

**Report 2  
Environmental  
Risk Assessment**

**HAA MATERIALS  
RECYCLING FACILITY  
PORT TALBOT  
STEELWORKS**

*Report Number 1514r2v1d0216*

*Commissioned by*  
Tata Steel UK Limited  
PO Box 108  
Port Talbot Works  
Port Talbot  
SA13 2NG

*Prepared by*  
Geotechnology Ltd  
Ty Coed  
Cefn-yr-Allt  
Aberdulais  
SA10 8HE



**February 2016**

---

# Table of Contents

---

|          |                                                  |           |
|----------|--------------------------------------------------|-----------|
| <b>1</b> | <b>INTRODUCTION</b>                              | <b>1</b>  |
| 1.1      | Background                                       | 1         |
| 1.2      | Context of Proposed Activities                   | 1         |
| <b>2</b> | <b>PROPOSED ACTIVITIES</b>                       | <b>2</b>  |
| 2.1      | Responsibility                                   | 2         |
| 2.1      | Acceptable Wastes                                | 2         |
| 2.2      | Operating Techniques                             | 3         |
| 2.2.1    | Production of Aggregates under Quality Control   | 5         |
| 2.2.2    | Metal Separation and Recovery                    | 7         |
| 2.3      | Waste Quantities                                 | 7         |
| 2.4      | Access and Egress                                | 7         |
| 2.5      | Site Infrastructure and Layout                   | 8         |
| 2.6      | Drainage                                         | 8         |
| 2.7      | Technical Ability                                | 8         |
| 2.8      | Management Systems and Toolkit                   | 8         |
| <b>3</b> | <b>ENVIRONMENTAL SETTING</b>                     | <b>9</b>  |
| 3.1      | Location                                         | 9         |
| 3.2      | Ground Conditions                                | 9         |
| 3.3      | Groundwater                                      | 9         |
| 3.4      | Surface Water                                    | 10        |
| 3.5      | Flood Potential                                  | 10        |
| 3.6      | Air Quality                                      | 10        |
| 3.7      | Sensitive Land Uses                              | 10        |
| 3.7.1    | Margam Moors SSSI                                | 11        |
| 3.7.2    | Eglwys Nunydd                                    | 11        |
| 3.7.3    | Kenfig National Nature Reserve                   | 12        |
| 3.8      | Human Receptors                                  | 12        |
| <b>4</b> | <b>ASSESSMENT METHODOLOGY</b>                    | <b>13</b> |
| 4.1      | Approach                                         | 13        |
| 4.2      | Identification and Evaluation of Potential Risks | 13        |
| 4.2.1    | Consequence of Impact                            | 14        |
| 4.2.2    | Probability of Impact                            | 14        |
| 4.2.3    | Presentation of Plausible Risks                  | 17        |
| 4.2.4    | Cumulative Impacts                               | 18        |
| 4.3      | H1 Assessment                                    | 18        |
| <b>5</b> | <b>FOCUSSING THE ASSESSMENT</b>                  | <b>19</b> |
| 5.1      | Site Context                                     | 19        |
| 5.2      | Evaluation of Hazards                            | 19        |
| 5.3      | Evaluation of Receptors                          | 22        |
| 5.4      | Evaluation of Pathways                           | 23        |
| <b>6</b> | <b>EVALUATION OF RISKS</b>                       | <b>25</b> |
| 6.1      | Release of Airborne Particulates                 | 25        |
| 6.1.1    | Evaluation of Cumulative Impacts                 | 28        |

---

|          |                                         |           |
|----------|-----------------------------------------|-----------|
| 6.2      | Release of Polluting Fluids             | 28        |
| 6.2.1    | Evaluation of Cumulative Impacts        | 29        |
| 6.3      | Noise and Vibration                     | 30        |
| 6.3.1    | Cumulative Impact                       | 31        |
| 6.4      | Visual Landscape                        | 32        |
| 6.5      | Primary Resources                       | 32        |
| 6.6      | Other Aspects                           | 33        |
| 6.6.1    | Odour                                   | 33        |
| 6.6.2    | Flooding                                | 34        |
| 6.6.3    | Energy Consumption and Emissions to Air | 34        |
| 6.6.4    | Raw Materials Usage                     | 34        |
| 6.6.5    | Production of Waste                     | 35        |
| 6.7      | Summary                                 | 43        |
| <b>7</b> | <b>OUTPUT FROM ASSESSMENT</b>           | <b>44</b> |
| 7.1      | Link to Documented Management System    | 44        |
| 7.2      | Monitoring Plan                         | 44        |
| <b>8</b> | <b>SUMMARY AND CONCLUSIONS</b>          | <b>45</b> |

---

## List of Tables

---

|            |                                                                                                         |    |
|------------|---------------------------------------------------------------------------------------------------------|----|
| Table 1-1  | Application Details                                                                                     | 1  |
| Table 2-1  | List of Wastes to be Accepted                                                                           | 2  |
| Table 2-2  | Proposed Waste Processing Activities                                                                    | 3  |
| Table 2-3  | Relevant Standards and Specifications                                                                   | 7  |
| Table 4-1  | Criteria for evaluation of the consequence of possible impacts                                          | 15 |
| Table 4-2  | Criteria for evaluation of the likelihood of possible impacts                                           | 16 |
| Table 4-3  | Overall consequence and likelihood ratings                                                              | 16 |
| Table 4-4  | Matrix used to determine overall significance of potential impact                                       | 17 |
| Table 4-5  | Explanation and interpretation of significance ratings for impacts remaining after mitigation           | 17 |
| Table 5-1  | Key Hazards Screening Matrix                                                                            | 20 |
| Table 5-2  | Receptor Screening Matrix                                                                               | 23 |
| Table 5-3  | Plausible Exposure Pathway Screening                                                                    | 24 |
| Table 6-1  | Assessment of potential impact of airborne particulates on identified human receptors                   | 26 |
| Table 6-2  | Assessment of potential impact of airborne particulates on identified livestock in Margam Moors         | 27 |
| Table 6-3  | Assessment of potential impact of airborne particulates on flora and fauna at Margam Moors SSSI         | 28 |
| Table 6-4  | Assessment of potential risks to surface water and groundwater                                          | 29 |
| Table 6-5  | Assessment of potential impact of noise and vibration on identified human receptors                     | 30 |
| Table 6-6  | Assessment of potential impact of noise and vibration on livestock in Margam Moors                      | 31 |
| Table 6-7  | Assessment of potential impact of noise and vibration on Protected Flora and Fauna at Margam Moors SSSI | 31 |
| Table 6-8  | Assessment of potential impact on visual landscape                                                      | 32 |
| Table 6-9  | Assessment of positive impact on primary resource consumption                                           | 33 |
| Table 6-10 | Evaluation of Potential Impacts from Particulate Matter                                                 | 36 |
| Table 6-11 | Evaluation of Potential Impacts from Litter and Pests                                                   | 37 |
| Table 6-12 | Evaluation of Potential Impacts from Odour, Noise and Vibration                                         | 38 |
| Table 6-13 | Evaluation of Potential Impacts from Vandalism and Fire                                                 | 39 |
| Table 6-14 | Evaluation of Potential Impacts of Flooding                                                             | 40 |
| Table 6-15 | Evaluation of Potential Impacts on Surface Water                                                        | 41 |
| Table 6-16 | Evaluation of Potential Impacts on Groundwater                                                          | 42 |

---

## List of Flowcharts

---

|               |                                            |
|---------------|--------------------------------------------|
| Flowchart 2-1 | Proposed Activities                        |
| Flowchart 2-2 | Typical Processing of Slag Based Waste     |
| Flowchart 2-3 | Typical Processing of Concrete Based Waste |

---

## List of Figures

---

1. Site Plan
2. Proposed Site Layout and Access
3. Location of Key Receptors

## List of Appendices

---

1. Criteria for Steel Quality Protocol

---

# 1 INTRODUCTION

## 1.1 Background

Geotechnology has been commissioned by Tata Steel (UK) Ltd (Tata) to prepare a Permit Variation application for submission to Natural Resources Wales (NRW) for a proposed waste materials recycling facility at Port Talbot Steel Works, Port Talbot. The details of the application are summarised in Table 1-1 and the site location is shown on Figure 1.

**Table 1-1 Application Details**

|                                |                                                                                  |
|--------------------------------|----------------------------------------------------------------------------------|
| <b>Name of the Applicant</b>   | Tata Steel UK Ltd                                                                |
| <b>Activity Address</b>        | HAA Materials Recycling Facility<br>Port Talbot Works<br>Port Talbot<br>SA13 2NG |
| <b>Permit Number</b>           | EPR/BL7108IM                                                                     |
| <b>National Grid Reference</b> | 278000 185670                                                                    |

The development proposals seek to utilise previously developed land, known as the HAA, within the Steel Works installation boundary as shown on Figure 1. The proposals would enable Tata to receive and process waste on hardstanding to enable recovery and recycling.

As part of the Permit application Tata is required to describe the environmental risks posed by the proposals. The objective of this Environmental Risk Assessment (ERA) is to therefore establish the risks, if any, the proposed waste activities pose to the environment, human health or amenity issues of concern.

## 1.2 Context of Proposed Activities

This assessment adopts the principles underlying the H1 Environmental Risk Assessment approach set out by NRW. In this context, the digital H1 software tool, which has been developed to help consistently quantify the impact of proposed releases from regulated activities, has been used as a method of quantifying potential impacts on human and ecological receptors. The impacts are also described using a series of risk matrices, similar to those used by NRW for Standard Rules Permits and which form the cornerstone of ISO 14001 Environmental Management Systems. This latter approach is particularly valid at this site as the proposed operations and pollution control measures are the same as those considered acceptable by NRW under a range of Standard Rules Permits underpinned by generic risk assessments and the facility would be operated in accordance with a documented management system that will ultimately be accredited to ISO 14001. Within this context, the proposed activities could be considered conventional and the associated environmental risks familiar to NRW as they are the same as those proposed in several Standard Rules for materials recycling facilities.

## 2 PROPOSED ACTIVITIES

### 2.1 Responsibility

In accordance with RGN1, Tata will be the legal organisation with control over the operation of the HAA. Tata will hold the Permit but employ a contractor to undertake the activities via clear contractual arrangements. Tata will employ a contractor who, on behalf of Tata, will be contracted to operate the HAA in accordance with a written management system that identifies and minimises risks of pollution, including those arising from operations, maintenance, accidents, incidents, non-conformances, closure and those drawn to the attention of the operator as a result of complaints.

### 2.1 Acceptable Wastes

The proposed HAA Waste Management Facility will primarily accept waste generated by Tata. However, Tata also want the HAA to accept listed wastes from the open market outside the Tata Installations.

Following processing at the HAA, Tata would primarily produce recovered aggregate, either for use within the steelworks or supplied to schemes outside the steelworks provided relevant Quality Protocols are satisfied. Other wastes may be recycled into the steel making process.

Tata will only accept the waste types listed in Table 2-1 provided they are listed in the Permit issued by NRW. Tata will operate a rigorous documented management system that includes waste acceptance procedures and Factory Production Control. As the bulk of the wastes will be generated by Tata, the controls will extend to the source limiting the opportunity for wastes which are not acceptable to be delivered to site.

**Table 2-1 List of Wastes to be Accepted**

| EWC Code | Description of Wastes to be Accepted                                                                                                                                             | Anticipated Outputs from HAA following processing | Entry Type |
|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|------------|
| 01 04 08 | Waste gravel and crushed rocks other than those mentioned in 01 04 07 may include excavation from mineral workings                                                               | Recovered as Aggregate                            | MN         |
| 01 04 09 | Waste sand only                                                                                                                                                                  | Recovered as Aggregate                            | AN         |
| 10 11 03 | Waste glass-based fibrous materials allowed only if: Wastes without organic binders                                                                                              | Recovered as Aggregate                            | AN         |
| 15 01 07 | Glass packaging                                                                                                                                                                  | Recovered as Aggregate                            | AN         |
| 17 01 01 | Concrete (excluding concrete slurry)                                                                                                                                             | Recovered as Aggregate                            | MN         |
| 17 01 02 | Bricks                                                                                                                                                                           | Recovered as Aggregate                            | MN         |
| 17 01 03 | Tiles and ceramics                                                                                                                                                               |                                                   | MN         |
| 17 01 07 | Mixtures of concrete, bricks, tiles and ceramics other than those mentioned in 17 01 06                                                                                          | Recovered as Aggregate                            | MN         |
| 17 02 02 | Glass (Must not include fibreglass or glass fibre)                                                                                                                               | Recovered as Aggregate                            | MN         |
| 17 03 02 | Bituminous mixtures                                                                                                                                                              | Recovered as Aggregate                            | MN         |
| 17 05 04 | Soil and stones other than those mentioned in 17 05 03<br>Must not contain any contaminated soil or stone from contaminated sites.                                               | Recovered as Aggregate                            | MN         |
| 17 05 06 | Dredging spoil other than those mentioned in 17 05 05 allowed only if:<br>Inert aggregate from dredgings.<br>Must not contain contaminated dredgings.<br>Must not contain fines. | Recovered as Aggregate                            | MN         |
| 17 05 08 | Track ballast other than those mentioned in 17 05 07                                                                                                                             | Recovered as Aggregate                            | MN         |
| 17 09 04 | Mixed construction and demolition waste comprising granular material                                                                                                             | Recovered as Aggregate                            | MN         |
| 19 12 05 | Glass Does not include glass from cathode ray tubes.                                                                                                                             | Recovered as Aggregate                            | AN         |
| 19 12 09 | Minerals (for example sand, stones)                                                                                                                                              | Recovered as Aggregate                            | AN         |
| 20 01 02 | Glass Must not include fibreglass.                                                                                                                                               | Recovered as Aggregate                            | AN         |
| 20 02 02 | Garden and park wastes (including cemetery waste) – soil and stones<br>Must not contain contaminated stones from garden and parks waste.                                         | Recovered as Aggregate                            | AN         |
| 16 11 04 | Refractory                                                                                                                                                                       |                                                   | MN         |
| 10 02 01 | Waste from the processing of blast furnace slag / steel slag                                                                                                                     | QP Steel slag                                     | AN         |
| 10 02 02 | Unprocessed blast furnace slag / steel slag                                                                                                                                      | QP Steel slag                                     | AN         |
| 10 02 99 | Slab yard refuse                                                                                                                                                                 | Recycled back into process                        | AN         |
|          | Iron ore refuse                                                                                                                                                                  | Recycled back into process                        | AN         |
| 19 03 05 | stabilised wastes other than those mentioned in 19 03 04                                                                                                                         |                                                   | AN         |
| 19 03 07 | solidified wastes other than those mentioned in 19 03 06                                                                                                                         |                                                   | AN         |

## 2.2 Operating Techniques

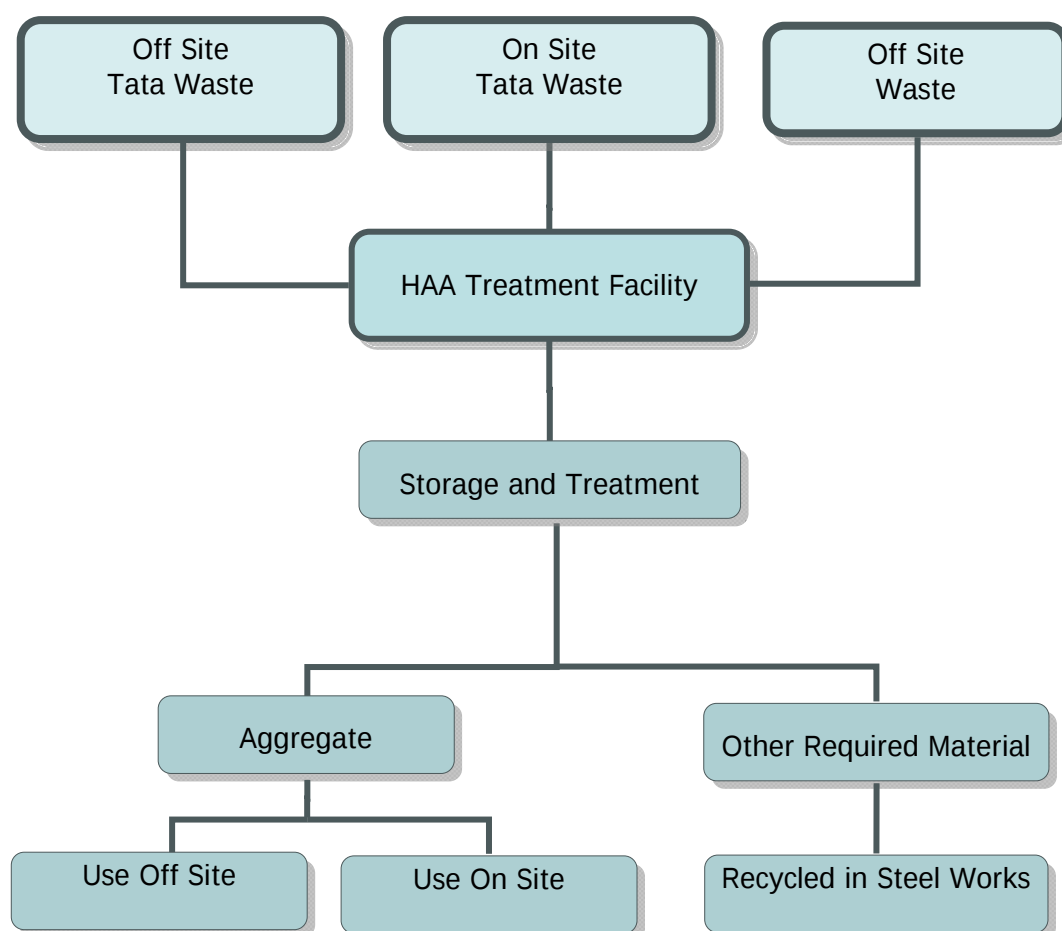
At the site, the waste will be temporarily stored and processed according to the techniques summarised in Table 2-2. In the second column of Table 2-2 are the suggested process limitations.

**Table 2-2 Proposed Waste Processing Activities**

| Proposed Recovery and Disposal Codes applicable at the Site                                                                                                                                                                                                                                                  | Indicative Description of Proposed Activities                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>R13:</b> Storage of wastes pending the operations numbered R3 and R5.<br><b>R3:</b> Recycling or reclamation of organic substances which are not used as solvents.<br><b>R4:</b> Recycling/reclamation of metals and metal compounds<br><b>R5:</b> Recycling or reclamation of other inorganic materials. | Treatment of listed wastes consisting only of sorting, separation, screening, crushing and blending of waste for recycling internally or recovery as a soil, soil substitute or aggregate.<br>Secure storage of listed wastes pending treatment.<br>Storage of wastes shall not exceed 150,000 tonnes in total at any one time.<br>No more than 300,000 tonnes of waste shall be treated per year.<br>Where disposal is required, this will be undertaken in accordance with Duty of Care and legal requirements. |

A process flow chart summarising the proposed activities is provided below.

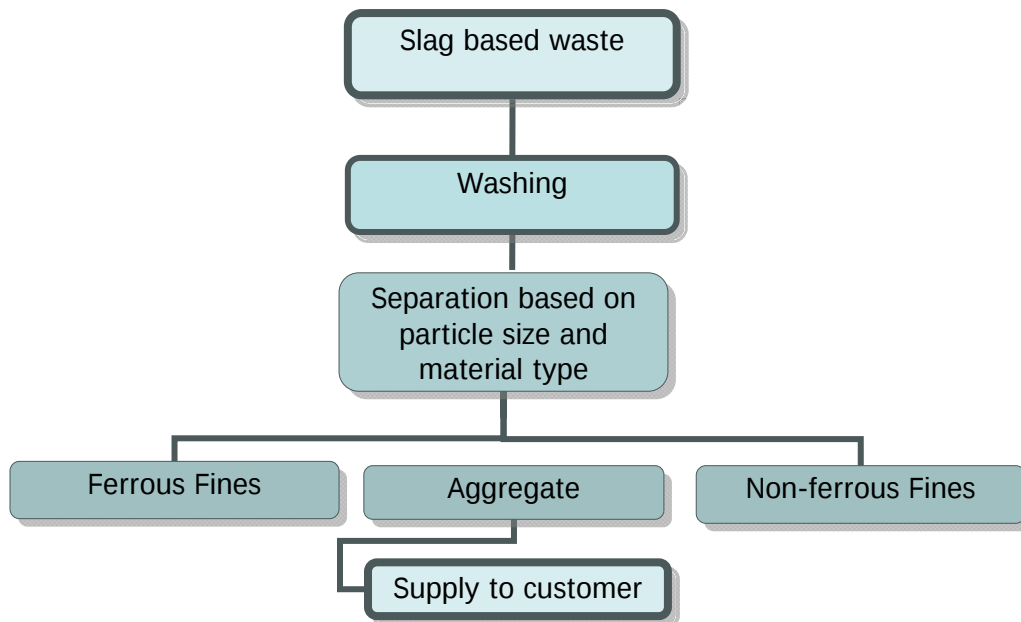
**Flowchart 2-1 Proposed Activities**



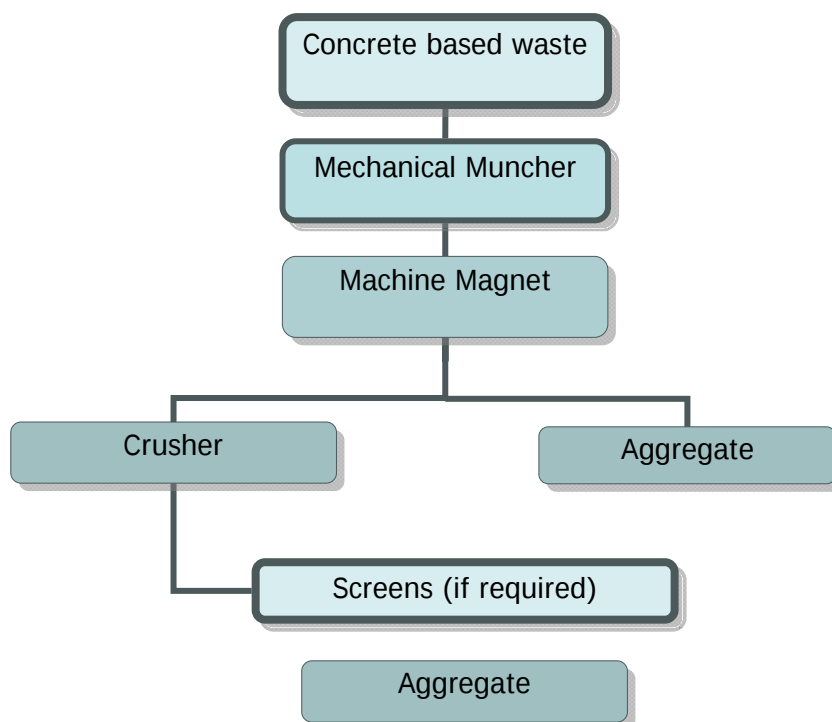
---

The treatment processes at the HAA will utilise conventional plant to separate, screen and crush the wastes, where required, to produce aggregates comprising different particle sizes. The overall process for slag based wastes and concrete/mixed demolition based wastes is provided in the two process flow diagrams provided in Flowcharts 2-2 and 2-3. Some materials may simply need to be screened.

**Flowchart 2-2 Typical Processing of Slag Based Waste**



**Flowchart 2-3 Typical Processing of Concrete Based Waste**



---

Screening and crushing will involve the use of proprietary mobile plant supported by front loading shovels and 20T excavators.

The set-up of the screen and crusher creates a number of processing options with respect to the process flowcharts. This is because the screen and crusher allow variable sized material to be produced depending upon the jaw dimension and screen sizes used. This process is partly dependent on the input oversize materials but also on customer requirements. Materials such as heavily reinforced concrete may also sometimes require reprocessing to achieve the final aggregate grading.

In some instances, aggregates produced at the HAA, such as washed and screened mineral sand, will be taken directly back into the steelmaking process for use in the sinter plant. In this context, the sand must satisfy the input requirements of the steelmaking process rather than aggregate standards. All wash water is kept within the close loop system.

### **2.2.1 Production of Aggregates under Quality Control**

Tata intends to produce aggregates i.e. granular materials, in accordance with the *WRAP Quality Protocol for the Production of Aggregates from Inert Waste*. The aggregates will primarily be used in construction, either on-site or off-site. For the avoidance of doubt, clays and soils are not considered to be aggregates and so will not be subject to the Quality Protocol. The production will be subject to Factory Production Control.

The production of aggregates will involve size reduction and sorting, where necessary, of the acceptable wastes to produce aggregates that meet the Standards and Specifications set out in the Quality Protocol. Some materials may not require processing to meet the Standards and Specifications or the requirements of customers holding relevant Permits, Exemptions of Cl:aire Code of Practice declarations.

The precise range of aggregates will be dependent upon demand and will be controlled by altering the way in which the waste is processed. To demonstrate that aggregate has been produced, a rigorous testing regime will be in place in accordance with the requirements of the protocol.

The processing of the material will primarily involve screening and crushing coupled with an over band magnet to remove ferrous metals. An eddy current separator may also be used to selectively remove non-ferrous components.

In accordance with the site management system, all plant will be subject to a proactive preventative maintenance plan. The plant will be fitted with integral dust and noise suppression in accordance with prevailing Health and Safety requirements.

Following the processing, virtually all ferrous metal will have been recovered from the waste and a series of size graded stockpiles of aggregate will be available to be tested and used.

In addition to the WRAP QP, the Environment Agency has more recently published a series of Quality Protocols (QPs) which outline when a waste derived material can be regarded as a non-waste product and no longer subject to waste controls. One of these QPs is titled *Aggregate from waste steel slag (Steel QP)*. If an operator can demonstrate that their production of aggregates meets the standard set out in the Steel QP, and the rules for all QPs, then the aggregates may be regarded as fully recovered and no longer subject to waste controls. A copy of the QP for the production of aggregate from steel slag and the set

---

of rules all QP's must satisfy is provided in Appendix 1. Tata will, therefore, also propose aggregate from steel slag in accordance with this QP.

For operators to benefit from WRAP and Steel QPs operators must:

- use only the correct waste as feedstocks
- make only the permitted products
- comply with the relevant European standard, specification and quality controls for the product being manufactured with all required tests being met and the aggregate needing no further treatment, weathering or size reduction before use
- have a manual of Factory Production Control (FPC)
- have marked the product to the CE requirements of the Construction Products Regulations
- transport, store, handle and process the wastes and the final product following good practice guidelines
- supply the customer with delivery documents confirming the product meets the quality protocol

BS EN 13242:2013 *Aggregates for unbound and hydraulically bound materials for use in civil engineering work and road construction* specifies a Factory Production Control system to ensure that aggregates for unbound applications conform to the relevant requirements of the standard. PD6682-6 provides further guidance for UK users of BS EN 13242.

In the UK, the required level of attestation of conformity to European Standards for aggregates is 4 (with the exception of aggregates for use in skid-resistant surfacing's). This means that the aggregate producer must operate a "first party" system of FPC following initial type testing. Certification and surveillance by notified accreditation bodies ("third parties") is not required. Factory Production Control for the production of aggregates is specified in BS EN 16236 *Evaluation of conformity of aggregates — Initial Type Testing and Factory Production Control*, although this is currently withdrawn as technical changes are required.

Tata will ensure that the aggregates produced at the HAA are done so in accordance with a FPC that provides a record of all policies and methods for managing the waste material - from waste arriving at the HAA, through to storage, processing, transport, and delivery of quality protocol approved products. The FPC will essentially be a management system focussed on the production process which aims to ensure that product quality is consistently maintained to the required specifications. Evidence of its adoption and implementation will be achieved through scheduled controls and tests on measuring equipment, raw materials and constituents, processes, machines and manufacturing equipment and finished products, including material properties in products. Most importantly, the system will provide evidence for conformity assessment and for the management of non-conforming products.

Typical end uses for the aggregates are summarised in Table 2-3.

---

**Table 2-3 Relevant Standards and Specifications**

| Typical End Uses                     | Relevant Testing Standard | Application Specification                       |
|--------------------------------------|---------------------------|-------------------------------------------------|
| <b>Unbound aggregate</b>             |                           |                                                 |
| Pipe bedding, drainage               | BS EN 13242               | Highway Works series 500                        |
| Granular fill, general fill, capping | BS EN 13242               | Highway Works series 600 and BS EN 13285        |
| Sub base                             | BS EN 13242               | Highway Works series 800 and BS EN 13285        |
| <b>Semi-bound aggregate</b>          |                           |                                                 |
| Surface dressing                     | BS EN 13043               | Highway Works series 900                        |
| <b>Bound aggregate</b>               |                           |                                                 |
| for concrete                         | BS EN 12620               | Highway Works series 1000 and BS 8500-2         |
| for asphalt                          | BS EN 13043               | Highway Works series 900                        |
| for hydraulically bound mixtures     | BS EN 13242               | Highway Works series 800 and BS EN 14277-1 to 5 |
| for use in bituminous mixtures       | BS EN 13108-8             | Highway Works series 900 and BS EN 13108-1 to 5 |

### 2.2.2 Metal Separation and Recovery

During the production of aggregates small amounts of ferrous metals will be removed by magnets built into the screens/shredders. The metal will be temporarily stockpiled before transferred for recovery in the steel works.

## 2.3 Waste Quantities

Tata wish to process up to 300,000 tonnes/year at the HAA facility. The waste streams will be dominated by steel slag.

## 2.4 Access and Egress

The majority of the waste to be accepted at the site will come from sources on site at Port Talbot and will arrive via the existing site roads and in accordance with existing site rules. On this basis, Tata will have close control over waste classification and source segregation. Tata will also be able to influence the way in which the wastes are handled and transported. The intention is that most wastes will be segregated, sorted and processed at source, where possible, to minimise the processing required at the HAA. Wherever possible, Tata will also aim to ensure that return vehicle movements take processed aggregate back to the relevant construction projects minimising vehicular movements.

At present, the site benefits from unrestricted vehicular access to the site (i.e. in terms of the site being accessed at any time of the day/night, by any category of vehicle) from the Tata site roads. However, under normal operations the site will operate between 07:00 and 16:30 and deliveries will be restricted to occur between these times. The site will not accept waste or operate outside of these hours.

As part of the proposals, vehicles from outside the works will also need to gain access to the facility during operational hours only. Such deliveries will be required to enter and exit the site via the secure and manned existing vehicular access point and then follow the existing Works Deliveries instructions used by all deliveries to the steel works. This will involve reporting to the Security Gatehouse and registering the delivery. External waste would typically be delivered to site using eight wheeler 20t lorries.

---

## **2.5 Site Infrastructure and Layout**

The site benefits from a stable hardstanding platform capable of supporting the proposed operation. Upon entry to the site each vehicle will pass over a weighbridge for weighing before being directed to the relevant stockpile or processing area. The proposed site layout is shown on Figure 2.

## **2.6 Drainage**

The site currently benefits from permeable hardstanding placed as part of the previous uses of the HAA area.

## **2.7 Technical Ability**

Tata recognises that to operate under a Permit, trained and competent staff are required. On this basis, the appointed sub-contractor will employ personnel who hold the relevant WAMITAB certification.

## **2.8 Management Systems and Toolkit**

Tata will operate the recycling facility in accordance with the 'How to comply' guidance and will continually review the site Environmental Management System and procedures to ensure the operation is based on sound current environmental practice. Most importantly, this Environmental Risk Assessment will be routinely reviewed to ensure the predictions are valid, control measures are adequate and current and the environment remains protected.

---

## 3 ENVIRONMENTAL SETTING

### 3.1 Location

The Port Talbot steel works site is known to have had a long and diversified industrial history with coke, iron and steel making processes being undertaken over a period extending hundreds of years and as such there is a diverse and complex contaminant history.

Specifically, the area occupied by the HAA was historically used as part of the former adjacent Grange Coke Ovens and comprises a vacant level platform of made ground, primarily constructed from granular slag and coal / coke residues. The site therefore currently benefits from a hardstanding that provides a compact solid surface capable of withstanding the proposed operation.

### 3.2 Ground Conditions

Intrusive investigation of the surrounding areas has identified made ground extends to depths of approximately 7.0m and comprises loose to dense brownish grey clayey silty fine to coarse sand with much fine to medium angular gravel and rare cobble, consisting of both slag and coal residues. Below the made ground are aeolian sand deposits approximately 2m thick, beneath which are estuarine alluvium in the form of greenish grey silty sand, with some shell fragments encountered. In some areas a peat layer is encountered. In some areas, the made ground directly overlies the alluvium. Glacial drift deposits comprising over-consolidated boulder clay is typically encountered below the alluvium and comprises firm to stiff olive grey very silty clay with much fine to coarse sub-rounded to angular gravel and occasional cobble.

Sufficient archive information from investigations indicates that the geology would essentially comprise the following:

| <u>Stratum</u>                                                    | <u>Thickness(m)</u> |
|-------------------------------------------------------------------|---------------------|
| Made Ground (comprising slag in many areas)                       | 0 – 7               |
| Aeolian Sands                                                     | 0 – 7               |
| Alluvium and Estuarine Alluvium (comprising of clays and gravels) | 3 – 10              |
| Glacial Drift                                                     | 4 - >10             |
| Coal Measures Bedrock                                             |                     |

### 3.3 Groundwater

A silty clay layer is present at relatively shallow depth below the site which acts as an aquitard to groundwater. This clay layer therefore results in a perched upper aquifer in the dune sand together with an underlying deeper aquifer in the alluvial deposits. Given the properties of the geological strata the site is not in Source Protection Zone and previous sampling of the groundwater has revealed a variable range of contaminants relating to the long site history. These contaminants include elevated pH, metals and hydrocarbons. Very shallow hydraulic gradients are observed in both and as a result there is limited contaminant mobility.

---

### **3.4 Surface Water**

In close proximity to the site are several surface water ditches the course of which have been modified by development of the steel works. Currently, these shallow ditches drain to the BOS plant reservoir where the water provides a source of process water used only by the steel works. These ditches are the only significant downstream surface water receptors. Beyond these immediate ditches, which would have originally formed part of Margam Moors the site is surrounded by a sand dune field. Other surface water features in the vicinity of the site comprise the River Kenfig over 1000m to the south, the Margam Moors ditch system some 400m to the south and the Bristol Channel to the west. All of these features are hydraulically upgradient of the HAA site.

The flat lying moors have been managed for centuries for agricultural production by draining the clay soils using a deep network of ditches. The configuration of ditches has been developed to address local ground conditions. The ditches are at their densest along the southern and western edge of the moors where there is a need to drain surface water originating from the pronounced springline. All the ditches feed into the Mother Ditch which flows northward to a single gauged collection point. From here the entire flow of water is abstracted into the works for use as process water. The pumping is carried out after the water discharges over a weir, and therefore pumping cannot affect water levels in the ditches.

### **3.5 Flood Potential**

The HAA is in an area of the steelworks that is at potential risk of flooding (Zone 2 and Zone 3).

### **3.6 Air Quality**

As part of the Permit an extensive air quality monitoring network is in place. The monitoring programme and results are evaluated in accordance with the steel works Air Quality Management Plan.

The detail of the air quality monitoring programme is not repeated here as it is already covered in the Permit.

### **3.7 Sensitive Land Uses**

Three sites of ecological importance lie in close proximity to the site:

- Margam Moors SSSI is 330m to the south
- Eglwys Nunydd Reservoir SSSI which is 660 m to the southeast
- Kenfig National Nature Reserve (KNNR)(a designated SAC) is beyond Margam Moors and is over 1000 to the south in a different hydrological catchment

Livestock graze in Margam Moors and in the fields directly to the south of the HAA.

---

### 3.7.1 Margam Moors SSSI

The northern part of Margam Moors lies approximately 330m from the proposed HAA while the western perimeter is some 40m from the active Morfa Non Hazardous Landfill. Margam Moors is a Site of Special Scientific Interest (SSSI) designated because of the following features:

The mosaic of drainage ditches provides the main interest of the moors and it is principally for this feature that the site was designated as a Site of Special Scientific Interest (SSSI). In a Welsh context only the extensive Wentlooge Levels support a similar assemblage of habitats and species.

Important bird species that have been lost through habitat loss and possibly changes in management include White-fronted Goose *Anser albifrons* (a winter visitor) and Yellow Wagtail *Motacilla flava* (a summer visitor).

The site does still support numerous species of high conservation value including aquatic plants such as Frogbit *Hydrocharis morsus-ranae*, Flowering Rush *Butomus umbellatus*, Cyperus Sedge *Carex pseudocyperus*, Brown Sedge *C. disticha*, Unbranched Bur-reed *Sparganium emersum* and Arrowhead *Sagittaria sagittifolia*. All except the latter were recorded during this survey and were found to be thriving. In addition to the plants a rich assemblage of scarce aquatic invertebrates are known from the moors and a selection of previously recorded and additional species of high conservation value were noted during this survey. Continuous management is required to prevent Common Reed *Phragmites australis* from shading out some of the more sensitive species and many ditches were found to be in need of some management.

Marginal habitats of significance include areas of species-rich mesotrophic marsh. These result from seepage of water from the base of the dunes and support a characteristic suite of species, often with substantial quantities of Yellow Flag *Iris pseudotata* Steel, Meadowsweet *Filipendula ulmaria*, Water Mint *Mentha aquatica*, Ragged Robin *Lychnis flos-cuculi* and Lesser Spearwort *Ranunculus flammula*.

Areas of semi-improved grassland were found to be in a less favourable condition and uncommon species known to have been recorded in the past, e.g. Green-winged Orchid *Orchis morio*, Common Twayblade *Listera ovata* and Cowslip *Primula veris*, were either not recorded at all or were very scarce. An area of dense birch/sallow scrub occurs in the very south of the site. Biodiversity Action Plan species associated with the pastures and ditches include Shrill Carder Bee *Bombus sylvarum*, Brown-banded Carder Bee *B. humilis*, Brown Hare *Lepus europaeus*, Skylark *Alauda arvensis* and Reed Bunting *Emberiza schoeniclus*. The Kingfisher, a schedule 1 species protected under the Wildlife and Countryside Act has also been recorded in the past (Gillham, 1976).

### 3.7.2 Eglwys Nunydd

The works reservoir is the largest sheet of fresh water in the county of Neath Port Talbot and is designated a SSSI. The reservoir is on the site of Margam Moors which, before being reclaimed for the Abbey Steel Works, was a notable site for wildfowl. The reservoir attracts large numbers of wintering waterfowl and passage migrants. Notable species include Great Crested and Little Grebes, Mallard, Gadwall and Coot now breed.

---

### **3.7.3 Kenfig National Nature Reserve**

The northern boundary of Kenfig National Nature Reserve (KNNR) follows the southern bank of Kenfig River which flows to within 40m of the southern edge of Morfa Closed Landfill. The river is over 1000m from the proposed HAA. KNNR is a Special Area of Conservation (SAC).

### **3.8 Human Receptors**

There are no residential properties within 500m of the HAA site boundary. Within this zone are offices, workshops and industrial units where personnel from Tata (and other companies) are located during working hours. The closest point members of the public would be to the HAA is approximately 330m to the south-east on Cefn Gwrgan which is used to access the beach to the west and members of the public also access Margam Moors to the south of the access track.

---

## 4 ASSESSMENT METHODOLOGY

In the following chapters the influence the proposed activities could have on the environment is evaluated.

### 4.1 Approach

Two approaches have been used to assess the risks of the proposed activities. One is based on the EA H1 software tool, which enables a detailed evaluation of identified exposure pathways and the other, more conventional risk assessment, assists in identifying the exposure pathways based on a conceptual site model. This latter is semi-quantitative and based on the approach adopted by NRW in generic risk assessments that accompany Standard Permit applications. The conceptual site model, presented as a matrix, identifies plausible pollution linkages (source-pathway-receptor relationships) and potential impacts to the local environment which could arise as a result of the proposed activities.

This combined approach enables:

- screening out those linkages that are insignificant and don't need detailed assessment
- assessment of potentially significant risks in more detail if needed

The approach has three stages:

- identify risks from the proposed activities
- assess the risks and check that they are acceptable
- justify appropriate measures to control identified risks, if necessary

In the assessment the following aspects have been considered:

- Odour
- Noise and vibration
- Fugitive emissions to air and water – uncontrolled releases such as dust, run-off from operational areas, but not controlled releases from point-sources and problems with mud, pests or litter
- Controlled releases to air
- Controlled discharges to surface waters
- Controlled discharges to ground or groundwater
- Ozone and Global warming potential
- Site waste

### 4.2 Identification and Evaluation of Potential Risks

There are a number of methods and approaches available for assessing the environmental risks potentially posed by a project. To provide a structured framework for assessment across several topic areas, generic assessment criteria have been clearly defined. The assessment of potential impacts has been based on a tabulated conceptual model based upon the standard source (hazard)–pathway–receptor model. The approach enables hazards and receptors to be readily identified and evaluates the pathway via which the human and environmental receptors may be impacted. If a pathway exists that potentially connects the hazard to the receptor then there is a risk that requires evaluation, management and potentially mitigation. If a pathway does not exist there is no risk of

---

impact. This approach has been adopted as it should be acceptable to all stakeholders with the methodology and findings transparent, defensible and repeatable.

For each plausible impact identified, the potential impacts have been classified as positive or negative and the probability and consequence of the event occurring has been evaluated.

In accordance with the concept of risk assessment, each impact has been characterised in terms of the possible consequence and likelihood. These two terms are functions of five sets of criteria which are defined below:

#### **4.2.1 Consequence of Impact**

The consequences of a hazard being realised may be actual or potential harm and is a measure that combines the assessment of:

- Magnitude – the severity of the impact.
- Scale – the geographical extent of influence of the impact.
- Duration – the time period over which the impact will continue to be experienced.

In this assessment the overall consequence of an impact will be rated as very high, high, moderate, low or very low.

#### **4.2.2 Probability of Impact**

Probability of exposure is the likelihood of the receptors being exposed to the hazard. Example definitions:

- Very high – exposure is inevitable with no control measures between source and receptor
- High – exposure is probable: direct exposure likely with no/few barriers between hazard source and receptor;
- Moderate – exposure is fairly probable: feasible exposure possible - barriers to exposure less controllable;
- Low – exposure is unlikely: several barriers exist between hazards source and receptors to mitigate against exposure:
- Very Low – exposure is very unlikely: effective, multiple barriers in place to mitigate against exposure.

For each of these criteria, a rating system has been developed. An explanation of the ratings associated with each of the above criteria are provided in Table 4-1 and Table 4-2. To facilitate a semi-quantitative evaluation of the potential impacts, each criteria has been given a numerical score between 1 and 5. Where there is insufficient data to categorise an impact against the criteria, the impact is assigned an appropriate default value and labelled 'unknown'. In these instances, a conservative approach is adopted and negative impacts are assigned a value of 5, reflecting the theoretical worst case scenario. Positive impacts that cannot be confidently rated against the criteria are assigned a value of 3, reflecting a theoretical mid case.

To obtain the overall **consequence** rating of the potential impact, the numerical values for each criteria (magnitude, scale and duration) are added together. Similarly, to obtain the overall **likelihood** of an impact, the exposure and probability scores are added together. The range of possible values for consequence is therefore 3-15, and the range for likelihood is 2-10.

**Table 4-1 Criteria for evaluation of the consequence of possible impacts**

| Criteria            | Description                                                                                                  | Possible Results |                                                                                                                                                                                                                                           |       |
|---------------------|--------------------------------------------------------------------------------------------------------------|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
|                     |                                                                                                              | Term             | Description                                                                                                                                                                                                                               | Score |
| Magnitude of Impact | An indication of the severity of the impact, either positive or negative                                     | Very High        | Extreme negative effect – Where environmental functions or processes permanently cease<br>Extreme positive effect – Permanently off-sets consumption of natural resources                                                                 | 5     |
|                     |                                                                                                              | High             | Severe negative effect – Where environmental functions or processes are altered to the extent that they temporarily cease<br>Severe positive effect - Temporarily off-sets consumption of natural resources                               | 4     |
|                     |                                                                                                              | Moderate         | Moderate negative effect - the affected environment is altered, but functions continue, albeit in a modified way<br>Moderate positive effect – Consumption of natural resources continues, but a significantly lower quantity is required | 3     |
|                     |                                                                                                              | Low              | Minimal negative effect - affects the environment in such a way that functions and processes are not affected<br>Minimal positive effect - Consumption of natural resources continues, but a large amount is still required               | 2     |
|                     |                                                                                                              | Very low         | Minimal or negligible effect                                                                                                                                                                                                              | 1     |
|                     |                                                                                                              | Unknown          | Magnitude of impact unknown                                                                                                                                                                                                               | 5*    |
| Scale of Impact     | An indication of the geographical extent of the impact, either negative or positive                          | National         | Affects international resources                                                                                                                                                                                                           | 5     |
|                     |                                                                                                              | Regional         | Affects the resources of Wales and the UK                                                                                                                                                                                                 | 4     |
|                     |                                                                                                              | District         | Affects off-site resources within adjacent County Boroughs                                                                                                                                                                                | 3     |
|                     |                                                                                                              | Local            | Affects the project area e.g. local residential and industrial areas                                                                                                                                                                      | 2     |
|                     |                                                                                                              | Site-specific    | Localised, confined to Steel Works                                                                                                                                                                                                        | 1     |
|                     |                                                                                                              | Unknown          | Extent of impact unknown                                                                                                                                                                                                                  | 5*    |
| Duration of Impact  | An indication of the duration or time over which the impact will be experienced, either negative or positive | Permanent        | Will remain permanently                                                                                                                                                                                                                   | 5     |
|                     |                                                                                                              | Long Term        | Extends beyond the recycling operations but not permanent                                                                                                                                                                                 | 4     |
|                     |                                                                                                              | Medium Term      | Throughout the recycling operation                                                                                                                                                                                                        | 3     |
|                     |                                                                                                              | Short Term       | Shorter than the recycling operations                                                                                                                                                                                                     | 2     |
|                     |                                                                                                              | Transient        | Very short duration                                                                                                                                                                                                                       | 1     |
|                     |                                                                                                              | Unknown          | Duration of impact unknown                                                                                                                                                                                                                | 5*    |

\* Score of 3 assigned for positive impacts

**Table 4-2 Criteria for evaluation of the likelihood of possible impacts**

| Exposure to Impact        | An indication of the frequency of the activity that may cause the impact, or the continuity of the exposure, either negative or positive |                 | <i>Discrete Event</i>                        | <i>Prolonged Exposure from a Single Activity or Event</i>                                     |    |
|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------|-----------------|----------------------------------------------|-----------------------------------------------------------------------------------------------|----|
|                           |                                                                                                                                          | Very high       | Daily or continuous                          | Exposure in perpetuity                                                                        | 5  |
|                           |                                                                                                                                          | High            | Weekly/once per week                         | Continuous exposure beyond the screening and materials recovery operations, but not permanent | 4  |
|                           |                                                                                                                                          | Moderate        | Monthly/once per month                       | Continuous exposure during screening and materials recovery operation                         | 3  |
|                           |                                                                                                                                          | Low             | Bi-annually                                  | Continuous exposure shorter than the screening and materials recovery operation               | 2  |
|                           |                                                                                                                                          | Very low        | Annually or less frequently                  | Prolonged exposure but for a very short duration                                              | 1  |
|                           |                                                                                                                                          | Unknown         | Frequency of activity unknown                | Continuity of exposure unknown                                                                | 5* |
| Probability of Occurrence | An assessment of the degree of certainty associated with a potential impact, either negative or positive                                 | Highly Likely   | Very likely or certain to occur              |                                                                                               | 5  |
|                           |                                                                                                                                          | Likely          | Likely to occur                              |                                                                                               | 4  |
|                           |                                                                                                                                          | Possible        | May possibly occur                           |                                                                                               | 3  |
|                           |                                                                                                                                          | Unlikely        | Unlikely to occur                            |                                                                                               | 2  |
|                           |                                                                                                                                          | Highly Unlikely | Very unlikely to occur, or almost impossible |                                                                                               | 1  |
|                           |                                                                                                                                          | Unknown         | Probability of occurrence unknown            |                                                                                               | 5* |

\* Score of 3 assigned for positive impacts

Based upon the overall aggregate scores for consequence and likelihood, each impact is assigned a qualitative term, ranging from 'very low' to 'very high'. The range of values equating to 'very low' and 'very high' have been chosen to approximate the 10<sup>th</sup> percentile and 90<sup>th</sup> percentile values of the overall ranges, for both consequence and likelihood. This system is summarised in Table 4-3.

**Table 4-3 Overall consequence and likelihood ratings**

| Overall Consequence | Sum of Magnitude + Scale + Duration | 3-4      | 5-7 | 8-11     | 12-14 | 15        |
|---------------------|-------------------------------------|----------|-----|----------|-------|-----------|
|                     |                                     | Very Low | Low | Moderate | High  | Very High |
| Overall Likelihood  | Sum of Exposure + Probability       | 2-3      | 4-5 | 6-7      | 8-9   | 10        |
|                     |                                     | Very Low | Low | Moderate | High  | Very High |

Finally, the overall risk is determined by cross-referencing the overall consequence and likelihood ratings, as shown in Table 4-4. This determines the overall risk of the impact, which is assigned one of five qualitative terms, ranging from 'very low significance' to 'very high significance'. Each of the qualitative terms and implication of these levels of significance for the proposed screening and recovery activities are provided in Table 4-5.

**Table 4-4 Matrix used to determine overall significance of potential impact**

|                                                                   |           | OVERALL CONSEQUENCE OF IMPACT<br>(Sum of Magnitude + Duration + Scale) |          |          |           |           |
|-------------------------------------------------------------------|-----------|------------------------------------------------------------------------|----------|----------|-----------|-----------|
|                                                                   |           | Very Low                                                               | Low      | Moderate | High      | Very High |
| OVERALL LIKELIHOOD OF IMPACT<br>(Sum of Exposure and Probability) | Very Low  | Very Low                                                               | Very Low | Low      | Low       | Moderate  |
|                                                                   | Low       | Very Low                                                               | Low      | Low      | Moderate  | High      |
|                                                                   | Moderate  | Low                                                                    | Low      | Moderate | High      | High      |
|                                                                   | High      | Low                                                                    | Moderate | High     | High      | Very High |
|                                                                   | Very High | Moderate                                                               | High     | High     | Very High | Very High |

**Table 4-5 Explanation and interpretation of significance ratings for impacts remaining after mitigation**

| Significance of Impact After Mitigation | Implications for Project                                                                     |                                                                                                                                                                                                                                                                                                                                                                           |
|-----------------------------------------|----------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Very high</i>                        | Extremely beneficial and enduring effect                                                     | An automatic fatal flaw. The screening and recovery scheme should not proceed unless the design is changed so that this impact is eliminated or its significance is reduced to acceptable levels.<br>There is a high probability that severe harm could arise to a designated receptor from an identified hazard.                                                         |
| <i>High</i>                             | Very substantial improvement to existing resources                                           | Unacceptable effect. The screening and recovery scheme should not proceed unless the design is changed so that the significance of this impact is reduced to acceptable levels. Harm is likely to arise to a designated receptor from an identified hazard without intervention.                                                                                          |
| <i>Moderate</i>                         | Appreciable improvement to, or will sustain, existing resources                              | Effect is serious enough to cause concern. Changes to screening and recovery scheme should be considered. It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that any such harm would be severe, and if any harm were to occur it is more likely, that the harm would be relatively mild. |
| <i>Low</i>                              | Some benefits                                                                                | Acceptable effect - the possibility of the impact occurring is by no means certain and the consequence of exposure is such that there would be no measureable harm.                                                                                                                                                                                                       |
| <i>Very low</i>                         | Negligible effect - probable that impact could occur but the impact would not be measureable | Negligible effect - probable that impact could occur but the impact would not be measureable.                                                                                                                                                                                                                                                                             |

#### 4.2.3 Presentation of Plausible Risks

In view of the large amount of data to be handled, matrices are used to present the potential risk ratings associated with the proposed activities in a clear, transparent and consistent manner.

---

Individual tables corresponding to each aspect (such as air quality, surface water) are used to assess the risks associated with the potential impacts.

#### **4.2.4 Cumulative Impacts**

Impacts can result from the combined effects of successive actions on the environment. These incremental effects may be significant even though the effects of each individual action are considered insignificant. In this report, cumulative effects have been assessed in qualitative, descriptive terms rather than providing specific ratings. The approach has focussed on the receptor and considered its capacity to accommodate the potential changes.

### **4.3 H1 Assessment**

The H1 assessment tool provided by NRW has been used to capture the results of the ERA in a systematic repeatable tool. The tool is fully programmed by the EA and the detail and guidance is not repeated here. The full output from the tool is provided in Appendix 3.

---

## **5 FOCUSING THE ASSESSMENT**

### **5.1 Site Context**

The scope of the Permit variation sought, the location of the activities proposed and the control measures that will be implemented will limit the potential risks posed to the environment. These aspects are listed below:

- site is within a Permitted area of established industrial use with a documented management system
- site is not easily visible by members of the public or local residents
- site is located within the steel works Installation boundary and will benefit from the high level of security
- site is not within 500m of residential properties
- site is not above a groundwater Source Protection Zone.
- site is not within an Air Quality Management Area (AQMA).
- site is not within 50 metres of any spring or well, or of any borehole used to supply water for domestic or food production purposes.
- site is not within 50 meters of a site that has relevant species of habitats protected under the Biodiversity Action Plan.
- site is not within 50 metres of a National Nature Reserve (NNR), Local Nature Reserve (LNR), Local Wildlife Site (LWS), Ancient woodland or Scheduled Ancient Monument.
- site is not within 250 metres of any borehole used to supply water for domestic or food production.
- site is not within 250 metres of the presence of Great Crested Newts where it is linked to breeding ponds of the newts by good habitat.
- Site is not within 300 metres of a European Site, Ramsar site or a Site of Special Scientific Interest (SSSI) designated for flora and fauna.

The Steel Works and existing waste management facilities at Morfa landfills are managed in accordance with Permits. Consequently, the focus of this impact assessment is solely related to the proposed materials recovery operations at the HAA. The principle activities that would be covered by the Permit, and which could impact the environment, are therefore haulage, stockpiling and storage and processing for recovery.

This impact assessment solely assesses the new and potential specific impacts associated with these activities and includes any new receptors that may be present since the original risk assessments for the works were completed. Therefore, prior to undertaking the impact evaluation, a screening of the potential hazards and receptors has been made to ensure that the impact assessment is current and solely focussed upon new potential impacts.

### **5.2 Evaluation of Hazards**

The hazards associated with the proposed screening and materials recovery operations have been identified through a screening exercise. The identified hazards are listed in Tables 7-1 and 7-2. Also presented in these Tables are some of the hazards previously evaluated in the Permits held by Tata. Where these latter hazards are not potentially associated with the proposed materials recovery operations they have been screened out of the current impact assessment. This is because these impacts have been previously identified, evaluated and mitigation measures incorporated into the existing Permit and Environmental Management Systems. The site already has preventative and contingency action plans for these potential

impacts which are routinely evaluated by site management and NRW in accordance with the Permits.

**Table 5-1 Key Hazards Screening Matrix**

| Aspect                      | Hazard giving rise to Impact                                         | Impact previously evaluated for Tata Permits | Additional hazard present during materials recovery operations at HAA | Hazard taken forward for impact assessment | Comment / Justification                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-----------------------------|----------------------------------------------------------------------|----------------------------------------------|-----------------------------------------------------------------------|--------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Noise and Vibration         | Additional vehicle movements leading to increase noise and vibration | ✓                                            | ✓                                                                     | ✓                                          | All on-site materials will be handled by plant already operational at the works and which are subject to proactive preventative maintenance programmes.<br>Operation of HAA will, at times, require vehicles to enter Works from off-site to deliver waste to the HAA and leave Works to deliver aggregate.                                                                                                                                                            |
|                             | Waste Deposition                                                     | ✓                                            | ✓                                                                     |                                            | No waste will be permanently deposited at the HAA.<br>Any waste generated at the HAA will be handled in-house by Tata and taken to Morfa landfills.<br>Documented management systems are already in place for waste management.                                                                                                                                                                                                                                        |
|                             | Materials handling and Processing of waste                           | ✓                                            | ✓                                                                     | ✓                                          | Recovery operations will require unloading, loading and materials handling.                                                                                                                                                                                                                                                                                                                                                                                            |
|                             | Machinery/ Generators/ Pumps                                         | ✓                                            | ✓                                                                     | ✓                                          | Recovery operations will require use of diesel power vehicles and plant.                                                                                                                                                                                                                                                                                                                                                                                               |
| Odour                       | Malodorous gas                                                       | ✓                                            |                                                                       |                                            | Biodegradable/putrescible waste is directed to Morfa landfill and will not be accepted at the HAA<br>Recovery operations will not expose biodegradable/ putrescible wastes that would lead to generation of malodorous gas and leachate encourage scavenging.<br>Quarantine area with sealed skip will be available at all times in case of abnormal incident.                                                                                                         |
|                             | Smoke from fire                                                      | ✓                                            | ✓                                                                     |                                            | Strict waste acceptance procedures will be implemented.<br>Recovery operations will not expose wastes that are flammable.<br>Documented management systems are already in place to prevent and manage potential fires.                                                                                                                                                                                                                                                 |
| Airborne Particulate Matter | Materials handling and processing                                    | ✓                                            | ✓                                                                     | ✓                                          | Materials handling outdoors will be required at HAA.                                                                                                                                                                                                                                                                                                                                                                                                                   |
|                             | Dispersion of dust and particulates from stockpiles                  | ✓                                            | ✓                                                                     | ✓                                          | Stockpiles of waste and aggregates may be susceptible to dispersion during suitable climatic conditions.                                                                                                                                                                                                                                                                                                                                                               |
|                             | Fire in site offices/ plant                                          | ✓                                            |                                                                       |                                            | Documented management systems are already in place to prevent and manage potential fires.                                                                                                                                                                                                                                                                                                                                                                              |
|                             | Vehicle Trafficking                                                  | ✓                                            | ✓                                                                     | ✓                                          | All on-site materials will be handled by plant already operational at the works and which are subject to proactive preventative maintenance programmes.<br>Operation of HAA will, at times, require vehicles to enter Works from off-site to deliver waste to the HAA and leave Works to deliver aggregate.<br>Management systems are already in place to prevent and manage dust occurrence and these will also apply to the proposed recovery operations at the HAA. |

**Table 5-1 Key Hazard Screening Matrix (Cont'd)**

| Impact Aspect                       | Activity giving rise to Impact                                                    | Impact previously evaluated for Tata Permits | Additional hazard / benefit present during materials recovery operations at HAA | Hazard / benefit taken forward for impact assessment | Comment / Justification                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-------------------------------------|-----------------------------------------------------------------------------------|----------------------------------------------|---------------------------------------------------------------------------------|------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Polluting Fluids                    | Suspended solids in surface run-off                                               |                                              | ✓                                                                               | ✓                                                    | HAA is located close to surface water ditches that drain to Works reservoir and are under control of Tata                                                                                                                                                                                                                                                                                                                                                 |
|                                     | Contaminants entrained in groundwater following infiltration through hardstanding | ✓                                            | ✓                                                                               | ✓                                                    | Recovery operations will be undertaken on hardstanding platform constructed as part of previous development of the steel works in this area.                                                                                                                                                                                                                                                                                                              |
|                                     | Spillage/ leakage of fuel oils                                                    | ✓                                            | ✓                                                                               |                                                      | Documented management systems already in place regarding storage of polluting substances and management of spills and leaks                                                                                                                                                                                                                                                                                                                               |
| Scavengers (birds, vermin, insects) | Faecal Droppings                                                                  | ✓                                            |                                                                                 |                                                      | Strict waste acceptance procedures will be implemented.<br>Recovery operations will not expose biodegradable/putrescible wastes that would encourage pests<br>Documented management systems are already in place to deal with vermin.                                                                                                                                                                                                                     |
|                                     | Infestation                                                                       | ✓                                            |                                                                                 |                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Litter                              | Light Fraction Delivery Waste                                                     | ✓                                            | ✓                                                                               |                                                      | Strict waste acceptance procedures will be implemented.<br>Recovery operations will only process suitable aggregate materials.<br>Documented management systems are already in place to deal with litter.                                                                                                                                                                                                                                                 |
|                                     | Light Fraction Deposited Waste                                                    | ✓                                            | ✓                                                                               |                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Mud on Road                         | Vehicle Movements                                                                 | ✓                                            | ✓                                                                               | ✓                                                    | All on-site materials will be handled by plant already operational at the works and which are subject to proactive preventative maintenance programmes.<br>Operation of HAA will, at times, require vehicles to enter Works from off-site to deliver waste to the HAA and leave Works to deliver aggregate.<br>Documented management systems are already in place to prevent and manage mud on road and these will also apply to the proposed activities. |
| Plant Movement                      | Collision with other plant and site staff/visitors                                | ✓                                            | ✓                                                                               |                                                      | Documented management systems are already in place to manage site vehicle movements<br>New drivers will be required to be inducted to site rules                                                                                                                                                                                                                                                                                                          |
| Visual Resources and Landscape      | Change to current landscape                                                       |                                              | ✓                                                                               | ✓                                                    | Recovery operations will require creation of temporary stockpiles and use of mobile plant                                                                                                                                                                                                                                                                                                                                                                 |
| Primary Resources                   | Consumption of primary resources e.g. quarried limestone                          |                                              |                                                                                 | ✓                                                    | Recovery operations will potentially offer the opportunity to reduce consumption of primary resources                                                                                                                                                                                                                                                                                                                                                     |

---

The hazards potentially associated with the screening and materials recovery operations that have been taken forward for impact assessment are:

- Vehicle movements generating noise and vibration
- Unloading and processing of waste for recovery
- Operation of recovery operation generating noise and vibration
- Dispersion of particulates during materials handling
- Dispersion of particulates from stockpiles
- Vehicle movements generating dust
- Suspended solids
- Contaminants entrained in groundwater following infiltration through hardstanding
- Vehicles movements generating mud on roads
- Alteration to visual landscape

Such hazards are not new to Tata and documented management systems and effective controls are already in place for similar activities with similar hazards in other parts of the works.

In addition to the hazards potentially associated with the proposed materials recovery operations there are also several important potential benefits. These are principally related to the reduction in the consumption of primary resources. An evaluation of these benefits is therefore also taken forward in the assessment.

Hazards screened out in this assessment will still be subject to Tata controls and covered by the documented Environmental Management System, where relevant.

### **5.3 Evaluation of Receptors**

Receptor screening has examined the presence of environmental, human and natural resource receptors. The evaluation has essentially been limited to a radial zone centred on the HAA with a diameter of some 1000m. This does not preclude receptors existing beyond this distance, but due to the nature of the hazards if the risks are shown to be acceptable to the receptors within this zone then the risks posed to receptors outside this zone should also be acceptable. This approach is not applied to the evaluation of the consumption of natural resources, such as quarried limestone, as these will exist well beyond this radius. Similarly, changes to the visual landscape have also been considered beyond the nominal radius.

The screening matrix presented in Table 5-3 summarises the identified receptors. A brief comment on their status and justification as to their inclusion is also provided. Figure 3 highlights the location of key features of interest.

All of the identified receptors have been taken forward as part of the impact assessment. There are no permanently occupied residences within 1000m of the site.

**Table 5-2 Receptor Screening Matrix**

| Main Receptor Category | Receptor / Benefactor Type              | Receptor/Benefactor Detail                                                                                                            | Comment/Justification                                                                                                                                                                                                                                                        |
|------------------------|-----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Human                  | On-site Tata/sub-contractor staff       | Office Staff<br>HAA operatives                                                                                                        | The office staff would be present at the office/ weighbridge.<br>A small number of staff would be involved with all aspects of the screening and materials recovery operations.                                                                                              |
|                        | Delivery Personnel                      | Delivery Driver and Crew                                                                                                              |                                                                                                                                                                                                                                                                              |
|                        | Emergency Services Staff                | Emergency Services Staff                                                                                                              | Emergency personnel may be required at any part of the site.                                                                                                                                                                                                                 |
|                        | Other Working Personnel                 | Tata/other companies staff working at the steel works                                                                                 | Site is surrounded by land owned by Tata and is used for steel making and steel distribution e.g. rail sidings are ~50m to the east.<br>Swansea – London railway line passes ~450m to the east of the site boundary.                                                         |
|                        |                                         | Farmers and staff                                                                                                                     | Margam Moors used for grazing.                                                                                                                                                                                                                                               |
|                        | General Public                          | Footpath Walkers                                                                                                                      | Public access and walk along Cefn Cwrgan, Margam Beach and Margam Moors.                                                                                                                                                                                                     |
|                        | Regulatory Staff                        | NRW Staff                                                                                                                             | Access all areas on an intermittent basis.                                                                                                                                                                                                                                   |
|                        | Engineering Staff                       | Engineering Consultants                                                                                                               | Access all areas on an intermittent basis.<br>Present duration key aspects of restoration and landfill construction.                                                                                                                                                         |
|                        | Off-site humans viewing the landscape   | Site can be viewed in the middle distance from a wide range of areas and elevations                                                   | Site cannot be readily observed by public.                                                                                                                                                                                                                                   |
| Groundwater            | Shallow Aquifer                         | Unconfined wind-blown sand deposit with vertical downward percolation eliminated or restricted by the presence of the underlying clay | Materials recovery operations cannot impact either surface water or groundwater as all activities will occur within fully lined Cell 2. Cell 2 is served by a new drainage system and active leachate collection and treatment which will prevent the release of all fluids. |
|                        | Deep Aquifer                            | Confined estuarine silty sands                                                                                                        |                                                                                                                                                                                                                                                                              |
| Surface Water          | Drainage Ditches                        | Margam Moors                                                                                                                          | Ditches in Margam Moors are upstream of proposed operation.                                                                                                                                                                                                                  |
|                        | River                                   | River Kenfig                                                                                                                          | River Kenfig is in different water catchment.                                                                                                                                                                                                                                |
|                        | Coastal Waters                          | Margam Sands and Bristol Channel                                                                                                      | Shallow groundwater tends to move inland in this area.                                                                                                                                                                                                                       |
| Primary Resources      | Raw materials used in steel making      | Process requires various materials including quarried limestone dust, scrap metal, iron, olivine and ferromanganese                   | Materials currently used are either shipped from overseas or hauled from local quarries/facilities.                                                                                                                                                                          |
|                        | Aggregates users (on-site and off-site) | Construction activities benefit from use of recycled aggregate                                                                        |                                                                                                                                                                                                                                                                              |
| Flora/Fauna            | Livestock in Margam Moors               | Cattle/sheep/other animals in surrounding field                                                                                       | Potentially present in fields surrounding landfill.                                                                                                                                                                                                                          |
|                        | Margam Moors SSSI                       | Located to south of proposed activities                                                                                               | Nationally important habitats and species.                                                                                                                                                                                                                                   |
|                        | KNNR                                    | Located to south of Margam Moors, beyond Morfa landfills                                                                              | Known to contain habitats and species of European importance.                                                                                                                                                                                                                |

## 5.4 Evaluation of Pathways

Fundamental to the source-pathway-receptor model is the presence of a linkage in the form of a pathway or mechanism that allows the receptor to be impacted by the hazard. If the pathway is not present then there is no risk of impact as the hazard [cannot](#) affect the receptor. Conversely, if the pathway can be cut there is no way in which the receptor may be impacted by the hazard and there is no risk of impact.

To ensure that the impact assessment only focuses on plausible impact pathways a matrix comparing all identified hazards with all identified receptors has been made in Table 5-3. Where a plausible pathway exists this is identified in the matrix with a number which links to a specific pathway identified as a footnote in the table. Plausible pathways connecting a receptor with an identified hazard are also highlighted grey. All of the plausible impact pathways are therefore taken forward for the impact assessments in the following sections.

**Table 5-3 Plausible Exposure Pathway Screening**

| RECEPTOR /<br>BENEFACTOR | RECEPTOR /<br>BENEFACTOR<br>DETAIL    | RELEASE OF<br>AIRBORNE<br>PARTICULATES          |                                                            |                                                 | RELEASE OF<br>POLLUTING<br>FLUIDS                                                             |                                        | NOISE AND<br>VIBRATION                                       |                                                   | VISUAL<br>LANDSCAPE                      | PRIMARY<br>RESOURCES |
|--------------------------|---------------------------------------|-------------------------------------------------|------------------------------------------------------------|-------------------------------------------------|-----------------------------------------------------------------------------------------------|----------------------------------------|--------------------------------------------------------------|---------------------------------------------------|------------------------------------------|----------------------|
|                          |                                       | Vehicle movements leading<br>to dust generation | Materials handling and<br>processing of waste for recovery | Dispersion of dust from temporary<br>stockpiles | Contaminants entrained in<br>groundwater following infiltration<br>through areas hardstanding | Suspended solids<br>in surface run-off | Vehicle movements leading<br>to increase noise and vibration | Materials handling<br>and processing for recovery | Alteration due to<br>proposed activities | Primary resources    |
| HUMAN                    | On-site Tata/ sub-contractor staff    | 1                                               | 1                                                          | 1                                               | N                                                                                             | N                                      | 6                                                            | 6                                                 | N                                        | N                    |
|                          | Delivery Personnel                    | 1                                               | 1                                                          | 1                                               | N                                                                                             | N                                      | 6                                                            | 6                                                 | N                                        | N                    |
|                          | Emergency Services Staff              | 1                                               | 1                                                          | 1                                               | N                                                                                             | N                                      | 6                                                            | 6                                                 | N                                        | N                    |
|                          | Other Working Personnel               | 1                                               | 1                                                          | 1                                               | N                                                                                             | N                                      | 6                                                            | 6                                                 | N                                        | N                    |
|                          | General Public                        | 1                                               | 1                                                          | 1                                               | N                                                                                             | N                                      | 6                                                            | 6                                                 | 7                                        | N                    |
|                          | Regulatory Staff                      | 1                                               | 1                                                          | 1                                               | N                                                                                             | N                                      | 6                                                            | 6                                                 | N                                        | N                    |
|                          | Engineering Staff                     | 1                                               | 1                                                          | 1                                               | N                                                                                             | N                                      | 6                                                            | 6                                                 | N                                        | N                    |
|                          | Off-site humans viewing the landscape | N                                               | N                                                          | N                                               | N                                                                                             | N                                      | N                                                            | N                                                 | 7                                        | N                    |
| GROUNDWATER              | Shallow Aquifer                       | N                                               | N                                                          | N                                               | 4                                                                                             | 4                                      | N                                                            | N                                                 | N                                        | N                    |
|                          | Deep Aquifer                          | N                                               | N                                                          | N                                               | N                                                                                             | N                                      | N                                                            | N                                                 | N                                        | N                    |
| SURFACE WATER            | Drainage Ditches                      | N                                               | N                                                          | N                                               | 5                                                                                             | 5                                      | N                                                            | N                                                 | N                                        | N                    |
|                          | River Kenfig                          | N                                               | N                                                          | N                                               | N                                                                                             | N                                      | N                                                            | N                                                 | N                                        | N                    |
|                          | Coastal Waters                        | N                                               | N                                                          | N                                               | N                                                                                             | N                                      | N                                                            | N                                                 | N                                        | N                    |
| PRIMARY RESOURCES        | Materials used in steel making        | N                                               | N                                                          | N                                               | N                                                                                             | N                                      | N                                                            | N                                                 | N                                        | 8                    |
|                          | Aggregates users                      | N                                               | N                                                          | N                                               | N                                                                                             | N                                      | N                                                            | N                                                 | N                                        | 8                    |
| FLORA / FAUNA            | Livestock in Margam Moors             | 3                                               | 3                                                          | 3                                               | N                                                                                             | N                                      | 6                                                            | 6                                                 | N                                        | N                    |
|                          | Flora and fauna at Margam Moors SSSI  | 2                                               | 2                                                          | 2                                               | N                                                                                             | N                                      | 6                                                            | 6                                                 | N                                        | N                    |
|                          | Flora and fauna at KNNR               | 2                                               | 2                                                          | 2                                               | N                                                                                             | N                                      | 6                                                            | 6                                                 | N                                        | N                    |

**NOTES TO TABLE**

- N No plausible pathway is considered to exist between identified receptor and hazards.
1. Receptor may be impacted by direct inhalation or ingestion of particulates.
  2. Receptor may be impacted by fall out of airborne particulates causing smothering.
  3. Receptor may be impacted by direct inhalation or ingestion of particulates or indirect ingestion of particulates attached to vegetation
  4. Receptor may be impacted by infiltration through unsaturated zone
  5. Receptor may be impacted by run-off quality
  6. Receptor may be impacted by nuisance associated with noise and vibration
  7. Receptor may be impacted by change to visual landscape
  8. Benefactor may benefit from reduction in consumption of primary resources

---

## **6 EVALUATION OF RISKS**

The output from the H1 assessment is presented in Appendix 3 and the risk assessment matrices in Tables 5-1 to 5-3. These are also discussed in the following sections.

### **6.1 Release of Airborne Particulates**

Tata maintain an Air Quality Management Plan for the Management of PM10 and Fugitive Dust Emissions at the site. The purpose of the Air Quality Management Plan (AQMP) is to describe and facilitate the implementation of measures taken by the Steelworks to manage air quality, limit potential atmospheric emissions and respond to air quality alerts regarding PM10 and fugitive dust emissions. As the external storage and processing of waste related to the production of aggregates clearly has the potential to release particulates under certain conditions, the operation of the HAA will fall under the strict controls and monitoring requirements of this system (as documented elsewhere in the Permit).

In this context, the activities at the HAA will therefore be subject to the same scrutiny and controls as the other works areas, including those operated by others, to ensure airborne impacts are identified, managed and reduced to acceptable levels. Each item of plant will be fitted with dust suppression and additional misters and bowsers will be deployed as required to any part of the operation, including transport routes. These controls will not only be used when wind speeds are high but also when there is a possibility of thermal ground disturbance encouraging particle lift off during the summer months. Further, as much of the dust arises from the way in which materials are handled and the size of stockpiles, care will be taken to ensure the site is efficiently organised to minimise vehicle movements and particulate release during loading and unloading vehicles. To ensure the activities are not impacting off-site receptors and the human health of site operatives is protected, daily site inspections will identify any additional measures required. Should complaints be received, these will be managed through the procedures documented in the Environmental Management System. Following receipt of a complaint investigations aimed at identifying the root-cause will be undertaken. Provided these measures are implemented the risk of airborne particulates to the identified receptors is considered to be low, as summarised in Tables 6-1 to 6-3.

**Table 6-1 Assessment of potential impact of airborne particulates on identified human receptors**

| Hazard                                       | Pathway                                        | Mitigation Measures                                                                                                                                                                                                                                                         | Magnitude | Scale | Duration | Overall Consequence of Impact | Exposure Frequency | Probability of Occurrence | Overall Likelihood | Residual Risk under Normal Conditions |
|----------------------------------------------|------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-------|----------|-------------------------------|--------------------|---------------------------|--------------------|---------------------------------------|
| Vehicle movements leading to dust dispersion | Direct inhalation or ingestion of particulates | Ensure dust suppression equipment (water bowser) is readily available during dry weather and warm weather periods.<br>Regularly dampen site roads as required<br>Provide correct RPE to site staff<br>Regularly maintain vehicles                                           | 3         | 2     | 3        | 8<br>(Moderate)               | 3                  | 2                         | 5<br>(Low)         | Low                                   |
| Materials handling and recovery operations   | Direct inhalation or ingestion of particulates | Screens fitted with dust suppression units<br>Cessation of operations until dust can be controlled or climatic conditions are more favourable<br>Implement Local AQMP                                                                                                       | 3         | 2     | 3        | 8<br>(Moderate)               | 3                  | 2                         | 5<br>(Low)         | Low                                   |
| Dispersion of dust from temporary stockpiles | Direct inhalation or ingestion of particulates | Ensure dust suppression equipment is readily available during weather periods when particulate uplift is likely.<br>Cover fine grained stockpiles if necessary<br>Ensure stockpiles of material are regularly utilised<br>Ensure stockpiles are not disturbed unnecessarily | 3         | 2     | 3        | 8<br>(Moderate)               | 3                  | 2                         | 5<br>(Low)         | Low                                   |

**Table 6-2 Assessment of potential impact of airborne particulates on identified livestock in Margam Moors**

| Hazard                                       | Pathway                                                                                                                                 | Mitigation Measures                                                                                                                                                                                                                                          | Magnitude | Scale | Duration | Overall Consequence of Impact | Exposure Frequency | Probability of Occurrence | Overall Likelihood | Residual Risk under Normal Conditions | Comments/ Justification                                                                                                   |
|----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-------|----------|-------------------------------|--------------------|---------------------------|--------------------|---------------------------------------|---------------------------------------------------------------------------------------------------------------------------|
| Vehicle movements leading to dust dispersion | Receptor may be impacted by direct inhalation or ingestion of particulates or indirect ingestion of particulates attached to vegetation | Ensure dust suppression equipment (water bowser) is readily available during dry weather periods.<br>Regularly dampen site roads as required<br>Provide correct RPE to site staff<br>Regularly maintain vehicles                                             | 2         | 3     | 3        | 8<br>(Moderate)               | 3                  | 1                         | 4<br>(Low)         | Low                                   | Livestock are located several hundred metres away from proposed activities (further away than identified human receptors) |
| Materials handling and recovery operations   | Receptor may be impacted by direct inhalation or ingestion of particulates or indirect ingestion of particulates attached to vegetation | Screens fitted with dust suppression units<br>Cessation of operations until dust can be controlled or climatic conditions are more favourable<br>Implement Local AQMP                                                                                        | 2         | 3     | 3        | 8<br>(Moderate)               | 3                  | 1                         | 4<br>(Low)         | Low                                   |                                                                                                                           |
| Dispersion of dust from temporary stockpiles | Receptor may be impacted by direct inhalation or ingestion of particulates or indirect ingestion of particulates attached to vegetation | Ensure dust suppression equipment (water bowser) is readily available during dry weather periods.<br>Cover fine grained stockpiles if necessary<br>Ensure stockpiles of material are regularly utilised<br>Ensure stockpiles are not disturbed unnecessarily | 2         | 3     | 3        | 8<br>(Moderate)               | 3                  | 1                         | 4<br>(Low)         | Low                                   |                                                                                                                           |

**Table 6-3 Assessment of potential impact of airborne particulates on flora and fauna at Margam Moors SSSI**

| Hazard                                          | Pathway                                                                          | Mitigation Measures                                                                                                                                                                               | Magnitude | Scale | Duration | Overall Consequence of Impact | Exposure Frequency | Probability of Occurrence | Overall Likelihood | Overall Significance of Impact |
|-------------------------------------------------|----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-------|----------|-------------------------------|--------------------|---------------------------|--------------------|--------------------------------|
| Vehicle movements leading to dust dispersion    | Receptor may be impacted by fall out of airborne particulates causing smothering | Ensure dust suppression equipment (water bowser) is readily available during dry weather periods. Regularly clean site roads. Make available dust masks to site staff Regularly maintain vehicles | 3         | 3     | 3        | 9 (Moderate)                  | 3                  | 1                         | 4 (Low)            | Low                            |
| Operation of screens leading to dust dispersion | Receptor may be impacted by fall out of airborne particulates causing smothering | Screens fitted with dust suppression units Cessation of operations until dust can be controlled or climatic conditions are more favourable                                                        | 3         | 3     | 3        | 9 (Moderate)                  | 3                  | 1                         | 4 (Low)            | Low                            |
| Dispersion of dust from temporary stockpiles    | Receptor may be impacted by fall out of airborne particulates causing smothering | Ensure dust suppression equipment (water bowser) is readily available during dry weather periods. Cover fine grained stockpiles if necessary Ensure stockpiles of material are regularly utilised | 3         | 3     | 3        | 9 (Moderate)                  | 3                  | 1                         | 4 (Low)            | Low                            |

### 6.1.1 Evaluation of Cumulative Impacts

Tata and NRW recognise that fugitive dust emissions can contribute to poor air quality which is why several Improvement Programmes have been implemented over recent years. As the operation of the HAA will fall under the control of the existing steel work AQMP and air quality monitoring programme, there are already mechanisms in place for any potential additional atmospheric loading from the HAA to be monitored and managed.

## 6.2 Release of Polluting Fluids

All wastes to be accepted at the site will be subject to stringent waste acceptance controls. None of the wastes will be liquid and many will be either listed inert or non-hazardous.

As most of the wastes for aggregate production are considered non-hazardous or inert, their storage and weathering outdoors will not pose a significant risk to the environment but the control of suspended solids will be important. This is similar to the generic risk assessment underpinning many Standard Rules Permits. At the HAA, the site benefits from a granular weathered platform that will act as a trap potentially retarding the movement of suspended solids. Additionally, as Tata control all of the surface water ditches in the immediate area and

their ultimate point of discharge, the Works Reservoir, there is no pathway for suspended solids to escape to the wider environment. As suspended solids in the surface water ditches and works reservoir are not desirable to Tata, source control at the HAA will involve ensuring that no run-off with suspended solids directly enters the ditches. In this context, the risk to surface water is considered low, as summarised in Table 6-4.

The hardstanding platform also provides additional unsaturated zone through which infiltration would need to pass before entering shallow groundwater, perched above the clay layer. Monitoring of the shallow groundwater has previously found the groundwater to be impacted by elevated pH and a range of contaminants at low levels and that it may be in hydraulic continuity with parts of the surface water ditches. As the wastes proposed to be accepted and temporarily stored and exposed to weathering at the HAA are similar to the materials used to construct the hardstanding platform, the impact on shallow groundwater is considered to be low, as summarised in Table 6-4.

**Table 6-4 Assessment of potential risks to surface water and groundwater**

| Hazard                                                          | Pathway                                          | Mitigation Measures                                                                                                                                                                                                                                                                    | Magnitude | Scale | Duration | Overall Consequence of Impact | Exposure Frequency | Probability of Occurrence | Overall Likelihood | Overall Significance of Impact |
|-----------------------------------------------------------------|--------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-------|----------|-------------------------------|--------------------|---------------------------|--------------------|--------------------------------|
| Contaminants entrained in infiltration migrating to groundwater | Infiltration through hardstanding platform       | Ensure strict waste acceptance controls are implemented.<br>Ensure sealed skips are available for quarantine<br>Provide all liquids with bunded storage.<br>Provide spill kits on site to deal with minor spills.<br>Ensure Tata Emergency Response Plan for Spillages is implemented. | 2         | 1     | 3        | 6 (Low)                       | 3                  | 3                         | 6 (Moderate)       | Low                            |
| Suspended solids in surface run-off                             | Direct run-off to adjacent surface water ditches | Ensure strict waste acceptance controls are implemented.<br>Ensure sealed skips are available for quarantine<br>Routinely inspect surface water ditches.                                                                                                                               | 2         | 1     | 3        | 6 (Low)                       | 2                  | 4                         | 4 (Moderate)       | Low                            |

### 6.2.1 Evaluation of Cumulative Impacts

There is a limited modified surface water catchment downstream of the HAA that drains to the Works Reservoir. Run-off from the existing hardstanding platform to these ditches has occurred for many years. As the dominant waste type to be accepted at the HAA is similar to the slag used to create the hardstanding platform runoff quality is not likely to change. Provided the potential release of suspended solids is controlled, there is little prospect of there being cumulative impacts downstream as there are few other sources draining to the small catchment. Similarly, as the extent of the proposed operations will not expand the existing raised hardstanding platform, further cumulative impacts on shallow groundwater are not likely to be significant.

---

## 6.3 Noise and Vibration

The waste accepted at the HAA will primarily arise from the steel making process with only a small contribution, as opportunities arise, coming from external off-site sources. On this basis, the scale of the development proposal is limited and will not generate a significant number of additional traffic movements off-site. Within this context, the risk of noise and vibration associated with traffic movements off-site impacting the identified receptors is considered to be low (see Tables 6-5 to 6-7). Further, as any vehicles moving materials into or out of the steel works will need to be subject to preventative maintenance programmes, there is little opportunity for additional noise and vibration to be generated under normal operating conditions.

Similarly, all of the vehicles and plant handling materials within the steelworks will comprise modern plant designed to meet current legislative controls relating to noise and vibration emissions. All plant and vehicles will also be subject to a preventative maintenance programme and the requirements of the steel works noise management plan. To ensure that noise and vibration emissions from the on-site activities are not likely to cause off-site pollution Tata will prevent, or where that is not practicable minimise, off-site noise migration. Measures that will be adopted will include the use of modern modular plant fitted with appropriate silencers, implementation of preventative maintenance programme, orientating site activities to minimise noise from reversing warning devices and use of broadband directional alarm to vehicles, where feasible. As there are few sensitive receptors within 500m of the site, the risks are considered to be low and acceptable provided the control measures are implemented.

**Table 6-5 Assessment of potential impact of noise and vibration on identified human receptors**

| Hazard                                       | Pathway                                        | Mitigation Measures                                                                                                                                                                         | Magnitude | Scale | Duration | Overall Consequence of Impact | Exposure Frequency | Probability of Occurrence | Overall Likelihood | Residual Risk under Normal Conditions |
|----------------------------------------------|------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-------|----------|-------------------------------|--------------------|---------------------------|--------------------|---------------------------------------|
| Vehicle movements leading to dust dispersion | Nuisance associated with elevated noise levels | Vehicles will be routinely maintained as part of proactive preventative maintenance programme<br>Vehicles used will be the same as those currently used as part of steel making operations. | 3         | 2     | 3        | 8 (Moderate)                  | 3                  | 2                         | 5 (Low)            | Low                                   |
| Materials handling and recovery operations   | Nuisance associated with elevated noise levels | Recovery plant is modern and well maintained and designed to minimise sound output.<br>Plan will be fitted with noise reducers and operated behind stockpiles where possible.               | 3         | 2     | 3        | 8 (Moderate)                  | 3                  | 2                         | 5 (Low)            | Low                                   |

**Table 6-6 Assessment of potential impact of noise and vibration on livestock in Margam Moors**

| Hazard                                       | Pathway                                        | Mitigation Measures                                                                                                                                                                 | Magnitude | Scale | Duration | Overall Consequence of Impact | Exposure Frequency | Probability of Occurrence | Overall Likelihood | Residual Risk |
|----------------------------------------------|------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-------|----------|-------------------------------|--------------------|---------------------------|--------------------|---------------|
| Vehicle movements leading to dust dispersion | Nuisance associated with elevated noise levels | Vehicles will be routinely maintained as part of proactive preventative maintenance programme<br>Vehicles used will be the same as those currently used as part landfill operations | 1         | 3     | 3        | 7 (Low)                       | 3                  | 1                         | 4 (Low)            | Low           |
| Materials handling and recovery operations   | Nuisance associated with elevated noise levels | Recovery plant is modern and well maintained and designed to minimise sound output<br>Plan will be fitted with noise reducers and operated behind stockpiles where possible         | 1         | 3     | 3        | 7 (Low)                       | 3                  | 1                         | 4 (Low)            | Low           |

**Table 6-7 Assessment of potential impact of noise and vibration on Protected Flora and Fauna at Margam Moors SSSI**

| Hazard                                                    | Pathway                                        | Mitigation Measures                                                                                                                                                                        | Magnitude | Scale | Duration | Overall Consequence of Impact | Exposure Frequency | Probability of Occurrence | Overall Likelihood | Overall Significance of Impact |
|-----------------------------------------------------------|------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-------|----------|-------------------------------|--------------------|---------------------------|--------------------|--------------------------------|
| Vehicle movements leading to increase noise and vibration | Nuisance associated with elevated noise levels | Vehicles will be routinely maintained as part of proactive preventative maintenance programme<br>Vehicles used will be the same as those currently used as part of steel making operations | 1         | 3     | 3        | 7 (Low)                       | 3                  | 1                         | 4 (Low)            | Low                            |
| Materials handling and processing for recovery            | Nuisance associated with elevated noise levels | Recovery plant is modern and well maintained and designed to minimise sound output<br>Plan will be fitted with noise reducers and operated behind stockpiles where possible                | 1         | 3     | 3        | 7 (Low)                       | 3                  | 1                         | 4 (Low)            | Low                            |

### 6.3.1 Cumulative Impact

The operation at the HAA will need to ensure that the noise levels are within those required for protection of worker human health. Ensuring these targets are achieved will significantly limit off-site noise.

The vehicles and plant proposed to be used are conventional within the materials handling industry and Tata is familiar with the effective controls to limit noise and vibration. Use of the small number of plant and vehicles and the distance to sensitive receptors suggests that cumulative noise impacts are not likely.

---

Should noise complaints occur these will be investigated in accordance with the document management system and an appropriate noise action plan developed for approval by NRW in accordance with the Permit.

## 6.4 Visual Landscape

The HAA cannot readily be seen from off-site as it is screened to the northeast by the CAPL, by vegetation to the east and south and Morfa Coke Ovens to the west. On this basis, the proposals will not significantly influence the zone of visual intrusion, either in the short-term or long-term. Further, there are no sensitive receptors in close proximity and on this basis the risk of the activity influencing the visual zone is considered low (see Table 6-8).

**Table 6-8 Assessment of potential impact on visual landscape**

| Hazard                                | Pathway                                                | Mitigation Measures                                                                                                                                 | Magnitude | Scale | Duration | Overall Consequence of Impact | Exposure Frequency | Probability of Occurrence | Overall Likelihood | Overall Significance of Impact |
|---------------------------------------|--------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-------|----------|-------------------------------|--------------------|---------------------------|--------------------|--------------------------------|
| Alteration due to proposed activities | Receptor may be impacted by change to visual landscape | Attempts will be made to position plant behind stockpiles.<br>All stockpiles are temporary.<br>HAA not readily visible as screened from many views. | 1         | 3     | 3        | 7 (Low)                       | 2                  | 3                         | 5 (Low)            | Low                            |

### 6.4.1 Evaluation of Cumulative Impacts

As the HAA cannot be readily viewed from off-site, and there are no permanent sensitive receptors within close proximity there is little opportunity for a cumulative impact on the visual landscape.

## 6.5 Primary Resources

Tata uses an enormous amount of raw materials to manufacture the millions of tonnes of steel it produces each year. A wide range of aggregates are also required for construction and maintenance throughout their works. Such materials are either brought to site from all over the world or from local sources, using boat and road transport. Through the proposed recovery of aggregates and the recycling of selected waste streams back into the production process the consumption of primary resources can be reduced. The proposed operation at the HAA could therefore significantly positively influence environmental and economic aspects of the production process. This assessment is summarised in Table 6-9.

**Table 6-9 Assessment of positive impact on primary resource consumption**

| Hazard                                 | Pathway                                                                                                                                                                                         | Mitigation Measures                            | Magnitude | Scale | Duration | Overall Consequence of Impact | Exposure Frequency | Probability of Occurrence | Overall Likelihood | Overall Significance of Impact | Comments / Justification                                                                                                                                                                                                                                                                                           |
|----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|-----------|-------|----------|-------------------------------|--------------------|---------------------------|--------------------|--------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Depletion of a finite primary resource | Production of aggregates from waste that can be used instead of primary aggregates<br>Potential recovery of materials that may off-set consumption of primary resources used during steelmaking | Positive nature of impact should be encouraged | 4         | 5     | 4        | 13 (High)                     | 4                  | 5                         | 9 (High)           | High                           | Materials recovered during screening operations will be used beyond the duration of the recovery operations<br>Recovered materials will directly off-set consumption of primary resources, some of which are shipped to site from overseas<br>Tata Steel has demonstrated certainty of use for recovered materials |

### 6.5.1.1 Evaluation of Cumulative Impacts

In addition to the materials recovery operations directly off-setting the consumption of primary resources, the proposed operations have many other direct and indirect positive cumulative impacts. These include:

- extending the landfill void space
- reducing the amount of waste landfilled
- reducing steel making production costs and therefore assisting with the preservation of local employment
- generating aggregates suitable for use
- reducing the number of material movements due to a reduction in the consumption of off-site raw materials

Combined with the highly significant positive impact identified in terms of directly reducing the consumption of primary resources, the proposed materials recovery operations offers many potential positive economic and environmental benefits.

## 6.6 Other Aspects

The preceding section was aimed at evaluating the principle identified risks associated with the proposed activity. The following sections evaluate other aspects covered by the Permit.

All aspects will be controlled through a documented management system.

### 6.6.1 Odour

The type of waste to be accepted is not biodegradable or putrescible and has a low odour potential. On this basis, odours are not likely to be a problem provided the waste acceptance controls, documented in the EMS, are implemented.

---

Should odour issues arise, olfactory monitoring will be undertaken to identify the root cause and relevant management plans implemented.

### **6.6.2 Flooding**

The site is located in an area identified by NRW to be at risk of flooding. Given that the proposals do not involve the construction of buildings the vulnerability status will not be altered. However, Tata recognises the vulnerability of the site and that in undertaking the development, careful consideration needs to be given to the flood risk and planned management of potential associated consequences.

As the mechanism of flooding is principally related to the overtopping of the adjacent surface water ditches, the rate of inundation at which the site would flood would be expected to be gradual with low velocities as the boundary with the ditches is long, open and relatively level along its length.

Within this context, the consequences of flooding can be managed and mitigated to a level which is acceptable for the type of development proposed. This will ensure that there is minimal risk to life, minimal disruption to people working in the area, minimal potential damage to property and minimal impact on the overall flood risk in the area. Management and mitigation measures that will be embedded in the design and Environmental Management system will include:

- Emergency response plan identifying emergency access and egress routes.
- Informing all staff and site visitors of the flood potential through site signage, training and induction.
- Locating most sensitive site activities away from areas of flooding.
- Using mobile plant which can be moved to safe areas for protection.
- Ensuring that only small quantities of diesel are stored at the site.
- Ensuring that only non-hazardous wastes could be potentially mobilised by flood water.

### **6.6.3 Energy Consumption and Emissions to Air**

The plant used to process the wastes will typically be powered by diesel motors and will only be operational on an as required basis. Each item of plant will be subject to a preventative maintenance programme. All vehicles delivering waste and transporting products off-site will also be diesel powered. Wherever possible, Tata will optimise vehicle movements by linking the delivery of waste to the site with the delivery of aggregates and recovered materials.

In addition to carbon dioxide, the diesel engines will also release NO<sub>x</sub>, hydrocarbons, carbon monoxide and PM<sub>10</sub> particulates. Ozone could potentially be produced at low level by photochemical reactions with these substances. The emissions of these substances, will however, be effectively controlled at the lowest level reasonably possible, by ensuring that the plant and vehicles are subject to a preventative maintenance programme.

### **6.6.4 Raw Materials Usage**

The plant is to receive wastes that require no external raw materials for their recovery apart from water used to wash selected waste streams. Surface water in the adjacent ditch, controlled by Tata, will be used for topping up the closed loop system. The only use of potable water will be the small amount consumed by the personnel in the portacabin offices.

---

#### **6.6.5 Production of Waste**

Tata is aiming for zero waste production at the site. This will be achieved by separating for off-site recovery any contraries (e.g. wood, metal and plastic) entrained in the main waste streams.

The satisfactory production of products (aggregates) and recovered materials will require rigorous testing programmes to be implemented as part of Factory Production Control. Should this identify any material that does not meet the requirements, then the material will be re-processed.

Long-term operation of the wash process will require the removal of trapped silt. The silt will be re-combined with the feedstocks and ultimately manufactured into the products.

Should disposal ever be required, either to the Morfa landfills operated by Tata or off-site, Tata will ensure that all aspects of Duty of Care are satisfied.

**Table 6-10 Evaluation of Potential Impacts from Particulate Matter**

| Data and information                           |                                                                                                                                                                                      |                                                           |                                                           | Judgement                   |                                                     |                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Controls                                                                                                                                                                                                                                                                                   |                                                                                                                       |
|------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|-----------------------------------------------------------|-----------------------------|-----------------------------------------------------|--------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| Receptor                                       | Source                                                                                                                                                                               | Harm                                                      | Pathway                                                   | Probability of exposure     | Consequence                                         | Magnitude of risk                          | Justification for magnitude                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Risk management                                                                                                                                                                                                                                                                            | Residual risk                                                                                                         |
| What is at risk?<br>What do I wish to protect? | What is the agent or process with potential to cause harm?                                                                                                                           | What are the harmful consequences if things go wrong?     | How might the receptor come into contact with the source? | How likely is this contact? | How severe will the consequences be if this occurs? | What is the overall magnitude of the risk? | On what did I base my judgement?                                                                                                                                                                                                                                                                                                                                                                                                                                            | How can I best manage the risk to reduce the magnitude?                                                                                                                                                                                                                                    | What is the magnitude of the risk after management? (This residual risk will be controlled by Compliance Assessment). |
| Local human population                         | Releases of particulate matter (dusts) and micro-organisms (bioaerosols) associated with activities such as operation of processing plant, vehicle movements and materials handling, | Harm to human health - respiratory irritation and illness | Off-site air transport then inhalation.                   | Low                         | Moderate                                            | Low                                        | Permitted waste types are non-hazardous and do not include dusts, powders or loose fibres and have a low potential to produce bioaerosols.<br>All processing of wood and plasterboard will be indoors and all plant fitted with dust suppressors.<br>Processing of inert and excavation waste will produce particulate matter so a high magnitude risk is estimated.<br>There is potential for increased dust generation from such activities during prolonged dry periods. | Ensure effective dust management plans are implemented.<br>Undertake all processing indoors when feasible.<br>Provide adequate dust suppression to all areas as required. Stop operations if control measures are not working effectively. Provide air-conditioned cabs on relevant plant. | Low                                                                                                                   |
| Local human population                         |                                                                                                                                                                                      | Nuisance - dust on cars, clothing etc.                    | Off-site air transport then deposition                    | Moderate                    | Low                                                 | Low                                        | As above. Local residents often sensitive to dust.                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                            | Low                                                                                                                   |

**Table 6-11 Evaluation of Potential Impacts from Litter and Pests**

| Data and information                                   |                                                                   |                                                                                              |                                                                  | Judgement                          |                                                            |                                                   |                                                                                                                                                                    | Controls                                                                                                                                                                                                               |                                                                                                                              |
|--------------------------------------------------------|-------------------------------------------------------------------|----------------------------------------------------------------------------------------------|------------------------------------------------------------------|------------------------------------|------------------------------------------------------------|---------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| Receptor                                               | Source                                                            | Harm                                                                                         | Pathway                                                          | Probability of exposure            | Consequence                                                | Magnitude of risk                                 | Justification for magnitude                                                                                                                                        | Risk management                                                                                                                                                                                                        | Residual risk                                                                                                                |
| <b>What is at risk?<br/>What do I wish to protect?</b> | <b>What is the agent or process with potential to cause harm?</b> | <b>What are the harmful consequences if things go wrong?</b>                                 | <b>How might the receptor come into contact with the source?</b> | <b>How likely is this contact?</b> | <b>How severe will the consequences be if this occurs?</b> | <b>What is the overall magnitude of the risk?</b> | <b>On what did I base my judgement?</b>                                                                                                                            | <b>How can I best manage the risk to reduce the magnitude?</b>                                                                                                                                                         | <b>What is the magnitude of the risk after management? (This residual risk will be controlled by Compliance Assessment).</b> |
| Local human population and wildlife.                   | Litter from light fraction contraries entrained in waste          | Nuisance, loss of amenity and harm to animal health                                          | Off-site air transport then deposition                           | Low                                | Low                                                        | Low                                               | Local residents often sensitive to litter, however waste types have low litter potential and site will be surrounded by fencing or trees.                          | Appropriate measures will include clearing litter arising from the activities from affected areas outside the site.                                                                                                    | Very low                                                                                                                     |
| Local human population                                 | Waste, litter and mud on local roads from vehicular movements     | Nuisance, loss of amenity, road traffic accidents.                                           | Vehicles entering and leaving site.                              | Low                                | Med                                                        | Low                                               | Road safety, local residents often sensitive to mud on roads. All deliveries of waste will be via Wharf Road and sheeted with no opportunity for wastes to escape. | As above. Appropriate measures will include clearing waste, litter and mud arising from the activities from affected areas outside the site. Staff and visitor vehicles will be restricted to clean non-working areas. | Very Low                                                                                                                     |
| Local human population                                 | Scavenging animals and scavenging birds                           | Harm to human health - from waste carried off site and faeces. Nuisance and loss of amenity. | Off-site air transport and over land deposition                  | Low                                | Low                                                        | Low                                               | Permitted wastes unlikely to attract scavenging animals and birds but site could become nesting / breeding site.                                                   | None specifically required provided waste acceptance controls are implemented. Develop and implement pest management plan if required.                                                                                 | Very low                                                                                                                     |
| Local human population                                 | Pests (e.g. flies)                                                | Harm to human health, nuisance, loss of amenity                                              | Off-site air transport and over land transport                   | Low                                | Moderate                                                   | Low                                               | Permitted waste types unlikely to attract pests.                                                                                                                   | None specifically required provided waste acceptance controls are implemented. Implement management plan if required.                                                                                                  | Very low                                                                                                                     |

**Table 6-12 Evaluation of Potential Impacts from Odour, Noise and Vibration**

| Data and information                           |                                                                                                           |                                                       |                                                           | Judgement                   |                                                     |                                            |                                                                                                                                                                                                                                                                                                                           | Controls                                                                                                                                                                                                         |                                                                                                                       |
|------------------------------------------------|-----------------------------------------------------------------------------------------------------------|-------------------------------------------------------|-----------------------------------------------------------|-----------------------------|-----------------------------------------------------|--------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| Receptor                                       | Source                                                                                                    | Harm                                                  | Pathway                                                   | Probability of exposure     | Consequence                                         | Magnitude of risk                          | Justification for magnitude                                                                                                                                                                                                                                                                                               | Risk management                                                                                                                                                                                                  | Residual risk                                                                                                         |
| What is at risk?<br>What do I wish to protect? | What is the agent or process with potential to cause harm?                                                | What are the harmful consequences if things go wrong? | How might the receptor come into contact with the source? | How likely is this contact? | How severe will the consequences be if this occurs? | What is the overall magnitude of the risk? | On what did I base my judgement?                                                                                                                                                                                                                                                                                          | How can I best manage the risk to reduce the magnitude?                                                                                                                                                          | What is the magnitude of the risk after management? (This residual risk will be controlled by Compliance Assessment). |
| Local human population                         | Odour from waste processing and storage                                                                   | Nuisance, loss of amenity                             | Off-site air transport then inhalation.                   | Low                         | Low                                                 | Low                                        | Local residents often sensitive to odour, however permitted waste types and process has low odour potential provided management systems are implemented.                                                                                                                                                                  | Implement effective waste acceptance control. If needed, undertake olfactory assessments and develop odour management plan as required.                                                                          | Very low                                                                                                              |
| Local human population                         | Noise and vibration from activities such as processing operations, vehicle movements, materials handling, | Nuisance, loss of amenity, loss of sleep.             | Noise through the air and vibration through the ground.   | Low                         | Moderate                                            | Low                                        | Local residents often sensitive to noise and vibration. All recycling activities will utilise modern, well maintained machinery and plant between 08:00 and 18:00. Processing of wood and plasterboard will occur indoors. Where manufacture of aggregates occurs outdoors noise mitigation measures will be implemented. | Undertake real-time noise monitoring of proposed site activities prior to the site becoming fully operational to ensure the plant is placed in optimal location and appropriate mitigation measures implemented. | Low                                                                                                                   |

**Table 6-13 Evaluation of Potential Impacts from Vandalism and Fire**

| Data and information                                                 |                                                                                                           |                                                                                                                                                    |                                                                                                                        | Judgement                          |                                                            |                                                   |                                                                                                                                                                                                                                                                                                                                                                          | Controls                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                              |
|----------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|------------------------------------|------------------------------------------------------------|---------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| Receptor                                                             | Source                                                                                                    | Harm                                                                                                                                               | Pathway                                                                                                                | Probability of exposure            | Consequence                                                | Magnitude of risk                                 | Justification for magnitude                                                                                                                                                                                                                                                                                                                                              | Risk management                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Residual risk                                                                                                                |
| <b>What is at risk?<br/>What do I wish to protect?</b>               | <b>What is the agent or process with potential to cause harm?</b>                                         | <b>What are the harmful consequences if things go wrong?</b>                                                                                       | <b>How might the receptor come into contact with the source?</b>                                                       | <b>How likely is this contact?</b> | <b>How severe will the consequences be if this occurs?</b> | <b>What is the overall magnitude of the risk?</b> | <b>On what did I base my judgement?</b>                                                                                                                                                                                                                                                                                                                                  | <b>How can I best manage the risk to reduce the magnitude?</b>                                                                                                                                                                                                                                                                                                                                                                                                  | <b>What is the magnitude of the risk after management? (This residual risk will be controlled by Compliance Assessment).</b> |
| Local human population after gaining unauthorised access to the site | Existing ground contamination related to site history                                                     | Health effects                                                                                                                                     | Direct physical contact, ingestion and inhalation                                                                      | Very Low                           | Very Low                                                   | Very Low                                          | Ground contamination suspected to exist based on historical land use but material not exposed as site is covered with concrete.                                                                                                                                                                                                                                          | All activities shall be managed and operated in accordance with documented management system which includes site security measures to prevent unauthorised access.                                                                                                                                                                                                                                                                                              | Very Low                                                                                                                     |
| Local human population after gaining unauthorised access to the site | All on-site hazards including waste; plant and vehicles.                                                  | Bodily injury                                                                                                                                      | Direct physical contact                                                                                                | Moderate                           | Low                                                        | Low                                               | Permitted waste types are mostly inert and non-hazardous and not readily accessible therefore only a low magnitude risk is estimated. All plant and vehicles will be locked down and secured at the end of each day.                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Low                                                                                                                          |
| Local human population and local environment                         | Arson and/or vandalism causing the release of polluting materials to air (smoke or fumes), water or land. | Respiratory irritation, illness and nuisance to local population. Injury to staff, fire fighters or arsonists/vandals. Pollution of water or land. | Air transport of smoke. Spillages and contaminated firewater by direct run-off from site and via surface water drains. | Low                                | Low                                                        | Low                                               | Permitted waste types are mainly non-flammable but wood waste will be present. Layout of wood storage and processing areas will involve consultation with Fire Rescue Service and be based on existing Pollution Prevention Guidance. Appropriate fire breaks and stockpile sizes will be maintained. Waste storage and processing areas will be served by hardstanding. | Tata will implement a documented management system that identifies measures to minimise and manage fire. Smoking shall be forbidden throughout the site. Appropriate heat detection apparatus shall be available to measure the temperature of stockpiles. Water, at sufficient pressure, shall be available. Spark arrestors shall be installed at appropriate locations. Stockpile heights shall be controlled and appropriate fire breaks shall be in place. | Low                                                                                                                          |
| Local human population and local environment                         | Accidental fire causing the release of polluting materials to air (smoke or fumes), water or land.        | Respiratory irritation, illness and nuisance to local population. Injury to staff or fire fighters. Pollution of water or land.                    |                                                                                                                        | Low                                | Low                                                        | Low                                               |                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Low                                                                                                                          |

**Table 6-14 Evaluation of Potential Impacts of Flooding**

| Data and information                                   |                                                                              |                                                                                        |                                                                  | Judgement                          |                                                            |                                                   |                                                                                                                                                                                                                | Controls                                                                                                                                                                                                 |                                                                                                                              |
|--------------------------------------------------------|------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|------------------------------------------------------------------|------------------------------------|------------------------------------------------------------|---------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| Receptor                                               | Source                                                                       | Harm                                                                                   | Pathway                                                          | Probability of exposure            | Consequence                                                | Magnitude of risk                                 | Justification for magnitude                                                                                                                                                                                    | Risk management                                                                                                                                                                                          | Residual risk                                                                                                                |
| <b>What is at risk?<br/>What do I wish to protect?</b> | <b>What is the agent or process with potential to cause harm?</b>            | <b>What are the harmful consequences if things go wrong?</b>                           | <b>How might the receptor come into contact with the source?</b> | <b>How likely is this contact?</b> | <b>How severe will the consequences be if this occurs?</b> | <b>What is the overall magnitude of the risk?</b> | <b>On what did I base my judgement?</b>                                                                                                                                                                        | <b>How can I best manage the risk to reduce the magnitude?</b>                                                                                                                                           | <b>What is the magnitude of the risk after management? (This residual risk will be controlled by Compliance Assessment).</b> |
| Local human population and local environment           | Gradual low velocity flooding of site to a predicted depth of less than 0.5m | If waste is washed off site it may contaminate buildings / natural habitats downstream | Flood waters                                                     | Moderate                           | Low                                                        | Low                                               | Site is located in flood zone. Permitted waste types are mostly inert and non-hazardous so any waste washed off site will add to the volume of the local post-flood clean-up workload, rather than the hazard. | Implement management system that details actions to be taken during flooding. Surface drains will be coloured blue and foul sewers red, both on site drainage plan and by painting drain covers on site. | Low                                                                                                                          |

**Table 6-15 Evaluation of Potential Impacts on Surface Water**

| Data and information                                   |                                                                                                                              |                                                                                                                 |                                                                                        | Judgement                          |                                                            |                                                   |                                                                                                                                                                                                                       | Controls                                                                                                                                                                                                              |                                                                                                                              |
|--------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|------------------------------------|------------------------------------------------------------|---------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| Receptor                                               | Source                                                                                                                       | Harm                                                                                                            | Pathway                                                                                | Probability of exposure            | Consequence                                                | Magnitude of risk                                 | Justification for magnitude                                                                                                                                                                                           | Risk management                                                                                                                                                                                                       | Residual risk                                                                                                                |
| <b>What is at risk?<br/>What do I wish to protect?</b> | <b>What is the agent or process with potential to cause harm?</b>                                                            | <b>What are the harmful consequences if things go wrong?</b>                                                    | <b>How might the receptor come into contact with the source?</b>                       | <b>How likely is this contact?</b> | <b>How severe will the consequences be if this occurs?</b> | <b>What is the overall magnitude of the risk?</b> | <b>On what did I base my judgement?</b>                                                                                                                                                                               | <b>How can I best manage the risk to reduce the magnitude?</b>                                                                                                                                                        | <b>What is the magnitude of the risk after management? (This residual risk will be controlled by Compliance Assessment).</b> |
| All surface waters close to and downstream of site.    | Made ground beneath site from historical land use                                                                            | Chronic effects: deterioration of water quality                                                                 | Leaching of existing made ground                                                       | Low                                | Low                                                        | Low                                               | Site is covered with concrete with limited leaching potential. Situation will not be altered by current proposals.                                                                                                    | None required.                                                                                                                                                                                                        | Very Low                                                                                                                     |
| All surface waters close to and downstream of site.    | Spillage / leakage of liquids, leachate from waste, contaminated rainwater run-off from waste e.g. diesel, suspended solids. | Acute effects including: elevated pH,<br><br>Chronic effects: deterioration of water quality controlled by Tata | Direct run-off from site across ground surface, via surface water drains, ditches etc. | Low                                | Low                                                        | Low                                               | Many waste types are listed inert<br>Leachate characteristics of slag based wastes will be similar to the leachate that would be generated by infiltration passing through the hardstanding platform already in place | All liquids including relevant chemical reagents, fuel oils etc. will be stored in accordance with COSHH and where necessary provided with secondary containment in accordance with EA Pollution Prevention Guidance. | Very Low                                                                                                                     |
| Local human population                                 | Contamination of surface waters used for recreational purposes following spillage or infiltration                            | Harm to human health - skin damage or gastro-intestinal illness.                                                | Direct contact or ingestion                                                            | Low                                | Low                                                        | Low                                               | Few users would enter surface water downstream of the site. Site is covered by impermeable concrete with drainage from waste storage and processing areas passing through full retention separator.                   |                                                                                                                                                                                                                       | Very Low                                                                                                                     |
| Abstraction from watercourse downstream of facility    | No pathway considered plausible.                                                                                             |                                                                                                                 |                                                                                        | No pathway considered plausible.   |                                                            |                                                   | No abstractions downstream                                                                                                                                                                                            | None                                                                                                                                                                                                                  | None                                                                                                                         |

**Table 6-16 Evaluation of Potential Impacts on Groundwater**

| Data and information                                   |                                                                                                                                               |                                                              |                                                                                  | Judgement                          |                                                            |                                                   |                                                                                                        | Controls                                                                                                                                                                                  |                                                                                                                              |
|--------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|----------------------------------------------------------------------------------|------------------------------------|------------------------------------------------------------|---------------------------------------------------|--------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| Receptor                                               | Source                                                                                                                                        | Harm                                                         | Pathway                                                                          | Probability of exposure            | Consequence                                                | Magnitude of risk                                 | Justification for magnitude                                                                            | Risk management                                                                                                                                                                           | Residual risk                                                                                                                |
| <b>What is at risk?<br/>What do I wish to protect?</b> | <b>What is the agent or process with potential to cause harm?</b>                                                                             | <b>What are the harmful consequences if things go wrong?</b> | <b>How might the receptor come into contact with the source?</b>                 | <b>How likely is this contact?</b> | <b>How severe will the consequences be if this occurs?</b> | <b>What is the overall magnitude of the risk?</b> | <b>On what did I base my judgement?</b>                                                                | <b>How can I best manage the risk to reduce the magnitude?</b>                                                                                                                            | <b>What is the magnitude of the risk after management? (This residual risk will be controlled by Compliance Assessment).</b> |
| Groundwater                                            | Made ground beneath site from historical land use                                                                                             | Chronic effects: deterioration of water quality              | Leaching and transport through soil / made ground to groundwater                 | Low                                | Low                                                        | Low                                               | Shallow made ground suspected of being contaminated due to historical land use.                        | Ensure effective management plans are implemented for future operations.                                                                                                                  | Very Low                                                                                                                     |
| Groundwater                                            | Spillage/ leakage of liquids, leachate from waste, drainage systems, contaminated rainwater run-off from waste e.g. diesel, suspended solids. | Chronic effects: contamination of groundwater,               | Infiltration and transport through soil/groundwater then extraction at borehole. | Low                                | Low                                                        | Low                                               | Waste stored and processed outdoors will be either inert or non-hazardous with low leaching potential. | All liquids including fuel oils etc. will be stored in accordance with COSHH and where necessary provided with secondary containment in accordance with EA Pollution Prevention Guidance. | Very Low                                                                                                                     |

---

## 6.7 Summary

The assessments demonstrate that the proposed activities will not result in significant unacceptable environmental impacts provided the control measures identified are fully adopted. To minimise the opportunity of these measures not being fully implemented, the operation of the facility will be in accordance with a documented management system which will specifically include measures aimed at protecting the environment. These will include:

- processing of waste will be undertaken in accordance with the Permit and a documented management system.
- Tata hold ISO9001 and ISO14001 certification and the principles underlying these standards will be applied to the operation of the site.
- site will be managed by personnel with relevant and current WAMITAB certification and waste management experience.
- areas used to store and process wastes will be on hardstanding capable of supporting the operations.
- Little potentially combustible waste wood will be temporarily stored
- Waste will not be burned, either in the open, inside buildings or in any form of incinerator.
- Wastes will only be treated using processes identified in the Permit.
- Where waste disposal is necessary, this will be undertaken in a manner which minimises its impact on the environment.
- The activities shall not extend beyond the Permit boundary.
- All liquids in containers, whose emission to water or land could cause pollution, shall be provided with secondary containment, unless other appropriate measures to prevent or where that is not practicable, to minimise, leakage and spillage from the primary container shall be used.
- Preventative maintenance programme will be in place for all plant and infrastructure.

---

## **7 OUTPUT FROM ASSESSMENT**

### **7.1 Link to Documented Management System**

For each of the exposure pathways evaluated in the assessment, Tata will ensure that a fully documented management system is in place by the time the site is operational.

### **7.2 Monitoring Plan**

Tata will also implement a documented monitoring programme to ensure the predictions of the impact assessment are validated. The programme will allow contingency actions to be taken.

---

## **8 SUMMARY AND CONCLUSIONS**

The assessment demonstrates that the operation of the waste management facility will not lead to any significant negative impacts to the environment or humans. The scheme does, however, provide many positive impacts.

This risk assessment will be need to be updated when necessary and directly linked to the Environmental Management System.

Figure 1 Site Plan



Figure 2 Proposed Site Layout and Access

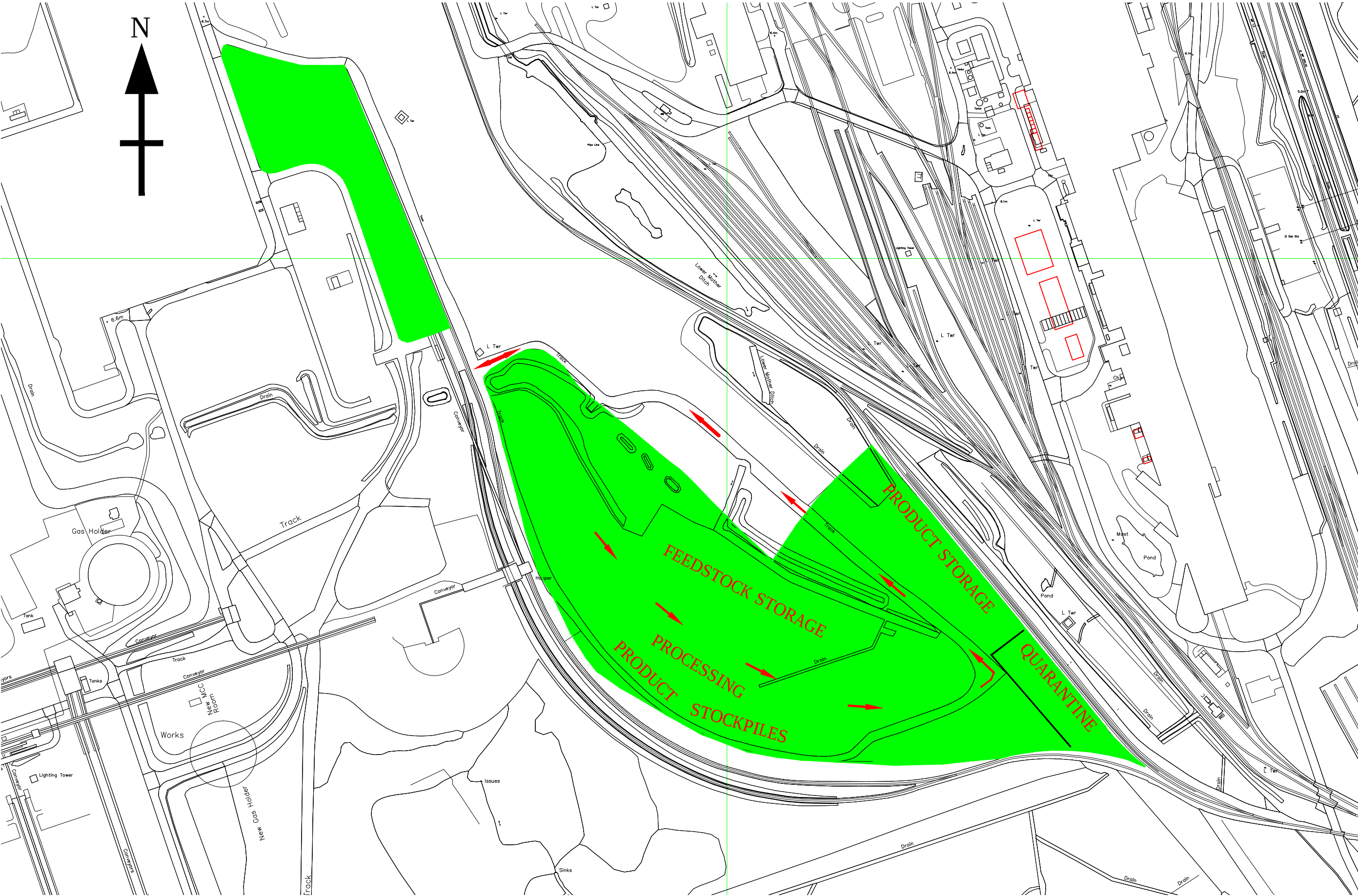


Figure 3 Location of Key Receptors



**Report 2  
Environmental Risk  
Assessment**

**HAA MATERIALS  
RECYCLING FACILITY  
PORT TALBOT  
STEELWORKS**

**Appendix 1  
Criteria for Steel Quality  
Protocol**

*Report Number 1514r2v1d0216*



- Environment Agency (<https://www.gov.uk/government/organisations/environment-agency>)

See more information about this Guidance (<https://www.gov.uk/government/publications/aggregate-from-waste-steel-slag-quality-protocol>)

Guidance

## Aggregate from waste steel slag: quality protocol

Published 1 April 2015

### Contents

1. When the final product is no longer waste
2. Waste you can use and codes
3. Uses
4. Record input waste
5. Standards, specifications and quality controls
6. Factory production control (FPC)
7. Tests
8. Good practice
9. Paperwork and records checklist
10. Unused steel slag aggregate: loss of non-waste status
11. Reviewing this quality protocol
12. Blended steel slag aggregate

This quality protocol applies to England and Wales.

### 1. When the final product is no longer waste

Aggregate product made from waste steel slag will be regarded as fully recovered and no longer subject to waste controls providing you can show that you:

- used only the correct waste steel slag materials
- made only the permitted products
- complied with the relevant European standard, specification and quality controls for the product you are making, and it passes all required tests and needs no further treatment, weathering or size reduction before use
- have a manual of your factory production control (FPC)
- have marked the product to the CE requirements (<https://www.gov.uk/ce-marking>) of the Construction Products Regulations ([http://ec.europa.eu/enterprise/sectors/construction/legislation/index\\_en.htm](http://ec.europa.eu/enterprise/sectors/construction/legislation/index_en.htm))
- transported, stored, handled and processed the waste steel slag and the final product following good practice guidelines
- supplied the customer with delivery documents confirming the product meets the quality protocol

Always make sure you follow duty of care responsibilities, and conditions on any environmental permit or waste management licence or exemption you hold.

## 2. Waste you can use and codes

You must only use the slag waste from steel-making method:

- basic oxygen steelmaking (BOS)
- electric arc furnace (EAF) - including carbon steel EAF and high alloy EAF
- argon oxidisation decarburisation (AOD)

The European Waste Catalogue (EWC) codes for steel slag are:

- 10.02.01 – wastes from the iron and steel industry from slag processing
- 10.02.02 – unprocessed slag waste from the iron and steel industry

## 3. Uses

Under the quality protocol you can process the correct waste steel slag to make specified unbound, semi-bound or fully bound aggregate products for use in the civil engineering and construction industries.

### 3.1 End uses for the types of steel slag aggregates

For unbound uses (BOS and carbon steel EAF slag aggregates only) the end uses are:

- aggregates for sub-base
- capping
- fills
- pipe bedding

For semi-bound uses (BOS, carbon steel EAF and high alloy EAF aggregates only) the end use is:

- aggregates for surface dressing

For bound uses (BOS carbon steel EAF, high alloy EAF and AOD slag aggregates), the end uses are both:

- aggregates for asphalt and concrete
- aggregates and activators for hydraulically bound mixtures

The standards and specification for each product and its intended use will tell you what shape, size, weathering or other processing you need to carry out.

Note: Lime that is present in unweathered steel slag may make the aggregate liable to later expansion and unsuited to certain uses. Always check the weathering time in line with the expansion testing requirements in BS EN 1744-1, for the product you intend to make.

## 4. Record input waste

Whether you use on-site waste steel slag, or have waste steel slag delivered for processing, keep records of:

- whether it's BOS, EAF or AOD waste steel slag – and include the EWC code (<https://www.gov.uk/government/publications/waste-classification-technical-guidance>)
- its volume or weight
- the source of the waste

- the date of delivery, and name and address of the supplier and carrier if the waste is not already on site
- your method for confirming the waste is acceptable input material – if not, your rejection or quarantine reasons and what you did with the rejected waste

## 5. Standards, specifications and quality controls

Note that FPC is factory production control.

### 5.1 Standards, specifications and quality controls for the use of aggregates

#### **Product end use: unbound steel slag aggregate - pipe bedding**

Standard: BS EN 13242

Application specification: Highway Works series 500

Quality controls: evaluation of conformity to standard and specification, and FPC to Level 4 of BS EN 13242

#### **Product end use: unbound steel slag aggregate - granular fill and general fill capping**

Standard: BS EN 13242

Application specification: Highway Works series 600 and BS EN 13285

Quality controls: evaluation of conformity to standard and specification, and FPC to Level 4 of BS EN 13242

#### **Product end use: unbound steel slag aggregate - sub base**

Standard: BS EN 13242

Application specification: Highway Works series 800 and BS EN 13285

Quality controls: evaluation of conformity to standard and specification, and FPC to Level 4 of BS EN 13242

#### **Product end use: semi-bound steel slag aggregate - surface dressing**

Standard: BS EN 13043

Application specification: Highway Works series 900

Quality controls: evaluation of conformity to standard and specification, and FPC to Level 2+ BS 13043 for high safety applications, or Level 4 BS 13043 for other applications

#### **Product end use: steel slag aggregate for concrete**

Standard: BS EN 12620

Application specification: Highway Works series 1000 and BS 8500-2

Quality controls: evaluation of conformity to standard and specification, and FPC to Level 4 of BS EN 12620

#### **Product end use: steel slag aggregate for asphalt**

Standard: BS EN 13043

Application specification: Highway Works series 900

Quality controls: evaluation of conformity to standard and specification, and FPC to Level 2+ BS 13043 for high safety applications, or Level 4 BS 13043 for other applications

## **Product end use: steel slag aggregate for hydraulically bound mixtures**

Standard: BS EN 13242

Application specification: Highway Works series 800 and BS EN 14227-1 to 5

Quality controls: evaluation of conformity to standard and specification, and FPC to Level 4 of BS EN 13242

The British Standards Institution (<http://shop.bsigroup.com/>) has guidance documents explaining how to apply the European Aggregate Standards within the UK. These are:

- PD 6682-1 - for BS EN 12620
- PD 6682-2 - for BS EN 13043
- PD 6682-6 - for BS EN 13242

You can find the British Standard Institution's engineering standards from the bsi website (<http://shop.bsigroup.com/en/Browse-by-Sector/Engineering/?t=r>) and the highway works series from the Department for Transport website (<http://www.standardsforhighways.co.uk/mchw/vol1/>)

## **6. Factory production control (FPC)**

You must have FPC in place to comply with the quality protocol and the BS EN standard for the product you are making. FPC is a record of all your policies and methods for managing the waste material - from steel slag arriving on site, through to storage, processing, transport, and delivery of quality protocol approved products to your customer.

It must include:

- how you assess and record input waste, your method statement of production (MSP), processing techniques, product testing, and staff training – set out each step and result, and specify how long you keep these records
- a description of the delivery documents you give to customers
- regular reviews to ensure practices and methods are up-to-date and work properly – you must keep a record of these reviews and detail any actions or changes you make
- a policy for managing any subcontractors
- a named representative responsible for the FPC and its correct use

### **6.1 Method statement of production (MSP)**

You need a written description of your methods for processing the waste steel slag for every product type you make. Include:

- what waste material you use, how you select it and how and where you store it
- the equipment you use and how you maintain it – record all checks and repairs or adjustments during production
- the checks you make for deterioration and product quality during handling, storage, transport and delivery

- how you identify your finished product up to the point of sale

## 6.2 Inspection, measuring and testing equipment

Keep method statements and records for:

- what equipment you have, with a unique identification for each
- maintenance and inspections
- how you use it, and any controls and adjustments you make

## 6.3 Staff training

You must train staff to understand and apply:

- waste material acceptance criteria
- procedures for dealing with non-compliant wastes
- inspections, sampling and testing

## 7. Tests

You must have a plan that specifies the type and frequency of testing for each aggregate product you produce from steel slag waste.

Make sure your testing programme conforms to both:

- test specifications in the BS EN standard for your aggregate product
- the test minimum frequency requirements

### 7.1 Testing requirements associated with particular end uses and standards

#### Product standard BS EN 13242

Test: particle size distribution, BS test reference: EN 933-1, minimum test frequency: weekly

Test: fines content, BS test reference: EN 933-1, minimum test frequency: weekly

Test: particle density and water absorption, BS reference: EN 1097-6, minimum test frequency: yearly

Test: resistance to fragmentation (Los Angeles), BS reference: EN 1097-2, minimum test frequency: twice a year

Test: volume stability, BS reference: EN 1744-1, minimum test frequency: twice a year

Test: magnesium sulphate soundness, BS reference: EN 1367-2, minimum test frequency: once every 2 years

#### Product standard BS EN 12620

Test: particle size distribution, BS test reference: EN 933-1, minimum test frequency: weekly

Test: fines content, BS reference: EN 933-1, minimum test frequency: weekly

Test: particle density and water absorption, BS reference: EN 1097-6, minimum test frequency: yearly

Test: resistance to fragmentation (Los Angeles), BS reference: EN 1097-2, minimum test frequency: twice a year

Test: sulfur containing compounds, BS reference: EN 1744-1, minimum test frequency: yearly

Test: magnesium sulphate soundness, BS reference: EN 1367-2, minimum test frequency: once every 2 years

## **Product standard BS EN 13043**

Test: particle size distribution, BS reference: EN 933-1, minimum test frequency: weekly

Test: fines content, BS reference: EN 933-1, minimum test frequency: weekly

Test: particle density and water absorption, BS reference: EN 1097-6, minimum test frequency: yearly

Test: resistance to fragmentation (Los Angeles), BS reference: EN 1097-2, minimum test frequency: yearly

Test: polished stone value (surface coarse only), BS reference: EN 1097-8, minimum test frequency: yearly

Test: volume stability, BS reference: EN 1744-1, minimum test frequency: twice a year

Test: magnesium sulphate soundness, BS reference: EN 1367-2, minimum test frequency: once every 2 years

You may interpret minimum test period frequencies in 2 ways. For example, if a minimum testing frequency is weekly, you may take this as 7 consecutive days of which 5 are production days, or the time it takes to complete 5 production days.

Keep test results for the time specified in your FPC – the quality protocol minimum is 2 years. You can also create summaries, for example, as a graph of test results over time.

## **7.2 When to test more or less often**

If you know the quality of your waste material or recycled aggregate is close to failing a standard, you should test the product more often. Record your increased test schedule in your FPC manual.

You may reduce your test frequency if:

- you are using highly automated, precision production equipment
- you have proven, long-term experience with consistency of a material's special properties
- your waste materials have proven high conformity
- you have a quality management system with exceptional product checking

You must give a full statement with reasons for reducing test frequencies in your FPC manual.

## **8. Good practice**

### **8.1 Move, store and handle waste steel slag and the final aggregate product safely**

All producers, distributors and users should minimise harm from dust and airborne particles when moving, processing or using waste steel slag or its aggregate products.

Take action to keep employees safe – follow Health and Safety Executive advice (<http://www.hse.gov.uk/workers/>) and provide personal protective equipment.

Where possible, use mechanical means of moving the aggregate rather than by hand – check the manual handling regulations (<http://www.hse.gov.uk/msd/pushpull/regulations.htm>).

Prevent dust and fine particles entering watercourses or drains, or landing on surrounding vegetation or property. You can use:

- enclosed containers, silos, bins and hoppers
- local exhaust ventilation and spray suppression systems
- open conveyors with wind boards to limit wind whipping

When using aggregate on construction or demolition sites follow the guidance:

- Pollution Prevention Guidelines PPG6 (<https://www.gov.uk/government/publications/construction-and-demolition-sites-ppg6-prevent-pollution>)
- Construction Industry Research and Information Association's (CIRIA's) Environmental Good Practice on Site (C692) ([http://www.ciria.org/Training/Training\\_courses/Environmental\\_good\\_practice\\_on\\_site.aspx](http://www.ciria.org/Training/Training_courses/Environmental_good_practice_on_site.aspx))

## 9. Paperwork and records checklist

You must keep information about your waste steel slag recovery process and aggregate production methods for 2 years.

All records must be legible and available to the Environment Agency on request.

### 9.1 Incoming waste

Record all input waste steel slag you accept or reject for aggregate processing – you may also need this information for your permit conditions.

### 9.2 Production data

Keep a copy of all tests - this includes details of any test failures, and adjustments you make to your production and control methods to meet the standard or specification for your intended product.

### 9.3 Outgoing steel slag aggregate product

You must create a document for your customer and keep a copy for your records. Include:

- name and details of the aggregate product, including any customer specification
- producer's name, address and contact details
- site address of production
- date of product dispatch
- quantity by volume or weight
- any identifying batch or serial number
- name, address and contact details of the customer
- description of the customer's business
- a statement of conformity to say the product meets the quality protocol and all standards, specification and quality control checks

If the customer asks, you must also include:

- results of any product tests
- outline details of your factory production control (FPC) manual
- good practice guidance for storing, transporting and handling the product

## 10. Unused steel slag aggregate: loss of non-waste status

Quality protocol compliant steel slag aggregate will become waste and subject to waste management controls (<https://www.gov.uk/managing-your-waste-an-overview>) if at any stage you dispose of it, or store it indefinitely with little prospect of use as an approved end product.

This applies to anyone holding stores of aggregate made from waste steel slag, not just producers.

## 11. Reviewing this quality protocol

We will review and update this quality protocol as needed. This could be because there is a:

- pollution incident
- change in the market
- change in legislation or case law
- change in the understanding of risk of steel slag
- significant change to the processes or technologies which produce steel slag

If the composition of the steel slag exceeds any of the limits in section 9 of the steel slag technical report that slag may not qualify as an input for this quality protocol.

Email [endofwaste@environment-agency.gov.uk](mailto:endofwaste@environment-agency.gov.uk) for a copy of the report.

## 12. Blended steel slag aggregate

If you blend quality protocol compliant steel slag aggregate with:

- waste material, the whole mixed volume becomes waste and you must apply waste management controls
- non-waste material, the whole volume is non-waste – but you will need to check it meets the standard, specification and quality controls of the end product you want to make



- Environment Agency (<https://www.gov.uk/government/organisations/environment-agency>)

See more information about this Guidance (<https://www.gov.uk/government/publications/quality-protocols-qps-rules-for-all-qps>)

Guidance

## Quality protocols (QPs): rules for all QPs

Published 1 June 2015

### Contents

1. Waste management control rules
2. Non-waste product rules
3. Imports and exports
4. Updating the QP
5. Environmental regulators

### 1. Waste management control rules

You must still apply waste controls (<https://www.gov.uk/managing-your-waste-an-overview>) until the point the material is no longer waste. Make sure you have the correct authorisation (<https://www.gov.uk/environmental-permit-check-if-you-need-one>) in place for the transport, storage, handling and treatment of waste from the relevant environmental regulator.

There is no legal duty to comply with a QP. But if you do not, you must continue to treat any waste derived material as waste. You must comply with waste management controls for its storage, handling, transport, use and disposal. If not, you may be committing an offence.

### 2. Non-waste product rules

When you produce a non-waste product you may need to comply with laws from which you were previously exempt.

For example, waste is exempt from Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) Regulation (<http://www.hse.gov.uk/reach/>). When you turn waste into a non-waste product, the exemption no longer applies.

### 3. Imports and exports

Although the QP product may cease to be waste in England, Wales and Northern Ireland, other countries may take a different view.

Check the Waste Shipment Regulations (EC/1013/2006) (<http://ec.europa.eu/environment/waste/shipments/legis.htm>), and with the competent authority in the country (<http://ec.europa.eu/environment/waste/shipments/links.htm>) of export or import to see whether waste controls apply to its movement.

### 3.1 European Union (EU) equivalent standards

Countries within the EU may recycle waste derived material using their own codes of practice or standards.

UK government accepts that the same materials from EU countries may cease to be waste providing processing and production follow either:

- a relevant standard or code of practice developed by that country
- an international standard or technical regulation adopted by that country

And that these give levels of product performance, and protection of human health and the environment, equal to those of the UK QPs.

## 4. Updating the QP

The environmental regulators will review and update a QP when appropriate. Make sure you refer to GOV.UK for the latest version.

It may be reviewed when there is a:

- pollution incident
- change in the market
- change in legislation or case law
- change to the agreed European standard
- change in the understanding of the chemical composition or physical properties of the material

A QP may be withdrawn if it is being misapplied and/or misused.

## 5. Environmental regulators

The contact details for the environmental regulators are:

Environment Agency (England)

Telephone: 03708 506 506\*

Email: [enquiries@environment-agency.gov.uk](mailto:enquiries@environment-agency.gov.uk)

Northern Ireland Environment Agency (NIEA)

Telephone: 028 9056 9837\*

Email: [BetterRegulation@doeni.gov.uk](mailto:BetterRegulation@doeni.gov.uk)

Natural Resources Wales (NRW)

Telephone: 0300 065 3000\*

Email: [enquiries@naturalresourceswales.gov.uk](mailto:enquiries@naturalresourceswales.gov.uk)

\*Find out about call charges (<https://www.gov.uk/call-charges>).



Geotechnical &  
Environmental Services

Ty Coed  
Cefn-yr-Allt  
Aberdulais  
Neath SA10 8HE

T 01639 775293  
F 01639 779173

[enquiries@geotechnology.net](mailto:enquiries@geotechnology.net)  
[www.geotechnology.net](http://www.geotechnology.net)