

# **High Speed Rail (Crewe – Manchester)**

## **Supplementary Environmental Statement 2 and Additional Provision 2 Environmental Statement**

### **Volume 5: Appendix LQ-001-00000**

#### **Land quality**

Land quality report

MA01: Hough to Walley's Green

MA02: Wimboldsley to Lostock Gralam

MA03: Pickmere to Agden and Hulseheath

MA06: Hulseheath to Manchester Airport

MA07: Davenport Green to Ardwick

MA08: Manchester Piccadilly Station

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MA08: Manchester Piccadilly Station



Department  
for Transport

High Speed Two (HS2) Limited has been tasked by the Department for Transport (DfT) with managing the delivery of a new national high speed rail network. It is a non-departmental public body wholly owned by the DfT.

High Speed Two (HS2) Limited  
Two Snowhill  
Snow Hill Queensway  
Birmingham B4 6GA

Telephone: 08081 434 434

General email enquiries: [HS2enquiries@hs2.org.uk](mailto:HS2enquiries@hs2.org.uk)

Website: [www.hs2.org.uk](http://www.hs2.org.uk)

A report prepared for High Speed Two (HS2) Limited:

**ARUP+** ERM | FOSTER + PARTNERS | JACOBS  
RAMBOLL | TYPISA | COSTAIN

**MWJV**

Mott MacDonald | WSP

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# 1 Introduction

- 1.1.1 This report is an appendix to the land quality assessment which forms part of Volume 5 of the Supplementary Environmental Statement 2 (SES2) and Additional Provision 2 Environmental Statement (AP2 ES). It comprises:
- a summary of engagement undertaken; and
  - detailed risk assessments associated with land contamination.
- 1.1.2 This appendix provides details of changes to the land quality assessment since the production of the High Speed Two (HS2) High Speed Rail (Crewe – Manchester) Environmental Statement (ES) published in 2022<sup>1</sup> (the main ES), and the Supplementary Environmental Statement 1 (SES1) and Additional Provision 1 Environmental Statement (AP1 ES) also published in 2022<sup>2</sup>.
- 1.1.3 This report is structured into two parts: Part 1 – SES2, and Part 2 – AP2 ES and covers the following community areas (CA):
- Hough to Walley’s Green (MA01);
  - Wimboldsley to Lostock Gralam (MA02);
  - Pickmere to Agden and Hulseheath (MA03);
  - Hulseheath to Manchester Airport (MA06);
  - Davenport Green to Ardwick (MA07); and
  - Manchester Piccadilly Station (MA08).
- 1.1.4 This appendix should be read in conjunction with:
- the SES2 and AP2 ES Volume 2, Community Area reports; and
  - the Land quality baseline data report in Background Information and Data (BID) accompanying SES2 and AP2 ES<sup>3</sup> (see BID LQ-002-00000 SES2 and AP2 ES).

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<sup>1</sup> High Speed Two Ltd (2022), High Speed Rail (Crewe – Manchester), *Environmental Statement*. Available online at: <https://www.gov.uk/government/collections/hs2-phase2b-crewe-manchester-environmental-statement>.

<sup>2</sup> High Speed Two Ltd (2022), High Speed Rail (Crewe – Manchester), *Supplementary Environmental Statement 1 and Additional Provision 1 Environmental Statement*. Available online at: <https://www.gov.uk/government/collections/hs2-phase-2b-crewe-manchester-supplementary-environmental-statement-1-and-additional-provision-1-environmental-statement>.

<sup>3</sup> High Speed Two Ltd (2023), High Speed Rail (Crewe – Manchester), *Background Information and Data accompanying Supplementary Environmental Statement 2 and Additional Provision 2 Environmental Statement, Land quality baseline data*, BID LQ-002-00000 SES2 and AP2 ES. Available online at: <https://www.gov.uk/government/collections/hs2-phase-2b-crewe-manchester-supplementary-environmental-statement-2-and-additional-provision-2-environmental-statement>.

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- 1.1.5 In addition, the main ES Volume 5, Appendices: LQ-001, and SES1 and AP1 ES Volume 5, Appendix: LQ-001-00000 should be referred to.
- 1.1.6 Maps referred to throughout this appendix are contained in the SES2 and AP2 ES Volume 5, Land quality Map Book: Map Series LQ-01 – Land Quality. Sites carried through to assessment are given a reference number (Site ID). In this report they are referred to as ‘MA07-221’ and in the maps they are referred to as ‘07-221’.
- 1.1.7 Further information regarding receptors in relation to each site or group of sites is set out in the SES2 and AP2 ES Land quality baseline data report (see BID LQ-002-00000 SES2 and AP2 ES<sup>3</sup>).
- 1.1.8 Minerals baseline data, information about Local Geological Sites and geological Sites of Special Scientific Interest (SSSI) and site visit records are also set out in the main ES BID and the SES2 and AP2 BID.
- 1.1.9 The Environmental Impact Assessment (EIA) Scope and Methodology Report (SMR)<sup>4</sup>, (see main ES, Volume 5, Appendix: CT-001-00001) should be referred to for details of the land quality assessment methodology.
- 1.1.10 The need for a number of corrections to the contents of the main ES and SES1 and AP1 ES have been identified. These are set out in report: Corrections to Volume 5 of the January 2022 Environmental Statement and the July 2022 Supplementary Environmental Statement 1 and Additional Provision 1 Environmental Statement, see SES2 and AP2 ES Volume 5, Appendix: CT-009-00000.
- 1.1.11 In order to differentiate between the original scheme and the subsequent changes, the following terms are used:
- ‘the original scheme’ – the Bill scheme submitted to Parliament in 2022, which was assessed in the main ES;
  - ‘the SES1 scheme’ – the original scheme with any changes described in SES1 that are within the existing powers of the Bill;
  - ‘the AP1 revised scheme’ – the original scheme as amended by SES1 changes and AP1 amendments;
  - ‘the SES2 scheme’ – the original scheme with any changes described in SES1 (submitted in July 2022) and the SES2; and
  - ‘the AP2 revised scheme’ – the original scheme as amended by SES1 and SES2 changes (as relevant) and AP2 amendments.

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<sup>4</sup> High Speed Two Ltd (2022), High Speed Rail (Crewe – Manchester), *Environmental Statement, Environmental Impact Assessment Scope and Methodology Report*, Volume 5, Appendix: CT-001-00001. Available online at: <https://www.gov.uk/government/collections/hs2-phase2b-crewe-manchester-environmental-statement>.

## 1.2 Scope of the assessment

- 1.2.1 The scope of the assessment in this report is limited to SES2 design changes and AP2 amendments which are considered likely to introduce a new significant effect, remove a significant effect, or result in a materially different significant effect on land quality than reported in the main ES and SES1 and AP1 ES.



## 2 Engagement

2.1.1 Table 1 to Table 6 set out the organisations that have been engaged with during the preparation of the land quality assessment of the SES2 scheme for each of the study areas<sup>5</sup>, the types of information that have been provided to the assessment team and any specific concerns raised.

**Table 1: Engagement on land quality issues undertaken for Hough to Walley's Green (MA01)**

Organisation	Method/dates of contracts	Information provided and/or specific concerns
Cheshire East Council (CEC)	Email to CEC (15 August 2022)	Email enquiring about any additional land contamination datasets to inform further studies.
	Email from CEC (15 September 2022)	Provision of requested data relating to land contamination.

**Table 2: Engagement on land quality issues undertaken for Wimboldsley to Lostock Gralam (MA02)**

Organisation	Method/dates of contracts	Information provided and/or specific concerns
Cheshire West and Chester Council (CWCC)	Email to CWCC (05 August 2022)	Email enquiring about any additional land contamination datasets to inform further studies.
	Meeting (20 September 2022)	Meeting to discuss land contamination data provision and type and format of dataset that could be provided to inform AP2 baseline.
	Email to CWCC (23 September 2022)	Email to confirm format of data.
	Email from CWCC (04 October 2022)	Provision of requested data relating to land contamination.

**Table 3: Engagement on land quality issues undertaken for Pickmere to Agden and Hulseheath (MA03)**

Organisation	Method/dates of contracts	Information provided and/or specific concerns
Cheshire East Council (CEC)	Email to CEC (15 August 2022)	Email enquiring about any additional land contamination datasets to inform further studies.
	Email from CEC (15 September 2022)	Provision of requested data relating to land contamination
Cheshire West and Chester Council (CWCC)	Email to CWCC (05 August 2022)	Email enquiring about any additional land contamination datasets to inform further studies.
	Meeting with CWCC (20 September 2022)	Meeting to discuss land contamination data provision and type and format of dataset that could be provided to inform AP2 baseline.
	Email to CWCC (23 September 2022)	Email to confirm format of data.
	Email from CWCC (04 October 2022)	Provision of requested data relating to land contamination.

<sup>5</sup> The study area is defined as the land required for the construction of the AP2 revised scheme plus a 250m buffer. In the case of groundwater abstractions, this buffer is increased to 1km.

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**Table 4: Engagement on land quality issues undertaken for Hulseheath to Manchester Airport (MA06)**

Organisation	Method/dates of contracts	Information provided and/or specific concerns
Cheshire East Council (CEC)	Email to CEC (15 August 2022)	Email enquiring about any additional land contamination datasets to inform further studies.
	Email from CEC (15 September 2022)	Provision of requested data relating to land contamination.
Manchester City Council (MCC)	Email to MCC (18 August 2022)	Request for updated datasets in regard to land contamination following request in November 2020.
	Email from MCC (25 August 2022)	Response confirming no known changes regarding land contamination data.

**Table 5: Engagement on land quality issues undertaken for Davenport Green to Ardwick (MA07)**

Organisation	Method/dates of contracts	Information provided and/or specific concerns
Manchester City Council (MCC)	Email to MCC (18 August 2022)	Request for updated datasets in regard to land contamination following request in November 2020.
	Email from MCC (25 August 2022)	Response confirming no known changes regarding land contamination data.

**Table 6: Engagement on land quality issues undertaken for Manchester Piccadilly Station (MA08)**

Organisation	Method/dates of contracts	Information provided and/or specific concerns
Manchester City Council (MCC)	Email to MCC (18 August 2022)	Request for updated datasets in regard to land contamination following request in November 2020.
	Email from MCC (25 August 2022)	Response confirming no known changes regarding land contamination data.

### **3 Risk assessment**

- 3.1.1 A four-stage process, comprising stages A to D, has been carried out in accordance with the methodology set out in the SMR<sup>4</sup> in the main ES. At each stage, professional judgement has been used to check that the screening and assessment process is highlighting significant land contamination sites.
- 3.1.2 Stage A highlights potentially contaminative sites based on their potential impact. Sites with a moderate to high potential impact move through to stage B where they are assessed based on receptor proximity.
- 3.1.3 Sites with a high potential impact pass through stage B to detailed assessment irrespective of receptor proximity. Sites with a moderate potential impact and moderate to high receptor proximity also go through to detailed assessment.
- 3.1.4 For those sites which pass through stage B, a further detailed risk assessment (stages C and D) has been carried out.
- 3.1.5 The results of stage C are presented in three conceptual site models (CSM) as qualitative risk assessments covering baseline, construction and post-construction scenarios. Stage D then compares the risk of impact at construction and post-construction stages with the baseline to determine the change in risk and hence the potential for a significant effect.
- 3.1.6 Part 1: SES2 and Part 2: AP2 ES (Sections 3.2 to 3.5) present assessments for potentially contaminated sites which have passed through the screening process within the study area. For each site the following data are presented:
- baseline risk assessment;
  - construction risk assessment;
  - post-construction risk assessment;
  - assessment of temporary (construction) effects; and
  - assessment of permanent (post-construction) effects.
- 3.1.7 The construction and post-construction risk assessments assume that appropriate mitigation has been undertaken and that the operation of the railway is in accordance with environmental legislation.
- 3.1.8 Where sites present a similar contamination risk, they have been grouped and considered together.
- 3.1.9 Where sites have been grouped together, only one CSM has been prepared for those sites.
- 3.1.10 The sites in the SES2 scheme and AP2 revised scheme study areas are listed in Table 7.
- 3.1.11 For clarity, 'on-site' in this document means 'within the land required for the construction of the SES2 scheme and AP2 revised scheme' and 'off-site' refers to 'land beyond this boundary, but within the study area'.

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**Table 7: Sites included in the risk assessment within the SES2 and AP2 ES study area**

Site group	Site title (site ID) and land use class <sup>6</sup>	SES2 or AP2 study area
<b>On-site</b>		
Freight terminal and former depots	Freight terminal (MA07-221), Class 2 Former railway depot (MA07-226), Class 2 Former bus depot (MA07-229), Class 2	AP2
Former depot and scrap yard <sup>7</sup>	Former depot (MA07-165), Class 2 Scrap yard (MA07-178), Class 2	AP2
<b>Off-site</b>		
Petrol filling stations	Petrol filling station (MA06-209), Class 3 Petrol filling station (MA07-244), Class 3	AP2

- 3.1.12 Contaminant types included within the risk assessments are based on the Department of the Environment, Farming and Rural Affairs and Environment Agency (2002); Priority Contaminants Report CLR 8<sup>8</sup>. Although this report has been withdrawn by the Environment Agency, it remains technically valid and there has been no subsequent authoritative replacement.
- 3.1.13 The remainder of this section presents the risk assessment for the sites going through to stages C and D of the assessment. These sites are shown in the SES2 and AP2 ES Volume 5 Land Quality Map Book.
- 3.1.14 The following abbreviations are used in Table 8 to Table 16:
- CoCP – Code of Construction Practice;
  - PAH – polycyclic aromatic hydrocarbons;
  - PCB – polychlorinated biphenyls; and
  - PPE – personal protective equipment.

<sup>6</sup> As defined by the SMR in the main ES.

<sup>7</sup> Off-site sources from the original scheme which are now on-site sources for the AP2 revised scheme.

<sup>8</sup> Department for Environment, Food and Rural Affairs and Environment Agency (2002), *Potential Contaminants for the Assessment of Land*, R&D Publication CLR8.

## **Part 1: Supplementary Environmental Statement 2**

3.1.15 There are no sites taken through to detailed assessment for the SES2 scheme.

## Part 2: Additional Provision 2 Environmental Statement

3.1.16 The screening process for the AP2 revised scheme has identified seven additional sites (MA07-221, MA07-226, MA07-229, MA07-165, MA07-178, MA06-209, MA07-244) are required to be taken through to detailed assessment.

### 3.2 Baseline risk assessment

**Table 8: Baseline CSM and qualitative risk assessment for freight terminal and former depots grouped for assessment (MA07-221, MA07-226 and MA07-229) (on-site)**

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline phase
Potential contamination from former and current activities: contaminants primarily comprising metals, PAH, asbestos, fuel and lubricating oils, petroleum and diesel range hydrocarbons. Potentially low levels of ground gas (methane, carbon dioxide).	Existing site users – Workers in commercial/industrial area	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters	Unlikely	Medium	Low
		Inhalation of ground gases	Unlikely	Medium	Low
	Adjacent site users – Residents and workers in commercial/industrial area	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters	Unlikely	Medium	Low
		Inhalation of ground gases	Unlikely	Medium	Low
	Controlled waters – groundwater	Leaching, vertical and lateral migration from	Low likelihood	Negligible	Very low

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Source	Receptor	Pathway	Probability	Consequence	Risk at baseline phase
	Secondary Undifferentiated aquifer of the glacial till	contaminated soils and waters			
	Controlled waters – groundwater Principal aquifer of the Chester Formation and Collyhurst Sandstone Formation Secondary B aquifer of the Manchester Marls Formation	Leaching, vertical and lateral migration from contaminated soils and waters	Unlikely	Minor to medium	Very low to low
	Controlled waters – surface water Corn Brook	Lateral migration through groundwater	Unlikely	Minor	Very low
	Property receptors – buildings, foundations and services (existing and adjacent)	Direct contact with contaminated soils and waters	Low likelihood	Minor	Low
		Exposure to explosive gases	Unlikely	Medium	Low

### Notes/assumptions:

- site assessed without construction of the AP2 revised scheme;
- see SES2 and AP2 BID document Table 15 for details of receptors for this group of sites;
- existing site users and adjacent site users in the receptor column refer to users at or near to the areas assessed;
- all receptors are applicable to all sites;
- Corn Brook is in culvert in the vicinity of the sites; and
- all sites are predominantly hardstanding at baseline.

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**Table 9: Baseline CSM and qualitative risk assessment for former depot and existing scrap yard grouped for assessment (MA07-165 and MA07-178) (on-site)**

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline phase
Potential contamination from former and current activities: contaminants primarily comprising heavy metals, asbestos, PAH, petroleum and diesel range hydrocarbons, lubricating oils. Potentially low levels of ground gas (methane and carbon dioxide).	Existing site users – Workers in commercial/industrial area	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters	Low likelihood	Medium	Moderate/low
		Inhalation of ground gases	Unlikely	Medium	Low
	Adjacent site users – Residents, and workers in commercial/industrial area	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters	Low likelihood to unlikely	Medium	Low to moderate/low
		Inhalation of ground gases	Unlikely	Medium	Low
	Controlled waters – groundwater Secondary Undifferentiated aquifer of the glacial till	Leaching, vertical and lateral migration from contaminated soils and waters	Low likelihood	Negligible	Very low
	Controlled waters – groundwater Principal aquifer of the Chester Formation Secondary A aquifer of the Halesowen Formation	Leaching, vertical and lateral migration from contaminated soils and waters	Unlikely	Medium	Low



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Source	Receptor	Pathway	Probability	Consequence	Risk at baseline phase
	Property receptors – buildings, foundations and services (existing and adjacent)	Direct contact with contaminated soils and waters	Low likelihood	Minor	Low
		Exposure to explosive gases	Unlikely	Medium	Low
<b>Notes/assumptions:</b>					
<ul style="list-style-type: none"> <li>• site assessed without construction of the AP2 revised scheme;</li> <li>• see SES2 and AP2 BID document Table 16 for details of receptors for this group of sites;</li> <li>• existing site users and adjacent site users in the receptor column refer to users at or near to the areas assessed;</li> <li>• sites identified as former sources for HB (offsite), now identified as on-site sources for AP2; and</li> <li>• both sites are underlain by secondary undifferentiated glacial till. Principal aquifer of the Chester Formation underlies the former depot (MA07-165) and Secondary A aquifer of the Halesowen Formation underlies the existing scrap yard (MA07-178).</li> </ul>					

**Table 10: Baseline CSM and qualitative risk assessment for petrol filling stations (MA06-209 and MA07-244) (off-site)**

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline phase
Residual contamination from former and current activities: contaminants primarily comprising petroleum and diesel range hydrocarbons,	Existing site users – Petrol station users and workers	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters	Low likelihood	Medium	Moderate/low

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Source	Receptor	Pathway	Probability	Consequence	Risk at baseline phase	
lead and methyl-tert butyl ether.	Adjacent site users –Residents, farm workers, walkers and workers in commercial area	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters	Unlikely	Medium	Low	
	Controlled waters – groundwater Secondary A aquifer of the glaciofluvial deposits	Leaching, vertical and lateral migration from contaminated soils and waters	Likely	Medium	Moderate	
	Controlled waters – groundwater Secondary B aquifer of the Tarporley Siltstone Formation Principal Aquifer of the Wilmslow Sandstone Formation	Leaching, vertical and lateral migration from contaminated soils and waters	Low likelihood to likely	Minor to medium	Low to moderate	
	Controlled waters – surface water Pigginshaw Brook and River Mersey	Lateral migration through groundwater Direct runoff from site	Low likelihood	Medium	Moderate/low	
	Property receptors – buildings, foundations and services (existing and adjacent)		Direct contact with contaminated soils and waters	Low likelihood	Minor	Low
			Exposure to gases/vapours	Low likelihood	Medium	Moderate/low

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Source	Receptor	Pathway	Probability	Consequence	Risk at baseline phase
<b>Notes/assumptions:</b>					
<ul style="list-style-type: none"> <li>• site assessed without construction of the SES2 scheme;</li> <li>• see SES2 and AP2 BID document Table 17 for details of receptors for this group of sites; and</li> <li>• existing site users and adjacent site users in the receptor column refer to users at or near to the areas assessed.</li> </ul>					

### 3.3 Construction risk assessment

**Table 11: Construction CSM and qualitative risk assessment for freight terminal and former depots grouped for assessment (MA07-221, MA07-226 and MA07-229) (on-site)**

Source	Receptor	Pathway	Probability	Consequence	Risk at construction phase
Potential contamination from former and current activities: contaminants primarily comprising heavy metals, PAH, asbestos, fuel and lubricating oils, petroleum and diesel range hydrocarbons. Potentially low levels of ground gas (methane, carbon dioxide).	Existing site users – Workers in commercial/industrial area	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters	Unlikely	Medium	Low
		Inhalation of ground gases	Unlikely	Medium	Low
	Adjacent site users – Residents and workers in commercial/industrial area	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters	Unlikely	Medium	Low
		Inhalation of ground gases	Unlikely	Medium	Low

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Source	Receptor	Pathway	Probability	Consequence	Risk at construction phase
	Controlled waters – groundwater Secondary Undifferentiated aquifer of the glacial till	Leaching, vertical and lateral migration from contaminated soils and waters	Low likelihood	Negligible	Very low
	Controlled waters – groundwater Principal aquifer of the Chester Formation and Collyhurst Sandstone Formation Secondary B aquifer of the Manchester Marls Formation	Leaching, vertical and lateral migration from contaminated soils and waters	Low likelihood	Minor to medium	Low to moderate/low
	Controlled waters – surface water Corn Brook	Lateral migration through groundwater	Unlikely	Minor	Very low
	Property receptors – buildings, foundations and services (existing and adjacent)	Direct contact with contaminated soils and waters	Low likelihood	Minor	Low
		Exposure to explosive gases	Unlikely	Medium	Low

**Notes/assumptions:**

- site investigation may be required for the utility corridor prior to construction of the AP2 revised scheme;
- sites which lie within the land required for construction of the AP2 revised scheme may require remediation;
- it is assumed the site will remain occupied during construction;
- remediation will be restricted to mitigation of land quality effects arising from the AP2 revised scheme;

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Source	Receptor	Pathway	Probability	Consequence	Risk at construction phase
<ul style="list-style-type: none"> <li>existing site users and adjacent site users in the receptor column refer to users at or near to the areas assessed;</li> <li>during construction, standard mitigation procedures are assumed to be implemented in accordance with the draft CoCP (main ES Volume 5, Appendix: CT-002-00000<sup>9</sup>). Construction workers have been excluded from assessment due to the use of PPE/risk management protocols and in accordance with the SMR; and</li> <li>while the draft CoCP will make it unlikely that there will be adverse consequences associated with construction e.g. the control of surface runoff and dust, it is considered that there may still be temporary minor adverse effects during the construction period from ground disturbance in these areas. The adoption of the draft CoCP generally results in a low to unlikely probability of a consequence, but in some cases the actual consequence may temporarily increase from that defined at baseline.</li> </ul>					

**Table 12: Construction CSM and qualitative risk assessment for former depot and existing scrap yard grouped for assessment (MA07-165 and MA07-178) (on-site)**

Source	Receptor	Pathway	Probability	Consequence	Risk at construction phase
Potential contamination from former and current activities: contaminants primarily comprising heavy metals, asbestos, PAH, petroleum and diesel range	Existing site users – Workers in commercial/industrial area	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters	N/A	N/A	N/A
		Inhalation of ground gases	N/A	N/A	N/A

<sup>9</sup> High Speed Two Ltd (2022), High Speed Rail (Crewe – Manchester), *Environmental Statement, Draft Code of Construction Practice*, Volume 5, Appendix: CT-002-00000. Available online at: <https://www.gov.uk/government/collections/hs2-phase2b-crewe-manchester-environmental-statement>.

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Source	Receptor	Pathway	Probability	Consequence	Risk at construction phase
hydrocarbons, lubricating oils. Potentially low levels of ground gas (methane and carbon dioxide).	Adjacent site users – Residents, and workers in commercial/industrial area	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters	Low likelihood to unlikely	Medium	Low to moderate/low
		Inhalation of ground gases	Unlikely	Medium	Low
	Controlled waters – groundwater Secondary Undifferentiated aquifer of the glacial till	Leaching, vertical and lateral migration from contaminated soils and waters	Low likelihood	Negligible	Very low
		Controlled waters – groundwater Principal aquifer of the Chester Formation Secondary A aquifer of the Halesowen Formation	Leaching, vertical and lateral migration from contaminated soils and waters	Low likelihood	Medium
	Property receptors – buildings, foundations and services (existing and adjacent)	Direct contact with contaminated soils and waters	Low likelihood	Minor	Low
		Exposure to explosive gases	Unlikely	Medium	Low

**Notes/assumptions:**

- site investigation may be required prior to construction of the AP2 revised scheme;
- sites which lie within the land required for construction of the AP2 revised scheme may require remediation;

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Source	Receptor	Pathway	Probability	Consequence	Risk at construction phase
<ul style="list-style-type: none"> <li>• it is assumed the site will remain occupied during construction;</li> <li>• remediation will be restricted to mitigation of land quality effects arising from the AP2 revised scheme;</li> <li>• existing site users and adjacent site users in the receptor column refer to users at or near to the areas assessed;</li> <li>• during construction, standard mitigation procedures are assumed to be implemented in accordance with the draft CoCP<sup>9</sup>. Construction workers have been excluded from assessment due to the use of PPE/risk management protocols and in accordance with the SMR; and</li> <li>• while the draft CoCP will make it unlikely that there will be adverse consequences associated with construction e.g. the control of surface runoff and dust, it is considered that there may still be temporary minor adverse effects during the construction period from ground disturbance in these areas. The adoption of the draft CoCP generally results in a low to unlikely probability of a consequence, but in some cases the actual consequence may temporarily increase from that defined at baseline.</li> </ul>					

**Table 13: Construction CSM and qualitative risk assessment for petrol filling stations (MA06-209 and MA07-244) (off-site)**

Source	Receptor	Pathway	Probability	Consequence	Risk at construction phase
Residual contamination from former and current activities: contaminants primarily comprising petroleum and diesel range hydrocarbons, lead and methyl-tert butyl ether.	Existing site users – Petrol station users and workers	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters	Low likelihood	Medium	Moderate/low
	Adjacent site users –Residents, farm workers, walkers and workers in commercial area	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters	Unlikely	Medium	Low

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Source	Receptor	Pathway	Probability	Consequence	Risk at construction phase
	Controlled waters – groundwater Secondary A aquifer of the glaciofluvial deposits	Leaching, vertical and lateral migration from contaminated soils and waters	Likely	Medium	Moderate
	Controlled waters – groundwater Secondary B aquifer of the Tarporley Siltstone Formation Principal Aquifer of the Wilmslow Sandstone Formation	Leaching, vertical and lateral migration from contaminated soils and waters	Low likelihood to likely	Minor to medium	Low to moderate
	Controlled waters – surface water Pigginshaw Brook and River Mersey	Lateral migration through groundwater Direct runoff from site	Low likelihood	Medium	Moderate/low
	Property receptors – buildings, foundations and services (existing and adjacent)	Direct contact with contaminated soils and waters	Low likelihood	Minor	Low
		Exposure to gases/vapours	Low likelihood	Medium	Moderate/low
<b>Notes/assumptions:</b>					
<ul style="list-style-type: none"> <li>• site investigation may be required prior to construction of the AP2 revised scheme;</li> <li>• existing site users and adjacent site users in the receptor column refer to users at or near to the areas assessed;</li> <li>• during construction, standard mitigation procedures are assumed to be implemented in accordance with the draft CoCP<sup>9</sup>. Construction workers have been excluded from assessment due to the use of PPE/risk management protocols and in accordance with the SMR; and</li> </ul>					



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Source	Receptor	Pathway	Probability	Consequence	Risk at construction phase
<ul style="list-style-type: none"> <li>while the draft CoCP will make it unlikely that there will be adverse consequences associated with construction e.g. the control of surface runoff and dust, it is considered that there may still be temporary minor adverse effects during the construction period from ground disturbance in these areas. The adoption of the draft CoCP generally results in a low to unlikely probability of a consequence, but in some cases the actual consequence may temporarily increase from that defined at baseline.</li> </ul>					

### 3.4 Post-construction risk assessment

**Table 14: Post-construction CSM and qualitative risk assessment for freight terminal and former depots grouped for assessment (MA07-221, MA07-226 and MA07-229) (on-site)**

Source	Receptor	Pathway	Probability	Consequence	Risk at post-construction phase
Potential contamination from former and current activities: contaminants primarily comprising heavy metals, PAH, asbestos, fuel and lubricating oils, petroleum and diesel range hydrocarbons. Potentially low levels of ground gas (methane, carbon dioxide).	Existing site users – Workers in commercial/ industrial area	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters	Unlikely	Medium	Low
		Inhalation of ground gases	Unlikely	Medium	Low
	Adjacent site users – Residents and workers in commercial/ industrial area	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters	Unlikely	Medium	Low

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Source	Receptor	Pathway	Probability	Consequence	Risk at post-construction phase
		Inhalation of ground gases	Unlikely	Medium	Low
	Controlled waters – groundwater Secondary Undifferentiated aquifer of the glacial till	Leaching, vertical and lateral migration from contaminated soils and waters	Low likelihood	Negligible	Very low
	Controlled waters – groundwater Principal aquifer of the Chester Formation and Collyhurst Sandstone Formation Secondary B aquifer of the Manchester Marls Formation	Leaching, vertical and lateral migration from contaminated soils and waters	Unlikely	Minor to medium	Very low to low
	Controlled waters – surface water Corn Brook	Lateral migration through groundwater	Unlikely	Minor	Very low
	Property receptors – buildings, foundations and services (existing and adjacent)	Direct contact with contaminated soils and waters	Low likelihood	Minor	Low
		Exposure to explosive gases	Unlikely	Medium	Low

### Notes/assumptions:

- assumes construction works are complete and remediation has been carried out where necessary. No pathways are left open; and
- existing site users and adjacent site users in the receptor column refer to users at or near to the areas assessed.

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**Table 15: Post-construction CSM and qualitative risk assessment for former depot and existing scrap yard grouped for assessment (MA07-165 and MA07-178) (on-site)**

Source	Receptor	Pathway	Probability	Consequence	Risk at post-construction phase
Potential contamination from former and current activities: contaminants primarily comprising heavy metals, asbestos, PAH, petroleum and diesel range hydrocarbons, lubricating oils. Potentially low levels of ground gas (methane and carbon dioxide).	Existing site users – Workers in commercial/industrial area Users of public realm	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters	Unlikely	Medium	Low
		Inhalation of ground gases	Unlikely	Medium	Low
	Adjacent site users – Residents, and workers in commercial/industrial area	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters	Unlikely	Medium	Low
		Inhalation of ground gases	Unlikely	Medium	Low
	Controlled waters – groundwater Secondary Undifferentiated aquifer of the glacial till	Leaching, vertical and lateral migration from contaminated soils and waters	Low likelihood	Negligible	Very low
	Controlled waters – groundwater Principal aquifer of the Chester Formation Secondary A aquifer of the Halesowen Formation	Leaching, vertical and lateral migration from contaminated soils and waters	Unlikely	Medium	Low

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Source	Receptor	Pathway	Probability	Consequence	Risk at post-construction phase
	Property receptors – buildings, foundations and services (existing and adjacent)	Direct contact with contaminated soils and waters	Low likelihood	Minor	Low
		Exposure to explosive gases	Unlikely	Medium	Low
<b>Notes/assumptions:</b>					
<ul style="list-style-type: none"> <li>• assumes construction works are complete and remediation has been carried out where necessary. No pathways are left open;</li> <li>• in the completed scheme MA07-165 will become grassland/habitat planting and MA08-178 will be released for future redevelopment use. The draft CoCP<sup>9</sup> measures will apply equally to land used for construction and land used temporarily, for example, for site offices and works compounds. However, for temporary works land, risk assessment and remediation will only be designed for the temporary use, rather than any long-term post-construction use; and</li> <li>• existing site users and adjacent site users in the receptor column refer to users at or near to the areas assessed.</li> </ul>					

**Table 16: Post-construction CSM and qualitative risk assessment for petrol filling stations (MA06-209 and MA07-244) (off-site)**

Source	Receptor	Pathway	Probability	Consequence	Risk at post-construction phase
Residual contamination from former and current activities: contaminants primarily comprising petroleum and diesel range hydrocarbons,	Existing site users – Petrol station users and workers	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters	Low likelihood	Medium	Moderate/low

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Source	Receptor	Pathway	Probability	Consequence	Risk at post-construction phase	
lead and methyl-tert butyl ether.	Adjacent site users –Residents, farm workers, walkers and workers in commercial area	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters	Unlikely	Medium	Low	
	Controlled waters – groundwater Secondary A aquifer of the glaciofluvial deposits	Leaching, vertical and lateral migration from contaminated soils and waters	Likely	Medium	Moderate	
	Controlled waters – groundwater Secondary B aquifer of the Tarporley Siltstone Formation Principal Aquifer of the Wilmslow Sandstone Formation	Leaching, vertical and lateral migration from contaminated soils and waters	Low likelihood to likely	Minor to medium	Low to moderate	
	Controlled waters – surface water Pigginshaw Brook and River Mersey	Lateral migration through groundwater Direct runoff from site	Low likelihood	Medium	Moderate/low	
	Property receptors – buildings, foundations and services (existing and adjacent)		Direct contact with contaminated soils and waters	Low likelihood	Minor	Low
			Exposure to gases/vapours	Low likelihood	Medium	Moderate/low
<b>Notes/assumptions:</b>						

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Source	Receptor	Pathway	Probability	Consequence	Risk at post-construction phase
<ul style="list-style-type: none"> <li>• assumes baseline conditions will not change at post-construction; and</li> <li>• existing site users and adjacent site users in the receptor column refer to users within/near to the areas assessed.</li> </ul>					

### 3.5 Assessment of temporary (construction) and permanent (post-construction) effects

3.5.1 The significance of the effects of land contamination is assessed by comparing the difference in risk of each contaminant linkage at baseline to those at construction and at post-construction stages. This provides a way of assessing both the adverse and beneficial effects during construction and the post-construction period.

**Table 17: Freight terminal and former depots grouped for assessment (MA07-221, MA07-226 and MA07-229) (on-site) – significance of effect assessments**

Contaminant linkage	Baseline risk	Construction risk	Post-construction risk	Construction significance	Post-construction significance
Exposure of existing site users to contamination by direct contact, ingestion and inhalation of dusts and vapours from contaminated soils and waters.	Low	Low	Low	Neutral effect	Neutral effect

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<b>Contaminant linkage</b>	<b>Baseline risk</b>	<b>Construction risk</b>	<b>Post-construction risk</b>	<b>Construction significance</b>	<b>Post-construction significance</b>
Exposure of existing site users through inhalation of ground gases.	Low	Low	Low	Neutral effect	Neutral effect
Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters impacting adjacent site users.	Low	Low	Low	Neutral effect	Neutral effect
Exposure of adjacent site users through inhalation of ground gases.	Low	Low	Low	Neutral effect	Neutral effect
Lateral and vertical migration of mobile contamination to groundwater (glacial till – Secondary undifferentiated aquifer).	Very low	Very low	Very low	Neutral effect	Neutral effect
Lateral and vertical migration of mobile contamination to groundwater (Chester Formation and Collyhurst Sandstone Formation – Principal aquifer and Manchester Marls	Very low to low	Low to moderate/low	Very low to low	Neutral effect	Neutral effect

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Contaminant linkage	Baseline risk	Construction risk	Post-construction risk	Construction significance	Post-construction significance
Formation – Secondary B aquifer).					
Discharge of contaminants to surface water by lateral migration through groundwater and direct runoff from site (Corn Brook).	Very low	Very low	Very low	Neutral effect	Neutral effect
Exposure of property via direct contact to contaminated soils and waters.	Low	Low	Low	Neutral effect	Neutral effect
Exposure of property and underground structures/services to explosive gases.	Low	Low	Low	Neutral effect	Neutral effect
Overall significance				Neutral effect	Neutral effect
<b>Notes/assumptions:</b>					
<ul style="list-style-type: none"> <li>the significance column may report a range of outcomes for a site. The draft CoCP<sup>9</sup> is designed to mitigate effects, and it is considered that only temporary minor adverse effects during the construction period will occur from ground disturbance;</li> <li>construction of the AP2 revised scheme at the site is related to utilities only and so it is assumed the site will remain occupied during construction; and</li> <li>it is assumed that existing properties will not be demolished during the construction stage.</li> </ul>					



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**Table 18: Former depot and existing scrap yard grouped for assessment (MA07-165 and MA07-178) (on-site) – significance of effect assessment**

Contaminant linkage	Baseline risk	Construction risk	Post-construction risk	Construction significance	Post-construction significance
Exposure of existing site users to contamination by direct contact, ingestion and inhalation of dusts and vapours from contaminated soils and waters.	Moderate/low	N/A	Low	N/A	Minor beneficial effect
Exposure of existing site users through inhalation of ground gases.	Low	N/A	Low	N/A	Neutral effect
Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters impacting adjacent site users.	Low to moderate/low	Low to moderate/low	Low	Neutral effect	Minor beneficial effect
Exposure of adjacent site users through inhalation of ground gases.	Low	Low	Low	Neutral effect	Neutral effect
Lateral and vertical migration of mobile contamination to groundwater (glacial till – Secondary undifferentiated aquifer).	Very low	Very low	Very low	Neutral effect	Neutral effect

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Contaminant linkage	Baseline risk	Construction risk	Post-construction risk	Construction significance	Post-construction significance
Lateral and vertical migration of mobile contamination to groundwater (Chester Formation – Principal aquifer and Halesowen Formation – Secondary A Aquifer).	Low	Moderate/low	Low	Minor adverse effect	Neutral effect
Exposure of property via direct contact to contaminated soils and waters.	Low	Low	Low	Neutral effect	Neutral effect
Exposure of property and underground structures/services to explosive gases.	Low	Low	Low	Neutral effect	Neutral effect
Overall significance				Neutral to minor adverse effect	Neutral to minor beneficial effect
<b>Notes/assumptions:</b>					
<ul style="list-style-type: none"> <li>the significance column may report a range of outcomes for a site. The draft CoCP<sup>9</sup> is designed to mitigate effects, and it is considered that only temporary minor adverse effects during the construction period will occur from ground disturbance;</li> <li>where human health receptors are no longer present during the construction and post-construction stages the risks are labelled as not applicable (N/A); and</li> <li>it is assumed that existing properties are demolished during the construction and post-construction stages and so risks to them have not been assessed.</li> </ul>					

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**Table 19: Petrol filling stations (MA06-209 and MA07-244) (off-site) – significance of effect assessment**

Contaminant linkage	Baseline risk	Construction risk	Post-construction risk	Construction significance	Post-construction significance
Exposure of existing site users to contamination by direct contact, ingestion and inhalation of dusts and vapours from contaminated soils and waters.	Moderate/low	Moderate/low	Moderate/low	Neutral effect	Neutral effect
Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters impacting adjacent site users.	Low	Low	Low	Neutral effect	Neutral effect
Lateral and vertical migration of mobile contamination to groundwater (glaciofluvial deposits – Secondary A aquifer).	Moderate	Moderate	Moderate	Neutral effect	Neutral effect
Lateral and vertical migration of mobile contamination to groundwater (Tarpurley Siltstone Formation – Secondary B aquifer and Wilmslow Sandstone	Low to moderate	Low to moderate	Low to moderate	Neutral effect	Neutral effect

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Contaminant linkage	Baseline risk	Construction risk	Post-construction risk	Construction significance	Post-construction significance
Formation – Principal Aquifer).					
Discharge of contaminants to surface water by lateral migration through groundwater and direct runoff from site (Pigginshaw Brook and River Mersey).	Moderate/low	Moderate/low	Moderate/low	Neutral effect	Neutral effect
Exposure of property via direct contact to contaminated soils and waters.	Low	Low	Low	Neutral effect	Neutral effect
Exposure of property and underground structures/services to explosive vapours/gases.	Moderate/low	Moderate/low	Moderate/low	Neutral effect	Neutral effect
Overall significance				Neutral effect	Neutral effect
<b>Notes/assumptions:</b>					
<ul style="list-style-type: none"> <li>the significance column may report a range of outcomes for a site. The draft CoCP<sup>9</sup> is designed to mitigate effects, and it is considered that only temporary minor adverse effects during the construction period will occur from ground disturbance.</li> </ul>					



**High Speed Two (HS2) Limited**

Two Snowhill

Snow Hill Queensway

Birmingham B4 6GA

Freephone: 08081 434 434

Minicom: 08081 456 472

Email: [HS2enquiries@hs2.org.uk](mailto:HS2enquiries@hs2.org.uk)