensure that emissions from normal operation of the facility do not risk significant impact on air quality, amenity, human health and protected ecological receptors.

The ELV for oil and grease has been added for the discharge of surface water to the Clean Surface Water Sewer (emission reference point W1) arising from surface waters collected in the yard area. It is considered that the descriptive limit described below will prevent significant deterioration of receiving waters:

- none visible.

We have set this ELV as there is the potential for contamination of surface waters in the yard area arising from leaks of fuel or oils from vehicle movements in this area. We consider that the visual inspection of the emissions from the on-site attenuation tank to the surface water drainage system (which is upstream of a further off-site attenuation tank and associated interceptor) is adequate to ensure emissions of hydrocarbon oil meet the benchmark value of 1-3 mg/l specified in our sector guidance for the chemicals sector (EPR 4.01 and EPR 4.02) for emissions to water.

## **Monitoring**

We have decided that monitoring should be carried out for the parameters listed in the permit, using the methods detailed and to the frequencies specified.

These monitoring requirements have been included in order to ensure the effectiveness of operational techniques to control, minimise and abate emissions to levels which are not likely to cause significant effect or are insignificant.

We made these decisions in accordance with the monitoring requirements set out in the draft 2019 WGC BREF, our sector guidance for the chemicals sector (EPR 4.01 and EPR 4.02), our monitoring and certification scheme (MCERTS) and our standards for monitoring stack emissions: techniques for periodic monitoring available from: <https://www.gov.uk/government/publications/monitoring-stack-emissions-techniques-and-standards-for-periodic-monitoring/monitoring-stack-emissions-techniques-and-standards-for-periodic-monitoring>.

Based on the information in the application we are not fully satisfied that the operator's techniques, personnel and equipment have either MCERTS certification or MCERTS accreditation as appropriate. This is not an issue as the operator proposes to sub-contract periodic monitoring of stack emissions and the permit requires that this monitoring is performed to MCERTS standards.

## Reporting

We have specified reporting in the permit.

We have required annual reporting of emissions to air from the facility exhaust abatement system stack (emissions source reference A1). Annual reporting of emissions to air is the normal reporting frequency set out in our permit template for the chemicals sector.

We have required six monthly reporting of emissions to water from the yard area surface water discharge reference W1. Six monthly reporting of discharges to water is the normal reporting frequency set out in our permit template for the chemicals sector.

We have required reporting of the following production and performance parameters annually:

- production of polyimide polymers;
- water usage;
- energy usage;
- total raw material used and,
- total solvent consumption (with solvent consumption as defined in Article 57 of the Industrial Emissions Directive as read in accordance with Schedule 1A to the Environmental Permitting (England and Wales) Regulations 2016).

Annual reporting of these parameters is the normal reporting frequency set out in our permit template for the chemicals sector.

We made these decisions in accordance with our sector guidance for the chemicals sector (EPR 4.01 and EPR 4.02).

## **Management System**

We are not aware of any reason to consider that the operator will not have the management system to enable it to comply with the permit conditions.

The decision was taken in accordance with the guidance on operator competence and how to develop a management system for environmental permits.

## **Financial competence**

There is no known reason to consider that the operator will not be financially able to comply with the permit conditions.

## **Growth duty**

We have considered our duty to have regard to the desirability of promoting economic growth set out in section 108(1) of the Deregulation Act 2015 and the guidance issued under section 110 of that Act in deciding whether to grant this permit.

Paragraph 1.3 of the guidance says:

“The primary role of regulators, in delivering regulation, is to achieve the regulatory outcomes for which they are responsible. For a number of regulators, these regulatory outcomes include an explicit reference to development or growth. The growth duty establishes economic growth as a factor that all specified regulators should have regard to, alongside the delivery of the protections set out in the relevant legislation.”

We have addressed the legislative requirements and environmental standards to be set for this operation in the body of the decision document above. The guidance is clear at paragraph 1.5 that the growth duty does not legitimise non-compliance and its purpose is not to achieve or pursue economic growth at the expense of necessary protections.

We consider the requirements and standards we have set in this permit are reasonable and necessary to avoid a risk of an unacceptable level of pollution. This also promotes growth amongst legitimate operators because the standards applied to the operator are consistent across businesses in this sector and have been set to achieve the required legislative standards.