



Application Support Document

The Royal Mint Limited

21st January 2025

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Application Support Document

The Royal Mint Limited



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Acronyms and Abbreviations

Name	Description
EA	Environmental Agency
ERA	Environmental Risk Assessment
EMS	Environmental Management System
PCB	Printed circuit boards
WEEE	Waste Electrical and Electronic Equipment

NON-TECHNICAL SUMMARY

This document has been prepared on behalf of The Royal Mint Ltd (*'The Applicant'* hereafter) by Sol Environment Ltd and provides supporting evidence as required by Environmental Permit Application Forms Part C2 and C3 issued by Natural Resources Wales (NRW).

The Royal Mint site is located at The Royal Mint, Pontyclun, Llantrissant, South Wales, CF72 8YT.

The site is regulated in accordance with the conditions established by Environmental Permit EPR/KP3135KV/V006 which allows the following Activities on site:

- The existing surface treatment and plating processes carried out by the Applicant are permitted as a Part A(1) Installation, as defined by Schedule 1, Section 2.3A(1)(a) 'Surface Treatment of Metals'.
- The existing Printed Circuit Board (PCB) processing and recovery plant is permitted as a Part A(1) Installation, as defined by Schedule 1, Section 5.3A(1)(a)(ii) 'Disposal or Recovery of Hazardous Waste'.
- The sites effluent treatment plant is permitted as a Part A(1) Installation, as defined by Schedule 1, Section 5.4(1)(a)(ii) 'Disposal of Non-Hazardous Waste'.

The Royal Mint is making this application to carry out a 'normal' Variation of their existing EPR permit under The Environmental Permitting (England and Wales) Regulations 2016 (as amended) to:

- Increase capacity to receive and process additional WEEE materials; and
- Downscale operations and significantly reduce their coin production operations on site with the decommissioning of several process lines, including:
 - Copper Plating Lines - CP2 and CP3;
 - Zinc Plating Line;
 - Armour 1 and Armour 2 (partial); and
 - Brass Plating Line, cyanide treatment plant and associated tanks.

In 2023 a 'normal' variation was made under The Environmental Permitting (England and Wales) Regulations 2016 (as amended) to include the installation a Printed Circuit Board (PCB) Processing Facility that can process approximately 4,000 tonnes per annum of printed circuit boards and selected electronic and electrical equipment residues. All aspects of the 2023 variation have been completed and implemented on site.

The Royal Mint operate and maintain a formal Environmental Management System (EMS) which has been certified to meet the requirements of the International Standard BS EN ISO14001:2015. The changes brought about by this permit variation will not result in any functional or material changes to the existing EMS. However, the sites Fire Prevention Plan has been updated to reflect the new operations on site.

Emissions to Air

This permit variation removes a considerable number of emission points. The following emission points are being removed and decommissioned:

- A1 and A2 – Zinc Plating ZP1;

- A3 and A4- Copper Plating CP2
- A7 and A8 – Copper Plating CP3;
- A9 – Direct Brass Plating Line and Cyanide Treatment Plant (DBP1 and CTP1);
- A10 – Direct Brass Plating Line and tanks (03, 04, 05 and 08);
- A15 – Nickel Plating lines;
- A28 – Melt Rolling Blanking Mill Extraction;
- A17 - A26 (except A21 and A23) – Annealing ovens and A&P building vents;
- A27 – Annealing oven; and
- A35 – Pyrolysis.

The following emission points will remain on site:

- A16 – Nickel Plating Line, Armour 2;
- A21 – Annealing ovens;
- A23 – Wellman 3;
- A29 – Dye Heat Treatment oven and tool room vents;
- A30 – Trial Zinc, copper and nickel plating baths;
- A31 – Trial Cleaning Station Baths;
- A32 – Depop stack;
- A33 – Spalek Wet Chemistry Scrubber; and
- A34 – Dust extraction.

As part of this permit variation, the identification of some smaller emissions points not previously considered have been addressed within the Air Quality Assessment carried out a part of this permit variation. These include:

- EP1 –Burn off oven – located to the north of building one; and
- ERV – Emergency release linked to A33 – located to the south of building 10a.

Detailed air quality modelling using the AERMOD 12 dispersion model has been carried out to determine the local air quality impacts associated with the retained emissions to air including the recently added emission points. The assessment has considered emissions of NO_x, trace metals, NH₃ HBr, HCl, acetic acid, chlorine, chlorine dioxide and fine particles (PM₁₀ and PM_{2.5}).

Predicted pollutant concentrations at sensitive receptor locations are compared with the air quality standards and objectives set for the protection of human health. It is concluded that predicted impacts are not significant or that it is unlikely that the air quality objectives would be exceeded.

At the identified habitat sites, the predicted process contributions are not significant compared with the critical levels for NO_x and NH₃ and site-specific critical loads for nutrient nitrogen deposition and acidification.

Based on the above information, it is considered that the proposed operations at the Site do not have an adverse impact on local air quality.

Odour

There are no odour emissions arising from this permit variation.

Emissions to Controlled Water and Sewer

There will be no change to emissions to controlled water or sewer as a result of this permit variation. Any waste water / effluent is contained and transferred off site for further treatment using third party specialist waste contractors.

Any releases to controlled water via W1 will remain as currently permitted.

Any emissions to sewer via S1 will remain as currently permitted. All emissions to sewer will remain in accordance with the sites current Trade Effluent Discharge consent (Ref No. TE409).

The proposed variations on site do not give rise to any contaminated or potentially contaminated discharges. All decommissioning will be carried out within the process and storage areas which are fully enclosed, therefore any spillages / run off will be effectively contained within the buildings and tankered off site for disposal.

Emissions to Land

There are no emissions to land arising from the Installation.

1. INTRODUCTION

This document has been prepared on behalf of The Royal Mint Ltd (*'The Applicant'* hereafter) by Sol Environment Ltd and provides supporting evidence as required by Environmental Permit Application Forms Part C2 and C3 issued by Natural Resources Wales (NRW).

The Royal Mint site is located at The Royal Mint, Pontyclun, Llantrissant, South Wales, CF72 8YT.

The site is regulated in accordance with the conditions established by Environmental Permit EPR/KP3135KV/V006 which allows the following Activities on site:

- The existing surface treatment and plating processes carried out by the Applicant are permitted as a Part A(1) Installation, as defined by Schedule 1, Section 2.3A(1)(a) 'Surface Treatment of Metals'.
- The existing Printed Circuit Board (PCB) processing and recovery plant is permitted as a Part A(1) Installation, as defined by Schedule 1, Section 5.3A(1)(a)(ii) 'Disposal or Recovery of Hazardous Waste'.
- The sites effluent treatment plant is permitted as a Part A(1) Installation, as defined by Schedule 1, Section 5.4(1)(a)(ii) 'Disposal of Non-Hazardous Waste'.

The Royal Mint is making this application to carry out a 'normal' Variation of their existing EPR permit under The Environmental Permitting (England and Wales) Regulations 2016 (as amended) to:

- Increase capacity to receive and process additional WEEE materials; and
- Downscale operations and significantly reduce their coin production operations on site with the decommissioning of several process lines, including:
 - Copper Plating Lines - CP2 and CP3;
 - Zinc Plating Line;
 - Armour 1 and Armour 2 (partial); and
 - Brass Plating Line, cyanide treatment plant and associated tanks.

In 2023 a 'normal' variation was made under The Environmental Permitting (England and Wales) Regulations 2016 (as amended) to include the installation a Printed Circuit Board (PCB) Processing Facility that can process approximately 4,000 tonnes per annum of printed circuit boards and selected electronic and electrical equipment residues. All aspects of the 2023 variation have been completed and implemented on site.

The Royal Mint operate and maintain a formal Environmental Management System (EMS) which has been certified to meet the requirements of the International Standard BS EN ISO14001:2015. The changes brought about by this permit variation will not result in any functional or material changes to the existing EMS, however the sites Fire Prevention Plan has been updated to reflect the new operations on site.

The remainder of this application support document is structured accordingly:

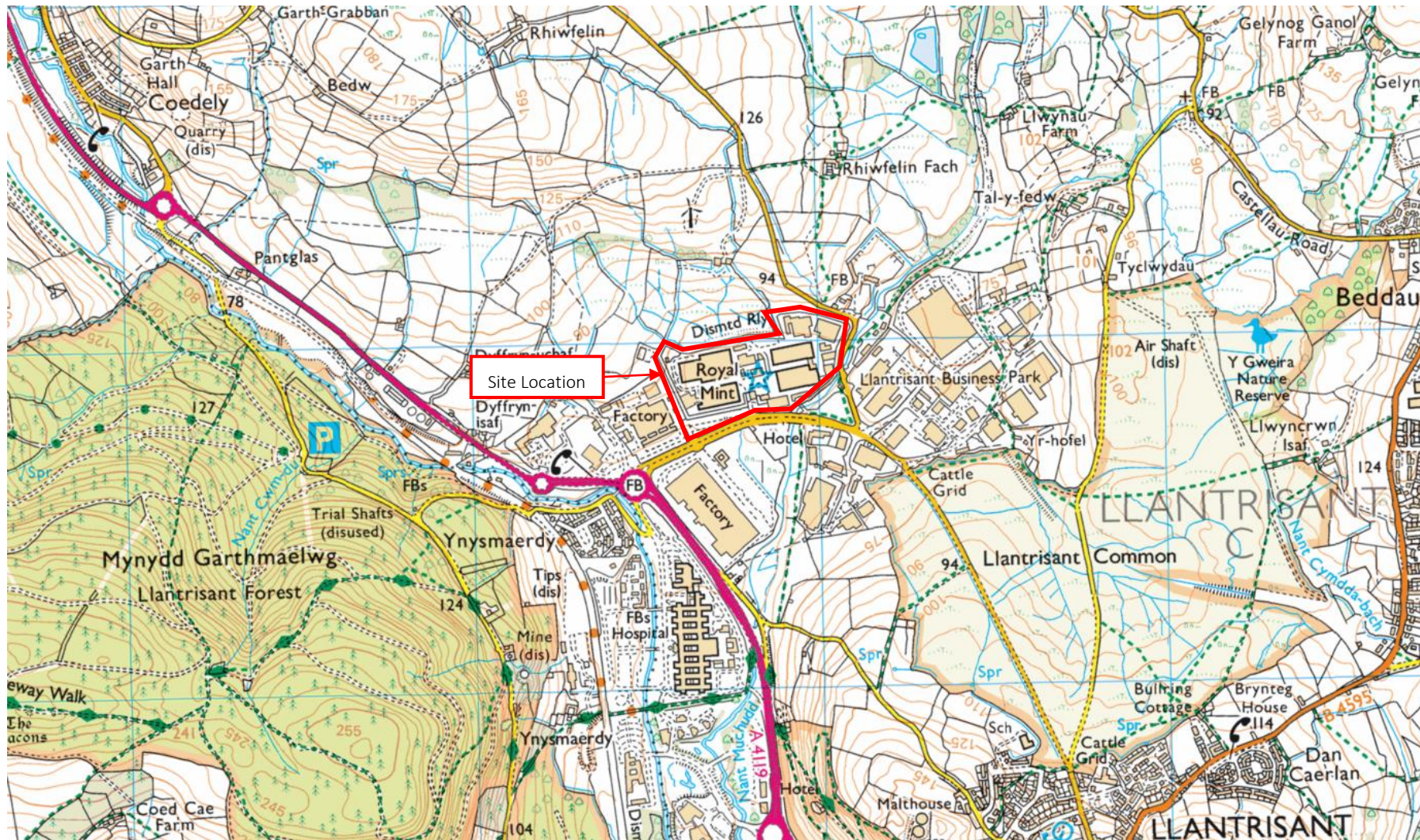
- Section 2: Provides specific nature of the proposed changes associated with the variation application;

- Section 3: Provides specific nature and detailed description of the emissions to air and water associated with the installation;
- Section 4: Provides details of all monitoring associated with the Installation; and
- Section 5: Provides an Environmental Impact and Assessment of the varied Installation.

All technical appendices associated with the permit variation are included within the following:

- Annex A: Site Plans;
- Annex B: Environmental and Climate Change Risk Assessment;
- Annex C: Environmental Management System Summary ;
- Annex D: Air Quality Assessment; and
- Annex E: Fire Prevention Plan.

The Site location, Installation Boundary and emissions plan is provided overleaf in Figure 1.1, 1.2 and 1.3.



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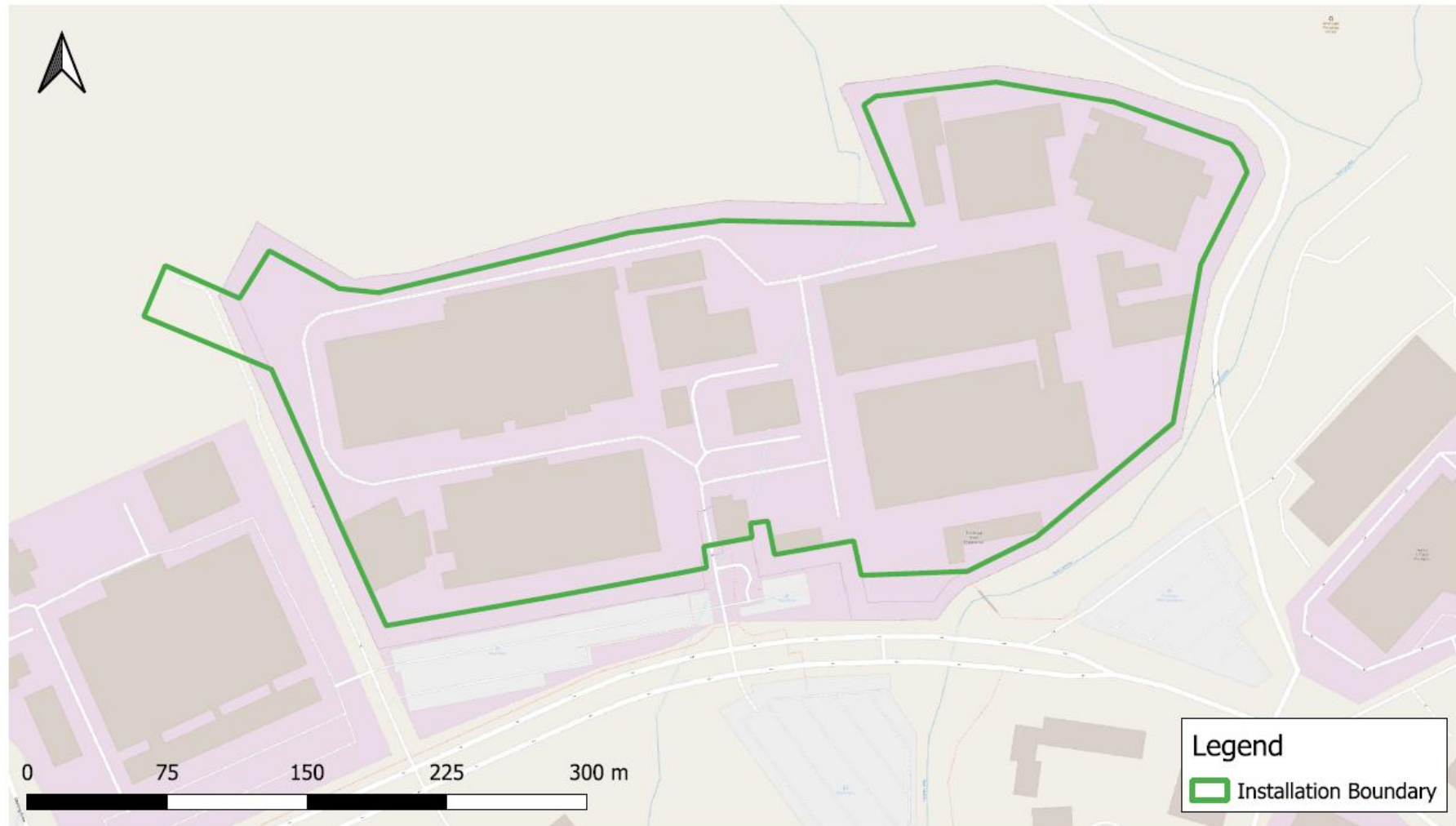


Figure 1.2 Installation Boundary

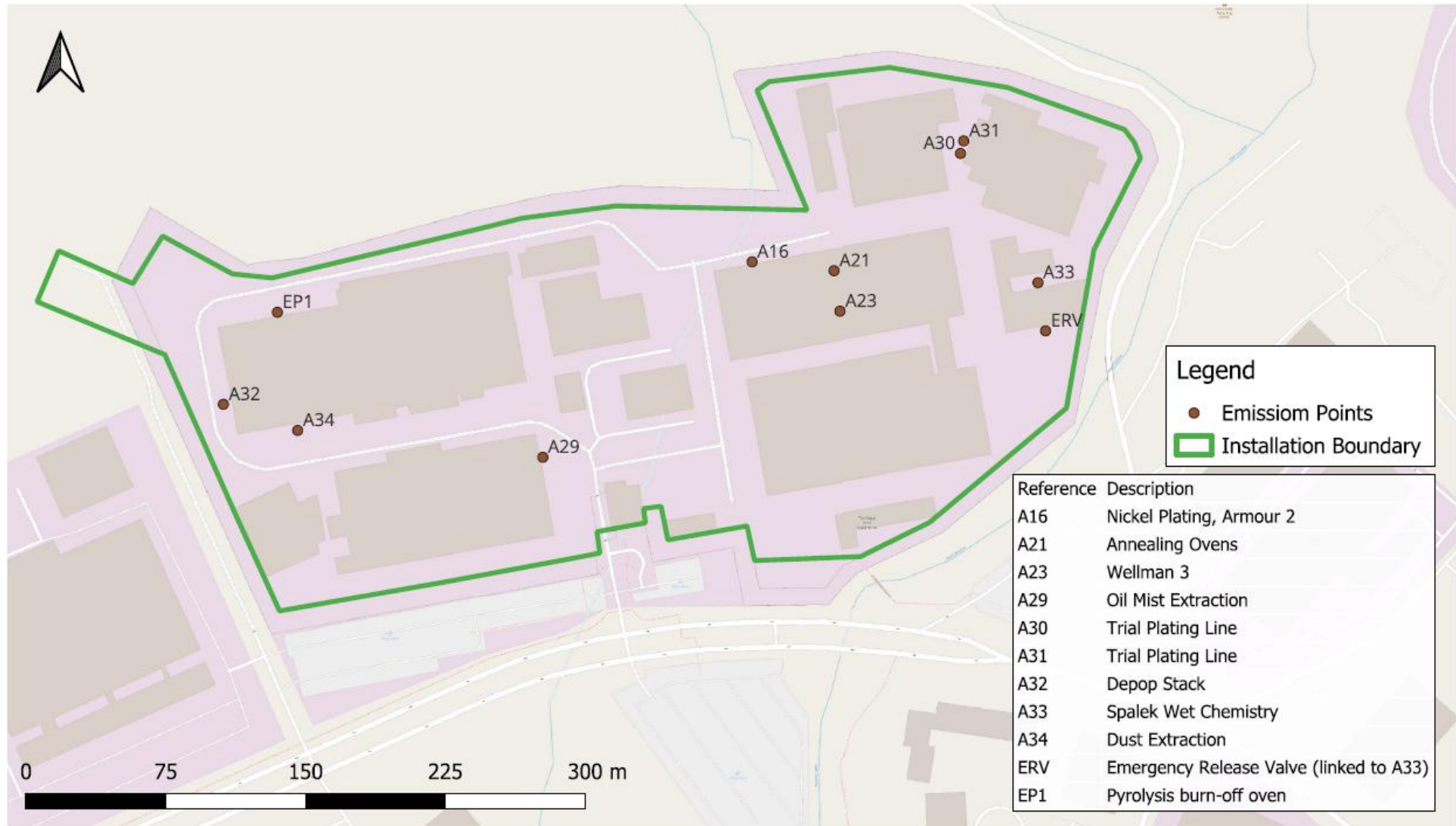


Figure 1.3 Emissions Point Plan

2. DESCRIPTION OF VARIED CHANGES

2.1 Description of the Proposed Changes

The Royal Mint is making this application to carry out a 'normal' Variation of their existing EPR permit under The Environmental Permitting (England and Wales) Regulations 2016 (as amended) to:

- Increase capacity to receive and process additional WEEE materials; and
- Downscale operations and significantly reduce their coin production operations on site with the decommissioning of several process lines, including:
 - Copper Plating Lines - CP2 and CP3;
 - Zinc Plating Line;
 - Armour 1 and Armour 2 (partial); and
 - Brass Plating Line, cyanide treatment plant and associated tanks.

There are no changes to the Listed Activities as result of the above changes.

Table 2.1 Permitted Activities

Activity Reference	Activity Listed in Schedule 1 of the EP Regulations	Description of Specified Activity	Limits of Specified Activity
AR1	Section 2.3A(1)(a) Surface treatment of metals Unless falling within Part A(2) of this Section, surface treating metals and plastic materials using an electrolytic or chemical process where the aggregated volume of the treatment vats is more than 30m ³	Surface treatment of metals	From receipt of raw materials to despatch of finished products and waste
AR2	Section 5.3A(1)(ii) Disposal or recovery of hazardous waste with a capacity exceeding 10 tonnes per day involving physico-chemical treatment;	Printed Circuit Board Processing and recovery. R4 – Recycling / reclamation of metals and metal compounds R5 – recycling / reclamation of other inorganic materials R13 – Storage of wastes pending any of the operations numbered R1 to R12	From receipt of raw materials to dispatch of processed waste
AR3	S5.4A(1)(a)(ii)	Effluent Treatment Plant	From receipt of effluent until discharge to public sewer

	Disposal of non-hazardous waste with a capacity exceeding 50 tonnes per day (or 100 tonnes per day if the only waste treatment activity is anaerobic digestion) involving one or more of the following activities, and excluding activities covered by Council Directive 91/271/EEC concerning urban waste-water treatment (ii) physico-chemical treatment;		
Directly Associated Activity			
AR4	Drainage of surface water	Discharge of surface run off and non-contact (uncontaminated) cooling water	Uncontaminated surface run off and non-contact cooling water
AR5	Annealing and burnishing	N/A	From receipt of raw materials to dispatch of finished products and waste
AR6	Heat treatment of tool dyes	N/A	From receipt of raw materials to dispatch of finished products and waste

2.2 Details of the Installation

2.2.1 Installation Boundary

No additional land is being added to the Installation Boundary as a result of this permit variation application and therefore an updated Site Condition Report has not been included as part of the application. Figure 1.2, in Section 1 shows the existing Installation Boundary.

All activities take place within the single Installation Boundary. No processing or storage activities take place in any area not previously consented or permitted under the existing permit. All chemicals are stored, used and processed above ground and without potential pollution to the underlying land and groundwater. No 'relevant hazardous substances' are proposed to be stored on site as part of the process.

2.2.2 Site Infrastructure and Design

The following changes will be made to the site infrastructure and design to accommodate the downscaling of operations and decommissioning of plant.

The following infrastructure will be removed from site:

- Copper Plating Lines - CP2 and CP3;
- Zinc Plating Line;
- Armour 1 and Armour 2 (partial); and

- Brass Plating Line, cyanide treatment plant and associated tanks.

All aspects of site drainage will remain unchanged. All drainage systems on the main site are as per the original permit application document and discharge under consent to the River Nant Muchudd.

The current site drainage plan is included within *Annex A – Site Plans*.

Waste Feedstocks

A detailed list of European Waste Catalogue (EWC) codes is provided in Table 2.2 below. The new codes that cover the increase in WEEE materials that will be accepted by the proposed variation are depicted in **RED**.

Table 2.2 Permitted Feedstock EWC codes and Types

Waste Code	Description
16	OTHER WASTES FROM INDUSTRIAL PROCESSES
16 01	waste from end-of-life vehicles and waste from their dismantling and maintenance
16 01 21*	Hazardous waste other than those mentioned in 16 01 07 to 16 01 11 and 16 01 13 and 16 01 14 (including catalytic converters with ceramic fibres and circuit boards).
16 02	waste from electrical and electronic equipment
16 02 13*	Discarded equipment containing hazardous components other than those mentioned in 16 02 09 to 16 02 12.
16 02 15*	hazardous components removed from discarded equipment
16 02 16	components removed from discarded equipment other than those mentioned in 16 02 15
19	WASTES FROM WASTE MANAGEMENT FACILITIES, OFF-SITE WASTE WATER TREATMENT PLANTS AND THE PREPARATION OF WATER INTENDED FOR HUMAN CONSUMPTION AND WATER FOR INDUSTRIAL USE
19 02	wastes from physio/chemical treatments
19 02 04	Premixed waste composed of at least one hazardous substance
19 12	wastes from the mechanical treatment of waste (for example sorting, crushing, compacting, pelletising) not otherwise specified
19 12 11*	other wastes (including mixtures of materials) from mechanical treatment of waste containing hazardous substances
19 12 12	Other waste (including mixtures of materials) from mechanical treatment of wastes other than those mentioned in 19 12 11.
20	MUNICIPAL WASTE
20 01	wastes from separately collected fractions
20 01 35*	Discarded electrical and electronic equipment other than those mentioned in 20 01 21 and 20 01 23 containing hazardous components
TOTAL	Maximum of 5,000 tonnes per annum

All waste will be accepted in accordance with the sites waste acceptance procedures that are included within the sites EMS.

Total volume of WEEE waste on site will be consist of the following:

- 4,000 per annum of PCB boards; and
- 1,000 per annum of additional WEEE waste as detailed above.

Raw Materials

The downscaling of various process lines will not impact the raw materials used on site as these are used in relation to the recovery process. The raw materials and chemicals provided in Table 2.3 will be utilised on site.

Table 2.3 Raw Materials

Raw Material	Volume / Quantity Stored on Site	Approximate Volume / Mass Used per Annum
Printed Circuit Boards	Stored within the dedicated storage areas within the MRB Building	4,000 tonnes
Mixed WEEE waste	Stored within dedicated storage areas within building 29 and CP2/ZP1 buildings	1,000 tonnes
Chemicals	Volume / Quantity Stored on Site	Approximate Volume / Mass Used per Annum
Glacial Acetic Acid (98% conc)	Liquid form. 30m ³ Holding Tank	380,000 litres
Hydrochloric Acid (36% conc)	This will be stored in 2 x 1m ³ IBCs within the Surface Treatment Plant building	85,000 litres
Calcium Chloride	Stored in 25kg sacks in Royal Mints existing chemical store building	17,000 kg
Sodium Chlorate	Stored in 25kg sacks in Royal Mints existing chemical store building	12,000 kg
Sodium Chlorate (solution)	This will be stored in 2 x 1 m ³ IBCs within the Surface Treatment Plant building	14,000 litres
Sodium Carbonate (solution)	This will be stored in 2 x 1 m ³ IBCs within the Surface Treatment Plant building	380,000 litres
Iron(ii) Chloride (solution)	This will be stored in 2 x 1 m ³ IBCs within the Surface Treatment Plant building	14,000 litres
Sodium Hydroxide	This will be stored in 2 x 1 m ³ IBCs within the Surface Treatment Plant building, and 2 x 1 m ³ IBCs within in building 1 (Scrubbers and potential neutralisation)	30,000 litres

2.3 Description of the Process

The following section provides details on the downscaling and decommissioning of the operations on site. All decommissioning on site will follow the hierarchy defined below:

- Reduction in process inventory and chemicals;
- Production operations cease;
- Isolation of equipment and systems associated with the plant;

- Draining and removal of any substances;
- Cleaning of plant and equipment; and
- Ongoing monitoring and investigation.

Royal Mint will no longer produce coinage for overseas markets and therefore the Brass line is not required for alloy plating. The Brass plating line is located within building 12 and will be decommissioned in accordance with a decommissioning plan. The decommissioning plan will include the following:

- All effluents associated with the Brass line will be stopped and disposed of off site at a suitable licenced facility, with no discharge entering the sites effluent treatment plant;
- The emission points associated with the Brass line, A9 and A10 will also be decommissioned with no emissions to air; and
- The storage tanks associated with the Brass line are contained within bunded areas and will be drained and cleaned as part of the decommissioning process. Any residues will be disposed of off site at a suitably licenced facility.

The Copper (CP2 and CP3) lines, Zinc Plating and Armour lines have already been decommissioned on site and are no longer in operation. The Brass line and associated cyanide solution was decommissioned Q4 2024. All infrastructure still remains onsite and will be removed in due course.

2.4 Waste Storage

The site will store the newly proposed WEEE waste in a newly formed, dedicated waste storage building, identified as Building 29 on the historic site layout plan provided in *Annex A – Site Plans* of this application. PCB's will continue to be stored in the MRB building.

The new storage area will accept up to 90m³ of waste at any one time, the EWC codes for which can be found in Section 2.2.2.

All waste will be stored on pallets, in boxes, or in flexible IBCs or other appropriate storage type, and stored in small individual units equalling 1m³. Waste will be stored in racking for access by site as and when required. Waste will not be stored in any other form other than what has been described within this document.

Waste storage is detailed in the Fire Prevention Plan supplied in *Annex E – Fire Prevention Plan*.

2.5 Energy Efficiency

Energy required by the site is either imported in the form of electricity from the National Grid or provided by the CHP plant, solar farm or wind turbines. Royal Mint monitors its energy use and costs closely and maintains an energy balance record each month which is summarised in the annual reporting to NRW as part of the annual pollution inventory reporting.

There will be no additional requirement for energy on site. Royal Mint expect energy demand to reduce following the decommissioning of numerous lines of process.

All plant and equipment have been chosen both on ability to perform and on its energy efficiency. Royal Mint have an operation and maintenance programme in place to undertake routine inspections and checks.

Plant will be monitored to ensure that no plant is operating ineffectively leading to the loss of energy. Regular maintenance will take place on site and any inefficient plant will be replaced.

2.6 Environment Management System

Royal Mint currently hold three ISO certifications associated with Quality, Environment and Energy.

All three including the Environmental Management System are certified by BSI. The environmental management certificate (Ref: EMS 84940) has been in place since August 2005.

To cover the three standards there is a hierarchy of procedures. The integrated procedures (IMP's) detailed within *Annex C – EMS Summary* are procedures that cover the common elements of the three standards.

The safety management procedures (SMP's) also detailed in *Annex C – EMS Summary* cover both Health Safety and Environment.

The Environmental Management Procedures (EMP's) that cover specifics with the current environmental permit and the ISO14001 standard that are not covered by the other procedures are also detailed within the EMS Summary.

Finally, there are the Environmental Working Procedures (EWP's) that cover specific operations with the Environment Management System.

The EMP's and EWP's will be updated to include the specific operations relating to the proposed variation and decommissioning of plant.

Royal Mints Safety Management System is also certified to ISO 45001.

Fire Prevention Plan

The site will be accepting printed circuit boards (PCB's) and additional WEEE as detailed within Section 2.2.2.

A Fire Prevention Plan (FPP) was not previously required on site due to the PCBs accepted on site being coated in bromine, which is a fire retardant material, resulting in there being a very low combustion risk from the material. However, due to the proposed acceptance of additional WEEE wastes, a Fire Prevention Plan (FPP) has been included within this application.

The site has been designed to allow active fire fighting. The site has a dedicated fire hydrant ring which is connected to a mains water supply and would provide a continuous supply of water in the event of a fire.

The site is able to contain up to 160m³ of contaminated firewater that may be generated in the event of a fire. The site requires a minimum of 108m³ of storage capacity for contaminate firewater. This area of site also benefits from the location of four penstock valves to prevent unauthorised release of contaminated firewater from site.

3. EMISSIONS AND THEIR ABATEMENT

3.1 Emissions to Air

This permit variation removes a considerable number of emission points. The following emission points are being removed and decommissioned:

- A1 and A2 – Zinc Plating ZP1;
- A3 and A4- Copper Plating CP2
- A7 and A8 – Copper Plating CP3;
- A9 – Direct Brass Plating Line and Cyanide Treatment Plant (DBP1 and CTP1);
- A10 – Direct Brass Plating Line and tanks (03, 04, 05 and 08);
- A15 – Nickel Plating lines;
- A28 – Melt Rolling Blanking Mill Extraction;
- A17 - A26 (except A21 and A23) – Annealing ovens and A&P building vents;
- A27 – Annealing oven; and
- A35 – Pyrolysis.

The following emission points will remain on site:

- A16 – Nickel Plating Line, Armour 2;
- A21 – Annealing ovens;
- A23 – Wellman 3;
- A29 – Dye Heat Treatment oven and tool room vents;
- A30 – Trial Zinc, copper and nickel plating baths;
- A31 – Trial Cleaning Station Baths;
- A32 – Depop stack;
- A33 – Spalek Wet Chemistry Scrubber; and
- A34 – Dust extraction. .

As part of this permit variation, the identification of some smaller emissions points, not previously considered, will be considered within the Air Quality Assessment carried out for operations on site, these include:

- EP1 – Burn off oven – located to the north of building one; and
- ERV – Emergency release linked to A33 – located to the south of building 10a.

The following emission points, provided in Table 3.1 have been included in the assessment. Only those emission sources that emit NO_x, NH₃, Cu, Zn, Pb, HBr, HCl, H₂SO₄, acetic acid, Cl₂, ClO₂, PM₁₀, and PM_{2.5} are included in the assessment. The emissions from the emergency release linked to emission point

A33 (ERV) has not been modelled due to infrequent releases only occurring during an emergency and for short periods of time.

Table 3.1 Emissions to Air considered for the Air Quality Assessment

Ref.	Source	Operational Hours (h/a)	Pollutant Emission
A16	Nickel Plating – Armour 2	2,160	NO _x , Cu, Zn and Pb
A21	SAFED 6 Annealing Oven	2,160	NO _x , NH ₃ and H ₂ SO ₄
A23	Seco Warick Oven	2,160	NO _x , NH ₃ and H ₂ SO ₄
A30	Trial Plating Line Emission 1	2,160	NO _x , HCl and H ₂ SO ₄
A31	Trial Plating Line Emission 2	2,160	NO _x , HCl and H ₂ SO ₄
A32	De-soldering scrubbing plant	8,232	NO _x , Cu, Zn, Pb and HBr
A33	Surface gold reactor scrubbing plant	2,940	NO _x , Cu, Zn,Pb, HCl, acetic acid, Cl ₂ and ClO ₂
A34	Dust extraction plant	8,232	PM ₁₀ and PM _{2.5}
EP1	Burn-off Oven	2,744	HBr

Table 3.2 and 3.3 below details the existing emission points on site.

Table 3.2 Existing Emission Parameters

Parameter / Sources	A16	A21	A23	A30	A31
Stack height (m)	16	15.1	15.1	10	10
Stack exit diameter (m)	0.90	0.25	0.30	0.20	0.20
Temperature of release (K)	293	335	352	294	294
Actual flow rate (Am ³ /s)	10.1	0.84	1.0	0.48	0.42
Normalised flow rate (Nm ³ /s) (a)	9.3	0.68	0.80	0.44	0.39
Emission velocity at stack exit (m/s)	15.9	17.1	14.7	15.3	13.3
Operational hours (h/a)	2160	2160	2160	2160	2160
Emission Concentrations (mg/Nm³)					
NO _x	0.3	14.2	0.2	0.42	0.42
Cu	0.067	-	-	-	-
Zn	0.12	-	-	-	-
Pb	0.025	-	-	-	-

NH ₃	-	0.77	0.91	-	-
HCl	0.17	-	-	0.066	0.066
Short-term Emission Rate (g/s)					
NO _x	0.0028	0.0097	0.00016	0.00019	0.00016
Cu	0.00041 (b)	-	-	-	-
Zn	0.0011	-	-	-	-
Pb	0.00023	-	-	-	-
NH ₃	-	0.00053	0.00073	-	-
HCl	0.0016	-	-	0.000029	0.000026
Long-term Emission Rate (g/s) (c)					
NO _x	0.00068	0.0024	0.000040	0.000046	0.000040
Cu	-	-	-	-	-
Zn	0.00027	-	-	-	-
Pb	0.000057	-	-	-	-
NH ₃	-	0.00013	0.00018	-	-
HCl	0.00039	-	-	0.0000072	0.0000063
(a) Corrected for temperature only					
(b) Assumes only two of the three pods operates					
(c) Emissions pro-rated according to the annual operating hours					

Table 3.3 Existing Emission Parameters

Parameter / Sources	A32	A33	A34	EP1
Stack height (m)	16	14.9	13.2	16
Stack exit diameter (m)	0.254	0.250	1.12	0.3
Temperature of release (K)	293	Ambient	Ambient	903
Actual flow rate (Am ³ /s)	0.51	0.97	13.9	0.68
Normalised flow rate (Nm ³ /s) (a)	0.48	0.92	13.2	0.20
Emission velocity at stack exit (m/s)	10.1	19.7	14.1	9.6
Operating hours per annum	8232	2940	8232	2744
Operating hours per day	24	12	24	8
Emission Concentrations (mg/Nm³)				

NO _x	0.01	0.01	-	-
Zn, Cu, Pb	0.01	0.01	-	-
HBr	10	-	-	50
HCl	-	10	-	-
Acetic acid	-	10	-	-
Chlorine	-	1	-	-
Chlorine dioxide	-	1	-	-
Total suspended particles	-	-	5	-
Short-term Emission Rate (g/s)				
NO _x	0.0000048	0.0000092	-	-
Cu	0.0000048	0.0000061 (b)	-	-
Zn	0.0000048	0.0000092		
Pb	0.0000048	0.0000092		
HBr	0.0048	-	-	0.010
HCl and acetic acid	-	0.0092	-	-
Chlorine and chlorine dioxide	-	0.00092	-	-
Total suspended particles	-	-	0.066	-
Long-term Emission Rate (g/s)				
NO _x	0.0000045	0.0000031	-	-
Zn, Pb	0.0000045	0.0000031		
HBr	0.0045	-	-	0.0032
HCl and acetic acid	-	0.0031	-	-
Chlorine and chlorine dioxide	-	0.00031	-	-
Total suspended particles	-	-	0.062	-

(a) Corrected for temperature only

(b) Assumes it operates for only two of the three shifts

(c) Emissions pro-rated according to the annual operating hours

3.2 Emissions to Controlled Water

There will be no change to emissions to controlled water as a result of this permit variation.

Any emissions via W1 will remain as currently permitted.

3.3 Emissions to Sewer

There will be no change to emissions to sewer as a result of this permit variation.

Any emissions via S1 will remain as currently permitted. All emissions to sewer will remain in accordance with the sites current Trade Effluent Discharge consent (Ref No. TE409).

3.4 Emissions to Land

There will be no change to emissions to land as a result of this permit variation.

3.5 Noise Emissions

There will be no noise emissions as a result of this permit variation. Operations on site will be reduced therefore ultimately reducing potential noise emissions from site.

Appropriate preventative maintenance will continue to be provided for plant onsite to ensure no deterioration of plant or equipment that would give rise to increases in noise.

The location of the site is in an active industrial site and therefore background noise levels are already high resulting in the impact from remaining site activities being minimal in comparison.

Therefore, during normal operating conditions there are no potential emissions of noise or vibration that are considered to have the potential to impact the environment.

Due to the above, noise is screened out as low risk and further assessment is not required.

3.6 Emissions of Waste

As a result of this variation there will be no changes to the emissions of waste from site and will remain as currently permitted.

Table 3.4 below provides information on the wastes and quantities that will be exported off site as a result of onsite operations.

Table 3.4 Waste Arisings and Disposal

Substance	Quantity (TPA)	Fate
Tin Alloy	90	R4
Spent Lixiviant (Acetic)	800	R6
Scrubber De-soldering	310	R5
Neutralisation Liquid	85	R6
Ferrous Mag	300	R4
Aluminum	150	R4
Copper	750	R4
Mixed Metals	850	R4
Integrated Circuit and Surface Mount Devices	600	R5
Bromine / Oil	145	R5
Mixed Plastics	110	R5
Cables	40	R5

4. ENVIRONMENTAL MONITORING

4.1 Impacts to Air

All emissions to air will be monitored as per the existing permit requirements.

4.2 Impacts to Controlled Water

There are no additional impacts to controlled water arising from this permit variation.

All emissions to controlled water will be monitored as per the existing permit requirements.

4.3 Impacts to Sewer

There are no additional impacts to controlled water arising from this permit variation.

All emissions to sewer will be monitored as per the existing permit requirements.

4.4 Impacts to Land

There are no impacts to land arising from this permit variation.

5. BAT JUSTIFICATION

All plant and equipment has been designed in accordance with BAT and will comply with the relevant standard and guidance requirements.

The following updated BAT demonstration is based on the EU BAT Conclusions on Waste Treatment published August 2018. The updated BAT demonstration is summarised in Table 5.1 and details the indicative BAT requirements that apply to the proposed process.

Table 5.1 Guidance Review – BREF Waste Treatment

BAT Reference	BAT Conclusion	Justification
BAT 1	In order to improve the overall environmental performance, BAT is to implement and adhere to an environmental management system (EMS) that incorporates the features provided within the BREF document.	Royal Mint have an Environmental Management System in place that is accredited to three ISO certification and meets the requirements of the BREF.
BAT 2	In order to improve the overall environmental performance of the plant, BAT is to use all of the techniques provided within the BREF document.	Royal Mint implement the following on site: <ul style="list-style-type: none"> • Waste Acceptance Procedures (EWP 4.5.4 – Waste Receipt Procedure); • A tracking system and inventory; • Waste segregation; and • Ensure waste compatibility during waste inspection.
BAT 3	In order to facilitate the reduction of emissions to water and air, BAT is to establish and to maintain an inventory of waste water and waste gas streams, as part of the environmental management system (see BAT 1), that incorporates all of the features provided within the BREF document.	Royal Mint will ensure that an inventory is kept on site detailing waste water and waste gas streams from site.
BAT 4	In order to reduce the environmental risk associated with the storage of waste, BAT is to use all of the techniques provided within the BREF document.	The following is carried out on site to reduce the environmental risk associated with the storage printed circuit boards and WEEE wastes: <ul style="list-style-type: none"> • Optimised storage locations; • Adequate storage capacity; • Safe storage operation; and • Dedicated hazardous waste storage.
BAT 5	In order to reduce the environmental risk associated with the handling and transfer of waste, BAT is to set up and implement handling and transfer procedures.	All handling and transfer of WEEE is carried out by competent staff and documented via the sites acceptance procedures and management system. Any spillages on site will be detected via the sites site walkover procedure and managed accordingly.
BAT 6	For relevant emissions to water as identified by the inventory of waste water streams (see BAT 3), BAT is to monitor key process parameters (e.g. waste water flow, pH, temperature, conductivity, BOD) at key locations (e.g. at the inlet and/or outlet of the pretreatment, at the inlet to the final treatment, at the point where the emission leaves the installation).	Any waste water / effluent is contained and transferred off site for further treatment using third party specialist waste contractors. There is no waste water treatment on site. There are no process emissions to controlled waters.

BAT 7	BAT is to monitor emissions to water with at least the frequency given below, and in accordance with EN standards. If EN standards are not available, BAT is to use ISO, national or other international standards that ensure the provision of data of an equivalent scientific quality.	There are no process emissions to controlled waters.
BAT 8	BAT is to monitor channelled emissions to air with at least the frequency given below, and in accordance with EN standards. If EN standards are not available, BAT is to use ISO, national or other international standards that ensure the provision of data of an equivalent scientific quality.	The necessary monitoring will be carried out by Royal Mint as specified by NRW.
BAT 9	BAT is to monitor diffuse emissions of organic compounds to air from the regeneration of spent solvents, the decontamination of equipment containing POPs with solvents, and the physico-chemical treatment of solvents for the recovery of their calorific value, at least once per year using one or a combination of the techniques given in the BREF guidance note.	N/A – no solvents are processed on site.
BAT 10	BAT is to periodically monitor odour emissions	There are no emissions to odour arising from this permit variation. WEEE waste is not odorous wastes and all processing takes place within existing buildings on site.
BAT 11	BAT is to monitor the annual consumption of water, energy and raw materials as well as the annual generation of residues and waste water, with a frequency of at least once per year.	The annual consumption of water, energy and raw materials and generation of residues and waste waters will be monitored at least annually.
BAT 12	In order to prevent or, where that is not practicable, to reduce odour emissions, BAT is to set up, implement and regularly review an odour management plan, as part of the environmental management system (see BAT 1).	There are no emissions to odour arising from this permit variation. WEEE waste is not odorous wastes and all processing takes place within existing buildings on site.
BAT 13	In order to prevent or, where that is not practicable, to reduce odour emissions, BAT is to use one or a combination of the techniques given in the BREF Guidance.	There are no emissions to odour arising from this permit variation. WEEE waste is not odorous wastes and all processing takes place within existing buildings on site.
BAT 14	In order to prevent or, where that is not practicable, to reduce diffuse emissions to air, in particular of dust, organic compounds and odour, BAT is to use an appropriate combination of the techniques given in the BREF guidance.	There is not expected to be any emissions to odour and dust arising from this permit variation. WEEE waste is not odorous in nature and all processing takes place within existing buildings on site. All dusts will be captured in dedicated extraction plants.

		The main processing equipment within the MRB Building is extracted via a dedicated dust extraction system. All dusts are returned back to the process to recover any precious metals content.
BAT 15	BAT is to use flaring only for safety reasons or for non-routine operating conditions (e.g. start-ups, shutdowns) by using both of the techniques given in the BREF Guidance.	N/A – there is no flaring on site.
BAT 16	In order to reduce emissions to air from flares when flaring is unavoidable, BAT is to use both of the techniques given in the BREF Guidance.	N/A – there is no flaring on site.
BAT 17	In order to prevent or, where that is not practicable, to reduce noise and vibration emissions, BAT is to set up, implement and regularly review a noise and vibration management plan, as part of the environmental management system (see BAT 1).	<p>There are no noise emissions arising from this permit variation. The process has been significantly reduced therefore reducing any potential noise emissions from site.</p> <p>The processing plant and associated equipment has been designed in accordance with best practice and to ensure that internal noise does not present an issue to the employees at the site under the Control of Noise at Work Regulations and to ensure that noise breakout does not lead to noise nuisance at the identified sensitive receptors.</p> <p>Appropriate preventative maintenance will be provided for the plant to ensure no deterioration of plant or equipment that would give rise to increases in noise.</p> <p>The location of the site is in an active industrial site and therefore background noise levels are already high resulting in the impact from the proposed plant being minimal in comparison.</p> <p>Therefore, during normal operating conditions there are no potential emissions of noise or vibration that are considered to have the potential to impact the environment.</p> <p>This is considered BAT for site and a noise and vibration management is not considered necessary.</p>

BAT 18	In order to prevent or, where that is not practicable, to reduce noise and vibration emissions, BAT is to use one or a combination of the techniques given in the BREF Guidance.	<p>Noise and vibration on site will be reduced from this permit variation due to downscaling operations. Noise and vibration emissions are reduced on site via the following measures:</p> <ul style="list-style-type: none"> • Appropriate location of equipment within existing industrial buildings; and • Operational measures that include: • Inspection and maintenance of the processing equipment; • Closing of doors and windows of enclosed areas, if possible; • Equipment only operated by experienced staff; • Processing only taking place during daytime hours; and • No processing relating to this variation operated at night. • Low noise equipment used where possible.
BAT 19	In order to optimise water consumption, to reduce the volume of waste water generated and to prevent or, where that is not practicable, to reduce emissions to soil and water, BAT is to use an appropriate combination of the techniques given in the BREF Guidance.	<p>There are no process emission to controlled waters therefore there are no emission to soil and water.</p> <p>The following measures are in place to reduce emission to soil and water:</p> <ul style="list-style-type: none"> • Water Management – a water mass balance will be maintained on site. • Impermeable Surface – all storage is within existing industrial buildings with impermeable services. • Techniques to Reduce Failures from Tanks and Vessels – all tanks will have the necessary secondary containment. • Roofing over Storage – all storage is within existing industrial buildings. • Adequate Drainage Infrastructure – all new activities relating to the PCB storage processing line are located within the former buildings and do not give rise to any contaminated or potentially contaminated discharges. All process and storage areas are fully enclosed, therefore any spillages / runoff will be effectively contained within the building and tankered off site. • Design and Maintenance Provisions to Allow Detection and Repair of Leaks – regular monitoring is carried out for potential leaks.
BAT 20	In order to reduce emissions to water, BAT is to treat waste water using an appropriate combination of the techniques given in the BREF Guidance.	Any waste water / effluent will be contained and transferred off site for further treatment using third party specialist waste contractors.

BAT 21	In order to prevent or limit the environmental consequences of accidents and incidents, BAT is to use all of the techniques given below, as part of the accident management plan (see BAT 1).	Royal Mint uses the following techniques to prevent or limit environmental consequences of accidents and incidents: <ul style="list-style-type: none"> • Protection measures; • Management of accidental emissions i.e spillage procedures and containment of fire water; and • Incident / accident system – all accidents will be recorded in the site diary etc.
BAT 22	In order to use materials efficiently, BAT is to substitute materials with waste.	This is currently not suitable for the proposed process but will be reviewed regularly if options become available.
BAT 23	In order to use energy efficiently, BAT is to use both of the techniques given in the BREF guidance.	Royal Mint monitors its energy use and costs closely and maintains an energy balance record each month which is summarised in the annual reporting to the EA as part of the annual pollution inventory reporting.
BAT 24	In order to reduce the quantity of waste sent for disposal, BAT is to maximise the reuse of packaging, as part of the residues management plan (see BAT 1).	Where possible, packaging will be reused for storage.

General BAT conclusions for the mechanical treatment of waste

BAT 25	In order to reduce emissions to air of dust, and of particulate-bound metals, PCDD/F and dioxin-like PCBs, BAT is to apply BAT 14d and to use one or a combination of the techniques given in the guidance.	The main processing equipment within the MRB Building is extracted via a dedicated dust extraction system. All dusts are returned back to the process to recover any precious metals content.
BAT 26 – BAT 28	BAT conclusions for shredding metal waste	N/A
BAT 29 – BAT 30	BAT conclusions for the treatment of WEEE containing VFCs and/or VHCs	N/A
BAT 31	BAT conclusions for the mechanical treatment of waste with calorific value	N/A
BAT 32	BAT conclusions for mechanical treatment of WEEE containing mercury	The likelihood of the incoming waste containing any liquid mercury is low. All required equipment will have the necessary extraction and abatement systems. Mercury levels can be periodically measured if required.
BAT 33 – BAT 37	BAT conclusions for the biological treatment of waste	N/A
BAT 38	BAT conclusions for the anaerobic treatment of waste	N/A

BAT 39	BAT conclusions for the mechanical biological treatment (MBT) of waste	N/A
BAT conclusions for the physico-chemical treatment of waste		
BAT 40	In order to improve the overall environmental performance, BAT is to monitor the waste input as part of the waste pre-acceptance and acceptance procedures	Royal Mint will monitor waste as part of the sites waste acceptance procedure (EWP 4.5.4 – Waste Receipt Procedure).
BAT 41	In order to reduce emissions of dust, organic compounds and NH3 to air, BAT is to apply BAT 14d and to use one or a combination of the techniques provided within the BREF document.	The main processing equipment within the MRB Building is extracted via a dedicated dust extraction system. All dusts are returned back to the process to recover any precious metals content.
BAT 42 – 44	BAT conclusions for the refining of waste oil	N/A
BAT 45	BAT conclusions for the physico-chemical treatment of waste with calorific value	N/A
BAT 46 – 47	BAT conclusions for the regeneration of spent solvents	N/A
BAT 48 – BAT 49	BAT conclusions for the thermal treatment of spent activated carbon, waste catalysts and excavated contaminated soil	N/A
BAT 50	BAT conclusions for the water washing of excavated contaminated soil	N/A
BAT 51	BAT conclusions for the decontamination of equipment containing PCBs	N/A
BAT 52 – BAT 53	BAT conclusions for the treatment of water-based liquid waste	N/A

6. IMPACTS TO THE ENVIRONMENT

6.1 Impacts to Air

Given the significant reductions in emissions to air, no additional impacts from the site are anticipated. An updated AQA has been included as part of this application to assess the remaining emission points. The updated Air Quality Assessment is included in *Annex D – AQA*.

Scope of the Assessment

The scope of the assessment has been determined in the following way:

- Review of air quality data for the area surrounding the site, including data from the Defra Air Quality Information Resource (UK-AIR);
- Desk study to confirm the location of nearby areas that may be sensitive to changes in local air quality; and
- Review and modelling of emissions data which have been used as an input to the Breeze AERMOD dispersion modelling assessment.

Predicted ground level concentrations are compared with relevant air quality standards for the protection of health and critical levels / loads for the protection of sensitive ecosystems and vegetation.

Detailed air quality modelling using the AERMOD 12 dispersion model has been carried out to determine the local air quality impacts associated with the retained emissions to air. The assessment has considered emissions of NO_x, trace metals, NH₃, HBr, HCl, acetic acid, chlorine, chlorine dioxide and fine particles (PM₁₀ and PM_{2.5}).

6.1.2 Sensitive Human Health Receptors

Specific receptors have been identified where people are likely to be regularly exposed for prolonged periods of time (e.g. residential areas). The location of each of the discrete sensitive receptors is presented in Table 6.1.

Table 6.1 Human Health Receptors

Ref.	Receptor	Type	Easting	Northing
D1	Rhiwfelin Fawr	Residential	303163	185915
D2	Rhiwfelin Nursing Home	Nursing Home	303276	186124
D3	Rhiwfelin Fach	Residential	304036	185512
D4	Glanmychudd-Fach	Residential	304071	185111
D5	Llantrisant Dialysis Centre	Medical Facility	304500	185110
D6	Tal-y-fedw	Residential	304693	185336
D7	Tyclwydau	Residential	304847	184161
D8	Llwyncrwn Isaf	Residential	305459	184617
D9	Ty'n-y-coed	Residential	305649	184240
D10	Coed-yr-Escob Primary School	School	304482	183941
D11	Graig-y-Ilan	Residential	303946	184107

D12	Royal Glamorgan Hospital	Hospital	303610	184366
D13	Glan-yr-ely	Residential	303378	184553
D14	Signalmans Cottage	Residential	303047	184627
D15	Dyffryn-isaf	Residential	303012	184754
D16	Dyffryn-uchaf	Residential	303063	184907
D17	Bedw	Residential	302567	185478
D18	Royal Mint Experience	Leisure	303887	184825

Predicted pollutant concentrations at sensitive receptor locations are compared with the air quality standards and objectives set for the protection of human health. It is concluded that predicted impacts are not significant or that it is unlikely that the air quality objectives would be exceeded.

6.1.3 Sensitive Habitat Sites

The Environment Agency's risk assessment guidance states that the impact of emissions to air on vegetation and ecosystems should be assessed for the following habitat sites within 10 km of the source:

- Special Areas of Conservation (SACs) and candidate SACs (cSACs) designated under the EC Habitats Directive ;
- Special Protection Areas (SPAs) and potential SPAs designated under the EC Birds Directive ; and
- Ramsar Sites designated under the Convention on Wetlands of International Importance .

Within 2 km of the source:

- Sites of Special Scientific Interest (SSSI) established by the 1981 Wildlife and Countryside Act;
- National Nature Reserves (NNR);
- Local Nature Reserves (LNR);
- Local wildlife sites (Sites of Interest for Nature Conservation, SINC and Sites of Local Interest for Nature Conservation, SLINC); and
- Ancient woodland.

Habitat receptor designations and locations relevant to the assessment are presented in Table 6.2.

Table 6.2 Sensitive Habitat Receptors

Receptor	Primary Habitat	Approx. Location (Relative to Site)
Llantrisant Common and Pastures SSSI	Acid grassland and bogs	300 m south and southwest
Rhos Tonyrefail SSSI	Blanket bog	100 m northwest
Cardiff Beech Woods SAC	Beech Woodland	7.5 km east-southeast

Due to the close proximity of the two SSSIs to the Site, the designated areas have been modelled using a Cartesian grid of 50 m resolution to enable the maximum impact to be determined. Cardiff Beech Woods SAC, which is 7.5 km from the facility, has been represented in the model by a discrete receptor at the nearest boundary of the designated area.

At the identified habitat sites, the predicted process contributions are not significant compared with the critical levels for NO_x and NH₃ and site-specific critical loads for nutrient nitrogen deposition and acidification.

Based on the above information, it is considered that the proposed operations at the Site do not have an adverse impact on local air quality.

6.2 Impacts to Controlled Water

There are no impacts to water arising from this permit variation.

All emissions to controlled water are within the existing permitted consents / emission limit values.

6.3 Impacts to Sewer

There are no impacts to sewer arising from this permit variation.

All emissions to sewer are within the existing permitted consents / emission limit values.

6.4 Impacts to Land

There are no impacts to land arising from this permit variation.