Produced by Bristol & Avon Transport & Recycling Ltd



**Environmental**

**Risk**

**Assessment**

Construction of Bristol and Avon Transport and Recycling Ltd, Hallen Yard

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| Date | **January 2014** |
| Revision | **0.2** |
| Document Reference | **BATPA08/02** |

**1.0 Scope**

Bristol and Avon Transport and Recycling Ltd are proposing to develop land off of Severn Road, Hallen, for use as their new Transport and Recycling yard. The land is currently classified as industrial land with Planning Permission for development. The site is 44,200m2 with a requirement to import suitable engineering fill to an agreed level of 7.45 AOD. The surface will then be laid to hardstanding for the yard areas and a warehouse, office, workshop and associated parking constructed.

**2.0 Site Description**

**2.1 Site Location**

The site is located at National Grid reference ST54623 81083, within an area of undeveloped farmland approximately 800 m to the northwest of Hallen, 2 km to the east of the Severn Estuary and 2.5 km to the north of Avonmouth, as shown on Site Location Map, drawing No. 2763-772-01.

The Site is situated in an area that is characterised by a patchwork of fields separated by drainage ditches and hedgerows with occasional mature trees. The fields were predominantly used for grazing livestock. Immediately to the north of the Site is a significant drainage ditch called Monks Well, beyond which is a gas works. The Site is located approximately 30m to the northwest of the M49 motorway. There is a small, unnamed drainage ditch to the south of the Site, beyond which there is an embankment that leads up to Severn Road. The land to the west of the Site comprises a former field that has recently been raised in preparation for development. There is also a small industrial to the west of the Site.

The site is fairly level, averaging at 6.2 AOD, with slight undulations in the northern field caused by historical land drains.

**2.2 Planning requirements**

This development was granted Planning Permission by Gloucestershire County Council Reference number: SG. 4244, (BATPA08/03).

**3.0 Environmental Sensitivity**

**3.1 Sites of environmental importance**

The site is located more than 1km of a site of environmental importance. It is situated 2km from The Severn Estuary, which is designated a SSSI.

The site is located 200m from Local Widlife Site (LWS) and up to 500m from a Coastal and Floodplain garzing marsh. The protection of these Nature and Heritage Conservation sites has been addressed in the Ecological report, ref BATPA0806 and subsequent letter received from Environ (January 2014). There is no pathway to these sensitive sites and a holding pond is being constructed as mitigation to control any potential escape of surface waters from the site.

**3.2 Geology and hydrogeology**

The geology of the area is taken from the British Geological Society map for the area. The superficial ground and drift geology are tidal flat deposits, rock type Clay and Silt. The bedrock is mercia mudstone.

**3.2.1 Groundwater**

The site is not located within a source protection zone.

**3.2.2 Surface water**

The majority of the site is drained by land drains and ditches which run along the Northern and Southern site boundary.

The proposed site will be laid to an impermeable hardstanding, where clean runoff is drained to interceptors. There will be a holding pond in the north west area of the site to contain surface waters during the construction phase and used as a wildlife pond following development of the site.

**4.0 Control of wastes**

The acceptance of wastes onto the site will be restricted to those set out in Table 1, which is set out within the Environment Permitting (England and Wales) Regulations 2007.

**Table 1.0**

|  |  |
| --- | --- |
| Waste Code | Description |
| 01 | Wastes resulting from exploration, mining, quarrying and physical and chemical treatment of minerals |
| 01 04 | Wastes from physical and chemical processing of non-metalliferrous minerals |
| 01 04 08 | Waste gravel and crushed rock other that those containing dangerous substances |
| 01 04 09 | Waste sand and clays |
| 10 | WASTES RESULTING FROM EXPLORATION, MINING, QUARRYING, AND PHYSICAL AND CHEMICAL TREATMENT OF MINERALS |
| 10 01 | Wastes from power stations and other combustion plants (exept 19) |
| 10 01 02 | Pulverized fuel ash only (subject to waste acceptance procedures and waste acceptance criteria) |
| 17 | Construction and demolition wastes (including excavated soil from contaminated sites) |
| 17 01 | Concrete, bricks, tiles and ceramics |
| 17 01 07 | Mixture of concrete, bricks and tiles |
| 17 03 | Bituminous mixtures, coal tar and tarred products |
| 17 03 02 | Bituminous mixtures other than those mentioned in 17 03 01 |
| 17 05 | Soil (including excavated soil from contaminated sites) stones and dredging spoil |
| 17 05 04 | Soil and stones |
| 19 | Wastes from wasted management facilities, off-site waste water treatment plants and preparation of water intended for human consumption and water for industrial use |
| 19 13 | Wastes from soil and groundwater remediation |
| 19 13 02 | Solid wastes from soil remediation other than those containing dangerous substances |
| 20 | Municipal wastes (household waste and similar commercial, industrial and institutional wastes) including separately collected fractions |
| 20 02 | Garden and park wastes (including cemetery waste) |
| 20 02 02 | Soil and stones |

**4.1 Haul Roads**

A temporary haul will be constructed into the site off the unadopted access road, this is to prevent mud and debris from escaping the site and to ensure vehicles are free from debris prior to existing.

**4.2 Potentially Contaminated Sites**

Where it is proposed to import soils and stones from sites that may have been used historically and where contamination may have occurred these will only be accepted following receipt of the necessary contamination reports, sampling methodologies and analysis.

To ensure that the waste is suitable for use site specific waste acceptance criteria is developed based on the existing site conditions and final end use.

Where necessary we may undertake further sampling of material being brought to site to ensure its suitability and ensure that it does not pose a risk to human health, amenity or the environment.

**4.3 Waste Acceptance Criteria**

Due to the amount of waste typically used at sites such as this and the inability at this early stage to identify exactly where the material is likely to come from this is a useful way of detailing what wastes will be used. We have considered both environmental and human health impacts and have used thresholds derived from the CLEA Soil Guideline, GAC and the Landfill Regulations, outlined in Table 2.0.

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| **Table 2.0 Threshold values for the final finished levels Hazard** | **Determinand** | **Threshold Used (mg/kg)** | **Assessment Guidance used** |
| Human Health Risks:  Site End users | Arsenic | 640 | CLEA SGVS Commercial & Industrial |
| Cadmium | 230 (pH 8) |
| Chromium | 5000 |
| Lead | 750 |
| Inorganic Mercury | 3600 |
| Nickel | 1800 |
| Selenium | 13000 |
| Total Phenols | 15 | CLEA SGVS Residential without plant uptake assuming 5% organic matter |
| Toluene | 15 |
| Ethyl benzene | 80 |
| Polyaromatic Hydrocarbons | 100 | Landfill Regulations.  Technical Guidance WM2 |
| Mineral Oils | 1000 |
| PCBs (7 congeners) | 1 |
| Free Cyanide | 20 | Dutch intervention values |
| Asbestos | No presence |  |
| Phytotoxicty | Copper | 250 | MAFF guidance on Phytotoxicity |
| Zinc | 1000 |

**4.3.1 Human Health**

Where available the threshold values are derived from published Soil Guideline Values (SGVs) or Generic Assessment Criteria (GACs). The SGV is defined, as the concentration below which there is “no significant possibility of significant harm to human health”. We have used the ‘Commercial & Industrial End Use’ guidelines due to the existing and future use of the site. The material will be covered with an impermeable final surface layer, which will prevent any pathway to human or environmental receptors.

GACs have been issued for a limited number of polynuclear aromatic hydrocarbons (PAH). For residential use without plant uptake, these vary from 1.32 mg/kg to 2,700 mg/kg, depending on toxicity. However the limit value for waste acceptable at landfills for inert waste (under the Landfill Regulations) is 100 mg/kg Total PAH, therefore we have adopted this limit here. We have also derived the screening values for Mineral Oils and PCBs from the Landfill Regulations. The Dutch standard for free cyanide has been used in the absence of a current UK guideline. If the waste fails outside of these threshold values we will undertake a site-specific risk assessment and advice will also be sought from the Environment Agency.

**4.3.2 Generic Risk Assessment criteria for risk to Plants**

Contaminants may be taken up and accumulated by plants through a range of mechanisms. The principal pathways are active and/or passive uptake through the plant root, adsorption to root surfaces and volatilisation from the soil surface followed by foliar uptake. Many substances capable of affecting vegetation exert this effect due to their water solubility. This characteristic can result in the transportation of contaminants to adjacent sites.

CLR11 states that the ICRCL Guidance Note 70/90 can be used for initial screening criteria. However where an ICRCL 70/90 criterion is lacking, the lowest criterion from MAFF has been used for the risk assessment. The list used below is for the commonly occurring priority pollutants to cause phytotoxicity.

**Table 3.0**

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| **Reference Published Assessment Criteria (mg/kg)** | As | B | Cr (total) | Cr (III) | Cr(VI) | Cu | Ni | Zn |
| **ICRCL 70/90 (1990) threshold trigger value** | 50 |  |  |  | 25 | 250 |  | 1000 |
| **MAFF Code of Good Agricultural Practice for the Protection of Soil (1998)** | 250 |  |  | Unlikely to be toxic except in v low pH. |  | 500 (grass) but may fall to 250 for clover and sensitive species (at pH≥6) | 110 (pH>7)  75 (pH 6-7)  60 (pH5.5-6.0) | 1000 (clover & grass at pH6) may fall to 300 for sensitive species (at pH6-7) |

Guidance published by MAFF subsequent to the ICRCL guidance recommends a maximum value of 1000mg/kg zinc for clover and productive grass species.

The proposed scheme does not include landscaping within the boundary apart from around the pond. All landscaped areas are covered with 300mm of clean topsoil for plant establishment. For areas within 1m of the landscaped areas MAFF guidance will be used.

**4.3.3 Controlled waters**

To ensure that the waste does not cause harm to the environment we will use leachate thresholds taken from the Waste Acceptance Criteria, from the Landfill Regulations (Table 4.0) where applicable. If the waste falls outside of these threshold values we will undertake a site-specific risk assessment which will address the potential impacts on controlled waters. Advice will also be sought from the Environment Agency.

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| **Table 4.0 Water soluble thresholds Hazard** | **Determinand** | **Threshold used (mg/kg)** | **Threshold derivation** |
| Contamination of controlled waters | Arsenic | 0.5 | Landfill Regulations (Leachate 10:1 L:S) |
| Barium | 20 |
| Cadmium | 0.04 |
| Total Chromium | 0.5 |
| Copper | 2 |
| Mercury | 0.01 |
| Molybdenum | 0.5 |
| Nickel | 0.4 |
| Lead | 0.5 |
| Antimony | 0.06 |
| Selenium | 0.1 |
| Zinc | 4 |
| Chloride | 800 |
| Fluoride | 10 |
| Sulphate | 1000 |
| Phenol Index | 1 |
| Dissolved organic carbon | 500 |
| Total dissolved solids | 4000 |

**4.4 Waste Acceptance Procedures**

Please refer to the acceptance flow chart BATPA08/08.

**5.0 Control of pollution**

**5.1 Mud and debris**

The deposit of material onto the surfaced road will be treated as an emergency and will be cleared by a vacuum/road sweeper. The on site wheel wash will be used by all vehicles as they exit the site. In addition all vehicles will be visually inspected to ensure that no mud is carried out on the wheels or body of the vehicle.

Vehicle movements are limited to the following operational hours, Table 5.0

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| --- | --- |
| **Table 5.0 Operating Hours** | |
| **Days** | **Hours of Use** |
| Monday – Friday | 0630-1800 |
| Saturday | 0630 – 1300 |
| Sunday & public holidays | No vehicle movements |

**5.2 Dust Control**

Vehicles carrying potentially dusty loads will be sheeted. During periods of dry weather, a bouser will be used to suppress the dust on the site and access roads.

**5.3 Odour control**

This presents a very low risk of odour nuisance. If malodorous waste is deposited on site it will be consigned to the quarantine skip and removed from site immediately. Any loads which are found to be malodorous will be rejected.

**5.4 Noise Control**

All site vehicles are fitted with exhaust silencers maintained to the manufacturer’s recommendations.

**5.5 Pest and Bird Control**

The waste streams will not contain putrescible wastes that would provide a source of food to insects, birds or vermin. No special measures are therefore required to control infestation by pests. This is reviewed if pests are observed at the site in significant numbers.

**5.6 Litter Control**

The types of waste deposited at the site are to be free of litter. Any loads containing a significant proportion of paper or cardboard will be rejected. Any litter noted will be picked up as soon as possible such that it is collected within 24 hours. Priority will be given to any litter that may have been blown off site. Records will be made of the incident, the location of the litter in relation to the site, the wind direction and the nature of the wastes.

Appropriate steps will be taken to remove the source of litter and a record made of the corrective action.

**5.8 Records**

Bristol and Avon Transport and Recycling Ltd, as the Principal contractor, will be on site during operational hours and the inspection findings will recorded in the site diary. All details of any breakdowns or complaints will be recorded on the day that each event occurs and will be investigated. Routine inspections will also be carried out to inspect the quality of the material entering the site, monitor the environmental controls and record the weather conditions.

**5.9 Surface water control**

The topsoil strip of the site is proposed to be carried out in phases to minimise the risk of suspended soilds contaminating the water receptor. During the construction phase no surface water will be permitted a pathway to the water receptor as a holding pond will collect on site water. Earthworks will be covered over in hardstanding as soon as possible following completion.

**6.0 Risk Assessment**

**6.1 Sources**

The wastes permitted are those listed within Table 1 as set out in the Environmental Permitting (England and Wales) Regulations 2007. The wastes include predominantly inert wastes or those with low polluting potential. The wastes are derived from the construction industry. The wastes will not contain items that represent a source of litter, odour or provide a food source to vermin or insects.

It is however recognised that some of these wastes may give rise to dust when dry and to runoff contaminated with suspended solids when there is significant rainfall. The wastes to be deposited will comprise of soils, clays, stones and rocks from development sites. These wastes are unlike to constitute a source of pollution other than by contaminated run off (see above).

Where it is proposed to use waste materials from sites where there may be potentially contaminative historical uses, these will only be accepted following a desk study and or sampling/ analytical results. Waste materials will be placed at the site using a back acting excavator and a dozer which will generate noise but will be fitted with exhaust silencers.

**6.2 Pathways**

The predominant pathway for dust and noise is atmospheric. Mud from vehicle wheels can be tracked onto the highway and provide a secondary source of dust. The pathway for suspended solids is surface water runoff. The pathway for contaminants should they be present in the soils will be by leaching in water and dust.

**6.3 Receptors**

Potential receptors:

* Adjacent dwellings
* Adjacent highways
* Groundwater
* Surface water
* Sensitive conservation sites

Of these the most sensitive human receptors for noise and dust are adjacent properties due to the proximity.

The site is not located within an Inner Source Protection Zone as defined by the Environment Agency Policy for the Protection of Groundwater. There is a watercourse near to the site.

**6.4 Magnitude of Risk (Source: Environment Agency)**

Magnitude of the risk is determined by combining the probability with the magnitude of the potential consequences, categorised as high, medium, low or very low.

Please see attached Risk Assessment.