

Environment Agency permitting decisions

Bespoke Variation and Updating Consolidation

We have decided to issue the variation for Stocksbridge Site operated by Tata Steel UK Limited.

The variation number is `EPR/UP3130FF/V007`

We consider in reaching that decision we have taken into account all relevant considerations and legal requirements and that the permit will ensure that the appropriate level of environmental protection is provided.

Purpose of this document

This decision document:

- explains how the application has been determined
- provides a record of the decision-making process
- shows how all relevant factors have been taken into account
- justifies the specific conditions in the permit other than those in our generic permit template.

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

Structure of this document

- Key issues
- Annex 1 the decision checklist
- Annex 2 the consultation and web publicising responses

Key issues of the decision

1. Choice of regulator

Under the Environmental Permitting Regulations (EPR) the site includes some Local Authority (Sheffield Council) regulated processes (e.g. Electro Slag Remelting (ESR) furnaces) and some Environment Agency regulated processes (e.g. hot rolling in the billet mill) as well as other equipment (e.g. Vacuum Arc Remelting (VAR) furnaces) that are not regulated by either.

The applicant confirmed that they would prefer the new Vacuum Induction melting (VIM) furnace to be regulated by the Environment Agency. The activity is best described in the EPR under Schedule 1 Section 2.1 Part A(2) (d) Casting ferrous metals at a foundry with a production capacity of >20 tonnes per day. The 2013 amendment to EPR states an A2 process in combination with Part A1 processes can be considered as an A1 process, and therefore would be regulated by the Environment Agency. We have taken 'in combination' to mean technically connected as described in our Regulatory Guidance Note 2 Appendices. The applicant has supplied an explanation of how the VIM furnace will be technically connected to the billet mill's A1 processes (via the VAR furnaces) meeting the tests set out in our guidance note RGN2. We have accepted this explanation and regulation of the VIM furnace. Sheffield Council Environmental Health Department have been informed of the decision.

Schedule activity 2.1 Part A(2) (d) has been added to the listed activities in Table 1.1.1.

2. Emissions to Air

The applicant has submitted the conclusions from ADMS v5.0 modelling of emissions to air from the new SA23 stack associated with the VIM furnace. The species considered were particulates (PM₁₀ and PM_{2.5}), Iron, Chromium (all Cr(II) or Cr(III), the process conditions do not generate Cr(VI)), Manganese, Nickel, Zinc Oxide and Molybdenum. In all cases the maximum Process Contribution was less than 1% of the relevant Air Quality Standards (AQS) or Environmental Assessment Levels (EAL), and so are considered an insignificant additional environmental impact.

The modelling makes a number of assumptions about the stack location and emission stream characteristics. In order to audit the findings a worst case model was constructed in our screening tool based on the Aermol modelling package.

- The full height of the building was used to the top of the building beside the stack outlet rather than the gable height.
- Both the maximum (200 degC) and typical (125 degC) operating temperatures were used. The modelling in the application uses 125degC.

- The maximum emission rate at the beginning of evacuation was used throughout (the submitted model uses 10% of this for long term effects).
- Only the particulates emissions were modelled in the check screening as the metals emissions are assumed concentrations in the particulates.
- A particulates emission rate of 0.081g/s used as in the submitted model.
- The limitations of the screening model are that it can only take account of the largest building, uses a different meteorological data to the submitted modelling set and cannot take account of terrain. However, a wider range of potential receptors locations were modelled around the site.

The screening model results show the worst case maximum particulate emission Process Contribution is 11% of short term AQS or EAL and 6.3% of long term AQS or EAL. These value are marginally in excess of the short and long term screening criteria for insignificance (less than 10% of the short term and less than 1% of the long term limits) but this is at a point well within the site boundary.

The Process Contributions at all the modelled off site locations are less than these criteria and are therefore considered insignificant under the Environment Agency's H1 screening methodology. Comparison between the applicants modelling results and the worst case screening for two locations are shown below.

| Results for audit of PM₁₀ modelling: | Result stated in application % of AQS or EAL | Comparison value from Worst Case Screening % of AQS or EAL |
|--|---|--|
| | Hunshelf Road (1997 met data) | 600m East of emission point (near to part of Hunshelf Road) |
| Annual Average | 0.04 | 0.28 |
| 90.4 th percentile of daily means | 0.10 | 0.65 |
| | Manchester Road (1996 met data) | 774 Manchester Road |
| Annual Average | 0.02 | 0.44 |
| 90.4 th percentile of daily means | 0.08 | 1.24 |

Additionally, the particulate abatement filters are stated as being able to achieve a concentration of 20 mg/m³ in all flow conditions. The submitted and check modelling both assumed this concentration with the theoretical peak flow rate of 14600m³/hr to generate the particulate emission rate of 0.081 g/s. But this flow rate is only expected to be relevant for a short period whenever

evacuation of the furnace begins, and will rapidly fall thereafter for the rest of the melt cycle.

The current BREF document for Ferrous Metals Processing Industry (2001) does not make direct reference to vacuum annealing furnaces but particulate emissions to air are not highlighted for the other types of annealing furnace.

The conclusion of insignificant additional environmental impact from the modelling submitted in the application is therefore accepted. The new emission point SA23 has been added to the release point list in condition 1.1.3 and Table 6.1.1 with no parameters or modelling.

However:

- i) We do not fully agree with all the assumptions made in the submitted modelling and there are relatively large differences between these figures and those in the check modelling.
- ii) The site is in a an Air Quality management Area for PM₁₀ concentrations.
- iii) All the modelling is based on projected performance from the equipment manufacturers including the maximum particulate concentration passing the fabric filters (which are primarily to protect the vacuum pumps).

We have therefore imposed an improvement condition to require the operator to carry out and submit confirmatory particulate monitoring covering a full melt cycle during or soon after commissioning of the Vacuum Annealing Furnace.

3. Noise

The applicant carried out a screening exercise that identified fan noise from air blast coolers and scrap handling as the two potential noise sources requiring further consideration.

For the scrap handling noise the applicant calculated the source noise level, inside the melting shop building of known construction with the door closed, to generate the noise levels that would just be noticeable in the surrounding community. They then concluded that these noise levels were so high that they cannot be caused by the intended scrap handling.

We do not fully agree with the details of the scrap metal noise calculations but having conducted our own sensitivity analysis using a range of typical values we agree with the applicant's conclusion that the additional noise from scrap metal handling associated with the VIM furnace is very unlikely to lead to complaints.

Formal noise modelling was conducted for the air blast coolers using a range of operational scenarios and existing background noise survey data. The results were submitted with the application. These concluded that in all modelled receiver locations the noise rating level will be at least 10 dB(A) less than the background level except for Newton Avenue at 100% fanload where the modelled rating level is still 7db(A) below the measured background. However, the activities permitted in June 2014 under variation

EPR/UP3130FF/V006 (V006) (which are not yet commissioned) were not included in the modelled noise from new activities or the background noise measurement.

Further information and clarification was requested in a Schedule 5 notice.

The Schedule 5 notice response identified some errors in the noise modelling assumptions and output for this application (V007) and therefore included updated modelling results and source files which also now included the V006 activities. The revised modelled rating noise levels for the variation V006 permitted activities plus those in this V007 application are not as low as in the submitted application (for V007 activities alone) but in all cases except Newton Avenue they are still below the current background and are therefore unlikely to give rise to complaints. In the Newton Avenue location the total rating noise is 2dB above the background indicating marginal significance in the likelihood of complaints under BS4142 methodology.

We carried out an analysis of sensitivity to the modelling assumptions and input values assuming worst case conditions such as:-

- Using our own 2m resolution terrain data.
- Adding in a 5dB rating noise feature penalty for tonal characteristics.
- Assuming non-absorbing ground.
- Using our own interpretation of the background noise at weekend night time levels.
- Including modelling of noise from operations permitted by the previous variation V006 (June 2014) in the West bank building which are not yet operational.

Although we do not fully agree with the details of the updated noise modelling submitted, we agree with the applicant's conclusion that the additional noise associated with the VIM furnace is very unlikely to lead to complaints.

The submitted electronic modelling files include the noise from the West bank building operations (permitted under V006) but accompanying BS4142 impact assessment report does not. It also stated that the new vacuum pumps will be designed so as not to have a tonal noise component but then presented frequency spectrum evidence from existing site fans that appeared to show just such a high frequency tone.

A second Schedule 5 notice was used to request an updated and complete BS4142 assessment and justification of the belief that the air blast coolers will not have a tonal component detectable at the nearest off-site receivers.

The revised BS4142 assessment based on the worst case of fans running at 100%, 5dB tonal characteristic penalty included (application V007) , plus West Bank building operations as permitted in June 2014 (V006) is acceptable (largest predicted LA_{eq} excess over background LA_{90} is +2dB at Newton Avenue). Evidence was also provided that the 8kHz frequency spectrum spike is not present in several other monitoring cycles and is therefore not

attributed to the existing fans. So there is no reason to assume that it will be present in the new equipment . Expected tonal component at low frequency from fan blades was discussed and shown not to be significant in the suppliers data.

Annex 1: decision checklist

This document should be read in conjunction with the application, supporting information and notice.

| Aspect considered | Justification / Detail | Criteria met |
|--|---|--------------|
| | | Yes |
| Receipt of submission | | |
| Confidential information | A claim for commercial or industrial confidentiality has not been made. | ✓ |
| Consultation | | |
| Scope of consultation | The consultation requirements were identified and implemented. The decision was taken in accordance with RGN 6 High Profile Sites, our Public Participation Statement and our Working Together Agreements. | ✓ |
| Responses to consultation, and web publicising | The web publicising, consultation responses (Annex 2) were taken into account in the decision. The decision was taken in accordance with our guidance. | ✓ |
| The facility | | |
| The regulated facility | This variation does not involve a change to the area of the installation. After confirmation of the final intended capacity of the Vacuum Induction Furnace in the Schedule 5 Qu1, the scheduled activity 2.1 Part A(2) (d) Casting ferrous metals at foundry with production capacity greater than 20 tonnes per day has been added to Table 1.1.1. | ✓ |
| European Directives | | |
| Applicable directives | All applicable European directives have been considered in the determination of the application. | ✓ |
| The site | | |
| Extent of the site of the facility | The operator has provided a plan which we consider is satisfactory, showing the extent of the site of the facility including new discharge point to air SA23. A plan is included in the permit and the operator is required to carry on the permitted activities within the site boundary. | ✓ |

| Aspect considered | Justification / Detail | Criteria met |
|---|---|--------------|
| | | Yes |
| Site condition report | The changes in this fixed fee substantial variation do not require the submission of a site condition report. | ✓ |
| Biodiversity, Heritage, Landscape and Nature Conservation | <p>The application is within the relevant distance criteria of a site of heritage, landscape or nature conservation, and/or protected species or habitat .</p> <p>South Pennine Moors Special Area of Conservation, Special Protection Area - Peak District Moors (South Pennine Moors Phase 1) SSSI's - Wharnccliffe Crags Local Nature sites - Wharnccliffe Heath, Town End Common Local Wildlife Sites - Black Moor Common, Forge Rocher and Tin Mill Rocher Ancient Woodlands – Ewden Wood, Sheephouse Wood, River Don Wood West, Huthwaite Wood, Green Lane Spring, Dean Wood, Hey Crook Common, Forge Rocher Wood, Wind Hill Wood, Oakenshaw Spring, Stones Wood, Wier Wood, New hall Wood.</p> <p>We have carried out an audit of the applicant's modelling of the proposed changes to emissions to air. Whilst we do not agree with all the calculated values, modelling parameters and methods we do agree with the overall conclusion that there will not be a significant impact on statutory and non-statutory habitat sites.</p> <p>We have not formally consulted on the application because we consider that the changes associated with the variation will not affect the above habitats sites.</p> | ✓ |
| Environmental Risk Assessment and operating techniques | | |
| Environmental risk | <p>We have reviewed the operator's assessment of the environmental risk from the facility. We agree with the screening conclusions that no further consideration was needed for:</p> <ul style="list-style-type: none"> • Accidents. • Fugitive emissions. The driers and preheaters will vent into the building. This is covered by assessment and reporting required in existing condition 4.1.5. • Controlled released to surface water. | ✓ |

| Aspect considered | Justification / Detail | Criteria met |
|--|--|--------------|
| | | Yes |
| | <p>Maintenance drain down of cooling water systems and emergency water will be discharged to drains leading to Outlet 8 Water Treatment Plant and from there will be discharged at existing point W3. This will be an infrequent occurrence and no new substances are introduced by this variation.</p> <ul style="list-style-type: none"> • Global warming potential. The applicant has stated that the additional impact from the combustion of approximately 4000-5000m³ extra natural gas per week in the driers and preheaters will be addressed in the EU ETS permit. • Site Waste. The majority of the waste types are already generated elsewhere on site. All new waste streams are already managed in the larger business so existing waste management routes can be used. • Loss of containment Liquid storage areas will be banded. Hydraulic power packs and valve stands will have drip trays. The plant is designed to minimise the risk of molten metal break out. • Resource efficiency. The changes in this variation are all addressed in existing energy efficiency procedures. <p>For assessment of Emissions to Air and Noise impacts see Key Issues above.</p> | |
| Operating techniques | <p>We have reviewed the techniques used by the operator and compared these with the relevant guidance notes where applicable.</p> <p>The relevant sections of the application and the response to the Schedule 5 notice, where they relate to the Vacuum Induction Melting furnace scheme, are included in the operational techniques Table 2.3.1</p> | ✓ |
| The permit conditions | | |
| Use of conditions other than those from the template | <p>Based on the information in the application, we consider that we do not need to impose conditions other than those in our permit template, which was developed in consultation with industry having regard to the relevant legislation.</p> | ✓ |

| Aspect considered | Justification / Detail | Criteria met |
|-------------------------------|---|--------------|
| | | Yes |
| | Updating consolidation only. | |
| Noise alternative conditions | <p>Although we have asked for additional information and clarification about sources and propagation noise from the site and have carried out a detailed review of the applicant's noise modelling and resulting impact assessment, we have concluded that there will not be an unacceptable increase in noise level at the residential properties to the south of the site.</p> <p>We therefore do not think it is necessary to impose additional noise conditions beyond the existing conditions 2.9.1 (noise related operational techniques) and 2.9.2 (Noise minimisation and maintenance of a Noise Management Plan).</p> <p>See Key Issues above.</p> | ✓ |
| Raw materials | The intended range of types of input for the Vacuum Induction Furnace were included in the application and have been referenced in the Raw Materials table 2.2.1. | ✓ |
| Waste types | There have been no changes to the permitted waste and revert material types and their storage as a result of this variation. | ✓ |
| Improvement conditions | Based on the information on the application, we have imposed confirmatory particulate monitoring covering a full melt cycle during commissioning of the Vacuum Annealing Furnace | ✓ |
| Incorporating the application | <p>We have specified that the applicant must operate the permit in accordance with descriptions in the application, including all additional information received as part of the determination process.</p> <p>These descriptions are specified in the Operating Techniques table in the permit.</p> | ✓ |
| Emission limits | <p>We have decided that emission limits should be set for the parameters listed in the permit including the new emission point to air SA23.</p> <p>See Key Issues above</p> | ✓ |
| Monitoring | We have decided that monitoring should be carried out for the parameters listed in the permit, using the methods detailed and to the frequencies specified, including for the | ✓ |

| Aspect considered | Justification / Detail | Criteria met |
|-------------------------------|---|--------------|
| | | Yes |
| | <p>new emission point to air SA23</p> <p>See Key Issues above</p> | |
| Reporting | <p>We have specified reporting in the permit, including for the new emission point to air SA23.</p> <p>See Key Issues above.</p> | ✓ |
| Operator Competence | | |
| Environment management system | <p>There is no known reason to consider that the operator will not have the management systems to enable it to comply with the permit conditions. The decision was taken in accordance with RGN 5 on Operator Competence.</p> | ✓ |

Annex 2: Consultation and web publicising responses

Consultation requests were sent to the Local Authority Public Health Department; Food Standards Agency; Health and Safety Executive and Public Health England. The decision was taken in accordance our Working Together Agreements.

The application was publicised on our website until 10th September 2014

Summary of responses to consultation and web publication and the way in which we have taken these into account in the determination process.

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| Response received from |
| Public Health England (Environmental Hazards and Emergencies Department – Centre for Radiation, Chemical and Environmental Hazards) |
| Brief summary of issues raised |
| Public Health England has no significant concerns around particulate and metals emissions in this application provided the applicant takes all appropriate measures to prevent or control pollution in accordance with the relevant sector guidance and industry best practice. |
| Summary of actions taken or show how this has been covered |
| The commitment in the application to operational techniques that will ensure appropriate measures is included in the permit through reference in Table 2.3.1 Operational Techniques. |

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| Response received from |
| Health and Safety Executive |
| Brief summary of issues raised |
| The HSE stated that its role as a statutory consultee should be restricted to major hazard sites and licensed nuclear sites only. |
| Summary of actions taken or show how this has been covered |
| This is not a major hazard site. |

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| Response received from |
| Sheffield Council Environmental Health Department |
| Brief summary of issues raised |
| No issues raised |
| Summary of actions taken or show how this has been covered |
| No action required. |