Produced by Bristol & Avon Transport & Recycling Ltd

Environmental Risk Assessment

Westgate Phase 2 Distribution Park, Western Approach, Bristol

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1.0 Scope

Bristol and Avon Transport and Recycling Ltd are the principal contractor for the development of land at Westgate Phase 2, Western Approach. The land is currently classified as Commercial/industrial land and the proposed development is to construct 8 large commercial units and associated yard and parking areas, these units range in size from 14,709m2 to 127,169m2. There is a requirement to import suitable engineering fill to an agreed level of 7.1 AOD beneath the buildings.

2.0 Site Description

2.1 Site Location

The site is located at National Grid reference ST56101 83191. The area which is the subject of this permit application is outlined in Green on Drawing No. 2928/772/02. All references to 'the site' in this statement shall mean this area. The site area is approximately 46.83 hectares.

The application site is located between Marsh Common Road to the East and the M49 to the West. It is currently in agricultural use with Ellinghurst Farm and its outbuildings at its Northern end and Brook and Church Farm to the Southern end.
Tesco Distribution Depot is located to the North East of the site. There is an area of Farmland included in the Masterplan but not included within this Phase of the Permit application. It is the north eastern fringe area which runs in line with Marsh Common Road. This area will form part of Phase 3.

The site is fairly level, averaging at 5.9 AOD.

2.2 Planning requirements

The site was granted planning permission in 1957 and 1958 for several uses, including 'for the construction and operation of offices, warehouses, stores, reservoirs, pumphouses, canteens, clubs, hostels, training establishments, amenity and welfare buildings, sports pavilion and sports and playing fields', please refer to Planning Permission SG4244 in Appendix C.

3.0 Environmental Sensitivity

3.1 Nature and Heritage Conservation

It is situated 2km from The Severn Estuary, which is designated a SSSI.

During the pre-application screening assessment the following was indicated:

Local Wildlife Sites (LWS) – within 200m

Protected Species – European Eel and Water vole up to 500m

Protected Habitats – Coastal and Floodplain Grazing Marsh up to 500m

The Phase 1 and Phase 2 ecological reports discuss the above in more detail and the mitigation measures in place.

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 rhines, with notable water courses being the Upper Compton Rhine and the Noor Rhine.

The proposed site will be laid to an impermeable hardstanding, where clean runoff is drained to interceptors. There will be a temporary holding ponds constructed to contain surface waters during the construction phase.

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
17	Construction and demolition wastes (including excavated soil from contaminated sites)
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

4.1 Haul Roads

A temporary haul will be constructed into the site off the 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.

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.

The deposit of wastes that require testing under the landfill directive (EWC 19 13 02) will meet the inert WAC standard and these wastes will only be used in areas that will be covered by the new build development.

4.3 Waste Acceptance Criteria

Waste Acceptance Criteria will be adopted for all waste with the EWC code 19 13 02 (solid wastes from soil remediation not containing hazardous materials).

Table 1. EWC 191302 Import Criteria below enabling works formation level (EWFL)

Determinand		Units	Source	Notes
Arsenic	640	mg kg^{-1}	LQM/CIEH S4UL	Commercial land use. If testing exceeds the criteria, it will be assessed against WM3, to ensure no hazardous waste is imported to site.
Beryllium	12	mg kg^{-1}	LQM/CIEH S4UL	Commercial land use. If testing exceeds the criteria, it will be assessed against WM3, to ensure no hazardous waste is imported to site.

Determinand		Units	Source	Notes
Cadmium	230	mg kg^{-1}	Based on WM3 Guidance on Hazardous Waste	If testing exceeds the criteria, it will be assessed against WM3, to ensure no hazardous waste is imported to site.
Chromium (III)	250	mg kg^{-1}	Based on WM3 Guidance on Hazardous Waste	If testing exceeds the criteria, it will be assessed against WM3, to ensure no hazardous waste is imported to site.
Chromium (VI)	49	mg kg^{-1}	C4SL	Commercial land use. If testing exceeds the criteria, it will be assessed against WM3, to ensure no hazardous waste is imported to site.
Copper	520	mg kg^{-1}	LQM/CIEH	Allotment land use. If testing exceeds the criteria, it will be assessed against WM3, to ensure no hazardous waste is imported to site.
Lead	630	mg kg^{-1}	C4SL	Public Open Space 1 land use. If testing exceeds the criteria, it will be assessed against WM3, to ensure no hazardous waste is imported to site.
Mercury, inorganic	500	mg kg^{-1}	Based on WM3 Guidance on Hazardous Waste	If testing exceeds the criteria, it will be assessed against WM3, to ensure no hazardous waste is imported to site.
Nickel	250	mg kg^{-1}	Based on WM3 Guidance on Hazardous Waste	If testing exceeds the criteria, it will be assessed against WM3, to ensure no hazardous waste is imported to site.
Selenium	50	mg kg^{-1}	Based on WM3 Guidance on Hazardous Waste	If testing exceeds the criteria, it will be assessed against WM3, to ensure no hazardous waste is imported to site.
Vanadium	410	mg kg^{-1}	LQM/CIEH S4UL	Based on residential with homegrown produce. If testing exceeds the criteria, it will be assessed against WM3, to ensure no hazardous waste is imported to site.
Zinc	623	mg kg^{-1}	EA Normalised SSV	Normalised SSV based on pH 7.6, SOM 8.0% and 75% clay content. If testing exceeds the criteria, it will be assessed against WM3, to ensure no hazardous waste is imported to site.
Cyanide (free)	20	mg kg^{-1}	Based on inert landfill threshold	If testing exceeds the criteria, it will be assessed against WM3, to ensure no hazardous waste is imported to site.
Asbestos	0.001	%	laboratory limit of quantification	If testing exceeds the criteria, it will be assessed against WM3, to ensure no hazardous waste is imported to site.
Total (of 16) PAHs	100	mg kg^{-1}	Based on inert landfill threshold	If total PAH exceeds 100 mg kg^{-1}, review the 16 US EPA PAHs below and risk assess where required. If testing exceeds the criteria, it will be assessed against WM3, to ensure no hazardous waste is imported to site.
Acenaphthene	57 *	mg kg^{-1}	LQM/CIEH	Based on 1% SOM residential without home grown produce - LQM/CIEH based on solubility saturation limit. If testing exceeds the criteria, it will be assessed against WM3, to ensure no hazardous waste is imported to site.

Determinand		Units	Source	Notes
Acenaphthylene	86.1 *	mg kg^{-1}	LQM/CIEH	Based on 1% SOM residential without home grown produce - LQM/CIEH based on solubility saturation limit. If testing exceeds the criteria, it will be assessed against WM3, to ensure no hazardous waste is imported to site.
Anthracene	2400 *	mg kg^{-1}	LQM/CIEH	Based on 1% SOM residential with home grown produce. If testing exceeds the criteria, it will be assessed against WM3, to ensure no hazardous waste is imported to site.
Benzo(a)anthracene	5.42 *	mg kg^{-1}	ATRISK soil	Based on 1% SOM residential without home grown produce. If testing exceeds the criteria, it will be assessed against WM3, to ensure no hazardous waste is imported to site.
Benzo(a)pyrene	10	mg kg^{-1}	Based on WM3 Guidance on Hazardous Waste	Using marker compound Benzo-a-pyrene, if the concentration of Benzo-a-pyrene (BaP) is less than 0.01% of the concentration of TPH, the oil is not carcinogenic or mutagenic. If testing exceeds the criteria, it will be assessed against WM3, to ensure no hazardous waste is imported to site.
Benzo (b) fluoranthene	3.9 *	mg kg^{-1}	LQM/CIEH	Based on 1% SOM residential without home grown produce. If testing exceeds the criteria, it will be assessed against WM3, to ensure no hazardous waste is imported to site.
Benzo(ghi)perylene	102 *	mg kg^{-1}	ATRISK soil	Based on 1% SOM residential without home grown produce. If testing exceeds the criteria, it will be assessed against WM3, to ensure no hazardous waste is imported to site.
Benzo (k) fluoranthene	77*	mg kg^{-1}	LQM/CIEH	Based on 1% SOM residential with home grown produce. If testing exceeds the criteria, it will be assessed against WM3, to ensure no hazardous waste is imported to site.
Chrysene	30*	mg kg^{-1}	LQM/CIEH	Based on 1% SOM residential without home grown produce. If testing exceeds the criteria, it will be assessed against WM3, to ensure no hazardous waste is imported to site.
Dibenzo(a,h)anthracene	0.31 *	mg kg^{-1}	LQM/CIEH	Based on 1% SOM residential without home grown produce. If testing exceeds the criteria, it will be assessed against WM3, to ensure no hazardous waste is imported to site.
Fluoranthene	280 *	mg kg^{-1}	LQM/CIEH	Based on 1% SOM residential with home grown produce. If testing exceeds the criteria, it will be assessed against WM3, to ensure no hazardous waste is imported to site.
Fluorene	30.9 *	mg kg^{-1}	LQM/CIEH	Based on 1% SOM residential without home grown produce - LQM/CIEH based on solubility saturation limit. If testing exceeds the criteria, it will be assessed against WM3, to ensure no hazardous waste is imported to site.
Indeno(1,2,3,cd)pyrene	45 *	mg kg^{-1}	LQM/CIEH	Based on 1% SOM residential without home grown produce. If testing exceeds the criteria, it will be assessed against WM3, to ensure no hazardous waste is imported to site.
Naphthalene	2.3 *	mg kg^{-1}	LQM/CIEH	Based on 1% SOM residential without home grown produce. If testing exceeds the criteria, it will be assessed against WM3, to ensure no hazardous waste is imported to site.
Phenanthrene	36 *	mg kg^{-1}	LQM/CIEH	Based on 1% SOM residential without home grown produce - LQM/CIEH based on solubility saturation limit. If testing exceeds the criteria, it will be assessed against WM3, to ensure no hazardous waste is imported to site.
Pyrene	668 *	mg kg^{-1}	ATRISK soil	Based on 1% SOM residential with home grown produce. If testing exceeds the criteria, it will be assessed against WM3, to ensure no hazardous waste is imported to site.
Total Petroleum Hydrocarbons	1000	mg kg^{-1}	Based on WM3 Guidance on Hazardous Waste	Using marker compound Benzo-a-pyrene, if the concentration of Benzo-a-pyrene (BaP) is less than 0.01% of the concentration of TPH, the oil is not carcinogenic or mutagenic. If testing exceeds the criteria, it will be assessed against WM3, to ensure no hazardous waste is imported to site.

Determinand		Units	Source	Notes

*** We will review the individual PAH species listed above to ensure we do not exceed the individual threshold and also ensure the total combined PAH are below 100 mg kg^{-1}**

Table 2. EWC 191302 Import Criteria landscaping area

Determinand		Units	Source	Notes
Arsenic	40	mg kg^{-1}	C4SL	Based on 1% SOM residential without home grown produce. Using C4SL rather than s4UL as S4SL is based on inhalation which is not applicable.
Boron	11,000	mg kg^{-1}	LQM/CIEH	Based on 1% SOM residential without home grown produce
Chromium (VI)	21	mg kg^{-1}	C4SL	Based on 1% SOM residential with or without home grown produce
Copper	205	mg kg^{-1}	EA Normalised SSV	Normalised SSV based on pH 7.6, SOM 8.0% and 75% clay content
Zinc	623	mg kg^{-1}	EA Normalised SSV	Normalised SSV based on pH 7.6, SOM 8.0% and 75% clay content

In order to protect groundwater all wastes under EWC 191302 will be required to meet the Inert Waste Acceptance Criteria (inert WAC).

4.4 Waste Acceptance Procedures

To ensure that only clean loads are accepted the following information will be requested from waste producers (if relevant) at the start of each contract to ensure compliance with the requirements (basic characterisation of the waste).

i. A site investigation report, including borehole logs (if available).

ii. Waste analyses (if available), including leachability tests.

iii. Name and address of the site from which the waste was excavated/produced.

iv. Detailed waste description, including EWC code and transfer note.

All soil sources must be assessed on a site-by-site basis and checked to ensure that the soils do not qualify as hazardous waste for any elevated species under current WMIII legislation.

If waste is brought in under sub-contract or delivered by other known hauliers then the carrier registration details will be taken. Any new haulage operators bringing waste to the site will be periodically checked with the Environment Agency to ensure that they are still registered. The procedures below are followed prior to the receipt of loads on site.

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

Table 5.0 Operating Hours	
Days	**Hours of Use**
Monday – Friday	07.00-1700
Saturday	08.00 – 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 solids contaminating the water receptor. During the construction phase no surface water will be permitted a pathway to the water receptor as a series of holding ponds 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

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.