Permitting Decisions- Variation

We have decided to grant the variation for Mastermelt Refining Services Limited operated by Mastermelt Refining Services Limited.

The variation number is EPR/BL1312IE/V015.

The permit was issued on 11/12/2025.

The variation adds a new activity to chemically treat non-ferrous metal waste using alkali and acid to extract precious metals from fuel cells and electrolysers which have undergone previous mechanical processing prior to arrival onsite.

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

- highlights key issues in the determination
- summarises the decision making process in the decision considerations section to show how the main relevant factors have been taken into account
- 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 and the variation notice.

Key issues of the decision

Process summary

The operator receives waste material coded EWC 19 12 03 non-ferrous metal. The waste is loaded onto a crane (50-120kg per load) and submerged within a series of treatment baths:

1. Molten salt bath. Heated potassium hydroxide solution. 200-220^{o}C. To help break down oxide layers.
2. Quench bath. Water bath to rinse and cool
3. Sulphuric acid cleaning bath. 20% sulphuric acid heated to 60^{o}C
4. Cold water rinse.

The above steps will be repeated until the platinum group metal (PGM) coating has been fully removed which will be verified by XRF analyser.

A PGM sludge remains within the system and is removed by crane and emptied into a sludge collection drum. This is then processed through the sites existing permitted processes - cyanide dissolution/precipitation and thermal treatment (ashing down).

Steps 1 and 2 are fully enclosed under local exhaust ventilation (LEV) to capture the steam from the step 2 bath. Step 3 is vented to atmosphere via existing emission point A1 (a 12m stack with caustic scrubber).

The plant is monitored and controlled with a consistent waste stream Waste is inspected upon receipt and manually batch loaded with critical operating parameters visible and controllable by a HMI (human-machine interface) panel. The bath operating temperatures are linked via thermocouples to the control panel.

The new plant is a specialist piece of equipment, designed to manufacturers specifications. The potassium hydroxide bath has an integrated double containment structure with a heavy gauge carbon steel ¾ inch inner furnace with a lighter gauge outer skin.

The sulphuric acid and rinse tanks are manufactured from 8mm polypropylene reinforced with 3 layers of GRP (glass reinforced plastic).

The plant is located within the main refinery building with impermeable concrete floor with chemical resistant coating. There are no surface water or sewer emission points. The flooring in the plant area has been built with an elevation so that in the event of spillage or rupture in the processing area, the solution will be washed down towards a 1000l capacity sump. If required this can be further drainage towards a 20,000l capacity holding tank from a manually operated “pump on/pump off” valve.

There are no point source emissions to sewer or surface water. Liquid wastes are stored and removed from site for third party treatment.

<u>Storage and handling of raw materials and wastes</u>

Sulphuric acid will be delivered in UN approved IBC’s and stored externally within the site’s chemical storage bund. Potassium hydroxide salt will be delivered in

solid form in UN approved metal drums and will be stored internally within the storage warehouse within sealed, labelled containers.

Waste material EWC19 12 03 nonferrous metal will be delivered pre-banded (bundled) or in wooden containers and stored externally in the yard area.

Process effluent is kept to a minimum. Water meters are installed on the quench baths. Water is re-used back into the process after a period of settling to allow the temperature to drop, pH adjustment and filtering. When spent, effluent is stored in UN approved IBCs or 200l drums within the bunded processing area in the main refinery or externally within the dedicated chemical storage bund prior to transport offsite.

Abatement

Emissions from the sulphuric acid bath are extracted via tank lip extraction with the ducting feeding into the existing caustic scrubber emission point A1. The scrubber is fitted with automatic dosing of liquid caustic soda with an inhibitor.

Drop out residues from the wet scrubbing base tanks are reprocessed for further recovery of precious metals. Waste solution is sent offsite as hazardous waste.

Point source emissions to air

The operator provided a H1 assessment which applied the most recent MCERTS air monitoring results from source A1 (nitrogen oxides, chlorine and hydrogen chloride) along with sulphuric acid introduced as part of the new process. This data was estimated using a mass balance calculation.

We have checked these calculations, and whilst we do not agree with the exact calculations given the available data and low vapor pressure of H_2SO_4 we agree with the operators' conclusions and consider the presented assessment to be conservative. Both our calculations and the operators sit well below the insignificance level.

The results of the operator's H1 screening assessment are summarised below:

Substance	EAL		Process contribution PC		PC as % of EAL		PC insignificant	
	LT	ST	LT	ST	LT	ST	<1% EAL	<10% EAL
	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³
Sulphuric acid	10	300	0.01	5.4	0.15%	1.81%	Y	Y
Nitrogen oxides (as NO2) ecological	30	75	0.15	3.1	0.52%	4.24%	Y	Y
Nitrogen dioxide	40	200	0.15	2.69	0.39	1.35%	Y	Y
Chlorine	0	290	0.01	0.5	-	0.18%	-	Y
Hydrogen chloride	0	750	0.02	0.7	-	0.10%	-	Y

The results show that all emissions can be screened out as insignificant as the PC is less than 1% and 10% of the respective EAL and no further assessment is necessary.

Emissions will likely be further reduced as the actual operations are likely to be in the region of 75% operation. The calculations presented are based on the unit operating 100% of the time.

Ecological receptors

The following conservation sites lie within the relevant screening distances for the installation:

Peak District Dales Special Area of Conservation (SAC) approximately 1500m from the installation
South Pennine Moors SAC/SPA Special Protection Area approximately 3300m from the installation

Within 2000m of the installation:
Pool's Cavern and Grin Low Wood Site of Special Scientific Interest (SSSI)
The Wye Valley SSSI
Topley Pike and Deep Dale SSSI
Ferneydale Grassland Local Nature Reserve/ Local Wildlife Site LNR/LWS
Buxton Youth Hostel Grassland LWS
Ashwood Dale LWS
Sherbrook Plantation LWS
Harpur Hill Disused Railway LWS

Ferney Bottom Meadows LWS
Cow Dale LWS
Dale Road Grassland LWS
Countess Cliff Grassland LWS
Cunningdale South LWS
Grin Low Grassland LWS
Cunningdale North LWS
Diamond Hill LWS
Ashwood Dale South Ancient Woodland
Pigtor Wood Ancient Woodland

When considering the grid maximum shown within the H1, both long- and short-term emissions for all nitrogen dioxides can be screened out.

Acid deposition

The operator provided an assessment of emissions on these habitats' sites. We have checked this using the process consultations (PCs) from the H1 assessment and calculated the sites new potential contribution to nitrogen and acid deposition.

The indicative PCs are less than 1% for both acid and nitrogen deposition accounting for NO_2, HCL and H_2SO_4 and multiplying the acid deposition PCs by 2 for dry and wet deposition of HCl and H_2SO_4.

We have also checked nitrogen and acid deposition against conservative critical loads in APIS.

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:

- UK Health Security Agency
- Local Authority Environmental Health

The comments and our responses are summarised in the consultation responses section.

The regulated facility

We considered the extent and nature of the facilities at the site in accordance with RGN2 ‘Understanding the meaning of regulated facility’, Appendix 2 of RGN2 ‘Defining the scope of the installation’, 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.

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

The plan is included in the permit.

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 (see key issues section).

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 nitrogen dioxide, hydrogen chloride, chlorine and sulphuric acid 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.

Updating permit conditions during consolidation

We have updated permit conditions to those in the current generic permit template as part of permit consolidation. The conditions will provide the same level of protection as those in the previous permits.

Waste types

We have specified the permitted waste types, descriptions and quantities, which can be accepted at the regulated facility.

We are satisfied that the operator can accept these wastes for the following reasons:

- they are suitable for the proposed activities
- the proposed infrastructure is appropriate

We made these decisions with respect to waste types in accordance with WM3

Improvement programme

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

We have included an improvement programme to ensure that emissions from the new sulphuric acid bath are as predicted by the operator. If they are higher, the operator is to undertake detailed investigation and provide additional mitigation.

Emission limits

No emission limits have been added, amended or deleted as a result of this variation.

Monitoring

We have decided that monitoring should be undertaken to verify the results of the operators H1 assessment and ensure the scrubber is working effectively to abate emissions.

We have made these decisions in accordance with our GOV.UK Guidance monitoring stack emissions.

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 variation.

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.

Brief summary of issues raised: UKHSA has no significant concerns.

Summary of actions taken: No specific action above and beyond permit assessment.