

## Permitting Decisions- Bespoke Permit

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We have decided to grant the permit for Polynt Composites UK Limited operated by Polynt Composites UK Limited.

The permit number is EPR/NP3807SA.

Polynt Composites UK Limited manufactures potassium 2-ethylhexanoate in isopropanol (KEH in IPA) at its sister facility in Leek. The Stallingborough facility is being permitted as a backup facility in the event that the Leek facility is inoperable. Under normal circumstances the Stallingborough facility is anticipated to operate only to produce a single validation batch (equivalent to 40-60 hours of operation) of KEH in IPA once every 3 years.

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 in the [decision considerations](#) section to show how the main relevant factors have been taken into account
- highlights [key issues](#) in the determination
- shows how we have considered the [consultation responses](#).

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

Read the permitting decisions in conjunction with the environmental permit.

## Key issues of the decision

We have reviewed the measures proposed by the operator and compared them against the indicative best available techniques (BAT) set out in our sector guidance, How to comply with your environmental permit, additional guidance for: Speciality Organic Chemicals Sector (EPR 4.02). A summary of the key operating techniques is provided below. Unless stated otherwise, we are satisfied that these measures represent BAT for the installation.

The site will be operated in accordance with the operator's Environmental Management System (EMS) that includes policies, management principles, organisational structure, responsibilities, standards and procedures, process controls and resources required to manage environmental protection across all aspects of the business. The operator anticipates seeking ISO 14001 accreditation within 12 months of the site becoming operational.

### Process description

A 22m<sup>3</sup> reactor vessel, heated by a gas-fired steam boiler is located within the designated process building. As the process is anticipated to be operated infrequently, the boiler will be sourced and brought onto site when needed. The rated thermal input of the boiler will be approximately 1.5MWth.

Isopropyl alcohol and 2-ethylhexanoic acid are pumped from IBCs using a semi-closed system to the vessel. Potassium carbonate in 25kg bags is loaded using a bag tip station with a powder screw conveyor, which enables the vessel lid to remain in situ.

The process benefits from a dedicated Process Logical Controller (PLC) control system that controls, monitors and reports the status of the plant to the site operators in the central control room. The PLC enables satisfactory start-up, normal operations, normal shutdown, the identification of abnormal operations and facilitates emergency shutdown in a safe and efficient manner.

A number of sensors are in place to inform the operator the plant is operating at optimal levels or to alert of conditions outside of configured set-points. Temperature is continuously monitored and the flow stops if low temperature in the vessel is reached.

The vessel is heated to promote the reaction and cooled using a single pass cooling system coil on the external wall of the reactor. The operator confirmed in their 02/08/2022 Schedule 5 response that no chemicals, such as scale inhibitors are added to the cooling water.

The air from the vessel is recirculated back to the reactor via a condenser. There is a separate closed loop cooling system on the condenser, connected to a glycol/water chiller unit.

During the process, aqueous isopropanol is removed to a 3m<sup>3</sup> receiving vessel. Emissions from the condenser and receiver pass through a carbon filter to minimise volatile organic compounds and associated odour emissions prior to release to the atmosphere.

When the reaction is complete, the product is tested and corrected with fresh isopropanol prior to circulation through a filter and discharged to a road tanker for transfer off-site.

Due to the anticipated infrequent operation of the plant at the site the majority of raw material will be stored at the operator's sister site at Leek, where processing occurs routinely. Raw materials for the test batch will be brought to the site when needed for the purpose of validation batch processing. Process wastes are transferred to IBCs and disposed of at a suitably permitted facility.

Once processing is complete, the reactor is washed out with water. All wash out effluent is pumped to IBCs and disposed of off-site.

There are no emissions to land or sewer. Uncontaminated cooling water and surface water run-off are passed through the main interceptor on site before being discharged via emission point W1, to a lagoon located on the neighbouring site, by agreement with the operator Tronox. This lagoon ultimately discharges to the Humber Estuary.

#### Operational and storage areas: surfacing, drainage and containment

In their 02/08/2022 Schedule 5 response, the operator confirmed that there is no secondary containment at the installation that complies with CIRIA 736. We therefore do not agree that the surfacing, drainage and containment arrangements for the storage areas and reactor area constitute BAT.

We have therefore included pre-operational condition 1 in Table S1.4 of the permit that requires the operator, prior to the commencement of operations, to submit a written report to the Environment Agency for approval, which includes the specification of infrastructure for all storage (raw materials and wastes) and processing areas, including surfacing, containment and drainage.

The quantity of raw materials stored under expected circumstances correlates to the quantity needed to process one validation batch and the anticipated infrequent use (once every 3 years).

#### Operating procedures relating to frequency of use

The plant at Stallingborough has been designed to replicate the operator's process at Leek. The plant control system is programmed to follow a set process step sequence that sets all process parameters and ensures associated safety conditions are followed.

The reactor, pipework and associated components, including the condenser and receiver, are constructed of stainless steel, designed for the pressure and temperature of the process, protected by a pressure relief valve and bursting disc, with a double mechanical seal on the reactor agitator.

Process equipment, such as high level protection, emergency-stops and pressure relief valves, are added to the operator's existing planned maintenance schedule for the site. This includes weekly inspections and testing and calibration in accordance with manufacturer's recommendations (at least annually). Rotating equipment and actuated valves will be maintained on a quarterly basis. Where deemed necessary, any planned maintenance will be brought forward or additional remedial or repair works undertaken.

Operating procedures will be developed specifically for the Stallingborough site based on the procedures already in place at Leek. Four technically competent staff from the Leek site, who routinely operate the plant for KEH in IPA production, will be brought to Stallingborough site to operate the plant in two shifts while the test batch is run over a 40-60 hour period. Training schedules include a training exercise prior to each three yearly test batch.

Due to the infrequency of operation, each test batch will be considered to be a recommissioning process under the close supervision of engineering and production staff. A water test will be carried out on the pumps and process system, to verify that the equipment is working as expected, a week prior to the commencement of a planned test batch.

Our guidance states that if operations have stopped for more than 12 months the Environment Agency needs to review activities before they can restart, for example to check the activity meets BAT. We have therefore included pre-operational condition 2, that applies if the plant is not operated for more than 12 months, and requires the operator, to submit a report that demonstrates the operation meets BAT. Table S4.3 also requires the operator to record annual hours of operation.

If the facility is required to operate as a contingency, the batch cycle is 40-60 hours, therefore the plant would operate 24 hours a day continuously during weekdays.

### Air emissions

For the purpose of this permit application, the operator initially followed the H1 screening procedure for the assessment of impacts of emissions of volatile organic compounds (VOC) and particulates (PM). The assessment was based on 40 hours operation per year (i.e. the test batch). The assessment did not take account of the emissions from the boiler. The assessment indicated that the predicted short-term impacts from emissions of VOCs could not be screened out. The short-term PC was predicted to be more than 20% of the short term

Environmental Standard (ES) minus twice the long term background concentration, which indicates that detailed modelling is required.

Following discussions with the Environment Agency, the applicant subsequently carried out detailed air dispersion modelling and impact assessment to assess the predicted impacts on human receptors (for example dwellings, work places and parks) and ecological sites, as appropriate, in line with the Environment Agency's guidance, Air emissions risk assessment for your environmental permit. The assessment is detailed in document Polynt Composites, Environmental Permit Application, Air Emissions Risk Assessment, reference 410.12276.00001, Version 0.1, June 2022. Emissions data for the assessment were obtained from periodic stack emissions monitoring for a similar process with representative emissions.

As the plant is only anticipated to be operated for testing purposes every three years, a worst-case scenario of three months annual operation was considered within the modelling assessment. This allows for the planned 40-60 hour testing scenario as well as a realistic worst-case operational scenario, should the main production plant in Leek become inoperable. The assessment includes predictions of impacts from emissions of oxides of nitrogen from the gas-fired boiler, which will always be in operation when the plant is operational. In order to provide a conservative approach, no emission abatement was considered within the modelling.

The following ecological receptors are within relevant screening distances:

- Humber Estuary Special Area of Conservation (SAC), Special Protection Area (SPA), Ramsar and Site of Special Scientific Interest (SSSI)
- Laporte Road Brownfield Site Local Wildlife Site (LWS)

We have reviewed the assessment and note that the operator has not assessed impacts at the LWS. Other than this, we are satisfied that the operator's assessment has taken into account all relevant ecological and human health receptors, that the model and its inputs are appropriate and that the assessment has been carried out in accordance with our guidance. We have considered the impacts at the LWS in our review.

We agree with the applicant's conclusions for human health, which are based on predicted results given in Tables 5-1, 5-2, 5-3, 5-4, 5-5, 5-6 and 5-7.

The applicant compared the predicted process contributions (PC) of the substances listed below against the environmental standards (ES) stated in our guidance:

- Nitrogen dioxide (long-term and short-term)
- Particulates PM10 (long-term and short-term)
- Particulates PM2.5 (long-term)

- Volatile organic compounds (as benzene) (short-term and long-term)

The table below provides the predicted PCs at the most impacted human receptor.

- For all substances the long-term PC is less than 1% of the ES and impacts are considered insignificant.
- For all substances the short-term PC is less than 10% of the ES and impacts are considered insignificant.

No further assessment of human health impacts is required.

<b>Long-term</b>				
<b>Pollutant</b>	<b>Averaging period</b>	<b>ES <math>\mu\text{g}/\text{m}^3</math></b>	<b>PC <math>\mu\text{g}/\text{m}^3</math></b>	<b>PC % of ES</b>
Nitrogen dioxide	Annual mean	40	<0.1	<0.1%
Particulates PM <sub>10</sub>	Annual mean	40	0.0008	<0.01%
Particulates PM <sub>2.5</sub>	Annual mean	25	0.0008	<0.01%
Benzene	Annual mean	5	0.0037	0.07%
<b>Short-term</b>				
Nitrogen dioxide	1-hour mean	200	0.2	0.1%
PM <sub>10</sub>	24-hour mean	50	0.008	0.02%
Benzene	24-hour mean	30	0.46	1.5%

The applicant's predicted results for ecological assessment of oxides of nitrogen (NOx) and nitrogen and acid deposition at the Humber Estuary SAC, SPA, SSSI and Ramsar are given in Tables 5-8, 5-9 and 5-10.

The applicant compared the predicted PCs of oxides of nitrogen (NOx) against the relevant critical levels and loads as stated in our guidance.

- The annual mean PC is less than 1% of the long-term critical level (30  $\mu\text{g}/\text{m}^3$ ) and is therefore be considered insignificant.

- The daily mean PC is less than 10% of the short-term critical level (75 µg/m<sup>3</sup>) and is therefore be considered insignificant.
- For both nitrogen and acid deposition, the PCs are less than 1% of the relevant critical load and are considered insignificant.

Our review of the impacts at the LWS indicate that both the short-term and long-term PC is less than 100% of the ES.

No further assessment of ecological impacts is required.

We are satisfied that the applicant's air dispersion modelling assessment is conservative and we agree with the applicant's conclusions regarding human health and ecological impacts for all testing and the emergency scenarios. Based on the information reviewed, we consider that aerial emissions associated with operation of the proposed installation will not cause exceedances of the applicable human health environmental standards and will not affect any site of nature conservation and protected species or habitats identified. We are satisfied that this is also the case for unrestricted operating hours. We have therefore not restricted operating hours in the permit.

#### Noise/vibration

The operator has provided an assessment of noise risk in accordance with our web guidance, 'Risk assessments for your environmental permit'. The overall risk with respect to noise is assessed to be not significant. The closest sensitive receptor is located approximately 1.8 kilometres to the southeast of the site

- The process vessel is anticipated only to be operated a period of 40-60 hours once every 3 years to run a validation batch.
- Low noise compressors and pumps are installed
- All equipment will be subject to regular maintenance in accordance with the manufacturer's recommendations and will be operated by competent personnel.

Based on the measures put in place for the new plant, we anticipate the risk of noise pollution will not be significant. Consequently we have not required a noise management plan as part of this determination. However, we have included our standard noise condition in the variation notice, which allows us to ask for a noise management plan if we become aware of noise-related problems on site.

#### Accident management

The operator has implemented and maintains an Accident Management Plan for the site, which was developed following a Hazard and Operability Risk Assessment process and which is reviewed every three years as a minimum or after any reportable incident on Site. Measures that are in place to minimise the risk and impact of accidents occurring on site include:

- Procedures for the management of accidents, including spillages and fires, with personnel responsibilities clearly defined. Provision of fire and spill management equipment. The site drainage system can be isolated to prevent discharge off site.
- Material Safety Data Sheets (MSDS) for potentially hazardous substances maintained on site.
- High level probes and alarms to prevent overfilling.
- Security measures to prevent unauthorised access, including 24-hour CCTV surveillance, security guard cover, fencing and lockable gates with an access control system.
- Maintenance of a log of all incidents and near misses. Each event is investigated to identify the cause and a remedial solution to prevent recurrence. Where necessary plant operations will cease. The operator's complaints procedure enables members of the public to contact the site directly. Complaints are recorded and investigated within one working day, with a follow up response communicated to the complainant within 10 working days.

### Energy and raw material efficiency

The site's EMS includes the monitoring and recording of energy, water and raw materials use and is subject to ongoing review to identify the potential for energy efficiency improvements. In addition to plant maintenance to ensure optimum energy efficiency, there are a number of specific energy efficiency measures in place, for example:

- the condenser closed cooling loop detects heat load - the pump will work at a lower speed when decreased temperature is identified, to lower energy consumption.
- variable speed drives for the air compressors.

## **Decision considerations**

### **Confidential information**

A claim for commercial or industrial confidentiality has not been made. The decision was taken in accordance with our guidance on confidentiality.

### **Identifying confidential information**

We have not identified 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 comments and our responses are summarised in the [consultation responses](#) section.

The application was publicised on the GOV.UK website.

We consulted the following organisations:

North East Lincolnshire Unitary Authority

Health and Safety Executive

UK Health Security Agency

Director of Public Health

One response was received (UK Health Security Agency). The comments and our responses are summarised in the [consultation responses](#) section.

## 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.

## The site

The operator has provided a plan which we consider to be satisfactory. This shows 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 not satisfactory as detailed in the section above, Operational and storage areas: surfacing, drainage and containment.

The decision was taken in accordance with our guidance on site condition reports.

## **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.

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**

We have reviewed the operator's assessment of the environmental risk from the facility. The operator's risk assessment is satisfactory.

## **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 screen out as insignificant**

Emissions of oxides of nitrogen, particulate matter and volatile organic compounds 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.

## **Use of conditions other than those from the template**

Based on the information in the application, we consider that we need to include conditions other than those in our permit template.

Annex I of MCPD requires information to be provided by the operator to the Environment Agency. However, as the gas boiler will be sourced when required, this information is unknown at the time of application.

Condition 4.2.2 has therefore been included in the permit and requires the operator to provide the information within 14 days of first operation of an individual MCP, using the form specified in table S4.4 of schedule 4.

## **Pre-operational conditions**

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

We did not agree that the operator's proposal for drainage and containment at the site constituted BAT. We have therefore included pre-operational condition 1 that requires the operator, before operations commence, to submit a written report to the Environment Agency for approval which includes the specification of infrastructure for all storage (raw materials and wastes) and processing areas, including surfacing, containment and drainage.

Our guidance states that if operations have stopped for more than 12 months the Environment Agency needs to review activities before they can restart, for example to check the activity meets BAT. We have therefore included pre-operational condition 2, that applies if the plant is not operated for more than 12 months, and requires the operator, to submit a report that demonstrates the operation meets BAT. Table S4.3 also requires the operator to record annual hours of operation.

## **Improvement programme**

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

The application air quality assessment was undertaken using emissions data for a similar process with representative emissions. In order to verify the assumptions made in the assessment, three improvement conditions have been included in the permit:

- IC1 requires the operator to carry out monitoring of releases of pollutants to air from the process under normal operating conditions.
- If the results of this monitoring show that emissions are higher than assessed in the application, IC2 requires the operator to undertake a further risk assessment based on the monitored results. If deemed necessary, the operator is required to propose and implement measures to reduce impacts to an acceptable level.
- IC3 requires the operator to implement any necessary improvements identified in IC2 to a timetable agreed in writing with the Environment Agency.

## **Emission Limits**

In accordance with Annex II of the MCPD, emission Limit Values (ELVs) have been added for the following substances:

- Oxides of nitrogen 100 mg/m<sup>3</sup>.

## **Monitoring**

In accordance with Annex III of the MCPD, 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 imposed in order to ensure the emissions from the process are in accordance with the ELVs assigned to protect the environment.

## **Reporting**

We have specified reporting in the permit for the following parameters:

- Releases of oxides of nitrogen and carbon monoxide to air from A41
- Annual production of KEH in IPA
- Water and energy usage
- Operating hours
- Information required by Annex I of MCPD.

## **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.

## **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.

## Consultation Responses

The following summarises the responses to consultation with other organisations and the way in which we have considered these in the determination process.

### **Responses from organisations listed in the consultation section:**

#### **Response received from: UK Health Security Agency – received 03/08/2022**

##### Brief summary of issues raised:

UK Health Security Agency advised that they had no significant concerns regarding the risk from emissions to air to the health of the local population from the installation, provided that the permit holder take all appropriate measures to prevent or control pollution, in accordance with the relevant sector guidance and industry best practice.

##### Summary of actions taken:

Regarding the risk from emissions to air, we are satisfied that the installation meets BAT relevant to the permitted operation. Refer to the key issues section.

#### **No responses were received from the other organisations listed in the consultation section.**