Environment Agency

Review of an Environmental Permit for an Installation subject to Chapter II of the Industrial Emissions Directive under the Environmental Permitting (England & Wales) Regulations 2016

Decision document recording our decision-making process following review of a permit

The Permit number is: EPR/BK6769IY
The Operator is: Thessco Limited
The Installation is: Royds Mills, Windsor Street, Sheffield, S4 7WB
This Variation Notice number is: EPR/BK6769IY/V003

What this document is about

Article 21(3) of the Industrial Emissions Directive (IED) requires the Environment Agency to review conditions in permits that it has issued and to ensure that the permit delivers compliance with relevant standards, within four years of the publication by the European Commission of updated decisions on BAT Conclusions.

We have reviewed the permit for this installation against the revised BAT Conclusions for the non-ferrous metals industries sector published on 30th June 2016 in the Official Journal of the European Union. Where appropriate, we also considered other relevant BAT Conclusions published prior to this date but not previously included in a permit review for the Installation. In this decision document, we set out the reasoning for the consolidated variation notice that we have issued.

It explains how we have reviewed and considered the techniques used by the Operator in the operation and control of the plant and activities of the installation. This review has been undertaken with reference to the decision made by the European Commission establishing best available techniques (BAT) conclusions (BATc) for the non-ferrous metals industries as detailed in the Official Journal of the European Union (L174) following a European Union, implementing decision (EU) 2016/1032 of 13th June 2016. It is our record of our decision-making process and shows how we have taken into account all relevant factors in reaching our position. It also provides a justification for the inclusion of any specific conditions in the permit that are in addition to those included in our generic permit template.

As well as considering the review of the operating techniques used by the Operator for the operation of the plant and activities of the installation, the consolidated variation notice takes into account and brings together in a single document all previous variations that relate to the original permit issue. Where this has not already been done, it also modernises the entire permit to reflect the conditions contained in our current generic permit template.

The introduction of new template conditions makes the Permit consistent with our current general approach and with other permits issued to installations in this sector. Although the wording of some conditions has changed, while others have been deleted because of the new regulatory approach, it does not reduce the level of environmental protection achieved by the Permit in any way. In this document we therefore address only our determination of substantive issues relating to the new BAT Conclusions and any changes to the operation of the installation.

We try to explain our decision as accurately, comprehensively and plainly as possible. Achieving all three objectives is not always easy, and we would welcome any feedback as to how we might improve our decision documents in future.

How this document is structured

1. Our proposed decision

2. How we reached our decision

3. The legal framework

4. Annex 1- Review of operating techniques within the Installation against BAT Conclusions

5. Annex 2a - Review and assessment of derogation request(s) made by the operator in relation to BAT Conclusions which include an Associated Emission Level (BAT-AEL) value

6. Annex 2b - Consultation responses

7. Annex 3 - Improvement Conditions

8. Annex 4 - Review and assessment of changes that are not part of the BAT Conclusions derived permit review

9. Annex 5 – Priority Compliance Issues & Detailed assessment of Regulation 60 Notice responses where future action likely

1 Our decision

We have decided to issue the Variation Notice to the Operator. This will allow it to continue to operate the Installation, subject to the conditions in the Consolidated Variation Notice that updates the whole permit.

We consider that, in reaching our decision, we have taken into account all relevant considerations and legal requirements and that the varied permit will ensure that a high level of protection is provided for the environment and human health.

The Consolidated Variation Notice contains many conditions taken from our standard Environmental Permit template including the relevant annexes. We developed these conditions in consultation with industry, having regard to the legal requirements of the Environmental Permitting Regulations and other relevant legislation. This document does not therefore include an explanation for these standard conditions. Where they are included in the Notice, we have considered the techniques identified by the operator for the operation of their installation, and have accepted that the details are sufficient and satisfactory to make those standard conditions appropriate. This document does, however, provide an explanation of our use of "tailor-made" or installation-specific conditions, or where our Permit template provides two or more options.

2 How we reached our decision

2.1 Requesting information to demonstrate compliance with BAT Conclusion techniques

We issued a Notice under regulation 60(1) of the Environmental Permitting (England and Wales) Regulations 2010 (a Regulation 60 Notice) on 16th December 2016 requiring the Operator to provide information to demonstrate where the operation of their installation currently meets, or how it will subsequently meet, the revised standards described in the relevant BAT Conclusions document.

The Notice required that where the revised standards are not currently met, the operator should provide information that

- Describes the techniques that will be implemented before 30th June 2020, which will then ensure that operations meet the revised standard, or
- justifies why standards will not be met by 30th June 2020, and confirmation of the date when the operation of those processes will cease within the installation or an explanation of why the revised BAT standard is not applicable to those processes, or

- justifies why an alternative technique will achieve the same level of environmental protection equivalent to the revised standard described in the BAT Conclusions.

Where the Operator proposed that they were not intending to meet a BAT standard that also included a BAT Associated Emission Level (BAT AEL) described in the BAT Conclusions Document, the Regulation 60 Notice required that the Operator make a formal request for derogation from compliance with that AEL (as provisioned by Article 15(4) of IED). In this circumstance, the Notice identified that any such request for derogation must be supported and justified by sufficient technical and commercial information that would enable us to determine acceptability of the derogation request.

An initial Regulation 60 Notice response was received from the Operator on 24/03/17, however this was subsequently reviewed and updated, resulting in a further submission which we received on 28/04/17.

We considered that this submission was in the correct form and contained sufficient information for us to begin our determination of the permit review but not that it necessarily contained all the information we would need to complete that determination.

The Operator made no claim for commercial confidentiality. We have not received any information in relation to the Regulation 60 Notice response that appears to be confidential in relation to any party.

2.2 Review of our own information in respect to the capability of the installation to meet revised standards included in the BAT Conclusions document

Based on our records and previous experience in the regulation of the installation we have no reason to consider that the operator will not be able to comply with the techniques and standards described in the BAT Conclusions.

2.3 Requests for Further Information during determination

Although we were able to consider the Regulation 60 Notice response generally satisfactory at receipt, we did in fact need more information in order to complete our permit review assessment, and issued a further information request in the form of an email on 10/05/18. A copy of the further information request was placed on our public register.

In addition to the responses to the above further information request, received on 17/05/18 and 18/05/18, we received additional information and/or clarification from the operator during the determination as follows:

- Response to our email dated 29/05/18, received 01/06/18, regarding the process description contained in the Introductory Note of the consolidated permit
- Response to our emails dated 29/05/18 and 30/05/18, received 30/05/18 and 31/05/18, regarding surface water run-off
- Response to our email dated 29/05/18, received 31/05/18, regarding the use of industrial solvents
- Response to our email dated 30/05/18, received 30/05/18, regarding discharges of cooling water to foul sewer
- Response to our email dated 01/06/18, received 05/06/18, regarding the requirement for an updated emissions point plan
- Response to our email dated 06/06/18, received 06/06/18, regarding the processing of spent refractory materials received on site as waste.

We made a copy of this information available to the public in the same way as the response(s) to our information request(s).

2.4 Surface Water Pollution Risk Assessment

As part of our delivery of the Water Framework Directive (WFD) requirements, we need to identify and assess the impact of all sources of hazardous pollutants to surface waters from regulated industry. We use the term 'hazardous pollutants' to collectively describe substances covered by the EQSD[1] (priority hazardous substances, priority substances and "other pollutants"). It also applies to the specific pollutants listed in the 2015 Directions[2], and substances which have operational (non-statutory) Environmental Quality Standards (EQS).

For all installations with discharges to surface water and/or sewer we required the operator, via our Regulation 60 Notice, to undertake a surface water pollution risk assessment, in two stages, as follows:

a) Provide emissions data for the following hazardous pollutants: silver, arsenic, cadmium, cobalt, chromium (total), chromium (VI), copper, mercury, nickel, lead and zinc. The BAT Conclusions for the Non-Ferrous Metals Industries specify BAT-AELs associated with the direct discharge of these substances to surface water. We therefore considered that these substances potentially posed the highest risk from industry and listed them in our Regulation 60 Notice. In addition, operators were required to identify and assess any other hazardous pollutants that may be present in their effluent. A full list of hazardous pollutants is included in our surface water pollution risk assessment guidance, which we 'signposted' operators to via the Regulation 60 Notice.

[1] Environmental Quality Standards Directive (EQSD) (2008/105/EC, as amended by 2013/39/EU)
[2] The Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015

b) Undertake a risk assessment using the above emissions data to determine whether any hazardous pollutants were liable to cause pollution of the downstream receiving waters. The WFD requires Member States to prior regulate, all substances in a discharge which are “liable to cause pollution”. Previously discharges from the Non-Ferrous Metals Industries were controlled on a “liable to contain” approach set by the Dangerous Substances Directive through either numeric limits, or descriptive conditions. Under the “liable to cause pollution” approach we would only consider applying numeric emission limits to those pollutants calculated to have the potential to cause pollution.

The risk assessment methodology uses a number of sequential screening steps to determine if a substance warrants detailed modelling and hence any emission limits being required, namely:

- Screen out insignificant emissions that do not warrant further investigation;
- Determine if significant load test is failed (for priority hazardous substances only);
- Decide if detailed modelling is needed;
- Assess emissions against relevant standards and set permit limits where considered necessary.

The methodology provides for undertaking assessments of both direct and indirect discharges to surface water, ‘indirect’ meaning that the effluent is discharged to foul sewer from the installation and is treated at a sewage treatment works (STW) prior to discharge to surface water. Treatment at the STW will remove a proportion of a discharged substance from the final effluent discharged to the environment. This removal needs to be taken into account when calculating the concentration of a hazardous pollutant which will be discharged to a receiving water via the sewage works. This is achieved by applying STRFs (sewage treatment reduction factors) within the screening steps.

Our intention was to use the non-ferrous metals permit review to regulate any discharge of hazardous pollutants to surface waters from this installation using the “liable to cause pollution” approach. However the operator did not provide a response to questions 5 and 6 on our Regulation 60 Notice. Nevertheless we have been able to review this aspect of their operations with reference to routine compliance monitoring returns for discharges to sewer and information obtained in response to email requests mentioned above. We describe the outcome of this review in Annex 4.

2.5 Condition of Soil and Groundwater

Articles 16 and 22 of the Industrial Emissions Directive (IED) require that a quantified baseline is established for the level of contamination of soil and groundwater with hazardous substances, in order that a comparison can be made on final cessation of activities.

We have used the non-ferrous metals permit review to regulate against the above IED requirements. Our Regulation 60 Notice required operators, where the activity of the installation involved the use, production or release of a relevant hazardous substance (as defined in Article 3(18) of the Industrial Emissions Directive), to carry out a risk assessment considering the possibility of soil and groundwater contamination at the installation with such substances. Where any risk of such contamination was established we requested that the operator either:

- prepare and submit a baseline report containing information necessary to determine the current state of soil and groundwater contamination; or

- provide a summary report referring to information previously submitted where they were satisfied that such information represented the current state of soil and groundwater contamination

so as to enable a quantified comparison to be made with the state of soil and groundwater contamination upon definitive cessation the activity.

Where operators concluded that there were no risks of soil or groundwater contamination (due to there not being any release of hazardous substances), they were required to provide a copy of the risk assessment.

Based on information obtained in response to our Regulation 60 Notice the operator has confirmed that they consider their original site condition report prepared in March 2002 (Report ref. 73.1410.01) to remain current in relation to the processes carried out on site. No further action is required.

3 The legal framework

The Consolidated Variation Notice will be issued under Regulations 18 and 20 of the EPR The Environmental Permitting regime is a legal vehicle which delivers most of the relevant legal requirements for activities falling within its scope. In particular, the regulated facility is:

- an *installation* as described by the IED;
- subject to aspects of other relevant legislation which also have to be addressed.

We consider that in issuing the Consolidated Variation Notice, it will ensure that the operation of the Installation complies with all relevant legal requirements and that a high level of protection will be delivered for the environment and human health.

We explain how we have addressed specific statutory requirements more fully in the rest of this document.

We have set emission limit values (ELV's) in line with the BAT Conclusions, unless a tighter, i.e. more stringent, limit was previously imposed and these limits have been carried forward. For emissions to each relevant environmental receptor (i.e. air, or surface water), the emission limits and monitoring requirements have been incorporated into the Consolidated Variation Notice via two tables in Schedule 3 – Emissions and monitoring, as follows:

Emissions to air

- Table S3.1a, the requirements of which are effective from the date of issue of the notice, and which contains the existing ELVs and monitoring requirements; and

- Table S3.1b, the requirements of which will take effect from 30th June 2020, and which contains amended ELV's where a BAT-AEL is specified in the BAT Conclusions, and any associated updated monitoring requirements.

Annex 1

Review of operating techniques within the Installation against BAT Conclusions

BAT Conclusions for the non-ferrous metals industries, were published by the European Commission on 30th June 2016. There are 184 BAT Conclusions. Table 1 of this annex provides a record of decisions made in relation to each relevant BAT Conclusion applicable to the installation.

This annex should be read in conjunction with the Consolidated Variation Notice.

The overall status of compliance with the BAT conclusion is indicated in the table as:

NA Not Applicable
CC Currently Compliant
FC Compliant in the future (within 4 years of publication of BAT conclusions)
NC Not Compliant

Table 1: Decision checklist for relevant BAT Conclusions		
Summary of BAT Conclusion requirement for Non-Ferrous Metals Industries	**Status** **NA / CC / FC / NC**	**Assessment of the installation capability to demonstrate compliance with the BAT Conclusion requirement** **Type of process: (1) PRECIOUS METALS PRODUCTION** **(2) CADMIUM PRODUCTION** **(3) COPPER PRODUCTION**
BAT Conclusions that are not applicable to this installation	**NA**	**General BAT Conclusions for Non-Ferrous Metals Industries:** 11-13, 15, 16, 17 **BAT Conclusions for copper production:** 20-25, 27-34, 36-44, 46-53 **BAT Conclusions for cadmium production:** 133 **BAT Conclusions for precious metals production:** 134, 136, 138, 142-146
BAT Conclusions where we accept the operator's Reg 60 notice response that they are currently compliant and no further explanation is required.	**CC**	**General BAT Conclusions for Non-Ferrous Metals Industries**: 1-10, 14, 18, 19 **BAT Conclusions for copper production:** 26, 35, 45, 54 **BAT Conclusions for cadmium production:** 131, 132 **BAT Conclusions for precious metals production:** 135, 137, 139-141, 147-149
BAT Conclusions where improvements will be undertaken on site within the 4 year period in order to achieve compliance with the narrative and/or BATAEL prior to the 4 year deadline	**FC**	None

Table 1: Decision checklist for relevant BAT Conclusions		
Summary of BAT Conclusion requirement for Non-Ferrous Metals Industries	**Status** **NA / CC / FC / NC**	**Assessment of the installation capability to demonstrate compliance with the BAT Conclusion requirement** **Type of process: (1) PRECIOUS METALS PRODUCTION** **(2) CADMIUM PRODUCTION** **(3) COPPER PRODUCTION**
BAT Conclusions where the Operator has responded that they are not compliant and have not submitted any plans to become compliant	**NC**	None

Key Issues

Where relevant and appropriate, we have incorporated the techniques described by the Operator in their Regulation 60 Notice response and subsequent emails (as detailed above) as specific operating techniques required by the permit, through their inclusion in Table S1.2 of the Consolidated Variation Notice.

Scope of BAT Conclusions

While the principal aim of the operator is the production of precious metals for the manufacture of silver and silver alloy based products, they do also manufacture cadmium, and copper, based alloys. Therefore for the purposes of this review we have considered the activities of the installation against relevant BAT from the copper, cadmium and precious metals sections of the NFM BAT Conclusions (BAT 20-54, BAT 131-133, and BAT 134-149 respectively), in addition to the general requirements set out in BAT 1-19.

Consideration of Section 4.2 activities

The operation of the installation comprises activities that are permitted under both Sections 2.2 and 4.2 of Schedule 1 of the Environmental Permitting Regulations 2016 (EPR), which relate to the non-ferrous metals (NFM) sector and the inorganic chemicals sector respectively. The Section 4.2 activities principally concern the hydrometallurgical refining of silver, an operation which is likely to result in emissions to air of oxides of nitrogen. Although permitted as Section 4.2 activities the processes are closely described in the NFM BREF and BAT Conclusions, however due to the way in which EPR is implemented, these activities do not fall under the non-ferrous metals section of EPR.

The driver for reviewing this permit is the publication of the NFM BAT Conclusions in June 2016 because it was considered that the Section 2.2 activity undertaken in the Melting Shop was the main activity of the Installation. Under the Industrial Emissions Directive (IED) our obligation is to review a permit within 4 years of the BAT Conclusions being produced for the main activity of an installation, taking into account all new or updated BAT Conclusions applicable to the installation (IED, article 21(3)). While this is clearly a reference to activities explicitly covered by the BAT Conclusions, we also consider that this brings within scope of the BAT Conclusions any other parts of the installation that we consider appropriate whether part of the main activity or not. In this case, due to widespread use of hydrometallurgical activities within precious metals production, and due to the fact that BAT for these activities is set out in the NFM BAT Conclusions, we have taken the decision to review the Section 4.2 activities and apply BAT as set out in the NFM BAT Conclusions. We consider that the NFM BREF is the most appropriate BREF for the installation.

BAT-AELs and monitoring requirements

BAT-AEL for dust (particulate matter)

Several of the relevant BAT-Conclusions specify a BAT-AEL for dust, as follows

- BAT 45 (copper production), BAT-AEL range is 2-5 mg/m^3
- BAT 132 (cadmium production), BAT-AEL range is 2-3 mg/m^3
- BAT 140 (precious metals production), BAT-AEL range is 2-5 mg/m^3

BAT 45 applies to emission point A1 only (Melting Shop)
BAT 132 applies to emission points A1 and A2 (Atomising Department)
BAT 140 applies to emission points A1 and A2

Emission point A1
Given that more than one BAT-AEL applies to emission point A1, due to the layout of the extraction system in the Melting Shop, i.e the use of common ductwork leading to a bag filter plant with a single stack, we have applied the more stringent BAT-AEL of 3 mg/m^3 on the permit, rather than 5 mg/m^3.

We have included an ELV for dust of 3 mg/m^3 which is in accordance with the upper BAT-AEL value in BAT 132. This replaces the current ELV for Melting Shop processes of 10 mg/m^3 and will apply from 30/06/20. Therefore the ELV for emission point A1 has been updated within the permit.

In terms of monitoring frequency, the current permit requires the operator to undertake both continuous monitoring and quarterly periodic monitoring (amended to 'annually' under a 'minor operational change'). They currently use a CEM on emission point A1 to ensure effective process control and report the results of spot sampling to the Environment Agency. We are satisfied that from 30/06/20 the monitoring frequency should be 'once per year' in accordance with the requirements of BAT 132.

Emission point A2
Given that more than one BAT-AEL applies to emission point A2, due to the layout of the extraction system in the Atomising Department, i.e the use of common ductwork leading to a bag filter plant with a single stack, we have applied the more stringent BAT-AEL of 3 mg/m^3 on the permit, rather than 5 mg/m^3.

We have included an ELV for dust of 3 mg/m^3 which is in accordance with the upper BAT-AEL value in BAT 132. This replaces the current ELV for Atomising Department processes of 10 mg/m^3 and will apply from 30/06/20. Therefore the ELV for emission point A2 has been updated within the permit.

In terms of monitoring frequency, the current permit requires the operator to undertake quarterly periodic monitoring (amended to 'annually' under a 'minor operational change'). We are satisfied that from 30/06/20 the monitoring

frequency should be ‘once per year’ in accordance with the requirements of BAT 132.

BAT-AEL for cadmium

BAT 132 specifies a BAT-AEL for cadmium of 0.1 mg/m^3. This BAT-AEL applies to emission points A1 and A2. The current permit already has an ELV for cadmium of 0.1 mg/m^3 on these emission points. We have therefore retained the current ELV for cadmium as this is already in accordance with the BAT-AEL. The ELV will continue to be applied to emission points A1 and A2.

In terms of monitoring frequency, the current permit requires the operator to undertake quarterly periodic monitoring (amended to ‘annually’ under a ‘minor operational change’) at emission points A1 and A2. We are satisfied that from 30/06/20 the monitoring frequency should be ‘once per year’ in accordance with the requirements of BAT 132.

BAT-AEL for oxides of nitrogen (NOx)

BAT 141 relates to hydrometallurgical operations and specifies a BAT-AEL for NOx, giving a range of 70-150 mg/m^3. This BAT-AEL applies to emission point A3 from the Refinery. The current permit does not contain an ELV for NOx at this emission point. We have therefore included an ELV for NOx of 150mg/m^3 which is in accordance with the upper BAT-AEL value. This ELV will apply from 30/06/20.

In terms of monitoring frequency, the current permit requires the operator to undertake quarterly periodic monitoring of NOx emissions from emission point A3. We are satisfied that from 30/06/20 the monitoring frequency should be ‘once per year.’

BAT 141 states that monitoring frequency could be either continuous (as an hourly average), or periodic (as an ‘average over the sampling period’). We are satisfied that periodic monitoring remains appropriate due to (a) the intermittent usage of the dissolving kettles in the Refinery and (b) the batch nature of the process itself, which takes approximately 24 hours.

Monitoring frequency of NOx emissions to air

BAT 10 of the NFM BAT Conclusions sets out the minimum monitoring requirements for the NFM sector, stating that BAT is to monitor stack emissions to air with at least the frequency given and in accordance with EN standards. Furthermore, it says that if EN standards are not available, BAT is to use ISO, national or other international standards that ensure the provision of data of an equivalent scientific quality.

For emissions of NOx from emission point A3, in relation to the Refinery scrubber, BAT 10 states that the minimum monitoring frequency should be

‘once per year’. Under the current permit the operator is required to monitor NOx emissions from this emission point on a quarterly basis.

The frequency of monitoring is typically dictated by the level of environmental risk posed by the parameter under investigation. For example, continuous monitoring is typically used for controlling higher environmental risks, when the feedback from such monitoring is required for process control, and where the absence of such monitoring could result in a lack of sufficient control and significant impacts; or when periodic monitoring does not give sufficiently representative results. On the other hand emissions with lower environmental risk would typically be subject to periodic monitoring only.

TBC

We have been unable to fully consider the implications for the operator as part of this review and will require the operator to provide further information to enable us to determine with respect to monitoring frequency, what is BAT for the site, and therefore to agree the appropriate NOx monitoring provision to be applied at the site from 30 June 2020. Our pragmatic approach to the monitoring aspects of the permit review is therefore:

1. To ensure that the existing permit has been updated to reflect current monitoring standards, in accordance with our M2 monitoring guidance. These standards are contained within Table S3.1a.

2. The inclusion of an Improvement Condition (IC1) in the permit requiring that the operator provides evidence to justify the frequency of periodic monitoring to be employed. That evidence will allow us to facilitate agreement of the appropriate monitoring provision that will apply from 30 June 2020 onwards.

3. To carry over the existing periodic monitoring requirements in Table S3.1b pending completion of IC1, which must be submitted to the Environment Agency within 12 months of the date of issue of this variation.

Update of emission points for discharges to air and sewer

An updated emission point plan has been submitted by the operator and is referred to in the varied permit.

They have confirmed that the following emission points to air are no longer in use and can be removed from the permit:

- A5 (Mann furnace)
- A6 (British furnace)
- A7 Birlec belt furnaces (Sheet & Wire Mill)
- A9 Sheet & Wire Mill rolling/drawing degreasing tank

- A11 Sheet & Wire Mill flux coating mixers
- A12 Clairpol abrasive wheel cleaner (Sheet & Wire Mill)

Tables S3.1a and S3.1b of the varied has been amended accordingly.

They have also confirmed that the following emission points to sewer are no longer in use and can be removed from the permit:

- S4B(I) CETP excess water
- S8(H) Process cooling water

Table S3.2 of the varied has been amended accordingly.

Confirmation of incoming wastes and EWC codes

During the course of this review and following our visit to the installation on 27/04/18 it is evident that the operator accepts waste onto site.

Spent refractory materials arising on-site are initially sent off-site for crushing and separation by a third party and are then accepted back onto the installation as waste, in the form of ‘fines’ and ‘metallics’. The metallics still contain some refractory materials and the fines contain some metallic constituents. The ‘metallics’ are processed on-site within the Refinery to reclaim the remaining silver content, while the ‘fines’ are only temporarily stored before being sent off-site again for further treatment.

We have established that the waste materials (fines and metallics) accepted onto the installation fall under the following EWC code(s):

- 10 06 02, dross and skimmings from primary and secondary production; and
- TBC

We have included a waste table (Table S2.2) within the varied permit which includes these waste codes.

Annex 2a

Assessment, determination and decision where an application(s) for Derogation from BAT Conclusions with associated emission levels (AEL) has been requested.

The IED enables a competent authority to allow derogations from BAT AELs stated in BAT Conclusions under specific circumstances as detailed under Article 15(4):

‘By way of derogation from paragraph 3, and without prejudice to Article 18, the competent authority may, in specific cases, set less strict emission limit values. Such a derogation may apply only where an assessment shows that the achievement of emission levels associated with the best available techniques as described in BAT Conclusions would lead to disproportionately higher costs compared to the environmental benefits due to:

(a) the geographical location or the local environmental conditions of the installation concerned; or

(b) the technical characteristics of the installation concerned.

The competent authority shall document in an annex to the permit conditions the reasons for the application of the first subparagraph including the result of the assessment and the justification for the conditions imposed. ‘

A summary of any derogation granted is also recorded in an Annex of the Consolidated Variation Notice in accordance with the requirement of IED Article 15(4) as described above.

The Operator did not request derogation from compliance with any AEL included within the BAT Conclusions as part of their Regulation 60 Notice response.

Annex 2b

Advertising and Consultation on the draft decision

This section is not applicable as no derogations from BAT-AEL's have been considered, nor is the installation a site of high public interest.

Annex 3

Improvement Conditions

This section is not applicable because all existing improvement conditions in the permit have been completed, an no new improvement conditions have been added as a result of the permit review against the BAT Conclusions.

Annex 4

Review and assessment of changes that are not part of the BAT Conclusions derived permit review.

Surface Water Pollution Risk Assessment

In response to our Regulation 60 Notice the operator has confirmed that they do not discharge site run-off to surface watercourses. All their uncontaminated site run-off is discharged to sewer.

The only other discharge to sewer is limited to periodic releases when their cooling towers are drained down every six months as part of their Legionella Management Plan (required by HSE for legionella control). Consequently the operator holds two Trade Effluent Consents from the sewerage undertaker, Yorkshire Water.

Four cooling towers are in use at the installation, serving the following areas:

- Melting Shop
- Factory 2
- Coinage Mill
- Sheet & Wire Mill plus Atomising Department

The current environmental permit includes the requirement to monitor the drain-down water prior to release to sewer for the following hazardous pollutants: cadmium, silver, copper, zinc, nickel, chromium, lead and tin. The permit contains ELVs for these substances, as well as for pH. The operator is also required to report concentrations of suspended solids and COD (Chemical Oxygen Demand). Regular compliance monitoring returns indicate that a total of 113m^3 of water has been discharged to sewer in the last 3 years (twice yearly release). The monitoring data reported shows that the operator has been compliant with permit ELVs, reporting figures below the Limit of Detection (LoD) for all substances.

We have considered whether it is appropriate to continue with this permit requirement to monitor and report on these small (generally <20m^3 each time) bi-annual discharges, a requirement which has been in place since 2005. Given the very low levels of metals that are consistently being reported, and the nature of, and the dilution afforded by the downstream sewerage network, we consider that the risk to water quality is low and does not warrant continued monitoring. We have therefore taken a risk-based decision to remove all ELVs and monitoring requirements for the discharge to sewer from the permit.

We consider that no further action is necessary.

Annex 5

Priority Compliance Issues & detailed assessment of Regulation 60 Notice responses where future action likely

BATc Number	Compliance Issue Priority BAT indicated in **Bold Text**	Relevant permit condition	Compliance stated by Operator NA / CC / FC / NC	Compliance assessment conclusion NA / CC / FC / NC	Summary of Permitting Officer assessment against BATc techniques	Compliance Action to implement BATc
	BAT 1-19: General requirements					
1	In order to improve the overall environmental performance, BAT is to implement and adhere to an environmental management system (EMS) that incorporates all of the features given	1.1	CC	CC	The operator has confirmed in their response that they are currently compliant with BAT 1. The operator states that they currently operate an EMS based on IPPC Permit Requirements as part of site Integrated Management System; requiring that meetings are held every 6 weeks involving senior management where all environmental management issues are considered and actions detailed where necessary. They further state that following transition of ISO9001 to 2015 specification they have committed to become compliant with ISO14001 by September 2019. They say that the auditor (BSI) has issued them with a Registered Letter of Intent regarding ISO14001 approval due to the work they	Confirm future compliance by Inspection.

BATc Number	Compliance Issue Priority BAT indicated in **Bold Text**	Relevant permit condition	Compliance stated by Operator NA / CC / FC / NC	Compliance assessment conclusion NA / CC / FC / NC	Summary of Permitting Officer assessment against BATc techniques	Compliance Action to implement BATc
					have completed so far. They therefore consider themselves to have an EMS which incorporates BAT1 techniques (a-i) and that their work in achieving ISO14001 will only enhance their compliance with this BAT. We are satisfied that the operator has re-established focus on their EMS; are working towards ISO14001 accreditation, and meet the requirements of this BAT Conclusion.	
2	In order to use energy efficiently, BAT is to use a combination of the techniques given	1.2	CC	CC	The operator has confirmed in their response that they are currently compliant with BAT 2. With respect to their melting and refining operations the operator has emphasised that it really is a batch based operation and the runs of regular alloys are limited, which in turn limits the effectiveness of many of their energy recovery systems. Nevertheless they confirm that a site energy management system monitored by an external company (Pro Enviro) is used to	None

BATc Number	Compliance Issue Priority BAT indicated in **Bold Text**	Relevant permit condition	Compliance stated by Operator NA / CC / FC / NC	Compliance assessment conclusion NA / CC / FC / NC	Summary of Permitting Officer assessment against BATc techniques	Compliance Action to implement BATc
					track gas, electricity and water usage, with periodic reports created in accordance with an Environmental Emissions Monitoring System (EEMS). (BAT 2a) In addition, they report that the following specific actions are carried out: • the upgrading of motors to high efficiency variable drives for electrical systems on rolling mills and other heavy usage equipment. (BAT 2n) • Dry concentrates and wet raw materials at low temperatures (BAT 2i) • Suitable insulation for high temperature equipment such as steam and hot water pipes (BAT 2l) The Environment Agency is satisfied that the operator meets the requirements of this BAT Conclusion.	

BATc Number	Compliance Issue Priority BAT indicated in **Bold Text**	Relevant permit condition	Compliance stated by Operator **NA / CC / FC / NC**	Compliance assessment conclusion **NA / CC / FC / NC**	Summary of Permitting Officer assessment against BATc techniques	Compliance Action to implement BATc
3	In order to improve overall environmental performance, BAT is to ensure stable process operation by using a process control system together with a combination of the techniques given	1.1	CC	CC	The operator has confirmed in their response that they are currently compliant with BAT 3. The operator states that they utilise a Site Integrated Management System to manage production processes. The Company operates under ISO9001:2015 certification which requires continual feedback to continually improve production processes. They state that all production processes, e.g. melting, rolling, wire drawing, etc, have detailed written process instructions. With respect to melting this would include the manner in which the metals are added to the melting unit, the maximum melting temperature, the maximum hold time at temperature and a recommended pouring time. Similarly for rolling or wire drawing the recommended reduction sequences are detailed. All metal inputs into the melting system are weighed, melting temperatures set and monitored using calibrated equipment and analysis of the molten alloy prior to casting by XRF reduces re-melts.	None

BATc Number	Compliance Issue Priority BAT indicated in **Bold Text**	Relevant permit condition	Compliance stated by Operator NA / CC / FC / NC	Compliance assessment conclusion NA / CC / FC / NC	Summary of Permitting Officer assessment against BATc techniques	Compliance Action to implement BATc
					They consider that as part of the IMS they utilise the following techniques: • Inspect and select input materials according to the process and the abatement techniques applied (BAT 3a) • Good mixing of the feed materials to achieve optimum conversion efficiency and reduce emissions and rejects (BAT 3b) • Feed weighing and metering systems (BAT 3c) • Monitor the critical process parameters of the air emission abatement plant such as gas temperature, reagent metering, pressure drop, ESP current and voltage, scrubbing liquid flow and pH and gaseous components (e.g. O_2 , CO, VOC), (BAT 3f) • Temperature monitoring and control at melting and smelting furnaces to prevent the generation of metal and metal oxide fumes through overheating (BAT 3j)	

BATc Number	Compliance Issue Priority BAT indicated in **Bold Text**	Relevant permit condition	Compliance stated by Operator NA / CC / FC / NC	Compliance assessment conclusion NA / CC / FC / NC	Summary of Permitting Officer assessment against BATc techniques	Compliance Action to implement BATc
					The Environment Agency is satisfied that the operator meets the requirements of this BAT Conclusion.	
4	In order to reduce channelled dust and metal emissions to air, BAT is to apply a maintenance management system which especially addresses the performance of dust abatement systems as part of the environmental management system (see BAT 1)	3.1	CC	CC	The operator has confirmed in their response that they are currently compliant with BAT 4. They state that regular inspection of dust abatement plant is undertaken, via both external Allianz Engineering inspection and their own internal maintenance schedule. They state that these regular inspections are part of their EMS system. The Environment Agency is satisfied that the operator meets the requirements of this BAT Conclusion.	None
5	In order to prevent or, where this is not practicable, to reduce diffuse emissions to air and water, BAT is to collect diffuse emissions as much as possible nearest to the source and treat them	3.2	CC	CC	The operator has confirmed in their response that they are currently compliant with BAT 5. Diffuse emissions to air are by and large minimised through the use of extraction	None

BATc Number	Compliance Issue Priority BAT indicated in **Bold Text**	Relevant permit condition	Compliance stated by Operator NA / CC / FC / NC	Compliance assessment conclusion NA / CC / FC / NC	Summary of Permitting Officer assessment against BATc techniques	Compliance Action to implement BATc
					systems. From our site visit undertaken on 27/04/18 it was clear that LEVs / extraction hoods were fitted above melting pots / furnaces in the Melting Shop. These are connected to a bag filter system which discharges via emission point A1. Dissolving kettles and other powder processing equipment in the Refinery have extraction hoods connected to a wet scrubber, discharging via emission point A2. Melting furnaces in the Atomising Shop have LEVs / extraction hoods connected to bag filter, discharging via emission point A3. The potential for metal fume being generated is also minimised through careful control of melt temperatures and by the fact that the raw materials generally comprise of clean copper, zinc, silver and cadmium.	

BATc Number	Compliance Issue Priority BAT indicated in **Bold Text**	Relevant permit condition	Compliance stated by Operator NA / CC / FC / NC	Compliance assessment conclusion NA / CC / FC / NC	Summary of Permitting Officer assessment against BATc techniques	Compliance Action to implement BATc
					Any finer materials, e.g. silver powders, filter bag dusts, metallics, are stored and transported in sealed containers / drums. Liquid raw materials, fuels process chemicals and wastes are stored in appropriately bunded tanks, and/or on drip trays. All surface run-off from within the installation boundary discharges to foul sewer. Thessco's visitor car park (outside the Installation boundary) discharges via interceptor to the River Don. The Environment Agency is satisfied that the operator meets the requirements of this BAT Conclusion.	
6	In order to prevent or, where this is not practicable, to reduce diffuse dust emissions to air, BAT is to set up and implement an action plan on diffuse dust emissions, as part of the environmental management system (see BAT 1), that incorporates both of the following measures:	3.2	CC	CC	The operator has confirmed in their response that they are currently compliant with BAT 6. They state that all production processes which may generate diffuse dusts are carried out under extraction systems. These systems are monitored to ensure operational efficiency, are routinely	None

BATc Number	Compliance Issue Priority BAT indicated in **Bold Text**	Relevant permit condition	Compliance stated by Operator NA / CC / FC / NC	Compliance assessment conclusion NA / CC / FC / NC	Summary of Permitting Officer assessment against BATc techniques	Compliance Action to implement BATc
	(a) identify the most relevant diffuse dust emission sources (using e.g. EN 15445); (b) define and implement appropriate actions and techniques to prevent or reduce diffuse emissions over a given time frame.				inspected as part of the EMS and in addition melting processes are monitored to reduce metal fume through internal checks and PCME monitoring. The Environment Agency is satisfied that risks associated with diffuse dusts are low and that appropriate measures are in place to control any such emissions. The current procedures will be formalised as part of the operator's updated EMS under ISO14001.	
7	In order to prevent diffuse emissions from the storage of raw materials, BAT is to use a combination of the techniques given	3.2	CC	CC	The operator has confirmed in their response that they are currently compliant with BAT 7. They state that raw materials are generally not dusts or powders, with a few minor exceptions, so do not generate in themselves diffuse emissions. They say that all metals are stored in separate labelled bins to prevent any metal loss. From our site visit it was clear that generally there are no loose or dusty raw materials, with the exception of (a) cadmium	None

BATc Number	Compliance Issue Priority BAT indicated in **Bold Text**	Relevant permit condition	Compliance stated by Operator NA / CC / FC / NC	Compliance assessment conclusion NA / CC / FC / NC	Summary of Permitting Officer assessment against BATc techniques	Compliance Action to implement BATc
					containing filter bag dust from the Atomising Department which is stored and transported in sealed containers back to the Refinery for metal recovery; (b) silver powder from the Refinery which is re-used within the alloy production process, and which is stored in sealed containers; and (c) metallics which are received back into the installation as waste in order to reclaim silver in the Refinery, which is stored in sealed drums. Raw materials used in the Melting Shop are typically metals in solid form (silver, copper, zinc and cadmium). Raw materials used in the Refinery are typically solid internal scraps / off-cuts / floor sweepings, and metallic. Raw materials used in the Atomising Shop are solid metals. No liquid or gaseous raw materials are used across the site (apart from potable	

BATc Number	Compliance Issue Priority BAT indicated in **Bold Text**	Relevant permit condition	Compliance stated by Operator NA / CC / FC / NC	Compliance assessment conclusion NA / CC / FC / NC	Summary of Permitting Officer assessment against BATc techniques	Compliance Action to implement BATc
					water in the Atomising Shop, degreasing solvents and pickling agents). Liquid raw materials and/or wastes are stored in bunded tanks and/or containers. We consider that BAT 7 techniques (a), (h) and (k) are used. The Environment Agency is satisfied that the operator meets the requirements of this BAT Conclusion.	
8	In order to prevent diffuse emissions from the handling and transport of raw materials, BAT is to use a combination of the techniques given	3.2	CC	CC	The operator has confirmed in their response that they are currently compliant with BAT 8. They state that that powder products are sieved in enclosed units and dust fines are gathered by extraction systems. All powders / metallic are transported in sealed containers / drums. All other raw materials (e.g. silver, copper, zinc and cadmium) are in solid, non-volatile form.	None

BATc Number	Compliance Issue Priority BAT indicated in **Bold Text**	Relevant permit condition	Compliance stated by Operator NA / CC / FC / NC	Compliance assessment conclusion NA / CC / FC / NC	Summary of Permitting Officer assessment against BATc techniques	Compliance Action to implement BATc
					From site visit we consider that techniques (c) and (d) are used to handle filter bag dusts, silver powders, and metallics. The Environment Agency is satisfied that the operator meets the requirements of this BAT Conclusion.	
9	In order to prevent or, where this is not practicable, to reduce diffuse emissions from metal production, BAT is to optimise the efficiency of off-gas collection and treatment by using a combination of the techniques given	3.2	CC	CC	The operator has confirmed in their response that they are currently compliant with BAT 9. They state that the extraction system has been specifically designed for their melting area and where there are 'holding' and 'pouring' melting units, both are hooded to prevent diffuse dust emissions. They consider that BAT 9 techniques (c) and (e) are those considered applicable for BAT: • BAT 9(c) - use a secondary hood for furnace operations such as charging and tapping • BAT 9(e) - optimise the design and operation of hooding and ductwork to capture fumes arising from the	None

BATc Number	Compliance Issue Priority BAT indicated in **Bold Text**	Relevant permit condition	Compliance stated by Operator NA / CC / FC / NC	Compliance assessment conclusion NA / CC / FC / NC	Summary of Permitting Officer assessment against BATc techniques	Compliance Action to implement BATc
					feed port and from hot metal, matte or slag tapping and transfers in covered launders The high value and overall cleanliness of the internally generated scrap feedstocks and bought-in raw materials also means that there is little (if any) organic contamination to generate diffuse emissions. The Environment Agency is satisfied that the operator meets the requirements of this BAT Conclusion.	
10	BAT is to monitor the stack emissions to air with at least the given frequency and in accordance with EN standards. If EN standards are not available, BAT is to use ISO, national or other international standards that ensure the provision of data of an equivalent scientific quality	3.1 3.5	CC	CC	The operator has confirmed in their response that they are currently compliant with BAT 10. They state that they have extraction plant with CEMS installed and that they undertake annual checks of metal emissions. Their current permit requires them to monitor emissions to air of both particulates and cadmium from the melting shop (emission point A1) and the water	None

BATc Number	Compliance Issue Priority BAT indicated in **Bold Text**	Relevant permit condition	Compliance stated by Operator **NA / CC / FC / NC**	Compliance assessment conclusion **NA / CC / FC / NC**	Summary of Permitting Officer assessment against BATc techniques	Compliance Action to implement BATc
					atomising extraction system (A2) and emissions of NOx from the refinery scrubber unit (A3). They use the CEM for effective process control and take spot samples annually for dust and cadmium and quarterly for NOx. This is already consistent with (or exceeds) the monitoring requirements set out in the BAT Conclusions. The Environment Agency is satisfied that the operator meets the requirements of this BAT Conclusion.	
11	In order to reduce mercury emissions to air (other than those that are routed to the sulphuric acid plant) from a pyrometallurgical process, BAT is to use one or both of the techniques given. BAT-AEL for Hg	NA	NA	NA	The Environment Agency has determined that this BAT Conclusion and BAT-AEL are not applicable to this installation. This is because they relate to pyrometallurgical processes, which are typically only undertaken during primary metal production, and therefore are not applicable to the production of precious metals as undertaken at this site.	None

BATc Number	Compliance Issue Priority BAT indicated in **Bold Text**	Relevant permit condition	Compliance stated by Operator NA / CC / FC / NC	Compliance assessment conclusion NA / CC / FC / NC	Summary of Permitting Officer assessment against BATc techniques	Compliance Action to implement BATc
					Furthermore the operator considers that BAT 11 does not apply to their installation, having confirmed that mercury is not present in any of their alloys or raw material sources.	
12	In order to reduce emissions of SO_2 from off-gases with a high SO_2 content and to avoid the generation of waste from the flue-gas cleaning system, BAT is to recover sulphur by producing sulphuric acid or liquid SO_2	NA	NA	NA	This BAT Conclusion is not applicable to plants producing precious metals, as confirmed by the applicability section within BAT 12. Furthermore, the operator considers that BAT 12 does not apply to their installation, having confirmed that their raw materials consist of the pure elements and that their internally generated scrap is also 'clean' in that it contains no sulphides, or other chemical compounds.	None
13	In order to prevent NOx emissions to air from a pyrometallurgical process, BAT is to use one of the techniques given	NA	NA	NA	The Environment Agency has determined that this BAT Conclusion is not applicable to this installation. This is because it relates to pyrometallurgical processes, which are typically only undertaken during primary metal production, and therefore are not applicable to the production of precious metals as undertaken at this site.	None

BATc Number	Compliance Issue Priority BAT indicated in **Bold Text**	Relevant permit condition	Compliance stated by Operator NA / CC / FC / NC	Compliance assessment conclusion NA / CC / FC / NC	Summary of Permitting Officer assessment against BATc techniques	Compliance Action to implement BATc
					Furthermore, the operator considers that BAT 13 does not apply to their installation, having confirmed that their NOx emissions stem from a hydrometallurigal process, whereas BAT13 refers to preventing NOx emissions from pyrometallurgical processes. From site visit it was evident that pyrometallurgical processes do not take place in the Melting Shop, where simple melting and alloying takes place.	
14	In order to prevent or reduce the generation of waste water, BAT is to use one or a combination of the techniques given	3.1	CC	CC	The operator has confirmed in their response that they are currently compliant with BAT 14. They state that all process water is re-cycled through the cooling towers with regular meter readings of water input and output to monitor evaporation losses and/or leakage using an external company called Pro Enviro. This means that all furnace cooling water, or water used in any production process is monitored. The cooling systems are of a closed loop type. The associated cooling towers are	None

BATc Number	Compliance Issue Priority BAT indicated in **Bold Text**	Relevant permit condition	Compliance stated by Operator NA / CC / FC / NC	Compliance assessment conclusion NA / CC / FC / NC	Summary of Permitting Officer assessment against BATc techniques	Compliance Action to implement BATc
					drained down, cleaned and re-filled twice a year under HSE regulations regarding legionella control. The use of free cooling systems for appropriate areas to reduce cooling tower dependence is under consideration for the future. The operator considers that BAT14 techniques (a), (b) and (f) are used: • BAT 14(a) - measure the amount of fresh water used and the amount of waste water discharged • BAT 14 (b) - reuse waste water from cleaning operations (including anode and cathode rinse water) and spills in the same process • BAT 14(f) - use a closed circuit cooling system The Environment Agency is satisfied that the operator meets the requirements of this BAT Conclusion.	

BATc Number	Compliance Issue Priority BAT indicated in **Bold Text**	Relevant permit condition	Compliance stated by Operator **NA / CC / FC / NC**	Compliance assessment conclusion **NA / CC / FC / NC**	Summary of Permitting Officer assessment against BATc techniques	Compliance Action to implement BATc
15	In order to prevent the contamination of water and to reduce emissions to water, BAT is to segregate uncontaminated waste water streams from waste water streams requiring treatment	NA	NA	NA	The Environment Agency has determined that this BAT Conclusion is not applicable for this installation as there is no on-site treatment of wastewater.	None
16	BAT is to use ISO 5667 for water sampling and to monitor the emissions to water at the point where the emission leaves the installation at least once per month and in accordance with EN standards. If EN standards are not available, BAT is to use ISO, national or other international standards that ensure the provision of data of an equivalent scientific quality. The monitoring frequency may be adapted if the data series clearly demonstrate sufficient stability of the emissions	NA	NA	NA	The Environment Agency has determined that this BAT Conclusion is not generally applicable for installations which only discharge wastewater to sewer. We do not require operators to routinely monitor discharges of wastewater to sewer where the discharge is already regulated (and monitored) by the sewerage undertaker via a trade effluent consent, unless there is a site-specific environmental need for additional monitoring, e.g. if there was a ELV on the environmental permit to protect water quality, in which case we would require monitoring to be undertaken in accordance with BAT 16. The above position is consistent with how we regulate other industrial sectors through the permitting process.	None

BATc Number	Compliance Issue Priority BAT indicated in **Bold Text**	Relevant permit condition	Compliance stated by Operator **NA / CC / FC / NC**	Compliance assessment conclusion **NA / CC / FC / NC**	Summary of Permitting Officer assessment against BATc techniques	Compliance Action to implement BATc
17	In order to reduce emissions to water, BAT is to treat the leakages from the storage of liquids and the waste water from non-ferrous metals production, including from the washing stage in the Waelz kiln process, and to remove metals and sulphates by using a combination of the techniques given	NA	NA	NA	The Environment Agency has determined that this BAT Conclusion is not applicable for installations which only discharge wastewater to sewer. The BAT-AELs for BAT 17 relate to direct emissions to receiving waters (as opposed to indirect emissions made via the foul sewer). It is our view that the intention of BAT 17 is to ensure that surface waters are appropriately protected, through the prevention of direct discharges which may otherwise have been made without (or with minimal) treatment.	None
18	In order to reduce noise emissions, BAT is to use one or a combination of the techniques given	3.4	CC	CC	The operator has confirmed in their response that they are currently compliant with BAT 18. They state that they have meetings approximately every six weeks of the site Integrated Management Group (chaired by the Managing Director) covering continual improvements to overall site management, environmental, health and safety and	None

BATc Number	Compliance Issue Priority BAT indicated in **Bold Text**	Relevant permit condition	Compliance stated by Operator NA / CC / FC / NC	Compliance assessment conclusion NA / CC / FC / NC	Summary of Permitting Officer assessment against BATc techniques	Compliance Action to implement BATc
					quality issues. Within this forum all aspects of site noise management are considered. They state that all noise producing areas are enclosed and regularly monitored to check decibel levels. We have not received any noise complaints about the site from local residents. From site visit it was evident that all processes are contained within enclosed buildings (considered to be satisfactory demonstration of BAT 18 technique (b) - enclose noisy plants or components in sound-absorbing structures. The Environment Agency is satisfied that the operator meets the requirements of this BAT Conclusion.	
19	In order to reduce odour emissions, BAT is to use one or a combination of the techniques given	3.3	CC	CC	The operator has confirmed in their response that they are currently compliant with BAT 19.	None

BATc Number	Compliance Issue Priority BAT indicated in **Bold Text**	Relevant permit condition	Compliance stated by Operator NA / CC / FC / NC	Compliance assessment conclusion NA / CC / FC / NC	Summary of Permitting Officer assessment against BATc techniques	Compliance Action to implement BATc
					They state that they have meetings approximately every six weeks of the site Integrated Management Group (chaired by the Managing Director) covering continual improvements to overall site management, environmental, health and safety and quality issues. Within this forum all aspects of site odour and emissions to air management are considered. They state that in general none of the metals used on site can be considered odorous. We have not received any odour complaints about the site from local residents. From site visit it was evident that no odorous raw materials are used, nor odours generated in the process. This is considered to be satisfactory demonstration of BAT 19 technique (b) - minimise the use of odorous materials.	

BATc Number	Compliance Issue Priority BAT indicated in **Bold Text**	Relevant permit condition	Compliance stated by Operator NA / CC / FC / NC	Compliance assessment conclusion NA / CC / FC / NC	Summary of Permitting Officer assessment against BATc techniques	Compliance Action to implement BATc
					The Environment Agency is satisfied that the operator meets the requirements of this BAT Conclusion.	
	BAT 20-54: Copper production					
20	In order to increase the secondary materials' recovery yield from scrap, BAT is to separate non- metallic constituents and metals other than copper by using one or a combination of the techniques given	NA	NA	NA	The operator considers that this BAT Conclusion does not apply to their installation. From site visit it was evident that there is no contamination of the incoming clean copper used as raw material in the Melting Shop and as such there is no need for materials separation. Although strictly speaking, the raw materials would be considered to be 'secondary' materials, they are typically copper sheet, strip, wire in a pure form. The Environment Agency is satisfied that this BAT Conclusion is not applicable.	None
21	In order to use energy efficiently in primary copper production, BAT is to use one or a combination of the techniques given	NA	NA	NA	The operator considers that this BAT Conclusion does not apply to their installation as no primary copper production is taking place.	None

BATc Number	Compliance Issue Priority BAT indicated in **Bold Text**	Relevant permit condition	Compliance stated by Operator NA / CC / FC / NC	Compliance assessment conclusion NA / CC / FC / NC	Summary of Permitting Officer assessment against BATc techniques	Compliance Action to implement BATc
					The Environment Agency is satisfied that this BAT Conclusion is not applicable.	
22	In order to use energy efficiently in secondary copper production, BAT is to use one or a combination of the techniques given	NA	NA	NA	The operator considers that this BAT Conclusion does not apply to their installation as they are not a secondary copper producer. The Environment Agency is satisfied that this BAT Conclusion is not applicable.	None
23	In order to use energy efficiently in electrorefining and electrowinning operations, BAT is to use a combination of the techniques given	NA	NA	NA	The operator considers that this BAT Conclusion does not apply to their installation as no electrorefining or electrowinning is taking place. The Environment Agency is satisfied that this BAT Conclusion is not applicable.	None
24	In order to reduce secondary emissions to air from furnaces and auxiliary devices in primary copper production and to optimise the performance of the abatement system,	NA	NA	NA	The operator considers that this BAT Conclusion does not apply to their installation as no primary copper production is taking place.	None

BATc Number	Compliance Issue Priority BAT indicated in **Bold Text**	Relevant permit condition	Compliance stated by Operator NA / CC / FC / NC	Compliance assessment conclusion NA / CC / FC / NC	Summary of Permitting Officer assessment against BATc techniques	Compliance Action to implement BATc
	BAT is to collect, mix and treat secondary emissions in a centralised off-gas cleaning system				The Environment Agency is satisfied that this BAT Conclusion is not applicable.	
25	In order to prevent or reduce diffuse emissions from pretreatment (such as blending, drying, mixing, homogenisation, screening and pelletisation) of primary and secondary materials, BAT is to use one or a combination of the techniques given	NA	NA	NA	The operator considers that this BAT Conclusion does not apply to their installation as no pretreatment of raw materials is taking place. The Environment Agency is satisfied that this BAT Conclusion is not applicable.	None
26	In order to prevent or reduce diffuse emissions from charging, smelting and tapping operations in primary and secondary copper smelters and from holding and melting furnaces, BAT is to use a combination of the techniques given	3.1 3.2	CC	CC	The operator has confirmed in their response that they are currently compliant with BAT 26, in relation to their melting furnaces. They state that BAT 26 techniques (d), (g), (h) and (i) are used. Hood enclosures, melt covers and a boosted extraction system connected to a bag filter plant are used for these processes within the Melting Shop. The temperatures of molten alloys are controlled by calibrated thermocouples and melting conditions detailed for that melt to prevent overheating for each alloy, thus	None

BATc Number	Compliance Issue Priority BAT indicated in **Bold Text**	Relevant permit condition	Compliance stated by Operator NA / CC / FC / NC	Compliance assessment conclusion NA / CC / FC / NC	Summary of Permitting Officer assessment against BATc techniques	Compliance Action to implement BATc
					keeping the melt at the minimum required temperature. The BAT requirements state: • BAT 26(d) - Capture hood/ enclosures at charging and tapping points in combination with an off-gas abatement system (e.g. housing/tunnel for ladle operation during tapping, and which is closed with a movable door/barrier equipped with a ventilation and abatement system) • BAT 26(g) - hold the temperature in the furnace at the lowest required level • BAT 26(h) - boosted suction systems • BAT 26(i) - enclosed building in combination with other techniques to collect the diffuse emissions The Environment Agency is satisfied that the operator meets the requirements of this BAT Conclusion	
27	In order to reduce diffuse emissions from Peirce-Smith converter (PS)	NA	NA	NA	The operator considers that this BAT Conclusion does not apply to their	None

BATc Number	Compliance Issue Priority BAT indicated in **Bold Text**	Relevant permit condition	Compliance stated by Operator NA / CC / FC / NC	Compliance assessment conclusion NA / CC / FC / NC	Summary of Permitting Officer assessment against BATc techniques	Compliance Action to implement BATc
	furnace in primary and secondary copper production, BAT is to use a combination of the techniques given				installation as no Peirce-Smith converter furnace is used. The Environment Agency is satisfied that this BAT Conclusion is not applicable.	
28	In order to reduce diffuse emissions from a Hoboken converter furnace in primary copper production, BAT is to use a combination of the techniques given	NA	NA	NA	The operator considers that this BAT Conclusion does not apply to their installation as no primary copper production is taking place. The Environment Agency is satisfied that this BAT Conclusion is not applicable.	None
29	In order to reduce diffuse emissions from the matte conversion process, BAT is to use a flash converting furnace	NA	NA	NA	The operator considers that this BAT Conclusion does not apply to their installation as the matte conversion process is not used. The Environment Agency is satisfied that this BAT Conclusion is not applicable.	None
30	In order to reduce diffuse emissions from a top-blown rotary converter (TBRC) furnace in secondary copper	NA	NA	NA	The operator considers that this BAT Conclusion does not apply to their	None

BATc Number	Compliance Issue Priority BAT indicated in **Bold Text**	Relevant permit condition	Compliance stated by Operator NA / CC / FC / NC	Compliance assessment conclusion NA / CC / FC / NC	Summary of Permitting Officer assessment against BATc techniques	Compliance Action to implement BATc
	production, BAT is to use a combination of the techniques given				installation as a top-blown rotary converter furnace is not used. The Environment Agency is satisfied that this BAT Conclusion is not applicable.	
31	In order to reduce diffuse emissions from copper recovery with a slag concentrator, BAT is to use the techniques given	NA	NA	NA	The operator considers that this BAT Conclusion does not apply to their installation as copper recovery with a slag concentrator is not used The Environment Agency is satisfied that this BAT Conclusion is not applicable.	None
32	In order to reduce diffuse emissions from copper-rich slag furnace treatment, BAT is to use a combination of the techniques given	NA	NA	NA	The operator considers that this BAT Conclusion does not apply to their installation as copper-rich slag furnace treatment is not undertaken. The Environment Agency is satisfied that this BAT Conclusion is not applicable.	None
33	In order to reduce diffuse emissions from anode casting in primary and secondary copper production, BAT is	NA	NA	NA	The operator considers that this BAT Conclusion does not apply to their	None

BATc Number	Compliance Issue Priority BAT indicated in **Bold Text**	Relevant permit condition	Compliance stated by Operator NA / CC / FC / NC	Compliance assessment conclusion NA / CC / FC / NC	Summary of Permitting Officer assessment against BATc techniques	Compliance Action to implement BATc
	to use one or a combination of the techniques given				installation as anode casting is not undertaken. The Environment Agency is satisfied that this BAT Conclusion is not applicable.	
34	In order to reduce diffuse emissions from electrolysis cells, BAT is to use one or a combination of the techniques given	NA	NA	NA	The operator considers that this BAT Conclusion does not apply to their installation as electrolysis cells are not used. The Environment Agency is satisfied that this BAT Conclusion is not applicable.	None
35	In order to reduce diffuse emissions from the casting of copper alloys, BAT is to use one or a combination of the techniques given	3.2	CC	CC	The operator has confirmed in their response that they are currently compliant with BAT 35. They state that all three BAT 35 techniques (a), (b) and (c) are used. Hood enclosures, melt covers and a boosted extraction system connected to a bag plant are in place.	None

BATc Number	Compliance Issue Priority BAT indicated in **Bold Text**	Relevant permit condition	Compliance stated by Operator NA / CC / FC / NC	Compliance assessment conclusion NA / CC / FC / NC	Summary of Permitting Officer assessment against BATc techniques	Compliance Action to implement BATc
					They also state that temperatures of molten alloys are controlled by calibrated thermocouples and melting conditions are detailed to prevent overheating for each alloy. High temperatures are required to generate copper fume (2562^{o}C) and the majority of their copper-phosphorous alloys are cast at 950^{o}C, well below the fume point, thus reducing the potential for diffuse emissions. The Environment Agency is satisfied that the operator meets the requirements of this BAT Conclusion.	
36	In order to reduce diffuse emissions from non-acid and acid pickling, BAT is to use one of the techniques given	NA	CC	NA	The operator has confirmed in their response that they are currently compliant with BAT 36. They state that in general, their production processes are undergoing continual review to remove acid cleaning requirements. For example, copper phosphorous strip production modified from a cast to an extruded route to achieve this. They add that all acid cleaning waters are contained in IBC's and sent off site for treatment by an	None

BATc Number	Compliance Issue Priority BAT indicated in **Bold Text**	Relevant permit condition	Compliance stated by Operator NA / CC / FC / NC	Compliance assessment conclusion NA / CC / FC / NC	Summary of Permitting Officer assessment against BATc techniques	Compliance Action to implement BATc
					approved waste handling contractor, therefore a closed circuit system exists. Our view is that because the pickling lines are not continuously in use, the specified 'applicability criteria' for BAT 36 means that both techniques (a) and (b) do not apply. We recognise that the continual review of the use of acid pickling by the operator will over time reduce the potential for diffuse emission from such processes. The Environment Agency is therefore satisfied that this BAT Conclusion is not applicable.	
37	In order to reduce dust and metal emissions to air from the reception, storage, handling, transport, metering, mixing, blending, crushing, drying, cutting and screening of raw materials, and the pyrolytic treatment of copper turnings in primary and secondary copper production, BAT is to use a bag filter.	NA	NA	NA	The operator considers that this BAT Conclusion does not apply to their installation as no potentially dusty activities take place in the Bullion Department where the raw materials are received and stored prior to melting. The Environment Agency is satisfied that this BAT Conclusion is not applicable.	None

BATc Number	Compliance Issue Priority BAT indicated in **Bold Text**	Relevant permit condition	Compliance stated by Operator **NA / CC / FC / NC**	Compliance assessment conclusion **NA / CC / FC / NC**	Summary of Permitting Officer assessment against BATc techniques	Compliance Action to implement BATc
	BAT-AEL for Dust					
38	In order to reduce dust and metal emissions to air from concentrate drying in primary copper production, BAT is to use a bag filter	NA	NA	NA	The operator considers that this BAT Conclusion does not apply to their installation as no primary copper production is taking place. The Environment Agency is satisfied that this BAT Conclusion is not applicable.	None
39	In order to reduce dust and metal emissions to air (other than those that are routed to the sulphuric acid or liquid SO2 plant or power plant) from the primary copper smelter and converter, BAT is to use a bag filter and/or a wet scrubber	NA	NA	NA	The operator considers that this BAT Conclusion does not apply to their installation as no primary copper production is taking place. The Environment Agency is satisfied that this BAT Conclusion is not applicable.	None
40	In order to reduce dust and metal emissions to air (other than those that are routed to the sulphuric acid plant) from the secondary copper smelter and converter and from the processing of secondary copper intermediates, BAT is to use a bag filter BAT-AEL for Dust	NA	NA	NA	The operator considers that this BAT Conclusion does not apply to their installation as the stated processes are not undertaken. The Environment Agency is satisfied that this BAT Conclusion is not applicable.	None

BATc Number	Compliance Issue Priority BAT indicated in **Bold Text**	Relevant permit condition	Compliance stated by Operator **NA / CC / FC / NC**	Compliance assessment conclusion **NA / CC / FC / NC**	Summary of Permitting Officer assessment against BATc techniques	Compliance Action to implement BATc
41	In order to reduce dust and metal emissions to air from the secondary copper holding furnace, BAT is to use a bag filter BAT-AEL for Dust	NA	NA	NA	The operator considers that this BAT Conclusion does not apply to their installation as there is no secondary copper holding furnace. The Environment Agency is satisfied that this BAT Conclusion is not applicable.	None
42	In order to reduce dust and metal emissions to air from copper-rich slag furnace processing, BAT is to use a bag filter or a scrubber in combination with an ESP BAT-AEL for Dust	NA	NA	NA	The operator considers that this BAT Conclusion does not apply to their installation as copper-rich slag furnace processing is not undertaken. The Environment Agency is satisfied that this BAT Conclusion is not applicable.	None
43	In order to reduce dust and metal emissions to air from the anode furnace in primary and secondary copper production, BAT is to use a bag filter or a scrubber in combination with an ESP BAT-AEL for Dust	NA	NA	NA	The operator considers that this BAT Conclusion does not apply to their installation as an anode furnace is not used. The Environment Agency is satisfied that this BAT Conclusion is not applicable.	None

BATc Number	Compliance Issue Priority BAT indicated in **Bold Text**	Relevant permit condition	Compliance stated by Operator **NA / CC / FC / NC**	Compliance assessment conclusion **NA / CC / FC / NC**	Summary of Permitting Officer assessment against BATc techniques	Compliance Action to implement BATc
44	In order to reduce dust and metal emissions to air from anode casting in primary and secondary copper production, BAT is to use a bag filter or, in the case of off-gases with a water content close to the dew point, a wet scrubber or a demister BAT-AEL for Dust	NA	NA	NA	The operator considers that this BAT Conclusion does not apply to their installation as anode casting is not undertaken. The Environment Agency is satisfied that this BAT Conclusion is not applicable.	None
45	In order to reduce dust and metal emissions to air from a copper melting furnace, BAT is to select and feed the raw materials according to the furnace type and the abatement system used and to use a bag filter BAT-AEL for Dust	3.1	CC	CC	The operator considers that they are currently compliant with BAT 45. The BAT-AEL for dust is relevant for emission point A1. The current permit limit at emission point A1 is 10mg/m^3, however the BAT-AEL is 5mg/m^3. Compliance monitoring results show measured dust concentrations at point A1 to be <1mg/m^3. Due to the fact that more than one type of metal may be melted in the same furnace, and because of the use of common extraction ductwork, rather than set an ELV of 5mg/m^3 (for copper melting), we are proposing to set the more stringent ELV of 3mg/m^3 which applies to the melting of	None

BATc Number	Compliance Issue Priority BAT indicated in **Bold Text**	Relevant permit condition	Compliance stated by Operator **NA / CC / FC / NC**	Compliance assessment conclusion **NA / CC / FC / NC**	Summary of Permitting Officer assessment against BATc techniques	Compliance Action to implement BATc
					cadmium (as set out under BAT 132, where the BAT-AEL is 3mg/m^3). The operator states that bag plants are used under continual CEMS monitoring to ensure IPPC emission limits are not exceeded. Melting instructions are in place to ensure correct charging of furnace (and it is part of ISO9001 requirements to have this process control in place). This includes selection of the raw materials to minimise dust emissions and temperature controls to minimise fume emissions. The Environment Agency is satisfied that the operator meets the requirements of this BAT Conclusion.	
46	In order to reduce organic compound emissions to air from the pyrolytic treatment of copper turnings, and the drying, smelting and melting of secondary raw materials, BAT is to use one of the techniques given BAT-AEL for TVOC	NA	NA	NA	The operator considers that this BAT Conclusion does not apply to their installation. From site visit it was evident that the raw materials used in the Melting Shop are clean, dry and of high purity and will not	None

BATc Number	Compliance Issue Priority BAT indicated in **Bold Text**	Relevant permit condition	Compliance stated by Operator NA / CC / FC / NC	Compliance assessment conclusion NA / CC / FC / NC	Summary of Permitting Officer assessment against BATc techniques	Compliance Action to implement BATc
					give rise to emissions of organic compounds. The Environment Agency is satisfied that this BAT Conclusion is not applicable.	
47	In order to reduce organic compound emissions to air from solvent extraction in hydrometallurgical copper production, BAT is to use both of the techniques given and to determine the VOC emissions annually, e.g. through mass balance	NA	NA	NA	The operator considers that this BAT Conclusion does not apply to their installation as hydrometallurgical copper production is not undertaken. The Environment Agency is satisfied that this BAT Conclusion is not applicable.	None
48	In order to reduce PCDD/F emissions to air from the pyrolytic treatment of copper turnings, smelting, melting, fire refining and converting operations in secondary copper production, BAT is to use one or a combination of the techniques given BAT-AEL for PCDD/F	NA	NA	NA	The operator considers that this BAT Conclusion does not apply to their installation. From site visit it was evident that the raw materials used in the Melting Shop are clean, dry and of high purity and will not give rise to emissions of PCDD/Fs. The Environment Agency is satisfied that this BAT Conclusion is not applicable.	None

BATc Number	Compliance Issue Priority BAT indicated in **Bold Text**	Relevant permit condition	Compliance stated by Operator **NA / CC / FC / NC**	Compliance assessment conclusion **NA / CC / FC / NC**	Summary of Permitting Officer assessment against BATc techniques	Compliance Action to implement BATc
49	In order to reduce SO_2 emissions (other than those that are routed to the sulphuric acid or liquid SO_2 plant or power plant) from primary and secondary copper production, BAT is to use one or a combination of the techniques given BAT-AEL for SO_2 (for secondary copper production)	NA	NA	NA	The operator considers that this BAT Conclusion does not apply to their installation as no primary / secondary copper production is taking place. From site visit it was evident that the raw materials used in the Melting Shop are clean, dry and of high purity and will not give rise to SO2 emissions The Environment Agency is satisfied that this BAT Conclusion is not applicable.	None
50	In order to reduce acid gas emissions to air from exhaust gases from the electrowinning cells, the electrorefining cells, the washing chamber of the cathode stripping machine and the anode scrap washing machine, BAT is to use a wet scrubber or a demister	NA	NA	NA	The operator considers that this BAT Conclusion does not apply to their installation as none of the described equipment is used. The Environment Agency is satisfied that this BAT Conclusion is not applicable.	None
51	In order to prevent soil and groundwater contamination from copper recovery in the slag concentrator, BAT is to use a drainage	NA	NA	NA	The operator considers that this BAT Conclusion does not apply to their installation as copper recovery in a slag concentrator is not undertaken.	None

BATc Number	Compliance Issue Priority BAT indicated in **Bold Text**	Relevant permit condition	Compliance stated by Operator **NA / CC / FC / NC**	Compliance assessment conclusion **NA / CC / FC / NC**	Summary of Permitting Officer assessment against BATc techniques	Compliance Action to implement BATc
	system in cooling areas and a correct design of the final slag storage area to collect overflow water and avoid fluid leakage				The Environment Agency is satisfied that this BAT Conclusion is not applicable.	
52	In order to prevent soil and groundwater contamination from the electrolysis in primary and secondary copper production, BAT is to use a combination of the techniques given	NA	NA	NA	The operator considers that this BAT Conclusion does not apply to their installation as electrolysis techniques are not undertaken. The Environment Agency is satisfied that this BAT Conclusion is not applicable.	None
53	In order to prevent the generation of waste water from primary and secondary copper production, BAT is to use one or a combination of the techniques given	NA	NA	NA	The operator considers that this BAT Conclusion does not apply to their installation as no process wastewater is generated. The cooling water discharges to sewer are periodic drain downs within closed loop systems. None of the techniques listed are necessary. The Environment Agency is satisfied that this BAT Conclusion is not applicable.	None

BATc Number	Compliance Issue Priority BAT indicated in **Bold Text**	Relevant permit condition	Compliance stated by Operator NA / CC / FC / NC	Compliance assessment conclusion NA / CC / FC / NC	Summary of Permitting Officer assessment against BATc techniques	Compliance Action to implement BATc
54	In order to reduce the quantities of waste sent for disposal from primary and secondary copper production, BAT is to organise operations so as to facilitate process residues reuse or, failing that, process residues recycling, including by using one or a combination of the techniques given	**1.4**	CC	CC	The operator has confirmed in their response that they are currently compliant with BAT 54. They state that BAT 54 technique (a) is used as filter bag dusts are mixed into a slurry and sent to the Refinery for recovery of metals. They further state that all material melted on site, if not usable as product is recycled in some way due to its precious metals content. This could be by re-melting into a different alloy, through the refinery or even through external recovery where ceramics used in the melting process are crushed to facilitate any precious metal reclamation.	None
	BAT 131-133: Cadmium production					
131	In order to reduce diffuse emissions to air, BAT is to use one or both of the techniques given	3.2	NA	CC	The operator considers that this BAT Conclusion does not apply to their installation. However our view is that BAT 131 does apply, due to the fact that the operator melts and casts cadmium in both the Melting Shop, producing cadmium alloy billets, and in the Atomising Department,	None

BATc Number	Compliance Issue Priority BAT indicated in **Bold Text**	Relevant permit condition	Compliance stated by Operator NA / CC / FC / NC	Compliance assessment conclusion NA / CC / FC / NC	Summary of Permitting Officer assessment against BATc techniques	Compliance Action to implement BATc
					where they melt cadmium bearing alloys as a preliminary step in the production of sintered cadmium alloy billets. In both these areas of the installation, BAT 131 technique (a) is used, i.e. a central extraction system connected to an abatement system, which in this case consists of LEV's connected to bag filter plant. The Environment Agency is satisfied that the operator meets the requirements of this BAT Conclusion.	
132	In order to reduce dust and metal emissions to air from pyrometallurgical cadmium production and the melting, alloying and casting of cadmium ingots, BAT is to use one or a combination of the techniques given BAT-AELs for Dust and Cd	3.1	CC	CC	The operator considers that they are currently compliant with BAT 132, in relation to their melting, alloying and casting of cadmium alloys in the Melting Shop and the Atomising Department. They use BAT 132 technique (a) bag filters, to abate emissions of dust and cadmium from these processes. CEMS monitoring ensures bag plants operate within required parameters. In	None

BATc Number	Compliance Issue Priority BAT indicated in **Bold Text**	Relevant permit condition	Compliance stated by Operator NA / CC / FC / NC	Compliance assessment conclusion NA / CC / FC / NC	Summary of Permitting Officer assessment against BATc techniques	Compliance Action to implement BATc
					addition, the operator reports that the site doctor monitors all Melting Shop personnel for cadmium through blood and urine samples and additional Casella air monitoring takes place during cadmium melting operations. The BAT-AEL for cadmium is 0.1mg/m^3 which is the same as the ELV on the current permit for emission points A1 (Melting Shop) and A2 (Atomising Department). Compliance monitoring data shows that results are generally <0.01mg/m^3, therefore we are satisfied that the BAT-AEL can be met. The BAT-AEL for dust of 3mg/m^3 applies to emission points A1 and A2 from 30/06/20. In contrast the existing ELV for these emission point is 10mg/m^3. Compliance monitoring data shows that the results are generally <1mg/m^3, therefore we are satisfied that the BAT-AEL can be met. The Environment Agency is satisfied that the operator meets the requirements of this BAT Conclusion.	

BATc Number	Compliance Issue Priority BAT indicated in **Bold Text**	Relevant permit condition	Compliance stated by Operator **NA / CC / FC / NC**	Compliance assessment conclusion **NA / CC / FC / NC**	Summary of Permitting Officer assessment against BATc techniques	Compliance Action to implement BATc
133	In order to reduce the quantities of waste sent for disposal from hydrometallurgical cadmium production, BAT is to organise operations on site so as to facilitate process residues reuse or, failing that, process residues recycling, including by using one of the techniques given	NA	NA	NA	The operator considers that this BAT Conclusion does not apply to their installation because they do not undertake the hydrometallurgical production of cadmium metal. The hydrometallurgical production of cadmium sulphate is undertaken in the Refinery by dissolving cadmium bearing filter bag dusts from the Melting Shop in sulphuric acid, in order to produce a material which can be sent off-site for recovery of the cadmium. The operator confirmed that there are no emissions of sulphur dioxide from this process. The Environment Agency is satisfied that this BAT Conclusion is not applicable.	None
	BAT 134-149: Precious metals production					
134	In order to reduce diffuse emissions to air from a pretreatment operation (such as crushing, sieving and mixing), BAT	NA	NA	NA	The operator considers that this BAT Conclusion does not apply to their installation as no pretreatment of raw materials is taking place.	None

BATc Number	Compliance Issue Priority BAT indicated in **Bold Text**	Relevant permit condition	Compliance stated by Operator NA / CC / FC / NC	Compliance assessment conclusion NA / CC / FC / NC	Summary of Permitting Officer assessment against BATc techniques	Compliance Action to implement BATc
	is to use one or a combination of the techniques given				From site visit it was clear that no pretreatment operations take place as due to the clean, solid, non-volatile nature of the raw materials, it is not necessary. The Environment Agency is satisfied that this BAT Conclusion is not applicable.	
135	In order to reduce diffuse emissions to air from smelting and melting (both Doré and non-Doré operations), BAT is to use all of the techniques given	3.1	CC	CC	The operator considers that they are currently compliant with BAT 135, which applies to melting processes within the Melting Shop and the Atomising Department. They state that melting areas are contained/enclosed. The furnaces are operated under extraction hoods at negative pressure, with extracted gases being passed through bag filters, and interlocks are in place. Therefore all four BAT 135 techniques are used across their melting operations:	None

BATc Number	Compliance Issue Priority BAT indicated in **Bold Text**	Relevant permit condition	Compliance stated by Operator NA / CC / FC / NC	Compliance assessment conclusion NA / CC / FC / NC	Summary of Permitting Officer assessment against BATc techniques	Compliance Action to implement BATc
					• BAT 135(a) - enclose buildings and/or smelting furnace areas • BAT 135(b) - perform operations under negative pressure • BAT 135(c) - connect furnace operations to dust collectors or extractors via hoods and a ductwork system • BAT 135(d) - electrically interlock furnace equipment with their dust collector or extractor, in order to ensure that no equipment may be operated unless the dust collector and filtering system are in operation. The Environment Agency is satisfied that the operator meets the requirements of this BAT Conclusion.	
136	In order to reduce diffuse emissions to air from leaching and gold electrolysis, BAT is to use one or a combination of the techniques given	NA	NA	NA	The operator considers that this BAT Conclusion does not apply to their installation as leaching and gold electrolysis not undertaken	None

BATc Number	Compliance Issue Priority BAT indicated in **Bold Text**	Relevant permit condition	Compliance stated by Operator NA / CC / FC / NC	Compliance assessment conclusion NA / CC / FC / NC	Summary of Permitting Officer assessment against BATc techniques	Compliance Action to implement BATc
					The Environment Agency is satisfied that this BAT Conclusion is not applicable.	
137	In order to reduce diffuse emissions from a hydrometallurgical operation, BAT is to use all of the techniques given	3.2	CC	CC	The operator considers that they are currently compliant with BAT 137, which applies to hydrometallurgical processes within the Refinery. They state that all hydrometallurgical operations take place in the silver refinery where any NOx generated by the process is treated by scrubber using hydrogen peroxide. All effluent from the refinery process is contained in IBC's for disposal with an approved waste handling contractor. All reaction vessels are sealed, contain level controls and are enclosed in a bunded area. Extraction of emissions is through a common ductwork system with an extraction back-up available. Therefore the Environment Agency is satisfied that both BAT 137 techniques (a) and (b) are used, and that the operator	None

BATc Number	Compliance Issue Priority BAT indicated in **Bold Text**	Relevant permit condition	Compliance stated by Operator NA / CC / FC / NC	Compliance assessment conclusion NA / CC / FC / NC	Summary of Permitting Officer assessment against BATc techniques	Compliance Action to implement BATc
					meets the requirements of this BAT Conclusion.	
138	In order to reduce diffuse emissions to air from incineration, calcining and drying, BAT is to use all of the techniques given	NA	NA	NA	The operator considers that this BAT Conclusion does not apply to their installation as incineration, calcining and drying are not relevant to the type of precious metals processes undertaken at the site. The Environment Agency is satisfied that this BAT Conclusion is not applicable.	None
139	In order to reduce diffuse emissions to air from the melting of final metal products during refining, BAT is to use both of the techniques given	3.2	CC	CC	The operator considers that they are currently compliant with BAT 139. Their view is that this BAT Conclusion applies to the melting of silver and silver alloys in the Melting Shop, using silver powders recovered as part of the Refinery operation. They state that the powder melting furnace is enclosed and has a negative pressure to enable efficient extraction of any fume	None

BATc Number	Compliance Issue Priority BAT indicated in **Bold Text**	Relevant permit condition	Compliance stated by Operator NA / CC / FC / NC	Compliance assessment conclusion NA / CC / FC / NC	Summary of Permitting Officer assessment against BATc techniques	Compliance Action to implement BATc
					evolved during the melting process. Any diffuse gases are captured via hoods and treated in the bag filter plant serving the Melting Shop. Both BAT 139 techniques are used: • BAT 139(a) - enclosed furnace with negative pressure • BAT 139(b) - appropriate housing, enclosures and capture hoods with efficient extraction/ventilation Therefore the Environment Agency is satisfied that the operator meets the requirements of this BAT Conclusion.	
140	In order to reduce dust and metal emissions to air from all dusty operations, such as crushing, sieving, mixing, melting, smelting, incineration, calcining, drying and refining, BAT is to use one of the techniques given BAT-AEL for Dust	**3.1**	CC	CC	The operator considers that they are currently compliant with BAT 140, which applies to melting operations in the Melting Shop and Atomising Department. They state that for the melting of silver, copper, zinc and cadmium, bag plant usage is considered appropriate, but a wet scrubber is not, due to the low levels of gas emissions. They also say that silver is	Confirm compliance via routine inspection and assessment of monitoring returns

BATc Number	Compliance Issue Priority BAT indicated in **Bold Text**	Relevant permit condition	Compliance stated by Operator NA / CC / FC / NC	Compliance assessment conclusion NA / CC / FC / NC	Summary of Permitting Officer assessment against BATc techniques	Compliance Action to implement BATc
					checked for selenium as an impurity (because selenium affects the electrical performance of silver fuse materials) and is considered deleterious to the products produced. BAT 140 technique (a), the use of bag filters, is in place on emissions points A1 and A2. The BAT-AEL for dust of 5mg/m^3 would apply to these emission points, however due to the fact that more than one type of metal may be melted in the same furnace, and because of the use of common extraction ductwork, rather than set an ELV of 5mg/m^3 (for precious metals production), we are proposing to set the more stringent ELV of 3mg/m^3 which applies to the melting of cadmium (as set out under BAT 132, where the BAT-AEL is 3mg/m^3). As mentioned previously we are satisfied that the proposed BAT-AEL can be met based on the compliance monitoring results submitted by the operator which show cadmium levels to be <0.01mg/m^3.	

BATc Number	Compliance Issue Priority BAT indicated in **Bold Text**	Relevant permit condition	Compliance stated by Operator **NA / CC / FC / NC**	Compliance assessment conclusion **NA / CC / FC / NC**	Summary of Permitting Officer assessment against BATc techniques	Compliance Action to implement BATc
					The Environment Agency is satisfied that the operator meets the requirements of this BAT Conclusion.	
141	In order to reduce NOx emissions to air from a hydrometallurgical operation involving dissolving/leaching with nitric acid, BAT is to use one or both of the techniques given BAT AEL for NOx	3.1	CC	CC	The operator considers that they are currently compliant with BAT 141, which applies to hydrometallurgical processes in the Refinery. They state that NOx emissions are controlled in accordance with BAT141 technique (b), using a scrubber with hydrogen peroxide as a suitable oxidising agent. The BAT-AEL for NOx of 150mg/m^3 will apply to emission point A3 from 30/06/20. The current permit requires the operator to monitor NOx emissions (as an hourly average) from emission point A3 on a quarterly basis, although there is currently no ELV in place. The operator has provided NOx monitoring data taken over a 24 hour batch of silver dissolution to demonstrate compliance with	Confirm compliance via routine inspection and assessment of monitoring returns

BATc Number	Compliance Issue Priority BAT indicated in **Bold Text**	Relevant permit condition	Compliance stated by Operator NA / CC / FC / NC	Compliance assessment conclusion NA / CC / FC / NC	Summary of Permitting Officer assessment against BATc techniques	Compliance Action to implement BATc
					the BAT-AEL, as historical hourly data suggested that emissions from the refinery exceeded this and could not be considered reliable in the context of the BAT 141 requirements. The results from this recent monitoring exercise were submitted and showed that NOx emissions, taken over the total batch time, were 76mg/m^3. Based on this data we are satisfied that the BAT-AEL can be met. Furthermore, as the silver dissolution process is not undertaken on a full-time basis, we are satisfied that CEMs is not appropriate. The varied permit will require periodic monitoring (once per year) for NOx at point A3, as an 'average over the sampling period.' The BAT Conclusions define 'Average over the sampling period' as "Average value of three consecutive measurements of at least 30 minutes each, unless otherwise stated. It further states that "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."	

BATc Number	Compliance Issue Priority BAT indicated in **Bold Text**	Relevant permit condition	Compliance stated by Operator NA / CC / FC / NC	Compliance assessment conclusion NA / CC / FC / NC	Summary of Permitting Officer assessment against BATc techniques	Compliance Action to implement BATc
					The Environment Agency is satisfied that the operator meets the requirements of this BAT Conclusion.	
142	In order to reduce SO_2 emissions to air (other than those that are routed to the sulphuric acid plant) from a melting and smelting operation for the production of Doré metal, including the associated incineration, calcining and drying operations, BAT is to use one or a combination of the techniques given BAT-AEL for SO_2	NA	NA	NA	The operator considers that this BAT Conclusion does not apply to their installation as the production of Dore metal is not undertaken. The Environment Agency is satisfied that this BAT Conclusion is not applicable.	None
143	In order to reduce SO_2 emissions to air from a hydrometallurgical operation, including the associated incineration, calcining and drying operations, BAT is to use a wet scrubber BAT-AEL for SO_2	NA	NA	NA	The operator considers that this BAT Conclusion does not apply to their installation. During the site visit we questioned the operator on the recovery of cadmium in the Refinery through dissolution of cadmium waste in sulphuric acid. They confirmed that the production of cadmium sulphate does not give rise to SO2 emissions The Environment Agency is satisfied that this BAT Conclusion is not applicable.	None

BATc Number	Compliance Issue Priority BAT indicated in **Bold Text**	Relevant permit condition	Compliance stated by Operator **NA / CC / FC / NC**	Compliance assessment conclusion **NA / CC / FC / NC**	Summary of Permitting Officer assessment against BATc techniques	Compliance Action to implement BATc
144	In order to reduce HCl and Cl_2 emissions to air from a hydrometallurgical operation, including the associated incineration, calcining and drying operations, BAT is to use an alkaline scrubber BAT-AELs for HCl and Cl_2	NA	NA	NA	The operator considers that this BAT Conclusion does not apply to their installation. During the site visit we questioned the operator on this and they confirmed that no chlorides or chlorine is used as a raw material in the Refinery, consequently there is no potential for HCl or Cl2 emissions. The Environment Agency is satisfied that this BAT Conclusion is not applicable.	None
145	In order to reduce NH_3 emissions to air from a hydrometallurgical operation using ammonia or ammonium chloride, BAT is to use a wet scrubber with sulphuric acid BAT-AEL for NH_3	NA	NA	NA	The operator considers that this BAT Conclusion does not apply to their installation. During the site visit we questioned the operator on this and they confirmed that no ammonia or ammonium chloride is used as a raw material in the Refinery – consequently there is no potential for NH3 emissions	None

BATc Number	Compliance Issue Priority BAT indicated in **Bold Text**	Relevant permit condition	Compliance stated by Operator NA / CC / FC / NC	Compliance assessment conclusion NA / CC / FC / NC	Summary of Permitting Officer assessment against BATc techniques	Compliance Action to implement BATc
					The Environment Agency is satisfied that this BAT Conclusion is not applicable.	
146	In order to reduce PCDD/F emissions to air from a drying operation where the raw materials contain organic compounds, halogens or other PCDD/F precursors, from an incineration operation, and from a calcining operation, BAT is to use one or a combination of the techniques given BAT-AEL for PCDD/F	NA	NA	NA	The operator considers that this BAT Conclusion does not apply to their installation. This is due to the nature of the raw materials, which do not contain organic compounds. The Environment Agency is satisfied that this BAT Conclusion is not applicable.	None
147	In order to prevent soil and groundwater contamination, BAT is to use a combination of the techniques given	3.2	CC	CC	The operator considers that they are currently compliant with BAT 147. They state that due to the value of the precious metals used on site extreme care is taken in preventing spillage and escape of materials. All melts are pre-weighed to prevent overfill of the melting vessels; cast material is then re-weighed and any weight loss must be accounted for. All cleaning solutions (e.g. strip cleaning line) are on	None

BATc Number	Compliance Issue Priority BAT indicated in **Bold Text**	Relevant permit condition	Compliance stated by Operator NA / CC / FC / NC	Compliance assessment conclusion NA / CC / FC / NC	Summary of Permitting Officer assessment against BATc techniques	Compliance Action to implement BATc
					bunds to prevent groundwater contamination and all production areas have impervious flooring. Water used in the production processes is closed loop and no water is required for the static cast billet materials. They consider that they use BAT 147 techniques (b) and (c): • BAT 147(b) - use of double-walled tanks or placements in resistant bunds • BAT 147(c) – use of impermeable and acid-resistant floors. The Environment Agency is satisfied that the operator meets the requirements of this BAT Conclusion.	
148	In order to prevent the generation of waste water, BAT is to use one or both of the techniques given	1.3	CC	CC	The operator considers that they are currently compliant with BAT 148. They state that in the silver refinery operation any water used in the scrubbing operation is converted to nitric acid for re-	None

BATc Number	Compliance Issue Priority BAT indicated in **Bold Text**	Relevant permit condition	Compliance stated by Operator NA / CC / FC / NC	Compliance assessment conclusion NA / CC / FC / NC	Summary of Permitting Officer assessment against BATc techniques	Compliance Action to implement BATc
					use in subsequent dissolution operations. Any waste liquors from the refinery operations are contained in a holding tanks and subsequently disposed of by approved waste carriers. For metal cleaning operations, rinse water is recycled and used to replenish cleaning solution baths They consider that they use both BAT 148 techniques (a) and (b): • BAT 148(a) - recycling of spent/recovered scrubbing liquids and other hydrometallurgical reagents in leaching and other refining operations • BAT 148(b) - Recycling of solutions from leaching, extraction and precipitation operations. Based on the information submitted our view is that they do use technique (a), however it isn't clear whether they recycle solutions specifically from leaching, extraction and precipitation operations. Nevertheless, the re-cycling of solutions used in metal cleaning baths clearly meets	

BATc Number	Compliance Issue Priority BAT indicated in **Bold Text**	Relevant permit condition	Compliance stated by Operator NA / CC / FC / NC	Compliance assessment conclusion NA / CC / FC / NC	Summary of Permitting Officer assessment against BATc techniques	Compliance Action to implement BATc
					the intent of the BAT Conclusion, to prevent the generation of wastewater, and in any case, the use of only one of the two techniques is necessary to demonstrate compliance. Therefore the Environment Agency is satisfied that the operator meets the requirements of this BAT Conclusion.	
149	In order to reduce the quantities of waste sent for disposal, BAT is to organise operations on site so as to facilitate process residues reuse or, failing that, process residues recycling, including by using one or a combination of the techniques given	1.4	CC	CC	The operator considers that they are currently compliant with BAT 149. They state that they have meetings approximately every six weeks of the site Integrated Management Group (chaired by the Managing Director) covering continual improvements to overall site management, environmental, health and safety and quality issues. Within this forum all aspects of production management, including scrap utilisation and effluent production and management are considered. All precious metals are recovered in some form.	None

BATc Number	Compliance Issue Priority BAT indicated in **Bold Text**	Relevant permit condition	Compliance stated by Operator NA / CC / FC / NC	Compliance assessment conclusion NA / CC / FC / NC	Summary of Permitting Officer assessment against BATc techniques	Compliance Action to implement BATc
					From site visit it was evident that BAT 149 technique (a) is used (although not strictly from a Dore production process). In facilitating the recovery of cadmium from filter bag dusts (by undertaking the first step, production of cadmium sulphate, prior to export off-site for further refining) the intent of the BAT Conclusion, i.e. reducing the quantities of waste sent for disposal, is met. BAT 149(a) states - Recovery of the metal content from slags, filter dust and residues of the wet dedusting system. The Environment Agency is satisfied that the operator meets the requirements of this BAT Conclusion.	