

**High Speed Rail: Consultation on the route from the
West Midlands to Manchester, Leeds and beyond**

Sustainability Statement

Appendix E10 – Waste

A report by Temple-ERM for HS2 Ltd



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CONTENTS

1.	INTRODUCTION.....	1
2.	SCOPE AND METHOD.....	1
2.1.	Overview	1
2.2.	Scope	2
2.3.	Method	2
2.4.	Key assumptions and limitations.....	4
3.	FINDINGS AND DETAILED HAZARD RATING	5
3.2.	Western leg	5
3.3.	Eastern leg	5

ANNEXES

Annex A	Hazard Rating	12
Annex B	List of sites within 250 metres of the proposed route	17

1. INTRODUCTION

- 1.1.1. This report has been prepared to support the HS2 Phase Two Proposed Scheme for Consultation Sustainability Statement (Sustainability Statement), a report which describes the extent to which the Government's proposed scheme for HS2 supports objectives for sustainable development. This document is a technical appendix which summarises the method for the Waste appraisal, informing the Sustainability Statement main report. The Sustainability Statement places emphasis on the key impacts only. This technical report summarises all the conclusions relating to the Waste appraisal.

2. SCOPE AND METHOD

2.1. Overview

- 2.1.1. This report describes the approach and findings of the landfill hazard assessment undertaken for the Appraisal of Sustainability (AoS) for the proposed scheme. Appendix B (AoS Method and Alternatives) provides an explanation of the methodology used for the AoS and the rationale behind it.
- 2.1.2. There are several thousand closed and operational (active) landfill sites known in England, some dating back over a century. The eastern and western legs of the proposed scheme pass close to¹ or intersect over one hundred such sites.
- 2.1.3. The proposed route is underlain by principal aquifers² in the sandstone and limestone and coal measures. These can be an important source of drinking water supplying substantial populations. There are also several superficial aquifers that will be locally important, for example, for agriculture and other local water supply.
- 2.1.4. Landfill sites may contain both hazardous and non-hazardous waste. The sites recorded in the data used date back to the beginning of the twentieth century and standards of landfill have changed markedly over the intervening years, such that some landfill sites may contain unreacted hazardous chemicals and asbestos. Many of the sites will contain biodegradable materials producing flammable gas (methane) and polluting liquid leached from the waste mass (leachate). The extent of any problems likely to be presented by these, and where these are manifested, will depend not only on the waste materials but also on their age, the engineering of the site and the surrounding geology.
- 2.1.5. The construction work for the project has the potential, in the absence of appropriate mitigation/management, to breach liners or compromise environmental controls at some landfills leading to a release of liquid to surface or groundwater or of gas to the atmosphere.
- 2.1.6. There are potentially severe consequences associated with any activity that could pollute groundwater abstractions or protected habitats, or simply pollute the groundwater resource which itself is protected under the terms of the Water Framework Directive.
- 2.1.7. This report sets out the potential hazards to different aspects of the environment as a result of the proximity of the proposed scheme to these landfills, and presents an outline ranking of these landfill sites according to their potential hazard to the environment.

¹ 'Close to' is defined as within 250 metres of a landfill site boundary.

² The Environment Agency defines principal aquifers as layers of rock or drift deposits that have high intergranular and/or fracture permeability - meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale.

2.2. Scope

2.2.1. The scope of this report is the potential hazard threat to the environment posed by the construction of the proposed scheme close to landfill sites identified in the Environment Agency dataset³, where:

- the landfill boundary lies within 250m either side of the centre line of the proposed route; and
- The nature of the construction and the intersection with, or proximity to, the landfill site was considered potentially to present an environment threat.

2.2.2. The potential effects of the route construction on these landfill sites and the resultant potential risks to the environment were considered firstly in relation to groundwater, and then in relation to the location of sensitive environments: RAMSARs, Special Areas of Conservation, Special Protection Areas, SSSIs, Registered Parks and Gardens, and rivers.

2.3. Method

2.3.1. The appraisal was carried out in stages. First, a 250m boundary was drawn on each side of the line of the proposed route to identify both operational and non-operational (disused) landfills whose boundaries intersected with, or were totally inside, this 500m corridor. These sites were assessed for the potential effects that they might have on the environment in relation to the available data, taking into account:

- Superficial and bedrock geology; and
- Principal and Superficial aquifers.

2.3.2. The second appraisal stage used the profile of the proposed route at the intersection with, or at the point closest to, each landfill site together with the information about the geology and groundwater from the first appraisal stage to determine where the proposed route was potentially most likely to create an adverse environmental impact arising from the disturbance of landfill. These were:

- Landfills intersected by the route whether the intersect was in a cutting, tunnel, at grade, embankment or viaduct; and
- Landfills not intersected by the route but where the landfill was within 25m of the centre line in tunnel or cutting.

2.3.3. Due to the number of landfills identified by this process, a hazard scoring system was devised based on the proximity of the proposed route to the landfill sites and the hazard potential. This second stage appraisal was carried out to produce an overall hazard rating (by multiplying individual hazard scores). Where an overall hazard rating of 100 or more was identified, consideration was given as to whether there were any protected features within 2.5km so that these can be taken into account, as appropriate, as the scheme is further developed.

2.3.4. The landfill hazard, intersect parameters and scoring system used in the second stage of assessment are set out in **Table 2.1**.

³ Environment Agency digital datasets: HIS_ENVAG_Historic_Landfill_Sites_010k and LAU_ENVAG_Authorised_Landfill_Sites_010k

Table 2.1 - Landfill hazard and intersect parameters and scoring system

Waste hazard	Score	Size (area in Ha)	Score	Intersect type	Score	Length of intersect	Score
Inert/cut and fill (eg M42 works)	1	<1	1	No intersect but within 25m of a cut/tunnel	1	No intersect	1
Construction & Demolition waste	2	<5	2	At Grade	2	<25m	2
Non-hazardous (old sites)	4	<25	3	Embankment	2.5	25-100m	3
Non-hazardous (new sites)	7	25-50	4	Viaduct	3.5	101-500m	4
Hazardous/Industrial in-house	10	>50	5	Cutting or tunnel	5	>500m	5

Explanatory table note

The potential threat to the environment resulting from the intersection or proximity of the proposed route to existing landfill sites was considered, in relation to the data available, to be a function of the following: the type/age of waste; the area of the landfill; the type of intersect between the proposed route and the landfill site; and the length of the landfill site that would be intersected by the proposed route. For each landfill in the second stage appraisal, a score was assigned for each parameter in Table 2.1. These scores were multiplied together to produce an overall hazard rating.

Thus, an inert landfill site of less than five hectares in area, where there was no intersect would score $1 \times 2 \times 1 \times 1 = 2$; whereas a hazardous landfill site with an area of 30 hectares and a 250m intersect in a tunnel would have an overall hazard rating of $10 \times 4 \times 5 \times 4 = 800$.

2.4. Key assumptions and limitations

- 2.4.1. The hazard rating reflects the relative hazard posed by the sites assessed, based on the source term (landfill data for the likely types and age of waste, waste volume) and the nature of the intersection. It does not take into account any physical barriers, eg the presence or absence of engineering measures (capping and lining of site) or geological strata to ameliorate any potential pollution, although the latter are commented on where relevant, as is the proximity to any intersect and sensitivity of the targets. The rating relates only to potential direct environmental impacts. It does not cover health and safety risks during construction works to on-site workers or to nearby populations, with the exception of potential landfill gas migration.
- 2.4.2. It was considered that the proposed scheme would not impact on any landfill whose boundary was further than 250 metres from the centre line of the route.
- 2.4.3. The overall hazard ratings should be seen as a relative indication only of the potential hazard posed by the intersection of the proposed route with landfill sites that have the selected characteristics. The factors that might affect a more detailed risk assessment were not available and could not therefore be taken into account.
- 2.4.4. It is important to note the following limitations in the data:
- Former landfill sites form the majority of the sites analysed and these data were collected in separate exercises from almost 50 waste disposal / regulation authorities in England (operating in and around 1990) and, assembled from an even earlier set of data (collected around 1970) by British Geological Survey for government. Consequently, there is a risk of inconsistency in terms of available information.
 - The GIS landfill shapefile is interpreted as the boundary of the fill material. However, each shapefile shows the licensed or permitted boundary and is almost certainly more extensive than the boundary of the fill.
 - No appraisal has been made of any potential hazard posed by the landfills to personnel working on route construction.
 - No appraisal has been made of any impact on global air quality (eg due to potential increases in greenhouse gases).
 - Only a general appraisal of the threat to the public due to dusts, spores and asbestos is possible related to the nature and size of the intersection.
 - Proximity to rivers is taken into account but the direction of flow and therefore the consequential downstream effects are not considered.
 - Importantly, waste input information is notoriously inaccurate; sites authorised for hazardous waste may not have received any hazardous waste and, conversely, for example, sites classified as inert may have received large quantities of biodegradable waste. There may therefore be a large variation in the reported content of the landfill and what is ultimately found on site.

3. FINDINGS AND DETAILED HAZARD RATING

3.1.1. The results of the hazard assessment are tabulated in **Annex A**. The key points are discussed below.

3.1.2. Details of all the landfill sites considered are tabulated in **Annex B**. These are split into operational and non-operational sites and the western and eastern legs.

3.2. Western leg

3.2.1. Stage one of the appraisal identified 19 non-operational landfill sites and two operational landfills in the corridor 250m either side of the proposed West Midlands to Manchester route. Of these, four non-operational and two operational landfill sites (ie a total of six landfill sites) were identified as requiring further consideration.

3.2.2. In stage two, all six of these sites had a hazard ranking score of over 100 and three were within 2.5km of a designated protected site. The three landfill sites and relevant environmental receptors are:

- Risley IV Landfill Site (Groundwater protection zone 3; Holcroft Moss and Risley Moss SSSIs (which also form part of the Manchester Mosses SAC);
- Lowton Sidings (Rixton Clay Pits SSSI and SAC); and
- British Railways Tip (Crewe Hall registered park and garden).

3.2.3. The location of landfill sites along the western leg and their hazard ratings where assessed are shown in **Figures 3.1 and 3.2**. Any crossings of landfill sites would be designed and undertaken to ensure that risks from contaminated materials are managed.

3.3. Eastern leg

3.3.1. Stage one of the appraisal identified 69 non-operational landfill sites and 13 operational landfills in the corridor 250m either side of the proposed West Midlands to Leeds route. Of these, 20 non-operational and 6 operational landfill sites (ie a total of 26 landfill sites) were assessed as requiring further consideration.

3.3.2. In stage two, 12 of the 26 landfills were identified as having a hazard ranking score of over 100. Of these the main features at risk are streams in the vicinity of the landfill sites. Four landfill sites had a hazard rating of more than 100 and were within 2.5km of a designated protected site. The landfill and relevant environmental receptors are:

- Cocksparrow Farm (Whitacre Heath SSSI);
- Land West of Railway (Kingsbury Wood and Kingsbury Brickworks SSSIs) Middleton Pool SSSI is just beyond 2.5km);
- Old Chesterfield Canal (Moss Valley SSSI); and
- Lemonroyd (Mickleton Ings SSSI and Oulton Hall, Registered Park and Garden).

3.3.3. The location of landfill sites along the eastern leg and their hazard ratings where assessed are shown in **Figures 3.3, 3.4 and 3.5**. Any crossings of landfill sites would be designed and undertaken to ensure that risks from contaminated materials are managed.

Overall

- 3.3.4. The site with the highest hazard rating was Minosus Ltd on the western leg. This is regarded as a landfill site although it is a hazardous waste repository. Although the proposed route intersects this site, there should be no impact on the environment because the Minosus site is deep underground and would be well below the route.
- 3.3.5. Overall, the number of landfill sites potentially impacted by the proposed scheme is relatively low. Moreover, while construction around these sites could present a risk to local streams and receptors, the expectation is that any effects could be controlled through typical or standard environmental protection measures. This would need to be considered further as part of the development of the scheme design.
- 3.3.6. The majority of the sites are either operational or contain biodegradable waste and are therefore liable to be producing landfill gas. Any works that impact on these sites could compromise gas collection systems resulting in the uncontrolled release of landfill gas containing methane and potentially also subsurface migration to nearby buildings. As part of further development of the scheme design, this potential should be assessed on a site by site basis through walkover surveys and the investigation of potential emissions and migration pathways. Appropriate mitigation and management measures would be identified where required.
- 3.3.7. Excavation at any of these landfill sites would create dust that potentially could impact on nearby populations in the absence of mitigation/management. Appropriate mitigation/management measures would be developed and applied.

Figure 3.1 - Landfill sites along the Western Leg (Map 1 of 2)

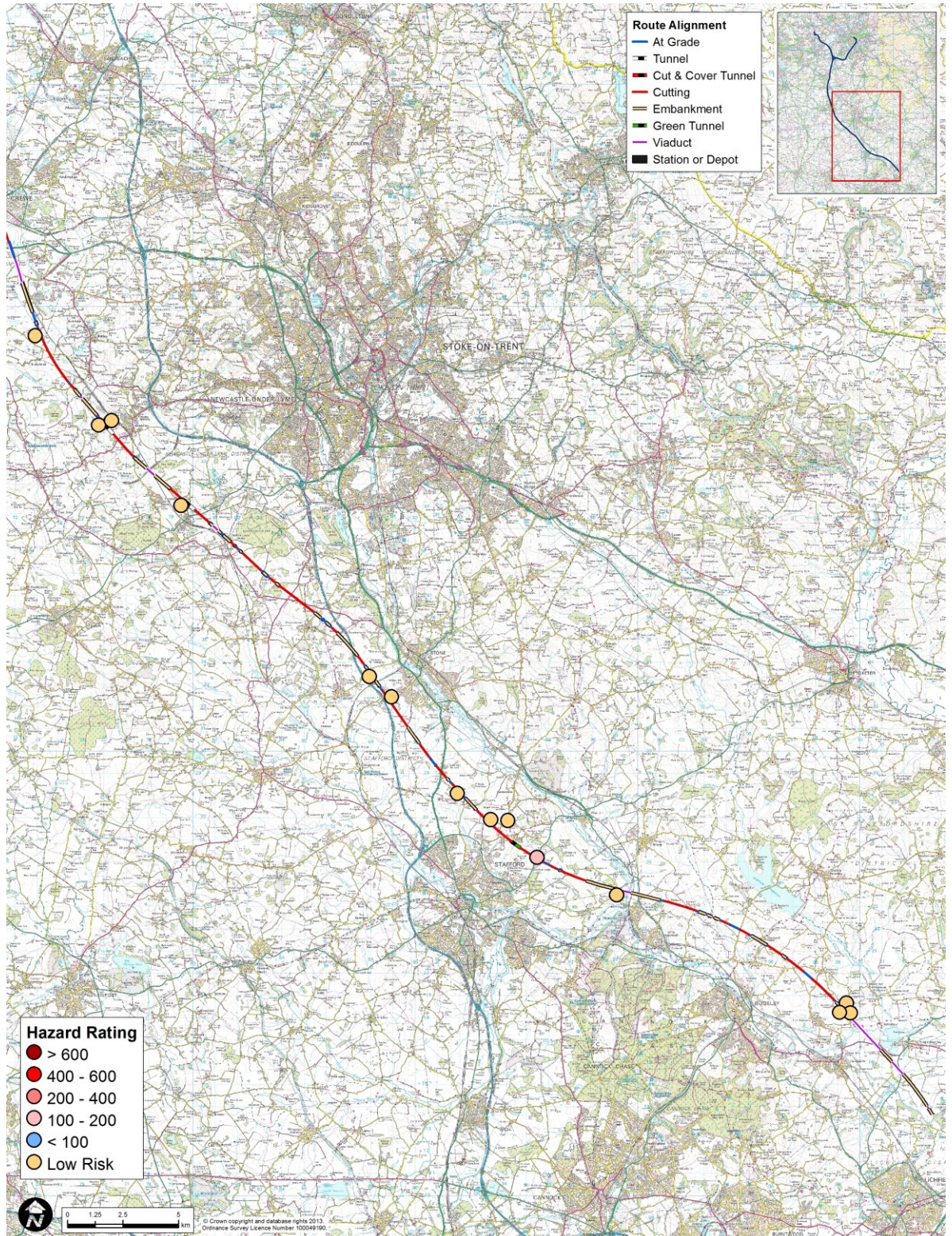


Figure 3.2 - Landfill sites along the Western Leg (Map 2 of 2)

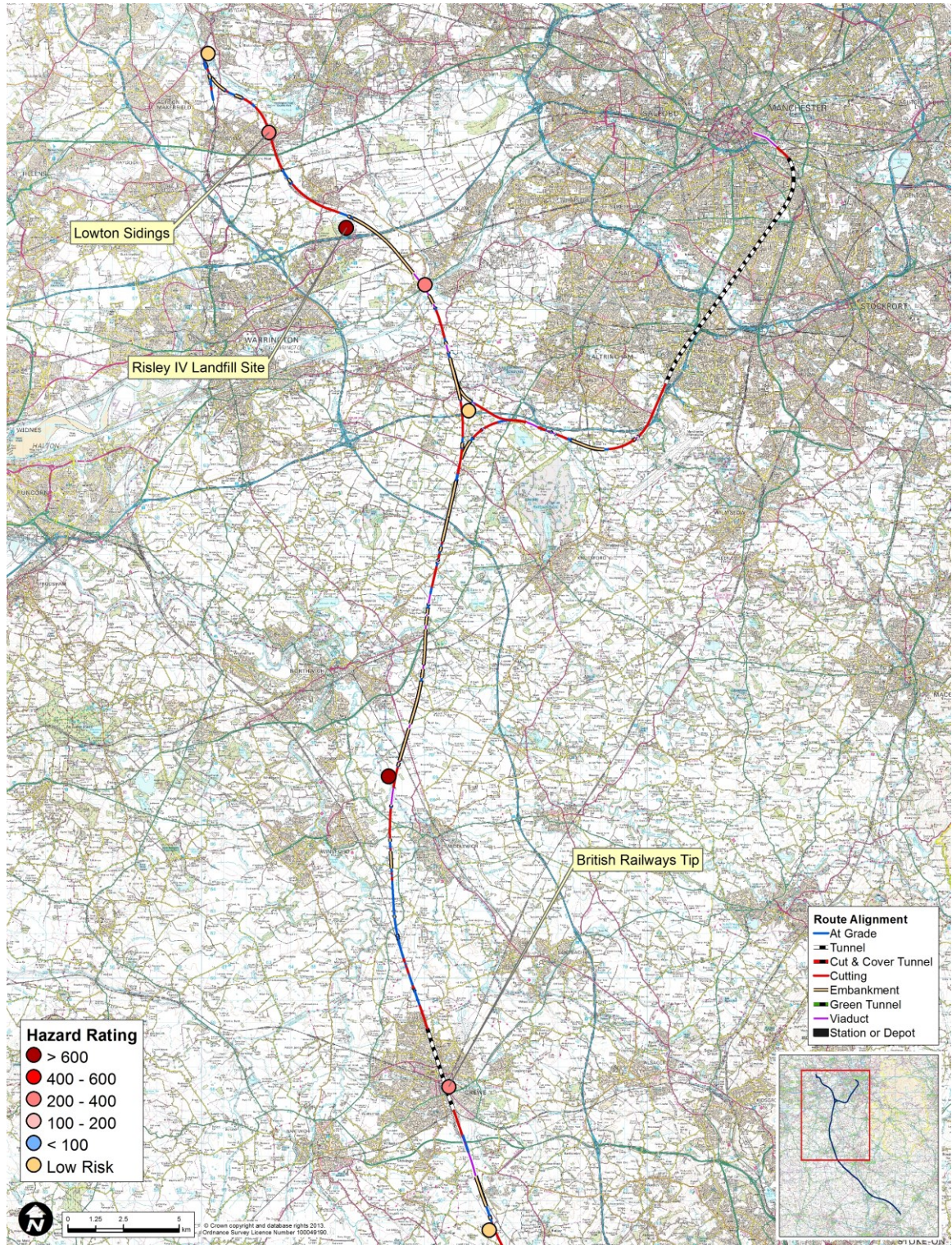


Figure 3.3 - Landfill sites along the Eastern Leg (Map 1 of 3)

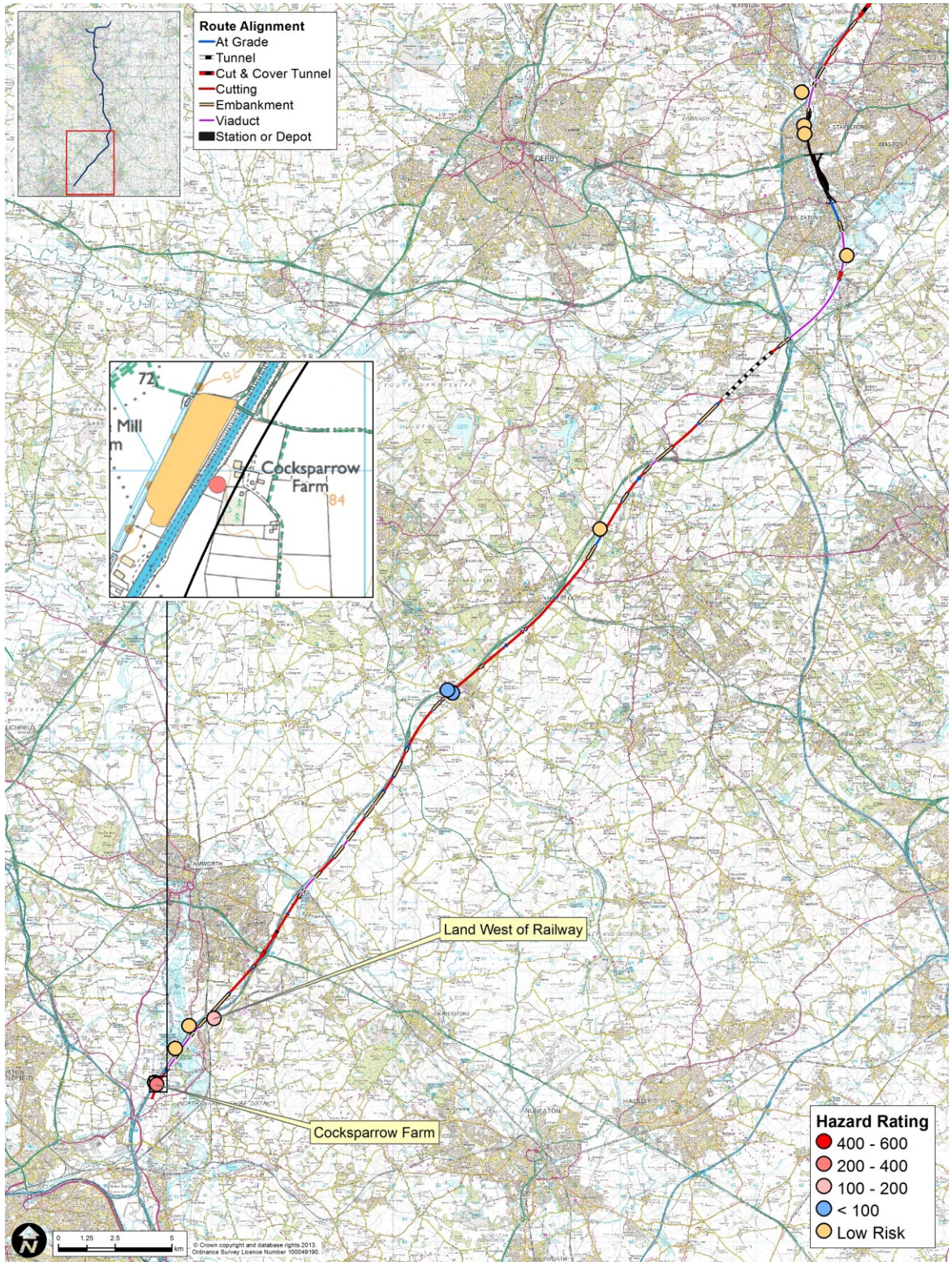


Figure 3.4 - Landfill sites along the Eastern Leg (Map 2 of 3)

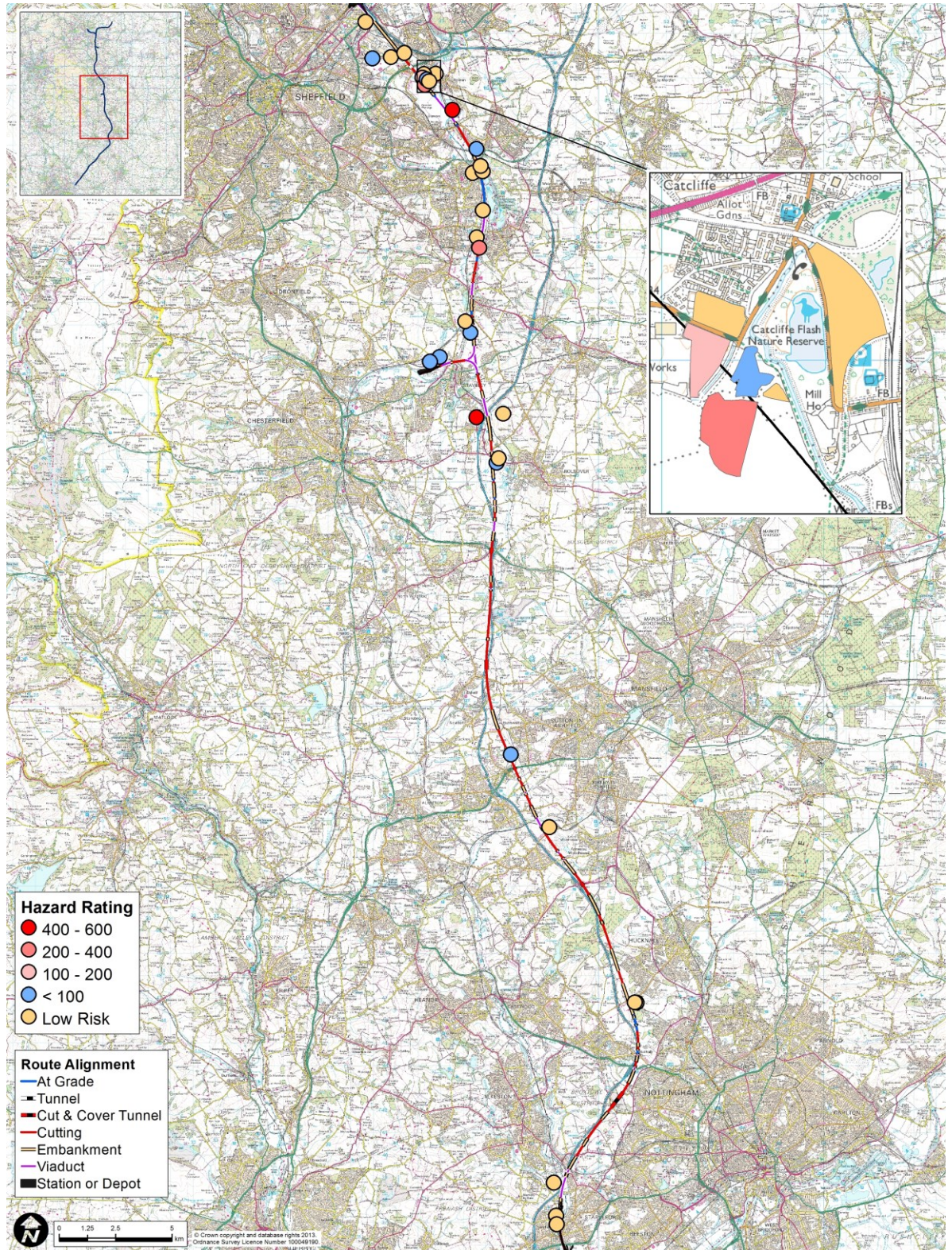
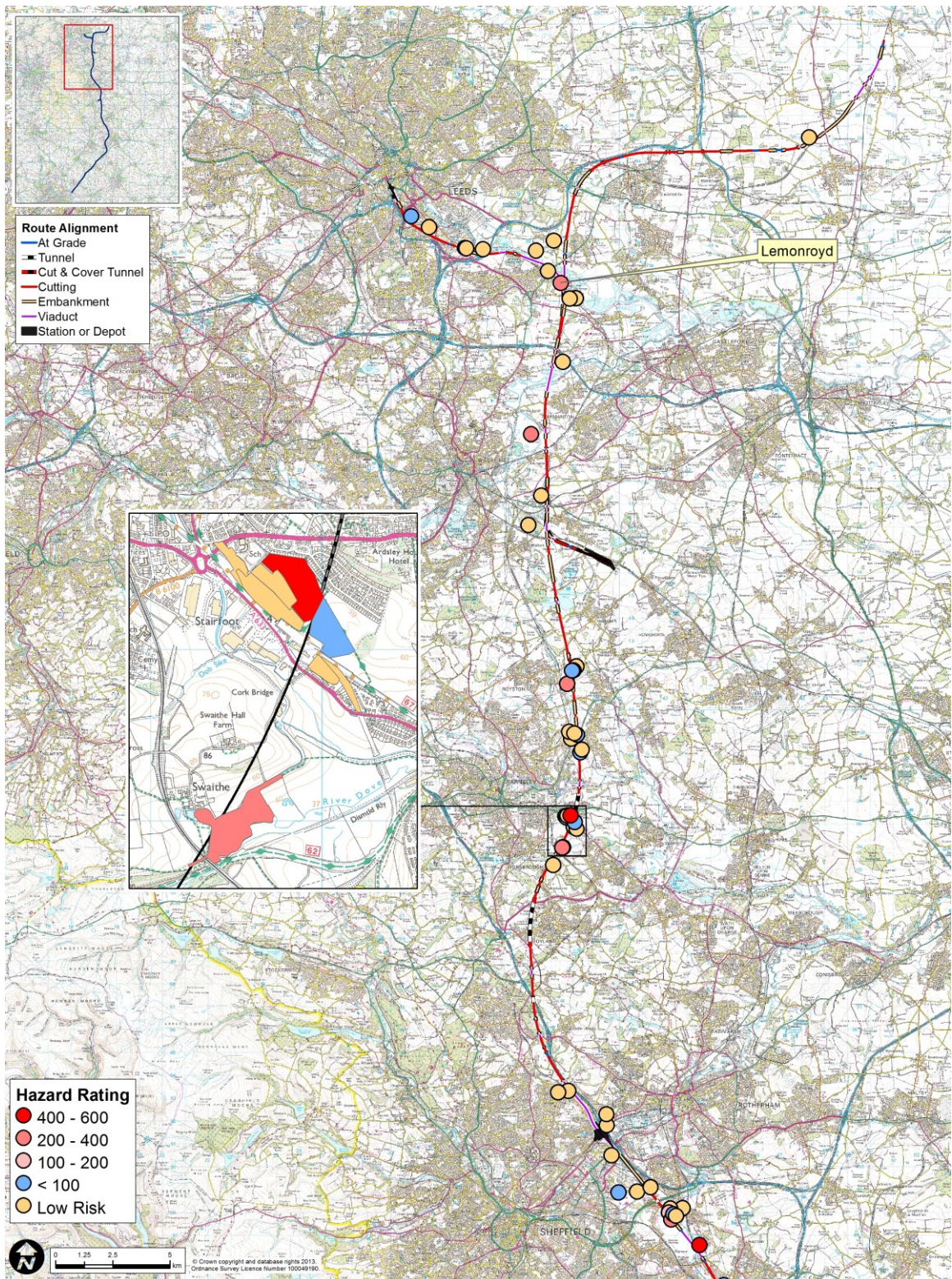


Figure 3.5 - Landfill sites along the Eastern Leg (Map 3 of 3)



Annex A Hazard Rating

Table A1 - Hazard Rating: Western Leg – Operational Landfill Sites

Site name	ID	Intersected	Length	Dist (m)	Route surface type	Superficial aquifer	Principal aquifer	Superficial geology	Bedrock	Other targets	Waste	Size	I/S type	Length	Score
Risley IV Landfill Site	479	Yes	140	0	Emb/Grade	A	High Prod	Sand and Gravel	Sandstone	Groundwater protection zone 3. SSSIs: Holcroft Moss 1.5km, Risley Moss 1.8km	10	5	3	4	600
Minosus Ltd	348	Yes	500	0	Cut	Unprod	Low Prod	Diamicton	Mudstones	None – stream	10	4	5	5	1000

Table A2 Hazard Rating: Eastern Leg - Operational Landfill Sites

Site name	ID	Intersected	Length (m)	Dist (m)	Route surface type	Superficial aquifer	Principal aquifer	Superficial geology	Bedrock	Other targets	Waste	Size	I/S type	Length	Score
Erin Landfill Site	419	Yes	155	0	Emb	None	Mod Prod	Clay, silt, sands	Coal measures	Stream	10	4	2.5	4	400
Staveley Landfill, Hall Lane	388	No	0	10	Emb/Cut	A	Mod Prod	Clay, silt, sands	Coal measures	Stream, Renishaw Hall 2.5km	10	3	1	1	30
Swallow nest Brickworks Quarry	393	No	0	35	Cut	None	Mod Prod	N/K	Coal measures		7	3	1	1	21
Stairfoot Landfill	13	Yes	150	0	Bore	None	Mod Prod	N/K	Coal measures	Stream 400m	7	3	5	4	420
R. Armstrong	20	Yes	90	0	Emb	None	Mod Prod	N/K	Coal measures	Stream	2	1	2.5	3	15
Welbeck Landfill Site	513	Yes	25	0	Emb/Cut	A	Mod prod	Silts etc	Coal measures	Stream	8.5	5	4	2	340

Table A3 - Hazard Rating: Western Leg - Non-Operational Landfill Sites

Site name	ID	Intersected	Length	Dist (m)	Route surface type	Superficial aquifer	Principal aquifer	Superficial geology	Bedrock	Other targets	Waste	Size	I/S type	Length	Score
Lowton Sidings	5550	Yes	365	0	Cut	Unprod	High Prod	Diamicton/CSS	Sandstone	Stream	5.5	3	5	4	330
Hollins Green	5745	Yes	230	0	Viad	A	Low Prod	Sand and Gravel / Diamicton	Mudstones	Stream 20m, Rixton Clay Pits SSSI, SAC, 1.4km	7	3	3.5	4	294
British Railways Tip	5415	Yes	120	0	Bore	A	Low Prod	Diamicton	Mudstones	Stream, Crewe Hall 1.6km	5.5	2	5	4	220
Stafford County Showground	774	Yes	105	0	Cut	N/K	High Prod	N/K	Sandstone	Stream 250m	7	1	5	4	140

Notation

- ID – polygon shape file identification number
- Intersected – does the HS2 route cross any part of the landfill polygon
- Length: the length of any intersection in metres;
- Dist - the distance in metres between the landfill polygon and the HS2 route;
- SSSI – Site of Special Scientific Interest
- SAC – Special Area of Conservation
- CSS - Clay, silt, sands
- Emb – embankment, Viad – viaduct, Bore – bored tunnel, Cut – cutting, Grade – at grade (surface)
- Prod – productivity
- Mod – moderate
- N/K – not known

Table A4 - Hazard Rating: Eastern Leg – Non-Operational Landfill Sites

Site name	ID	Intersected	Length (m)	Dist (m)	Route surface type	Superficial aquifer	Principal aquifer	Surface geology	Bedrock	Other targets	Waste	Size	I/S type	Score
Cocksparrow Farm	6442	Yes	No polygon	0	Cut	None	Low Prod	Diamicton	Mudstones	Whitacre Heath SSSI. Stream beyond other landfill	5.5	3	5	247.5
Land West Of Railway	1031	Yes	75	0	Viad	None	Mod Prod	N/K	Coal measures	SSSIs: Kingsbury Wood 1km, Kingsbury brickworks 1.2km, Middleton Pool 2.6 km	5.5	3	3.5	173.25
Canal Tip	281	No	0	25	Cut/Grade / Emb	None	High Prod	N/K	Triassic sand	Groundwater protection zone 3	4	1	1	4
Measham Landfill Site	1860	Yes	10	0	Emb	None	High Prod	N/K	Triassic sand	Groundwater protection zone 3	4	2	2.5	40
Blackwell Tip	2557	Yes	230	0	Cut/Emb /Viad/ Grade	A	Mod Prod	N/K	Coal measures	Stream (under landfill)	2	3	3	72
Chesterfield Road A632	3002	No	0	10	Emb	None	Mod Prod	N/K	Coal measures	Stream	4.5	2	1	9
Hall Lane Tip	395	No	0	10	Viad	A	Mod Prod	Clay, silt, sand	Coal measures	Renishaw Hall - 2.4km	4	3	1	12
Staveley Sewage Works	248	No	0	10	Viad/Emb	A	Mod Prod	Clay, silt, sand	Coal measures	Renishaw Hall - 840m	4	3	1	12
Old Chesterfield Canal	3310	Yes	850	0	Cut	A	Mod Prod	Clay, silt, sand	Coal measures	Moss Valley SSSI - 1.7km	4	2	5	200
Woodhouse Mill Tip	3268	Yes	270	0	Viad	A	Mod Prod	Clay, silt, sand	Coal measures	Stream	10	4	3.5	560

Site name	ID	Intersected	Length (m)	Dist (m)	Route surface type	Superficial aquifer	Principal aquifer	Surface geology	Bedrock	Other targets	Waste	Size	I/S type	Score
British Steel Corporation	3263	Yes	260	0	Emb	A	Mod Prod	N/K	Coal measures	Stream	10	3	2.5	300
Orgreave Road	3262	Yes	75	0	Emb	None	Mod Prod	N/K	Coal measures	Stream	7	2	2.5	105
Swaithe Tip	415	Yes	100	0	Emb/Viad/Cut	A	Mod Prod	N/K	Coal measures	Stream	4	3	4	144
C E Medlam	603	Yes	150 + 30	0	Emb	A	Mod Prod	N/K	Coal measures	Stream	7	3	2.5	210
Stairfoot Quarry No.2	3605	No	0	5	Bore	None	Mod Prod	N/K	Coal measures	None	10	2	1	20
Former Cudworth Railway Station	16	Yes	100	0	Emb	A	Mod Prod	N/K	Coal measures	Stream	2	2	2.5	30
Cudworth North Junction	3117	Yes	200	0	Emb(Via)	A	Mod Prod	N/K	Coal measures	Stream	7	3	3	252
Disused Workings	3868	No	0	5	Cut	None	Mod Prod	N/K	Coal measures	Stream - 150m				0
Lemonroyd	502	Yes	560 (3 lines)	0	Viad (Emb)	A	Mod prod	Clay, silt, sand & gravel	Coal measures	Oulton Hall 1.5km and Mickletown Ings SSSI 2.3km	5.5	3	3	247.5
Hunslet Grange, Former Housing Site	3839	No	0	20	Cut	A	Mod prod	Sands/Gravels	Coal measures	Hunslett Cemetry 2.4km	2	4	1	8

Annex B

List of sites within 250 metres of the proposed route

Table B1 - Western Leg: Operational Landfill Sites

Site name	ID	Date of issue	Area (Ha)	Type of landfill	Intersect	Length (m)	Dist (m)	Route surface type	Superficial aquifer	Principal aquifer	Superficial geology	Bedrock geology
Risley IV Landfill Site	479	28/08/1998	65.4	A1 : Co-Disposal Landfill Site	Yes	140	0	Emb / Grade	A	High Prod	Sand and Gravel	Sandstone
Minosus Ltd	348	20/08/2004	43.0	A2 : Other Landfill Site taking Special Waste	Yes	500	0	Cut	Unprod	Low Prod	Diamicton	Mudstones

Table B2 - Eastern Leg: Operational Landfill Sites

Site name	ID	Date of issue	Area (Ha)	Type of landfill	Intersect	Length (m)	Dist (m)	Route surface type	Superficial aquifer	Principal aquifer	Superficial geology	Bedrock geology
Landfill Development Co Ltd - Dunton Quarry	308	28/07/1987	9.3	A6 : Landfill taking other wastes	No	0	55	Cut	Unprod	Low Prod	Sand & Gravel	Mudstones
Former Coalite Smokeless Fuels Site	15	14/10/1991	0.4	A7 : Industrial Waste Landfill (Factory curtilage)	No	0	245	Emb/Viad	None	Mod Prod	N/K	Coal measures
Erin Landfill Site	419	06/09/1999	41.6	A2 : Other Landfill Site taking Special Waste	Yes	155	0	Embank	None	Mod Prod	Clay, silt, sands	Coal measures
Staveley Landfill, Hall Lane	388	07/02/1994	16.8	A4 : Household, Commercial & Industrial Waste Landfill	No	0	10	Emb/Cut	A	Mod Prod	Clay, silt, sands	Coal measures
Hopkinson Reclamation - Landfill	187	20/01/1993	13.4	A5 : Landfill taking Non-Biodegradable Wastes	No	0	60	Emb/Cut	A	Mod Prod	Clay, silt, sands	Coal measures
Swallownest Brickworks Quarry	393	09/02/1983	11.5	A4 : Household, Commercial & Industrial Waste Landfill	No	0	35	Cut	None	Mod Prod	N/K	Coal measures
Stairfoot Landfill	13	17/07/1991	6.7	A4 : Household, Commercial & Industrial Waste Landfill	Yes	150	0	Bore	None	Mod Prod	N/K	Coal measures
R. Armstrong	20	15/04/1991	0.4	A5 : Landfill taking Non-Biodegradable Wastes	Yes	90	0	Embank	None	Mod Prod	N/K	Coal measures
R. Armstrong	477	15/04/1991	0.6	A5 : Landfill taking Non-Biodegradable Wastes	No	0	85	Embank	A	Mod Prod	N/K	Coal measures
Welbeck Landfill Site	513	17/01/2012	89.7	Waste Landfilling; >10 t/day with Capacity >25,000t Excluding Inert Waste	Yes	25	0	Embank/Cut	A	Mod prod	silts etc	Coal measures
Gamblethorpe Landfill	185	08/03/1996	28.6	A4 : Household, Commercial & Industrial Waste Landfill	No	0	250	Embank/Grade	None	Mod Prod	N/K	Coal measures
Copley Lane Quarry	133	07/05/1991	8.4	Waste Landfilling; >10 t/day with Capacity >25,000t Excluding Inert Waste	No	0	30	Grade	None	High Prod	Diamicton	Dolomitic Limestone
Oxbow Ash Disposal Scheme	53	04/11/1981	17.4	A7 : Industrial Waste Landfill (Factory curtilage)	No	0	140	Viad	Yes	Mod Prod	Clay, silt, sand	Coal measures

Table B3 - Western Leg: Non-Operational Landfill Sites

Site name	ID	First input	Last input	Inert	Comm	Hhold	Ind	Intersected	Area (Ha)	Length	Dist (m)	Route surface type	Superficial aquifer	Principal aquifer	Superficial geology	Bedrock geology
Lily Lane	4975	31/12/1979	07/07/1983	Yes	Yes	Yes	Yes	No	11.4	0	120	Grade/Cut	A	High Prod	Diamicton/CSS	Sandstone
Lowton Sidings	5550	Data unavailable	Data unavailable					Yes	6.7	365	0	Cut	Unprod	High Prod	Diamicton/CSS	Sandstone
Hollins Green	5745	01/11/1989	31/07/1991				Yes	Yes	9.4	230	0	Viad	A	Low Prod	Sand and Gravel / Diamicton	Mudstones
Booth Bank Farm	6058	Data unavailable	Data unavailable					No	6.2	0	130	Cut	Unprod	High Prod	Diamicton	Sandstone
British Railways Tip	5415	Data unavailable	Data unavailable					Yes	4.1	120	0	Bore	A	Low Prod	Diamicton	Mudstones
Gonsley Green Farm	6588	Data unavailable	Data unavailable				Yes	No	0.2	0	210	Cut	Unprod	Low Prod	Diamicton	Mudstones
Bowerend Farm	5323	Data unavailable	Data unavailable					No	2.5	0	245	Bore	Unprod	High Prod	Sand & Gravel / Diamicton	Sandstone
Beechfields	5264	Data unavailable	Data unavailable					No	2.8	0	115	Cut/Bore	A	High Prod	Diamicton	Sandstone
Whitmore Heath	5265	26/11/1949	16/04/1959			Yes		No	1.4	0	175	Bore	N/K	High Prod	Clay,silts,sands	Sandstone
Poolhouse Farm	796	31/12/1958	31/12/1960			Yes		No	0.2	0	110	Emb	N/K	Low Prod	N/K	Mudstones
Near Micklow House	763	31/12/1963	Data unavailable			Yes		No	0.4	0	120	Cut	N/K	Low Prod	N/K	Mudstones
New Farm	2035	31/12/1979	31/12/1980				Yes	No	0.4	0	95	Cut	N/K	Low Prod	N/K	Mudstones
Kents Barn Farm	771	15/09/1983	14/01/1985	Yes			Yes	No	0.3	0	115	Cut	N/K	Low Prod	N/K	Mudstones
Disused Railway Cutting	296	Data unavailable	Data unavailable			Yes		No	3.6	0	100	Cut	N/K	Low Prod	N/K	Mudstones
Stafford County Showground	774	Data unavailable	30/06/1989	Yes			Yes	Yes	0.7	105	0	Cut	N/K	High Prod	N/K	Sandstone
Mountford - Tixhall Landfill Site	6306	31/03/1994	18/09/1995					No	1.3	0	190	Emb/Viad	A	Low Prod	Sand & Gravel	Mudstones
The Wharf Old Site	1496	Data unavailable	Data unavailable					No	7.3	0	150	Grade/Emb	N/K	Low Prod	Diamicton	Mudstones
Landfill Near Pipe Ridware	1499	31/12/1963	31/12/1967			Yes		No	0.1	0	190	Grade	N/K	Low Prod	N/K	Mudstones
Landfill Near Pipe Ridware	1498	31/12/1963	31/12/1967			Yes		No	0.3	0	90	Emb	N/K	Low Prod	N/K	Mudstones

Table B4 Eastern Leg: Non-Operational Landfill Sites

Site name	ID	First input	Last input	Inert	Comm	Hhold	Ind	Intersect	Area (Ha)	Length (m)	Dist (m)	Route surface type	Superficial aquifer	Principal aquifer	Superficial geology	Bedrock geology
M42 Mullensgrove Farm	1659	31/12/1984	31/12/1985	Yes				No	4.3	0	90	Cut/Grade	A	Low Prod	Sand & Gravel/Diamicton	Mudstones
Cocksparrow Farm	6442	12/04/1964	12/01/1988					Yes	0.2	No polygon	0	Cut	None	Low Prod	Diamicton	Mudstones
Kingsbury Landfill Site	864	31/12/1976	01/10/1988	Yes				No	0.4	0	170	Viad	None	Low Prod	Sand & Gravel	Mudstones
The Coppice	1539	31/12/1989	01/12/1990	Yes				No	2.0	0	245	Viad	A	Low Prod	N/K	Mudstones
Land West Of Railway	1031	Data unavailable	Data unavailable					Yes	22.6	75	0	Viad	None	Mod Prod	N/K	Coal measures
Canal Tip	281	31/01/1963	31/12/1971					No	0.8	0	25	Cut/Grade/Emb	None	High Prod	N/K	Triassic sand
Measham Landfill Site	1860	31/01/1963	31/12/1971		Yes	Yes		Yes	1.3	10	0	Embank	None	High Prod	N/K	Triassic sand
Smoile Wood	2203	31/12/1981	04/06/1993	Yes	Yes	Yes	Yes	No	7.5	0	50	Cut	None	Mod Prod	N/K	Coal measures
Fields Adjacent and Behind to Lockhouse at Cranfleet Lock	2670	28/02/1994	14/04/1994				Yes	No	1.0	0	60	Viad	A	Low Prod	Clay,silt, sand	Mudstones
S.W. Bailey and Sons	2596	31/12/1974	23/12/1986	Yes			Yes	No	0.1	0	110	Viad	A	High Prod	Clay,silt, sand	Triassic sand
Church Farm	2577	06/12/1991	31/03/1993	Yes				No	1.8	0	80	Viad	A	High Prod	Clay,silt, sand	Triassic sand
Old Works Tip	2570	17/02/1978	27/04/1994	Yes			Yes	No	13.3	0	195	Viad	A	Mod Prod	Clay,silt, sand	Coal measures
Hucknall Airfield	2461	31/12/1957	31/12/1993	Yes				No	1.9	0	185	Embank	None	High Prod	N/K	Dol Limestone
Eel Hole Farm	2462	31/12/1976	31/03/1994	Yes				No	0.5	0	185	Embank	None	High Prod	N/K	Dol Limestone
Portland Fields	2632	01/10/1965	31/12/1974	Yes	Yes	Yes	Yes	No	5.6	0	145	Cut/Emb	None	Mod Prod	N/K	Coal measures
Blackwell Tip	2557	31/12/1959	30/11/1986	Yes				Yes	12.2	230	0	Cut/Emb/ Viad/Grade	A	Mod Prod	N/K	Coal measures
Chesterfield Road A632	3002	31/07/1965	30/11/1986	Yes			Yes	No	1.3	0	10	Embank	None	Mod Prod	N/K	Coal measures
Tip No 11-054	2993	31/12/1968	30/11/1986					No	66.5	0	160	Emb/Viad	B	Mod Prod	Clay, silt, sand	Coal measures
Hall Lane Tip	395	Data unavailable	31/12/1966					No	18.5	0	10	Viad	A	Mod Prod	Clay, silt, sand	Coal measures
Staveley Sewage Works	248	31/12/1926	Data unavailable					No	7.1	0	10	Viad/Emb	A	Mod Prod	Clay, silt, sand	Coal measures
Old Chesterfield Canal	3310	31/12/1979	31/12/1980	Yes			Yes	Yes	3.8	850	0	Cut	A	Mod Prod	Clay, silt, sand	Coal measures
SW Corner of Site	3302	31/12/1981	31/12/1992	Yes			Yes	No	0.8	0	155	Cut	A	Mod Prod	Clay, silt, sand	Coal measures
Former Holbrook Colliery Branch Cutting	3281	01/01/1977	Data unavailable		Yes			No	0.9	0	65	Cut/Embank	None	Mod Prod	N/K	Coal measures

Site name	ID	First input	Last input	Inert	Comm	Hhold	Ind	Intersect	Area (Ha)	Length (m)	Dist (m)	Route surface type	Superficial aquifer	Principal aquifer	Superficial geology	Bedrock geology
Beighton Miners Welfare Club	3273	31/12/1980	14/04/1994	Yes				No	2.4	0	210	Embank	A	Mod Prod	Clay, silt, sand	Coal measures
Land East of Rotherham Road / Formerly Beighton Coke Oven Works and Brookhouse Colliery	3274	22/07/1988	28/09/1991	Yes	Yes		Yes	No	1.7	0	30	Emb/Viad	A	Mod Prod	Clay, silt, sand	Coal measures
Brookhouse Works	3275	17/11/1977	Data unavailable	Yes	Yes	Yes	Yes	No	1.0	0	60	Viad	A	Mod Prod	N/K	Coal measures
Woodhouse Mill Tip	3268	31/12/1982	31/12/1992	Yes	Yes	Yes	Yes	Yes	27.1	270	0	Viad	A	Mod Prod	Clay, silt, sand	Coal measures
British Steel Corporation	3265	31/12/1940	31/12/1992	Yes	Yes	Yes	Yes	No	0.4	0	180	Viad	A	Mod Prod	Clay, silt, sand	Coal measures
British Steel Corporation	3264	31/12/1940	31/12/1992	Yes	Yes	Yes	Yes	No	2.0	0	85	Embank	A	Mod Prod	N/K	Coal measures
British Steel Corporation	3263	31/12/1940	31/12/1992	Yes	Yes	Yes	Yes	Yes	5.7	30	0	Embank	A	Mod Prod	N/K	Coal measures
Orgreave Road	3262	31/12/1955	Data unavailable		Yes	Yes		Yes	3.2	210	0	Embank	None	Mod Prod	N/K	Coal measures
Orgreave Road	3261	Data unavailable	Data unavailable					No	2.7	0	150	Viad/Embank	None	Mod Prod	N/K	Coal measures
Waverley Opencast Coal Site	3266	20/12/1971	26/03/1993	Yes			Yes	No	51.6	0	210	Embank/Cut/Grade	None	Mod Prod	N/K	Coal measures
Avesta Tinsley Park Works	3056	04/09/1989	29/04/1994				Yes	No	78.8	0	35	Cut	None	Mod Prod	N/K	Coal measures
Wood Lane	3252	31/12/1958	Data unavailable				Yes	No	0.4	0	110	Cut	None	Mod Prod	N/K	Coal measures
230 Sheffield Road	3495	28/02/1983	04/03/1991	Yes	Yes	Yes	Yes	No	1.1	0	140	Viad	A	Mod Prod	Clay, silt, sand	Coal measures
Grange Lane	3459	24/05/1978	23/02/1993	Yes			Yes	No	0.8	0	70	Viad	A	Mod Prod	N/K	Coal measures
Deep Lane	3460	17/11/1977	27/11/1977	Yes	Yes			No	0.6	0	225	Viad	None	Mod Prod	N/K	Coal measures
Dovecliffe Quarry	3365	30/11/1976	31/12/1982	Yes	Yes	Yes	Yes	No	8.7	0	50	Embank/Via	None	Mod Prod	N/K	Coal measures
Swaithe Tip	415	Data unavailable	Data unavailable		Yes			Yes	5.7	100	0	Embank/Via/Cut	A	Mod Prod	N/K	Coal measures
C E Medlam	603	01/02/1979	31/12/1990	Yes	Yes	Yes	Yes	Yes	9.3	150 + 30	0	Embank	A	Mod Prod	N/K	Coal measures
Disused railway cutting to the rear of 39 Wombell Lane	3364	16/05/1984	31/12/1989	Yes	Yes			No	1.2	0	120	Cut	None	Mod Prod	N/K	Coal measures
Stairfoot Brickworks Quarry	3340	31/12/1976	31/12/1982	Yes	Yes	Yes	Yes	No	1.5	0	70	Cut	None	Mod Prod	N/K	Coal measures
Stairfoot Quarry No.2	3605	31/12/1982	31/12/1987	Yes	Yes	Yes	Yes	No	4.7	0	5	(Bore)	None	Mod Prod	N/K	Coal measures
Stairfoot	3581	Data	Data		Yes	Yes	Yes	No	4.4	0	40	Cut	None	Mod Prod	N/K	Coal measures

Site name	ID	First input	Last input	Inert	Comm	Hhold	Ind	Intersect	Area (Ha)	Length (m)	Dist (m)	Route surface type	Superficial aquifer	Principal aquifer	Superficial geology	Bedrock geology
Brickworks		unavailable	unavailable													
Stairfoot Landfill Site	3083	31/12/1987	31/12/1992	Yes	Yes	Yes	Yes	No	6.8	0	40	Cut	None	Mod Prod	N/K	Coal measures
Stairfoot North Quarry Phase 2	3582	31/01/1992	Data unavailable	Yes	Yes	Yes	Yes	No	2.7	0	120	(Bore)	None	Mod Prod	N/K	Coal measures
Former Cudworth Railway Station	16	08/09/1994	Data unavailable	Yes				Yes	1.9	100	0	Embank	A	Mod Prod	N/K	Coal measures
Newland Avenue	3609	31/12/1972	Data unavailable					No	0.2	0	130	Emb	None	Mod Prod	N/K	Coal measures
Bleach Croft Farm	3167	30/11/1987	31/12/1994	Yes	Yes			No	0.5	0	75	Emb(Via)	A	Mod Prod	N/K	Coal measures
Klondyke Tip	493	04/04/1972	Data unavailable	Yes	Yes		Yes	No	4.4	0	160	Emb(Via)	A	Mod Prod	N/K	Coal measures
Cudworth Landfill Site	3612	31/12/1973	31/12/1977	Yes	Yes	Yes	Yes	No	4.3	0	160	Emb(Via)	A	Mod Prod	N/K	Coal measures
Cudworth Tip Site	6208	Data unavailable	Data unavailable					No	6.7	0	170	Embank	A	Mod Prod	N/K	Coal measures
Cudworth North Junction	3117	31/12/1983	31/12/1995	Yes	Yes	Yes	Yes	Yes	23.3	200	0	Emb(Viad)	A	Mod Prod	N/K	Coal measures
Disused Workings	3868	Data unavailable	Data unavailable					No	0.2	0	5	Cut	None	Mod Prod	N/K	Coal measures
Disused Workings	3867	Data unavailable	Data unavailable					No	0.3	0	70	Cut	None	Mod Prod	N/K	Coal measures
Disused Workings	3287	Data unavailable	Data unavailable					No	0.2	0	220	Cut/Emb	N/A	N/A	N/A	N/A
Walton Colliery Reclamation Site	3934	Data unavailable	Data unavailable	Yes				No	84.1	0	50	Emb/viad	N/A	N/A	N/A	N/A
Land to East of Bracken Hill	3937	31/12/1991	28/04/1993	Yes	Yes			No	0.6	0	200	Embank	N/A	N/A	N/A	N/A
Foxholes	4000	01/02/1962	31/08/1977	Yes	Yes	Yes		No	6.2	0	100	Embank	N/A	N/A	N/A	N/A
Fleet Bridge Street Works	3865	Data unavailable	31/12/1976	Yes	Yes	Yes		No	4.0	0	65	Emb(Viad)	N/A	N/A	N/A	N/A
Fleet Bridge Street Works	3864	Data unavailable	31/12/1976	Yes	Yes	Yes		No	9.2	0	150	Emb(Viad)	N/A	N/A	N/A	N/A
Lemonroyd	502	04/09/1973	Data unavailable		Yes			Yes	8.3	560 (3 lines)	0	Viad (embank)	A	Mod prod	Clay, silt, sand & gravel	Coal measures
Pottery Lane	11	01/12/1969	Data unavailable	Yes				No	2.8	0	80	Viad	A	Mod prod	Clay, silt, sand & gravel	Coal measures
Skelton Grange Power Station	344	31/12/1945	Data unavailable	Yes			Yes	No	5.7	0	130	Embank	A	Mod prod	Sands/Gravels	Coal measures
IMI Yorkshire Alloys Limited	2969	01/02/1982	Data unavailable				Yes	No	0.5	0	40	Embank	A	Mod prod	Sands/Gravels	Coal measures
IMI Yorkshire Alloys Limited	2969	01/02/1982	Data unavailable				Yes	No	0.5	0	40	Embank	A	Mod prod	Sands/Gravels	Coal measures

Site name	ID	First input	Last input	Inert	Comm	Hhold	Ind	Intersect	Area (Ha)	Length (m)	Dist (m)	Route surface type	Superficial aquifer	Principal aquifer	Superficial geology	Bedrock geology
Land at Junction of Pepper Road/Pepper Lane	2949	31/10/1983	30/04/1984	Yes	Yes			No	0.5	0	250	Cutting	A	Mod Prod	Sands/Gravels	Coal measures
Hunslet Grange, Former Housing Site	3839	Data unavailable	Data unavailable	Yes	Yes			No	12.7	0	20	Cutting	A	Mod prod	Sands/Gravels	Coal measures

Notation

ID – polygon shape file identification number;

Inert – inert waste;

Comm – commercial waste;

Hhold – household waste;

Ind – industrial

Length – length of any intersect

Dist – distance of proposed route from landfill site boundary.