

Notice of variation and consolidation with introductory note

The Environmental Permitting (England & Wales) Regulations 2016

H J Enthoven Limited

Darley Dale Smelter
South Darley
Matlock
Derbyshire
DE4 2LP

Variation application number

EPR/BL5598IR/V009

Permit number

EPR/BL5598IR

Darley Dale Smelter

Permit number EPR/BL5598IR

Introductory note

This introductory note does not form a part of the notice.

Under the Environmental Permitting (England & Wales) Regulations 2016 (schedule 5, part 1, paragraph 19) a variation may comprise a consolidated permit reflecting the variations and a notice specifying the variations included in that consolidated permit.

Changes introduced by this variation notice/statutory review

This variation has been issued to update some of the conditions following a statutory review of the permits in the industry sector for non-ferrous metals. The opportunity has also been taken to consolidate the original permit and subsequent variations.

The Industrial Emissions Directive (IED) came into force on 7th January 2014 with the requirement to implement all relevant Best Available Techniques (BAT) Conclusions as described in the Commission Implementing Decision. In particular the BAT Conclusions for the non-ferrous metals industries (BATc) were published on 30th June 2016 in the Official Journal of the European Union (L174) following a European Union wide review of BAT, implementing decision (EU) 2016/1032 of 13th June 2016. From that document the BATc for this installation which apply from 30th June 2020 are 1-10, 12, 14-19, 90-101, and 103-107. The operator is already compliant with the BATc with the exception of 16, 17, 94 and 99. We have set improvement conditions in the varied permit to track progress against future compliance.

The schedules specify the changes made to the permit. Schedule 1 of the notice specifies the conditions that have been varied and schedule 2 comprises a consolidated permit which reflects the variations being made. Only the variations specified in schedule 1 are subject to a right of appeal.

Purpose of the installation

The purpose of the installation is to recover lead and other commercially valuable components from lead-bearing materials including wastes. The materials include waste lead-acid batteries, lead scrap from the battery manufacturing industry and other sources, lead dross from external sources and dross, lead-bearing dusts, sinter and sludges generated internally. Recovery involves the smelting and refining of the lead producing amongst other things lead ingots, blocks, strip and shot. The process is estimated to have a gross throughput capacity of circa 150,000 tonnes per annum (140,000 from lead-acid batteries, and 10,000 tonnes from scrap lead materials), producing circa 85,000 tonnes of lead.

Other commercially valuable materials resulting from the installation process include polypropylene from the battery casings, in the form of plastic chippings; and synthetic gypsum via two routes, battery acid neutralisation and flue gas desulphurisation (FGD) respectively.

Activities of the installation

The activities undertaken at the installation are shown in Table S1.1 of the permit and comprise of activities listed in Part 1 of Schedule 1 of the Environmental Permitting Regulations 2016 (EPR), which we refer to as 'listed activities', as well as unlisted Directly Associated Activities (DAA's).

The primary listed activities are permitted under Section 2.2 of EPR as follows:

- S2.2 Part A(1)(a), *Producing non-ferrous metals from ore, concentrates or secondary raw materials by metallurgical, chemical or electrolytic activities.*

This activity relates to the smelting of lead in two rotary furnaces and a single reverberatory (reverb) furnace.

- S2.2 Part A(1)(b), *Melting, including making alloys of, non-ferrous metals, including recovered products and the operation of non-ferrous metal foundries where and the operation of non-ferrous metal foundries where –*
 - (i) *the plant has a melting capacity of more than 4 tonnes per day for lead or cadmium or 20 tonnes per day for all other metals, and*
 - (ii) *any furnace (other than a vacuum furnace), bath or other holding vessel used in the plant for the melting has a design holding capacity of 5 or more tonnes.*

This activity relates to the refining of molten lead received from the smelting furnaces in fourteen refining kettles, and includes the casting of the refined lead into ingots and blocks.

Other 'listed activities' take place which involve the treatment and storage of hazardous wastes. These activities are also directly associated to the lead smelting and refining processes but due to their capacities are permitted under Section 5.3 Part A(1)(a)(ii) of EPR, *Disposal or recovery of hazardous waste with a capacity exceeding 10 tonnes per day involving physico-chemical treatment*, as follows:

- the crushing / breaking of batteries in the mechanical 'MA battery breaker';
- the treatment of battery acid in the Dove plant to obtain synthetic gypsum;
- the treatment of process effluents in the on-site Effluent Treatment Plant (ETP) prior to the treated effluent being discharged to the River Derwent;
- the treatment of reverberatory furnace off-gases in the FGD plant to obtain synthetic gypsum,

and under Section 5.6 Part A(1)(a) of EPR, *Temporary storage of hazardous waste with a total capacity exceeding 50 tonnes pending any of the activities listed in Sections 5.1, 5.2, 5.3...as follows:*

- the storage of hazardous waste received on-site prior to use in the process.

The other unlisted DAA's taking place at the installation are as follows:

- Pre-treatment of waste lead-acid batteries
- Raw materials storage and handling
- Materials and Furnace charge preparation
- Reverberatory furnace charge drying
- Off-gas collection, abatement and discharge
- Storage and handling of wastes generated on-site
- Strip production
- Shot production
- Polypropylene Plant

Brief description of the process

Delivery and Storage

Waste batteries are received on site in nominally 1 tonne capacity polypropylene containers or shrink-wrapped wooden pallets, or in bulk tippers containing up to 25 tonne. All batteries are tipped onto an acid-resistant receiving apron (which drains into the acid recovery area), where inspection of loads is undertaken. Once the load passes inspection it is transferred into one of two undercover, acid-resistant floor battery storage buildings. Batteries are then cracked to release the majority of the sulphuric acid electrolyte using suitable equipment. The acid drains by gravity to the Dove gypsum production facility.

Purchased drosses are generally received in steel drums, skips and IBC's and are tipped undercover in the materials preparation building. Internally produced sinter, slag, drosses and lead containing particulates (e.g. bag filters) are also stored here for furnace charge preparation.

Lead-bearing intermediate material from the battery breaking process, are stored with recovered lead-bearing sludge and dusts collected from abatement systems, in two undercover storage areas.

Other furnace reagents, such as coke and iron are stored in dedicated bays within the charge preparation area.

Liquid oxygen is delivered to site and are stored in four tanks, with a total capacity of approximately 190 tonne.

Battery Breaking

Batteries are transferred from the Battery Storage Building to the battery breaking plant by a front-end loader which feeds a hopper and conveyor system. Here the batteries are broken by being passed through a hammer mill and separate into various components by means of screens and “float/sink” separation techniques. Battery paste and lead bearing metallics are transferred to the charge preparation building. Washed polypropylene is stored in a separate covered bay prior to transfer to the polypropylene plant. Lead-containing separator materials are mixed with the lead bearing metallics stream.

The battery paste prior to transfer, has liquid lime added as a pre-reagent addition for the reverb furnace mix. Any liquid generated by this process undergoes pre-neutralisation to raise the pH prior to direct transfer to the ETP.

The battery breaking plant and building is subject to local exhaust ventilation that vents to air via a wet scrubber to a stack at a height of 15 metres. The liquor from this scrubber and the other liquors arising from the battery breaking activity pass to the ETP.

Dove gypsum facility

Sulphuric acid electrolyte received from the battery storage building is collected in five 30 m³ buffer tanks. A sedimentation process stage is then undertaken where solids are removed from the process for recovery at the effluent treatment plant. The remaining sulphuric acid raw material, then undergoes a chemical reaction with high-quality Calcium Oxide in a complex four stage process resulting in a gypsum material.

Materials preparation

Lead dross from external sources, and dross, lead-bearing dusts, and sinter from internal processes are crushed (where required) and screened within the materials preparation building to be transferred and used in the furnace charge. Silica slag is reduced in size prior to loading for transportation to landfill.

The materials preparation building is subject to local exhaust ventilation that vents to air via a bag filter to a stack at a height of 12 metres.

Furnace Charge Preparation

The main charge preparation building is an area where all furnace mixes are prepared for all 3 furnaces. Materials are mixed with reagents and prepared to a pre-set recipe before being transferred by overhead crane to feed hoppers. The reverb feed hopper can also be loaded by a front-end loader (FEL).

The furnace charge preparation building is subject to local exhaust ventilation that vents to air via a bag filter to a stack at a height of 25 metres.

Reverberatory furnace smelting

The furnace mix is transferred from the hopper via conveyors and screws to a rotating drier where the materials are dried to a maximum temperature of 125°C. The reverb drier is subject to local exhaust ventilation that vents to air via a bag filter to a stack at a height of 61 metres.

The dried charge has coke added prior to transport to the reverb furnace by enclosed conveyors. The furnace is continually fed, and lead is syphoned into two 150 tonne receiving pots located in the refinery. A lead oxide sinter layer is tapped into small pans, which is solidified then transferred to the materials preparation building for preparation, prior to further processing in the Rotary furnaces.

This furnace is fired by two gas and oxygen fuelled burners. Sulphur, within the furnace mix, is deliberately oxidised to a raw material via complex metallurgical and combustion reactions to form high concentration sulphur dioxide gas within the flue gas stream. Flue gases are fully combusted prior to quenching, where dust particles are removed via gravity and high temperature, pulsed jet, bag filtration. Particulate matter is

recycled to the furnace. After filtration the sulphur dioxide containing gas stream is maintained at high temperature and transfers to the flue gas de-sulphurisation production facility.

Flue Gas Desulphurisation (FGD) plant

Sulphur dioxide gas raw material is introduced to water in a FlowPac where it converts to sulphurous acid. High quality hydrated lime milk (calcium oxide) is added to the FlowPac where the sulphurous acid reacts with the calcium oxide to produce calcium sulphite (CaSO_3). Oxidisation air is then introduced into the FlowPac converting the calcium sulphite via oxidation, into a gypsum material (calcium sulphate hydrate ($\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$)), which is then dried utilising a hydro cyclone and vacuum belt filter discharging to a storage bunker prior to loading for dispatch. The majority of effluent arising from the process is recycled but a small flow discharges to the ETP periodically.

Rotary furnace smelting

The furnace mix is transferred from one of four hoppers to one of two gas and oxygen burner fuelled furnaces by enclosed conveyors. The two furnaces are both 25 tonnes nominal capacity and operate as batch charges over several hours' dependant on the furnace mix.

Each furnace area is kept under negative pressure throughout the charging and operational cycle, with hot gases vented through extraction to a bag filter abatement system. Gases are directed through a quench gas trail, where larger dust particles are collected and where the flue gases are collected with hygiene air to less than 120°C prior to filtration in a reverse pulse bag filter. Both bag filters vent to air via a stack, 61 metres in height. Particulate matter collected in the bag filters is recycled back to the furnaces.

Lead is tapped into two 70 tonne receiving pots, which when full have the surface dross layer skimmed before being pumped to the adjacent refinery. Glassy slag is tapped into slag moulds which is initially cooled under an extraction hood that vents to the main hygiene air extraction system. It is then transferred to a slag storage area prior to transfer to the materials preparation area. The slag storage area is subject to local exhaust ventilation that vents to air via a bag filter to a stack at a height of 20 metres.

Refining

The refinery is equipped with fourteen, 120 to 150 tonne capacity, natural gas fired kettles for the refining treatment of bullion to either pure lead or adjustment into specification for various lead alloys. The kettles are fully enclosed when in use and are vented to air via a reverse pulse bag filter to a stack at a height of 30 metres. Particulates collected by the bag filter are recycled. The combustion gases are released to air via their own stacks.

Ingot casting

Once the lead has been refined to the appropriate specification, the metal is cast into ingots of 25kg or 50kg. Finished products are stored in warehousing prior to sale, or re-melted for strip and/or shot production.

Block casting

Once the lead has been refined to the appropriate specification, the metal is cast into blocks up to 3.5 tonnes. Finished products are stored in warehousing prior to sale or re-melted for strip and/or shot production.

Strip Production

The Strip Mill is equipped with three gas fired melting kettles (1 x 70 tonne pot and 2 x 30 tonne pots), and a continuous casting, rolling and coiling machine. The kettles are fully enclosed when in use and are vented to air via a stack at a height of 12 metres. A reverse pulse bag filter is installed, and the particulate matter collected is recycled. The combustion gases are released to air at a height of 9 metres. Wastewater containing some emulsified oil is collected locally in an above ground bunded collection tank, periodically emptied and recovered off site.

Shot Production

Shot is produced in a plant which uses a technique of spraying molten lead alloy at just above its freezing point to produce sub-1mm shot, for use in industry. The plant is equipped with a gas fired 70 tonne melting kettle which is fully enclosed when in use and which vents to air via a bag filter and stack at a height of 12 metres.

Polypropylene Plant

Washed polypropylene from the battery breaking plant is placed into an infeed hopper by a front-end loader. The hopper then discharges into a wash plant where the polypropylene is further washed and granulated to smaller fractions prior to storage in four 10 tonne intermediate hoppers. The intermediate hoppers discharge into feed conveyors where customer specific reagents are added prior to melting, filtering and extrusion through a die face. The resultant extrusion is cut and quenched prior to transfer to drying silos. The resulting material is then dried for several hours before storage in silos or packaged for the customer. The die face and filter area are extracted and filtered during a three-stage process. The first and second stages consist of self-draining Absolent filters. The third stage consists of a HEPA filter. The centrifugal fan discharges into the building. The majority of effluent arising from the process is recycled but a small flow discharges to the ETP periodically.

Effluent Treatment Plant

The bulk of the spent sulphuric acid electrolyte drained from batteries in the battery storage building naturally drains to the Dove gypsum production facility. Any excess not captured here will drain to the Effluent Treatment Plant. In addition, the discharge from the battery breaker pre-neutralisation plant drains to the ETP, along with the recovered solids from the Dove gypsum production facility buffer tanks, and effluent from the FGD plant, and polypropylene plant respectively. The ETP outlet goes to the River Derwent (controlled waters) near Yatestooop Sough, at emission point W1.

Some site drainage from the western part of the site is channelled via an interceptor to the Cowley Brook, at emission point W2, with the discharge comprising surface run-off from around the strip mill, canteen, laundry, medical block, training office, and main office.

Liquors flowing to the effluent treatment plant usually range in pH from approximately 1 to approximately 7. The discharge from the effluent treatment plant is required to be of pH 6 to 10. The optimum pH range, at which lead has minimum solubility, is 9.0 to 9.4.

The treatment approach is based on pH adjustment, coagulation, flocculation, solids separation, sludge dewatering and gravity sedimentation. The liquor passes through a number of clearly defined processes (stages) to effect this treatment. These stages are:

- (a) reception and screening (screenings consist of fine plastic materials and are deposited via a screw conveyor into a skip for off-site disposal);
- (b) addition of Ferric Chloride solution;
- (c) conditioning (pH adjustment by the addition of sodium hydroxide solution and calcium hydroxide);
- (d) separate addition of flocculating agents;
- (e) solid separation (by means of a clarifier and hydraulic residence in 4m deep dammed lagoons 4&5);
- (f) tertiary filtration (by means of a proprietary cloth filter system);
- (g) solids dewatering (sludge from the clarifier is dewatered across a vacuum belt filter; the dewatered sludge is collected and recycled);
- (h) dams desludging (dredged and drained solids recycled).
- (i) Reverse osmosis / ion exchange filtration.

Because the existing drainage system results in both process effluent and surface drainage flowing to the effluent treatment plant, during periods of heavy rainfall excess liquor is stored in collection system tanks, dams and a blind tank, before being returned to process when conditions allow.

The site operates an Environmental Management System that is certified to ISO 14001. The operator is also accredited under ISO 50001 in relation to energy efficient management.

The status log of a permit sets out the permitting history, including any changes to the permit reference number.

Status log of the permit		
Description	Date	Comments
Application BL5598IR	Received 12/12/01	Duly made date, submission made 29th Nov 2001
Request by Agency for further information under Schedule 4	Request dated 6/02/02	Response dated 28/03/02
Request by Agency for further information under Schedule 4	Request dated 6/03/02	Response dated 22/04/02
Request by Agency for further information under Schedule 4	Request dated 27/03/02	Response dated 24/06/02
Request by Agency for further information under Schedule 4	Request dated 9/05/02	Response dated 10/09/02
Request by Agency to extend determination by 6 months from 24/06/02 to 24/12/02	Request dated 11/06/02	Request accepted 18/06/02
Request by Agency for further information under Schedule 4	Request dated 10/3/03	Acceptable response dated 8/08/03.
Request by Agency to extend determination time	Request dated 14/05/03	Request accepted 21/05/03
Permit BL5598IR	Determined 30/01/04	Issued 30/01/04
Application for Variation GP3935LU	Received 08/03/06	Duly made date 08/03/06
Request for further information	Request dated 28/04/06	Received 26/06/06
Request to extend determination period.	06/11/06	Extension agreed by Operator 11/07/06
Draft variation on public register	17/08/06	Public Participation Directive
Variation GP3935LU	Determined 25/09/06	Issued 25/09/06
Variation application TP3434GB	Duly made 08/01/09	
Variation EA/EPR/BL5598IR/V004	Determined 08/01/09	
Agency led variation request EPR/BL5598IR/V005 (PAS Ref LP3135ND)	Request Approved 18/04/13	Update management condition in permit to modern template format
Variation Notice EPR/BL5598IR/V005	Issued 03/05/13	
Agency led variation EPR/BL5598IR/V006	Issued 28/03/2014	
Environment Agency initiated variation EPR/BL5598IR/V007	31/03/2014	Variation to insert conditions required by Article 3 of Regulation (EU) No 493/2012.
Environment Agency led variation request EPR/BL5598IR/V008 (PAS – YP3134AA)	01/07/2015	Agency led variation to update the notification requirements and proforma to modern conditions and standards. Varied permit issued.

Status log of the permit		
Description	Date	Comments
Regulation 60 Notice dated 16/12/16 (Notice requiring information for statutory review of permit)	Response Received 31/03/17	Technical standards detailed in response to the information notice. Information to demonstrate that relevant BAT Conclusions are met for the non-ferrous metals industries as detailed in document reference L174.
Additional information received with respect to BAT 17 of the BAT Conclusions for the non-ferrous metals industries as detailed in document reference L174	Received 24/0717	Information in relation to the treated effluent discharge to the River Derwent and compliance with BAT Conclusions.
Additional information received in response to letter request for information dated 20/06/18, ref. EMD/RI/MR/EPR-BL5598IR.	Received 06/07/18	Information in relation to the quantity and throughput of hazardous waste received on-site and processed via the various activities
Additional information received in response to email request for information dated 25/11/19. EPR/BL5598IR/V009	Received 30/01/2020	Information in relation to process description, waste codes and tonnages, emission points to air and surface water, and installation boundary plan.
Additional information received in response to email request for information dated 06/04/2020. EPR/BL5598IR/V009	Received 15/04/2020	Information in relation to general process description, waste types, effluent treatment and stack heights.
Additional information received following meeting with operator on 20/04/2020 to discuss permitted waste types EPR/BL5598IR/V009	Received 21/04/2020	Confirmation of waste types and EWC codes for lead recovery operation
Additional information received in response to Environment Agency email dated 04/06/2020. EPR/BL5598IR/V009	Received 04/06/2020	Confirmation of installation boundary
Environment Agency initiated variation EPR/BL5598IR/V009 (variation and consolidation)	19/06/2020	Statutory review of permit – Non-ferrous metals BAT Conclusions published 30/06/16.
Variation determined EPR/BL5598IR/V009 (Billing Ref: UP3635JF)		Varied and consolidated permit issued

End of introductory note

Notice of variation and consolidation

The Environmental Permitting (England and Wales) Regulations 2016

The Environment Agency in exercise of its powers under regulation 20 of the Environmental Permitting (England and Wales) Regulations 2016 varies and consolidates

Permit number

EPR/BL5598IR

Issued to

H J Enthoven Limited (“the operator”)

whose registered office is

Darley Dale Smelter

South Darley

Matlock

Derbyshire

DE4 2LP

company registration number 02821551

to operate an installation at

Darley Dale Smelter

South Darley

Matlock

Derbyshire

DE4 2LP

to the extent set out in the schedules.

The notice shall take effect from 19/06/2020

Name	Date
Sifelani Mpofu	19/06/2020

Authorised on behalf of the Environment Agency

Schedule 1

All conditions other than 1.1.1, 1.1.2, 1.1.3, 2.3.8, 3.3.1, 3.3.2, 3.4.1 and 4.3.1 have been varied by the consolidated permit EPR/BL5598IR as a result of an Environment Agency initiated variation.

Schedule 2 – consolidated permit

Consolidated permit issued as a separate document.

Permit

The Environmental Permitting (England and Wales) Regulations 2016

Permit number

EPR/BL5598IR

This is the consolidated permit referred to in the variation and consolidation notice for application EPR/BL5598IR/V009 authorising,

H J Enthoven Limited (“the operator”),

whose registered office is

**Darley Dale Smelter
South Darley
Matlock
Derbyshire
DE4 2LP**

company registration number 02821551

to operate an installation at

**Darley Dale Smelter
South Darley
Matlock
Derbyshire
DE4 2LP**

to the extent authorised by and subject to the conditions of this permit.

Name	Date
Sifelani Mpofu	19/06/2020

Authorised on behalf of the Environment Agency

Conditions

1 Management

1.1 General management

- 1.1.1 The operator shall manage and operate the activities:
- (a) in accordance with a written management system that identifies and minimises risks of pollution, including those arising from operations, maintenance, accidents, incidents, non-conformances, closure and those drawn to the attention of the operator as a result of complaints; and
 - (b) using sufficient competent persons and resources.
- 1.1.2 Records demonstrating compliance with condition 1.1.1 shall be maintained.
- 1.1.3 Any person having duties that are or may be affected by the matters set out in this permit shall have convenient access to a copy of it kept at or near the place where those duties are carried out.

1.2 Energy efficiency

- 1.2.1 The operator shall:
- (a) take appropriate measures to ensure that energy is used efficiently in the activities;
 - (b) review and record at least every four years whether there are suitable opportunities to improve the energy efficiency of the activities; and
 - (c) take any further appropriate measures identified by a review.

1.3 Efficient use of raw materials

- 1.3.1 The operator shall:
- (a) take appropriate measures to ensure that raw materials and water are used efficiently in the activities;
 - (b) maintain records of raw materials and water used in the activities;
 - (c) review and record at least every four years whether there are suitable alternative materials that could reduce environmental impact or opportunities to improve the efficiency of raw material and water use; and
 - (d) take any further appropriate measures identified by a review.

1.4 Avoidance, recovery and disposal of wastes produced by the activities

- 1.4.1 The operator shall take appropriate measures to ensure that:
- (a) the waste hierarchy referred to in Article 4 of the Waste Framework Directive is applied to the generation of waste by the activities; and
 - (b) any waste generated by the activities is treated in accordance with the waste hierarchy referred to in Article 4 of the Waste Framework Directive; and
 - (c) where disposal is necessary, this is undertaken in a manner which minimises its impact on the environment.
- 1.4.2 The operator shall review and record at least every four years whether changes to those measures should be made and take any further appropriate measures identified by a review.

2 Operations

2.1 Permitted activities

- 2.1.1 The operator is only authorised to carry out the activities specified in schedule 1 table S1.1 (the “activities”).
- 2.1.2 Waste authorised by this permit shall be clearly distinguished from any other waste on the site.

2.2 The site

- 2.2.1 The activities shall not extend beyond the site, being the land shown edged in pink on the site plan at schedule 7 to this permit.

2.3 Operating techniques

- 2.3.1 The activities shall, subject to the conditions of this permit, be operated using the techniques and in the manner described in the documentation specified in schedule 1, table S1.2, unless otherwise agreed in writing by the Environment Agency.
- 2.3.2 If notified by the Environment Agency that the activities are giving rise to pollution, the operator shall submit to the Environment Agency for approval within the period specified, a revision of any plan or other documentation (“plan”) specified in schedule 1, table S1.2 or otherwise required under this permit which identifies and minimises the risks of pollution relevant to that plan, and shall implement the approved revised plan in place of the original from the date of approval, unless otherwise agreed in writing by the Environment Agency.
- 2.3.3 Any raw materials or fuels listed in schedule 2 table S2.1 shall conform to the specifications set out in that table.
- 2.3.4 Waste shall only be accepted if:
 - (a) it is of a type and quantity listed in schedule 2 tables S2.2 and S2.3; and
 - (b) it conforms to the description in the documentation supplied by the producer and holder.
- 2.3.5 The operator shall ensure that where waste produced by the activities is sent to a relevant waste operation, that operation is provided with the following information, prior to the receipt of the waste:
 - (a) the nature of the process producing the waste;
 - (b) the composition of the waste;
 - (c) the handling requirements of the waste;
 - (d) the hazardous property associated with the waste, if applicable; and
 - (e) the waste code of the waste.
- 2.3.6 The operator shall ensure that where waste produced by the activities is sent to a landfill site, it meets the waste acceptance criteria for that landfill.
- 2.3.7 Notwithstanding condition 2.3.4 non-metallic material (battery separator plate material) derived from battery breaking cannot be imported to the operator’s site. Non-metallic materials (battery separator plate material) are defined as the remains of the battery once the metals and the polypropylene have been removed.

Waste battery and accumulator treatment

- 2.3.8 Treatment of waste batteries and accumulators must meet the minimum requirements set out in Annex III, Part A of Directive 2006/66/EC of the European Parliament and of the Council on batteries and accumulators and waste batteries and accumulators and repealing Directive 91/157/EEC.

- 2.3.9 The operator must calculate the recycling efficiency of a process for recycling waste batteries and accumulators, and report to the Environment Agency, in accordance with Article 3 of Regulation (EU) No 493/2012.

Hazardous waste storage and treatment

- 2.3.10 Hazardous waste shall not be mixed, either with a different category of hazardous waste or with other waste, substances or materials, unless it is authorised by schedule 1 table S1.1 and appropriate measures are taken.

2.4 Improvement programme

- 2.4.1 The operator shall complete the improvements specified in schedule 1 table S1.3 by the date specified in that table unless otherwise agreed in writing by the Environment Agency.
- 2.4.2 Except in the case of an improvement which consists only of a submission to the Environment Agency, the operator shall notify the Environment Agency within 14 days of completion of each improvement.

3 Emissions and monitoring

3.1 Emissions to water, air or land

- 3.1.1 There shall be no point source emissions to water, air or land except from the sources and emission points listed in schedule 3 tables S3.1a, S3.1b, S3.2a and S3.2b.
- 3.1.2 The limits given in schedule 3 shall not be exceeded.
- 3.1.3 Periodic monitoring shall be carried out at least once every 5 years for groundwater and 10 years for soil, unless such monitoring is based on a systematic appraisal of the risk of contamination.

3.2 Emissions of substances not controlled by emission limits

- 3.2.1 Emissions of substances not controlled by emission limits (excluding odour) shall not cause pollution. The operator shall not be taken to have breached this condition if appropriate measures, including, but not limited to, those specified in any approved emissions management plan, have been taken to prevent or where that is not practicable, to minimise, those emissions.
- 3.2.2 The operator shall:
- (a) if notified by the Environment Agency that the activities are giving rise to pollution, submit to the Environment Agency for approval within the period specified, an emissions management plan which identifies and minimises the risks of pollution from emissions of substances not controlled by emission limits;
 - (b) implement the approved emissions management plan, from the date of approval, unless otherwise agreed in writing by the Environment Agency.
- 3.2.3 All liquids in containers, whose emission to water or land could cause pollution, shall be provided with secondary containment, unless the operator has used other appropriate measures to prevent or where that is not practicable, to minimise, leakage and spillage from the primary container.

3.3 Odour

- 3.3.1 Emissions from the activities shall be free from odour at levels likely to cause pollution outside the site, as perceived by an authorised officer of the Environment Agency, unless the operator has used appropriate measures, including, but not limited to, those specified in any approved odour management plan, to prevent or where that is not practicable to minimise the odour.

3.3.2 The operator shall:

- (a) if notified by the Environment Agency that the activities are giving rise to pollution outside the site due to odour, submit to the Environment Agency for approval within the period specified, an odour management plan which identifies and minimises the risks of pollution from odour;
- (b) implement the approved odour management plan, from the date of approval, unless otherwise agreed in writing by the Environment Agency.

3.4 Noise and vibration

3.4.1 Emissions from the activities shall be free from noise and vibration at levels likely to cause pollution outside the site, as perceived by an authorised officer of the Environment Agency, unless the operator has used appropriate measures, including, but not limited to, those specified in any approved noise and vibration management plan to prevent or where that is not practicable to minimise the noise and vibration.

3.5 Monitoring

3.5.1 The operator shall, unless otherwise agreed in writing by the Environment Agency, undertake the monitoring specified in the following tables in schedule 3 to this permit:

- (a) point source emissions specified in tables S3.1a, S3.1b, S3.2a and S3.2b;

3.5.2 The operator shall maintain records of all monitoring required by this permit including records of the taking and analysis of samples, instrument measurements (periodic and continual), calibrations, examinations, tests and surveys and any assessment or evaluation made on the basis of such data.

3.5.3 Monitoring equipment, techniques, personnel and organisations employed for the emissions monitoring programme and the environmental or other monitoring specified in condition 3.5.1 shall have either MCERTS certification or MCERTS accreditation (as appropriate), where available, unless otherwise agreed in writing by the Environment Agency.

3.5.4 Permanent means of access shall be provided to enable sampling/monitoring to be carried out in relation to the emission points specified in schedule 3 tables S3.1a, S3.1b, S3.2a and S3.2b unless otherwise agreed in writing by the Environment Agency.

3.6 Fire prevention

3.6.1 The operator shall take all appropriate measures to prevent fires on site and minimise the risk of pollution from them including, but not limited to, those specified in any approved fire prevention plan.

3.6.2 The operator shall:

- (a) if notified by the Environment Agency that the activities are giving rise to a risk of fire, submit to the Environment Agency for approval within the period specified, a fire prevention plan which prevents fires and minimises the risk of pollution from fires;
- (b) implement the fire prevention plan, from the date of approval, unless otherwise agreed in writing by the Environment Agency.

4 Information

4.1 Records

4.1.1 All records required to be made by this permit shall:

- (a) be legible;
- (b) be made as soon as reasonably practicable;

- (c) if amended, be amended in such a way that the original and any subsequent amendments remain legible, or are capable of retrieval; and
- (d) be retained, unless otherwise agreed in writing by the Environment Agency, for at least 6 years from the date when the records were made, or in the case of the following records until permit surrender:
 - (i) off-site environmental effects; and
 - (ii) matters which affect the condition of the land and groundwater.

4.1.2 The operator shall keep on site all records, plans and the management system required to be maintained by this permit, unless otherwise agreed in writing by the Environment Agency.

4.2 Reporting

4.2.1 The operator shall send all reports and notifications required by the permit to the Environment Agency using the contact details supplied in writing by the Environment Agency.

4.2.2 A report or reports on the performance of the activities over the previous year shall be submitted to the Environment Agency by 31 January (or other date agreed in writing by the Environment Agency) each year. The report(s) shall include as a minimum:

- (a) a review of the results of the monitoring and assessment carried out in accordance with the permit including an interpretive review of that data;
- (b) the annual production /treatment data set out in schedule 4 table S4.2; and
- (c) the performance parameters set out in schedule 4 table S4.3 using the forms specified in table S4.4 of that schedule.

4.2.3 Within 28 days of the end of the reporting period the operator shall, unless otherwise agreed in writing by the Environment Agency, submit reports of the monitoring and assessment carried out in accordance with the conditions of this permit, as follows:

- (a) in respect of the parameters and emission points specified in schedule 4 table S4.1;
- (b) for the reporting periods specified in schedule 4 table S4.1 and using the forms specified in schedule 4 table S4.4 ; and
- (c) giving the information from such results and assessments as may be required by the forms specified in those tables.

4.2.4 The operator shall, unless notice under this condition has been served within the preceding four years, submit to the Environment Agency, within six months of receipt of a written notice, a report assessing whether there are other appropriate measures that could be taken to prevent, or where that is not practicable, to minimise pollution.

4.2.5 Within 1 month of the end of each quarter, the operator shall submit to the Environment Agency using the form made available for the purpose, the information specified on the form relating to the site and the waste accepted and removed from it during the previous quarter.

4.3 Notifications

4.3.1 In the event:

- (a) that the operation of the activities gives rise to an incident or accident which significantly affects or may significantly affect the environment, the operator must immediately—
 - (i) inform the Environment Agency,
 - (ii) take the measures necessary to limit the environmental consequences of such an incident or accident, and

- (iii) take the measures necessary to prevent further possible incidents or accidents;
 - (b) of a breach of any permit condition the operator must immediately—
 - (i) inform the Environment Agency, and
 - (ii) take the measures necessary to ensure that compliance is restored within the shortest possible time;
 - (c) of a breach of permit condition which poses an immediate danger to human health or threatens to cause an immediate significant adverse effect on the environment, the operator must immediately suspend the operation of the activities or the relevant part of it until compliance with the permit conditions has been restored.
- 4.3.2 Any information provided under condition 4.3.1 shall be confirmed by sending the information listed in schedule 5 to this permit within the time period specified in that schedule.
- 4.3.3 Where the Environment Agency has requested in writing that it shall be notified when the operator is to undertake monitoring and/or spot sampling, the operator shall inform the Environment Agency when the relevant monitoring and/or spot sampling is to take place. The operator shall provide this information to the Environment Agency at least 14 days before the date the monitoring is to be undertaken.
- 4.3.4 The Environment Agency shall be notified within 14 days of the occurrence of the following matters, except where such disclosure is prohibited by Stock Exchange rules:
- Where the operator is a registered company:
- (a) any change in the operator's trading name, registered name or registered office address; and
 - (b) any steps taken with a view to the operator going into administration, entering into a company voluntary arrangement or being wound up.
- Where the operator is a corporate body other than a registered company:
- (a) any change in the operator's name or address; and
 - (b) any steps taken with a view to the dissolution of the operator.
- In any other case:
- (a) the death of any of the named operators (where the operator consists of more than one named individual);
 - (b) any change in the operator's name(s) or address(es); and
 - (c) any steps taken with a view to the operator, or any one of them, going into bankruptcy, entering into a composition or arrangement with creditors, or, in the case of them being in a partnership, dissolving the partnership.
- 4.3.5 Where the operator proposes to make a change in the nature or functioning, or an extension of the activities, which may have consequences for the environment and the change is not otherwise the subject of an application for approval under the Regulations or this permit:
- (a) the Environment Agency shall be notified at least 14 days before making the change; and
 - (b) the notification shall contain a description of the proposed change in operation.
- 4.3.6 The Environment Agency shall be given at least 14 days notice before implementation of any part of the site closure plan.
- 4.3.7 Where the operator has entered into a climate change agreement with the Government, the Environment Agency shall be notified within one month of:
- (a) a decision by the Secretary of State not to re-certify the agreement;
 - (b) a decision by either the operator or the Secretary of State to terminate the agreement; and

(c) any subsequent decision by the Secretary of State to re-certify such an agreement.

4.4 Interpretation

4.4.1 In this permit the expressions listed in schedule 6 shall have the meaning given in that schedule.

4.4.2 In this permit references to reports and notifications mean written reports and notifications, except where reference is made to notification being made “immediately”, in which case it may be provided by telephone.

Schedule 1 – Operations

Table S1.1 activities			
Activity reference	Activity listed in Schedule 1 of the EP Regulations	Description of specified activity and WFD Annex I and II operations	Limits of specified activity and waste types
AR1	Section 2.2 A(1)(a)	Producing non-ferrous metals from ore, concentrates or secondary raw materials by metallurgical, chemical or electrolytic activities <i>[Lead smelting in 1 No. reverb furnace and 2 No. rotary furnaces]</i>	From charging of smelting furnaces with lead bearing wastes (from activities AR3, AR7 and AR11) and other raw materials (from activity AR9), to the tapping of molten lead for further on-site processing
AR2	Section 2.2 A(1)(b):	Melting, including making alloys of, non-ferrous metals, including recovered products and the operation of non-ferrous metal foundries where- (i) the plant has a melting capacity of more than 4 tonnes per day for lead or cadmium or 20 tonnes per day for all other metals, and (ii) any furnace (other than a vacuum furnace), bath or other holding vessel used in the plant for the melting has a design holding capacity of 5 or more tonnes <i>[Lead refining in 14 No. refining kettles]</i>	From charging of refining kettles with molten lead (arising from activity AR1) and alloying additions, to the casting of ingots and blocks
AR3	Section 5.3 A(1)(a)(ii)	Disposal or recovery of hazardous waste with a capacity exceeding 10 tonnes per day involving physico-chemical treatment R5: Recycling/reclamation of other inorganic compounds R4: Recycling/reclamation of metals and metal compounds R3: Recycling/reclamation of organic substances which are not used as solvents <i>[Operation of the MA Battery Breaker]</i>	From loading of waste (arising from activity AR8) into the mechanical battery breaking plant, to the discharge of separated materials for further processing
AR4		Disposal or recovery of hazardous waste with a capacity exceeding 10 tonnes per day involving physico-chemical treatment R5: Recycling/reclamation of other inorganic compounds <i>[Operation of the Dove plant]</i>	From receipt of battery acid (arising from activity AR8), at the Dove plant to the storage of gypsum for off-site despatch, and the discharge of solids for on-site treatment. Includes storage of battery acid in buffer tanks prior to the neutralisation reaction.

Table S1.1 activities			
Activity reference	Activity listed in Schedule 1 of the EP Regulations	Description of specified activity and WFD Annex I and II operations	Limits of specified activity and waste types
AR5		<p>Disposal or recovery of hazardous waste with a capacity exceeding 10 tonnes per day involving physico-chemical treatment</p> <p>D9: Physical / physico-chemical treatment of waste</p> <p><i>[Operation of the on-site Effluent Treatment Plant]</i></p>	<p>From receipt of on-site generated wastewater and contaminated site drainage at the effluent treatment plant, to the direct discharge of treated effluent to the River Derwent</p> <p>Treatment including screening, chemical conditioning, solids separation, filtration, dewatering, desludging, and reverse osmosis / ion exchange processes</p>
AR6		<p>Disposal or recovery of hazardous waste with a capacity exceeding 10 tonnes per day involving physico-chemical treatment</p> <p>R5: Recycling/reclamation of other inorganic compounds</p> <p><i>[Operation of the Flue Gas Desulphurisation plant]</i></p>	<p>From receipt of sulphur dioxide gas (arising from activity AR1) at the FGD FlowPac, to the storage of gypsum for off-site despatch</p>
AR7	S5.6A(1)(a)	<p>Temporary storage of hazardous waste with a total capacity exceeding 50 tonnes pending any of the activities listed in Sections 5.1, 5.2, 5.3...except (i) temporary storage, pending collection, on the site where the waste is generated.</p> <p>R13: Storage of waste pending any of the operations numbered R1 to R12 (excluding temporary storage, pending collection, on the site where the waste is produced</p> <p><i>[Storage of waste lead-acid batteries, and other lead-bearing wastes, including scrap lead, scrap glass, purchased drosses]</i></p>	<p>From receipt of hazardous waste on-site until utilisation in the production process</p> <p>Hazardous waste types specified in Tables S2.2 and S2.3</p>
Other Directly Associated Activities			
AR8	Pre-treatment of waste lead-acid batteries	<p>Cracking of battery casings to liberate contained acid using a tracked loader within the battery storage building</p> <p>R5: Recycling / reclamation of other inorganic materials</p>	<p>From receipt of batteries in the battery storage building to the loading of the mechanical battery breaking plant, including drainage and collection of battery acid for further processing and/or treatment</p> <p>Waste types as specified in Table S2.2</p>
AR9	Raw materials storage and handling	<p>Receipt, handling and storage of non-waste raw materials and all process chemicals / substances, including coke, iron, lime, and liquid oxygen</p>	<p>From receipt of raw materials until utilisation in the production process</p>

Table S1.1 activities			
Activity reference	Activity listed in Schedule 1 of the EP Regulations	Description of specified activity and WFD Annex I and II operations	Limits of specified activity and waste types
AR10	Materials and Furnace charge preparation	Preparation of smelting furnace charges R13: Storage of waste pending any of the operations numbered R1 to R12 (excluding temporary storage, pending collection, on the site where the waste is produced)	From receipt of lead bearing wastes (from activity AR3 and from external sources) and other raw materials (from activity AR9), to their despatch for smelting. Processes include crushing, screening, and mixing. Waste types as specified in Table S2.3
AR11	Reverberatory furnace drier	Drying of furnace charge in a rotary drier	From loading of drier to the charging of the reverb furnace
AR12	Off-gas collection, abatement and discharge	Collection by local exhaust ventilation (LEV) systems, transfer via ducting to abatement plant and emission to air	From LEV extraction points to the exit from exhaust stacks
AR13	Storage and handling of wastes generated on-site	Storing and handling of process related wastes, including internally produced drosses, sinter, slags, and filter bag dusts. R13: Storage of waste pending any of the operations numbered R1 to R12 (excluding temporary storage, pending collection, on the site where the waste is produced) D15: Storage pending any of the operations numbered D 1 to D 14 (excluding temporary storage, pending collection, on the site where the waste is produced)	From generation of waste by the permitted activities, to the despatch of waste off-site, or for re-use in the production process. Except wastes from finished products packaging and storage
AR14	Strip production	Operation of Strip Mill for the re-melting of lead alloy in 3 No. melting kettles to produce lead strip	From charging of melting kettles to the casting, rolling, and coiling of finished product, including the collection of wastewater for storage and off-site despatch
AR15	Shot production	Operation of Shot Plant for the re-melting of lead alloy in 1 No. melting kettle to produce lead shot	From charging of melting kettle to the spraying of molten lead, producing shot
AR16	Polypropylene plant	Processing of plastic battery casing material R5: Recycling / reclamation of other inorganic materials R3: Recycling/reclamation of organic substances which are not used as solvents	From receipt of washed polypropylene (arising following activity AR3) to the storage of polypropylene chippings for off-site despatch. Process includes washing, granulation, melting, filtering, extrusion, cutting, quenching and drying. Raw materials shall consist of waste battery casings from activity AR3 only , and additional process chemicals / substances

Table S1.2 Operating techniques		
Description	Parts	Date Received
Application	The responses to question 2.3 given in section B2.3/HJE of the application.	12/12/01
Response to 27/3/02 Schedule 4 Part 1 Notice	Response to question 3 and all attachments	26/6/02
Additional information Wire extrusion facility	Letter 7 March 2003 with attachments	10/3/03
Additional information	Addendum to Application, B2.3 Bag filters, Lime silo, explosion doors, summary of extant operating and maintenance procedures, furnace burners, Impact of VOC, underground tanks.	8/8/03
Application for substantial variation GP3935LU	Section C2.1/ HJE "Details of the variations to operation proposed", excluding section C2.1, attachment 1, point 1 "Low waste technology".	08/03/06
Response to Regulation 60 Notice – request for further information dated 06/12/16	Technical standards detailed in response to BAT Conclusions 1-10, 12, 14-19, 90-101, and 103-107 of the notice provided under Regulation 60(1) of Environmental Permitting Regulations. Best available techniques as described in BAT Conclusions under Directive 2010/75/EU of the European Parliament and of the Council on industrial emissions for non-ferrous metals industries	Received 31/03/17
Receipt of additional information to the Regulation 60 Notice	Technical standards detailed in response to BAT Conclusion 17 of the notice provided under Regulation 60(1) of Environmental Permitting Regulations. Best available techniques as described in BAT Conclusions under Directive 2010/75/EU of the European Parliament and of the Council on industrial emissions for non-ferrous metals industries	Received 24/07/17
Additional information received in response to email request for information dated 25/11/19. EPR/BL5598IR/V009	The following updated documents: - List of emission points to air - List of emission points to surface water - Emission points plan	Received 30/01/2020
Additional information received in response to email request for information dated 06/04/2020. EPR/BL5598IR/V009	Information in relation to strip and shot production, and effluents arising from FGD gypsum plant and polypropylene plant	Received 15/04/2020
Additional information received following meeting with operator on 20/04/2020 to discuss permitted waste types. EPR/BL5598IR/V009	Confirmation of waste types and EWC codes for lead recovery operation	Received 21/04/2020
Additional information received in response to email request for information dated 30/04/2020	Information relating to emission points to surface water	Received 06/05/2020
Additional information received in response to email dated 04/06/2020	Installation boundary plan, Drg. No. SD 000016420, Rev.3, dated 13.02.18	Received 04/06/2020

Table S1.3 Improvement programme requirements		
Reference	Improvement Condition	Completion date
IC1	<p>The operator shall submit, for approval by the Environment Agency, a report setting out progress to achieving the Non-ferrous metals BAT conclusion AELs where BAT is currently not achieved, but will be achieved before 30th June 2020. The report shall include, but not be limited to, the following:</p> <ol style="list-style-type: none"> 1) Current performance against the BATc AELs 2) Methodology for reaching the AELs <p>The report shall address the following BATc - 17, 94 and 99:</p> <ul style="list-style-type: none"> • BAT 17 – BAT-AELs for direct discharge of wastewater to surface water • BAT 94 – BAT-AEL for dust in emissions to air from raw material preparation areas • BAT 99 – BAT-AEL for PCDD/F in emissions to air from the smelting of secondary lead raw materials 	30/06/2020
IC2	<p>The operator shall submit, for approval by the Environment Agency, a report setting out progress to achieving the Non-ferrous metals 'Narrative' BAT where BAT is currently not achieved, but will be achieved before 30th June 2020. The report shall include, but not be limited to, the following:</p> <ol style="list-style-type: none"> 1) Methodology for achieving BAT 2) Associated targets / timelines for reaching compliance by 30th June 2020. <p>The report shall address the following BATc - 16, 17, 94 and 99:</p> <ul style="list-style-type: none"> • BAT 16 – monitoring of emissions to surface water • BAT 17 – abatement of wastewater to surface water • BAT 94 – abatement of emissions to air from raw material preparation areas • BAT 99 – abatement of emissions to air from the smelting of secondary lead raw materials 	30/06/2020
IC3	<p>The operator shall submit, for approval by the Environment Agency, a risk assessment considering the possibility of soil and groundwater contamination at the installation where the activity involves the use, production or release of a relevant hazardous substance (as defined in Article 3(18) of the Industrial Emissions Directive). The risk assessment shall clearly establish with appropriate evidence whether or not there is a risk of contamination of soil and groundwater.</p>	30/09/2020
IC4	<p>Where the risk assessment carried out under IC3 above establishes a risk to soil and groundwater the operator shall:</p> <ol style="list-style-type: none"> 1) prepare and submit a baseline report compliant with Article 22 of the Industrial Emissions Directive (IED) containing information necessary to determine the current state of soil and groundwater contamination; or 2) provide a summary report referring to information previously submitted where the operator is satisfied that such information represents the current state of soil and groundwater contamination, <p>so as to enable a quantified comparison to be made with the state of soil and groundwater contamination upon definitive cessation of activity.</p>	30/06/2021

Table S1.3 Improvement programme requirements		
Reference	Improvement Condition	Completion date
IC5	<p>The operator shall submit a surface water pollution risk assessment to the Environment Agency for approval, which shall assess the impact of discharges of hazardous pollutants from the installation upon the River Derwent.</p> <p>The risk assessment shall be undertaken in accordance with published Environment Agency guidance on .GOV.UK and shall include the following:</p> <ol style="list-style-type: none"> 1) Results of emissions monitoring from the on-site Effluent Treatment Plant, carried out using the methods and standards specified in table S3.2b of this permit, and as described in Environment Agency M18 guidance; 2) Completion of Phase 1 Part A screening tests for the following substances, as listed the Non-ferrous metals BAT Conclusions: antimony, arsenic, cadmium, cobalt, copper, iron, mercury, nickel, lead, tin, sulphate and zinc; and the reporting of results; 3) Completion of Phase 1 Part B screening tests for the following priority hazardous substances: cadmium and mercury; and the reporting of results. 	30/06/2021

Schedule 2 – Waste types, raw materials and fuels

Table S2.1 Raw materials and fuels	
Raw materials and fuel description	Specification
-	-

Table S2.2 Permitted waste types and quantities for the processing of waste batteries	
Maximum quantity	140,000 tonnes per annum
Waste code	Description
16	Wastes not otherwise specified in the list
16 06	batteries and accumulators
16 06 01*	lead batteries

Table S2.3 Permitted waste types and quantities for the processing of lead bearing waste materials (not including batteries)	
Maximum quantity	10,000 tonnes per annum
Waste code	Description
01	Wastes resulting from exploration, mining, quarrying, and physical and chemical treatment of minerals
01 01	wastes from mineral excavation
01 01 01	wastes from mineral metalliferous excavation
06	Wastes from inorganic chemical processes
06 03	wastes from the MFSU of salts and their solutions and metallic oxides
06 03 15*	metallic oxides containing heavy metals
10	Wastes from thermal processes
10 02	wastes from the iron and steel industry
10 02 10	mill scales
10 04	wastes from lead thermal metallurgy
10 04 02*	dross and skimmings from primary and secondary production
10 04 04*	flue-gas dust
10 04 05*	other particulates and dust
10 11	wastes from manufacture of glass and glass products
10 11 11*	waste glass in small particles and glass powder containing heavy metals (for example from cathode ray tubes)
12	Wastes from shaping and physical and mechanical surface treatment of metals and plastics
12 01	wastes from shaping and physical and mechanical surface treatment of metals and plastics
12 01 01	ferrous metal filings and turnings

Table S2.3 Permitted waste types and quantities for the processing of lead bearing waste materials (not including batteries)	
Maximum quantity	10,000 tonnes per annum
Waste code	Description
17	Construction and demolition wastes (including excavated soil from contaminated sites)
17 04	metals (including their alloys)
17 04 03	lead
17 04 09*	metal waste contaminated with hazardous substances
17 04 11	cables other than those mentioned in 17 04 10
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 12	wastes from the mechanical treatment of waste (for example sorting, crushing, compacting, pelletising) not otherwise specified
19 12 03	non-ferrous metal
19 12 04	plastic and rubber
19 12 11*	other wastes (including mixtures of materials) from mechanical treatment of waste containing hazardous substances

Schedule 3 – Emissions and monitoring

Table S3.1a Point source emissions to air – emission limits and monitoring requirements Effective until 29 June 2020						
Emission point ref. & location	Source	Parameter	Limit (incl. unit)	Reference period	Monitoring frequency	Monitoring standard or method
A1 [as shown on Drawing. No. SD000013999, Rev.02, dated 28/01/2020]	Stack A (61m) serving Rotary Furnaces No. 1 & No. 2 (process and hygiene gases after Intensiv No.1 & Intensiv No. 2 baghouses) and Charge dryer (process gases after Intensiv No.6 baghouse) and 2 Holding kettles: Rotary pots (hygiene gases). Also serving the Reverberatory furnace and associated baghouse and gypsum plant	Particulate	5 mg/m ³	Weekly average or extractive sample (min 4 hour)	Quarterly - 2 months Minimum interval between extractive monitoring	BS EN 13284-1 and MID
		Lead and compounds taken together (as metal)	2 mg/m ³	Weekly average or extractive sample (min 4 hour)	Weekly	BS EN 14385 and MID
		Cadmium and compounds taken together (as element)	0.5 mg/m ³	Weekly average or extractive sample (min 4 hour)	Weekly	BS EN 14385 and MID
		Copper, lead, nickel, zinc and their compounds taken together (as metal)	3 mg/m ³	Weekly average or extractive sample (min 4 hour)	Quarterly - 2 months Minimum interval between extractive monitoring	BS EN 14385 and MID
		Antimony, tin, tellurium and their compounds taken together (as element)	2 mg/m ³	Weekly average or extractive sample (min 4 hour)	Quarterly - 2 months Minimum interval between extractive monitoring	BS EN 14385 and MID
		Cadmium, arsenic, mercury, thallium, selenium and their compounds taken together (as element)	0.5 mg/m ³	Weekly average or extractive sample (min 4 hour)	Quarterly - 2 months Minimum interval between extractive monitoring	BS EN 14385 and MID
		Oxides of nitrogen (as NO ₂) (oxy fuel burners used)	300 mg/m ³	Monthly average or extractive sample (min 4 hour)	Twice a year - 4 months Minimum interval between extractive monitoring	BS EN 14792

Table S3.1a Point source emissions to air – emission limits and monitoring requirements Effective until 29 June 2020						
Emission point ref. & location	Source	Parameter	Limit (incl. unit)	Reference period	Monitoring frequency	Monitoring standard or method
		Sulphur dioxide	500 mg/m ³	Monthly average or extractive sample (min 4 hour)	Twice a year - 4 months Minimum interval between extractive monitoring	BS EN 14791
		Hydrogen chloride	10 mg/m ³	Monthly average or extractive sample (min 4 hour)	Twice a year - 4 months Minimum interval between extractive monitoring	BS EN 1911 Parts 1, 2 and 3
		Carbon monoxide	150 mg/m ³	Monthly average or extractive sample (min 4 hour)	Twice a year - 4 months Minimum interval between extractive monitoring	BS EN 15058
		Volatile Organic Compounds (as carbon)	50 mg/m ³	Monthly average or extractive sample (min 4 hour)	Twice a year - 4 months Minimum interval between extractive monitoring	BS EN 12619: 2013
		Dioxins & Furans (ITEQ)	1 ng/m ³ (total combined) Note 2	Monthly average or extractive sample (min 4 hour)	Twice a year - 4 months Minimum interval between extractive monitoring	BS EN 1948: Parts 1, 2 and 3, and MID
A2 [as shown on Drawing. No. SD000013999, Rev.02, dated 28/01/2020]	Stack B (30m) serving the 13 Refinery kettles (hygiene gases after Intensiv No. 3 baghouse) and 2 holding kettles serving the Reverberatory furnace	Particulate	5 mg/m ³	Weekly average or extractive sample (min 4 hour)	Quarterly - 2 months Minimum interval between extractive monitoring	BS EN 13284-1 and MID
		Lead and compounds taken together (as metal)	2 mg/m ³	Weekly average or extractive sample (min 4 hour)	Weekly	BS EN 14385 and MID

Table S3.1a Point source emissions to air – emission limits and monitoring requirements						
Effective until 29 June 2020						
Emission point ref. & location	Source	Parameter	Limit (incl. unit)	Reference period	Monitoring frequency	Monitoring standard or method
		Cadmium and compounds taken together (as element)	0.5 mg/m ³	Weekly average or extractive sample (min 4 hour)	Weekly	BS EN 14385 and MID
		Copper, lead, nickel, zinc and their compounds taken together (as metal)	3 mg/m ³	Weekly average or extractive sample (min 4 hour)	Quarterly - 2 months Minimum interval between extractive monitoring	BS EN 14385 and MID
		Antimony, tin, tellurium and their compounds taken together (as element)	2 mg/m ³	Weekly average or extractive sample (min 4 hour)	Quarterly - 2 months Minimum interval between extractive monitoring	BS EN 14385 and MID
		Cadmium, arsenic, mercury, thallium, selenium and their compounds taken together (as element)	0.5 mg/m ³	Weekly average or extractive sample (min 4 hour)	Quarterly - 2 months Minimum interval between extractive monitoring	BS EN 14385 and MID
		Volatile Organic Compounds (as carbon)	50 mg/m ³	Monthly average or extractive sample (min 4 hour)	Twice a year - 4 months Minimum interval between extractive monitoring	BS EN 12619: 2013
		Dioxins & Furans (ITEQ)	1 ng/m ³ (total combined) Note 2	Monthly average or extractive sample (min 4 hour)	Twice a year - 4 months Minimum interval between extractive monitoring	BS EN 1948: Parts 1, 2 and 3, and MID

Table S3.1a Point source emissions to air – emission limits and monitoring requirements Effective until 29 June 2020						
Emission point ref. & location	Source	Parameter	Limit (incl. unit)	Reference period	Monitoring frequency	Monitoring standard or method
A4 [as shown on Drawing. No. SD000013999, Rev.02, dated 28/01/2020]	Stack D (25m) serving the charge preparation building and the slag area (hygiene gases after Intensiv No 5 baghouse). Also serving the Reverberatory furnace and charge dryer (hygiene gases).	Particulate	5 mg/m ³	Weekly average or extractive sample (min 4 hour)	Quarterly - 2 months Minimum interval between extractive monitoring	BS EN 13284-1 and MID
		Lead and compounds taken together (as metal)	2 mg/m ³	Weekly average or extractive sample (min 4 hour)	Weekly	BS EN 14385 and MID
		Cadmium and compounds taken together (as element)	0.5 mg/m ³	Weekly average or extractive sample (min 4 hour)	Weekly	BS EN 14385 and MID
		Copper, lead, nickel, zinc and their compounds taken together (as metal)	3 mg/m ³	Weekly average or extractive sample (min 4 hour)	Quarterly - 2 months Minimum interval between extractive monitoring	BS EN 14385 and MID
		Antimony, tin, tellurium and their compounds taken together (as element)	2 mg/m ³	Weekly average or extractive sample (min 4 hour)	Quarterly - 2 months Minimum interval between extractive monitoring	BS EN 14385 and MID
		Cadmium, arsenic, mercury, thallium, selenium and their compounds taken together (as element)	0.5 mg/m ³	Weekly average or extractive sample (min 4 hour)	Quarterly - 2 months Minimum interval between extractive monitoring	BS EN 14385 and MID
A5 [as shown on Drawing. No. SD000013999, Rev.02, dated 28/01/2020]	Stack E (15m) serving the MA battery breaker (hygiene gases after wet scrubber)	Particulate	5 mg/m ³	Weekly average or extractive sample (min 4 hour)	Quarterly - 2 months Minimum interval between extractive monitoring	BS EN 13284-1 and MID

Table S3.1a Point source emissions to air – emission limits and monitoring requirements Effective until 29 June 2020						
Emission point ref. & location	Source	Parameter	Limit (incl. unit)	Reference period	Monitoring frequency	Monitoring standard or method
		Copper, lead, nickel, zinc and their compounds taken together (as metal)	3 mg/m ³	Weekly average or extractive sample (min 4 hour)	Quarterly - 2 months Minimum interval between extractive monitoring	BS EN 14385 and MID
		Antimony, tin, tellurium and their compounds taken together (as element)	2 mg/m ³	Weekly average or extractive sample (min 4 hour)	Quarterly - 2 months Minimum interval between extractive monitoring	BS EN 14385 and MID
		Cadmium, arsenic, mercury, thallium, selenium and their compounds taken together (as element)	0.5 mg/m ³	Weekly average or extractive sample (min 4 hour)	Quarterly - 2 months Minimum interval between extractive monitoring	BS EN 14385 and MID
		Sulphuric Acid	1 mg/m ³	Monthly average or extractive sample (min 4 hour)	Twice a year - 4 months Minimum interval between extractive monitoring	Methodology US EPA Method 8
A7 [as shown on Drawing. No. SD000013999, Rev.02, dated 28/01/2020]	Stack G (12m) serving Materials Handling building, shot manufacturing plant and slag storage area (hygiene gases after intensive 8 baghouse).	Particulate	5 mg/m ³	Weekly average or extractive sample (min 4 hour)	Quarterly - 2 months Minimum interval between extractive monitoring	BS EN 13284-1 and MID
		Lead and compounds taken together (as metal)	2 mg/m ³	Weekly average or extractive sample (min 4 hour)	Weekly	BS EN 14385 and MID
		Cadmium and compounds taken together (as element)	0.5 mg/m ³	Weekly average or extractive sample (min 4 hour)	Weekly	BS EN 14385 and MID

Table S3.1a Point source emissions to air – emission limits and monitoring requirements Effective until 29 June 2020						
Emission point ref. & location	Source	Parameter	Limit (incl. unit)	Reference period	Monitoring frequency	Monitoring standard or method
		Copper, lead, nickel, zinc and their compounds taken together (as metal)	3 mg/m ³	Weekly average or extractive sample (min 4 hour)	Quarterly - 2 months Minimum interval between extractive monitoring	BS EN 14385 and MID
		Antimony, tin, tellurium and their compounds taken together (as element)	2 mg/m ³	Weekly average or extractive sample (min 4 hour)	Quarterly - 2 months Minimum interval between extractive monitoring	BS EN 14385 and MID
		Cadmium, arsenic, mercury, thallium, selenium and their compounds taken together (as element)	0.5 mg/m ³	Weekly average or extractive sample (min 4 hour)	Quarterly - 2 months Minimum interval between extractive monitoring	BS EN 14385 and MID
A10 [as shown on Drawing. No. SD000013999, Rev.02, dated 28/01/2020]	Stack K (12m) serving the Strip Mill (hygiene gases after baghouse)	Particulate	5 mg/m ³	Weekly average or extractive sample (min 4 hour)	Quarterly - 2 months Minimum interval between extractive monitoring	BS EN 13284-1 and MID
		Lead and compounds taken together (as metal)	2 mg/m ³	Weekly average or extractive sample (min 4 hour)	Weekly	BS EN 14385 and MID
		Cadmium and compounds taken together (as element)	0.5 mg/m ³	Weekly average or extractive sample (min 4 hour)	Weekly	BS EN 14385 and MID
		Copper, lead, nickel, zinc and their compounds taken together (as metal)	3 mg/m ³	Weekly average or extractive sample (min 4 hour)	Quarterly - 2 months Minimum interval between extractive monitoring	BS EN 14385 and MID

Table S3.1a Point source emissions to air – emission limits and monitoring requirements Effective until 29 June 2020						
Emission point ref. & location	Source	Parameter	Limit (incl. unit)	Reference period	Monitoring frequency	Monitoring standard or method
		Antimony, tin, tellurium and their compounds taken together (as element)	2 mg/m ³	Weekly average or extractive sample (min 4 hour)	Quarterly - 2 months Minimum interval between extractive monitoring	BS EN 14385 and MID
		Cadmium, arsenic, mercury, thallium, selenium and their compounds taken together (as element)	0.5 mg/m ³	Weekly average or extractive sample (min 4 hour)	Quarterly - 2 months Minimum interval between extractive monitoring	BS EN 14385 and MID
A11/1 [as shown on Drawing. No. SD000013999, Rev.02, dated 28/01/2020] Located on north side of Refinery building	Stack releasing combustion gases from Reverberatory furnace kettle 3A	Oxides of nitrogen (as NO ₂) mg Nm ⁻³	100 mg/m ³	Monthly average or extractive sample (min 4 hour)	Twice a year - 4 months Minimum interval between extractive monitoring	BS EN 14792
		Sulphur dioxide mg Nm ⁻³ (natural gas fuel)	50 mg/m ³	Monthly average or extractive sample (min 4 hour)	Twice a year - 4 months Minimum interval between extractive monitoring	BS EN 14791
		Carbon monoxide	150 mg/m ³	Monthly average or extractive sample (min 4 hour)	Twice a year - 4 months Minimum interval between extractive monitoring	BS EN 15058
A11/2 [as shown on Drawing. No. SD000013999, Rev.02, dated 28/01/2020] Located on north side of Refinery building	Stack releasing combustion gases from Reverberatory furnace kettle 3B	Oxides of nitrogen (as NO ₂) mg Nm ⁻³	100 mg/m ³	Monthly average or extractive sample (min 4 hour)	Twice a year - 4 months Minimum interval between extractive monitoring	BS EN 14792
		Sulphur dioxide mg Nm ⁻³ (natural gas fuel)	50 mg/m ³	Monthly average or extractive sample (min 4 hour)	Twice a year - 4 months Minimum interval between extractive monitoring	BS EN 14791

Table S3.1a Point source emissions to air – emission limits and monitoring requirements Effective until 29 June 2020						
Emission point ref. & location	Source	Parameter	Limit (incl. unit)	Reference period	Monitoring frequency	Monitoring standard or method
		Carbon monoxide	150 mg/m ³	Monthly average or extractive sample (min 4 hour)	Twice a year - 4 months Minimum interval between extractive monitoring	BS EN 15058
A12/1 [as shown on Drawing. No. SD000013999, Rev.02, dated 28/01/2020]	Stack releasing combustion gases from holding kettle No. 1	Oxides of nitrogen (as NO ₂) mg Nm ⁻³	100 mg/m ³	Monthly average or extractive sample (min 4 hour)	Twice a year - 4 months Minimum interval between extractive monitoring	BS EN 14792
		Sulphur dioxide mg Nm ⁻³ (natural gas fuel)	50 mg/m ³	Monthly average or extractive sample (min 4 hour)	Twice a year - 4 months Minimum interval between extractive monitoring	BS EN 14791
		Carbon monoxide	150 mg/m ³	Monthly average or extractive sample (min 4 hour)	Twice a year - 4 months Minimum interval between extractive monitoring	BS EN 15058
A12/2 [as shown on Drawing. No. SD000013999, Rev.02, dated 28/01/2020]	Stack releasing combustion gases from holding kettle No. 2	Oxides of nitrogen (as NO ₂) mg Nm ⁻³	100 mg/m ³	Monthly average or extractive sample (min 4 hour)	Twice a year - 4 months Minimum interval between extractive monitoring	BS EN 14792
		Sulphur dioxide mg Nm ⁻³ (natural gas fuel)	50 mg/m ³	Monthly average or extractive sample (min 4 hour)	Twice a year - 4 months Minimum interval between extractive monitoring	BS EN 14791

Table S3.1a Point source emissions to air – emission limits and monitoring requirements Effective until 29 June 2020						
Emission point ref. & location	Source	Parameter	Limit (incl. unit)	Reference period	Monitoring frequency	Monitoring standard or method
		Carbon monoxide	150 mg/m ³	Monthly average or extractive sample (min 4 hour)	Twice a year - 4 months Minimum interval between extractive monitoring	BS EN 15058
A14/1 [as shown on Drawing. No. SD000013999, Rev.02, dated 28/01/2020]	Stack releasing combustion gases from refinery kettle No. 3	Oxides of nitrogen (as NO ₂) mg Nm ⁻³	100 mg/m ³	Monthly average or extractive sample (min 4 hour)	Twice a year - 4 months Minimum interval between extractive monitoring	BS EN 14792
		Sulphur dioxide mg Nm ⁻³ (natural gas fuel)	50 mg/m ³	Monthly average or extractive sample (min 4 hour)	Twice a year - 4 months Minimum interval between extractive monitoring	BS EN 14791
		Carbon monoxide	150 mg/m ³	Monthly average or extractive sample (min 4 hour)	Twice a year - 4 months Minimum interval between extractive monitoring	BS EN 15058
A14/2 [as shown on Drawing. No. SD000013999, Rev.02, dated 28/01/2020]	Stack releasing combustion gases from refinery kettle No. 4	Oxides of nitrogen (as NO ₂) mg Nm ⁻³	100 mg/m ³	Monthly average or extractive sample (min 4 hour)	Twice a year - 4 months Minimum interval between extractive monitoring	BS EN 14792
		Sulphur dioxide mg Nm ⁻³ (natural gas fuel)	50 mg/m ³	Monthly average or extractive sample (min 4 hour)	Twice a year - 4 months Minimum interval between extractive monitoring	BS EN 14791
		Carbon monoxide	150 mg/m ³	Monthly average or extractive sample (min 4 hour)	Twice a year - 4 months Minimum interval between extractive monitoring	BS EN 15058

Table S3.1a Point source emissions to air – emission limits and monitoring requirements Effective until 29 June 2020						
Emission point ref. & location	Source	Parameter	Limit (incl. unit)	Reference period	Monitoring frequency	Monitoring standard or method
A14/3 [as shown on Drawing. No. SD000013999, Rev.02, dated 28/01/2020]	Stack releasing combustion gases from refinery kettle No. 5	Oxides of nitrogen (as NO ₂) mg Nm ⁻³	100 mg/m ³	Monthly average or extractive sample (min 4 hour)	Twice a year - 4 months Minimum interval between extractive monitoring	BS EN 14792
		Sulphur dioxide mg Nm ⁻³ (natural gas fuel)	50 mg/m ³	Monthly average or extractive sample (min 4 hour)	Twice a year - 4 months Minimum interval between extractive monitoring	BS EN 14791
		Carbon monoxide	150 mg/m ³	Monthly average or extractive sample (min 4 hour)	Twice a year - 4 months Minimum interval between extractive monitoring	BS EN 15058
A14/4 [as shown on Drawing. No. SD000013999, Rev.02, dated 28/01/2020]	Stack releasing combustion gases from refinery kettle No. 6	Oxides of nitrogen (as NO ₂) mg Nm ⁻³	100 mg/m ³	Monthly average or extractive sample (min 4 hour)	Twice a year - 4 months Minimum interval between extractive monitoring	BS EN 14792
		Sulphur dioxide mg Nm ⁻³ (natural gas fuel)	50 mg/m ³	Monthly average or extractive sample (min 4 hour)	Twice a year - 4 months Minimum interval between extractive monitoring	BS EN 14791
		Carbon monoxide	150 mg/m ³	Monthly average or extractive sample (min 4 hour)	Twice a year - 4 months Minimum interval between extractive monitoring	BS EN 15058
A14/5 [as shown on Drawing. No. SD000013999, Rev.02, dated 28/01/2020]	Stack releasing combustion gases from refinery kettle No. 7	Oxides of nitrogen (as NO ₂) mg Nm ⁻³	100 mg/m ³	Monthly average or extractive sample (min 4 hour)	Twice a year - 4 months Minimum interval between extractive monitoring	BS EN 14792

Table S3.1a Point source emissions to air – emission limits and monitoring requirements Effective until 29 June 2020						
Emission point ref. & location	Source	Parameter	Limit (incl. unit)	Reference period	Monitoring frequency	Monitoring standard or method
		Sulphur dioxide mg Nm ⁻³ (natural gas fuel)	50 mg/m ³	Monthly average or extractive sample (min 4 hour)	Twice a year - 4 months Minimum interval between extractive monitoring	BS EN 14791
		Carbon monoxide	150 mg/m ³	Monthly average or extractive sample (min 4 hour)	Twice a year - 4 months Minimum interval between extractive monitoring	BS EN 15058
A14/6 [as shown on Drawing. No. SD000013999, Rev.02, dated 28/01/2020]	Stack releasing combustion gases from refinery kettle No. 8	Oxides of nitrogen (as NO ₂) mg Nm ⁻³	100 mg/m ³	Monthly average or extractive sample (min 4 hour)	Twice a year - 4 months Minimum interval between extractive monitoring	BS EN 14792
		Sulphur dioxide mg Nm ⁻³ (natural gas fuel)	50 mg/m ³	Monthly average or extractive sample (min 4 hour)	Twice a year - 4 months Minimum interval between extractive monitoring	BS EN 14791
		Carbon monoxide	150 mg/m ³	Monthly average or extractive sample (min 4 hour)	Twice a year - 4 months Minimum interval between extractive monitoring	BS EN 15058
A14/7 [as shown on Drawing. No. SD000013999, Rev.02, dated 28/01/2020]	Stack releasing combustion gases from refinery kettle No. 9	Oxides of nitrogen (as NO ₂) mg Nm ⁻³	100 mg/m ³	Monthly average or extractive sample (min 4 hour)	Twice a year - 4 months Minimum interval between extractive monitoring	BS EN 14792
		Sulphur dioxide mg Nm ⁻³ (natural gas fuel)	50 mg/m ³	Monthly average or extractive sample (min 4 hour)	Twice a year - 4 months Minimum interval between extractive monitoring	BS EN 14791

Table S3.1a Point source emissions to air – emission limits and monitoring requirements Effective until 29 June 2020						
Emission point ref. & location	Source	Parameter	Limit (incl. unit)	Reference period	Monitoring frequency	Monitoring standard or method
		Carbon monoxide	150 mg/m ³	Monthly average or extractive sample (min 4 hour)	Twice a year - 4 months Minimum interval between extractive monitoring	BS EN 15058
A14/8 [as shown on Drawing. No. SD000013999, Rev.02, dated 28/01/2020]	Stack releasing combustion gases from refinery kettle No. 10	Oxides of nitrogen (as NO ₂) mg Nm ⁻³	100 mg/m ³	Monthly average or extractive sample (min 4 hour)	Twice a year - 4 months Minimum interval between extractive monitoring	BS EN 14792
		Sulphur dioxide mg Nm ⁻³ (natural gas fuel)	50 mg/m ³	Monthly average or extractive sample (min 4 hour)	Twice a year - 4 months Minimum interval between extractive monitoring	BS EN 14791
		Carbon monoxide	150 mg/m ³	Monthly average or extractive sample (min 4 hour)	Twice a year - 4 months Minimum interval between extractive monitoring	BS EN 15058
A14/9 [as shown on Drawing. No. SD000013999, Rev.02, dated 28/01/2020]	Stack releasing combustion gases from refinery kettle No. 11	Oxides of nitrogen (as NO ₂) mg Nm ⁻³	100 mg/m ³	Monthly average or extractive sample (min 4 hour)	Twice a year - 4 months Minimum interval between extractive monitoring	BS EN 14792
		Sulphur dioxide mg Nm ⁻³ (natural gas fuel)	50 mg/m ³	Monthly average or extractive sample (min 4 hour)	Twice a year - 4 months Minimum interval between extractive monitoring	BS EN 14791
		Carbon monoxide	150 mg/m ³	Monthly average or extractive sample (min 4 hour)	Twice a year - 4 months Minimum interval between extractive monitoring	BS EN 15058

Table S3.1a Point source emissions to air – emission limits and monitoring requirements Effective until 29 June 2020						
Emission point ref. & location	Source	Parameter	Limit (incl. unit)	Reference period	Monitoring frequency	Monitoring standard or method
A14/10 [as shown on Drawing. No. SD000013999, Rev.02, dated 28/01/2020]	Stack releasing combustion gases from refinery kettle No. 12	Oxides of nitrogen (as NO ₂) mg Nm ⁻³	100 mg/m ³	Monthly average or extractive sample (min 4 hour)	Twice a year - 4 months Minimum interval between extractive monitoring	BS EN 14792
		Sulphur dioxide mg Nm ⁻³ (natural gas fuel)	50 mg/m ³	Monthly average or extractive sample (min 4 hour)	Twice a year - 4 months Minimum interval between extractive monitoring	BS EN 14791
		Carbon monoxide	150 mg/m ³	Monthly average or extractive sample (min 4 hour)	Twice a year - 4 months Minimum interval between extractive monitoring	BS EN 15058
A14/11 [as shown on Drawing. No. SD000013999, Rev.02, dated 28/01/2020]	Stack releasing combustion gases from refinery kettle No. 13	Oxides of nitrogen (as NO ₂) mg Nm ⁻³	100 mg/m ³	Monthly average or extractive sample (min 4 hour)	Twice a year - 4 months Minimum interval between extractive monitoring	BS EN 14792
		Sulphur dioxide mg Nm ⁻³ (natural gas fuel)	50 mg/m ³	Monthly average or extractive sample (min 4 hour)	Twice a year - 4 months Minimum interval between extractive monitoring	BS EN 14791
		Carbon monoxide	150 mg/m ³	Monthly average or extractive sample (min 4 hour)	Twice a year - 4 months Minimum interval between extractive monitoring	BS EN 15058
A14/12 [as shown on Drawing. No. SD000013999, Rev.02, dated 28/01/2020]	Stack releasing combustion gases from refinery kettle No. 14	Oxides of nitrogen (as NO ₂) mg Nm ⁻³	100 mg/m ³	Monthly average or extractive sample (min 4 hour)	Twice a year - 4 months Minimum interval between extractive monitoring	BS EN 14792

Table S3.1a Point source emissions to air – emission limits and monitoring requirements Effective until 29 June 2020						
Emission point ref. & location	Source	Parameter	Limit (incl. unit)	Reference period	Monitoring frequency	Monitoring standard or method
		Sulphur dioxide mg Nm ⁻³ (natural gas fuel)	50 mg/m ³	Monthly average or extractive sample (min 4 hour)	Twice a year - 4 months Minimum interval between extractive monitoring	BS EN 14791
		Carbon monoxide	150 mg/m ³	Monthly average or extractive sample (min 4 hour)	Twice a year - 4 months Minimum interval between extractive monitoring	BS EN 15058
A14/13 [as shown on Drawing. No. SD000013999, Rev.02, dated 28/01/2020]	Stack releasing combustion gases from refinery kettle No. 15	Oxides of nitrogen (as NO ₂) mg Nm ⁻³	100 mg/m ³	Monthly average or extractive sample (min 4 hour)	Twice a year - 4 months Minimum interval between extractive monitoring	BS EN 14792
		Sulphur dioxide mg Nm ⁻³ (natural gas fuel)	50 mg/m ³	Monthly average or extractive sample (min 4 hour)	Twice a year - 4 months Minimum interval between extractive monitoring	BS EN 14791
		Carbon monoxide	150 mg/m ³	Monthly average or extractive sample (min 4 hour)	Twice a year - 4 months Minimum interval between extractive monitoring	BS EN 15058
A15/1 [as shown on Drawing. No. SD000013999, Rev.02, dated 28/01/2020]	Stack releasing combustion gases from strip mill kettle No. 30A	Oxides of nitrogen (as NO ₂) mg Nm ⁻³	100 mg/m ³	Monthly average or extractive sample (min 4 hour)	Twice a year - 4 months Minimum interval between extractive monitoring	BS EN 14792
		Sulphur dioxide mg Nm ⁻³ (natural gas fuel)	50 mg/m ³	Monthly average or extractive sample (min 4 hour)	Twice a year - 4 months Minimum interval between extractive monitoring	BS EN 14791

Table S3.1a Point source emissions to air – emission limits and monitoring requirements Effective until 29 June 2020						
Emission point ref. & location	Source	Parameter	Limit (incl. unit)	Reference period	Monitoring frequency	Monitoring standard or method
		Carbon monoxide	150 mg/m ³	Monthly average or extractive sample (min 4 hour)	Twice a year - 4 months Minimum interval between extractive monitoring	BS EN 15058
A15/2 [as shown on Drawing. No. SD000013999, Rev.02, dated 28/01/2020]	Stack releasing combustion gases from strip mill kettle No. 30B	Oxides of nitrogen (as NO ₂) mg Nm ⁻³	100 mg/m ³	Monthly average or extractive sample (min 4 hour)	Twice a year - 4 months Minimum interval between extractive monitoring	BS EN 14792
		Sulphur dioxide mg Nm ⁻³ (natural gas fuel)	50 mg/m ³	Monthly average or extractive sample (min 4 hour)	Twice a year - 4 months Minimum interval between extractive monitoring	BS EN 14791
		Carbon monoxide	150 mg/m ³	Monthly average or extractive sample (min 4 hour)	Twice a year - 4 months Minimum interval between extractive monitoring	BS EN 15058
A15/3 [as shown on Drawing. No. SD000013999, Rev.02, dated 28/01/2020]	Stack releasing combustion gases from strip mill kettle No. 70C	Oxides of nitrogen (as NO ₂) mg Nm ⁻³	100 mg/m ³	Monthly average or extractive sample (min 4 hour)	Twice a year - 4 months Minimum interval between extractive monitoring	BS EN 14792
		Sulphur dioxide mg Nm ⁻³ (natural gas fuel)	50 mg/m ³	Monthly average or extractive sample (min 4 hour)	Twice a year - 4 months Minimum interval between extractive monitoring	BS EN 14791
		Carbon monoxide	150 mg/m ³	Monthly average or extractive sample (min 4 hour)	Twice a year - 4 months Minimum interval between extractive monitoring	BS EN 15058

Table S3.1a Point source emissions to air – emission limits and monitoring requirements Effective until 29 June 2020						
Emission point ref. & location	Source	Parameter	Limit (incl. unit)	Reference period	Monitoring frequency	Monitoring standard or method
A16 [as shown on Drawing. No. SD000013999, Rev.02, dated 28/01/2020]	Stack releasing combustion gases from shot plant kettle	Oxides of nitrogen (as NO ₂) mg Nm ⁻³	100 mg/m ³	Monthly average or extractive sample (min 4 hour)	Twice a year - 4 months Minimum interval between extractive monitoring	BS EN 14792
		Sulphur dioxide mg Nm ⁻³ (natural gas fuel)	50 mg/m ³	Monthly average or extractive sample (min 4 hour)	Twice a year - 4 months Minimum interval between extractive monitoring	BS EN 14791
		Carbon monoxide	150 mg/m ³	Monthly average or extractive sample (min 4 hour)	Twice a year - 4 months Minimum interval between extractive monitoring	BS EN 15058
A17/1 [as shown on Drawing. No. SD000013999, Rev.02, dated 28/01/2020]	Vent on sodium carbonate / lime / magnesium hydroxide silo no. 1	Particulate mg Nm ⁻³	No limit set Note 1	Unloading bulk lime or sodium carbonate or magnesium hydroxide	Note 3	BS EN 13284-1 and MID
A17/2 [as shown on Drawing. No. SD000013999, Rev.02, dated 28/01/2020]	Vent on sodium carbonate / lime / magnesium hydroxide silo no. 2	Particulate mg Nm ⁻³	No limit set Note 1	Unloading bulk lime or sodium carbonate or magnesium hydroxide	Note 3	BS EN 13284-1 and MID
A18/1 [as shown on Drawing. No. SD000013999, Rev.02, dated 28/01/2020]	Vent on lime silo	Particulate mg Nm ⁻³	No limit set Note 1	Unloading bulk lime	Note 3	BS EN 13284-1 and MID
A18/2 [as shown on Drawing. No. SD000013999, Rev.02, dated 28/01/2020]	Vent on lime silo	Particulate mg Nm ⁻³	No limit set Note 1	Unloading bulk lime	Note 3	BS EN 13284-1 and MID

Table S3.1a Point source emissions to air – emission limits and monitoring requirements Effective until 29 June 2020						
Emission point ref. & location	Source	Parameter	Limit (incl. unit)	Reference period	Monitoring frequency	Monitoring standard or method
A18/3 [as shown on Drawing. No. SD000013999, Rev.02, dated 28/01/2020]	Vent on lime silo	Particulate mg Nm ⁻³	No limit set Note 1	Unloading bulk lime	Note 3	BS EN 13284-1 and MID
A19 [as shown on Drawing. No. SD000013999, Rev.02, dated 28/01/2020]	Vent on vehicle fuel storage tank	No parameter set	No limit set	-	-	-

Note 1: For these release points only, a particulate emission concentration limit of 10 mg/m³ is appropriate for this type of cartridge filter type abatement. However, the Environment Agency recognises that it is neither practicable, nor beneficial to test small individual filters. The Operator is therefore required generally to ensure that visible emissions of dust are prevented, or in the event of a visible emission, that such steps are taken as to minimise the release, and that prompt inspection and maintenance is carried out as soon as practicable. Operating instructions shall state visual observations are taken during unloading of bulk lime or sodium carbonate.

Note 2: The Operator shall aim to achieve a target emission of dioxins and furans of less than 0.1 ng/m³ (ITEQ) at emission points A1 and A2.

Note 3: The frequency of monitoring (if required) shall be agreed in writing with the Environment Agency.

General notes to table S3.1a
Metals include both gaseous, vapour and solid phases as well as their compounds (expressed as the metal or total as specified).
For emission points A11 to A16 the limits in Table S1.3a are expressed at 273K, 101.3 kPa, dry basis, 3% oxygen if for combustion purposes.
For emission points A1 to A10 the limits in Table S1.3a are expressed at 273K, 101.3 kPa, dry basis (if >3% moisture), actual oxygen.

Table S3.1b Point source emissions to air – emission limits and monitoring requirements Effective from 30 June 2020						
Emission point ref. & location	Source	Parameter	Limit (incl. unit)	Reference period	Monitoring frequency	Monitoring standard or method
A1 [as shown on Drawing. No. SD000013999, Rev.02, dated 28/01/2020]1	Stack A (61m) serving Rotary Furnaces No. 1 & No. 2 (process and hygiene gases after Intensiv No.1 & Intensiv No. 2 baghouses) and Charge dryer (process gases after Intensiv No.6 baghouse) and 2 Holding kettles:	Particulate	4 mg/m ³	Average over the sampling period	Twice per year	BS EN 13284-1 and MID
		Lead and its compounds	1 mg/m ³	Average over the sampling period	Twice per year	BS EN 14385 and MID
		Antimony and its compounds	No limit set	Average over the sampling period	Once per year	BS EN 14385 and MID

Table S3.1b Point source emissions to air – emission limits and monitoring requirements Effective from 30 June 2020						
Emission point ref. & location	Source	Parameter	Limit (incl. unit)	Reference period	Monitoring frequency	Monitoring standard or method
	Rotary pots (hygiene gases). Also serving the Reverberatory furnace and associated baghouse and gypsum plant	Arsenic and its compounds	No limit set	Average over the sampling period	Once per year	BS EN 14385 and MID
		Cadmium and its compounds	No limit set	Average over the sampling period	Once per year	BS EN 14385 and MID
		Copper and its compounds	No limit set	Average over the sampling period	Once per year	BS EN 14385 and MID
		TVOC (as C)	40 mg/m ³	Average over the sample period	Twice per year	BS EN 12619: 2013
		Dioxins & Furans (PCDD/F) (ng I-TEQ/Nm ³)	0.1 ng/m ³	Average over the sampling period of at least 6 hours	Twice per year	BS EN 1948: Parts 1, 2 and 3, and MID
		Mercury and its compounds	No limit set	Average over the sampling period	Once per year	BS EN 13211 (see MID for BS EN 14385) BS EN 14884
		Oxides of nitrogen (as NO ₂)	No limit set	Average over the sample period	Once per year	BS EN 14792
		Sulphur dioxide	350 mg/m ³	Average over the sample period	Twice per year	BS EN 14791
A2 [as shown on Drawing. No. SD000013999, Rev.02, dated 28/01/2020]	Stack B (30m) serving the 13 Refinery kettles (hygiene gases after Intensiv No. 3 baghouse) and 2 holding kettles serving the Reverberatory furnace	Particulate	4 mg/m ³	Average over the sampling period	Twice per year	BS EN 13284-1 and MID
		Lead and its compounds	1 mg/m ³	Average over the sampling period	Twice per year	BS EN 14385 and MID
		Antimony and its compounds	No limit set	Average over the sampling period	Once per year	BS EN 14385 and MID
		Arsenic and its compounds	No limit set	Average over the sampling period	Once per year	BS EN 14385 and MID

Table S3.1b Point source emissions to air – emission limits and monitoring requirements Effective from 30 June 2020						
Emission point ref. & location	Source	Parameter	Limit (incl. unit)	Reference period	Monitoring frequency	Monitoring standard or method
		Cadmium and its compounds	No limit set	Average over the sampling period	Once per year	BS EN 14385 and MID
		Copper and its compounds	No limit set	Average over the sampling period	Once per year	BS EN 14385 and MID
		TVOC (as C)	40 mg/m ³	Average over the sample period	Twice per year	BS EN 12619: 2013
		Dioxins & Furans (PCDD/F) (ng I-TEQ/Nm ³)	0.1 ng/m ³	Average over the sampling period of at least 6 hours	Twice per year	BS EN 1948: Parts 1, 2 and 3, and MID
		Mercury and its compounds	No limit set	Average over the sampling period	Once per year	BS EN 13211 (see MID for BS EN 14385) BS EN 14884
A4 [as shown on Drawing. No. SD000013999, Rev.02, dated 28/01/2020]	Stack D (25m) serving the charge preparation building and the slag storage area (hygiene gases after Intensiv No 5 baghouse) Also serving the Reverberatory furnace and charge dryer (hygiene gases)	Particulate	5 mg/m ³	Average over the sampling period	Twice per year	BS EN 13284-1 and MID
		Lead and its compounds	No limit set	Average over the sampling period	Once per year	BS EN 14385 and MID
		Cadmium and its compounds	No limit set	Average over the sampling period	Once per year	BS EN 14385 and MID
		Mercury and its compounds	No limit set	Average over the sampling period	Once per year	BS EN 13211 (see MID for BS EN 14385) BS EN 14884
A5 [as shown on Drawing. No. SD000013999, Rev.02, dated 28/01/2020]	Stack E (15m) serving the MA battery breaker (hygiene gases after wet scrubber)	Particulate	5 mg/m ³	Twice per year	BS EN 13284-1 and MID	Average over the sampling period
		Lead and its compounds	No limit set	Average over the sampling period	Once per year	BS EN 14385 and MID

Table S3.1b Point source emissions to air – emission limits and monitoring requirements Effective from 30 June 2020						
Emission point ref. & location	Source	Parameter	Limit (incl. unit)	Reference period	Monitoring frequency	Monitoring standard or method
		Cadmium and its compounds	No limit set	Average over the sampling period	Once per year	BS EN 14385 and MID
		Mercury and its compounds	No limit set	Average over the sampling period	Once per year	BS EN 13211 (see MID for BS EN 14385) BS EN 14884
A7 [as shown on Drawing. No. SD000013999, Rev.02, dated 28/01/2020]	Stack G (12m) serving Materials Handling building, shot manufacturing plant and slag storage area (hygiene gases after intensive 8 baghouse).	Particulate	5 mg/m ³	Average over the sampling period	Twice per year	BS EN 14385 and MID
		Lead and its compounds	No limit set	Average over the sampling period	Once per year	BS EN 14385 and MID
		Antimony and its compounds	No limit set	Average over the sampling period	Once per year	BS EN 14385 and MID
		Arsenic and its compounds	No limit set	Average over the sampling period	Once per year	BS EN 14385 and MID
		Cadmium and its compounds	No limit set	Average over the sampling period	Once per year	BS EN 14385 and MID
		Copper and its compounds	No limit set	Average over the sampling period	Once per year	BS EN 14385 and MID
		Mercury and its compounds	No limit set	Average over the sampling period	Once per year	BS EN 13211 (see MID for BS EN 14385) BS EN 14884
A10 [as shown on Drawing. No. SD000013999, Rev.02, dated 28/01/2020]	Stack K (12m) serving the Strip Mill (hygiene gases after baghouse)	Particulate	4 mg/m ³	Average over the sampling period	Twice per year	BS EN 13284-1 and MID
		Lead and its compounds	1 mg/m ³	Average over the sampling period	Twice per year	BS EN 14385 and MID

Table S3.1b Point source emissions to air – emission limits and monitoring requirements Effective from 30 June 2020						
Emission point ref. & location	Source	Parameter	Limit (incl. unit)	Reference period	Monitoring frequency	Monitoring standard or method
		Antimony and its compounds	No limit set	Average over the sampling period	Once per year	BS EN 14385 and MID
		Arsenic and its compounds	No limit set	Average over the sampling period	Once per year	BS EN 14385 and MID
		Cadmium and its compounds	No limit set	Average over the sampling period	Once per year	BS EN 14385 and MID
		Copper and its compounds	No limit set	Average over the sampling period	Once per year	BS EN 14385 and MID
		Mercury and its compounds	No limit set	Average over the sampling period	Once per year	BS EN 13211 (see MID for BS EN 14385) BS EN 14884
A11/1 [as shown on Drawing. No. SD000013999, Rev.02, dated 28/01/2020] Located on north side of Refinery building	Stack releasing combustion gases from Reverberatory furnace kettle 3A	Oxides of nitrogen (as NO ₂) (oxy-fuel burners used)	No limit set	Average over the sample period	Once per year	BS EN 14792
		Carbon monoxide	No limit set	-	-	-
A11/2 [as shown on Drawing. No. SD000013999, Rev.02, dated 28/01/2020] Located on north side of Refinery building	Stack releasing combustion gases from Reverberatory furnace kettle 3B	Oxides of nitrogen (as NO ₂) (oxy-fuel burners used)	No limit set	Average over the sample period	Once per year	BS EN 14792
		Carbon monoxide	No limit set	-	-	-
A12/1 [as shown on Drawing. No. SD000013999, Rev.02, dated 28/01/2020]	Stack releasing combustion gases from holding kettle No. 1	Oxides of nitrogen (as NO ₂) (oxy-fuel burners used)	No limit set	Average over the sample period	Once per year	BS EN 14792
		Carbon monoxide	No limit set	-	-	-

Table S3.1b Point source emissions to air – emission limits and monitoring requirements Effective from 30 June 2020						
Emission point ref. & location	Source	Parameter	Limit (incl. unit)	Reference period	Monitoring frequency	Monitoring standard or method
A12/2 [as shown on Drawing. No. SD000013999, Rev.02, dated 28/01/2020]	Stack releasing combustion gases from holding kettle No. 2	Oxides of nitrogen (as NO ₂) (oxy-fuel burners used)	No limit set	Average over the sample period	Once per year	BS EN 14792
		Carbon monoxide	No limit set	-	-	-
A14/1 [as shown on Drawing. No. SD000013999, Rev.02, dated 28/01/2020]	Stack releasing combustion gases from refinery kettle No. 3	Oxides of nitrogen (as NO ₂) (oxy-fuel burners used)	No limit set	Average over the sample period	Once per year	BS EN 14792
		Carbon monoxide	No limit set	-	-	-
A14/2 [as shown on Drawing. No. SD000013999, Rev.02, dated 28/01/2020]	Stack releasing combustion gases from refinery kettle No. 4	Oxides of nitrogen (as NO ₂) (oxy-fuel burners used)	No limit set	Average over the sample period	Once per year	BS EN 14792
		Carbon monoxide	No limit set	-	-	-
A14/3 [as shown on Drawing. No. SD000013999, Rev.02, dated 28/01/2020]	Stack releasing combustion gases from refinery kettle No. 5	Oxides of nitrogen (as NO ₂) (oxy-fuel burners used)	No limit set	Average over the sample period	Once per year	BS EN 14792
		Carbon monoxide	No limit set	-	-	-
A14/4 [as shown on Drawing. No. SD000013999, Rev.02, dated 28/01/2020]	Stack releasing combustion gases from refinery kettle No. 6	Oxides of nitrogen (as NO ₂) (oxy-fuel burners used)	No limit set	Average over the sample period	Once per year	BS EN 14792
		Carbon monoxide	No limit set	-	-	-
A14/5 [as shown on Drawing. No. SD000013999, Rev.02, dated 28/01/2020]	Stack releasing combustion gases from refinery kettle No. 7	Oxides of nitrogen (as NO ₂) (oxy-fuel burners used)	No limit set	Average over the sample period	Once per year	BS EN 14792
		Carbon monoxide	No limit set	-	-	-
A14/6 [as shown on Drawing. No. SD000013999, Rev.02, dated 28/01/2020]	Stack releasing combustion gases from refinery kettle No. 8	Oxides of nitrogen (as NO ₂) (oxy-fuel burners used)	No limit set	Average over the sample period	Once per year	BS EN 14792
		Carbon monoxide	No limit set	-	-	-

Table S3.1b Point source emissions to air – emission limits and monitoring requirements Effective from 30 June 2020						
Emission point ref. & location	Source	Parameter	Limit (incl. unit)	Reference period	Monitoring frequency	Monitoring standard or method
A14/7 [as shown on Drawing. No. SD000013999, Rev.02, dated 28/01/2020]	Stack releasing combustion gases from refinery kettle No. 9	Oxides of nitrogen (as NO ₂) <i>(oxy-fuel burners used)</i>	No limit set	Average over the sample period	Once per year	BS EN 14792
		Carbon monoxide	No limit set	-	-	-
A14/8 [as shown on Drawing. No. SD000013999, Rev.02, dated 28/01/2020]	Stack releasing combustion gases from refinery kettle No. 10	Oxides of nitrogen (as NO ₂) <i>(oxy-fuel burners used)</i>	No limit set	Average over the sample period	Once per year	BS EN 14792
		Carbon monoxide	No limit set	-	-	-
A14/9 [as shown on Drawing. No. SD000013999, Rev.02, dated 28/01/2020]	Stack releasing combustion gases from refinery kettle No. 11	Oxides of nitrogen (as NO ₂) <i>(oxy-fuel burners used)</i>	No limit set	Average over the sample period	Once per year	BS EN 14792
		Carbon monoxide	No limit set	-	-	-
A14/10 [as shown on Drawing. No. SD000013999, Rev.02, dated 28/01/2020]	Stack releasing combustion gases from refinery kettle No. 12	Oxides of nitrogen (as NO ₂) <i>(oxy-fuel burners used)</i>	No limit set	Average over the sample period	Once per year	BS EN 14792
		Carbon monoxide	No limit set	-	-	-
A14/11 [as shown on Drawing. No. SD000013999, Rev.02, dated 28/01/2020]	Stack releasing combustion gases from refinery kettle No. 13	Oxides of nitrogen (as NO ₂) <i>(oxy-fuel burners used)</i>	No limit set	Average over the sample period	Once per year	BS EN 14792
		Carbon monoxide	No limit set	-	-	-
A14/12 [as shown on Drawing. No. SD000013999, Rev.02, dated 28/01/2020]	Stack releasing combustion gases from refinery kettle No. 14	Oxides of nitrogen (as NO ₂) <i>(oxy-fuel burners used)</i>	No limit set	Average over the sample period	Once per year	BS EN 14792
		Carbon monoxide	No limit set	-	-	-
A14/13 [as shown on Drawing. No. SD000013999, Rev.02, dated 28/01/2020]	Stack releasing combustion gases from refinery kettle No. 15	Oxides of nitrogen (as NO ₂) <i>(oxy-fuel burners used)</i>	No limit set	Average over the sample period	Once per year	BS EN 14792
		Carbon monoxide	No limit set	-	-	-

Table S3.1b Point source emissions to air – emission limits and monitoring requirements Effective from 30 June 2020						
Emission point ref. & location	Source	Parameter	Limit (incl. unit)	Reference period	Monitoring frequency	Monitoring standard or method
A15/1 [as shown on Drawing. No. SD000013999, Rev.02, dated 28/01/2020]	Stack releasing combustion gases from strip mill kettle No. 30A	Oxides of nitrogen (as NO ₂) (<i>oxy-fuel burners used</i>)	No limit set	Average over the sample period	Once per year	BS EN 14792
		Carbon monoxide	No limit set	-	-	-
A15/2 [as shown on Drawing. No. SD000013999, Rev.02, dated 28/01/2020]	Stack releasing combustion gases from strip mill kettle No. 30B	Oxides of nitrogen (as NO ₂) (<i>oxy-fuel burners used</i>)	No limit set	Average over the sample period	Once per year	BS EN 14792
		Carbon monoxide	No limit set	-	-	-
A15/3 [as shown on Drawing. No. SD000013999, Rev.02, dated 28/01/2020]	Stack releasing combustion gases from strip mill kettle No. 70C	Oxides of nitrogen (as NO ₂) (<i>oxy-fuel burners used</i>)	No limit set	Average over the sample period	Once per year	BS EN 14792
		Carbon monoxide	No limit set	-	-	-
A16 [as shown on Drawing. No. SD000013999, Rev.02, dated 28/01/2020]	Stack releasing combustion gases from shot plant kettle	Oxides of nitrogen (as NO ₂) (<i>oxy-fuel burners used</i>)	No limit set	Average over the sample period	Once per year	BS EN 14792
		Carbon monoxide	No limit set	-	-	-
A17/1 [as shown on Drawing. No. SD000013999, Rev.02, dated 28/01/2020]	Vent on sodium carbonate / lime / magnesium hydroxide silo no. 1	Particulate	No limit set Note 1	Unloading bulk lime or sodium carbonate or magnesium hydroxide	Note 2	BS EN 13284-1 and MID
A17/2 [as shown on Drawing. No. SD000013999, Rev.02, dated 28/01/2020]	Vent on sodium carbonate / lime / magnesium hydroxide silo no. 2	Particulate	No limit set Note 1	Unloading bulk lime or sodium carbonate or magnesium hydroxide	Note 2	BS EN 13284-1 and MID
A18/1 [as shown on Drawing. No. SD000013999, Rev.02, dated 28/01/2020]	Vent on lime silo	Particulate	No limit set Note 1	Unloading bulk lime	Note 2	BS EN 13284-1 and MID

Table S3.1b Point source emissions to air – emission limits and monitoring requirements Effective from 30 June 2020						
Emission point ref. & location	Source	Parameter	Limit (incl. unit)	Reference period	Monitoring frequency	Monitoring standard or method
A18/2 [as shown on Drawing. No. SD000013999, Rev.02, dated 28/01/2020]	Vent on <i>lime silo</i>	Particulate	No limit set Note 1	Unloading bulk lime	Note 2	BS EN 13284-1 and MID
A18/3 [as shown on Drawing. No. SD000013999, Rev.02, dated 28/01/2020]	Vent on <i>lime silo</i>	Particulate	No limit set Note 1	Unloading bulk lime	Note 2	BS EN 13284-1 and MID
A19 [as shown on Drawing. No. SD000013999, Rev.02, dated 28/01/2020]	Vent on <i>vehicle fuel storage tank</i>	No parameter set	No limit set	-	-	-
<p>Note 1: The Operator is required generally to ensure that visible emissions of dust are prevented, or in the event of a visible emission, that such steps are taken as to minimise the release, and that prompt inspection and maintenance is carried out as soon as practicable. Operating instructions shall state visual observations are taken during unloading of bulk lime, sodium carbonate or magnesium hydroxide.</p> <p>Note 2: The frequency of monitoring (if required) shall be agreed in writing with the Environment Agency.</p>						

Table S3.2a Point Source emissions to water (other than sewer) and land – emission limits and monitoring requirements Effective until 29 June 2020						
Emission point ref. & location	Source	Parameter	Limit (incl. unit)	Reference Period	Monitoring frequency (* or as otherwise agreed in writing)	Monitoring standard or method (or as otherwise agreed in writing)
W1 [as shown on site plan at Schedule 7] emission to the River Derwent Note 4	Effluent treatment plant (ETP)	Flow rate (integrated)	100 m ³ /hr Note 2		Continuous	ETP Operating Procedure Section 12
		Biochemical oxygen demand (BOD)	14.429 kg/d(10.0)	Flow weighted weekly average Note 1	Weekly	BS EN 1899
			14.429 kg/d(10.0)	Spot sample Note 3		

Table S3.2a Point Source emissions to water (other than sewer) and land – emission limits and monitoring requirements
Effective until 29 June 2020

Emission point ref. & location	Source	Parameter	Limit (incl. unit)	Reference Period	Monitoring frequency (* or as otherwise agreed in writing)	Monitoring standard or method (or as otherwise agreed in writing)
		Suspended solids	50.501 kg/d (35.0)	Flow weighted daily average Note 1	3 days / week with 1 day between samples *	BS EN 872
			50.501 kg/d (35.0)	Spot sample Note 3		
		Total hydrocarbon oil No visible oil as	No interference fringe colours on the surface of Dams 4&5	-	Daily	Laboratory Operating Procedure section 2.2
		pH max	10.0	-	Continuous	BS ISO 10523
		pH min	6.0	-	Note 5	
		Ammonium (Total) (as Nitrogen)	7.214 kg/d (5.00)	Flow weighted weekly average Note 1	Weekly	BS 6068 or BS EN ISO 11732
			7.211 kg/d (5.00)	Spot sample Note 3		
		Antimony and its compounds (as Sb)	1.443 kg/d (1.00)	Monthly average Note 1	Weekly	BS EN ISO 17294-2, or BS EN ISO 11885, or BS EN ISO 15586
			1.443 kg/d (1.00)	Spot sample Note 3		
		Arsenic and its compounds (as As)	0.721 kg/d (0.500)	Monthly average Note 1	Weekly	BS EN ISO 17294-2, or BS EN ISO 11885, or BS EN ISO 15586
			0.721 kg/d (0.500)	Spot sample Note 3		
		Cadmium and its compounds (as Cd)	0.289 kg/d (0.200)	Flow weighted daily average Note 1	3 days / week with 1 day between samples *	BS EN ISO 17294-2, or BS EN ISO 11885, or BS EN ISO 15586
			0.289 kg/d (0.200)	Spot sample Note 3		
		Copper and its compounds (as Cu)	0.721 kg/d (0.500)	Monthly average Note 1	Weekly	BS EN ISO 17294-2, or BS EN ISO 11885, or BS EN ISO 15586
			0.721 kg/d (0.500)	Spot sample Note 3		

Table S3.2a Point Source emissions to water (other than sewer) and land – emission limits and monitoring requirements Effective until 29 June 2020								
Emission point ref. & location	Source	Parameter	Limit (incl. unit)	Reference Period	Monitoring frequency (* or as otherwise agreed in writing)	Monitoring standard or method (or as otherwise agreed in writing)		
		Mercury and its compounds (as Hg)	0.014 kg/d (0.010)	Monthly average Note 1	Weekly	BS EN ISO 12846, or BS EN ISO 17852		
			0.014 kg/d (0.010)	Spot sample Note 3				
		Nickel and its compounds (as Ni)	0.721 kg/d (0.500)	Monthly average Note 1	Weekly	BS EN ISO 17294-2, or BS EN ISO 11885, or BS EN ISO 15586		
			0.721 kg/d (0.500)	Spot sample Note 3				
		Lead and its compounds (as Pb)	1.3 kg/d (1.00)	Flow weighted daily average Note 1	3 days / week with 1 day between samples *	BS EN ISO 17294-2, or BS EN ISO 11885, or BS EN ISO 15586		
			1.2 kg/d (1.00)	Spot sample Note 3				
			1.443 kg/d (1.00)	Spot sample Note 3				
		Zinc and its compounds (as Zn)	1.0 kg/d (1.00)	Monthly average Note 1	Weekly	BS EN ISO 17294-2, or BS EN ISO 11885, or BS EN ISO 15586		
			1.2 kg/d (1.00)	Spot sample Note 3				
		W2 [as shown on site plan in Schedule 7] emission to the Cowley Brook, tributary of the River Derwent	Surface waters drainage from hillside via the French drain together with surface drainage around strip mill, car park, canteen, laundry, medical block, training office and main office via an interceptor	Total hydrocarbon oil	No interference fringe colours on the surface of discharge	-	Daily	Laboratory Operating Procedure section 2.2

Table S3.2a Point Source emissions to water (other than sewer) and land – emission limits and monitoring requirements
Effective until 29 June 2020

Emission point ref. & location	Source	Parameter	Limit (incl. unit)	Reference Period	Monitoring frequency (* or as otherwise agreed in writing)	Monitoring standard or method (or as otherwise agreed in writing)
<p>Note 1: Flow weighted daily samples. Weekly composite prepared from daily samples. Monthly average calculated from weekly composites. Automated sampling system shall have 90% availability</p> <p>Note 2: ELV applies when the ELV for Suspended Solids, pH, Cadmium and Lead is breached and/or when the ETP Blind tank overflows.</p> <p>Note 3: No spot sample shall exceed the spot limit value by more than 50%.</p> <p>Note 4: "Absolute mass release" Emission Limit Values as kg day⁻¹ have been used which relate directly to environmental impact. The limit in brackets is the equivalent mg / l concentration at an Effluent Treatment Plant discharge rate of 60.12 m³/hr converted from g s⁻¹ mass release rate to kg day⁻¹ for direct comparison purposes.</p> <p>Note 5: Maximum and minimum shall be determined based on a 15-minute average reading.</p>						

Table S3.2b Point Source emissions to water (other than sewer) and land – emission limits and monitoring requirements
Effective from 30 June 2020

Emission point ref. & location	Source	Parameter	Limit (incl. unit)	Reference Period	Monitoring frequency (* or as otherwise agreed in writing)	Monitoring standard or method (or as otherwise agreed in writing)
W1 [as shown on site plan at Schedule 7] emission to the River Derwent	Effluent treatment plant (ETP)	Flow rate (integrated)	61 m ³ /hr	Weekly average Note 5	Continuous	MCERTS self-monitoring of effluent flow scheme
			100 m ³ /hr Note 2	Maximum		
		Biochemical oxygen demand (BOD)	10 mg/l	Flow weighted weekly average Note 1	Weekly	BS EN 1899
			10 mg/l	Spot sample Note 3		
		Total suspended solids	35 mg/l	Flow weighted daily average Note 1	3 days / week with 1 day between samples *	BS EN 872
			35 mg/l	Spot sample Note 3		
		Ammoniacal nitrogen (as N)	5 mg/l	Flow weighted weekly average Note 1	Weekly	BS 6068, or BS EN ISO 11732
			5 mg/l	Spot sample Note 3		

Table S3.2b Point Source emissions to water (other than sewer) and land – emission limits and monitoring requirements
Effective from 30 June 2020

Emission point ref. & location	Source	Parameter	Limit (incl. unit)	Reference Period	Monitoring frequency (* or as otherwise agreed in writing)	Monitoring standard or method (or as otherwise agreed in writing)
		Oil and grease	No visible trace present	Instantaneous	Daily	Visual inspection
		pH max	10.0	-	Continuous Note 4	BS EN ISO 10523
		pH min	6.0	-		
		Antimony	No limit set	Daily average	Weekly	BS EN ISO 11885, or BS EN ISO 15586, or BS EN ISO 17294-2
		Arsenic	0.1 mg/l	Daily average	Weekly	BS EN ISO 11885, or BS EN ISO 15586, or BS EN ISO 17294-2
		Cadmium	0.1 mg/l	Daily average	3 days / week with 1 day between samples *	BS EN ISO 11885, or BS EN ISO 15586, or BS EN ISO 17294-2
		Cobalt	0.1 mg/l	Daily average	Weekly	BS EN ISO 11885, or BS EN ISO 15586, or BS EN ISO 17294-2
		Copper	0.2 mg/l	Daily average	Weekly	BS EN ISO 11885, or BS EN ISO 15586, or BS EN ISO 17294-2

Table S3.2b Point Source emissions to water (other than sewer) and land – emission limits and monitoring requirements
Effective from 30 June 2020

Emission point ref. & location	Source	Parameter	Limit (incl. unit)	Reference Period	Monitoring frequency (* or as otherwise agreed in writing)	Monitoring standard or method (or as otherwise agreed in writing)
		Iron	No limit set	Daily average	Weekly	BS EN ISO 11885, or BS EN ISO 15586, or BS EN ISO 17294-2
		Lead	0.5 mg/l	Daily average	3 days / week with 1 day between samples *	BS EN ISO 11885, or BS EN ISO 15586, or BS EN ISO 17294-2
		Mercury	0.05 mg/l	Daily average	Weekly	BS EN ISO 17852, or BS EN ISO 12846
		Nickel	0.5 mg/l	Daily average	Weekly	BS EN ISO 11885, or BS EN ISO 15586, or BS EN ISO 17294-2
		Sulphate	No limit set	Daily average	Weekly	BS EN ISO 10304-1
		Tin	No limit set	Daily average	Weekly	BS EN ISO 11885, or BS EN ISO 15586, or BS EN ISO 17294-2
		Zinc	1 mg/l	Daily average	Weekly	BS EN ISO 11885, or BS EN ISO 15586, or BS EN ISO 17294-2

Table S3.2b Point Source emissions to water (other than sewer) and land – emission limits and monitoring requirements
Effective from 30 June 2020

Emission point ref. & location	Source	Parameter	Limit (incl. unit)	Reference Period	Monitoring frequency (* or as otherwise agreed in writing)	Monitoring standard or method (or as otherwise agreed in writing)
W2 [as shown on site plan in Schedule 7] emission to the Cowley Brook, tributary of the River Derwent	Surface waters drainage from hillside via the French drain together with surface drainage around strip mill, car park, canteen, laundry, medical block, training office and main office via an interceptor	Oil and grease	No visible trace present	Instantaneous	Daily	Visual inspection

Note 1: Flow weighted daily samples. Weekly composite prepared from daily samples. Monthly average calculated from weekly composites. Automated sampling system shall have 90% availability

Note 2: ELV applies when the ELV for Suspended Solids, pH, Cadmium and Lead is breached and/or when the ETP Blind tank overflows.

Note 3: No spot sample shall exceed the spot limit value by more than 50%.

Note 4: Maximum and minimum shall be determined based on a 15-minute average reading.

Note 5: Weekly average calculated as the mean of daily hourly averages for the week

Schedule 4 – Reporting

Parameters, for which reports shall be made, in accordance with conditions of this permit, are listed below.

Parameter	Emission or monitoring point/reference	Reporting period	Period begins
Emissions to air Parameters as required by condition 3.5.1.	A1, A2, A4, A5, A7, A10, A11, A12, A14, A15, A16	Every 12 months	1 January
Emissions to water Parameters as required by condition 3.5.1	W1, W2	Every 6 months	1 January, 1 July

Parameter	Units
-	-

Parameter	Frequency of assessment	Units
Water usage	Annually	tonnes
Energy usage	Annually	MWh

Media/parameter	Reporting format	Date of form
Air	Form air 1 or other form as agreed in writing by the Environment Agency	01/06/2020
Water and Land	Form water 1 or other form as agreed in writing by the Environment Agency	01/06/2020
Water usage	Form water usage 1 or other form as agreed in writing by the Environment Agency	01/06/2020
Energy usage	Form energy 1 or other form as agreed in writing by the Environment Agency	01/06/2020
Waste subject to condition 4.2.5	Waste tonnage return from the Environment Agency website or other form as agreed in writing by the Environment Agency	As stated in online form

Schedule 5 – Notification

These pages outline the information that the operator must provide.

Units of measurement used in information supplied under Part A and B requirements shall be appropriate to the circumstances of the emission. Where appropriate, a comparison should be made of actual emissions and authorised emission limits.

If any information is considered commercially confidential, it should be separated from non-confidential information, supplied on a separate sheet and accompanied by an application for commercial confidentiality under the provisions of the EP Regulations.

Part A

Permit Number	
Name of operator	
Location of Facility	
Time and date of the detection	

(a) Notification requirements for any malfunction, breakdown or failure of equipment or techniques, accident, or emission of a substance not controlled by an emission limit which has caused, is causing or may cause significant pollution	
To be notified within 24 hours of detection	
Date and time of the event	
Reference or description of the location of the event	
Description of where any release into the environment took place	
Substances(s) potentially released	
Best estimate of the quantity or rate of release of substances	
Measures taken, or intended to be taken, to stop any emission	
Description of the failure or accident.	

(b) Notification requirements for the breach of a limit	
To be notified within 24 hours of detection unless otherwise specified below	
Emission point reference/ source	
Parameter(s)	
Limit	
Measured value and uncertainty	
Date and time of monitoring	

(b) Notification requirements for the breach of a limit	
To be notified within 24 hours of detection unless otherwise specified below	
Measures taken, or intended to be taken, to stop the emission	

Time periods for notification following detection of a breach of a limit	
Parameter	Notification period

(c) Notification requirements for the detection of any significant adverse environmental effect	
To be notified within 24 hours of detection	
Description of where the effect on the environment was detected	
Substances(s) detected	
Concentrations of substances detected	
Date of monitoring/sampling	

Part B – to be submitted as soon as practicable

Any more accurate information on the matters for notification under Part A.	
Measures taken, or intended to be taken, to prevent a recurrence of the incident	
Measures taken, or intended to be taken, to rectify, limit or prevent any pollution of the environment which has been or may be caused by the emission	
The dates of any unauthorised emissions from the facility in the preceding 24 months.	

Name*	
Post	
Signature	
Date	

* authorised to sign on behalf of the operator

Schedule 6 – Interpretation

“accident” means an accident that may result in pollution.

“application” means the application for this permit, together with any additional information supplied by the operator as part of the application and any response to a notice served under Schedule 5 to the EP Regulations.

“authorised officer” means any person authorised by the Environment Agency under section 108(1) of The Environment Act 1995 to exercise, in accordance with the terms of any such authorisation, any power specified in section 108(4) of that Act.

“average over the sampling period” means the average value of three consecutive measurements of at least 30 minutes each, unless otherwise stated, as defined in the *General Considerations* section of the Non-Ferrous Metals BAT Conclusions. For batch processes, the average of a representative number of measurements taken over the total batch time or the result of a measurement carried out over the total batch time can be used.

“BAT-AELs” means BAT-associated emission levels, i.e. the emission levels associated with the best available techniques for emissions to air and/or water, as set out in the Non-Ferrous Metals BAT Conclusions.

“daily average” (for emissions to air) means the average over a period of 24 hours of valid half-hourly or hourly averages obtained by continuous measurements, as defined in the *General Considerations* section of the Non-Ferrous Metals BAT Conclusions. A half-hourly or hourly average shall be considered valid if measurements are available for a minimum of (a) 20 minutes during the half hour, or (b) 40 minutes during the hour. The number of half-hourly or hourly averages so validated shall not exceed 5 per day.

“daily average” (for emissions to water) means the average over a sampling period of 24 hours taken as a flow-proportional composite sample (or as a time-proportional composite sample provided that sufficient flow stability is demonstrated), as defined in the *General Considerations* section of the Non-Ferrous Metals BAT Conclusions. For discontinuous flows, a different sampling procedure yielding representative results (e.g. spot sampling) can be used.

“daily hourly average” means the average over a period of 24 hours of hourly averages obtained by continuous effluent flow measurement

“disposal” means any of the operations provided for in Annex I to Directive 2008/98/EC of the European Parliament and of the Council on waste.

“emissions to land” includes emissions to groundwater.

“EP Regulations” means The Environmental Permitting (England and Wales) Regulations SI 2016 No.1154 and words and expressions used in this permit which are also used in the Regulations have the same meanings as in those Regulations.

“emissions of substances not controlled by emission limits” means emissions of substances to air, water or land from the activities, either from the emission points specified in schedule 3 or from other localised or diffuse sources, which are not controlled by an emission limit.

“groundwater” means all water, which is below the surface of the ground in the saturation zone and in direct contact with the ground or subsoil.

“Hazardous property” has the meaning in Annex III of the Waste Framework Directive.

“Hazardous waste” has the meaning given in the Hazardous Waste (England and Wales) Regulations 2005 (as amended).

“Industrial Emissions Directive” means DIRECTIVE 2010/75/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 24 November 2010 on industrial emissions

“List of Wastes” means the list of wastes established by Commission Decision 2000/532/EC replacing Decision 94/3/EC establishing a list of wastes pursuant to Article 1(a) of Council Directive 75/442/EEC on

waste and Council Decision 94/904/EC establishing a list of hazardous waste pursuant to Article 1(4) of Council Directive 91/689/EEC on hazardous waste, as amended from time to time.

“MCERTS” means the Environment Agency’s Monitoring Certification Scheme.

“quarter” means a calendar year quarter commencing on 1 January, 1 April, 1 July or 1 October.

“recovery” means any of the operations provided for in Annex II to Directive 2008/98/EC of the European Parliament and of the Council on waste.

“Waste code” means the six digit code referable to a type of waste in accordance with the List of Wastes and in relation to hazardous waste, includes the asterisk.

“Waste Framework Directive” or “WFD” means Waste Framework Directive 2008/98/EC of the European Parliament and of the Council on waste

Where a minimum limit is set for any emission parameter, for example pH, reference to exceeding the limit shall mean that the parameter shall not be less than that limit.

Unless otherwise stated, any references in this permit to concentrations of substances in emissions into air means:

- in relation to emissions from combustion processes and not subject to BAT-AELs for air emissions, the concentration in dry air at a temperature of 273.15K, at a pressure of 101.3 kPa, and with an oxygen content of 3% dry for liquid and gaseous fuels and 6% dry for solid fuels; and/or
- in relation to emissions from non-combustion sources and not subject to BAT-AELs for air emissions, the concentration at a temperature of 273.15K and at a pressure of 101.3 kPa, with no correction for water vapour content; and/or
- in relation to emissions from non-combustion sources subject to BAT-AELs for air emissions, the concentration in dry air at a temperature of 273.15K and at a pressure of 101.3 kPa; and/or
- in relation to emissions from combustion processes subject to BAT-AELs for air emissions, the concentration in dry air at a temperature of 273.15K and at a pressure of 101.3 kPa, and with an oxygen content of 3% dry for liquid and gaseous fuels and 6% dry for solid fuels.

“year” means calendar year ending 31 December.

When the following terms appear in the waste code list in Schedule 2, table 2.2, for that table, they have the meaning given below:

‘hazardous substance’ means a substance classified as hazardous as a consequence of fulfilling the criteria laid down in parts 2 to 5 of Annex I to Regulation (EC) No 1272/2008

‘heavy metal’ means any compound of antimony, arsenic, cadmium, chromium (VI), copper, lead, mercury, nickel, selenium, tellurium, thallium and tin, as well as these materials in metallic form, as far as these are classified as hazardous substances

‘PCBs’ means

- polychlorinated biphenyls
- polychlorinated terphenyls
- monomethyl-tetrachlorodiphenyl methane, Monomethyl-dichloro-diphenyl methane, Monomethyldibromo-diphenyl methane
- any mixture containing any of the above mentioned substances in a total of more than 0,005 %by weight

‘transition metals’ means any of the following metals: any compound of scandium, vanadium, manganese, cobalt, copper, yttrium, niobium, hafnium, tungsten, titanium, chromium, iron, nickel, zinc, zirconium,

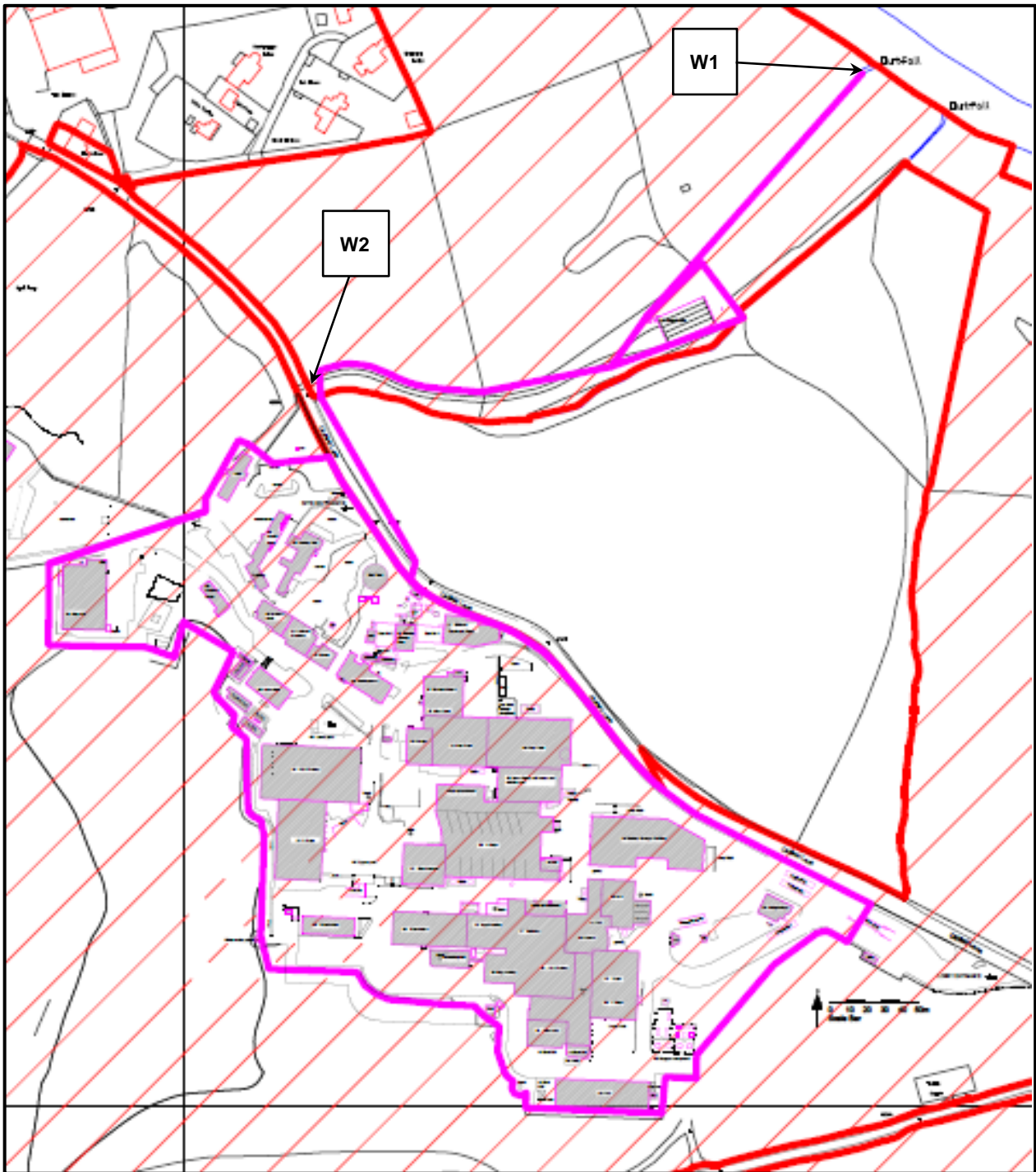
molybdenum and tantalum, as well as these materials in metallic form, as far as these are classified as hazardous substances

'stabilisation' means processes which change the hazardousness of the constituents in the waste and transform hazardous waste into non-hazardous waste

'solidification' means processes which only change the physical state of the waste by using additives without changing the chemical properties of the waste

'partly stabilised wastes' means wastes containing, after the stabilisation process, hazardous constituents which have not been changed completely into non-hazardous constituents and could be released into the environment in the short, middle or long term

Schedule 7 – Site plan



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