

# Midland Metro

## 7.10

## Contaminated Land

### 7.10.1 Introduction

The presence of contaminated materials encountered during construction presents a risk to subsurface soil, surface waters, groundwaters and the ambient air (see *Section 7.10.2* below) and to the health and safety of construction workers. In particular, under the Construction (Design and Management) Regulations 1994 <sup>([21])</sup> scheme designers <sup>([22])</sup> must be able to:

- identify hazards inherent in their designs;
- identify the resultant risk during construction, maintenance or demolition; and
- understand how to eliminate the hazards or reduce the risks.

Consequently, the purpose of this assessment has been to identify areas of potentially contaminated land on the proposed alignment of the Wednesbury to Brierley Hill scheme.

The definition of contaminated land in the UK follows established procedures of risk assessment, which recognise that risk is the product of a linkage between a contaminant source, an exposure pathway and a receptor. In defining whether land is contaminated, the regulatory authorities need to determine in the first instance whether any pollutant linkages exist for a piece of land and then, that the pollution linkage:

- is resulting in significant harm being caused to the receptor in the pollutant linkage; or
- presents a significant possibility of significant harm being caused to that receptor;

or that the linkage:

- is resulting in the pollution of controlled waters which constitute the receptor; or
- is likely to result in such pollution.

The risk assessment of contaminated land is, therefore, a two stage process which may initially be based on a qualitative assessment of the likelihood of complete pollution linkages, and a quantitative element which will seek to determine the degree of harm and the significance of such harm on the receptor.

### 7.10.2 Receptors Included in the Assessment

Construction works which disturb contaminated land, in the absence of mitigation measures, present a risk of remobilising contaminants and causing additional contamination through impact on subsurface soil, surface waters, groundwaters and to the ambient air. In addition, exposure to contaminated material can potentially present a risk to those in its immediate vicinity, particularly construction workers through skin contact, accidental ingestion or the inhalation of contaminants mobilised into the atmosphere.

### 7.10.3 Relevant Planning Policy Information

A description of planning policy relevant to the scheme is described below.

Policy PC1, Ground Conditions in the Sandwell UDP <sup>([23])</sup> states “*The Council will require developers to establish that the development proposal can proceed without danger to the public or the structures proposed and that this is evidenced in any submission for planning permission for built development*”.

Policy UR9 Contaminated Land in the Dudley UDP <sup>([24])</sup> states that “*where it is known or suspected that land is contaminated the Council will require planning applications to be accompanied by sufficient information to determine the remediation required in relation to the proposed land use*”.

### 7.10.4 Methodology

In order to broadly categorise potential contaminating land uses on the proposed route and within a 400 m corridor of the scheme, a desktop review of information on the environmental setting (current and historical land uses, geological conditions and groundwater vulnerability <sup>([25])</sup> and sensitivity <sup>([26])</sup>) was undertaken. The assessment was based on information obtained from the following sources:

- British Geological Maps, solid and drift editions (Nos. 167 and 168);
- Environment Agency Groundwater Vulnerability Map, Sheet 22 (South Staffordshire & East Shropshire);
- Selected Ordnance Survey Maps between 1887 and 1993;
- Information provided by the EA; and
- Envirocheck <sup>([27])</sup> report, which includes a review of data held by the EA, English Nature, British Geological Survey, the Coal Authority and the National Radiological Protection Board.

### 7.10.5 Existing Baseline Conditions

#### Historical Potentially Contaminative Land Use

A description of historical land uses for the proposed alignment corridor is described below for each section of the route. This information has been gleaned from a review of historical mapping.

- Existing Rail Corridor: Wednesbury to Tipton Road** - A review of historical maps for the area indicated that, for the land in the immediate vicinity of the proposed route, some areas were developed for residential use prior to 1887. Potentially contaminating land use within 400 m corridor of the route has subsequently included: collieries and associated coal shafts and pits; a foundry; brewery; brick works; iron and steel works; tube works; engineering works; unspecified works; furnaces; gas works; slag works; glass works; timber yard; stockyards; depots; sewage works; an electric sub-station and several trading estates, in addition to warehouses/industrial/factories units (uses unspecified). This area has also had tramlines and railway lines with the associated sidings, goods sheds and stations running through it. The north east corner of the Leabrook Waste Repository Site is located adjacent to the alignment where it leaves Line 1 and the existing depot.
- Dudley Town Centre: Tipton Green to Blower's Green Road** - A review of historical maps indicates that it was first developed for residential and commercial use prior to 1887. Potentially contaminating industrial land use within this area in the 400m corridor of the proposed route has included: a tannery; collieries and associated coal shafts and pits; furnaces; iron foundries; a brewery; brick works; iron works; chemical works; manufacturing works; unspecified works; gas works; cement works; lime works; engineering works; bus depot; hospitals and several industrial units (uses unspecified). This area has also had tramlines and railway lines with the associated sidings, goods sheds and stations running through it. The remainder of the area is characterised mainly by mixed residential, commercial (eg banks, offices, shops) and public/municipal (eg Dudley Caste, Zoo, Government offices) land uses.
- Existing Rail Corridor: Blower's Green Road to Pensnett Canal** - A review of historical maps indicates that the majority of land in the immediate vicinity of the proposed route has been used predominantly for industrial and commercial uses. Potentially contaminating land use within the 400 m corridor of the proposed route has subsequently included: collieries and associated coal shafts and pits; iron works; unspecified works; wharfs; brick works; furnaces; gas works; slag works; glass works; a timber yard; a stockyard; and several trading estates and warehouses (uses unspecified). This area also has railway lines and associated sidings and stations running through it.
- Merry Hill: Pensnett Canal to Brierley Hill** - A review of historical maps indicates that land around the proposed scheme (ie within the 400 m corridor of the proposed route) has been used mainly for residential (ie around Woodside and Brierley Hill) and commercial purposes. Potentially contaminating land use within the study corridor has subsequently included: saw mills; collieries and associated coal shafts; brick works; railway lines and sidings and furnaces.

### Current Potentially Contaminating Land Use

Current potentially contaminating land uses were identified by review of the most recently available 1:10,000 Ordnance Survey Maps, and from an Envirocheck Report commissioned as part of this EIA.

This review identified a range of potentially contaminative land uses on, and in close proximity to, the proposed route of the scheme. These arise from a number of commercial and industrial sites which include: metal foundries; coal merchants; printers; wrought iron workings and forging; metal castings; paint stripping; dry cleaning; scrap metal sites; garages; bus/coach depots; warehouses; petroleum retail facilities; industrial parks; engineering and manufacturing (glass, tool, winch, nut and bolt, plastics, computer and mould) facilities. A landfill and waste disposal site and food processing/general unspecified factory sites are also located within proximity of the route.

In addition, data obtained from the EA <sup>(28)]</sup> indicates that several registered landfill sites are located within the vicinity of the scheme, as described below in *Table 7.16*.

Table 7.16 Registered Landfill Sites within 400 m of the Alignment

Location	Licence Number (where known)	Proximity to the Route	Site Status	Details
Newby Hill Top, Smith Road, Wednesbury	SL 0087	c. 100 m	Operational	-
Leabrook Repository, Leabrook Road, Wednesbury	SL 1230	Directly adjacent	Operational since 1993	Licensed for waste materials for restoration (excluding and material liable to give rise to environmental hazard) and sewage sludge from the Toll End Sewage Works.
Blackbrook Valley, Blackbrook/Pedmore Road, Netherton, Dudley	1988 to 1990 SL 518	c. 430m	Closed	Permitted wastes include soil, subsoil, hardcore, excavation material and foundry sand. A former open cast mine. Deposits of general colliery waste. Redeveloped for Hurst Lane Industrial Park Development.

Cochrane Road/ Vine Street, Harts Hill, Dudley	Unlicensed pre 1923, to 1982	c. 50 m	Surrendered 1994	Permitted wastes include refractory material, slag and hardcore. Operational prior to licensing. Previously received corrugated roofing asbestos, factory rubbish, empty chemical containers, bulky household waste, timber, oily sludge and rags, abrasive belting, incinerator ash and residue, and empty drums.
Pear tree Lane, Netherton, Dudley	1960 to 1981	c. 400 m	-	Operational prior to licensing. Waste received includes tipping from Glynwed Integrated Services activities.
Pear tree Lane, Netherton, Dudley	Unknown	c. 400 m	-	Unknown waste. Operational prior to licensing. Contact local authority for further information.
Hollyhall Road, Blowers Green, Dudley	Unknown	c. 500 m	-	Unknown waste. Operational prior to licensing. Contact local authority for further information.
Pear Tree Lane, Netherton, Dudley	1977 to 1979	c. 410 m	-	Permitted wastes include rubble, hardcore, and other inert materials. Operational since 1901. Previously received asbestos, old drums, general rubbish, brick, rubble, paint tins, lagging materials and garden waste.
Blowers Green Road, Blowers Green, Dudley	Unlicensed operation	c. 100 m	Ceased 1965	Unknown
Prospect Row, Blowers Green, Dudley	Unlicensed operation	c. 1000 m	Ceased 1929	Unknown
Wolverton Road, Dudley	Unlicensed operation	c. 100 m	Unknown	Unknown
Dudley Sports Centre, Burnt Tree Island, Tipton/ Birmingham Road, Tipton, Dudley	Licensed July 1985 to Dec 1985	c. 200 m	Unknown	Permitted wastes include foundry sand and mines and quarry waste.  Filled to stabilise ground after subsidence into old mine workings.
Castlegate, Burnt Tree Island, Tipton/ Birmingham Road, Tipton, Dudley	Operational since 1970's, licensed 1996	Directly adjacent	Unknown	Permitted for domestic waste.  Eastern site filled with non-waste granular material prior to waste management licensing.
Gillio's Factory, Birmingham Road, Dudley	Unknown	c. 500 m	Unknown	Accepted domestic waste.  Land restored and possibly used as public open space.
Churchfield street, Dudley	1978 to 1981 SL164	c. 150 m	Surrendered	Permitted wastes include boiler ash building material, floor & road sweepings and other inert material. Operational since 1900 prior licensing. Contains four abandoned mine shafts. Received wooden pallets, old drums, scrap metal, asbestos lagged pipes and cloth cuttings.

Dudley District Depot, Constitution Hill, Dudley	Licensed March 1990 to Sept 1990	c. 80 m	Surrendered	Permitted wastes include gravel, brick rubble, crushed concrete, slag and natural sand.  Contains two old gasholder tanks. Low concentration methane detected (mains gas).
Dudley Zoo, Bear Pit, 2 The Broadway, Castle Hill, Dudley	Operational 1980 to 1982	c. 250 m	Closed	Permitted wastes include soil, subsoil, foundry sand/ clinker and hardcore.  Some fly tipping reported from Zoo (sweepings and rubbish bin contents).
Cochrane Road/ Vine street, Harts Hill, Dudley.	Licensed 1979 to 1982.	c. 100m	Surrendered 1994, Closed	Permitted wastes include refractory material, slag and hardcore.  Operational since 1923 prior to licensing. Previously received corrugated roofing asbestos, general factory rubbish, empty chemical containers, bulky household waste, timber, oily sludge and rags, abrasive belting, empty drums and incinerator ash and residue.
Pear Tree Lane, Netherton, Dudley	1947 to 1987 SL209	c. 450m	Operational	Permitted wastes include furnace slag from steel processing excavated materials and inert wastes. Extended to soil, subsoil, hardcore, excavation material and foundry sand.  Operational prior to licensing. Received inert materials, slags fills and sand from foundry, and tipped asbestos waste, special waste removed. Current receiving soil from reclaimed site since May 1996. Contains 20 boreholes, and 8% CO2 recorded.
Grazebrook Industrial Estate, Peartree Lane, Blackbrook Valley, Dudley	License SL884/1036	c. 450 m	Operational since 1992	Permitted wastes include soil, subsoil, hardcore, excavation material and foundry sand. Contains 20 permanent monitoring boreholes. Inert materials and slags fills from foundry. Current receiving soil from reclaimed site since May 1996, and 8% CO2 recorded.
Level Street Tip, Level Street, Brierley Hill	1948 to 1984 SL115	c. 200 m	Surrendered	Permitted wastes include refractory rubble, civil engineering rubble, precipitator dust and dust flakes, iron slags and clinker, foundry sands, ferrous metal scrap, commercial waste, domestic wastes and asbestos.  Historical inert process wastes and construction/ demolition wastes and approx  1 tonne of asbestos lagging were deposited. Disused mine shafts were present on-site

Sites that have been occupied by potentially contaminative historic and current land uses (within the immediate vicinity of the scheme) are shown in *Figure 7.1* in *Volume 2*. It should be noted that this assessment does not take into account any data from investigations or remediation of contaminated land which has occurred in the area.

### Geological Setting

The *British Geological Survey Map Sheet 167 and 168 (Solid and Drift Edition)* describes the geology underlying the proposed scheme, which

consists of the Coal Measures with no reported drift deposits.

The Coal Measures from the Carboniferous are extensive in thickness (up to 400 m) with the main rock units in the area comprising of Etruria Marl from the Upper Coal Measures and the Productive Measures from the Middle Coal Measures. The bedrock from Etruria Marl consists of a complex cyclic sequence of marls, grits and conglomerates. The Productive Measures consists of a complex cyclic sequence of shales, clays, sandstones, ironstones and coal seams. Many of the cycles are incomplete which gives variation both laterally and vertically. The mine workings that have occurred within the 400 m corridor along the proposed scheme, may pose a potential concern with regard ground stability and foundation design.

The shales and the well cemented sandstones have low primary permeabilities. Water can occur in the sandstones due to the various faulting and the many fractures caused by subsidence from mining activities and in the grits and conglomerates. The area is complex structurally with faulting having affected the bedrock and as such, a number of individual beds are commonly discontinuous.

However, around the Tipton area, small outcrops of Silurian Formations, Lower Ludlow Shales and Wenlock Limestone occur.

### Hydrogeological Setting

Where the potential for contaminated land to be present is established, an assessment of the area's hydrogeological vulnerability to the spread of contaminants and its sensitivity to such impacts is necessary.

The entire length of the proposed scheme is underlain by the Coal Measures Group which is classified as a Minor Aquifer by the EA's *Groundwater Vulnerability Map, Sheet 22 (South Staffordshire & East Shropshire)*. This unit has variable permeability.

The Carboniferous Coal Measures comprise predominantly shales and clays with intermittent sandstone, grit and conglomerate lenses, which gives the group variable permeability. Both the shales and the well cemented sandstones have low primary permeabilities, however, secondary permeability is induced by joints and fractures. This formation yields only minor aquifers that seldom produce large quantities of water for abstraction, although they are important for local supplies and base flow to rivers.

The occasional outcrops of the Silurian limestones are also classed as a minor aquifer, however, the Ludlow Shales are a non-aquifer unit.

Information provided by the EA indicates the presence of several licensed abstractions within 1 km of the route in the Brierley Hill and Dudley areas, including one within 500 m for potable water.

It is therefore considered that the potential for groundwater vulnerability to contamination is moderate, due to the known absence of overlying low permeability drift on the proposed route. The sensitivity is classed as moderate to high due to the location of potable sources in the area.

### Surface Water Resources

The proposed route crosses the River Tame and the Tame Valley Canal, Walsall Canal, Birmingham Canal, Parkhead Locks, Pensnett Canal and Dudley Canal. The canals are approximately 2 m deep, probably lined and therefore, are unlikely to be in hydraulic continuity with any perched groundwater or aquifer in the vicinity (as mentioned within the *water resources section*). The vulnerability of the surface waters is considered to be moderate to high where the route crosses them, but otherwise low, especially with regard the canals. The sensitivity is considered to be moderate to low.

### 7.10.6 Predicted Impacts

Owing to the presence of the historical and current industrial land use described above, there is the potential for soil and groundwater contamination to occur within the 400 m corridor of the proposed scheme.

Construction activities will present a potential risk of remobilising contaminants and causing additional contamination through impact on subsurface soil, surface waters, groundwaters and to the ambient air. The groundwater sensitivity is considered to be moderate to low. The application of good site practices will, however, ensure that any potential negative effects are reduced. Any contaminated material encountered will be dealt with in compliance with best practice and current legislation and statutory guidance. Appropriate protection of aquifers will also be required by the EA during construction activities.

In addition, as discussed in *Section 2.7.5* the alignment crosses areas of coal bearing strata that are known to have been mined in the past. The exact nature of these workings including their locations, depths and present condition is not known at present. However, there is the potential that contaminated water from mine workings may be encountered during the construction of the scheme.

The draft CoCP (see *Appendix D*) requires the Concessionaire to undertake site investigations prior to works in areas where the environmental setting indicates that there is a potential for contaminated land to be directly encountered.

For areas where site investigations are required a conceptual ground model will be developed, following receipt of soil and groundwater analytical data. This will allow the site specific environmental, geological and hydrogeological information obtained during the investigative works to be utilised to identify potential contaminant source-pathway-receptor linkages. Should it be required, a quantified risk assessment may be undertaken to determine whether specific remedial measures relating to soil and/or groundwater contamination will be required during the construction and operational phases of the project.

For areas where site investigation reveals the presence of contaminated land, a management plan will be prepared in order to comply with all the relevant handling and disposal legislation. The plan will set out measures to avoid remobilisation of contaminants via surface waters, groundwater and in the ambient air.

The plan may include one or more of the following mitigation measures where site investigations identifies the presence of contaminants:

- the removal of contaminated material (including contaminated dewatering discharge) and its disposal at a licensed and approved site and re-instatement with approved materials;
- the isolation and/or treatment of contaminated material in-situ;
- the containment and/or treatment of groundwaters; and

- the requirement of construction personnel to wear appropriate personal protective equipment that provides a high level of protection against any contaminants that potentially may be encountered.

Compliance with the management plan will minimise impacts due to contaminated land. Where potentially contaminated material is excavated, it will be necessary to determine the concentrations of any contaminant to establish whether the material can be placed elsewhere on the site, or if it should be classified as an environmental hazard by the EA or as special waste (as defined in the Special Waste Regulations (1996) as amended). Excavated materials classified as giving rise to an environmental hazard, or Special Waste, will be disposed of at a suitably licensed waste disposal site. All parties shall discharge their statutory obligations in relation to the Waste Management Duty of Care, imposed by section 34 of the Environmental Protection Act (1990) and if applicable, the Special Waste Regulation (1996).

### 7.10.7 Summary of Residual Impacts

Site investigations, the preparation of a management plan, where appropriate, and compliance with the plan, will ensure that no residual effects arise from the excavation and handling of any contaminated land.

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