

# High Speed Rail (Crewe – Manchester) Environmental Statement

## Volume 2: Community Area reports

MA06: Hulseheath to Manchester Airport

# HS2

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

**Volume 2: Community Area reports**

MA06: Hulseheath to Manchester Airport



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.

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## Preface

### The Environmental Statement

This document forms part of Volume 2 of the Environmental Statement (ES) that accompanies the deposit of the High Speed Rail (Crewe – Manchester) hybrid Bill (hereafter referred to as the Bill). This Bill would authorise:

- the Phase 2b Western Leg, which comprises the section of the proposed High Speed Two (HS2) rail network from Crewe to Manchester, with connections onto the West Coast Main Line;
- a number of works that are required beyond the route, such as to the existing conventional rail network, to enable the operation of the Western Leg; and
- provision for future Northern Powerhouse Rail services to connect with HS2.

Collectively, these are referred to in this ES as ‘the Proposed Scheme’. The ES describes the Proposed Scheme and reports its likely significant environmental effects and the measures proposed to mitigate adverse effects.

The hybrid Bill for Phase One of the HS2 network, between London and the West Midlands, was the subject of an ES deposited in November 2013. The Phase One hybrid Bill received Royal Assent in February 2017. The main works on Phase One commenced in April 2020.

The hybrid Bill for Phase 2a of the HS2 network, between the West Midlands and Crewe, was the subject of an ES deposited in July 2017. The Phase 2a Bill received Royal Assent in February 2021.

### Consultation on the Environmental Statement

The public has an opportunity to comment on this ES which accompanies the deposit of the Bill. The period of public consultation on the ES extends for at least 56 days (eight weeks) after the first newspaper notices that follow deposit of Bill documents in Parliament.

### Structure of the Environmental Statement

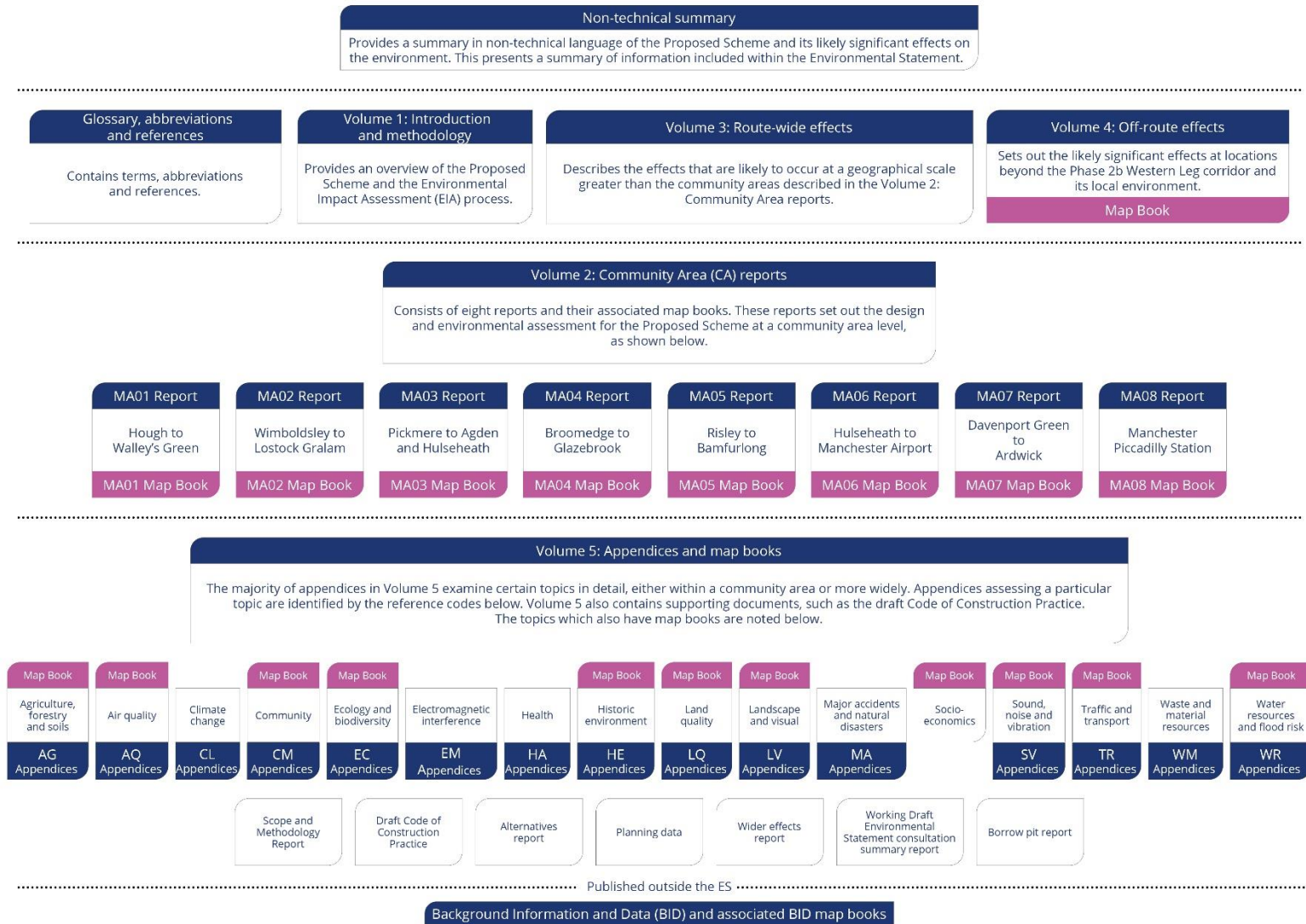
This report is part of the suite of documents that make up the ES for the Proposed Scheme. The structure of the ES is shown in Figure 1 and described in more detail in Volume 1. The ES has been prepared by persons who have sufficient expertise to ensure the completeness and technical quality of the statement.

# Environmental Statement

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**Figure 1: Structure of the Environmental Statement**



# 1 Introduction

## 1.1 Introduction to HS2

- 1.1.1 High Speed Two (HS2) is a new high speed railway proposed by the Government to connect major cities in Britain. It will transform intercity and long distance passenger rail travel in the UK, providing the first major increase in intercity rail capacity for over a century and freeing up substantial capacity for rail travel and freight on the conventional rail network. London, Birmingham, Manchester and cities in the Midlands, the North and Scotland will be served by high speed trains running at speeds of up to 360kph (225mph) on HS2 lines and on the existing conventional rail network. As part of the Proposed Scheme, new stations will be built at Manchester Piccadilly and Manchester Airport, in addition to the new stations in London and the West Midlands included in HS2 Phase One.
- 1.1.2 The Proposed Scheme that is the subject of this ES consists of:
- the HS2 Western Leg from Crewe to Manchester, including:
    - new stations at Manchester Airport and Manchester Piccadilly;
    - a depot north of Crewe;
    - maintenance facilities north of Crewe and at Ashley; and
    - a connection onto the West Coast Main Line (WCML) near Bamfurlong;
  - the Crewe Northern Connection, connecting the route of the Proposed Scheme with the WCML and enabling future Northern Powerhouse Rail (NPR) services to connect with HS2;
  - provision for the NPR London to Liverpool, Manchester to Liverpool, and Manchester to Leeds junctions, to enable these future NPR routes to connect with HS2; and
  - a number of works at locations beyond the Western Leg route corridor, referred to as 'off-route works', which include:
    - works to enable HS2 trains to call at existing stations further north on the WCML; and
    - construction of depots to provide overnight stabling for HS2 trains serving the north of England and Scotland.
- 1.1.3 The Proposed Scheme will connect with HS2 Phase 2a at Hough, to the south of Crewe.
- 1.1.4 Construction of the Proposed Scheme is assumed to commence in 2025, with operation assumed to start in 2038.
- 1.1.5 The environmental effects of the Proposed Scheme have been assessed. The findings of the assessment are reported in the ES, of which this Volume 2 report forms a part. The ES has been deposited alongside the Bill, in accordance with the requirements of Parliamentary

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Standing Order 27A (SO27A)<sup>1</sup>. A working draft ES was consulted on during the development of the Phase 2b proposals to help inform the design and assessment of the Proposed Scheme.

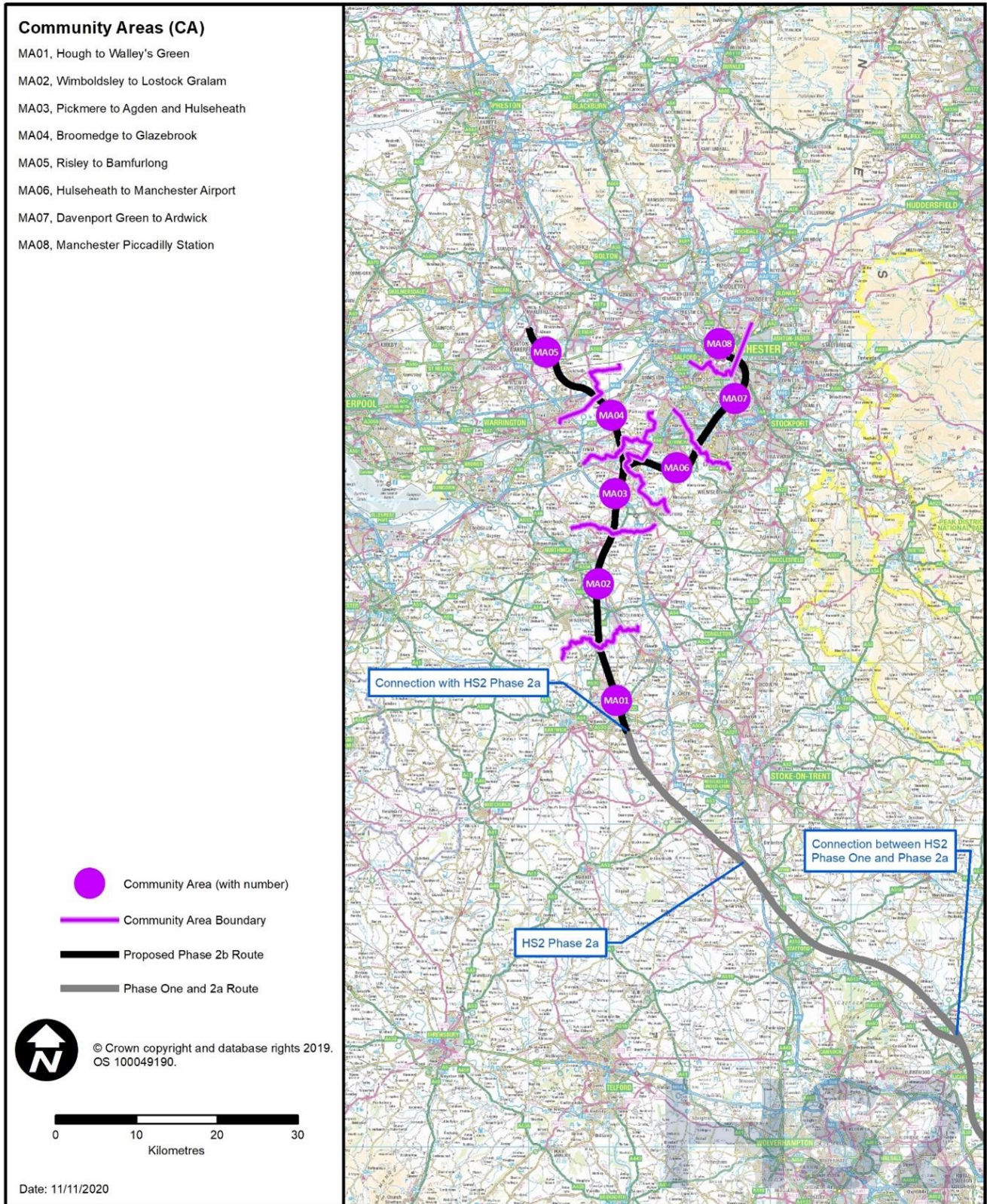
- 1.1.6 For environmental assessment and community engagement purposes, the Proposed Scheme has been divided into eight community areas (CA). These are shown in Figure 2. This CA report relates to the Hulseheath to Manchester Airport area (MA06).

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<sup>1</sup> House of Commons (2019), *Standing Order 27A relating to private business (environmental assessment)*, House of Commons. Available at: <https://www.parliament.uk/business/publications/commons/sessional-orders-private1/>.

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**Figure 2: The HS2 Phase 2b Western Leg route and community areas**



## 1.2 Purpose of this report

- 1.2.1 This report presents the likely significant effects of the construction and operation of the Proposed Scheme on the environment within Hulseheath to Manchester Airport area. The report also describes the proposed means to avoid, prevent, reduce or, if possible, offset the likely significant effects of the Proposed Scheme on the environment within the area, along with any proposed monitoring measures.

## 1.3 Structure of this report

- 1.3.1 This report is divided into the following sections:

- Section 1: an introduction to HS2 and the purpose and structure of this report;
- Section 2: overview of the community area, description of the Proposed Scheme within the community area and its construction and operation, and a list of the local alternatives considered;
- Section 3: consultation and stakeholder engagement; and
- Sections 4 to 15: an assessment of the following environmental topics:
  - agriculture, forestry and soils (Section 4);
  - air quality (Section 5);
  - community (Section 6);
  - ecology and biodiversity (Section 7);
  - health (Section 8);
  - historic environment (Section 9);
  - land quality (Section 10);
  - landscape and visual (Section 11);
  - socio-economics (Section 12);
  - sound, noise and vibration (Section 13);
  - traffic and transport (Section 14); and
  - water resources and flood risk (Section 15).

- 1.3.2 Each environmental topic section (Section 4 to 15) comprises:

- an introduction to the topic;
- a description of the existing and future environmental baseline within the community area;
- a description of the impacts and likely significant environmental effects arising during construction and operation of the Proposed Scheme, including cumulative effects; and
- a description of proposed mitigation and monitoring measures that have been identified to address any significant adverse effects.

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- 1.3.3 Environmental effects have been assessed in accordance with the scope, methodology, assumptions and limitations set out in Volume 1 and the EIA Scope and Methodology Report (SMR)<sup>2</sup>. Volume 1 also sets out assumptions relating to the impact of Covid-19 on the environmental baseline.
- 1.3.4 The maps relevant to the Hulseheath to Manchester Airport area are provided in a separate corresponding document entitled Volume 2: MA06 Map Book, which should be read in conjunction with this report. The maps contain grid references that are referred to in this report to enable features to be located.
- 1.3.5 The Proposed Scheme described in this report is that shown on the Map Series CT-05 (construction) and CT-06 (operation) (Volume 2: MA06 Map Book). There is some flexibility during detailed design to alter the horizontal and vertical alignments and other details within the limits shown on the plans and sections submitted to Parliament and as set out in the Bill, and this flexibility is included within the scope of the environmental assessment. Further explanation is provided in Volume 1, Section 1.
- 1.3.6 In addition to the environmental topics covered in Sections 4 to 15 of this report, climate change, electromagnetic interference, major accidents and disasters, and waste and material resources are addressed in Volume 3 on a route-wide basis. An assessment of potential environmental effects beyond the route corridor and its associated local environment has also been undertaken and this 'off-route' assessment is reported in Volume 4.
- 1.3.7 Supporting technical information, including technical appendices and map books, relating to the assessment in this Volume 2 report is provided in Volume 5 of the ES.
- 1.3.8 In addition to the technical appendices and map books in Volume 5, certain reports and maps containing Background Information and Data (BID) have been produced, which do not form part of the ES. These documents are available on the HS2 Ltd website ([www.hs2.org.uk](http://www.hs2.org.uk)). The BID reports and maps present survey information, collated from published and unpublished sources, and other background data, and are referenced at various places within the ES.

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<sup>2</sup> Volume 5: Appendix CT-001-00001, Environmental Impact Assessment Scope and Methodology Report.



## 2 Overview of the area and description of the Proposed Scheme

### 2.1 Overview of the area

#### General

- 2.1.1 The Proposed Scheme in the Hulseheath to Manchester Airport area will comprise four main components:
- HS2 Manchester spur (referred to in this report as the route of the Proposed Scheme), 10.7km in length in this area;
  - passive provision for a connection between HS2 and a future Northern Powerhouse Rail (NPR) route between Manchester and Liverpool, referred to as NPR Manchester to Liverpool junction;
  - Ashley infrastructure maintenance base – rail (IMB-R); and
  - Manchester Airport High Speed station.
- 2.1.2 The route of the Proposed Scheme is orientated broadly east-west through the centre of the area and north-south as it follows the M56 in the east.
- 2.1.3 The Proposed Scheme in the Hulseheath to Manchester Airport area will be within the local authority areas of Cheshire East Council (CEC), Trafford Metropolitan Borough Council (TMBC), Manchester City Council (MCC) and the Greater Manchester Combined Authority (GMCA). The Proposed Scheme will pass through the parishes of Millington, Rostherne, Mobberley, Ashley and Ringway.
- 2.1.4 The boundary between High Legh parish and Millington parish forms the south-western boundary of the Hulseheath to Manchester Airport area. The boundary between Trafford district and Manchester district forms the north-eastern boundary of this area. The Hulseheath to Manchester Airport area lies to the north-east of the Pickmere to Agden and Hulseheath area (MA03) and south-west of Davenport Green to Ardwick area (MA07), as shown in Figure 3.

#### Settlement, land use and topography

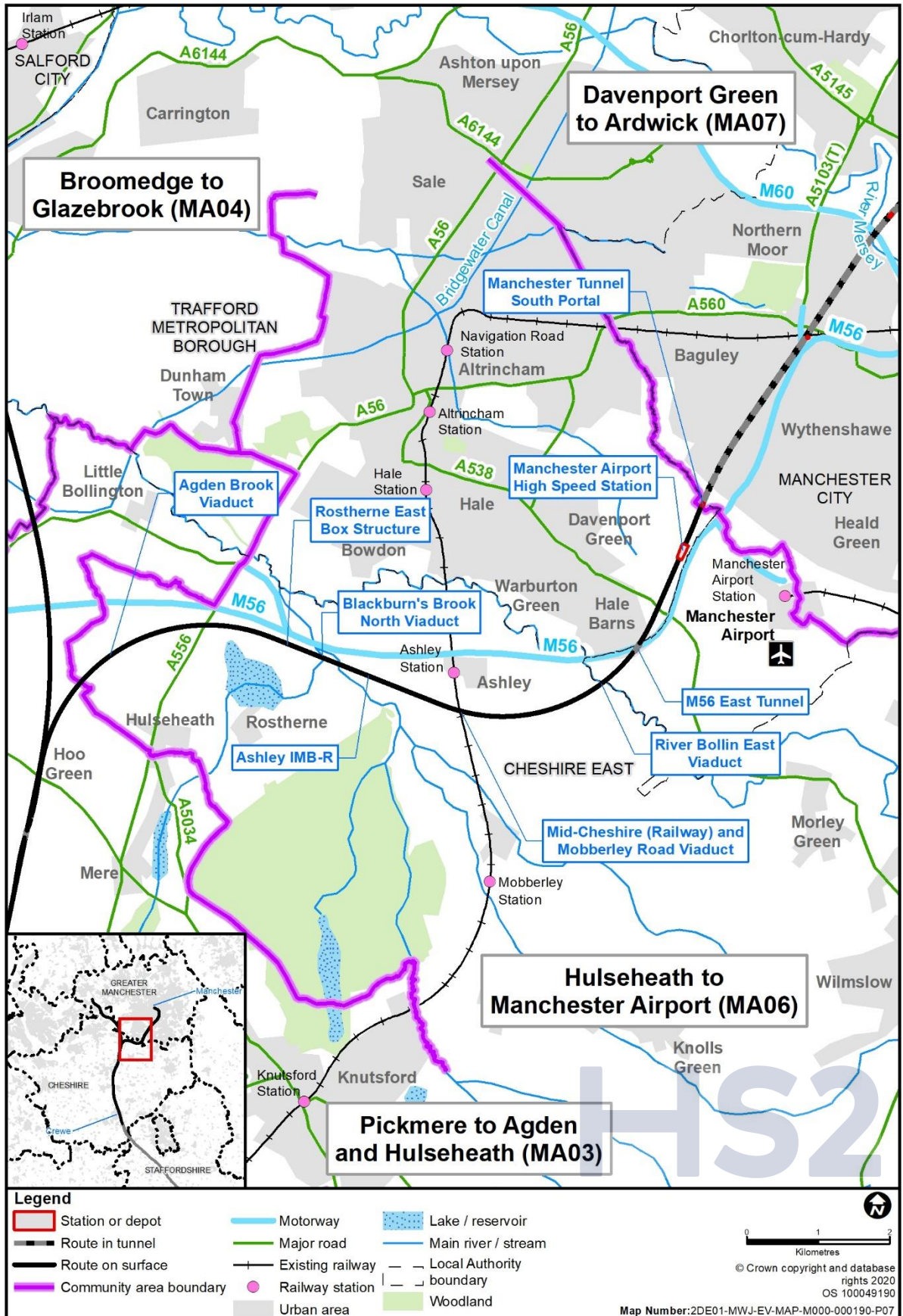
- 2.1.5 The Hulseheath to Manchester Airport area is predominantly semi-rural in character with agriculture and recreation being the main land uses. Urban land use dominates the northern part of the area, notably the towns of Altrincham and Hale.
- 2.1.6 The main settlements are Altrincham, Hale, Hale Barns and Bowdon. There are also a number of villages in the area including Hulseheath, Rostherne, Ashley, Mobberley, Thorns Green and Halebank. These settlements are interspersed with isolated dwellings and farmsteads.

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- 2.1.7 Notable land uses include Manchester Airport, which is located within the eastern part of the area and consists of three terminals, two runways and other related functions covering approximately 560ha.
- 2.1.8 The area is predominantly flat with some undulating countryside. The highest point is located at Davenport Green (77m above Ordnance Datum (AOD)), in the east; the lowest point is located in Bowdon (25m AOD), in the west.

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**Figure 3: Community area context map**



## Key transport infrastructure

- 2.1.9 Manchester Airport is located towards the eastern extent of the Hulseheath to Manchester Airport area. Manchester Airport is primarily accessed from the strategic road network via the M56 junctions 5 and 6. The airport also has its own transport interchange which connects bus, coach, rail and light rail services.
- 2.1.10 The M56 runs through the centre of the area, with junction 8 in the west of the area and junction 5 in the east. There are a number of other key highways in the area predominantly running through the towns of Altrincham and Hale. These include the A56 Manchester Road, the A556, the A560 Stockport Road, the A538 Altrincham Road/Water Lane/Wilmslow Road/Hale Road and the A5144 Thorley Lane/Delahays Road.
- 2.1.11 The Mid-Cheshire Line passes through the area from Knutsford in the south, connecting with the Warrington and Altrincham Junction Railway, which runs east-west in the north of the area. Rail services are accessible via the following stations: Mobberley, Ashley, Hale, Altrincham and Navigation Road.
- 2.1.12 The Manchester Airport Line is a Manchester Metrolink tram line running from Manchester city centre to the transport interchange at Manchester Airport via the suburb of Wythenshawe.
- 2.1.13 The Bridgewater Canal passes through the area, from the northern extent of Dunham Massey and through Altrincham to the area's northern boundary.
- 2.1.14 The Cheshire Cycleway (Regional Route 70) and Manchester Airport Orbital Cycleway (Regional Route 85), which are part of the National Cycle Network, run through the area.

## Socio-economic profile

- 2.1.15 The professional, scientific and technical sector accounts for the largest proportion of businesses within the CEC area (19%), with construction the second largest (9%), followed by business administration and support services (9%). The professional, scientific and technical sector accounts for the largest proportion of businesses (20%) in the TMBC area, with business administration and support services the second largest (11%), followed by information and communication services (9%). The professional, scientific and technical (18%) and retail (18%) sectors account for the largest proportion of businesses in the MCC area, followed by business administration and support services (9%)<sup>3</sup>.
- 2.1.16 According to the Annual Population Survey 2020<sup>4</sup>, the employment rate (the proportion of residents aged 16-64 in employment) within the CEC, TMBC and MCC areas was 76%

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<sup>3</sup> Office for National Statistics (2020), *UK Business Counts - Local units by industry and employment size band 2020*. Available online at: <http://www.nomisweb.co.uk/datasets/idbrlu>.

<sup>4</sup> Office for National Statistics (2020), *Annual Population Survey*. NOMIS. Available online at: <http://www.nomisweb.co.uk/datasets/apsnew>. This number includes the jobs held by residents of CEC, TMBC and MCC irrespective of where they work.

(171,300 people), 78% (114,800) and 66% (257,800), respectively. In 2020, unemployment in the CEC area was 4%, 5% in the TMBC area and 9% in the MCC area.

- 2.1.17 The same survey indicates that 42% of residents aged 16-64 in the CEC area were qualified to National Vocational Qualification level 4 (NVQ4) and above, while 5% of residents had no qualifications. In the TMBC area, 51% of residents aged 16-64 were qualified to NVQ4 and above, with 4% of residents having no qualifications. In the MCC area, 48% of residents aged 16-64 were qualified to NVQ4 and above, with 8% of residents having no qualifications.

## **Notable community facilities**

- 2.1.18 The main concentrations of community facilities are within the larger urban settlements of Altrincham, Hale and Bowdon. The villages of Millington, Rostherne, Ashley and Warburton Green, and the settlement of Hale Barns, provide a smaller number of local services.
- 2.1.19 Millington is a village located in the west of the area. There are a small number of notable community facilities which include the Children's Adventure Farm Trust at Booth Bank Farm.
- 2.1.20 Rostherne is a rural settlement located in the west of the area. There are a small number of notable community facilities which include the Bucklow Manor Nursing Home and St Mary's Church.
- 2.1.21 Ashley is a village located south of the M56 and centrally within the area. Notable community facilities in Ashley include St Elizabeth's Church and Community Centre and Ashley Cricket Club and the Greyhound pub. In addition, Higher Thorns Green Farm operates in conjunction with the Fairfield Farm Project, run by Fairfield Care Ltd.
- 2.1.22 The settlement of Hale Barns is located north of the M56 in the north-east of the area. Notable community facilities in Hale Barns include St Ambrose Preparatory School, Elmridge Primary School, Holy Angels Church, All Saints Church, Hale Synagogue, and Hale Chapel and Sephardi Congregation of South Manchester. Other notable community facilities include: Sunrise of Hale Barns care home and a health centre.

## **Recreation, leisure and open space**

- 2.1.23 Notable recreation, leisure and open space facilities include three large National Trust properties (Tatton Park, Quarry Bank Mill and Dunham Massey), and Rostherne Mere. Waterways which pass through the area include the Bridgewater Canal and the River Bollin, which provide opportunities for boating, canoeing and other recreational activities.
- 2.1.24 Other notable facilities in the area include Ashley Cricket Club; Hale Golf Club (south of Hale); Hale Barns Cricket Club; the Tennis Club, Hale Barns; Bollin Valley Way; Cheshire Ring Canal Walk; and Ringway Golf Club (north of Hale Barns).

## **Policy and planning context**

- 2.1.25 Volume 1 provides an overview of the case for HS2.

## Planning framework

2.1.26 Relevant development plan documents and other planning policies have been considered in relation to environmental topics, as part of considering the Proposed Scheme in the local context. Development plan documents and other planning policies relevant to the Hulseheath to Manchester Airport area are listed in Volume 5: Appendix CT-004-00000, Planning data. These have been considered and referred to where appropriate to the assessment described in Sections 4 to 15 of this Volume 2 report.

## Committed development

- 2.1.27 Committed developments are defined as developments with planning permission and sites allocated for development, or safeguarded for minerals in adopted development plans, on or close to the land required for the Proposed Scheme. Section 7 of Volume 1 sets out the approach to identifying and considering committed developments in the assessment. The committed developments relevant to the assessment of the Proposed Scheme in the Hulseheath to Manchester Airport area are listed in Volume 5: Appendix CT-004-00000, Planning data and are shown in Volume 5, Planning Data/Committed Development Map Book: maps CT-13-319 to CT-13-322a.
- 2.1.28 These have been considered to determine whether they would result in a material change to the future baseline or have the potential to give rise to cumulative effects for each environmental topic. The committed developments considered in the assessment for the Hulseheath to Manchester Airport area are reported in the relevant topic sections of this report.

## Changes to the design since the working draft ES

- 2.1.29 A number of changes have been introduced to the Proposed Scheme in this area since the working draft ES was published. The key changes in this area (including approximate dimensions where appropriate) are as follows:
- introduction of the following features to enable passive provision for NPR Manchester to Liverpool junction:
    - Millington North cutting (see Volume 2: MA06 Map Book, map CT-06-351, H3 to J4 and map CT-06-352, C4 to F5);
    - Rostherne North cutting (see Volume 2: MA06 Map Book, map CT-06-353, A4 to C4);
    - Rostherne West embankment (see Volume 2: MA06 Map Book, map CT-06-353, C4 to E5);
    - Rostherne East box structure (see Volume 2: MA06 Map Book, map CT-06-353, E5 to F5);
    - foundations to enable future provision of a viaduct for NPR Manchester to Liverpool junction (see Volume 2: MA06 Map Book, map CT-06-353, F5 to I5); and

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- Rostherne East embankment (see Volume 2: MA06 Map Book, map CT-06-353, I5 to J5 and map CT-06-354, A5 to B6);
- introduction of Ashley IMB-R, to support railway infrastructure maintenance activities for the Proposed Scheme (see Volume 2: MA06 Map Book, map CT-06-353, I5 to J5, and map CT-06-354, A5 to E5);
- introduction of Mid-Cheshire (Railway) and Mobberley Road viaduct to carry the route of the Proposed Scheme over the Mid-Cheshire Line and the realigned Mobberley Road (see Volume 2: MA06 Map Book, map CT-06-354, H6 to J5);
- changes to Manchester Airport High Speed station through design development and to accommodate future NPR services and Metrolink services, comprising the introduction of two additional island platforms, resulting in four stopping platforms (see Volume 2: MA06 Map Book, map CT-06-356, J4 to J5 and map CT-06-357a, A6 to D6);
- the realignment of the A538 Hale Road, realignment of the A538 Hale Road/Station Access gyratory, and permanent closure of Hasty Lane to enable access to Manchester Airport High Speed station (see Volume 2: MA06 Map Book, map CT-06-356, H3 to J6);
- highway improvements at the M56 junction 6 connecting the realigned A538 Hale Road, the A538 Wilmslow Road and Runger Lane. This will include additional lanes and introduction of M56/A538 Wilmslow Road offline underbridge (see Volume 2: MA06 Map Book, map CT-06-356, G6 to I9);
- increase in the length of Manchester Airport High Speed station cutting by 100m. As a consequence, Manchester tunnel south portal, which was included within the Hulseheath to Manchester Airport area in the working draft ES, is now included within the Davenport Green to Ardwick area (MA07) (see Volume 2: MA06 Map Book, map CT-06-357a, G6);
- introduction of utilities works including the diversion of a Cadent Gas high pressure pipeline, National Grid high pressure gas pipelines and electricity transmission lines, and United Utilities water mains throughout the Hulseheath to Manchester Airport area, as described in Section 2.2;
- introduction of three telecommunications sites (see Volume 2: MA06 Map Book, map CT-06-351, H4 and map CT-06-352, C5, map CT-06-353, D4, and map CT-06-355, H7 to I7);
- introduction of Ashley Road auto-transformer station (see Volume 2: MA06 Map Book, map CT-06-354, F6);
- introduction of a temporary railhead at Ashley, which will provide a facility for the construction of track, signal and electrifications systems for the Proposed Scheme (see Volume 2: MA06 Map Book, map CT-05-353, G5 to J6, map CT-05-354, A5 to J10, map CT-05-354-R1, H1 to J5, map CT-05-355-R1, A1 to A10, and map CT-05-355-R2, B7 to C1);
- temporary realignment of a 1.4km section of the M56 during the construction period to accommodate the construction of M56 East tunnel (see Volume 2: MA06 Map Book, map CT-05-356, C3 to G7); and
- the removal of Millington Lane satellite compound (see Volume 2: MA06 Map Book, map CT-05-351, G5 to H7) and introduction of Mobberley Road South satellite compound (see Volume 2: MA06 Map Book, map CT-05-354, H9 to I10, and map CT-05-354-R1, G1 to H3).

2.1.30 In addition, the location and layout of construction compounds, stockpiles and site haul routes have been considered as part of the development of the design. Mitigation such as landscape earthworks, compensatory planting, and replacement ponds and wetlands have also been included throughout the Hulseheath to Manchester Airport area to reduce adverse effects from the Proposed Scheme.

## 2.2 Description of the Proposed Scheme

### General

- 2.2.1 The following section describes the main features of the Proposed Scheme in the Hulseheath to Manchester Airport area, including the proposed environmental mitigation measures that have been identified. Further general information on typical permanent features is provided in Volume 1, Section 5. Similarly, a general description of the approach to mitigation is explained in Volume 1, Section 9. Some of the ecological mitigation described in this section has been provided on a precautionary basis. This is described in Section 7, Ecology and biodiversity.
- 2.2.2 Land required for operation of the Proposed Scheme is described in this section and is shown on Volume 2: Map Series CT-06. Land required for construction is described in Section 2.3 and shown on Volume 2: Map Series CT-05.

### Overview

- 2.2.3 The Proposed Scheme within the Hulseheath to Manchester Airport area has four main components:
- the route of the Proposed Scheme;
  - NPR Manchester to Liverpool junction;
  - Ashley IMB-R: infrastructure maintenance facility for the Proposed Scheme, occupying land adjacent to the route of the Proposed Scheme, to the south of the M56 and west of the Mid-Cheshire Line; and
  - Manchester Airport High Speed station: an intermodal station to provide high speed rail connections to Manchester Airport, provisions for future NPR services and Metrolink services as well as local bus services.
- 2.2.4 Each of these components and their associated key features are set out in the following sections. Where key features are associated with more than one component of the Proposed Scheme, they are described within the section they are first associated with.
- 2.2.5 Where reference is made to the Proposed Scheme, this includes two or more of the components listed above. The components are also described individually, where relevant.
- 2.2.6 In addition to the features described below, the Proposed Scheme in the area will also include maintenance access points and routes, and hedgerow planting. There will also be



additional utilities works in the area, which may include works to low voltage overhead or underground lines, gas pipes, sewers and telecommunication cables.

## **The route of the Proposed Scheme**

- 2.2.7 The route of the Proposed Scheme through the Hulseheath to Manchester Airport area will be approximately 10.7km long. The route will extend from Hulseheath in the west and will travel north-east towards Manchester Airport, where it will enter Manchester tunnel south portal in the Davenport Green to Ardwick area (MA07).
- 2.2.8 This section of route is illustrated on maps CT-06-351 to CT-06-357a in the Volume 2: MA06 Map Book.
- 2.2.9 All dimensions in the sections below are approximate.
- 2.2.10 The route of the Proposed Scheme will consist of 870m of viaducts, 6.3km of cuttings, 3.2km of embankments, a 235m long box structure and a 133m long tunnel in the Hulseheath to Manchester Airport area.
- 2.2.11 These components and their associated key features are described in six separate sections below. In general, the Proposed Scheme is described from west to east.

### **Hulseheath North embankment to Agden Brook viaduct**

- 2.2.12 The route of the Proposed Scheme will continue from the eastern boundary of the Pickmere to Agden and Hulseheath area (MA03) on Hulsehealth North embankment before rising onto Agden Brook viaduct.
- 2.2.13 Key features of this 639m section will be:
- continuation of Hulseheath North embankment, 520m in length and up to 14m in height in this section, with associated areas of landscape mitigation planting to provide visual screening for residential properties along Back Lane, Thowler Lane and Boothbank Lane, and help integrate the route of the Proposed Scheme into the surrounding landscape (see Volume 2: MA06 Map Book, map CT-06-351, C8 to E6);
  - accommodation access for Ivy House Farm, located to the south-east of the route of the Proposed Scheme from the realigned Peacock Lane and pass above Millington Clough offline underbridge (located in the Pickmere to Agden and Hulseheath area (MA03)) (see Volume 2: MA06 Map Book, map CT-06-351, C9 to D7);
  - Millington Clough offline underbridge, 26m in length, with a height clearance of 4m, located on the boundary of the Pickmere to Agden and Hulseheath area (MA03) and the Hulseheath to Manchester Airport area, to convey Millington Clough underneath Ivy House Farm accommodation access (see Volume 2: MA03 Map Book, map CT-06-351, C9);
  - Millington Clough underbridge, 58m in length with a height clearance of 9m, located on the boundary of the Pickmere to Agden and Hulseheath area (MA03) and the Hulseheath

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to Manchester Airport area, to allow continued surface water flow under Hulseheath North embankment (see Volume 2: MA06 Map Book, map CT-06-351, C8 to C9);

- a balancing pond for highway drainage, 200m south of Millington Clough underbridge. Access will be provided from the realigned Peacock Lane (see Volume 2: MA06 Map Book, map CT-06-351, C10 and map CT-06-351-R1, C2);
- an area of wetland habitat creation to the west and east of the route of the Proposed Scheme extending along a tributary of Millington Clough, to provide replacement habitat to reconnect Millington Clough with the floodplain (see Volume 2: MA06 Map Book, map CT-06-351, C8 to D9);
- an area of woodland habitat creation along the southern side of Hulseheath North embankment, to provide replacement habitat for bats (see Volume 2: MA06 Map Book, map CT-06-351, C9 to D7);
- diversion of an underground Cadent Gas 300mm high pressure gas pipeline, for 3.4km in length, to pass under the route of the Proposed Scheme 270m south-west of Agden Brook viaduct (see Volume 2: MA06 Map Book, map CT-06-351, D1 to D10, map CT-06-351-L1, D2 to C10, and map CT-06-351-R1, A6 to D1);
- an area of woodland habitat creation north-west of the route of the Proposed Scheme, adjacent to a HS2 access road, to provide replacement habitat (see Volume 2: MA06 Map Book, map CT-06-351, D6 to D7);
- diversion of Footpath Millington 3/1, up to 320m north-east of its current alignment for 790m. The footpath will connect with Footpath Millington 4/1 to cross the route of the Proposed Scheme under Agden Brook viaduct, increasing journey length by 405m (see Volume 2: MA06 Map Book, map CT-06-351, C3 to E6);
- closure of Footpath Millington 3/3 where it crosses the route of the Proposed Scheme. Users will be diverted along Footpath Millington 4/2 and Footpath Millington 4/1, to cross the route of the Proposed Scheme under Agden Brook viaduct and diverted Footpath Millington 3/1. This will increase journey length by 405m (see Volume 2: MA06 Map Book, map CT-06-351, E6 to E8);
- diversion of an underground National Grid 900mm high pressure gas pipeline, for 2.7km in length, to pass under the route of the Proposed Scheme 70m south-west of Agden Brook viaduct (see Volume 2: MA06 Map Book, map CT-06-351, C1 to E10, map CT-06-351-L1, C9 to D10, and map CT-06-351-R1, A8 to E1);
- closure of Footpath Millington 5/2 where it crosses the route of the Proposed Scheme. Users will be diverted along Footpath Millington 4/1, to cross the route of the Proposed Scheme under Agden Brook viaduct and diverted Footpath Millington 3/1. This will increase journey length by 325m (see Volume 2: MA06 Map Book, map CT-06-351, E6 to E7);
- diversion of an underground National Grid 900mm high pressure gas pipeline, for 4.9km in length, to pass under the route of the Proposed Scheme 40m south-west of Agden Brook viaduct (see Volume 2: MA06 Map Book, map CT-06-351, D1 to E10, map CT-06-351-L1, D2 to C10, and map CT-06-351-R1, B10 to E1);

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- Agden Brook viaduct, 119m in length and up to 14m in height (see Volume 2: MA06 Map Book, map CT-06-351, E6 to F6);
- diversion of an underground Mainline Pipeline 300mm fuel pipeline for 740m in length, to pass under the route of the Proposed Scheme under Agden Brook viaduct (see Volume 2: MA06 Map Book, map CT-06-351, E3 to F9);
- a replacement floodplain storage area on the southern side of the route of the Proposed Scheme in the Agden Brook catchment area, 100m south of Agden Brook viaduct (Volume 2: MA06 Map Book, map CT-06-351, E7 to F8);
- an area of wetland habitat creation under Agden Brook viaduct, extending south along the eastern side of Agden Brook, to provide replacement habitat to reconnect Agden Brook with the floodplain (see Volume 2: MA06 Map Book, map CT-06-351, E8 to F6);
- an area of woodland habitat creation either side of Agden Brook viaduct and south-west of Millington cutting, to provide replacement habitat (see Volume 2: MA06, map CT-06-351, E5 to F7); and
- permanent diversion of minor utilities within this section, including Scottish Power and Openreach underground cables and overhead lines and United Utilities potable water mains (located within the area shown on Volume 2: MA06 Map Book, map CT-06-351).

## **Millington cutting to Rostherne cutting**

2.2.14 The route of the Proposed Scheme will continue from Agden Brook viaduct into Millington cutting before continuing into Rostherne cutting.

2.2.15 Key features of this 2.7km section will be:

- Millington cutting, 1.5km in length, up to 13m in depth and 94m in width. Within Millington cutting, Millington North cutting (a provision for NPR Manchester to Liverpool junction), will connect to the route of the Proposed Scheme (described in NPR Manchester to Liverpool junction section below) (see Volume 2: MA06 Map Book, map CT-06-351, F6 to J4, and map CT-06-352, A7 to H6);
- realignment of a section of Millington Lane, up to 5m above ground level for 296m, crossing the route of the Proposed Scheme on Millington Lane overbridge with a height of 6m above ground level, 10m above track level and a length of 69m. The change in journey length will be negligible (see Volume 2: MA06 Map Book, map CT-06-351, F4 to G6 and map CT-06-352, A5 to B7);
- Millington Lane telecommunications site, 49m by 24m in area, to the north of the route of the Proposed Scheme, including a railway telecommunications mast up to 20m in height. Landscape mitigation planting to the north, east and west of Millington Lane telecommunication site to provide visual screening for Booth Bank Farmhouse and users of Footpath Millington 11/1, and help integrate the route of the Proposed Scheme into the surrounding landscape. Access will be provided via an access road from the realigned Millington Lane (see Volume 2: MA06 Map Book, map CT-06-351, F4 to H4 and map CT-06-352, A5 to C5);

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- closure of Footpath Millington 8/1, where it crosses the route of the Proposed Scheme. Users will be diverted along Footpath Millington 6/2 and Footpath Millington 7/4 to cross the Proposed Scheme on Footpath Millington 7/4 accommodation overbridge. This will increase journey length by 364m (see Volume 2: MA06 Map Book, map CT-06-352, E6 to F4);
- diversion of existing access for Mereside Farm, up to 40m north-east of its current alignment for 125m, crossing the Proposed Scheme via Footpath Millington 7/4 accommodation overbridge. The change in journey length will be negligible (see Volume 2: MA06 Map Book, map CT-06-352, D9 to F6);
- accommodation access for Newhall Farm, crossing the Proposed Scheme via Footpath Millington 7/4 accommodation overbridge from the diverted Mereside Farm access (see Volume 2: MA06 Map Book, map CT-06-352, F4 to F6);
- diversion of Footpath Millington 7/4, up to 75m north-east of its current alignment for 442m, crossing the Proposed Scheme on Footpath Millington 7/4 accommodation overbridge, increasing the journey length by 48m (see Volume 2: MA06 Map Book, map CT-06-352, E4 to F7);
- Footpath Millington 7/4 accommodation overbridge, 74m in length, up to 7m above ground level and 12m above track level, with associated landscape mitigation planting to provide visual screening for users of the PRow network, Mereside Farm, Hope Cottage and Newhall Cottages and help integrate the Proposed Scheme into the surrounding landscape (see Volume 2: MA06 Map Book, map CT-06-352, F4 to F6);
- diversion of an underground United Utilities 400mm water main, for 659m in length, to pass under the Proposed Scheme 200m north-west of Mereside Farm (see Volume 2: MA06 Map Book, map CT-06-352, F7 to G3);
- a balancing pond for highway drainage, 50m north-west of Mereside Farm and adjacent to the diverted Footpath Millington 7/4. Access will be provided via an access road from the diverted Mereside Farm access (see Volume 2: MA06 Map Book, map CT-06-352, F6);
- a surface water pumping station for highways drainage, to the south of the route of the Proposed Scheme, 90m north-west of Mereside Farm. Access will be provided via the diverted Mereside Farm access (see Volume 2: MA06 Map Book, map CT-06-352, F5);
- landscape earthworks, 1m in height, with associated landscape mitigation planting, beginning at Footpath Millington 7/4 accommodation overbridge and continuing along the southern side of Millington cutting to A556 Chester Road overbridge. The landscape earthworks will provide visual screening for users of Footpath Millington 7/4 and Mereside Farm and help integrate the Proposed Scheme into the surrounding landscape (see Volume 2: Map CT-06-352, F5 to G6);
- modification of an existing balancing pond for highway drainage, 50m north of A556 Chester Road overbridge. Access will be provided from the A556. Landscape mitigation planting will be provided on the southern side of the modified balancing pond to provide visual screening for Hope Cottage and to help integrate the Proposed Scheme into the surrounding landscape (see Volume 2: MA06 Map Book, map CT-06-352, G3 to H5);

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- realignment of the A556, up to 1m above ground level for 300m, will cross the Proposed Scheme on A556 Chester Road overbridge with a height of up to 2m above ground level, 11m above track level and a length of 108m. The journey length will not change (see Volume 2: MA06 Map Book, map CT-06-352, G6 to H4);
- diversion of an underground United Utilities 315mm water main, for 292m in length, to pass under the Proposed Scheme 100m north-west of Cherry Tree Farm (see Volume 2: MA06 Map Book, map CT-06-352, G6 to H4);
- landscape earthworks, 1m in height, with associated landscape mitigation planting, beginning at A556 Chester Road overbridge and continuing along the southern side of Millington cutting to Cherry Tree Farm. The landscape earthworks and mitigation planting will provide visual screening for Cherry Tree Farm and help integrate the Proposed Scheme into the surrounding landscape (see Volume 2: MA06 Map Book, map CT-06-352, G5 to H6);
- an area of landscape mitigation planting to the north of Millington cutting, to help integrate the Proposed Scheme into the surrounding landscape (see Volume 2: MA06 Map Book, map CT-06-352, H4 to H5);
- an area of woodland habitat creation along the southern side of Rostherne cutting, to provide replacement habitat (see Volume 2: MA06 Map Book, map CT-06-352, H6 to J7 and map CT-06-353, A5);
- Rostherne cutting, 1.2km in length, up to 6m in depth and 83m in width (see Volume 2: MA06 Map Book, map CT-06-352, H5 to J7 and map CT-06-353, A5 to E5), with retaining walls to the west and east as follows:
  - Rostherne cutting retaining wall west, 110m in length, all of which will be below ground level, located to the north of the route of the Proposed Scheme, 150m north-east of A556 Chester Road overbridge (see Volume 2: MA06 Map Book, map CT-06-352, H5 to I5); and
  - Rostherne cutting retaining wall east, 323m in length, all of which will be below ground level, located between Rostherne cutting and Rostherne embankment, 50m south of Tom Lane telecommunications site (see Volume 2: MA06 Map Book, map CT-06-353, D5 to E5);
- Rostherne Mere groundwater recharge trenches, 1m in width, south of the Proposed Scheme near Cherry Tree Lane, to help maintain groundwater and surface water levels in Rostherne Mere (see Volume 2: MA06 Map Book, map CT-06-352, I7 to J9 and map CT-06-353, A6 to C7);
- a surface water pumping station for track and groundwater drainage, to the south of the route of the Proposed Scheme, 100m south-west of Yarwood Heath Farm accommodation overbridge. Access will be provided from an access road via Tom Lane (see Volume 2: MA06 Map Book, map CT-06-353, B5 to B6);
- closure of Tom Lane for motorised vehicles where it crosses the Proposed Scheme. Tom Lane will be retained as a private access road for Yarwood Heath Farm (see Volume 2: MA06 Map Book, map CT-06-353, A4 to B6);

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- realignment of existing access for Yarwood Heath Farm, up to 25m west of its current alignment for 277m, crossing the Proposed Scheme on the Yarwood Heath Farm accommodation overbridge, 82m in length, up to 9m above existing ground level and 12m above track level. The change in journey length will be negligible (see Volume 2: MA06 Map Book, map CT-06-353, A4 to B6);
- diversion of Footpath Rostherne 4/1, up to 350m north-west of the current alignment for 325m, crossing the route of the Proposed Scheme on Yarwood Heath Farm accommodation overbridge, increasing journey length by 615m (see Volume 2: MA06 Map Book, map CT-06-353, A4 to B6);
- landscape earthworks, 6m in height, with associated landscape mitigation planting, beginning at Yarwood Heath Farm accommodation overbridge and continuing along the southern side of Rostherne cutting and Rostherne East box structure. The landscape earthworks and landscape mitigation planting will provide visual screening for residential properties along Cherry Tree Lane and help integrate the Proposed Scheme into the surrounding landscape (see Volume 2: MA06 Map Book, CT-06-353, B5 to G5); and
- Tom Lane telecommunications site, 49m by 24m in area, to the north of the route of the Proposed Scheme, including a railway telecommunications mast up to 20m in height. Access will be provided via an access road from the realigned Yarwood Heath Farm access (see Volume 2: MA06 Map Book, map CT-06-353, A4 to D4).

## **Rostherne East box structure to Birkin Brook embankment**

2.2.16 The route of the Proposed Scheme will continue from Rostherne East box structure onto Blackburn's Brook embankment, Blackburn's Brook North viaduct, and Birkin Brook embankment.

2.2.17 Key features of this 1.6km section will be:

- Rostherne East box structure, 235m in length and up to 12m above ground level, to carry the route of the Proposed Scheme beneath NPR Manchester to Liverpool junction (see Volume 2: MA06 Map Book, map CT-06-353, E5 to F5);
- an area of woodland habitat creation along the southern side of Rostherne East box structure, to provide replacement habitat (see Volume 2: MA06 Map Book, map CT-06-353, E5 to G6);
- Blackburn's Brook embankment, 57m in length and up to 3m in height (see Volume 2: MA06 Map Book, map CT-06-353, F5 to G5);
- a replacement floodplain storage area on the southern side of the route of the Proposed Scheme, in the Blackburn's Brook catchment area, 250m south of Blackburn's Brook embankment (see Volume 2: MA06 Map Book, map CT-06-353, G6);
- Blackburn's Brook North viaduct, 385m in length and up to 11m in height (see Volume 2: MA06 Map Book, map CT-06-353, G5 to I5);

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- an area of wetland habitat creation to the north and south of Blackburn's Brook North viaduct, to provide replacement habitat to reconnect Blackburn's Brook and Birkin Brook with the floodplain (see Volume 2: MA06 Map Book, map CT-06-353, F4 to I6);
- diversion of a National Grid transmission 400kV overhead power line, for 1.9km in length, to cross Birkin Brook embankment 470m north-west of Birkin Farm (see Volume 2: MA06 Map Book, map CT-06-353, G4 to J5, map CT-06-354, A5 to F10, and map CT-06-354-R1, D1 to E2);
- an area of woodland habitat creation to the north and south of Blackburn's Brook North viaduct, to provide replacement habitat and increase habitat connectivity. The woodland habitat creation to the north will also provide commuting and foraging habitat for bats (see Volume 2: MA06 Map Book, map CT-06-353, G4 to H6);
- three ecological mitigation ponds to the south of Blackburn's Brook North viaduct, to provide replacement habitat for great crested newt (see Volume 2: MA06 Map Book, map CT-06-353, G5 to G6);
- realignment of a section of Footpath Rostherne 5/1, up to 130m east of its current alignment for 360m, crossing the route of the Proposed Scheme under Blackburn's Brook North viaduct, increasing journey length by 244m. A structure will be provided to carry users over Birkin Brook (see Volume 2: MA06 Map Book, map CT-06-353, G4 to H5);
- diversion of Footpath Ashley 3/1, up to 365m south-east of its current alignment for 1.1km. The footpath will connect with the diverted Footpath Rostherne 5/1, 100m west of Birkin Brook embankment crossing the route of the Proposed Scheme under Blackburn's Brook North viaduct, increasing the journey length by 624m (see Volume 2: MA06 Map Book, map CT-06-353, H3 to J6 and map CT-06-354, A5 to D6);
- Birkin Brook embankment, 882m in length and up to 8m in height, with associated landscape earthworks to the north, and landscape mitigation planting to the north and south, to provide visual screening for users of Footpath Ashley 3/1, visitors to Tatton Park, residential properties along Ashley Road, and help integrate the Proposed Scheme into the surrounding landscape. The Ashley IMB-R will be located on Birkin Brook embankment, this is discussed in further detail in the Ashley IMB-R section below (see Volume 2: MA06 Map Book, map CT-06-353, I4 to J5, and map CT-06-354, A5 to D6);
- an area of grassland habitat creation to the south of the Proposed Scheme, 60m south of Birkin Brook embankment, to provide replacement habitat and replacement floodplain storage (see Volume 2: MA06 Map Book, map CT-06-353, I6 to J6);
- a balancing pond for railway drainage, 40m south of Birkin Brook embankment. Access will be provided via an access road from the diverted Ashley Road (see Volume 2: MA06 Map Book, map CT-06-353, I5 to J6);
- an area of woodland habitat creation along the northern side of Birkin Brook embankment, to provide replacement habitat (see Volume 2: MA06 Map Book, map CT-06-354, A4 to B5); and
- a balancing pond for highway drainage, within an area of woodland habitat creation to provide replacement habitat and increase habitat connectivity, located 30m north of

Birkin Farm. Access will be provided via an access road from the diverted Ashley Road (see Volume 2: MA06 Map Book, map CT-06-354, D6).

## **Ashley embankment to Thorns Green embankment**

2.2.18 The route of the Proposed Scheme will continue onto Ashley embankment, Mid-Cheshire (Railway) and Mobberley Road viaduct and Thorns Green embankment.

2.2.19 Key features of this 2km section will include:

- Ashley embankment, 829m in length and up to 9m in height, with associated landscape earthworks to the north of the route of the Proposed Scheme, and landscape mitigation planting to the north and south, to provide visual screening for users of the PRow network, Ashley Cricket Club, residential properties within Ashley and along Ashley Road, and to help integrate the Proposed Scheme into the surrounding landscape (see Volume 2: MA06 Map Book, map CT-06-354, D5 to H6);
- Ashley embankment retaining wall, 189m in length and up to 6m above ground level, located between Ashley IMB-R and Ashley embankment, 100m north-east of Birkin Farm (see Volume 2: MA06 Map Book, map CT-06-354, D5 to E5);
- closure of a section of Ashley Road to the north of the Proposed Scheme, 40m west of Stock Farm. A turning head will be provided to facilitate vehicle access on the retained section of Ashley Road. To the south of the Proposed Scheme, Ashley Road will be diverted 880m to the south-east, joining the realigned Mobberley Road 250m north-east of Arden Lodge. Users of the diverted Ashley Road will cross the route of the Proposed Scheme underneath Mid-Cheshire (Railway) and Mobberley Road viaduct, increasing journey length by 2.7km. Landscape mitigation planting will be provided along the diverted Ashley Road to provide visual screening for users of the PRow network (see Volume 2: MA06 Map Book, map CT-06-354, D9 to I2);
- Ashley Road offline west culvert, 70m east of Birkin Farm, to convey Tributary of Birkin Brook 4 under the diverted Ashley Road (see Volume 2: MA06 Map Book, map CT-06-354, D6);
- a balancing pond for railway drainage, within an area of grassland habitat creation to provide replacement habitat, 100m east of Birkin Farm. Access will be provided from the diverted Ashley Road (see Volume 2: MA06 Map Book, map CT-06-354, E6 to F6);
- six ecological mitigation ponds within an area of grassland habitat creation to the south of Ashley embankment to provide replacement habitat for great crested newt (see Volume 2: MA06 Map Book, map CT-06-354, E6-F6);
- closure of Lamb Lane where it crosses the Proposed Scheme west of Ashley Road auto-transformer station. Users will be diverted along the diverted Ashley Road and realigned Mobberley Road before crossing the Proposed Scheme underneath Mid-Cheshire (Railway) and Mobberley Road viaduct, increasing journey length by 2.2km (see Volume 2: MA06 Map Book, map CT-06-354, E5 to F7);
- landscape earthworks, 2m in height, 75m east of Stock Farm and continuing east along Ashley embankment. The landscape earthworks will provide visual screening for users of



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Footpath Ashley 6/5, Ashley Cricket Club, properties in Ashley and along Ashley Road and help integrate the Proposed Scheme into the surrounding landscape (see Volume 2: MA06 Map Book, map CT-06-354, E5 to H5);

- closure of access from Stock Farm to Lamb Lane where it crosses the route of the Proposed Scheme. Access to Stock Farm will be maintained from Ashley Road north of the Proposed Scheme (see Volume 2: MA06 Map Book, map CT-06-354, E5);
- diversion of a section of Footpath Ashley 7/1, up to 125m north-east of its current alignment for 100m, to join the diverted Ashley Road. The journey length will not change (see Volume 2: MA06 Map Book, map CT-06-354, F7);
- two areas of woodland habitat creation along the northern and southern side of the diverted Ashley Road, to provide replacement habitat (see Volume 2: MA06 Map Book, map CT-06-354, F6 to H8);
- diversion of Footpath Ashley 8/2, up to 30m south of its current alignment for 100m, to continue onto the diverted Footpath Ashley 8/1 with no change in journey length (see Volume 2: MA06 Map Book, map CT-06-354, F6 to H6);
- diversion of a section of Footpath Ashley 6/4, up to 30m south of its current alignment for 30m, to continue onto the diverted Footpath Ashley 8/1 and diverted Footpath Ashley 8/2. The journey length will decrease by 30m (see Volume 2: MA06 Map Book, map CT-06-354, F6);
- diversion of Footpath Ashley 8/1, up to 60m south of its current alignment for 320m, to continue onto the diverted Footpath Ashley 8/2 to the west and New PRoW to the east. The change in journey length will be negligible (see Volume 2: MA06 Map Book, map CT-06-354, F6 to I6);
- Ashley Road auto-transformer station, 85m by 26m in area, to the south of the route of the Proposed Scheme, including signalling equipment and a railway telecommunications mast up to 20m in height. Access will be provided via an access road from the diverted Ashley Road. Landscape mitigation planting surrounding Ashley Road auto-transformer station will provide visual screening for users of the PRoW network and help integrate the Proposed Scheme into the surrounding landscape (see Volume 2: MA06 Map Book, map CT-06-354, F6);
- New PRoW, 730m in length between Ashley Road and the diverted Ashley Road, crossing the route of the Proposed Scheme underneath Mid-Cheshire (Railway) and Mobberley Road viaduct (see Volume 2: MA06 Map Book, map CT-06-354, G2 to H7);
- diversion of a section of Footpath Ashley 6/5, up to 440m east of its current alignment for 1.3km, to join the New PRoW and crossing the route of the Proposed Scheme underneath Mid-Cheshire (Railway) and Mobberley Road viaduct, increasing journey length by 921m (see Volume 2: MA06 Map Book, map CT-06-354, F2 to H5);
- three ecological mitigation ponds within an area of grassland habitat creation, located to the south of the route of the Proposed Scheme, to provide replacement habitat for great crested newt (see Volume 2: MA06 Map Book, map CT-06-354, H6);

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- two ecological mitigation ponds located west of the Mid-Cheshire Line, to provide replacement habitat for great crested newt (see Volume 2: MA06 Map Book, CT-06-354, I6 to I7);
- an area of wetland habitat creation located between the diverted Ashley Road and Mid-Cheshire Line, 50m west of Mobberley Road offline overbridge, to provide interconnectivity between wetland habitats (see Volume 2: MA06 Map Book, CT-06-354, H8 to I6);
- realignment of Mobberley Road, up to 142m east of its current alignment for 824m, with associated landscape mitigation planting to provide visual screening for users of the PRoW network and Lower House Farm and help integrate the Proposed Scheme into the existing landscape. The realigned Mobberley Road will cross over the Mid-Cheshire Line via Mobberley Road offline overbridge. The change in journey length will be negligible (see Volume 2: MA06 Map Book, map CT-06-354, I4 to J9);
- Mobberley Road offline overbridge, 110m in length, up to 7m above ground level and 6m above track level, to carry the realigned Mobberley Road over the Mid-Cheshire Line (see Volume 2: MA06 Map Book, map CT-06-354, I7);
- to accommodate the realignment of Mobberley Road, diversion of the following watercourses will reconnect floodplain and provide interconnectivity between wetland habitats:
  - diversion of a section of Tributary of Birkin Brook 1 for 910m to the north and south of the realigned Mobberley Road (see Volume 2: MA06 Map Book, map CT-06-354, I8 to J6, and map CT-06-355, A7 to A9);
  - diversion of Tributary of Birkin Brook 2 for 20m to the south of the realigned Mobberley Road (see Volume 2: MA06 Map Book, map CT-06-354, I7 to J6); and
  - diversion of Tributary of Birkin Brook 3 for 45m to the south-east of the realigned Mobberley Road (see Volume 2: MA06 Map Book, map CT-06-354, J6, and map CT-06-355, A6);
- a balancing pond for highway drainage, located 200m north-east of Arden Lodge. Access will be provided via the realigned Mobberley Road (see Volume 2: MA06 Map Book, map CT-06-354, H8 to I9);
- Mobberley Road offline culvert, 10m south of Mid-Cheshire (Railway) and Mobberley Road viaduct, to convey an unnamed watercourse under an access track (See Volume 2: MA06 Map Book, map CT-06-354, I6);
- Ashley Road offline east culvert, 250m south of Mid-Cheshire (Railway) and Mobberley Road viaduct, to convey a section of Tributary of Birkin Brook 1 under the diverted Ashley Road (see Volume 2: MA06 Map Book, map CT-06-354, H8);
- a balancing pond for highway drainage, 200m south of Mid-Cheshire (Railway) and Mobberley Road viaduct. Access will be provided via the diverted Ashley Road (see Volume 2: MA06 Map Book, map CT-06-354, H8 to I7);
- Mid-Cheshire (railway) and Mobberley Road viaduct, 266m in length and up to 9m in height above existing ground level, to carry the route of the Proposed Scheme over the

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Mid-Cheshire Line and the realigned Mobberley Road (see Volume 2: MA06 Map Book, map CT-06-354, H6 to J5);

- five ecological mitigation ponds within an area of grassland habitat creation, located east of the realigned Mobberley Road and west of the Mid-Cheshire Line, to provide replacement habitat for great crested newt (see Volume 2: MA06 Map Book, map CT-06-354, I9 to J9);
- an area of woodland habitat creation located 150m south of Mobberley Road offline overbridge, to provide replacement habitat and improve habitat connectivity (see Volume 2: MA06 Map Book, map CT-06-354, I8 to J9);
- three ecological mitigation ponds within an area of grassland habitat creation, located south of Mobberley Road offline overbridge and west of the Mid-Cheshire Line, to provide replacement habitat for great crested newt (see Volume 2: MA06 Map Book, map CT-06-354, I8 to J8);
- an area of wetland habitat creation, located along the eastern edge of the Mid-Cheshire Line and south of the realigned Mobberley Road, to provide replacement habitat to reconnect tributaries of Birkin Brook with the floodplain (see Volume 2: MA06 Map Book, map-CT-06-354, I6 to J8);
- a balancing pond for railway drainage, 30m south of Mid-Cheshire (Railway) and Mobberley Road viaduct within an area of grassland habitat creation to provide replacement habitat. Access will be provided via an access road from the realigned Mobberley Road (see Volume 2: MA06 Map Book, map CT-06-354, I6);
- five ecological mitigation ponds within an area of grassland habitat creation, located immediately north of Mid-Cheshire (Railway) and Mobberley Road viaduct and west of the realigned Mobberley Road, to provide replacement habitat for great crested newt (see Volume 2: MA06 Map Book, map CT-06-354, I4 to I5);
- an area of woodland habitat creation, located 150m east of Arden Lodge, to provide replacement habitat and improve habitat connectivity (see Volume 2: MA06 Map Book, map CT-06-354, I10 to J10, and map CT-06-354-R1, H2 to J3);
- an area of landscape mitigation planting, located 125m north-east of Mobberley Road offline overbridge, to provide visual screening for Lower House Farm and help integrate the Proposed Scheme into the existing landscape (see Volume 2: MA06 Map Book, map CT-06-354, J6);
- a balancing pond for highway drainage, located 20m south of Thorns Green embankment. Access will be provided via an access track from the realigned Mobberley Road (see Volume 2: MA06 Map Book, map CT-06-354, J6);
- realignment of Tributary of Birkin Brook 2 for 30m to the south of Thorns Green Embankment (see Volume 2: MA06 Map Book, map CT-06-355, A6 to A7);
- Thorns Green embankment, 725m in length and up to 8m in height, with landscape mitigation planting to provide visual screening for properties in Ashley and users of Footpath Ashley 20/1 and help integrate the Proposed Scheme into the surrounding landscape (see Volume 2: MA06 Map Book, map CT-06-354, J5, and map CT-06-355, A5 to D7);

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- landscape earthworks, up to 6m in height, on the northern side of Thorns Green embankment. The landscape earthworks will provide visual screening for properties in Ashley and on Back Lane and Castle Mill Lane, and will help integrate the Proposed Scheme into the surrounding landscape (see Volume 2: MA06 Map Book, map CT-06-355, A5 to D7);
- three ecological mitigation ponds within an area of grassland habitat creation, located north of the route of the Proposed Scheme and east of the realigned Mobberley Road, to provide replacement habitat for great crested newt (see Volume 2: MA06 Map Book, map CT-06-354, I4 to J5, and map CT-06-355, A4 to B6);
- diversion of a section of Footpath Ashley 20/1, up to 15m west of its current alignment to join the realigned Mobberley Road. The change in journey length will be negligible (see Volume 2: MA06 Map Book, map CT-06-354, I4);
- three ecological mitigation ponds within an area of grassland habitat creation located south of Thorns Green embankment, to provide replacement habitat for great crested newt (see Volume 2: MA06 Map Book, map CT-06-354, J5 to J6, and map CT-06-355, A6 to B7);
- a balancing pond for railway drainage, located 20m south of Thorns Green embankment and 250m north of Lower House Farm, access will be provided via an access road from the realigned Mobberley Road (see Volume 2: MA06 Map Book, map CT-06-355, A7 to B7);
- an area of woodland habitat creation along the southern side of Thorns Green embankment to provide replacement habitat (see Volume 2: MA06 Map Book, map CT-06-355, B6 to D9);
- diversion of existing access for Back Lane Farm, up to 32m east of its current alignment for 375m, crossing the route of the Proposed Scheme on Back Lane Farm accommodation overbridge. The change in journey length will be negligible (see Volume 2: MA06 Map Book, map CT-06-355, D5 to D8);
- Back Lane Farm accommodation overbridge, 61m in length, up to 13m above ground level and 9m above track level, with associated landscape mitigation planting to provide visual screening for properties in Ashley and Back Lane Farm and help integrate the Proposed Scheme into the surrounding landscape (see Volume 2: MA06 Map Book, map CT-06-355, D6 to D8);
- an ecological mitigation pond located 50m east of Back Lane Farm accommodation overbridge, to provide replacement pond habitat (see Volume 2: MA06 Map Book, map CT-06-355, D6 to D7); and
- permanent diversion or decommissioning of minor utilities within this section, including Scottish Power and Openreach underground cables and overhead lines, United Utilities potable water mains and Cadent Gas low-pressure gas main (located within the area shown on Volume 2: MA06 Map Book, map CT-06-354 to map CT-06-355).

## Thorns Green cutting to M56 East tunnel

- 2.2.20 The route of the Proposed Scheme will continue from Thorns Green embankment into Thorns Green cutting before passing onto River Bollin south embankment. It will then continue onto River Bollin east viaduct and River Bollin north embankment, into Ringway cutting and M56 East tunnel.
- 2.2.21 Key features of this 1.9km section will be:
- Thorns Green cutting, 1km in length, up to 8m in depth and 76m in width, with associated landscape earthworks, up to 2m in height, and landscape mitigation planting to the north to provide visual screening for users of Footpath Ashley 10/1, properties in Ashley, Thorns Green, and on Castle Mill Lane and help integrate the route of the Proposed Scheme into the existing landscape (see Volume 2: MA06 Map Book, map CT-06-355, D7 to I6);
  - an area of woodland habitat creation along the southern side of Thorns Green cutting to provide replacement habitat (see Volume 2: MA06 Map Book, map CT-06-355, D7 to I6);
  - five ecological mitigation ponds within an area of grassland habitat creation, located 320m east of Back Lane Farm accommodation overbridge, to provide replacement habitat for great crested newt (see Volume 2: MA06 Map Book, map CT-06-355, E7 to G8);
  - closure of Brickhill Lane where it crosses the route of the Proposed Scheme. Users will be diverted along Back Lane, realigned Castle Mill Lane, and diverted section of Brickhill Lane increasing the journey length by 856m (see Volume 2: MA06 Map Book, map CT-06-355, G6);
  - diversion of a section of Brickhill Lane, up to 360m east of its current alignment for 454m. Users will be diverted onto the realigned Castle Mill Lane before crossing the route of the Proposed Scheme on Castle Mill Lane overbridge, increasing the journey length by 856m (see Volume 2: MA06 Map Book, map CT-06-355, G6 to I7);
  - earthworks, up to 3m in height, with landscape mitigation planting, located north of the diverted Brickhill Lane and south of Thorns Green cutting, and to help integrate the Proposed Scheme into the existing landscape (see Volume 2: MA06 Map Book, map CT-06-355, G7 to H7);
  - an ecological mitigation pond, located south of the diverted Brickhill Lane and 190m south-west of Castle Mill Lane telecommunications site, to provide replacement pond habitat (see Volume 2: MA06 Map Book, map CT-06-355, G7 to H7);
  - a balancing pond for highway drainage, 230m north-west of Castle Mill Lane overbridge. Access will be provided via Castle Mill Lane (see Volume 2: MA06 Map Book, map CT-06-355, H5);
  - Castle Mill Lane telecommunications site, 49m by 24m in area, to the south of the route of the Proposed Scheme, including a railway telecommunications mast up to 20m in height, with associated landscape mitigation planting to help integrate the route of the Proposed Scheme into the existing landscape. Access will be provided via an access track

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from the diverted Brickhill Lane (see Volume 2: MA06 Map Book, map CT-06-355, H6 to I7);

- realignment of Castle Mill Lane, up to 50m north of its current alignment for 440m, crossing the route of the Proposed Scheme on Castle Mill Lane overbridge, increasing the journey length by 215m (see Volume 2: MA06 Map Book, map CT-06-355, H5 to I7);
- Castle Mill Lane overbridge, 61m in length, up to 3m above ground level and 10m above track level (see Volume 2: MA06 Map Book, map CT-06-355, I6);
- diversion of a section of Footpath Ashley 10/1, up to 75m north-west of its current alignment for 300m, increasing the journey length by 114m (see Volume 2: MA06 Map Book, map CT-06-355, I5 to J5 and map CT-06-356, A3 to A4);
- an area of woodland habitat creation along the southern side of Thorns Green cutting, 50m east of Castle Mill Lane overbridge, to provide replacement habitat (see Volume 2: MA06 Map Book, map CT-06-355, I6 to J7);
- River Bollin South embankment, 94m in length and up to 6m in height, with associated landscape earthworks and mitigation planting to the north to provide visual screening for users of Footpath Ashley 10/1 and Footpath Ringway 14, Thorns Green Farm, and to help integrate the Proposed Scheme into the existing landscape (see Volume 2: MA06 Map Book, map CT-06-355, I5 to J6 and map CT-06-356, A4 to B5);
- a balancing pond for railway drainage, within an area of woodland habitat creation, 30m south-east of River Bollin South embankment. Access will be provided via an access road from the realigned Castle Mill Lane (see Volume 2: MA06 Map Book, map CT-06-355, I6 to J7, map CT-06-356, A5 to B6);
- River Bollin East viaduct, 100m in length and up to 13m in height to carry the route of the Proposed Scheme over the River Bollin (see Volume 2: MA06 Map Book, map CT-06-356, A5 to B5);
- replacement floodplain storage area on the northern side of the route of the Proposed Scheme in the River Bollin catchment area, 100m north of River Bollin East viaduct (see Volume 2: MA06 Map Book, map CT-06-356, B4 to B5);
- realignment of Footpath Ringway 12, up to 55m east of its current alignment for 415m, increasing the journey length by 142m (see Volume 2: MA06 Map Book, map CT-06-356, B4 to C5);
- a balancing pond for railway drainage within an area of woodland habitat creation, 90m north-west of River Bollin East viaduct. Access will be provided via an access road from the realigned Sunbank Lane (see Volume 2: MA06 Map Book, map CT-06-356, B4);
- eight ecological mitigation ponds within an area of grassland habitat creation, located along the north-west side of River Bollin North embankment and Ringway cutting, to provide replacement habitat for great crested newt (see Volume 2: MA06 Map Book, map CT-06-356, B2 to D5);
- three areas of woodland habitat creation, located 220m north-west of River Bollin East viaduct, along the eastern side of River Bollin North embankment and Ringway cutting,

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and along the north-west side of Ringway cutting, to provide replacement habitat and habitat connectivity (see Volume 2: MA06 Map Book, map CT-06-356, B2 to D6);

- River Bollin North embankment, 66m in length and up to 10m in height (see Volume 2: MA06 Map Book, map CT-06-356, B5);
- Ringway cutting, 430m in length, up to 11m in depth and 98m in width, with associated landscape earthworks, 2m in height, including mitigation planting on the south-eastern side to provide visual screening for visitors to Sunbank Wood, residents of properties in Hale Bank and along Sunbank Lane, and help integrate the Proposed Scheme into the existing landscape (see Volume 2: MA06 Map Book, map CT-06-356, B5 to E6);
- a balancing pond for highway drainage, 125m south of Sunbank Lane overbridge. Access will be provided from the realigned Sunbank Lane (see Volume 2: MA06 Map Book, map CT-06-356, C6 to C7);
- realignment of Sunbank Lane, up to 20m west of its current alignment for 316m, crossing the route of the Proposed Scheme on Sunbank Lane overbridge. The change in journey length will be negligible (see Volume 2: MA06 Map Book, map CT-06-356, C7 to D5);
- Sunbank Lane overbridge, 70m in length, up to 4m above ground level and 10m above track level, with associated landscape mitigation planting to help integrate the route of the Proposed Scheme into the existing landscape (see Volume 2: MA06 Map Book, map CT-06-356, C5 to C6);
- a balancing pond for highway drainage, 110m north-west of Sunbank Lane overbridge. Access will be provided via an access road from the realigned Sunbank Lane (see Volume 2: MA06 Map Book, map CT-06-356, C4 to C5);
- diversion of a section of Footpath Ringway 11, up to 230m south-east of its current alignment for 450m, increasing journey length by 303m (see Volume 2: MA06 Map Book, map CT-06-356, C6 to E6);
- M56 cutting retaining walls, 66m in length, all of which will be below ground level, located to the north-west and south-east of the route of the Proposed Scheme, 250m north-east of Sunbank Lane overbridge (see Volume 2: MA06 Map Book, map CT-06-356, D5 to E6);
- M56 East tunnel, 133m in length and up to 15m in depth (see Volume 2: MA06 Map Book, map CT-06-356, E6);
- an area of woodland habitat creation to the east and west of M56 East tunnel, to provide replacement habitat (see Volume 2: MA06 Map Book, map CT-06-356, D5 to F7);
- permanent diversion of an underground United Utilities 110mm water main, for 1.4km in length, along Sunbank Lane (located within the area shown on Volume 2: MA06 Map Book, maps CT-06-356); and
- permanent diversion of minor utilities within this section, including Scottish Power and Openreach underground cables and overhead lines and a Cadent Gas low-pressure gas main (located within the area shown on Volume 2: MA06 Map Book, maps CT-06-355 to CT-06-356).

## Manchester Airport High Speed station and approaches

- 2.2.22 The route of the Proposed Scheme will continue from M56 East tunnel into Manchester Airport High Speed station cutting, which will be 2.1km in length, up to 13m in depth and 106m in width (see Volume 2: MA06 Map Book, map CT-06-356, E5 to J5 and map CT-06-357a, A6 to G6). There will be retaining walls along the cutting, as follows:
- Manchester Airport High Speed station cutting retaining wall south, 86m in length, all of which will be below ground level, located to the north-west and south-east of the route of the Proposed Scheme, adjacent to the north side of the M56 (see Volume 2: MA06 Map Book, map CT-06-356, E5 to F6); and
  - Manchester Airport High Speed station cutting retaining wall north, 1.8km in length, all of which will be below ground level, running along the western and eastern side of the route of the Proposed Scheme (see Volume 2: MA06 Map Book, map CT-06-356, G6 to J5 and map CT-06-357a, A6 to G6).
- 2.2.23 There will be landscape earthworks, with associated landscape mitigation planting, to the west of Manchester Airport High Speed station cutting to provide visual screening for residents of properties in Warburton Green and to the east of the cutting to provide visual screening for residents of properties along Sunbank Lane, and to help integrate the route of the Proposed Scheme into the surrounding landscape (see Volume 2: MA06 Map Book, map CT-06-356, E7 to H6).
- 2.2.24 The route of the Proposed Scheme will enter Manchester Airport High Speed station. Manchester Airport High Speed station will be a new intermodal station located west of the M56, between junctions 5 and 6, and north of the A538 Hale Road.
- 2.2.25 The station will include:
- a central concourse, up to 11m above existing ground level, for interchange and access to waiting areas, passenger information and ticketing facilities;
  - a roof and canopy structure, up to 228m in length, 98m in width, and 30m above existing ground level, spanning the length of the central concourse and provision for a Metrolink station;
  - two island platforms, up to 415m in length and 3m below existing ground level, providing four platform faces to accommodate HS2 services and future NPR services;
  - a western forecourt, including provision for public transport (buses and taxis), with access from Manchester Airport High Speed station access road (west);
  - an eastern forecourt, including provision for private motorised vehicular drop-offs and pick-ups, with access from Manchester Airport High Speed station access road (east);
  - two multi-storey car parks located south-west and south-east of the central concourse;
  - a new pedestrian and cycle route to the west of the station;



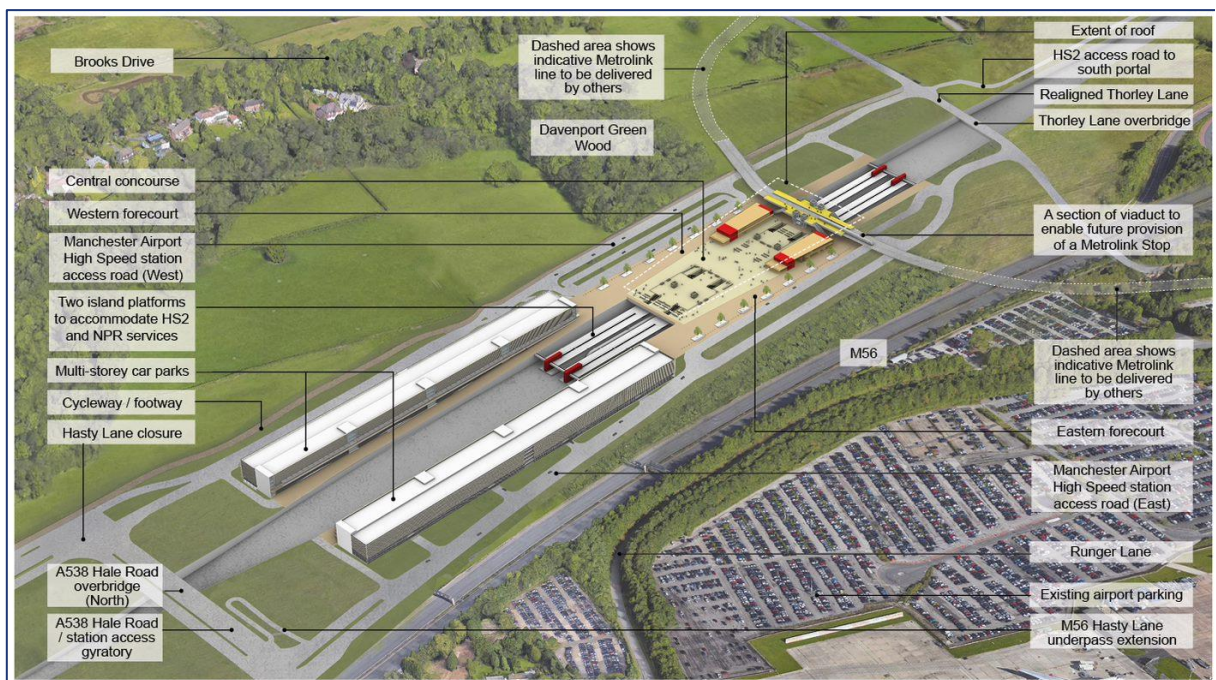
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- a section of viaduct, 216m in length and up to 15m above existing ground level, to enable future provision of a Metrolink station. The section of viaduct will be constructed as part of the Proposed Scheme. Approaches to the viaduct from the west and east will not be constructed as part of the Proposed Scheme;
- a cycle parking area;
- utility diversions (including water main, electricity and telecommunications cables); and
- public realm.

2.2.26 The route of the Proposed Scheme will continue from M56 East tunnel into Manchester Airport High Speed station cutting before entering Manchester tunnel south portal in the Davenport Green to Ardwick area (MA07).

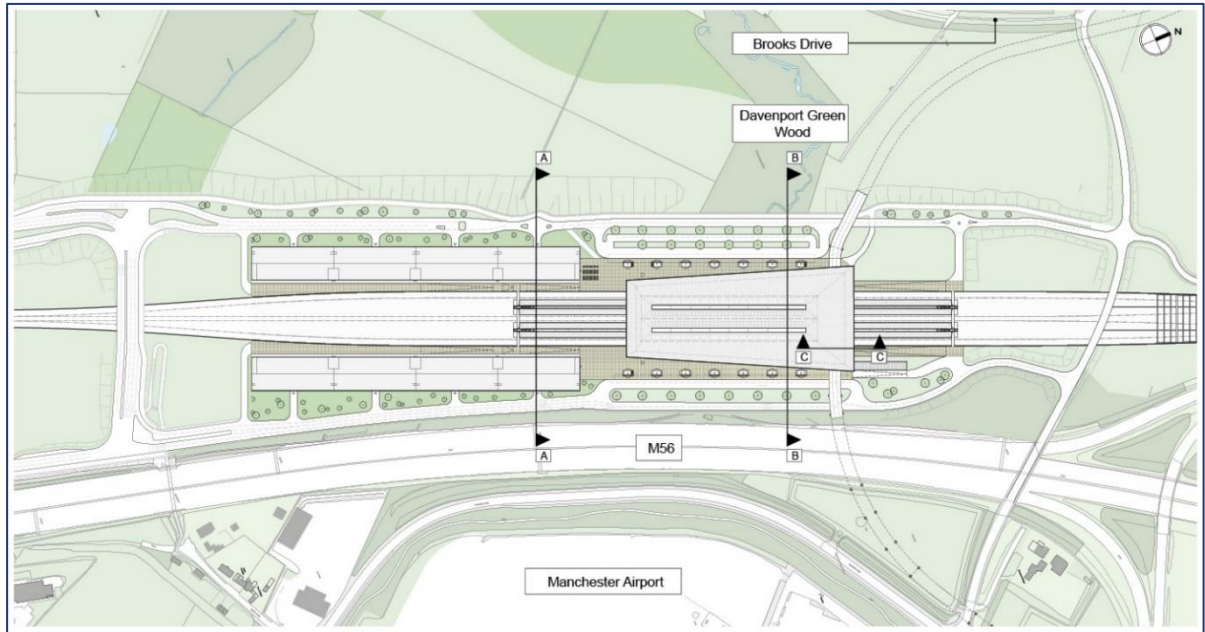
2.2.27 Illustrative aerial visualisations and elevational cross sections of Manchester Airport High Speed station are shown in Figure 4 to Figure 8.

**Figure 4: Manchester Airport High Speed station visualisation looking north**

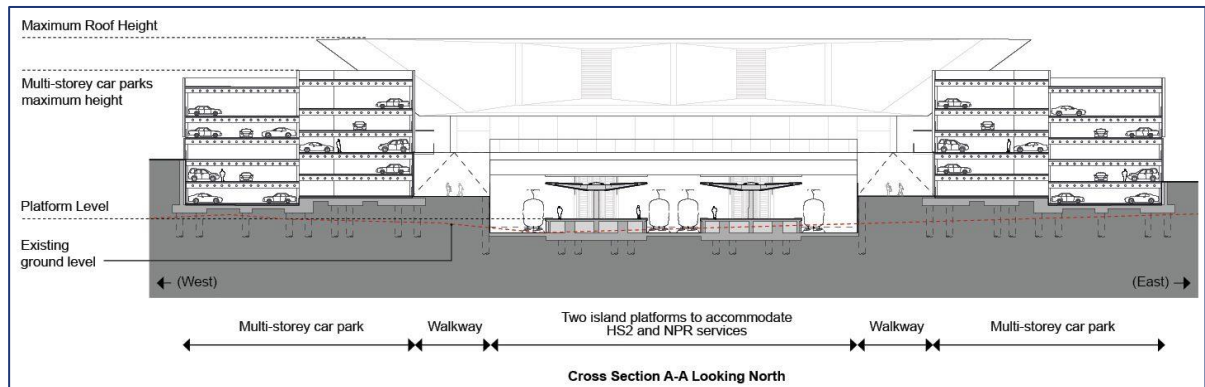


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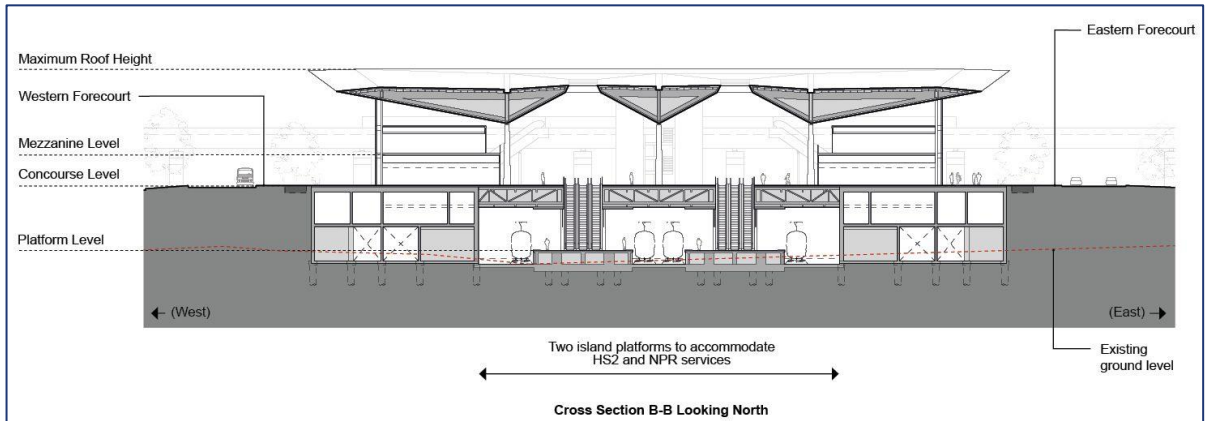
**Figure 5: Manchester Airport High Speed station**



**Figure 6: Manchester Airport High Speed station (Cross Section A-A)**

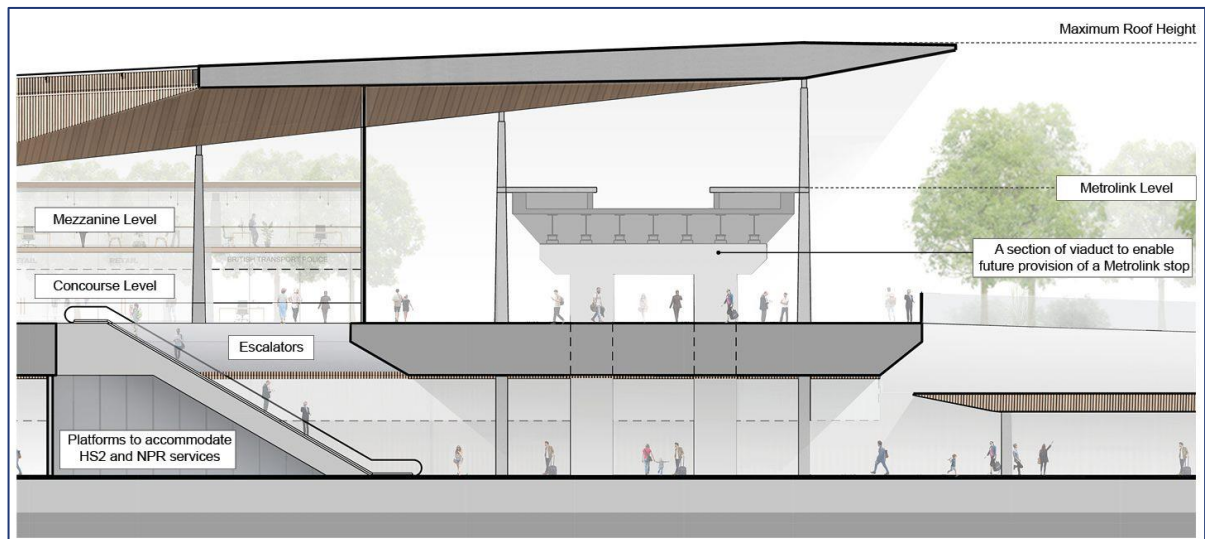


**Figure 7: Manchester Airport High Speed station (Cross Section B-B)**



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**Figure 8: Manchester Airport High Speed station (Cross Section C-C)**



- 2.2.28 The Manchester Airport High Speed station building will have forecourts to the east and west leading to a central concourse area. The central concourse will have the following levels:
- the ground level concourse area will provide access to the main ticket hall and will include waiting areas and lounges, passenger information, ticketing facilities, retail units and public conveniences;
  - the mezzanine level will provide access to offices and welfare facilities for railway/station staff;
  - the platform level will provide access to the platforms, station maintenance facilities and plant rooms for heating and ventilation equipment, electricity substations, information technology and telecommunications equipment; and
  - the Metrolink level will provide access to future Metrolink services. Provision will be made for escalators and lifts to access the Metrolink level from the central concourse.
- 2.2.29 Access to and from each level within the central concourse will be via escalators and lifts, with facilities for step-free access to each level. Emergency accesses to and from the central concourse and platforms will be provided.
- 2.2.30 The western forecourt will include 33 taxi queuing bays, four taxi pick-up bays, eight taxi drop-off bays, four bus bays, one airport shuttle bus bay, and 300 bicycle bays. The eastern forecourt will include provision for private motorised vehicular drop-offs and pick-ups, including 25 car pick-up bays and 12 car drop-off bays.
- 2.2.31 The two multi-storey car parks will provide up to 3,752 car spaces, 21 private hire car bays, and 40 staff parking bays. Stairs and lifts will provide access to a sheltered public walkway, which will link the multi-storey car parks with the central concourse.
- 2.2.32 The Manchester Airport High Speed station access road (west) will provide access to the western forecourt and multi-storey car park located 50m south-west of the central

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concourse. Access to the Manchester Airport High Speed station access road (west) from the realigned A538 Hale Road will include private motor vehicles and public transport. Access from the realigned Thorley Lane will be limited to public transport and emergency vehicles only.

- 2.2.33 The Manchester Airport High Speed station access road (east) will provide access to the eastern forecourt and multi-storey car park located 50m south of the central concourse. Vehicular movements turning onto Manchester Airport High Speed station access road (east) from the realigned A538 Hale Road will include private motor vehicles and public transport. Vehicular movements turning onto Manchester Airport High Speed station access road (east) from the realigned Thorley Lane will be limited to public transport and emergency vehicles only.
- 2.2.34 A pedestrian and cycle route will be provided to the west of the station and will run parallel to Manchester Airport High Speed station access road (west), connecting the realigned A538 Hale Road to the realigned Thorley Lane.
- 2.2.35 There will be four main areas of new public realm around the station to allow for cycle and pedestrian movements in all directions:
- the eastern forecourt;
  - the western forecourt;
  - the pedestrian walkways between the multi-storey car parks and the central concourse; and
  - the pedestrian and cycle route.
- 2.2.36 Rainwater from the station building roofs and facades will be collected and channelled via a series of gutters and rainwater pipes to a below ground drainage network. Rainwater will be channelled through a rainwater harvesting tank, to enable its re-use in the station, where possible. Drainage collected from the internal road network and car parking areas will be passed through pollution control systems, including rain gardens<sup>5</sup>, before discharging into existing watercourses, including Timperley Brook and Tributary of Timperley Brook 1.
- 2.2.37 Foul water drainage will be provided and flows from the station will discharge to a pumping station located to the south of the station building.
- 2.2.38 The following changes to the existing road network will form the A538 Hale Road/Station Access gyratory, which will provide access to and accommodate Manchester Airport High Speed station:
- realignment of the A538 Hale Road, 285m north-east of its current alignment for 725m. Eastbound traffic will cross the route of the Proposed Scheme via A538 Hale Road overbridge (north), up to 11m above existing ground and 10m above track level. This will

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<sup>5</sup> Rain gardens are areas of planting located in shallow depressions. They are designed to reduce the flow rate, increase infiltration and improve the water quality of runoff from impermeable areas such as roofs, roads and car parking.

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increase the journey length by 370m. Westbound traffic will cross the route of the Proposed Scheme via A538 Hale Road overbridge (south), up to 5m above existing ground level and 9m above track level with no change in journey length. The A538 Hale Road service road (south) will be provided to maintain access to residential properties (see Volume 2: MA06 Map Book, map CT-06-356, H4 to I6);

- closure of a section of Hasty Lane to the west of the Proposed Scheme, 135m north-west of A538 Hale Road overbridge (south). The A538 Hale Road service road (north) will be provided to maintain access to residential properties (see Volume 2: MA06 Map Book, map CT-06-356, H4 to J6);
- M56/A538 Wilmslow Road offline underbridge, 49m in length with a height clearance of 7m, crossing underneath the M56 (see Volume 2: MA06 Map Book, map CT-06-356, H7);
- A538 Wilmslow Road offline retaining wall, 108m in length, all of which will be below ground level, located along the northern side of the A538 Wilmslow Road, 50m east of M56/A538 Wilmslow Road offline underbridge (see Volume 2: MA06 Map Book, map CT-06-356, H7 to H8);
- the junction of the realigned A538 Hale Road, M56 junction 6 northbound slip roads, and A538 Wilmslow Road will be changed from a roundabout to a signalised crossroad. Landscape mitigation planting will help integrate the Proposed Scheme into the existing landscape (see Volume 2: MA06 Map Book, map CT-06-356, G6 to I7);
- the junction of the A538 Wilmslow Road, the M56 junction 6 southbound slip roads and Runger Lane will be changed from a roundabout to a signalised crossroad. Landscape mitigation will help integrate the Proposed Scheme into the existing landscape (see Volume 2: MA06 Map Book, map CT-06-356, G7 to I10);
- realignment of Thorley Lane, 55m to the south of its current alignment for 456m, crossing the route of the Proposed Scheme on Thorley Lane overbridge. The change in journey length will be negligible (see Volume 2: MA06 Map Book, map CT-06-357a, E4 to E7); and
- Thorley Lane overbridge, 55m in length, up to 4m above ground level and 9m above track level (see Volume 2: MA06 Map Book, map CT-06-357, E6).

2.2.39 The following changes to the PRoW network will also be required to accommodate Manchester Airport High Speed station:

- M56 Hasty Lane underpass extension, 25m in length and 3m in width, to maintain non-motorised user access between Hasty Lane and Manchester Airport High Speed station (see Volume 2: MA06 Map Book, map CT-06-356, J6);
- M56/A538 Wilmslow Road offline non-motorised user underpass, 66m in length and 6m in width (see Volume 2: MA06 Map Book, map CT-06-356, H7);
- diversion of Footpath Ringway 9, up to 150m north-west of its current alignment for 375m, users will connect into the realigned A538 Hale Road, increasing the journey length by 43m (see Volume 2: MA06 Map Book, map CT-06-356, F4 to H5);
- closure of Footpath Ringway 7 where it crosses the Proposed Scheme. Users will be diverted along the realigned A538 Hale Road and Brooks Drive, increasing the journey

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length by 640m (see Volume 2: MA06 Map Book, map CT-06-356, J6 and map CT-06-357a, A7 to B7); and

- closure of Footpath Hale 16 where it crosses the Proposed Scheme. Users will be diverted via Brooks Drive, the realigned Thorley Lane, and the realigned A538 Hale Road, increasing journey length by 676m (see Volume 2: MA06 Map Book, map CT-06-357a, B7 to C3).

2.2.40 Additional key features in this area will include:

- a surface water pumping station for highway drainage, to the east of the route of the Proposed Scheme, 100m east of A538 Hale Road overbridge (south). Access will be provided via the realigned A538 Hale Road (see Volume 2: MA06 Map Book, map CT-06-356, H6);
- an area of woodland habitat creation 100m west of the route of the Proposed Scheme, to provide replacement habitat (see Volume 2: MA06 Map Book, map CT-06-356, I4 to J3);
- four ecological mitigation ponds with an area of woodland habitat creation 200m west of the route of the Proposed Scheme, to provide replacement habitat for great crested newt (see Volume 2: MA06 Map Book, map CT-06-356, J2 to J3, and map CT-06-357a, A3 to C4);
- Hasty Lane offline culvert, 150m east of A538 Hale Road overbridge (south), for highway drainage along the realigned A538 Hale Road and Manchester Airport High Speed station access road (east) (see Volume 2: MA06 Map Book, map CT-06-356, I6 to J6, and map CT-06-357a, A7 to C7);
- landscape earthworks, up to 11m in height, beginning 150m north-west of A538 Hale Road overbridge (north) continuing along the western side of Manchester Airport High Speed station access road (west) for 460m. The landscape earthworks will provide visual screening for residents of properties in Davenport Green, on A538 Hale Road and Brooks Drive, and help to integrate the Proposed Scheme into the existing landscape (see Volume 2: MA06 Map Book, map CT-06-356, J4 and CT-06-357a, A5 to C5);
- realignment of Timperley Brook for 330m in a west-east direction and to provide replacement habitat and replacement floodplain storage area, located to the west of Brooks Drive, partially within the Ringway Golf Club golf course (see Volume 2: MA06 Map Book, map CT-06-357a, B1 to C3);
- four ecological mitigation ponds within an area of grassland habitat creation, located 150m west of Manchester Airport High Speed station cutting, to provide replacement habitat for great crested newt (see Volume 2: MA06 Map Book, map CT-06-357a, B3 to B4);
- Davenport Green Wood offline reinforced soil retaining wall, 175m in length and up to 11m in height, all of which will be above existing ground level, located 50m west of Manchester Airport High Speed station, to limit the land required as part of the Proposed Scheme (see Volume 2: MA06 Map Book, map CT-06-357a, C5 to D5);
- to accommodate Manchester Airport High Speed station, the following works to Timperley Brook will be required:

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- realignment of Timperley Brook for 80m in a north-south direction to run parallel with Manchester Airport High Speed station access road (east) (see Volume 2: MA06 Map Book, map CT-06-357a, C7);
- Timperley Brook inverted siphon, 170m in length, located 260m south of Thorley Lane overbridge, for the realignment of Timperley Brook under Manchester Airport High Speed station (see Volume 2: MA06 Map Book, map CT-06-357a, C5 to C7); and
- realignment of Timperley Brook for 35m in an east-west direction to connect Timperley Brook inverted siphon with the existing watercourse (see Volume 2: MA06 Map Book, map CT-06-357a, C7);
- two areas of woodland habitat creation, located along the eastern and western side of the route of the Proposed Scheme from Thorley Lane overbridge to Manchester tunnel south portal (located in the Davenport Green to Ardwick area (MA07), to provide replacement habitat (see Volume 2: MA06 Map Book, map CT-06-357a, E6 to G7);
- an area of landscape mitigation planting, surrounding Manchester tunnel south portal auto-transformer station and Manchester tunnel south portal building (both located in the Davenport Green to Ardwick area (MA07)), to provide visual screening for residents of properties in Newall Green and to help integrate the Proposed Scheme into the surrounding landscape (see Volume 2: MA06 Map Book, map CT-06-357a, F6 to G6);
- permanent relocation of a mobile telephone mast, from 25m south-east of Thorley Lane overbridge, to 85m north of Thorley Lane overbridge (see Volume 2: MA06 Map Book, map CT-06-357a, E6 to F6); and
- permanent diversion and decommissioning of minor utilities within this section, including Scottish Power, Openreach and Vodafone underground cables and overhead lines, United Utilities potable water mains and a Cadent Gas low-pressure gas main (located within the area shown on Volume 2: MA06 Map Book, maps CT-06-356 to CT-06-357a).

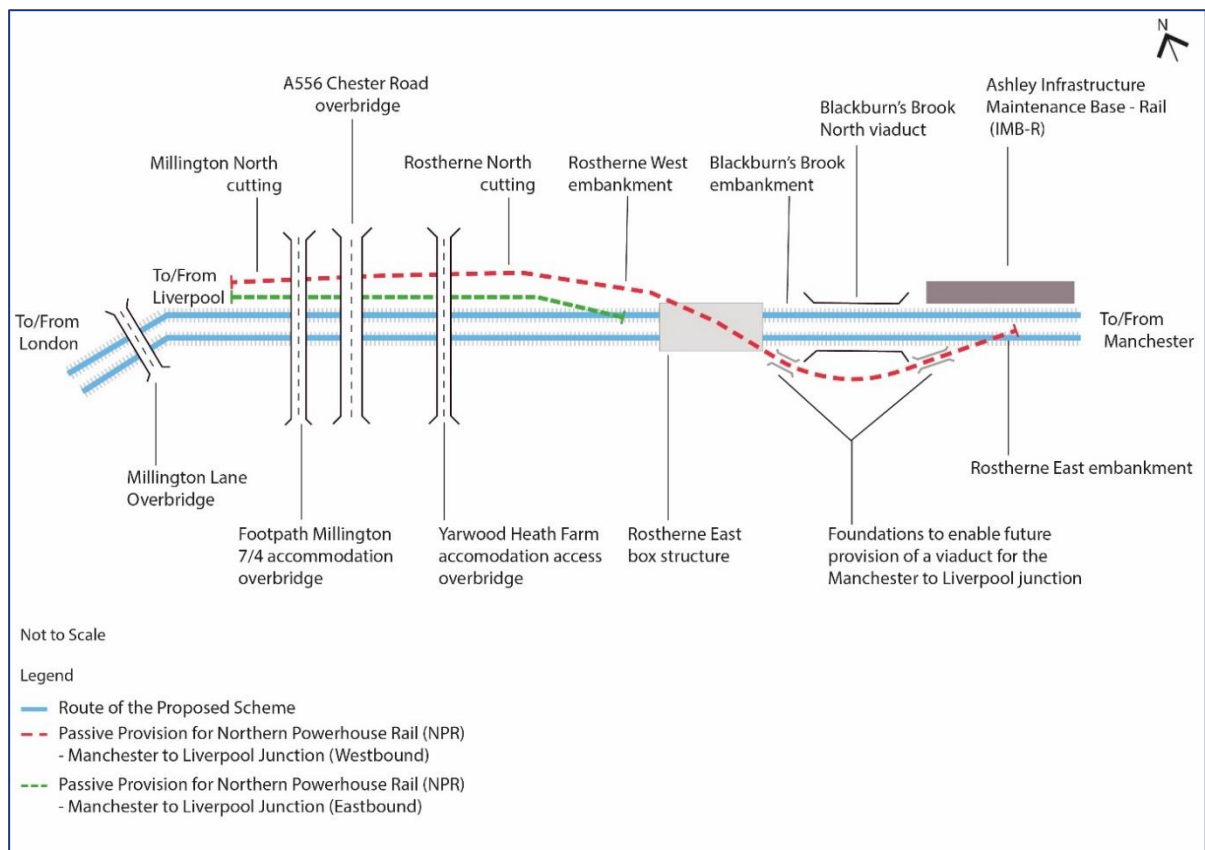
2.2.41 New and diverted utility works for Manchester Airport High Speed station will include:

- diversion of a Scottish Power transmission 11kV overhead power line, for 461m in length, following the realigned A538 Hale Road (located within the area shown on Volume 2: MA06 Map Book, maps CT-06-356 and CT-06-357a); and
- a new electricity supply from the existing Electricity North West primary distribution site located off Styal Road will be provided to the new primary substation to be located on Thorley Lane. The electricity supply will be connected by an Electricity North West 33kV below ground cable, for 3.1km in length, to provide permanent electricity supply to Manchester Airport High Speed station and Manchester South tunnel portal (located in the Davenport Green to Ardwick area (MA07) (located within the area shown on Volume 2: MA06 Map Book, maps CT-06-357a, CT-06-357a-R1, CT-06-357a-R2, and CT-06-357a-R3).

## NPR Manchester to Liverpool junction

- 2.2.42 The Proposed Scheme in the Hulseheath to Manchester Airport area will make passive provision for future connections between HS2 and NPR between Manchester and Liverpool. This provision is referred to as NPR Manchester to Liverpool junction.
- 2.2.43 The NPR Manchester to Liverpool junction (eastbound) provision, as shown on Figure 9, will start at Millington North cutting and merges with the route of the Proposed Scheme within Rostherne cutting, east of A556 Chester Road overbridge. The NPR Manchester to Liverpool junction (eastbound) continues in a north-westerly direction towards Manchester Airport High Speed station and Manchester Piccadilly Station.
- 2.2.44 The NPR Manchester to Liverpool junction (westbound) provision, as shown on Figure 9, will diverge from the route of the Proposed Scheme along Rostherne East embankment and terminate at Millington North cutting.

**Figure 9: Key provisions for NPR Manchester to Liverpool junction**



- 2.2.45 The NPR Manchester to Liverpool junction is illustrated on Volume 2: MA06 Map Book maps CT-06-352 to CT-06-353.
- 2.2.46 Key features of this section will include:
- Millington North cutting, 526m in length, up to 11m in depth and 82m in width, with associated landscape mitigation planting to provide visual screening for residents of



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Hope Cottage and users of Footpath Millington 7/4, and to help integrate the Proposed Scheme into the surrounding landscape (see Volume 2: MA06 Map Book, map CT-06-351, H3 to J4 and CT-06-352, C4 to F5);

- Rostherne North cutting, 456m in length, up to 6m in depth and 30m in width (see Volume 2: MA06 Map Book, map CT-06-353, A4 to C4);
- Rostherne West embankment, 730m in length and up to 12m in height, with associated woodland habitat creation to provide replacement habitat (see Volume 2: MA06 Map Book, map CT-06-353, A5 to E5);
- foundations to enable future provision of a viaduct for NPR Manchester to Liverpool junction (see Volume 2: MA06 Map Book, map CT-06-353, F5 to I5); and
- Rostherne East embankment, 252m in length and up to 10m in height, with associated landscape mitigation planting to provide visual screening for residents of Birkin Farm, users of Footpath Ashley 3/1, and visitors to Tatton Park (see Volume 2: MA06 Map Book, map CT-06-353, I5 to J6 and map CT-06-354, A5 to C6).

## Ashley IMB-R

- 2.2.47 Ashley IMB-R will occupy approximately 4ha of land, 150m south of the M56 and 650m west of the Mid-Cheshire Line to the north of the route of the Proposed Scheme. The Ashley IMB-R will connect to the route of the Proposed Scheme via sidings on Birkin Brook embankment. Vehicular access to and from Ashley IMB-R will be provided from access roads via Ashley Road, adjacent to Stock Farm.
- 2.2.48 The Ashley IMB-R will support railway infrastructure maintenance activities for the Proposed Scheme. The IMB-R will not be in continuous use and will be a smaller, satellite facility to the main maintenance facilities at Stone IMB-R (which forms part of the HS2 Phase 2a scheme<sup>6</sup>) and Crewe North rolling stock depot (RSD) in the Wimboldsley to Lostock Gralam area (MA02). Operation of Ashley IMB-R is described in Section 2.4.
- 2.2.49 The Ashley IMB-R will be a permanent facility extending 1km in length, on top of Birkin Brook embankment, adjacent to the route of the Proposed Scheme. The Ashley IMB-R will be located at the same level above ground as the route of the Proposed Scheme. The Ashley IMB-R will be 36m in width at its widest point.
- 2.2.50 The Ashley IMB-R is illustrated on Volume 2: MA06 Map Book maps CT-06-353 and CT-06-354.

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<sup>6</sup> HS2 Ltd (2017), *High Speed Rail (West Midlands – Crewe), Environmental Statement, Volume 2: Community Area Report, CA3: Stone and Swynnerton*. Available online at: [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/627565/E15\\_CA3\\_Stone\\_and\\_Swynnerton\\_WEB\\_final.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/627565/E15_CA3_Stone_and_Swynnerton_WEB_final.pdf).

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- 2.2.51 Key features associated with Ashley IMB-R will include:
- two sidings, 360m and 180m in length, which will diverge from the route of the Proposed Scheme on Birkin Brook embankment, 100m west of Stock Farm. Trains will use these sidings to enter and exit Ashley IMB-R;
  - an open storage area, 100m by 10m;
  - office and welfare facilities, which will be used during periods of maintenance works;
  - 10 parking spaces for cars and long-wheelbase maintenance vehicles;
  - a headshunt, 360m in length, which comprises a length of track to release trains in the direction in which they originated, as well as allowing trains to change tracks and direction;
  - an area of woodland habitat creation 20m north of Ashley IMB-R, to provide replacement habitat (see Volume 2: MA06 Map Book, map CT-06-353, J3 to J4, and map CT-06-354, A4 to B5); and
  - landscape earthworks, 2m in height, with associated landscape mitigation planting, beginning 470m north-west of Birkin Farm and continuing along the northern side of Ashley IMB-R. The landscape earthworks and mitigation planting will provide visual screening to residents of properties within Ashley and help integrate the Proposed Scheme into the existing landscape (see Volume 2: MA06 Map Book, map CT-06-354, B5 to E5).
- 2.2.52 There will be maintenance access routes and utility works within this section, which may include works to low voltage overhead or underground lines, gas pipes, sewers and telecommunication cables.

## Demolitions

- 2.2.53 As set out in Volume 1, as the design develops, it is likely that not all the properties identified for demolition would need to be demolished, for example where not all of the land is required for permanent works.
- 2.2.54 The following have been identified for demolition: 24 residential properties, eight commercial/business properties (including farm outbuildings) and five other structures. These will be needed for construction of the permanent features or, in some cases, to enable the construction works for the Proposed Scheme. Demolitions will be managed from the same construction compounds as the permanent features with which they are associated. The identified demolitions are listed in Section 2.3 under the relevant construction compounds.

## 2.3 Construction of the Proposed Scheme

- 2.3.1 This section describes the key construction activities that are envisaged to be needed to build the Proposed Scheme in the Hulseheath to Manchester Airport area. It includes:
- an overview of the construction process;
  - a description of the advance works;
  - a description of the engineering works to build the Proposed Scheme;
  - information on construction waste and material resources;
  - a description of how the Proposed Scheme will be commissioned;
  - an indicative construction programme; and
  - monitoring arrangements during the construction period.
- 2.3.2 The construction arrangements described in this section provide the basis for the assessment presented in this ES.
- 2.3.3 Land used only for construction purposes will be restored as agreed with the owner of the land and the relevant planning authority once construction works on that land are complete.
- 2.3.4 Land will be required permanently for the key features of the Proposed Scheme described in Section 2.2.
- 2.3.5 During the construction phase, public roads and PRoW routes will remain open for public use wherever reasonably practicable. Where such routes cross the Proposed Scheme and require diversion, the alternative road or PRoW crossing the Proposed Scheme will be constructed prior to any closure of existing roads or PRoW, wherever reasonably practicable. Where they cross the Proposed Scheme in proximity to their existing alignment, a temporary alternative alignment may be required. In some instances, diverted or realigned roads or PRoW may need to pass through areas required for construction of the Proposed Scheme. Routes through these areas will be identified by the nominated undertaker and provided where it is safe and reasonably practicable to do so. The routes through these areas may change over the duration of the construction period.
- 2.3.6 Volume 1, Section 5 and Section 6 provide details of the permanent features of the Proposed Scheme and typical construction techniques. For the purposes of the environmental assessment, standard construction techniques as described in Section 6 of Volume 1 have been assumed.

### Code of Construction Practice

- 2.3.7 All contractors will be required to comply with a Code of Construction Practice (CoCP). In addition, Local Environmental Management Plans (LEMPs) will be produced for each local authority area. The CoCP and LEMPs will be the means of controlling the construction works associated with the Proposed Scheme, and set out monitoring requirements, with the objective of ensuring that the effects of the works on people and the natural environment

are reduced as far as reasonably practicable. The CoCP will contain generic control measures and standards to be implemented throughout the construction process. The LEMPs will set out how the project will adapt and deliver the required environmental and community protection measures within each area through the implementation of specific measures required to control dust and other emissions from activities in the area.

- 2.3.8 In addition, HS2 Ltd has produced a Community Engagement Framework<sup>7</sup> which sets out how HS2 Ltd and its contractors, as well as their sub-contractors, will undertake community engagement during the construction of the HS2 project. The framework is being implemented on Phase One of HS2 and will apply to all phases of HS2.
- 2.3.9 The objectives of the framework include:
- to set out how HS2 Ltd and its contractors will undertake community engagement during the construction of the project;
  - to provide clarity and reassurance to HS2 Ltd's stakeholders about how community engagement activity will be managed; and
  - to help HS2 Ltd be a good neighbour to local communities, including by providing accurate and timely information about construction works and offering opportunities to influence them, where appropriate.
- 2.3.10 A draft CoCP has been prepared (see Volume 5: Appendix CT-002-00000). It will remain a draft document through the parliamentary process and the CoCP will be finalised at Royal Assent. The CoCP sets out measures to be implemented by the nominated undertaker.

## Overview of the construction process

- 2.3.11 Building and preparing the Proposed Scheme for operation will comprise the following general stages:
- advance works including: site investigations further to those already undertaken; preliminary mitigation works; preliminary enabling works;
  - civil engineering works including: establishment of construction compounds; site haul routes, site preparation and enabling works; main earthworks and structure works; foundations for and construction of depots/stations buildings; site restoration; removal of construction compounds where the compound is not required for railway installation works; and associated utility diversions;
  - railway installation works including: establishment of construction compounds; infrastructure installation; connections to utilities; changes to the existing rail network; site restoration; and removal of construction compounds;
  - site finalisation works; and
  - systems testing and commissioning.

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<sup>7</sup> High Speed Two Ltd (2017), *Community Engagement Framework*. Available online at: [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/625971/hs2\\_community\\_engagement\\_framework.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/625971/hs2_community_engagement_framework.pdf).

- 2.3.12 General information about the construction process is set out in more detail in Volume 1, Section 6, and the draft CoCP (see Volume 5: Appendix CT-002-00000) including:
- the approach to environmental management during construction and the role of the CoCP (Section 2);
  - working hours (Section 5);
  - management of construction traffic (Section 14); and
  - handling of construction materials (Section 15).

## Advance works

- 2.3.13 General information about advance works can be found in Volume 1, Section 6. Advance works will be required before the main construction works commence and typically include:
- further detailed site investigations and surveys for proposed construction compounds;
  - further detailed environmental surveys;
  - advance mitigation works including, where appropriate, contamination remediation, habitat creation and translocation, landscape planting and built heritage survey and investigation;
  - advance site access works;
  - site establishment with temporary fence construction;
  - removal of vegetation, and stripping and storing of soil; and
  - utility diversions and new utility connections for facilities associated with the Proposed Scheme.

## Engineering works

### Introduction

- 2.3.14 Construction of the Proposed Scheme will require the following broad types of engineering works in the Hulseheath to Manchester Airport area, and within land adjacent to the route:
- civil engineering works, including earthworks such as embankments and cuttings, construction of bridges, viaducts, an IMB-R, a station and works to public roads;
  - works to the conventional railway; and
  - works to install, test and commission railway systems, including track, overhead line equipment, communications and signalling equipment and traction power supply.
- 2.3.15 The construction of track and railway systems works will include the installation of track form, rails, infill material, minor drainage works, and installation of electrification, signalling and communication equipment.
- 2.3.16 The construction of the Proposed Scheme will be divided into sections, each of which will be managed from compounds. The compounds will act as the main interface between the

construction work sites and the public highway, as well as performing other functions as described below. Compounds will either be main compounds or satellite compounds. Satellite compounds are generally smaller than main compounds. Compounds will either be used for civil engineering works, for railway installation works, or for both.

## **General overview of construction compounds**

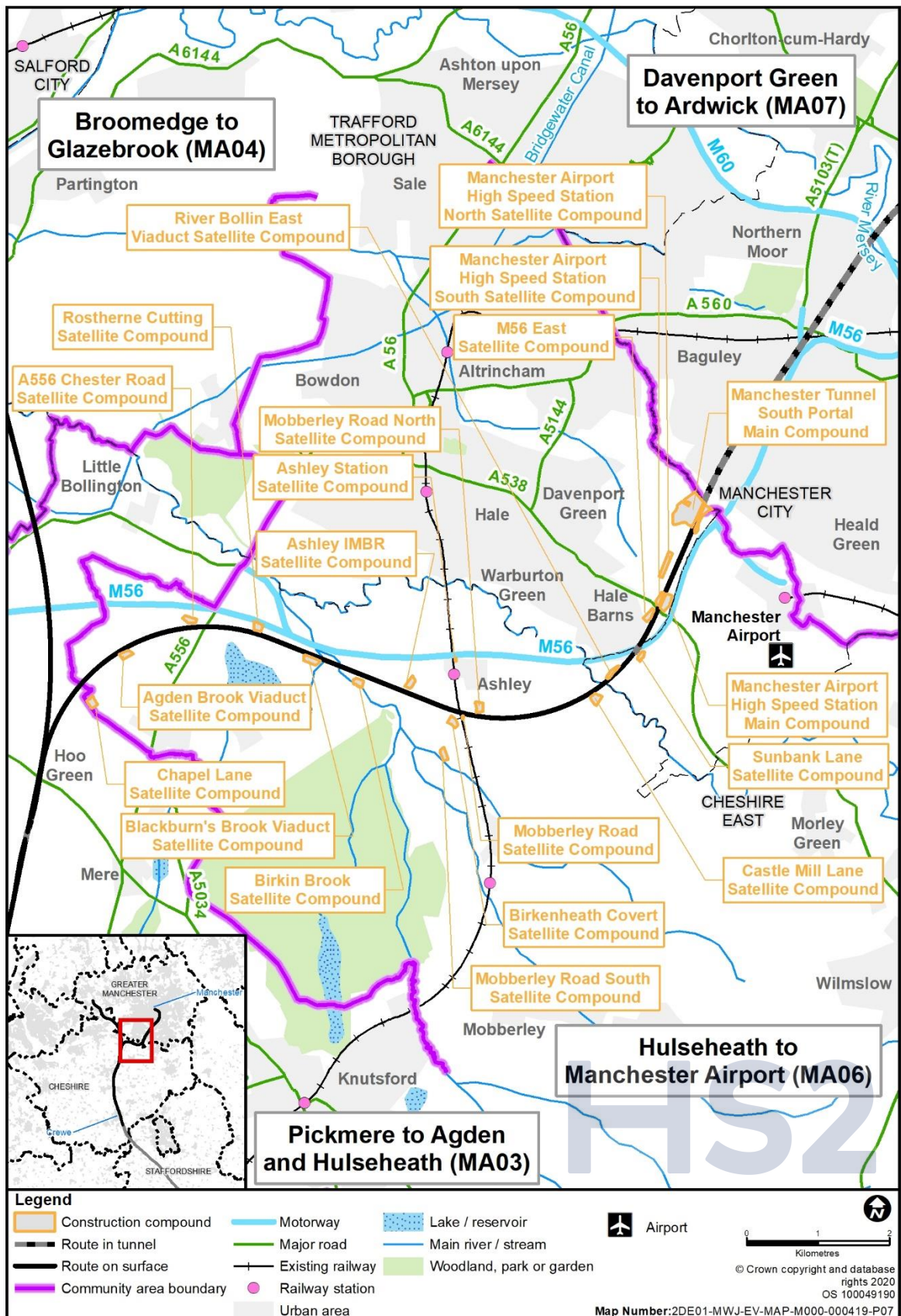
- 2.3.17 Main compounds will be used for core project management staff (i.e. engineering, planning and construction delivery) and commercial and administrative staff. These teams will directly manage some works and coordinate the works at the satellite compounds. In general, a main compound will include:
- space for the storage of bulk materials;
  - space for the receipt, storage and loading and unloading of excavated material;
  - an area for the fabrication of temporary works equipment and finished goods;
  - fuel storage;
  - plant and equipment storage including plant maintenance facilities; and
  - office space for management staff, limited car parking for staff and site operatives, and welfare facilities.
- 2.3.18 Satellite compounds will be used to manage specific works along a section of the route. Depending on the nature and extent of the works to be managed, these satellite compounds could include office accommodation for staff, local storage for plant and materials, car parking for staff and site operatives, and welfare facilities.
- 2.3.19 Two main civil engineering compounds, the Manchester Airport High Speed station main compound and the Manchester tunnel south portal main compound, will be located in the Hulseheath to Manchester Airport area.
- 2.3.20 Sixteen civil engineering satellite compounds will be located in the Hulseheath to Manchester Airport area. The Manchester Airport High Speed station main compound will manage four civil engineering satellite compounds. The remaining 12 satellite compounds for civil engineering works will be managed from the A50 Warrington Road main compound in the Pickmere to Agden and Hulseheath area (MA03) (see Volume 2, Community Area report: Pickmere to Agden and Hulseheath area (MA03)). The Manchester tunnel south portal main compound will manage two civil engineering satellite compounds located in the Davenport Green to Ardwick area (MA07) (see Volume 2, Community Area report: Davenport Green to Ardwick area (MA07)).
- 2.3.21 Two compounds in the Hulseheath to Manchester Airport area will also be used to install railway systems after the civil engineering works have been completed. The railway systems compounds will be managed from the Manchester Airport High Speed station main compound and the A50 Warrington Road main compound (located in the Pickmere to Agden and Hulseheath area (MA03)). In addition, there will be a further two additional satellite compounds used for railway system works only.

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- 2.3.22 The Ashley railhead will be located 300m south of Ashley in the Hulseheath to Manchester Airport area (see Volume 2: MA06 Map Book, map CT-05-353, CT-05-354, CT-05-354-R1, CT-05-355-R1, CT-05-355-R2). This temporary railhead will be used to receive and stockpile materials, by rail, required for the construction of the railway tracks, signals, and electrification systems for the Proposed Scheme.
- 2.3.23 The location of construction compounds in the Hulseheath to Manchester Airport area is shown on Figure 10. Map Series CT-05 (in the Volume 2: MA06 Map Book) show in detail the locations of the construction compounds described below.
- 2.3.24 A number of utility diversions will be required. For the purpose of this assessment, it is assumed that utility diversions in this area will be managed from the compounds listed below.

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**Figure 10: Location of construction compounds in the Hulseheath to Manchester Airport area**





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- 2.3.25 Figure 11 shows the management relationship for civil engineering works compounds and Figure 12 for the railway installation works. Details of the works associated with individual compounds are provided in subsequent sections of this report.
- 2.3.26 Soil stripped as part of the works, prior to it being used when the land is reinstated, will be stored for the duration of construction. The location of topsoil storage areas will generally be adjacent to compounds and areas of construction activity. These areas are referred to as material stockpiles are shown on maps CT-05-351 to CT-05-357a, in the Volume 2: MA06 Map Book.
- 2.3.27 Some areas will include transfer nodes. Transfer nodes are additional areas of land required to unload, store and load bulk earthworks materials that are moved to and from the site on public highways. These areas will allow material to be transferred between road vehicles and site vehicles during construction to balance traffic movements on the road network. The transfer nodes within the Hulseheath to Manchester Airport area are shown on maps CT-05-352, CT-05-353, CT-05-354, CT-05-354-R1, CT-05-356, CT-05-357a in the Volume 2: MA06 Map Book.
- 2.3.28 Further information on the function of compounds is provided in Section 6 of Volume 1 and Section 5 of the draft CoCP. This includes general provisions for the operation of compounds, such as security fencing, lighting, utilities supply, site drainage and codes of worker behaviour.

## **Construction traffic routes, site haul routes and transfer nodes**

- 2.3.29 The Ashley railhead will connect with the existing railway network for the movement of excavated materials by rail. This will reduce the volume of construction vehicles using the public road network.
- 2.3.30 Construction vehicles, where loaded, will carry materials, plant, other equipment and the workforce. Vehicle movements will take place on public roads, within construction compounds and transfer nodes and between the compounds or transfer nodes and working areas. Where reasonably practicable, movements between the construction compounds or transfer nodes and the working areas will be on designated haul routes within the construction site, often along the line of the route of the Proposed Scheme or running parallel to it.
- 2.3.31 The construction compounds, transfer nodes, and railheads will provide the interface between the construction works and the public road or railway network. The likely road routes to access compounds in the Hulseheath to Manchester Airport area are described in subsequent sections of this report.

## **Use of borrow pits**

- 2.3.32 The Proposed Scheme will require material with suitable engineering properties for the construction of a high-speed railway. This is described as acceptable engineering material and will be provided, in part, through excavation of cuttings and other earthworks undertaken to construct the Proposed Scheme. A borrow pit is an area where additional acceptable engineering material will be extracted for use in the construction of the Proposed Scheme.
- 2.3.33 Volume 5: Appendix CT-008-00000 Borrow Pit report sets out the need for and approach to identifying suitable borrow pit locations, as well as the use and restoration strategy for the proposed borrow pits. General information on borrow pits is also provided in Volume 1, Section 6.
- 2.3.34 The borrow pits required for construction of the Proposed Scheme are all located in the Wimboldsley to Lostock Gralam area (MA02). Material from these borrow pits may be used in the construction of earthworks in other areas. Material excavated from tunnels, cuttings and other earthworks as part of the construction of the Proposed Scheme may be used to backfill or restore the borrow pits. This material will, where reasonably practicable, be transported via site haul routes. However, some of the material may be provided from more distant locations across the Proposed Scheme. As such it may be necessary to transport some of this material along public roads.

## **Construction compounds**

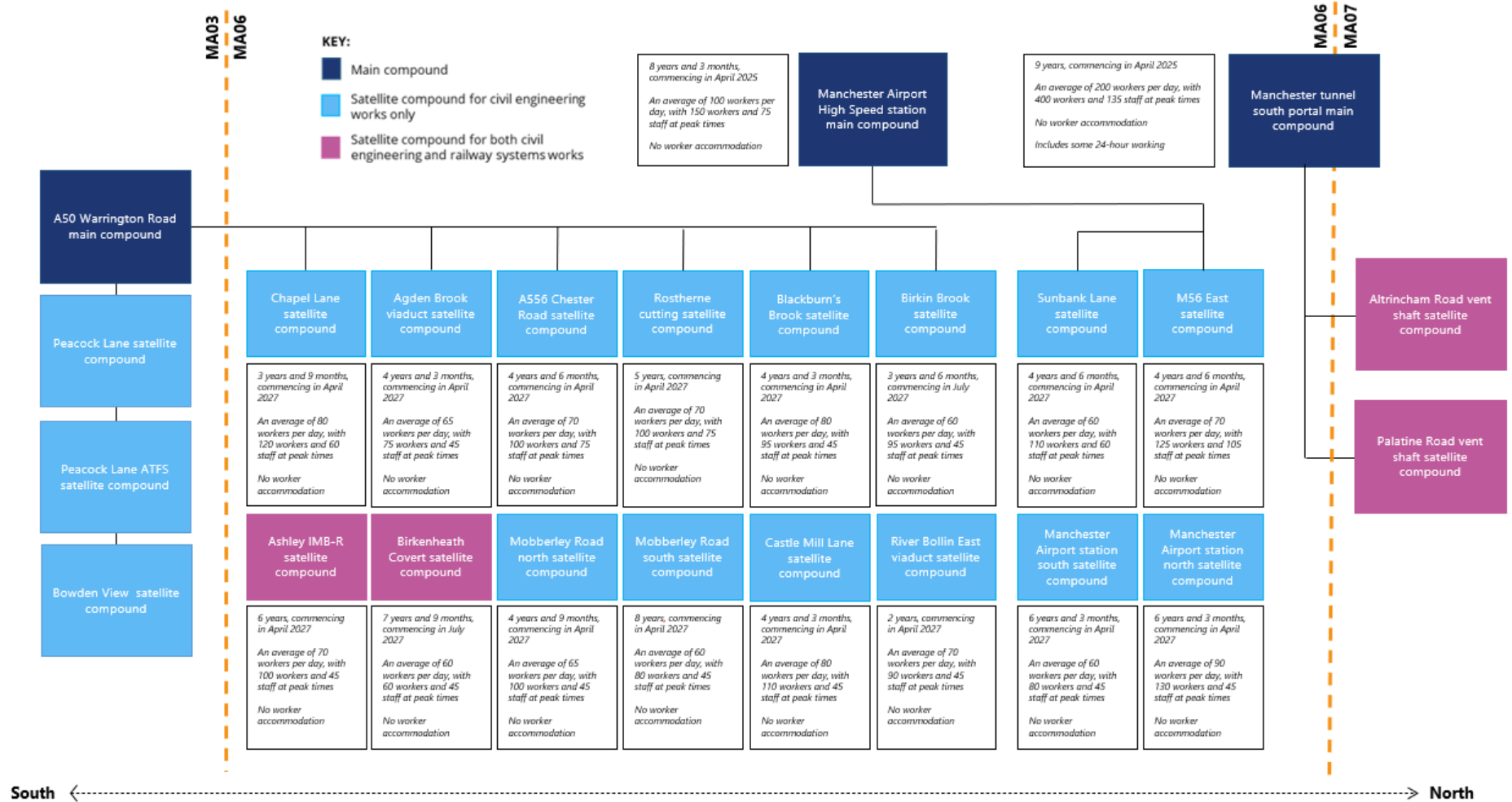
- 2.3.35 This section provides a summary of the works to be managed from the construction compounds in the Hulseheath to Manchester Airport area, as illustrated in Figure 11 and Figure 12. All dates and durations of activities and number of workers are indicative. All compounds will undertake initial site set-up works, and at the end of its use, finalisation works including site reinstatement, landscaping and planting (as necessary).

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**Figure 11: Construction compounds for civil engineering works**

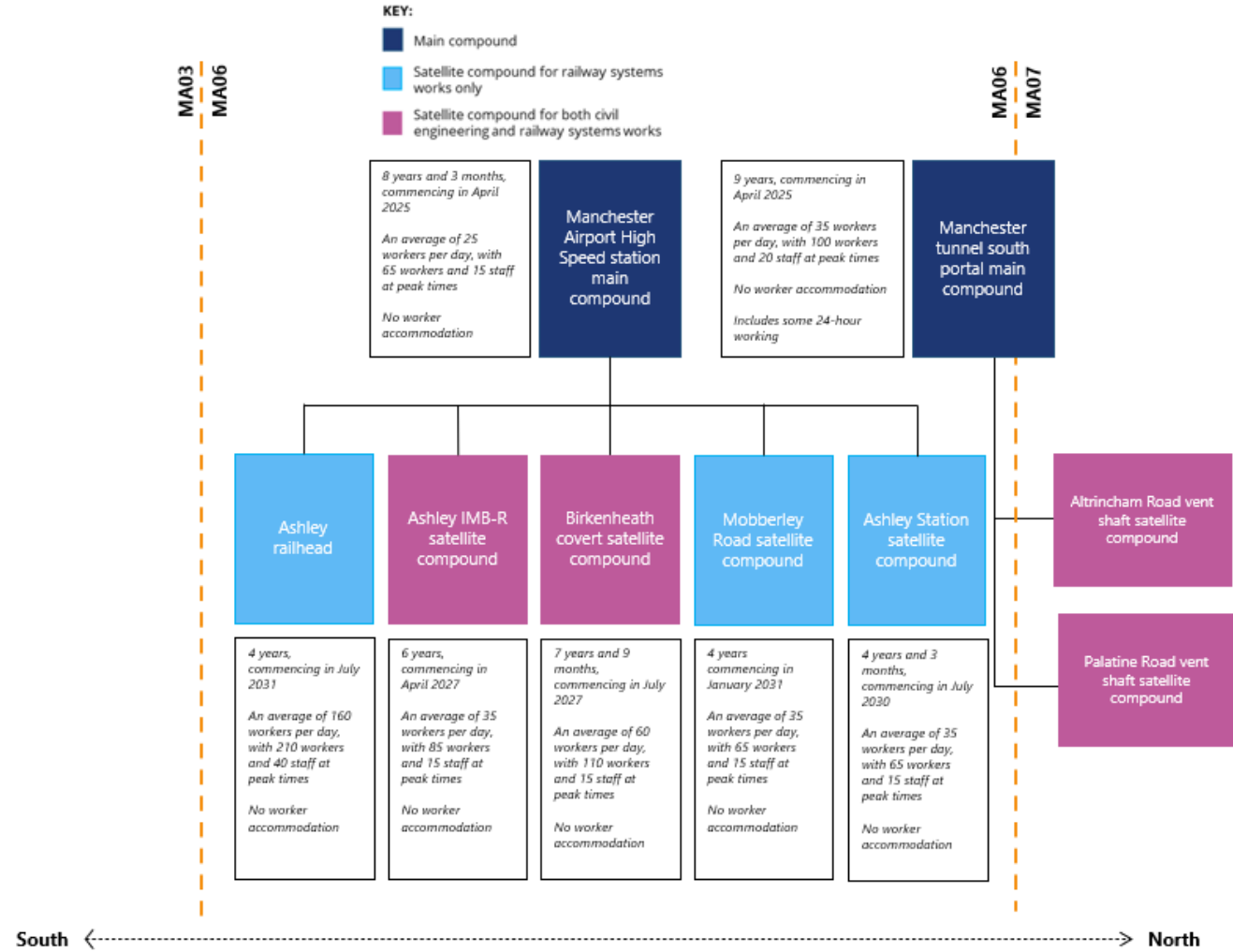


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**Figure 12: Construction compounds for railway systems works**



## **Peacock Lane satellite compound**

- 2.3.36 This compound will be located within the Pickmere to Agden and Hulseheath area (MA03). It is described in Volume 2, Community Area report: Pickmere to Agden and Hulseheath (MA03). The compound will be used to manage the construction of Millington Clough offline underbridge, which will take two years to complete.
- 2.3.37 No demolitions in the Hulseheath to Manchester Airport area will be required as a result of the works to be managed from this compound.

## **Peacock Lane ATFS satellite compound**

- 2.3.38 This compound will be located within the Pickmere to Agden and Hulseheath area (MA03). It is described in Volume 2, Community Area report: Pickmere to Agden and Hulseheath (MA03). The compound, along with Agden Brook viaduct satellite compound, will be used to manage the construction of Agden Brook viaduct, within the Hulseheath to Manchester Airport area.
- 2.3.39 The construction of Agden Brook viaduct will take two years and three months to complete.
- 2.3.40 No demolitions in the Hulseheath to Manchester Airport area will be required as a result of the works to be managed from this compound.

## **Bowden View satellite compound**

- 2.3.41 This compound will be located within the Pickmere to Agden and Hulseheath area (MA03). It is described in Volume 2, Community Area report: Pickmere to Agden and Hulseheath (MA03). The compound will be used to manage the construction of Hulseheath North embankment within the Hulseheath to Manchester Airport area.
- 2.3.42 The construction of Hulseheath North embankment will take one year and nine months to complete.
- 2.3.43 No demolitions in the Hulseheath to Manchester Airport area will be required as a result of the works to be managed from this compound.

## **Chapel Lane satellite compound**

- 2.3.44 This compound will be used to manage civil engineering works (see Volume 2: MA06 Map Book, map CT-05-351-R1, C2 to D3). It will:
- provide eight temporary material stockpiles (located in the Pickmere to Agden and Hulseheath area (MA03)) immediately to the north-west and south-east of the Proposed Scheme (see Volume 2: MA06 Map Book, map CT-05-351-R1, A6 to B1); and
  - be accessed via Chapel Lane and the A556 temporary slip roads.
- 2.3.45 No demolitions will be required as a result of the works to be managed from this compound.

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- 2.3.46 The compound will be used to manage the construction of Millington Clough underbridge, which will take two years and six months to complete.
- 2.3.47 This compound will manage the construction of temporary slip roads leading from the A556 onto Chapel Lane, which will take six months to complete. The slip roads will provide access to Peacock Lane satellite compound, Peacock Lane ATFS satellite compound, and Agden Lane satellite compound (all within the Pickmere to Agden and Hulseheath area (MA03)), and Chapel Lane satellite compound for four years and six months.
- 2.3.48 The works to be managed from this compound will require the temporary diversion of Footpath Millington 2/1 for a period of two years and eight months, with users diverted south-east of Chapel Lane satellite compound, increasing journey length by 359m. On completion of construction, Footpath Millington 2/1 will be permanently reinstated along its existing alignment.

### **Agden Brook viaduct satellite compound**

- 2.3.49 This compound will be used to manage civil engineering works (see Volume 2: MA06 Map Book, map CT-05-351, F6 to G6). It will:
- provide three temporary material stockpiles immediately to the north-west and south-west of the Proposed Scheme (see Volume 2: MA06 Map Book, map CT-05-351); and
  - be accessed via Millington Lane, south-east of the Proposed Scheme.
- 2.3.50 No demolitions will be required as a result of the works to be managed from this compound.
- 2.3.51 This compound, along with Peacock Lane ATFS satellite compound (located in the Pickmere to Agden and Hulseheath area (MA03)), will be used to manage the construction of Agden Brook viaduct, which will take two years and three months to complete.
- 2.3.52 This compound will be used to manage the construction of Millington Lane overbridge, which will take two years and nine months to complete.
- 2.3.53 This compound will be used to manage the permanent realignment of Millington Lane, which will take two years and nine months to complete. These works will require the temporary closure of Millington Lane for a period of one year and nine months, with users diverted along Peacock Lane and the B5569 Chester Road, increasing the journey length by 4km.
- 2.3.54 The works to be managed from the compound will require the following works to PRow:
- temporary realignment of Footpath Millington 4/1, 40m north-east of its existing alignment for 296m, for a period of two years and one month, increasing journey length by 76m. On completion of construction, Footpath Millington 4/1 will be permanently reinstated along its existing alignment; and
  - permanent closure of Footpath Millington 5/2. During construction, users will be temporarily diverted via Footpath Millington 4/1 and Boothbank Lane, increasing journey

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length by 489m. On completion of construction, users will be permanently diverted along Footpath Millington 4/1 and diverted Footpath Millington 3/1.

- 2.3.55 The compound will be used to manage the construction of Millington Lane telecommunications site. The construction of Millington Lane telecommunications site foundations will take six months to complete. The installation of Millington Lane telecommunications site railways systems equipment will take six months to complete.

## **A556 Chester Road satellite compound**

- 2.3.56 This compound will be used to manage civil engineering works (see Volume 2: MA06 Map Book, map CT-05-352, F5 to G3). It will:
- provide seven temporary materials stockpiles to the north and south of the Proposed Scheme (see Volume 2: MA06 Map Book, map CT-05-352);
  - provide a transfer node to the north of the compound accessed from the A556 and via site haul routes (see Volume 2: MA06 Map Book, map CT-05-352); and
  - be accessed via site haul routes north of the Proposed Scheme, connecting to the A556.
- 2.3.57 The works to be managed from this compound will require demolition of the buildings identified in Table 1.

**Table 1: Demolitions required as a result of the works to be managed from A556 Chester Road satellite compound**

<b>Type</b>	<b>Description</b>	<b>Location</b>	<b>Feature resulting in the demolition</b>
Commercial	Four commercial units comprising three two storey buildings and two single storey buildings on Cherry Tree Lane	Cherry Tree Lane, Rostherne	Millington cutting

- 2.3.58 The compound will be used to manage the construction of the following bridges:
- Footpath Millington 7/4 accommodation overbridge, which will take two years and three months to complete; and
  - A556 Chester Road overbridge, which will take two years and nine months to complete. Construction of A556 Chester Road overbridge will require the temporary realignment of the northbound carriageway of the A556 for a period of one year and seven months. The realigned carriageway will be constructed offline, 25m north-west of the existing alignment for 400m. On completion of construction, the A556 will be permanently reinstated along its existing alignment.
- 2.3.59 This compound will also be used to manage the construction of Millington cutting, which will take four years and three months to complete.
- 2.3.60 The works to be managed from this compound will require the following works to PRow:
- temporary diversion of Footpath Millington 7/4. Users will be diverted via an alternate route along Footpath Millington 6/1 and Footpath Millington 8/1, for a period of two

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years until completion of construction of Footpath Millington 7/4 overbridge. On completion of construction, Footpath Millington 7/4 will be permanently diverted; and

- permanent closure of Footpath Millington 8/1 upon completion of construction of Footpath Millington 7/4 overbridge. Users will be diverted along Footpath Millington 6/2 and Footpath Millington 7/4.

2.3.61 The works to be managed from this compound will involve the following works to utilities:

- permanent diversion of an underground United Utilities 400mm water main, which will take six months to complete; and
- permanent diversion of an underground United Utilities 315mm water main, which will take six months to complete.

## Rostherne cutting satellite compound

2.3.62 This compound will be used to manage civil engineering works (shown on Volume 2: MA06 Map Book, map CT-05-353, B4 to D4). It will:

- provide four temporary materials stockpiles to the north and south of the Proposed Scheme (see Volume 2: MA06 Map Book, map CT-05-352 and map CT-05-353);
- provide a transfer node to the east of the compound accessed from Yarwoodheath Lane and via site haul routes (as shown on Volume 2: MA06 Map Book, map CT-05-352, A4 to D4); and
- be accessed via site haul routes north of the Proposed Scheme, connecting to Cherry Tree Lane and Yarwoodheath Lane (via the M56 temporary overbridge).

2.3.63 The works to be managed from this compound will require demolition of the buildings identified in Table 2.

**Table 2: Demolitions required as a result of the works to be managed from Rostherne cutting satellite compound**

Type	Description	Location	Feature resulting in the demolition
Residential	Three properties on Yarwoodheath Lane	Yarwoodheath Lane, Rostherne	Rostherne cutting
Residential	Two properties on Lamb Lane	Lamb Lane, Ashley	Ashley embankment
Commercial	One commercial business comprising three single storey buildings and three steel framed barns on Yarwoodheath Lane	Yarwoodheath Lane, Rostherne	Rostherne cutting

2.3.64 This compound will be used to manage the construction of Yarwood Heath Farm accommodation overbridge and realigned Yarwood Heath Farm access, which will take one year and nine months to complete. During construction of the overbridge and realigned access, Yarwoodheath Lane will be temporarily closed for one year. Road users travelling from Cherry Tree Lane to Yarwood Heath Farm will be diverted along Cherry Tree Lane, the B5569 Chester Road, the A50 Warrington Road and the A556, increasing journey length by 9.6km. Road users travelling from Yarwood Heath Farm to Cherry Tree Lane will be diverted



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along the A556, the B5569 Chester Road and Cherry Tree Lane, increasing journey length by 3.3km. On completion of construction, Yarwoodheath Lane will be reopened along its existing alignment.

- 2.3.65 The compound will be used to manage the construction of a temporary overbridge over the M56, located 250m south of Yarwood Heath Farm. Construction of the temporary overbridge will not interfere with the operation of the M56. The temporary overbridge will be used by construction traffic travelling between Rostherne cutting satellite compound and Yarwoodheath Lane north of the M56.
- 2.3.66 The compound will also be used to manage the construction of the following earthworks:
- Millington North cutting, which will take three years and six months to complete;
  - Rostherne cutting, which will take three years and six months to complete;
  - Rostherne North cutting, which will take three years and six months to complete;
  - Rostherne West embankment, which will take one year and nine months to complete;
  - Birkin Brook embankment, which will take two years to complete;
  - Ashley embankment, which will take two years to complete; and
  - Rostherne East embankment, which will take three years to complete.
- 2.3.67 The compound will also be used to manage the construction of the following retaining walls:
- Rostherne cutting retaining wall west, which will take one year and nine months to complete; and
  - Rostherne cutting retaining wall east, which will take three years to complete.
- 2.3.68 The works to be managed from this compound will require the temporary closure of Footpath Rostherne 13/1 for three years until Yarwood Heath Farm accommodation overbridge has been constructed. On completion of construction, Footpath Rostherne 13/1 will be permanently reinstated along its existing alignment.
- 2.3.69 The compound will be used to manage the construction of Tom Lane telecommunications site. The construction of Tom Lane telecommunications site foundations will take six months to complete. The installation of Tom Lane telecommunications site railways systems equipment will take six months to complete.

## **Blackburn's Brook satellite compound**

- 2.3.70 This compound will be used to manage civil engineering works (see Volume 2: MA06 Map Book, map CT-05-353, F5 to G6). It will:
- provide three temporary material stockpiles to the south of the Proposed Scheme (see Volume 2: MA06 Map Book, map CT-05-353); and
  - be accessed via site haul routes south of the Proposed Scheme, connecting to Cherry Tree Lane during civil engineering works and railway systems works.
- 2.3.71 No demolitions will be required as a result of the works to be managed from this compound.

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- 2.3.72 This compound, along with Birkin Brook satellite compound, will be used to manage the construction of Blackburn's Brook North viaduct, which will take two years and six months to complete.
- 2.3.73 This compound will be used to manage the construction of Rostherne East box structure, which will take two years to complete.
- 2.3.74 This compound will be used to manage the construction of Blackburn's Brook embankment, which will take two years to complete.
- 2.3.75 The works to be managed from this compound will require the temporary diversion of Footpath Rostherne 5/1 for a period of one year and nine months, with users diverted 200m east of the current alignment for 470m, increasing the journey length by 244m. On completion of construction, Footpath Rostherne 5/1 will be permanently realigned.

### **Birkin Brook satellite compound**

- 2.3.76 This compound will be used to manage civil engineering works (see Volume 2: MA06 Map Book, map CT-05-353, I5 to J6, and map CT-06-354, A5 to A6). It will:
- provide one temporary materials stockpile to the south of the Proposed Scheme (see Volume 2: MA06 Map Book, map CT-05-354); and
  - be accessed via site haul routes south of the Proposed Scheme, connecting to Ashley Road.
- 2.3.77 No demolitions will be required as a result of the works to be managed from this compound.
- 2.3.78 This compound, along with Blackburn's Brook satellite compound, will be used to manage the construction of Blackburn's Brook North viaduct, which will take two years and six months to complete.
- 2.3.79 This compound will be used to manage the construction of foundations to enable future provision of a viaduct for NPR Manchester to Liverpool junction, which will take nine months to complete.
- 2.3.80 The works to be managed from this compound will require the temporary closure of Footpath Ashley 3/1 for the duration of the construction period. On completion of construction, Footpath Ashley 3/1 will be permanently diverted.

### **Ashley IMB-R satellite compound**

- 2.3.81 This compound will be used to manage civil engineering works and rail systems works (see Volume 2: MA06 Map Book, map CT-05-354, D4 to E5). It will:
- provide two temporary material stockpiles to the north of the Proposed Scheme (see Volume 2: MA06 Map Book, map CT-05-354);
  - provide a transfer node to the west of the compound accessed from Ashley Road and via site haul routes (see Volume 2: MA06 Map Book, map CT-05-354); and
  - be accessed via Ashley Road.

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- 2.3.82 No demolitions will be required as a result of the works to be managed from this compound.
- 2.3.83 This compound will be used to manage the construction of Ashley embankment retaining wall, which will take four years and six months to complete.
- 2.3.84 This compound, along with Birkinheath Covert satellite compound, will be used to manage the construction of Ashley IMB-R, which will take one year to complete.
- 2.3.85 This compound will be used to manage the construction and installation of Ashley Road auto-transformer station, located 190m east of Stock Farm. The construction of Ashley Road auto-transformer station foundations and building will take one year to complete. The installation of Ashley Road auto-transformer station railway systems equipment will take one year to complete.
- 2.3.86 This compound will be used to manage the permanent diversion of National Grid transmission 400kV overhead power line, which will take three months to complete.
- 2.3.87 Key railway systems installation works to be managed from this compound include the installation of switches, crossover connections, and track works on the route of the Proposed Scheme, which will take one year and nine months to complete.

### **Birkinheath Covert satellite compound**

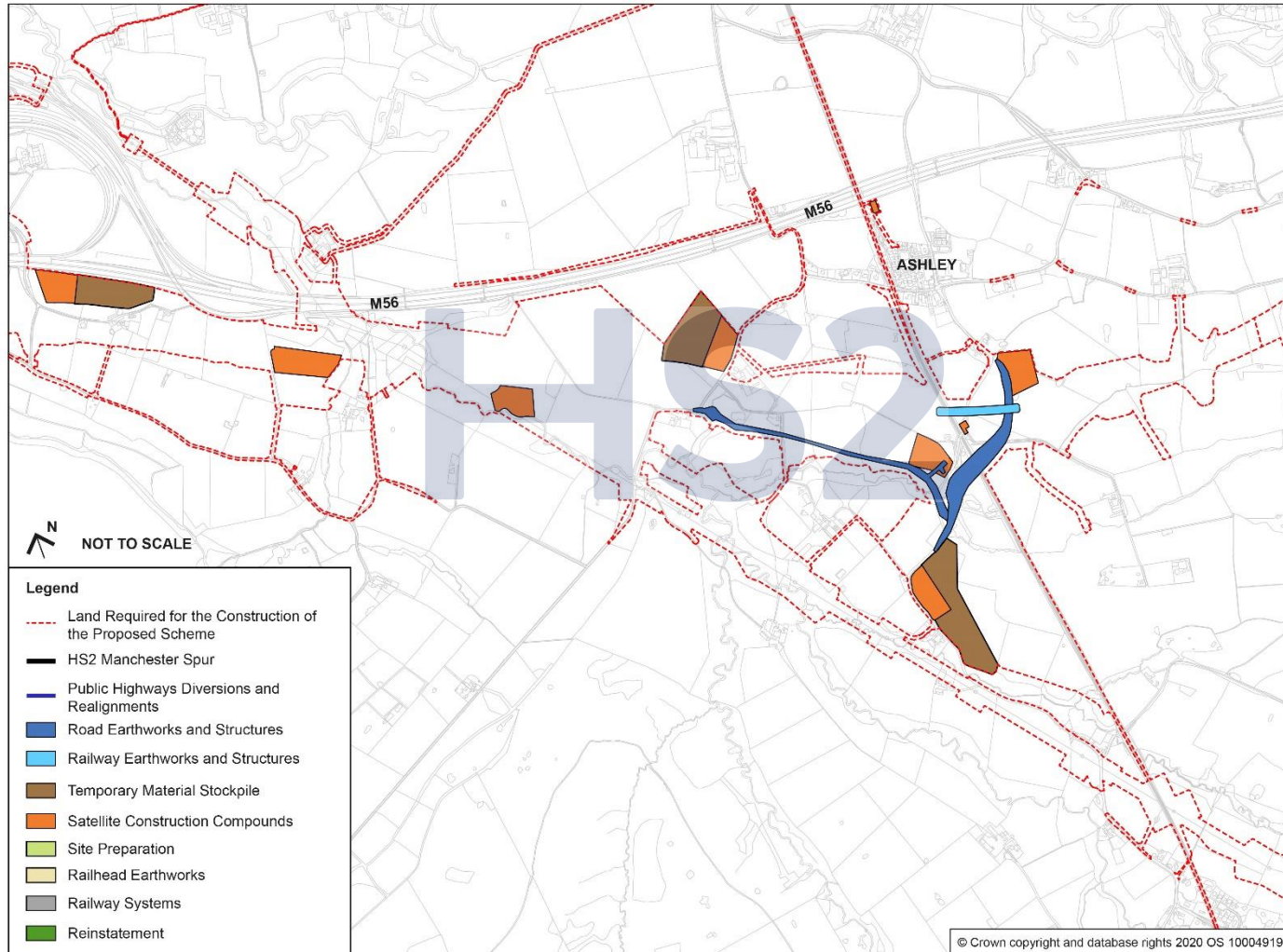
- 2.3.88 This compound will be used to manage civil engineering works and rail systems works (see Volume 2: MA06 Map Book, map CT-05-354, H6 to I7). It will:
- provide four temporary materials stockpiles to the south of the Proposed Scheme (see Volume 2: MA06 Map Book, map CT-05-354); and
  - be accessed via site haul routes south of the route of the Proposed Scheme, connecting to the diverted Ashley Road.
- 2.3.89 No demolitions will be required as a result of the works to be managed from this compound.
- 2.3.90 This compound, along with Mobberley Road South satellite compound, will be used to manage the construction of the temporary Ashley railhead, which will take two years and three months to complete.
- 2.3.91 The works to construct and decommission the temporary Ashley railhead will be carried out in stages, as detailed below and illustrated in Figure 13 to Figure 18:
- Stage 1 - advance works, to include the establishment of fencing and screening, the diversion of major and minor utilities, the diversion and/or stopping up of public and private roads, and the undertaking of surveys and mitigation works;
  - Stage 2 - site preparation works, to include the stripping and storage of topsoil and subsoil, levelling of existing land profiles, and importation of materials;
  - Stage 3 - construction of sidings, to include the installation of temporary civils and railway infrastructure that support the storage and distribution of necessary rail construction items;

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- Stage 4 - railhead operations, the use of the sidings to facilitate the construction of the route of the Proposed Scheme and Ashley IMB-R;
- Stage 5 - removal of temporary infrastructure: This will include rails, hardstanding, imported materials and temporary roads; and
- Stage 6 - reinstatement: This will include reinstatement of stored materials as close as reasonably practicable to the original landform.

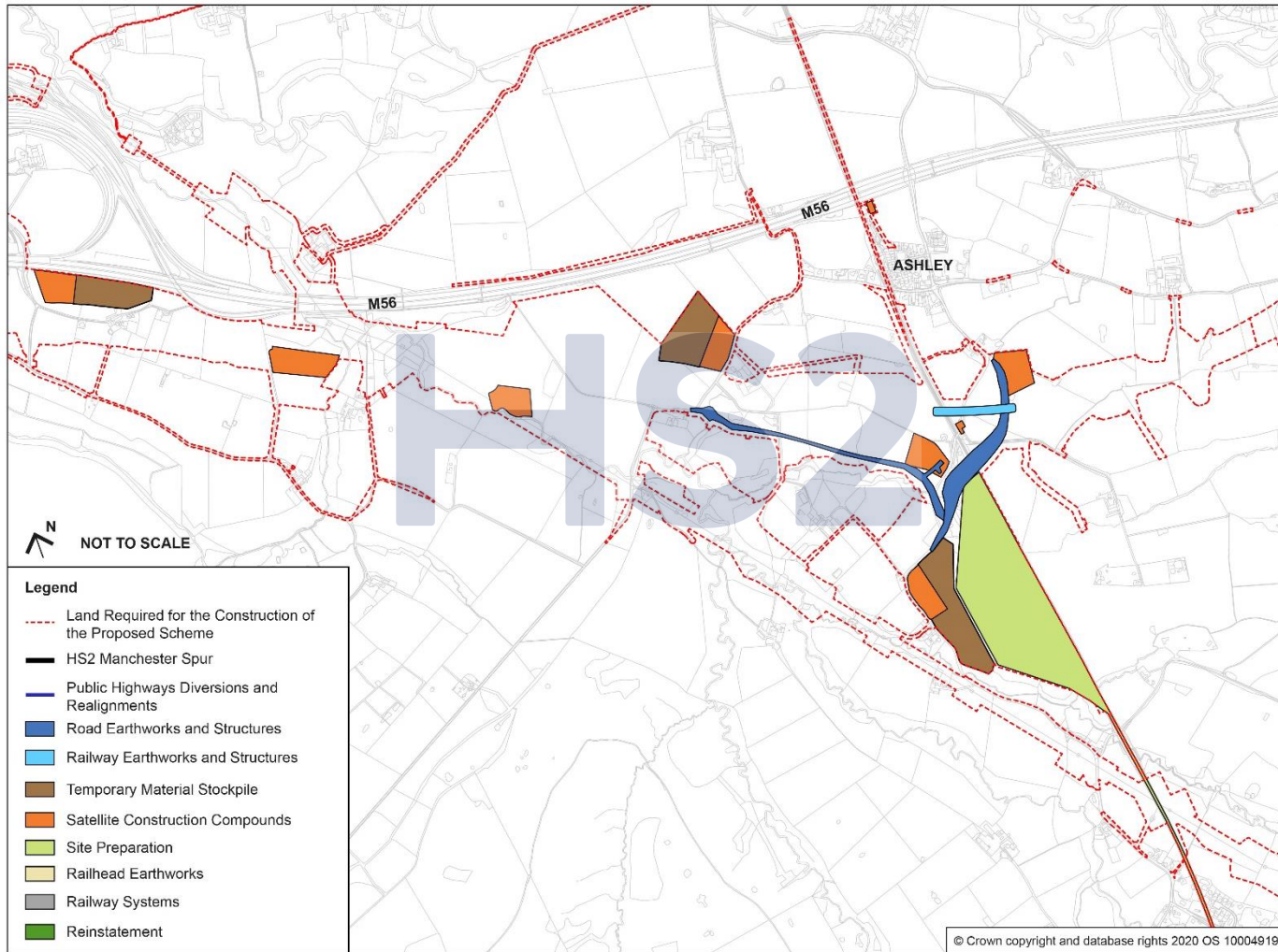
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**Figure 13: Construction phasing at Ashley railhead (Stage 1)**



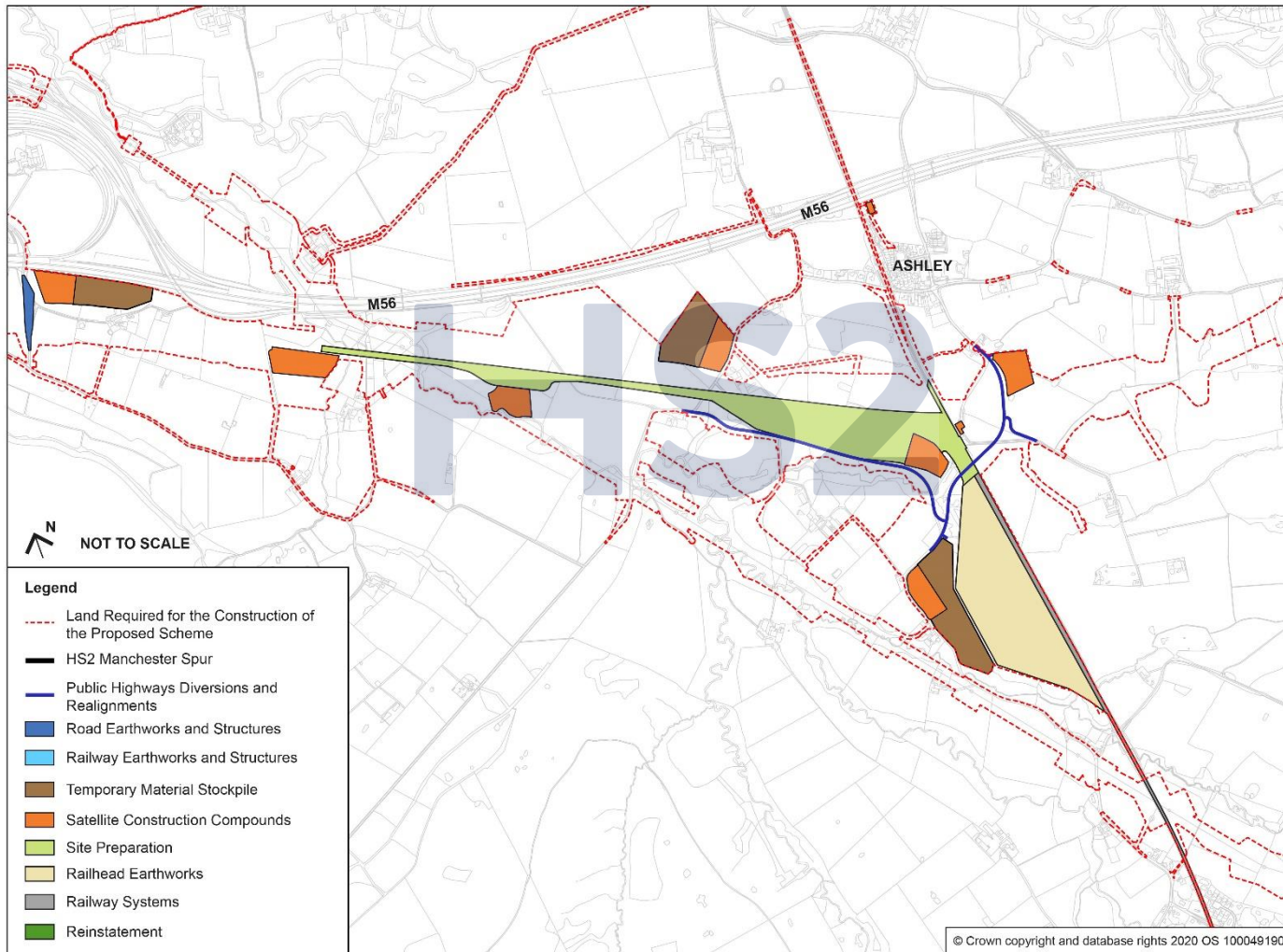
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**Figure 14: Construction phasing at Ashley railhead (Stage 2)**



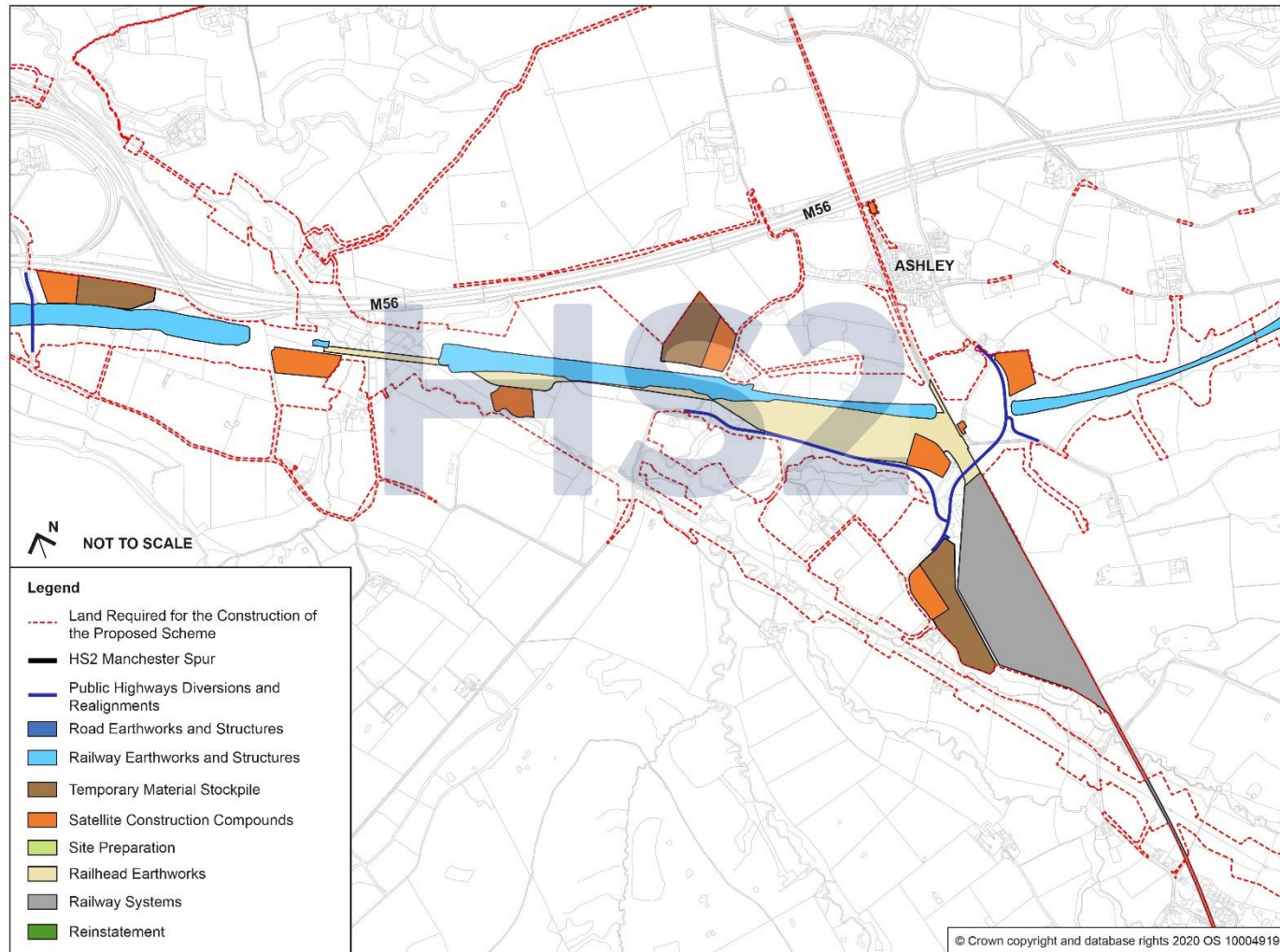
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**Figure 15: Construction phasing at Ashley railhead (Stage 3)**



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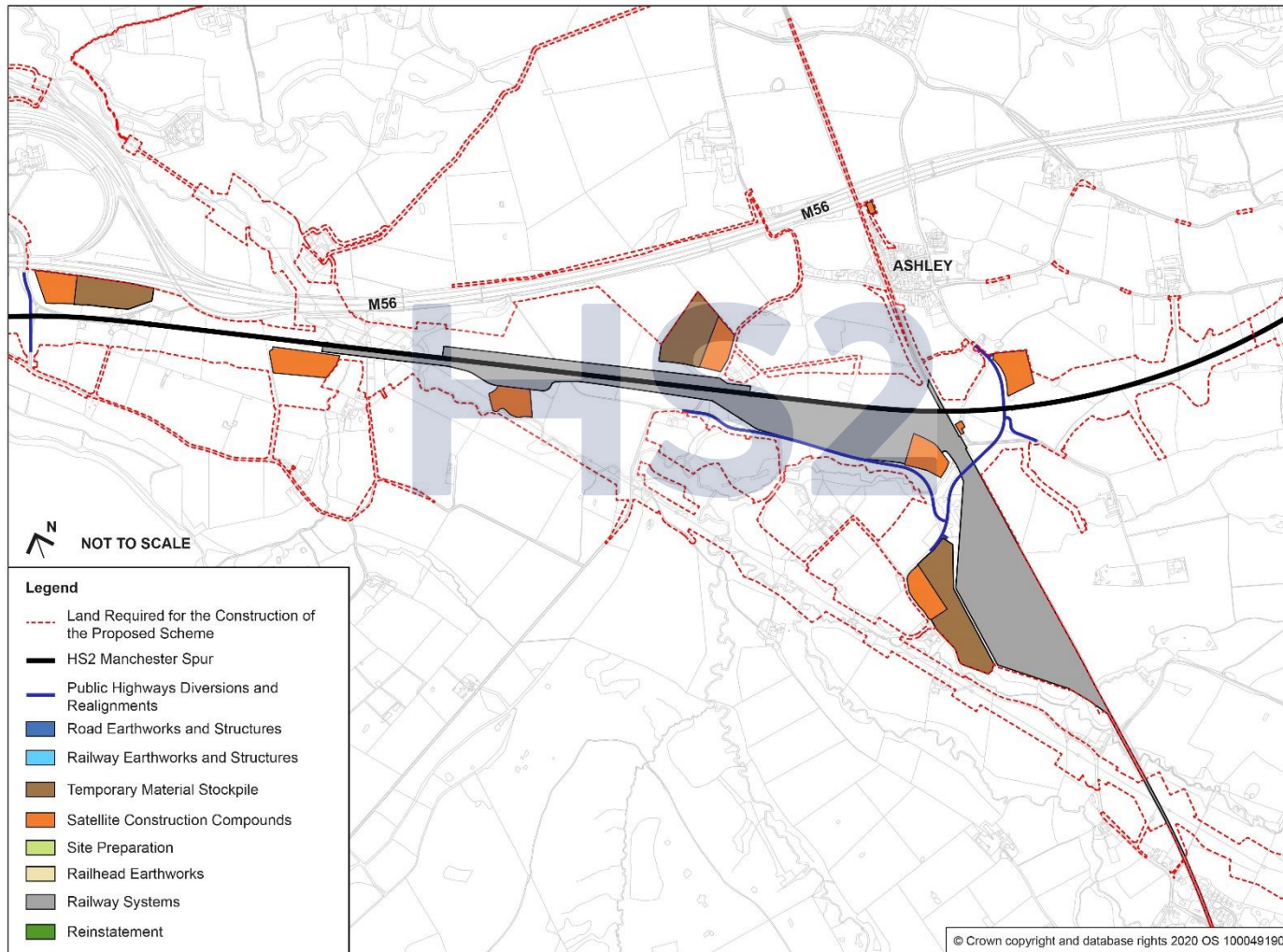
**Figure 16: Construction phasing at Ashley railhead (Stage 4)**





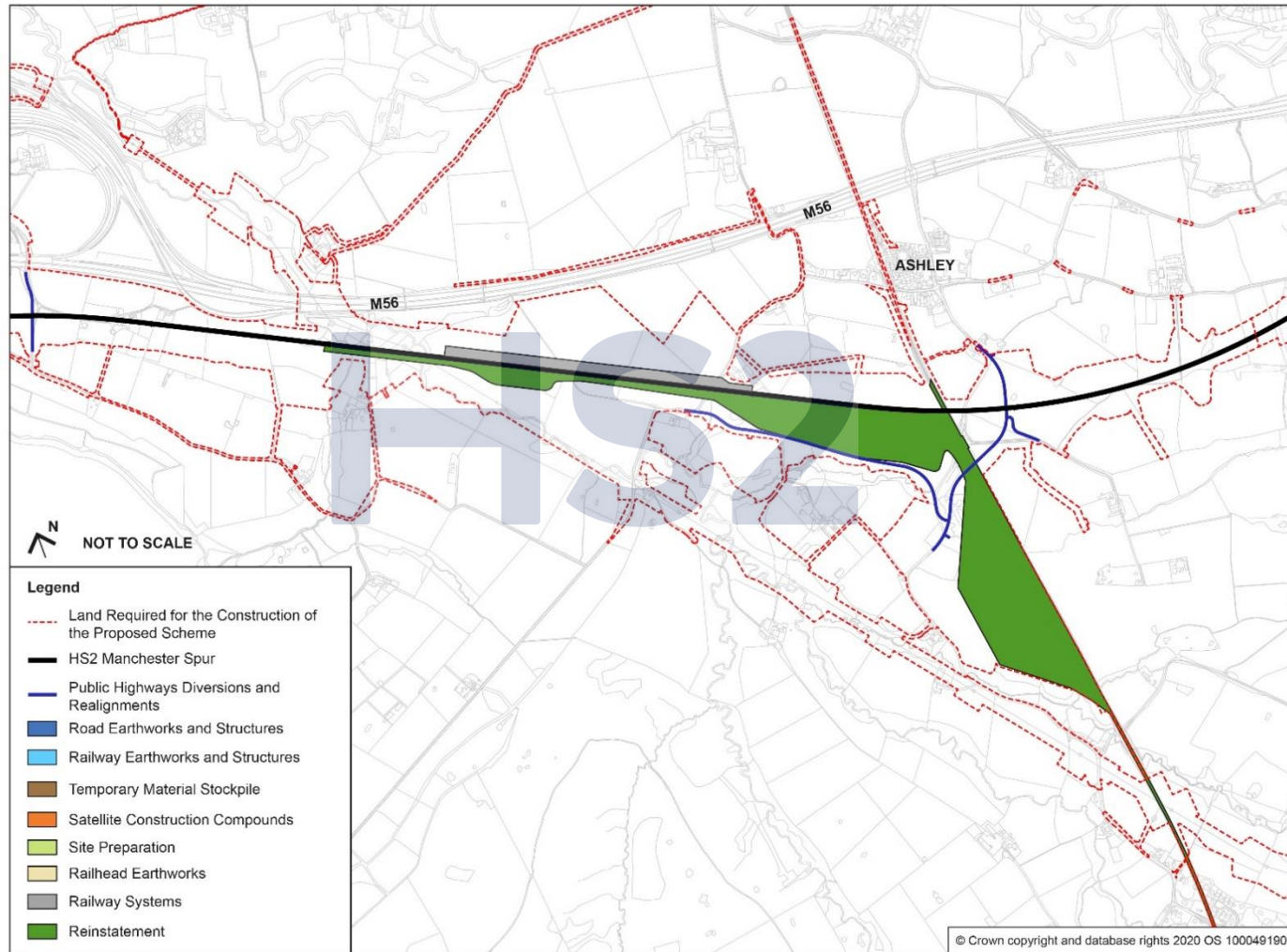
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**Figure 17: Construction phasing at Ashley railhead (Stage 5)**



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**Figure 18: Construction phasing at Ashley railhead (Stage 6)**



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- 2.3.92 This compound, along with Ashley IMB-R satellite compound, will be used to manage the construction of Ashley IMB-R, which will take one year to complete.
- 2.3.93 This compound, along with Mobberley Road South satellite compound, will be used to manage the construction of Mid-Cheshire (Railway) and Mobberley Road viaduct, which will take two years and six months to complete.
- 2.3.94 The compound will be used to manage the permanent diversion of Ashley Road, 850m east of its existing alignment, which will take two years to complete. The existing Ashley Road will remain open during the construction of the diverted Ashley Road, which will be constructed offline. During construction, a temporary realignment of Ashley Road between Birkin Farm and Stock Farm will be in place for two years, decreasing journey length by 17m. On completion of construction, there will be tie-in works and traffic management for a period of six months to connect the new diversion with the existing road, to the south of the Proposed Scheme, and realigned Mobberley Road.
- 2.3.95 This compound will be used to manage the construction of Ashley Road offline east and west culverts, each of which will take nine months to complete.
- 2.3.96 The works to be managed from this compound will require the following works to PRow:
- temporary closure of Footpath Ashley 6/4 during construction for a period of five years and two months. On completion of construction, Footpath Ashley 6/4 will be permanently diverted;
  - temporary closure of Footpath Ashley 6/5 during construction for a period of five years and two months. Users will be diverted along Ashley Road and the realigned Mobberley Road, increasing journey length by 1.7km. On completion of construction, Footpath Ashley 6/5 will be permanently diverted;
  - temporary closure of Footpath Ashley 8/1 during construction for a period of five years and two months. Users will be diverted along the realigned Ashley Road, increasing journey length by 157m. On completion of construction, Footpath Ashley 8/1 will be permanently diverted; and
  - temporary closure of Footpath Ashley 8/2 during construction for a period of five years and two months. On completion of construction, Footpath Ashley 8/2 will be permanently diverted.

## **Mobberley Road North satellite compound**

- 2.3.97 This compound will be used to manage civil engineering works (see Volume 2: MA06 Map Book, map CT-05-354, H4 to I5). It will:
- provide five temporary material stockpiles to the north of the Proposed Scheme (see Volume 2: Map CT-05-354, A5 to H5); and
  - be accessed via site haul routes north of the route of the Proposed Scheme, connecting to the realigned Mobberley Road.
- 2.3.98 No demolitions will be required as a result of the works to be managed from this compound.

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- 2.3.99 The compound will be used to manage the construction of the following bridges and viaducts:
- Mobberley Road offline overbridge, which will take one year and three months to complete; and
  - Back Lane Farm accommodation overbridge, which will take two years and three months to complete.
- 2.3.100 The works to be managed from this compound will require the following works to public and private roads:
- permanent diversion of existing access for Back Lane Farm, which will take two years and three months to complete. During construction, the existing access will be temporarily realigned up to 15m west of its current alignment for 375m. On completion of construction, the access for Back Lane Farm will be permanently realigned; and
  - permanent realignment of Mobberley Road, and associated watercourse diversions (Tributary of Birkin Brook 1, 2, and 3), which will take two years to complete. Mobberley Road will remain open during the realignment, which will be constructed offline. On completion of construction, there will be tie-in works and traffic management requiring weekend closures over a period of six months.

### **Ashley Station satellite compound**

- 2.3.101 This compound will be used to manage railway systems works (see Volume 2: Map CT-05-354-L1, G8). It will be accessed via site haul routes north of the route of the Proposed Scheme, connecting into Hough Green and Cow Lane.
- 2.3.102 No demolitions will be required as a result of the works to be managed from this compound.
- 2.3.103 This compound will be used to manage railway system works associated with the existing conventional rail network to facilitate the operation of Ashley railhead, which will take one year and three months to complete.

### **Mobberley Road satellite compound**

- 2.3.104 This compound will be used to manage railway systems works (see Volume 2: Map CT-05-354, I6). It will be accessed via site haul routes south of the route of the Proposed Scheme, connecting to the realigned Mobberley Road.
- 2.3.105 No demolitions will be required as a result of the works to be managed from this compound.
- 2.3.106 This compound will be used to manage railway system works associated with the existing conventional rail network to facilitate the operation of Ashley railhead, which will take 12 months to complete.

## **Mobberley Road South satellite compound**

- 2.3.107 This compound will be used to manage civil engineering works (see Volume 2: MA06 Map Book, map CT-05-354, H9 to I10, and map CT-05-354-R1, G1 to H3). It will:
- provide a transfer node east of the compound which will be accessed via Mobberley Road (see Volume 2: Map CT-05-354-R1, G1 to I4); and
  - be accessed via Mobberley Road.
- 2.3.108 No demolitions will be required as a result of the works to be managed from this compound.
- 2.3.109 This compound will be used to manage the construction of Thorns Green embankment, which will take two years to complete.
- 2.3.110 This compound, along with Birkinheath Covert satellite compound, will be used to manage the construction of Mid-Cheshire (Railway) and Mobberley Road viaduct, which will take two years and six months to complete.
- 2.3.111 This compound, along with Birkinheath Covert satellite compound, will be used to manage the construction of the temporary Ashley railhead, which will take two years and three months to complete.

## **Ashley railhead**

- 2.3.112 Ashley railhead will be used to receive and stockpile materials, by rail, required for the construction of the railway tracks, signals and electrification systems for the Proposed Scheme.
- 2.3.113 Ashley railhead will be located on land south of the M56 and north of Birkin Brook. It will extend southwards alongside the Mid-Cheshire Line (see Volume 2: MA06 Map Book, map CT-05353, H4 to J6, map CT-05-354, A5 to J10, map CT-05-354-R1, H1 to J5, map CT-05-355-R1, A1 to A10, and map CT-05-355-R2, A7 to B1). It will:
- be accessed via the diverted Ashley Road and realigned Mobberley Road, which will be constructed as part of the Proposed Scheme;
  - be constructed over a period of two years and three months, commencing during 2029. Construction will be managed from Birkinheath Covert satellite compound and Mobberley Road South satellite compound;
  - be operational for two years and nine months, commencing during 2031; and
  - be removed and the site reinstated over a period of one year, commencing in 2034.
- 2.3.114 Ashley railhead will be capable of receiving and dispatching up to 18 trains per day, to and from the existing railway network, via purpose-built sidings adjacent to the Mid-Cheshire Line. Rail deliveries into the railhead will be undertaken during day and night-time hours and at weekends, though unloading will be undertaken during a standard 10-hour (08:00-18:00) working day (Monday to midday Saturday), where reasonably practicable.

## Castle Mill Lane satellite compound

2.3.115 This compound will be used to manage civil engineering works (see Volume 2: MA06 Map Book, map CT-05-355, I6 to J8). It will:

- provide six temporary materials stockpiles to the south of the Proposed Scheme (see Volume 2: MA06 Map Book, map CT-05-355, A6 to J7); and
- be accessed via Castle Mill Lane.

2.3.116 The works to be managed from this compound will require demolition of the buildings and structures identified in Table 3.

**Table 3: Demolitions required as a result of the works to be managed from Castle Mill Lane satellite compound**

Type	Description	Location	Feature resulting in the demolition
Residential	Five residential properties on Castle Mill Lane	Castle Mill Lane, Ashley	Thorns Green cutting
Commercial	One farm business comprising four single storey buildings and five steel framed barns on Castle Mill Lane	Castle Mill Lane, Ashley	Thorns Green cutting
Other	Three ancillary/stable units comprising one one-storey and two timber framed barns off Back Lane	Back Lane, Ashley	Thorns Green cutting
Other	One stable building comprising one single storey building and two timber framed barns associated with Windy Howe	Back Lane, Ashley	Thorns Green cutting

2.3.117 This compound will be used to manage the construction of Castle Mill Lane overbridge, which will take three years and three months to complete.

2.3.118 This compound, along with River Bollin East viaduct satellite compound, will be used to manage the construction of River Bollin East viaduct, which will take one year and three months to complete.

2.3.119 The compound will be used to manage the construction of the following earthworks:

- Thorns Green cutting, which will take two years and six months to complete; and
- River Bollin South embankment, which will take one year and six months to complete.

2.3.120 The works to be managed from this compound will require the following works to public and private roads:

- permanent diversion of Brickhill Lane, up to 360m east of its current alignment, which will take three years and three months to complete. Brickhill Lane will remain open during the diversion, which will be constructed offline. On completion of construction, there will be tie-in works and traffic management requiring weekend closures over a period of six months; and
- temporary closure of Castle Mill Lane during construction for a period of one year and three months. Users will be diverted via the diverted Brickhill Lane and existing Brickhill

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Lane, increasing the journey length by 415m. On completion of construction, Castle Mill Lane will be permanently realigned.

- 2.3.121 The works to be managed from this compound will require the temporary closure of Footpath Ashley 10/1 for a period of one year and two months during construction. Users will be diverted via Castle Mill Lane and Footpath Ashley 11/1, increasing journey length by 442m. On completion of construction, Footpath Ashley 10/1 will be permanently realigned.
- 2.3.122 The compound will be used to manage the construction of Castle Mill Lane telecommunications site. The construction of Castle Mill Lane telecommunications site foundations will take six months to complete. The installation of Castle Mill Lane telecommunications site railways systems equipment will take six months to complete.

### **River Bollin East viaduct satellite compound**

- 2.3.123 This compound will be used to manage civil engineering works (see Volume 2: MA06 Map Book, map CT-05-356, B5 to C5). It will:
- provide two temporary materials stockpiles to the west of the route of the Proposed Scheme (see Volume 2: Map CT-05-356, B3 to C5); and
  - be accessed via Sunbank Lane.

No demolitions will be required as a result of the works to be managed from this compound.

- 2.3.124 This compound, along with Castle Mill Lane satellite compound, will be used to manage the construction of River Bollin East viaduct, which will take one year and three months.
- 2.3.125 This compound will be used to manage the permanent diversion of an underground United Utilities 110mm water main, which will take nine months to complete.
- 2.3.126 The works to be managed from this compound will require the following works to PRow:
- temporary closure of Footpath Ringway 14 during construction for a period of one year and two months. Users will be diverted via Rossmill Lane, Chapel Lane, Sunbank Lane and Footpath Ringway 13, increasing journey length by 972m. On completion of construction, Footpath Ringway 14 will be permanently reinstated along its existing alignment; and
  - temporary closure of Footpath Ringway 12 during construction for a period of one year and two months. Users will be diverted via Rossmill Lane, Chapel Lane and Sunbank Lane, increasing journey length by 299m. On completion of construction, Footpath Ringway 12 will be permanently realigned.

## Sunbank Lane satellite compound

- 2.3.127 This compound will be used to manage civil engineering works (see Volume 2: MA06 Map Book, map CT-05-356, D6 to E7). It will:
- provide one temporary materials stockpile to the east of the Proposed Scheme (see Volume 2: MA06 Map Book, map CT-05-356, B5 to C6);
  - provide a transfer node to the south-east of the compound accessed from Sunbank Lane and via site haul routes (see Volume 2: MA06 Map Book, map CT-05-356, C6 to D7); and
  - be accessed from Sunbank Lane.
- 2.3.128 The works to be managed from this compound will require demolition of the buildings and structures identified in Table 4.

**Table 4: Demolitions required as a result of the works to be managed from Castle Mill Lane satellite compound**

Type	Description	Location	Feature resulting in the demolition
Residential	Five residential properties on Sunbank Lane	Sunbank Lane, Ringway	Ringway cutting

- 2.3.129 This compound will be used to manage the construction of Sunbank Lane overbridge, which will take two years to complete.
- 2.3.130 This compound, along with M56 East satellite compound, will be used to manage the construction of M56 East tunnel, which will take four years and three months to complete.
- 2.3.131 The compound will be used to manage the construction of the following earthworks:
- River Bollin North embankment, which will take two years and three months to complete; and
  - Ringway cutting, which will take two years and three months to complete.
- 2.3.132 This compound will be used to manage the construction of M56 cutting retaining wall, which will take one year to complete.
- 2.3.133 The works to be managed from this compound will require the following works to public roads:
- temporary closure of Sunbank Lane, with users diverted via Chapel Lane, Greengate, High Elm Road, the A538 Hale Road, the A538 Wilmslow Road, before re-joining Sunbank Lane, for a period of six years and three months, increasing journey length by 3.3km. On completion of construction, Sunbank Lane will be permanently realigned; and
  - temporary realignment of a 1.4km section of the M56, for a period of three years and three months to accommodate the construction of M56 East tunnel. The change in journey length will be negligible. Following the construction of M56 East tunnel, the M56 will be reinstated on its current alignment.



- 2.3.134 The works to be managed from this compound will require the following works to PRow:
- the temporary realignment of Footpath Ringway 10, 25m south-east of its existing alignment for 115m, for a period of three years and three months, decreasing journey length by 20m. On completion of construction, Footpath Ringway 10 will be permanently reinstated along its existing alignment; and
  - the temporary closure of Footpath Ringway 11 for a period of three years and three months. Users will be diverted via Sunbank Lane increasing journey length by 354m. On completion of construction, Footpath Ringway 11 will be permanently diverted.

## **M56 East satellite compound**

- 2.3.135 This compound will be used to manage civil engineering works (see Volume 2: MA06 Map Book, map CT-05-356, F4 to H5). It will:
- provide a transfer node to the south-west of the compound accessed from the A538 Hale Road and via site haul routes (see Volume 2: Map CT-05-356, F4 to H5); and
  - be accessed via site haul routes south-west of the Proposed Scheme, connecting to the A538 Hale Road.
- 2.3.136 No demolitions will be required as a result of the works to be managed from this compound.
- 2.3.137 This compound, along with Sunbank Lane satellite compound, will be used to manage the construction of M56 East tunnel, which will take four years and three months to complete.
- 2.3.138 This compound will be used to manage the construction of Manchester Airport High Speed station cutting, which will take two years to complete.
- 2.3.139 This compound will be used to manage the construction of Manchester Airport High Speed station cutting retaining wall south, which will take two years and three months to complete.

## **Manchester Airport High Speed station south satellite compound**

- 2.3.140 This compound will be used to manage civil engineering works (see Volume 2: MA06 Map Book, map CT-05-356, H5 to I5). It will be accessed via the A538 Hale Road.
- 2.3.141 No demolitions will be required as a result of the works to be managed from this compound.
- 2.3.142 This compound will be used to manage the construction of A538 Hale Road overbridge (south), which will take four years to complete.
- 2.3.143 The works to be managed from this compound will require the temporary realignment of a 300m section of the A538 Hale Road, for a period of two years and eight months. On completion of construction, the A538 Hale Road will be permanently realigned.
- 2.3.144 This compound will be used to manage the construction of Hasty Lane offline culvert, which will take nine months to complete.

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2.3.145 This compound, along with Manchester Airport High Speed station main compound and Manchester Airport High Speed station north satellite compound, will be used to manage the construction of Manchester Airport High Speed station, which will take six years to complete.

2.3.146 The works to construct Manchester Airport High Speed station will be carried out in stages, as detailed below and illustrated in Figure 19 to Figure 23. Construction of Manchester Airport High Speed station will be carried in parallel with other components of the Proposed Scheme, the details of which are also provided below:

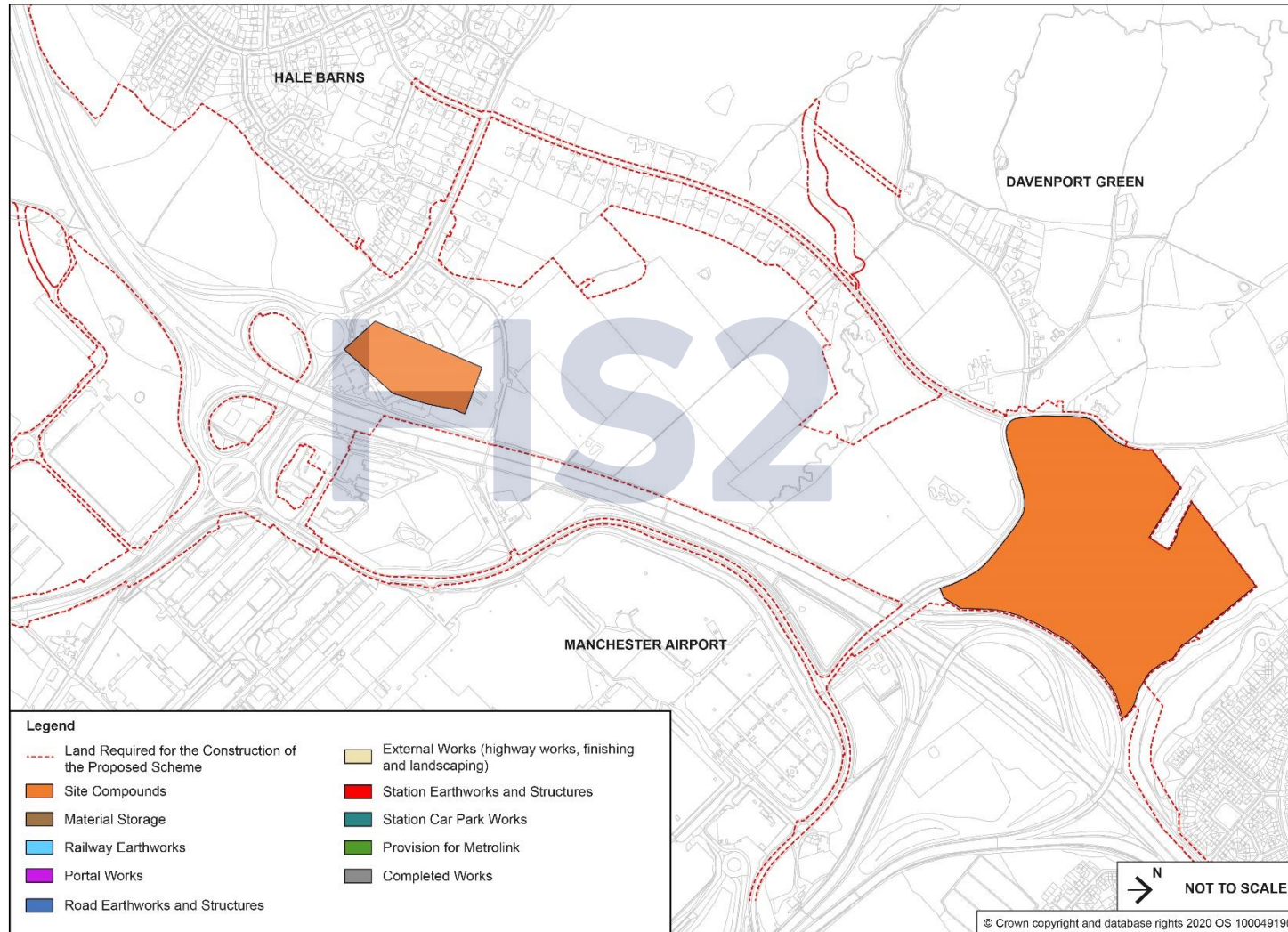
- Stage 1 works will include:
  - site clearance and mobilisation of construction compounds; and
  - advance works, including; utility works, establishment of screening, creation of site haul routes, and demolition works.
- Stage 2 works will include:
  - construction of Manchester Airport High Speed station foundations and reinforced concrete structure;
  - construction of Manchester Airport High Speed station cutting and associated retaining walls;
  - construction of the Manchester tunnel south portal;
  - construction of A538 Hale Road overbridge (south), A538 Hale Road overbridge (north) and Thorley Lane overbridge;
  - offline construction of M56/A538 Wilmslow Road offline underbridge and M56/A538 Wilmslow Road Offline non-motorised user underpass; and
  - modifications to the existing highway network including the realigned A538 Hale Road and realigned Thorley Lane.
- Stage 3 works will include:
  - construction of Manchester Airport High Speed station building (including; installation of steelwork, internal fit-out, and platform canopies);
  - construction of Manchester Airport High Speed station car parks; and
  - offline construction of M56/A538 Wilmslow Road offline underbridge and M56/A538 Wilmslow Road Offline non-motorised user underpass.
- Stage 4 works will include:
  - construction of Manchester Airport High Speed station building roof and canopy structure; and
  - construction of a section of viaduct to enable future provision of a Metrolink station.
- Stage 5 works will include:
  - external works, including; highway works, landscaping and public realm, drainage works, and installation of street furniture;
  - handover to railway systems works once platform areas are complete; and
  - railway systems works, to include track bed, slab track, rails, overhead line equipment, operational and signalling equipment.

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- 2.3.147 This compound will be used to manage M56 Hasty Lane underpass extension, which will take nine months to complete.

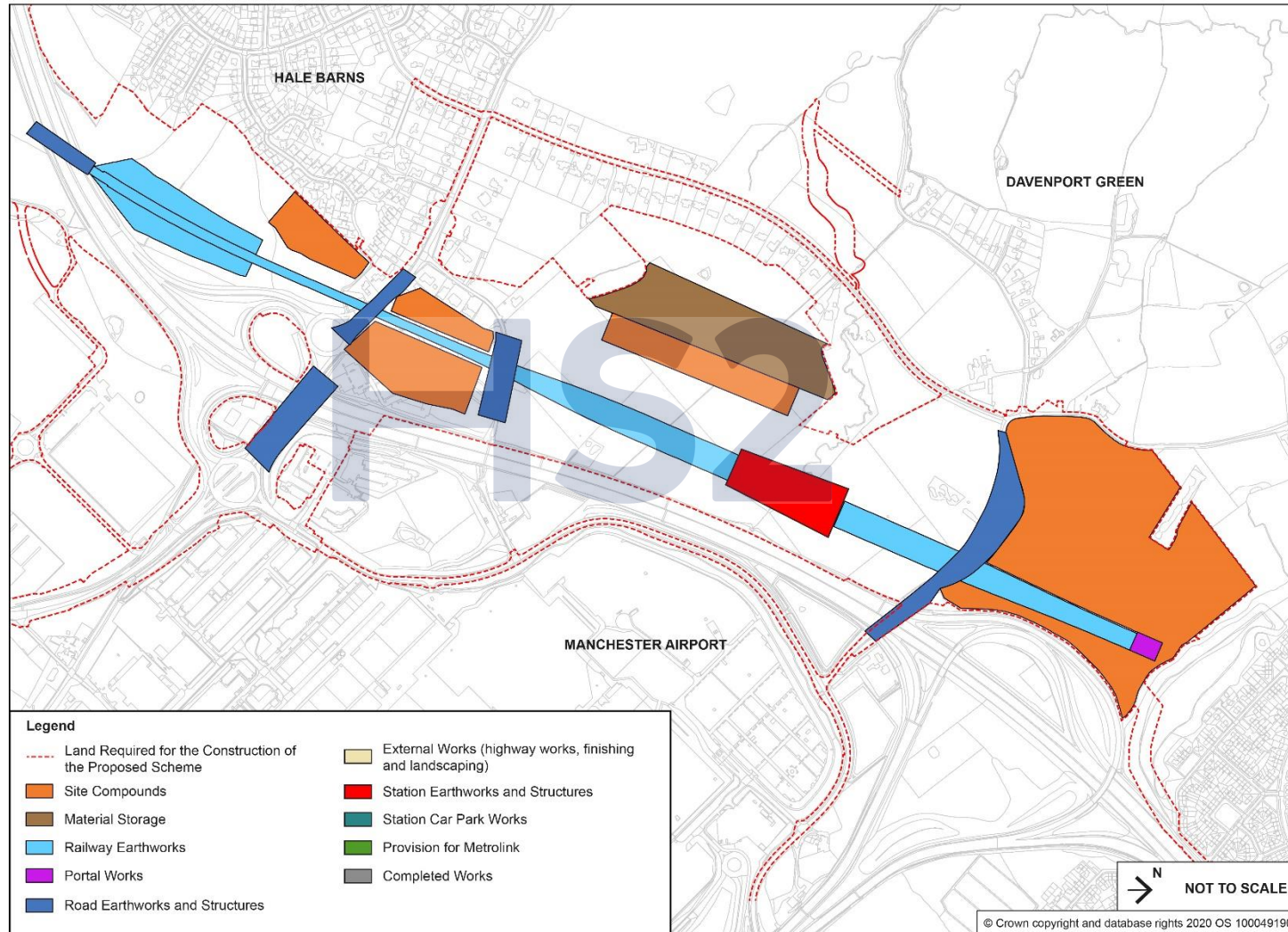
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**Figure 19: Construction phasing at Manchester Airport High Speed station (Stage 1)**



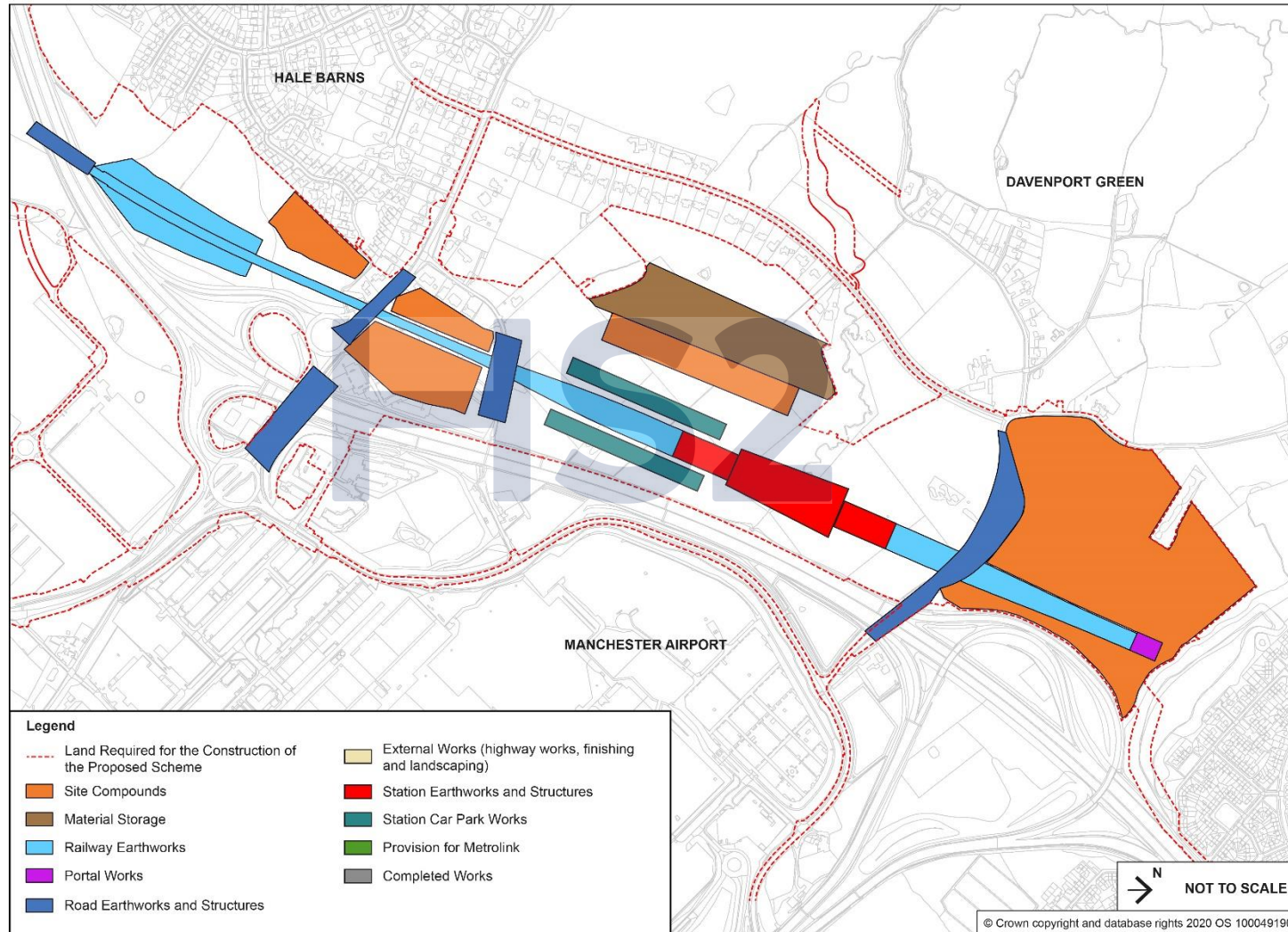
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**Figure 20: Construction phasing at Manchester Airport High Speed station (Stage 2)**



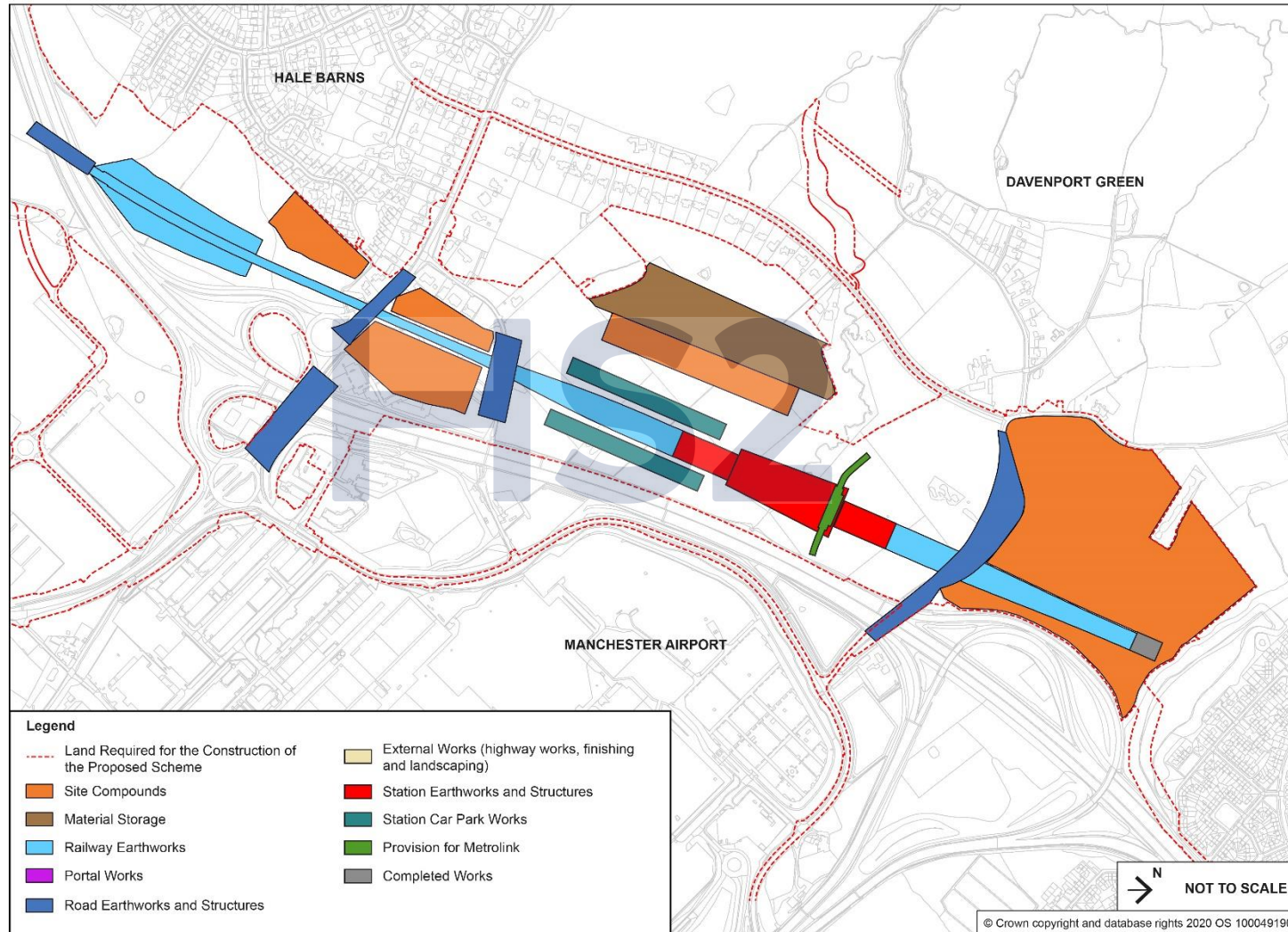
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**Figure 21: Construction phasing at Manchester Airport High Speed station (Stage 3)**



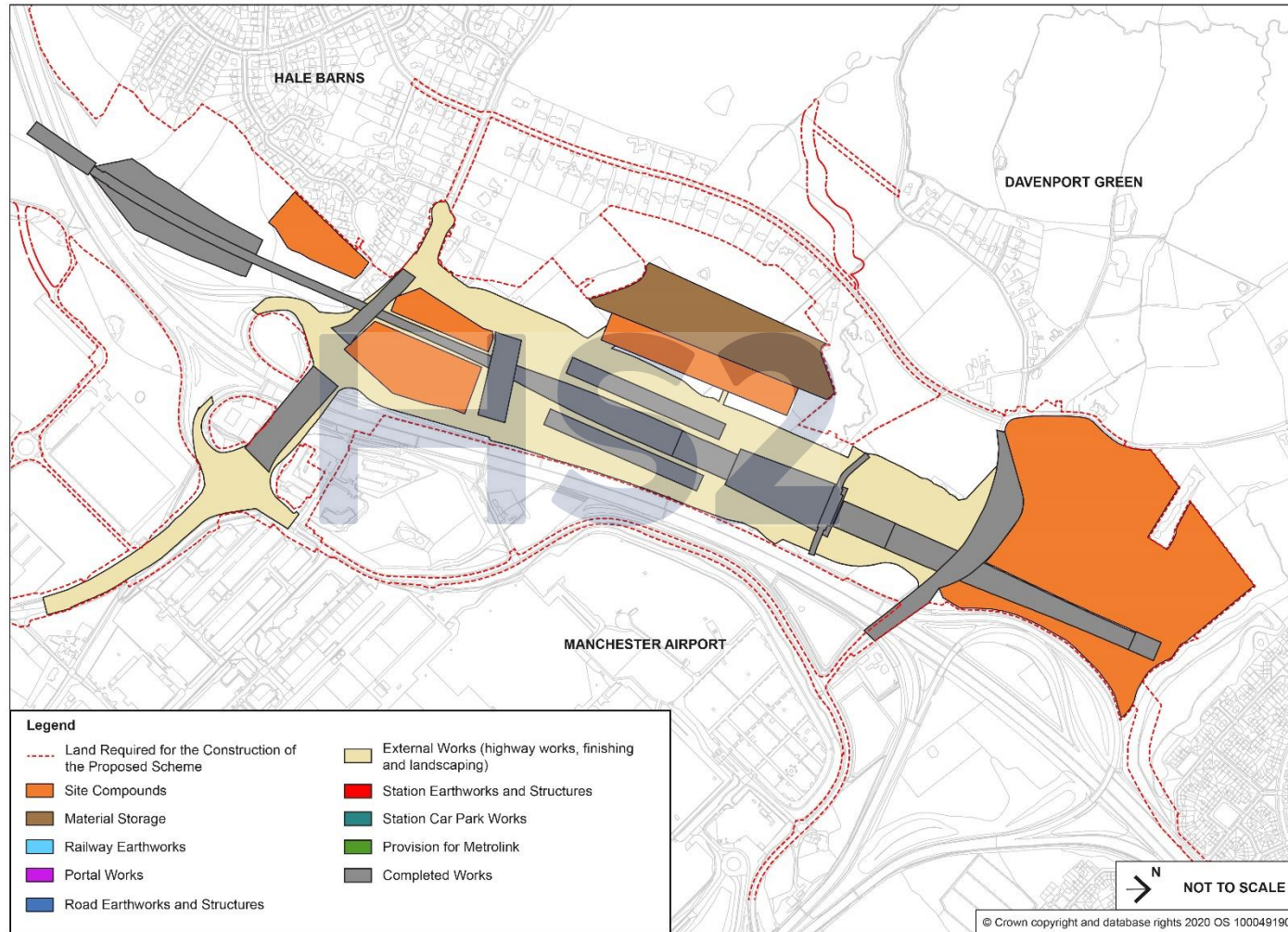
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**Figure 22: Construction phasing at Manchester Airport High Speed station (Stage 4)**



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**Figure 23: Construction phasing at Manchester Airport High Speed station (Stage 5)**





## Manchester Airport High Speed station main compound

2.3.148 This compound will be used to manage civil engineering and rail system works (shown on Volume 2: MA06 Map Book, map CT-05-356, H5 to I6). It will:

- be used to manage civil engineering works for a period of six years and three months, followed by both civil engineering and railway systems works for a period of one year and three months, and then railway system works only for a period of nine months;
- provide main compound support to four civil engineering satellite compounds and two transfer nodes in the Hulseheath to Manchester Airport area;
- provide main compound support to nine railway system satellite compounds, four located in the Hulseheath to Manchester Airport area and five located in the Risley to Bamfurlong area (MA05); and
- be accessed from the A538 Hale Road.

2.3.149 The works to be managed from this compound will require demolition of the buildings and structures identified in Table 5.

**Table 5: Demolitions required as a result of the works to be managed from Manchester Airport High Speed station main compound**

Type	Description	Location	Feature resulting in the demolition
Residential	Five properties on A538 Hale Road	A538 Hale Road, Hale Barns	Manchester Airport High Speed station cutting
Residential	Four properties on Hasty Lane	Hasty Lane, Hale Barns	Manchester Airport High Speed station cutting
Commercial	One commercial hotel comprising 18 one/two/three storey buildings on A538 Hale Road	A538 Hale Road, Hale Barns	Manchester Airport High Speed station cutting
Commercial	One commercial property comprising one two-storey building and one ancillary building on Hasty Lane	Hasty Lane, Hale Barns	Manchester Airport High Speed station cutting
Other	Electricity substation comprising one one-storey building on A538 Hale Road	Hasty Lane, Hale Barns	Manchester Airport High Speed station cutting

2.3.150 This compound, along with Manchester Airport High Speed station north satellite compound and Manchester tunnel south portal main compound will be used to manage the construction of Manchester Airport High Speed station cutting retaining wall north, which will take three years and three months to complete.

2.3.151 This compound will be used to manage the construction of the A538 Wilmslow Road offline retaining wall, which will take six months to complete.

2.3.152 This compound, along with Manchester Airport High Speed station south satellite compound and Manchester Airport High Speed station north satellite compound, will be used to manage the construction of Manchester Airport High Speed station and associated infrastructure, which will take six years to complete.

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- 2.3.153 This compound will be used to manage the construction of M56/A538 Wilmslow Road offline underbridge, which will take two years and three months to complete.
- 2.3.154 This compound will be used to manage M56/A538 Wilmslow Road Offline non-motorised user underpass which will take six months to complete.
- 2.3.155 Key railway systems installation works to be managed from this compound include the installation of switches and crossover connections required for Manchester Airport High Speed station and the installation of slab track, which will take two years.

## **Manchester Airport High Speed station north satellite compound**

- 2.3.156 This compound will be used to manage civil engineering works (see Volume 2: MA06 Map Book, map CT-05-357a, A5 to C5). It will:
- provide a transfer node to the west of the compound, accessed via site haul routes connecting to the A538 Hale Road (as shown on Volume 2: MA06 Map Book, map CT-05-357a, A4 to C5); and
  - be accessed via site haul routes west of the Proposed Scheme, connecting to the A538 Hale Road.
- 2.3.157 No demolitions will be required as a result of the works to be managed from this compound.
- 2.3.158 This compound will be used to manage the construction of A538 Hale Road overbridge (north) which will take four years to complete.
- 2.3.159 This compound, along with Manchester Airport High Speed station main compound and Manchester Airport High Speed station north satellite compound, will be used to manage the construction of Manchester Airport High Speed station cutting retaining wall north, which will take three years and three months to complete.
- 2.3.160 This compound will be used to manage the construction of Davenport Green Wood offline reinforced soil retaining wall, which will take six months to complete.
- 2.3.161 The works to be managed from this compound will require the permanent closure of Footpath Hale 16.
- 2.3.162 The works to be managed from this compound will require the permanent realignment of Timperley Brook underneath Manchester Airport High Speed station and construction of Timperley Brook inverted siphon. These works will be carried out during the construction period for the Manchester Airport High Speed station.
- 2.3.163 The works to be managed from this compound will involve the following works to utilities:
- the permanent diversion of a Scottish Power transmission 11kV overhead power line which will take three months to complete; and
  - the connection of a new Electricity Northwest 33kV below ground cable, which will take one year and three months to complete.

2.3.164 The compound, along with Manchester Airport High Speed station south satellite compound and Manchester Airport High Speed station main compound, will be used to manage the construction of Manchester Airport High Speed station and associated infrastructure, which will take six years to complete.

## **Manchester tunnel south portal main compound**

2.3.165 This compound will be located primarily in the Hulseheath to Manchester Airport area, partially extending into the Davenport Green to Ardwick area (MA07) (see Volume 2: Map CT-05-357a, E3 to H7). This compound will be used to manage civil engineering and rail systems works. It will:

- be used to manage civil engineering works for a period of six years and three months, followed by both civil engineering and rail system works for a period of one year, and then railway system works only for a period of one year and nine months;
- provide main compound support to two civil engineering satellite compounds located in the Davenport Green to Ardwick area (MA07);
- provide a transfer node to the south of the compound, accessed from Thorley Lane and via site haul routes (as shown on Volume 2: Map CT-05-357a, D4 to E5); and
- be accessed from Thorley Lane.

2.3.166 No demolitions will be required in the Hulseheath to Manchester Airport area as a result of the works to be managed from this compound.

2.3.167 This compound will be used to manage the construction of Thorley Lane overbridge, which will take three years and three months to complete.

2.3.168 This compound, along with Manchester Airport High Speed station main compound and the Manchester Airport High Speed station north satellite compound, will be used to manage the construction of Manchester Airport High Speed station cutting retaining wall north, which will take three years and three months to complete.

2.3.169 The works to be managed from this compound will require the permanent realignment of Thorley Lane, 55m south of its current alignment, which will take three years and three months to complete. Thorley Lane will remain open during the realignment, which will be constructed offline (i.e. generally constructed along or nearby existing routes, which will remain open during construction). On completion of construction of the offline section, traffic management measures will be implemented for six months to enable connection between the realigned road and the existing road.

2.3.170 This compound will be used to manage the construction and installation of Manchester tunnel south portal auto-transformer station, located 300m north of Thorley Lane overbridge in the Davenport Green to Ardwick area (MA07). The construction of Manchester tunnel south portal auto-transformer station will take one year to complete. The installation of Manchester tunnel south portal auto-transformer station railways systems equipment will take one year to complete.

- 2.3.171 Key railway systems installation works to be managed from this compound include the installation of switches and crossing connections required for Manchester Airport High Speed station and the installation of slab track, which will take two years and nine months. Two tunnel boring machines (TBMs) will be driven and serviced from this compound. The TBMs will be used to construct the twin bore sections of the Manchester tunnel in the Davenport Green to Ardwick area (MA07). Further details are provided in Volume 2, Community Area report: Davenport Green to Ardwick area (MA07).

## **Construction waste and material resources**

- 2.3.172 Excavated material generated across the Proposed Scheme will be reused as engineering fill material or in the environmental mitigation earthworks of the Proposed Scheme, where suitable and reasonably practicable.
- 2.3.173 Forecasts of the amount of construction, demolition and excavation waste (CDEW) that will be produced during construction of the Proposed Scheme are reported in Volume 3, Route-wide effects.
- 2.3.174 Local excess or shortfall of excavated material within the Hulseheath to Manchester Airport area will be managed through the mitigation earthworks design approach adopted for the Proposed Scheme, as well as the use of borrow pits in other community areas, with the aim of contributing to an overall balance of excavated material on a route-wide basis. The overall balance of excavated material will be presented in Volume 3, Section 15.

## **Commissioning of the railway**

- 2.3.175 Commissioning is the process of testing the infrastructure to ensure that it operates as expected. It will be carried out in the period prior to opening. Further details are provided in Volume 1, Section 6.

## **Construction programme**

- 2.3.176 A construction programme illustrating indicative periods for each of the core construction activities described above is provided in Figure 24.

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**Figure 24: Indicative construction programme between 2025 and 2035**

Hulseheath to Manchester Airport	2025 Quarters				2026 Quarters				2027 Quarters				2028 Quarters				2029 Quarters				2030 Quarters				2031 Quarters				2032 Quarters				2033 Quarters				2034 Quarters				2035 Quarters											
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4								
<b>Construction activity</b>	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Area Advance Works (MA06)																																																				
<b>Bowden View satellite compound (MA03)</b>																																																				
Site preparation and setup																																																				
Hulseheath North embankment																																																				
Site reinstatement																																																				
<b>Chapel Lane satellite compound</b>																																																				
Site preparation and setup																																																				
Millington Clough underbridge																																																				
Ivy House Farm accommodation access																																																				
Peacock Lane viaduct																																																				
Site reinstatement																																																				
<b>Agden Brook Viaduct satellite compound</b>																																																				
Site preparation and setup																																																				
Agden Brook viaduct																																																				

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Hulseheath to Manchester Airport	2025 Quarters	2026 Quarters	2027 Quarters	2028 Quarters	2029 Quarters	2030 Quarters	2031 Quarters	2032 Quarters	2033 Quarters	2034 Quarters	2035 Quarters
Millington Lane overbridge											
Millington Lane telecommunications site (civil works)											
Millington Lane telecommunications site (rail systems works)											
Site reinstatement											
<b>A556 Chester Road satellite compound</b>											
Utilities (major)											
Site preparation and setup											
A556 Chester Road overbridge											
Millington cutting											
Footpath Millington 7/4 accommodation overbridge											
Site reinstatement											
<b>Rosterne Cutting satellite compound</b>											
Site preparation and setup											
Rosterne cutting retaining wall west											

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Hulseheath to Manchester Airport	2025 Quarters	2026 Quarters	2027 Quarters	2028 Quarters	2029 Quarters	2030 Quarters	2031 Quarters	2032 Quarters	2033 Quarters	2034 Quarters	2035 Quarters
Rosterne West embankment											
Rosterne cutting retaining wall east											
Rosterne East embankment											
Rosterne cutting											
Rosterne North cutting											
Millington North cutting											
Birkin Brook embankment											
Yarwood Heath Farm accommodation overbridge											
Ashley embankment											
Tom Lane telecommunications site (civil works)											
Tom Lane telecommunications site (rail systems works)											
Site reinstatement											
<b>Blackburn's Brook satellite compound</b>											
Site preparation and setup											
Rosterne East box structure											

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Hulseheath to Manchester Airport	2025 Quarters	2026 Quarters	2027 Quarters	2028 Quarters	2029 Quarters	2030 Quarters	2031 Quarters	2032 Quarters	2033 Quarters	2034 Quarters	2035 Quarters
Blackburn's Brook North viaduct				■	■	■	■				
Blackburn's Brook embankment						■	■	■	■		
Site reinstatement							■	■			
<b>Birkin Brook satellite compound</b>				■	■	■	■	■	■		
Site preparation and setup				■							
Blackburn's Brook North viaduct				■	■	■	■				
NPR Manchester to Liverpool Junction viaduct foundations					■	■					
Site reinstatement							■				
<b>Ashley IMB-R satellite compound</b>				■	■	■	■	■	■	■	
Site preparation and setup				■							
Utilities (major)				■							
Ashley embankment retaining wall				■	■	■	■	■	■	■	
Ashley IMB-R (civil works)							■	■	■		
Ashley Road auto-transformer station (civil works)							■	■	■		



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Hulseheath to Manchester Airport	2025 Quarters	2026 Quarters	2027 Quarters	2028 Quarters	2029 Quarters	2030 Quarters	2031 Quarters	2032 Quarters	2033 Quarters	2034 Quarters	2035 Quarters
Ashley Road auto-transformer station (rail systems works)											
Rail systems - switches and crossings											
Site reinstatement											
<b>Ashley Railhead</b>											
Rail systems installation (track installation works)											
<b>Birkenheath Covert satellite compound</b>											
Site preparation and setup											
Mid-Cheshire (Railway) and Moberley Road viaduct											
Ashley Road diversion											
Ashley Road East offline culvert											
Ashley Road West offline culvert											
Ashley railhead (civil works)											
Ashley IMB-R (civil works)											
Rail systems - track installation works											
Site reinstatement											

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Hulseheath to Manchester Airport	2025 Quarters			2026 Quarters			2027 Quarters			2028 Quarters			2029 Quarters			2030 Quarters			2031 Quarters			2032 Quarters			2033 Quarters			2034 Quarters			2035 Quarters		
<b>Mobberley Road North satellite compound</b>																																	
Site preparation and setup																																	
Mobberley Road offline overbridge																																	
Mobberley Road realignment																																	
Back Lane Farm accommodation overbridge																																	
Site reinstatement																																	
<b>Mobberley Road South satellite compound</b>																																	
Site preparation and setup																																	
Mid-Cheshire (Railway) and Mobberley Road viaduct																																	
Ashley railhead (civil works)																																	
Thorns Green embankment																																	
Site reinstatement																																	
<b>Mobberley Road satellite compound</b>																																	
Rail systems - track installation																																	

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Hulseheath to Manchester Airport	2025 Quarters	2026 Quarters	2027 Quarters	2028 Quarters	2029 Quarters	2030 Quarters	2031 Quarters	2032 Quarters	2033 Quarters	2034 Quarters	2035 Quarters
<b>Ashley Stations satellite compound</b>											
Rail systems - track installation											
<b>Castle Mill Lane satellite compound</b>											
Site preparation and setup											
Thorns Green cutting											
Brickhill Lane diversion											
Castle Mill Lane overbridge and realignment											
River Bollin East viaduct											
River Bollin South embankment											
Castle Mill Lane telecommunications site (civil works)											
Site reinstatement											
<b>River Bollin East Viaduct satellite compound</b>											
Site preparation and setup											
River Bollin East viaduct											
Site reinstatement											

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Hulseheath to Manchester Airport	2025 Quarters	2026 Quarters	2027 Quarters	2028 Quarters	2029 Quarters	2030 Quarters	2031 Quarters	2032 Quarters	2033 Quarters	2034 Quarters	2035 Quarters
<b>Sunbank Lane satellite compound</b>											
Site preparation and setup											
Ringway cutting											
M56 East tunnel											
M56 cutting retaining walls											
Sunbank Lane overbridge and realignment											
River Bollin North embankment											
Site reinstatement											
<b>M56 East satellite compound</b>											
Site preparation and setup											
Manchester Airport High Speed Station cutting											
Manchester Airport High Speed Station cutting retaining wall south											
M56 East tunnel											
Site reinstatement											
<b>Manchester Airport High Speed Station South satellite compound</b>											

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Hulseheath to Manchester Airport	2025 Quarters	2026 Quarters	2027 Quarters	2028 Quarters	2029 Quarters	2030 Quarters	2031 Quarters	2032 Quarters	2033 Quarters	2034 Quarters	2035 Quarters
Site preparation and setup											
A538 Hale Road overbridge (south) and realignment											
Manchester Airport High Speed station											
Site reinstatement											
<b>Manchester Airport High Speed Station main compound</b>											
Site preparation and setup											
Manchester Airport High Speed station (advance works)											
Manchester Airport High Speed station cutting retaining wall north											
Manchester Airport High Speed station											
M56 Hasty Lane underpass extension											
M56/A538 Wilmslow Road offline underbridge											
A538 Wilmslow Road offline retaining wall											
Rail systems - switches											

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Hulseheath to Manchester Airport	2025 Quarters	2026 Quarters	2027 Quarters	2028 Quarters	2029 Quarters	2030 Quarters	2031 Quarters	2032 Quarters	2033 Quarters	2034 Quarters	2035 Quarters
Rail systems - crossing works											
Site reinstatement											
<b>Manchester Airport Station North satellite compound</b>											
Site preparation and setup											
Davenport Green Wood offline retaining wall											
Manchester Airport High Speed station cutting retaining wall north											
A538 Hale Road overbridge (north) and realignment											
Manchester Airport High Speed station											
Site reinstatement											
<b>Manchester Tunnel South Portal main compound</b>											
Manchester Tunnel South portal (advance works)											
Site preparation and setup											
Manchester Airport High Speed station cutting retaining wall north											

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Hulseheath to Manchester Airport	2025 Quarters	2026 Quarters	2027 Quarters	2028 Quarters	2029 Quarters	2030 Quarters	2031 Quarters	2032 Quarters	2033 Quarters	2034 Quarters	2035 Quarters
Thorley Lane overbridge and realignment											
Manchester Tunnel South portal auto-transformer station (civil works)											
Manchester Tunnel South portal auto-transformer station (rail systems works)											
Rail systems - track works											
Site reinstatement											
<b>Track laying and testing and commissioning</b>											
Area track laying											
Testing and commissioning											

## Monitoring during construction

- 2.3.177 The appointed contractor will be required to undertake the necessary monitoring for each environmental topic to comply with the requirements of the CoCP, the relevant LEMP and any additional consent requirements. Any actions that may be necessary for compliance will be reported to the nominated undertaker and remedial action identified.
- 2.3.178 The CoCP and the relevant LEMP will set out inspection and monitoring procedures to assess the effectiveness of measures to prevent or reduce environmental effects during construction. Relevant local authorities and consenting authorities, such as the Environment Agency, will be consulted on the monitoring procedures to be implemented prior to construction commencement, as appropriate.

## 2.4 Operation of the Proposed Scheme

### Introduction

- 2.4.1 This section describes the operational characteristics of the Proposed Scheme in the Hulseheath to Manchester Airport area. Volume 1, Section 4 describes the envisaged operational characteristics of the Proposed Scheme as a whole, including Phase One, Phase 2a and Phase 2b.

### HS2 services

- 2.4.2 It is anticipated that there will be up to six trains per hour each way passing through the Hulseheath to Manchester Airport area. Services are expected to operate between 05:00 and midnight from Monday to Saturday and between 08:00 and midnight on Sunday.
- 2.4.3 In this area, trains will run at speeds of up to 225mph (360kph). The trains will be either single 200m trains or two 200m trains coupled together, depending on demand and time of day.
- 2.4.4 Manchester Airport High Speed station will provide connections to Manchester Airport and to other transport services, including buses, coaches, private cars, taxis and provision for future connection to Metrolink.
- 2.4.5 The station will accommodate public facilities such as waiting areas, ticket machines, information, public toilets and retail, and food and beverage outlets. There will also be station control rooms, as well as staff facilities including toilets and changing room facilities.

### Maintenance

- 2.4.6 Volume 1, Section 4 describes the maintenance regime for the Proposed Scheme.
- 2.4.7 Provision for railway maintenance vehicles will be made at Crewe North rolling stock depot (RSD) in the Wimboldsley to Lostock Gralam area (MA02). Further information on this depot



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can be found in Volume 2: Community Area report, Wimboldsley to Lostock Gralam area (MA02).

- 2.4.8 Ashley IMB-R will be a smaller satellite facility and will provide support to the core facility at Stone IMB-R. Ashley IMB-R will enable temporary satellite stabling of railway maintenance vehicles to help optimise the works during periods of railway infrastructure maintenance and avoid railway maintenance vehicles having to depart from and return to Stone IMB-R within the maintenance period.
- 2.4.9 Railway maintenance vehicles will usually be loaded or unloaded at Stone IMB-R, before the vehicles travel to Ashley IMB-R. However, unplanned events might result in the need to occasionally load or unload vehicles directly at Ashley IMB-R, which will generally occur during the day, if required.
- 2.4.10 Maintenance activities, supported by the railway maintenance vehicles stabled at Ashley IMB-R, will generally be undertaken during the night-time. The start of a maintenance works period will be midnight and the end of the maintenance period will be 04:59 (except Sunday mornings, when it will extend to 07:59). It is anticipated that during periods of maintenance activities at Ashley IMB-R, there will be two railway maintenance vehicle departures and two arrivals at the beginning and end of the maintenance period.
- 2.4.11 Maintenance works may be required over consecutive nights. When this is required the railway maintenance vehicles may be stabled at Ashley IMB-R for the duration of the works in the area. This will predominantly be for several days but could include vehicle stabling for a period of up to several weeks. When railway maintenance vehicles are temporarily stabled at Ashley IMB-R, this will generally be during the day.
- 2.4.12 The sidings at Ashley IMB-R will provide facilities to allow for vehicle preparation and inspection during daytime. Ad-hoc minor servicing of the vehicles may be undertaken during the day, such as replacement of grinding wheels and calibration of measurement equipment to prepare the maintenance vehicles for operation.
- 2.4.13 Ballasted track and slab track will need to be renewed approximately every 10 to 15 years. During these periods, the sidings at Ashley IMB-R will be used for stabling and maintenance works over a period of several months, typically for up to three or four days a week and over consecutive weekends.
- 2.4.14 Maintenance staff will be based at Stone IMB-R or Crewe North RSD and will only work from Ashley IMB-R when work needs be managed from this IMB-R. Staff will arrive and depart at Ashley IMB-R by road, with parking provided for 10 vehicles. An office facility building including welfare facilities for staff will also be provided, which will generally only be in use during periods of maintenance.
- 2.4.15 Road vehicle access for delivery of materials and equipment to Ashley IMB-R will be from Ashley Road. Only light supplies will be delivered to Ashley IMB-R by road. Heavy maintenance materials and equipment will arrive by rail from Stone IMB-R or Crewe North RSD. There will be a facility at Ashley IMB-R to store spare parts required for maintenance activities.

2.4.16 Lighting will be required for all external working areas of Ashley IMB-R during the maintenance periods. This includes the access road, general circulation areas, walkways, and storage and loading areas. The height of lighting installations will be kept as low as reasonably practicable to facilitate maintenance and to reduce light pollution. Automatic lighting control systems complete with photocells and time clocks will be used to operate all external lighting. The lights and their support systems will also be designed to reduce the visual impact of the lighting installation. LED or low energy lamps will be used for lighting in the external areas to reduce energy consumption.

## **Operational waste and material resources**

- 2.4.17 The assessment of the likely significant environmental effects associated with the disposal of operational waste has been undertaken for the Proposed Scheme as a whole and is reported in Volume 3, Section 15.
- 2.4.18 Forecasts of the amount of waste arising from track maintenance and ancillary infrastructure and the associated potential significant environmental effects are provided in Volume 5: Appendix WM-001-00000.

## **Monitoring during operation**

- 2.4.19 The nominated undertaker will be responsible for monitoring during operation of the Proposed Scheme. General monitoring measures during operation are set out in area-specific monitoring measures for each environmental topic area, which are presented in Sections 4 to 15 of this report.
- 2.4.20 Relevant local authorities and consenting authorities, such as the Environment Agency, will be consulted on the monitoring procedures to be implemented during operation prior to construction commencement.

## **2.5 Route section alternatives**

### **Introduction**

- 2.5.1 The Proposed Scheme described in Section 2.2 has been selected following design development, which included consideration of environmental impacts.
- 2.5.2 The Alternatives Report (Volume 5: Appendix CT-003-00000) describes the local alternatives considered as part of the design development of the Proposed Scheme. Local alternative options for the following elements of the Proposed Scheme in the Hulseheath to Manchester Airport area are reported in Volume 5:
- the location of Ashley railhead;
  - the location of Ashley IMB-R;
  - the highway arrangements for the A538 Hale Road; and
  - the alignment of Manchester Airport High Speed station.

## **3 Stakeholder engagement and consultation**

### **3.1 Introduction**

- 3.1.1 HS2 Ltd's approach to stakeholder engagement and consultation on the Proposed Scheme is set out in Volume 1, Section 3.
- 3.1.2 Since the initial preferred route announcement in November 2016, HS2 Ltd has carried out a programme of stakeholder engagement and consultation with a broad range of stakeholders.
- 3.1.3 A variety of mechanisms have been used to enable an open and inclusive approach to engagement and consultation, reflecting the differing requirements and expectations of stakeholders.
- 3.1.4 Feedback from stakeholder engagement and the consultations on the working draft Environmental Statement (ES) and design refinements has been considered as part of the design and assessment of the Proposed Scheme presented in this ES.

### **3.2 Key stages of Phase 2b engagement and consultation**

- 3.2.1 This section provides a summary of consultation activities and engagement undertaken or underway in the Hulseheath to Manchester Airport area since the initial preferred route announcement. This summary of engagement is in addition to the route wide engagement outlined in Volume 1, Section 3.

#### **Draft EIA Scope and Methodology Report (SMR) consultation**

- 3.2.2 The draft EIA SMR (the 2017 SMR) was consulted on between July and September 2017 and was issued to statutory bodies, non-government organisations and local authorities. It was made available on the [gov.uk](https://www.gov.uk) website, allowing comment by local interest groups and the public. A total of 107 responses to the 2017 SMR were received, as a result of which changes were made to the EIA SMR. A revised EIA SMR was published in October 2018 (the 2018 SMR) as part of the working draft ES (described in the following section).

3.2.3 The changes between the draft 2017 SMR and the publication of the 2018 SMR were set out in the EIA SMR Consultation Report<sup>8</sup>, also published in October 2018. The assessment set out in this ES follows the scope and methodology in the EIA SMR<sup>9</sup> in Volume 5 of this ES.

## Consultation on the working draft ES

3.2.4 As set out in Volume 1 Section 3, two parallel consultations were undertaken by HS2 Ltd in 2018: a consultation on the working draft ES and a consultation on the working draft EQIA. These consultations related to the full Phase 2b scheme (including both Eastern Leg and Western Leg). As part of the process of consultation, stakeholders were invited to comment on the full Phase 2b scheme and the working draft ES and working draft EQIA Report. Documents were made available on the [gov.uk](https://www.gov.uk) website.

3.2.5 As part of the consultation, information events were held in communities along both the Eastern and Western legs of the full Phase 2b route. Within the Hulseheath to Manchester Airport area, an event was held at Hale Barns (December 2018).

3.2.6 A total of 37,899 responses were received through the consultation on the working draft ES. These responses were analysed. The themes and issues relevant to the Hulseheath to Manchester Airport area included commentary on:

- interface with the A556 and how the route of the Proposed Scheme will cross under the M56;
- Manchester Airport High Speed station and its interface with existing transport modes including Metrolink, highways and with wider development proposals;
- proximity to Rostherne Mere Site of Special Scientific Interest (SSSI), Ramsar site and National Nature Reserve (NNR), and associated watercourses;
- the impact on Hancock's Bank and Davenport Green Wood ancient woodland;
- provision of public rights of way (PRoW) and routes used by cyclists during both the construction and operational stages of the Proposed Scheme;
- provision of access to severed agricultural land, including access under viaducts, and the provision of farm access tracks;
- proximity to and impact on local communities, in particular Ashley, Thorns Green, Hale Barns, Hale Bank, Ringway and Warburton Green, both during construction and operation;
- temporary and permanent road diversions causing delay to journeys in the Ashley, Thorns Green, Hale Barns, Hale Bank, Ringway and Warburton Green areas;

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<sup>8</sup> HS2 Ltd (2018), *HS2 Phase 2b: Crewe to Manchester and West Midlands to Leeds, Environmental Impact Assessment Scope and Methodology Report, Consultation Summary Report*. Available online at: <https://www.gov.uk/government/collections/hs2-phase-2b-crewe-manchester-environmental-statement>.

<sup>9</sup> Volume 5: Appendix CT-001-00001, Environmental Impact Assessment Scope and Methodology Report.

- requests for the route of the Proposed Scheme to be within a cutting to the south of Ashley rather than on embankment as requested by Esther McVey MP, Cheshire East Council, Ashley Parish Council and local residents in the Ashley area;
- the number and configuration of platforms at Manchester Airport High Speed station to allow efficient future integration of Northern Powerhouse Rail (NPR) services; and
- crossing of Timperley Brook at Manchester Airport High Speed station and the impact on connecting watercourses downstream.

3.2.7 A working draft ES Consultation Summary Report<sup>10</sup> has been published as part of the ES detailing how consultation responses have been taken into consideration in the development of the Proposed Scheme design and its assessment.

3.2.8 Feedback from that consultation and ongoing stakeholder engagement have been considered as part of the development of the Proposed Scheme, and the assessment and identification of mitigation opportunities for the Hulseheath to Manchester Airport.

## Consultation on design refinements

### Design refinements 2019

3.2.9 Design refinements to the Proposed Scheme in the Hulseheath to Manchester Airport area were consulted upon between June and September 2019. These design refinements were related to two pieces of new infrastructure near Ashley: a temporary construction railhead and a permanent maintenance base-rail facility, as well as passive provision for the proposed Manchester to Liverpool and London to Liverpool Junctions which provides future proofing for NPR and HS2 services. Details of the proposed design refinements, along with supporting information such as visualisations and plan and profile maps, were made available in public locations and online at the [gov.uk](https://www.gov.uk) website. As part of this process, stakeholders were invited to comment on the design refinements made to the full Phase 2b scheme since the working draft ES consultation.

3.2.10 As part of design refinement consultation, information events were held in areas where design refinements were being consulted. Within the Hulseheath to Manchester Airport area, information events were held at Hale (July 2019).

3.2.11 A total of 1,307 responses were received through the consultation on the 11 design refinements across the full Phase 2b scheme. These responses were analysed and the themes and issues relevant to the Hulseheath to Manchester Airport area included:

- impacts of construction and operation of Ashley railhead and Ashley infrastructure maintenance base – rail (IMB-R);

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<sup>10</sup> Volume 5: Appendix CT-007-00001, Working draft Environmental Statement Consultation Summary Report.

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- passive provision for NPR and properties potentially affected by NPR beyond the area of the Proposed Scheme;
- impact on local wildlife sites and woodland in the area including the Wood near Arden House, Ashley Brickworks, Erlam's Meadow, Hancock's Bank South, Ryecroft Covert, Ecclesfield Wood and Sugar Brook;
- severance and fragmentation of wildlife corridors in the local area;
- construction phasing and cumulative effects from construction of Ashley railhead, Ashley IMB-R, and passive provision for NPR;
- impacts upon water quality and hydrology of main watercourses and their tributaries;
- industrialisation of the rural area of Ashley as a result of the presence of Ashley railhead and Ashley IMB-R; and
- additional traffic movements on local roads as a result of increased construction activity.

3.2.12 A summary of how the responses received were considered in the development of the Proposed Scheme is outlined in the High Speed Two: Design Refinement Consultation Response<sup>11</sup> available online at the [gov.uk](https://www.gov.uk) website. This report relates to development of the Phase 2b Western Leg, referred to as the Proposed Scheme following the decision by government to prioritise this leg.

## Design refinements 2020

3.2.13 Further design refinements to the Proposed Scheme in the Hulseheath to Manchester Airport area were consulted upon between October and December 2020. These design refinements related to changes to the design of Manchester Airport High Speed station. Documents containing information about the proposed design refinements, along with supporting information such as visualisations and construction and operational plans, were made available at on the [gov.uk](https://www.gov.uk) webpage. Information was also made available on the [hs2.org.uk](https://www.hs2.org.uk) webpage, where an interactive map and a virtual exhibition room provided alternative ways for people to access the information. Printed copies of the consultation materials were sent free of charge following requests to the HS2 Helpdesk.

3.2.14 A total of 326 responses were received through the consultation on design refinements. These responses were analysed and the themes and issues relevant to the Hulseheath to Manchester Airport area included:

- welcoming the inclusion for passive provision for the integration of NPR and Metrolink at Manchester Airport High Speed station;
- the location of Manchester Airport High Speed station and distance from Manchester Airport;

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<sup>11</sup> HS2 Ltd (2020), *High Speed Two: Phase 2b Design Refinement Consultation*. Available online at: <https://www.gov.uk/government/collections/hs2-phase-2b-crewe-manchester-environmental-statement>.

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- visual impacts on local residents due to the raising of the Proposed Scheme and the addition of the car parks at Manchester Airport High Speed station;
- the number of car parking spaces proposed at Manchester Airport High Speed station;
- the capacity of the road design to accommodate forecast change in demand for HS2 and NPR;
- impacts on local roads including the use of heavy goods vehicles (HGV)/movement of excavated material during the construction phase;
- change to views, green space and the character of the local countryside;
- impact on local wildlife sites and woodland in the area including the Davenport Green ancient woodland and Site of Biological interest (SBI);
- impacts upon water quality and hydrology of main watercourses, including Timperley Brook and associated tributaries;
- concern that the construction works associated with temporary material stockpiles could cause dust, air pollution and noise impacts;
- impact on local roads, particularly during construction, including specific roads such as Brooks Drive, Castle Mill Lane, Runger Lane and Thorley Lane; and
- the adequacy of pedestrian and cycling connectivity.

3.2.15 A summary of the comments received is available at the [gov.uk](https://www.gov.uk) website.

## 3.3 Engagement and consultation with stakeholder groups

### Communities

- 3.3.1 Community stakeholders in the Hulseheath to Manchester Airport area include a range of local interest groups, local facility and service providers, places of worship, schools and educational establishments, cultural, leisure and sports stakeholders.
- 3.3.2 The purpose of this engagement has been to provide affected communities with information on the development of the Proposed Scheme and to give the opportunity to raise issues in relation to the design and assessment of the Proposed Scheme. Feedback from communities has helped inform the baseline information and evolving assessment of impacts in this ES and concurrent EQIA, as well as identify opportunities for mitigation within the design.
- 3.3.3 Programmes of public information events were held to share new information with communities and engage them on it. HS2 Ltd notified people of these by sending leaflets to addresses along the route, advertising in local media and via social media. Public information events were held in September 2017, between June and July 2018, October and December 2018, June and July 2019. In October and November 2020, information events were held using online channels including webinars and a virtual exhibition room. Information events were held in June and July 2021 using a combination of in-person

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information events and online webinars. Members of local communities and other interested parties were invited to engage on issues pertinent to the development of the Proposed Scheme design and its assessment.

3.3.4 Engagement has been, and will continue to be, undertaken with community stakeholders, particularly those close to the Proposed Scheme. These stakeholders include educational establishments, organisations with specialist interest or those catering to the needs of vulnerable people within the community. This has informed the assessment of community and health impacts in this ES, whilst also informing the concurrent EQIA.

3.3.5 Table 6 summarises key engagement undertaken with community stakeholders to date, including the focus of the engagement and how this has informed the design and assessment of the Proposed Scheme.

**Table 6: Engagement to date with community stakeholders**

Stakeholder	Area of focus	How this has informed the design and assessment of the Proposed Scheme
Bucklow Manor Nursing Home	Meeting to discuss the proximity of the construction traffic routes and the construction compounds in relation to Bucklow Manor Nursing Home.	Information has been used to improve understanding of baseline conditions and provide an opportunity to consider and discuss any mitigation that may be required.
Children’s Adventure Farm Trust	Meeting to discuss potential impacts on the Children’s Adventure Farm Trust, specifically regarding accessibility and construction impacts and also provided an opportunity to inform the EQIA. Further meeting to review the Proposed Scheme and confirm reduction of impacts following Millington Lane realignment and overview of proposed utilities diversion impacts.	Information has been used to improve understanding of baseline conditions and provide an opportunity to consider and discuss any mitigation that may be required. In response to engagement feedback, Millington Lane has been realigned further from the Children’s Adventure Farm Trust.
Hale Barns Cricket Club	Meeting to provide an update on the Proposed Scheme, consultation activities and to gather information on baseline conditions and potential impacts on the Hale Barns Cricket Club.	Information has been used to improve understanding of baseline conditions and provide an opportunity to consider and discuss any mitigation that may be required.
Hale Barns residents’ group	Series of meetings to provide an update on the Proposed Scheme and consultation activities and to gather information on baseline conditions and potential impacts on the community, including; <ul style="list-style-type: none"> <li>• construction traffic;</li> <li>• temporary and permanent road diversions;</li> <li>• proposals for car parking at Manchester Airport High Speed station;</li> <li>• M56 East tunnel, the proposed crossing under the M56;</li> <li>• the proposal for the extension of Metrolink; and</li> <li>• alternatives to the cutting at Hale Barns.</li> </ul>	Information obtained through engagement has been used to improve understanding of community baseline conditions and provide an opportunity to consider and discuss any mitigation that may be required.



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Stakeholder	Area of focus	How this has informed the design and assessment of the Proposed Scheme
Hasty Lane Pony Sanctuary	Meetings to gather information for the ES baseline related to activities at Hasty Lane Pony Sanctuary, which is located within the land required for construction of the Proposed Scheme.	Information has been used to improve understanding of baseline conditions and provide an opportunity to consider and discuss any mitigation that may be required.
Higher Thorns Green Farm and Fairfield Care Ltd	Meetings to gather information for the ES baseline related to activities at Higher Thorns Green Farm and identify potential impacts on the community. The Higher Thorns Green Farm includes a working farm that provides social and educational farm experiences and hosts the Fairfield Farm Project (run by Fairfield Care Ltd), which is an outreach programme for children and adults with learning disabilities, receiving care. This also provided an opportunity to inform the EQIA.	Information has been used to improve understanding of baseline conditions and provide an opportunity to consider and discuss any mitigation that may be required. Discussions on future arrangements for the Farm Project are ongoing with Fairfield Care Limited.
Ringway Golf Club	Meeting to provide an update on the Proposed Scheme, consultation activities and to gather information on baseline conditions and potential impacts on Ringway Golf Club.	Information has been used to improve understanding of baseline conditions and provide an opportunity to consider and discuss any mitigation that may be required.
St Elizabeth's Church, Ashley	Meetings to gather information for the ES baseline on activities at St Elizabeth's Church. Potential impacts discussed included the impact of construction traffic and temporary and permanent road diversions.	Information has been used to improve understanding of baseline conditions and provide an opportunity to consider and discuss any mitigation that may be required.

## MPs, local authorities and parish councils

- 3.3.6 HS2 Ltd has offered to engage with all relevant MPs during the development of the Proposed Scheme in order to discuss key issues and concerns.
- 3.3.7 Direct engagement has also been offered to and undertaken with metropolitan, city, county, borough, unitary and parish councils within the Hulseheath to Manchester Airport area. The purpose of this engagement was to collate local baseline information and knowledge to inform the design and assessment, identify and understand local issues and concerns, provide access to wider stakeholders and communities and provide a mechanism for ongoing dialogue and discussion on the assessment and design development.
- 3.3.8 HS2 Ltd has offered to engage with all relevant MPs during the development of the Proposed Scheme in order to discuss key issues and concerns.
- 3.3.9 Table 7 summarises key engagement undertaken with MPs local authorities and parish councils to date, including the focus of the engagement and how this has informed the design and assessment of the Proposed Scheme.

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**Table 7: Engagement to date with MPs, local authorities and parish councils**

Stakeholder	Area of focus	How this has informed the design and assessment of the Proposed Scheme
Esther McVey MP for Tatton	Regular engagement activities with the MP and her office to discuss impacts on residents, farmers and the local community, as well as the management of property acquisitions. Raised issues regarding the location of Ashley railhead and the impact of construction traffic upon the local highways.	Feedback informed the planning of engagement and consultation activity in the local area, including the setting up of the Implementation Advisory Group (North) (see below). Information obtained through engagement was used to improve understanding of baseline conditions within the local community and for consideration of mitigation proposals.
Cheshire East Council	Series of meetings to discuss the Proposed Scheme, provide updates on consultation activities and understand potential impacts on the local community. Discussion points included proposed highway realignments, integration with local authority transport strategy and regeneration opportunities, as well as noise and visual impacts on Ashley during the construction and operation of the Proposed Scheme. Technical meetings were held to collate baseline data and discuss key assessment topics including but not limited to air quality; ecology; land quality; sound, noise and vibration; traffic and transport; and waste. Discussions also included consideration of impacts on Tatton Park.	Information has been used to improve understanding of baseline conditions and provide an opportunity to consider and discuss any mitigation that may be required.
Manchester City Council	Extensive engagement with Manchester City Council regarding Manchester Airport High Speed station and its interface with Manchester Airport, the surrounding communities and the local and strategic road network including the M56. Series of meetings to discuss the Proposed Scheme, provide updates on consultation activities and understand potential impacts on communities, businesses and emergency services, particularly during construction. Consideration was also given as to the potential impact upon Greater Manchester Spatial Framework. Technical meetings were held to collate baseline data and discuss key assessment topics including but not limited to air quality; land quality; sound, noise, and vibration; traffic and transport; and waste.	Information has been used to improve understanding of baseline conditions and provide an opportunity to consider any mitigation that may be required. In response to local engagement there have been a number of changes to the Proposed Scheme in this area including a review of the highways configuration to access Manchester Airport High Speed station, provision of additional road traffic capacity, as well as the integration of Metrolink.

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Stakeholder	Area of focus	How this has informed the design and assessment of the Proposed Scheme
Trafford Metropolitan Borough Council	<p>Extensive engagement with Trafford Metropolitan Borough Council regarding the Manchester Airport High Speed station and its interface with Manchester Airport, the surrounding communities and the local and strategic road network including the M56. Series of meetings to discuss the Proposed Scheme, provide updates on consultation activities and understand potential impacts on communities, businesses and emergency services, particularly during construction. Consideration was also given as to the potential impact upon the Greater Manchester Spatial Framework. Technical meetings were held to collate baseline data and discuss key assessment topics including but not limited to air quality; land quality; sound, noise and vibration; traffic and transport; and waste.</p>	<p>Information has been used to improve understanding of baseline conditions and provide an opportunity to consider any mitigation that may be required. In response to local engagement there have been a number of changes to the Proposed Scheme in this area including a review of the highways configuration to access Manchester Airport High Speed station, provision of additional road traffic capacity, as well as the integration of Metrolink.</p>
<p>Greater Manchester stakeholders (this includes representation from national and local government organisations and transport infrastructure companies including Manchester City Council; Trafford Metropolitan Borough Council; Transport for Greater Manchester; Transport for the North; Highways England; and Manchester Airports Group)</p>	<p>Series of meetings to discuss the Proposed Scheme and understand key concerns and potential impacts on the local community, connectivity with Manchester Airport and impacts on the strategic and local road network. Discussion in regard to Manchester Airport High Speed station, and provision sought by local authorities for:</p> <ul style="list-style-type: none"> <li>• provision of integrated Metrolink stop at Manchester Airport High Speed station;</li> <li>• connectivity between Manchester Airport High Speed station and proposed Masterplan development sites;</li> <li>• potential to integrate NPR services with proposed HS2 rail infrastructure and stations;</li> <li>• allowance for the Timperley Wedge Masterplan development sites to the west of Manchester Airport High Speed station;</li> <li>• connectivity to the strategic road network, local road network, airport and surrounding planned and potential developments (including improved highway/public transport links); and</li> <li>• appropriate car parking provision to serve Manchester Airport High Speed station.</li> </ul>	<p>Feedback has been used to improve understanding of baseline conditions and provide an opportunity to consider and discuss any mitigation that may be required. This engagement has shaped the proposed design of Manchester Airport High Speed station, influenced the proposals for the road network and informed the construction and operational design. In response to local engagement there have been a number of changes to the Proposed Scheme in this area including a review of the highways configuration to access Manchester Airport High Speed station, provision of additional road traffic capacity, as well as the integration of Metrolink.</p>
Cheshire Association of Local Councils	<p>General introductory and project update meeting, including ongoing design development.</p>	<p>Information has been used to inform consultation and engagement activities with Parish Councils in Cheshire.</p>

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Stakeholder	Area of focus	How this has informed the design and assessment of the Proposed Scheme
Ashley Parish Council	Series of meetings to discuss the Proposed Scheme, provide updates on consultation activities and understand potential impacts on the local community. Key areas for discussion including the embankment south-west of Ashley and associated concerns regarding community severance of Ashley, visual and noise impacts, and highways disruption and a request for Birkin Brook embankment and Ashley embankment to be replaced with a cutting. During the Design Refinement Consultation briefings additional concerns were raised by the Council regarding the location of Ashley railhead and Ashley IMB-R. Both at the Implementation Advisory Group (North) and separately, the council participated in briefings provided by specialists regarding impacts of the Proposed Scheme on water resources along with broader environmental matters.	Information has been used to improve understanding of baseline conditions and provide an opportunity to consider any mitigation that may be required. In response to local engagement consideration was given for a cutting to the south-west of Ashley to form part of the Proposed Scheme.
Millington Parish Council	Meeting to discuss the impacts of the Proposed Scheme including highways diversions, the realignment of Millington Lane, and the appropriateness of highways identified as construction routes. Concerns raised about impact to Rostherne Mere (SSSI, Ramsar, NNR) during construction and operation. Regular briefings provided both with the Parish and at Implementation Advisory Group (North). The Parish Council has also participated in specialist meetings relating to Design Refinement Consultation matters relating to water resources and broader environmental matters.	Information has been used to improve understanding of baseline conditions and provide an opportunity to consider any mitigation that may be required. The feedback received from the Parish council has helped to inform the construction traffic modelling in this area and drainage design around Blackburn's Brook and Rostherne Mere (SSSI, Ramsar, National Nature Reserve).
Rostherne Parish Council	Meeting to discuss the impacts of the Proposed Scheme including highways diversions and construction traffic routing. Issues raised about the impact to Rostherne Mere (SSSI, Ramsar, National Nature Reserve) during construction and operation. Regular briefings provided both with the Parish and at the Implementation Advisory Group (North). The Parish Council has also participated in specialist meetings relating to Design Refinement Consultation matters relating to water resources and broader environmental matters.	Information used to improve understanding of baseline conditions of the Proposed Scheme as well as potential impacts and mitigation opportunities. The feedback received from the Parish has helped to inform the construction traffic modelling in this area and drainage design around the Blackburn's Brook and Rostherne Mere (SSSI, Ramsar, National Nature Reserve).

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Stakeholder	Area of focus	How this has informed the design and assessment of the Proposed Scheme
Ringway Parish Council	Meeting alongside Hale Barns residents' group to discuss the Proposed Scheme and understand potential impacts on the local community. Ringway Parish Council also attended technical meetings to discuss highways and construction routes, as well as drainage and water receptors in the area. Potential impacts raised related to the impact of construction traffic, temporary and permanent road diversions.	Information used to improve understanding of baseline conditions of the Proposed Scheme as well as potential impacts and mitigation opportunities.
Implementation Advisory Group (North) A HS2 facilitated group with the following membership: Ashley, Millington, Rostherne and Ringway local parish councils, Esther McVey MP and Councillors Kate Parkinson (High Leigh and Tatton) and Charlotte Leach (Mobberley Ward) elected members of Cheshire East Council	There have been a series of meetings to update the group on the Proposed Scheme and the consultation process, collate local data and understand their areas of interest and concern. These have included technical meetings to discuss issues raised associated with highways and construction routes, the drainage and water flow in the area and the proposed NPR connections.	Information used to improve understanding of baseline conditions, including understanding the local hydrological flows and provide an opportunity to consider any mitigation that may be required.
A HS2 Ltd facilitated meeting with attendees from Millington, Rostherne and Ashley parish councils.	A technical meeting to discuss issues raised associated with highways and construction traffic routes, earthworks and the movement of excavated material in relation to construction compound locations.	Information used to improve understanding of baseline conditions of the Proposed Scheme as well as potential impacts and mitigation opportunities.

3.3.10 Local authorities and parish councils will continue to be engaged as part of the development of the Proposed Scheme with ongoing dialogue on key topics such as highways, PRoW and the draft Code of Construction Practice (CoCP)<sup>12</sup>.

## Expert, technical and specialist groups

3.3.11 Engagement has been undertaken with technical and specialist organisations to provide appropriate specialist input to inform the design and assessment of the Proposed Scheme. This includes engagement with statutory bodies, local authorities and utility companies operational within the Hulseheath to Manchester Airport area.

3.3.12 Engagement with metropolitan, city, county, unitary and borough councils within the Hulseheath to Manchester Airport area has been undertaken in order to:

- collate local baseline information;
- identify and understand issues and concerns; and

<sup>12</sup> Volume 5: Appendix CT-002-00000, draft Code of Construction Practice (CoCP).

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- provide a mechanism for ongoing dialogue and discussion on the assessment and design development.

- 3.3.13 Engagement has focused on the technical areas that inform the assessment, including air quality, landscape and visual, sound, noise and vibration and traffic and transport. Briefings were offered to specialist and technical stakeholders across the Proposed Scheme during the period of consultation on the working draft ES to provide information on the evolving design and assessment of the Proposed Scheme in their respective areas.
- 3.3.14 Engagement has been offered to blue light emergency service stakeholders including fire and rescue, police force and ambulance service providers, with meetings undertaken to share information on the Proposed Scheme. This has included design review meetings to present design detail on fire engineering and safety design aspects of the Proposed Scheme.
- 3.3.15 Engagement will continue with these stakeholders as the project progresses, including consultation to support the development of local traffic management plans prior to construction starting.
- 3.3.16 Table 8 includes engagement undertaken with technical and specialist groups and how this has informed the design and assessment of the Proposed Scheme in the Hulseheath to Manchester Airport area.

**Table 8: Engagement to-date with expert, technical and specialist groups**

Type	Stakeholder	Area of focus	How this has informed the design and assessment of the Proposed Scheme
Statutory and national	British Geological Survey	Geological conditions	Information has been used to improve understanding of baseline geological issues route-wide and specifically at Rostherne cutting and M56 East tunnel, locations to refine the assessment and any proposed mitigation.
Statutory and national	Canal & River Trust	Waterways	Information has been used to inform the historic environment, landscape and visual assessment and improve understanding of baseline conditions for route-wide application, including the water resources and flood risk assessment.
Statutory and national	Coal Authority	Coal mining	Information has been used to improve understanding of baseline conditions for coal mining route-wide, informing the assessment and proposed mitigation.
Statutory and national	Department for Environment, Food and Rural Affairs	Agriculture and land quality issues	Informed agricultural and land quality assessment methodology, baseline conditions for route-wide application, assessment and proposed mitigation.

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Type	Stakeholder	Area of focus	How this has informed the design and assessment of the Proposed Scheme
Statutory and national	Environment Agency	Land quality, ecology and biodiversity and water and flood risk issues	Informed land quality, ecology and biodiversity, water resources, surface water flood risk and Water Framework Directive methodology. Improved understanding of baseline conditions, (including the provision of data), along the route of the Proposed Scheme and the proposed mitigation including at the River Bollin, Blackburn's Brook, Birkin Brook (that flows from Rostherne Mere) and Timperley Brook crossing locations.
Statutory and national	Animal and Plant Health Agency (APHA)	Land quality issues	Information on the location of farm burial and pyre sites associated with the 1967/8 and 2001 outbreaks of foot and mouth disease as well as anthrax infected cattle burial sites has been obtained from APHA. This has been used to improve understanding of land contamination baseline conditions along the route of the Proposed Scheme and to inform the assessment and proposed mitigation.
Statutory and national	Forestry Commission	Forestry, ecology and landscape issues	Informed the ecological and landscape assessment methodology, improved understanding of baseline conditions and the assessment and proposed mitigation.
Statutory and national	Highways England	Strategic road network, traffic and transport issues	Informed the assessment of road network capacity and identification of proposed future Highways England works that informed the design, including the potential widening of the M56. Highways England also informed the design of the crossing under the A556, the M56, the design of the M56 junction 6 and the temporary realignment of the M56 during construction.
Statutory and national	Historic England	Nationally designated heritage assets and the heritage assessment methodology	Informed methodology for assessing setting and impacts on historic landscape at national and regional level. Identification and assessment methodology of designated and non-designated heritage assets including the Grade II listed Buckhall.
Statutory and national	National Farmers Union	Farming issues	Information was used to improve understanding of route-wide issues for farmers and growers.
Statutory and national	Country Land and Business Association	Farming issues	Information was used to improve understanding of route-wide issues for farmers and growers.
Statutory and national	National Trust	Owned assets and related impacts	Informed considerations around National Trust owned assets and factors to be considered in the design and assessment of the Proposed Scheme, including at Dunham Massey and Tatton Park.

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Type	Stakeholder	Area of focus	How this has informed the design and assessment of the Proposed Scheme
Statutory and national	Natural England	Ecology, agricultural land quality, surface water, groundwater and landscape and visual related issues	Provided further information regarding the natural environment on a route-wide basis. Informed methodological approach and detailed local conditions and factors to be taken into consideration in the assessment including Rostherne Mere and Davenport Green Wood ancient woodland.
Statutory and national	Network Rail	Rail infrastructure	Informed route-wide considerations around rail infrastructure network, including the crossing over the Mid-Cheshire line at Ashley and factors to be considered in the design and assessment of the Proposed Scheme.
Statutory and national	Public Health England	Public health issues	Informed methodology and factors to be taken into consideration in the health assessment.
Statutory and national	The Woodland Trust	Woodland and ancient woodland issues	Information was used to improve understanding around potential ancient woodland sites and informed methodology and detailed local conditions and factors to be taken into consideration in the assessment.
Statutory sub-national	Transport for the North	Connectivity to Northern Powerhouse Rail	Informed assessment around integration of NPR including at Manchester Airport High Speed station and Manchester Piccadilly High Speed station.
Local Authority technical meetings	Cheshire East Council	Meetings to discuss the sound, noise and vibration and air quality assessments including proposed mitigation.	Information used to improve understanding of baseline conditions and provide an opportunity to consider any mitigation that may be required.
Local Authority technical meetings	Cheshire East Council	Meeting to discuss the ecology and biodiversity assessment including the mitigation strategy.	Information used to improve understanding of baseline conditions, support the identification of sensitive ecological sites, and consider appropriate mitigation and compensation for habitat loss associated with the Proposed Scheme.
Local Authority technical meetings	Cheshire East Council	Meetings with technical leads to collate data and discuss the historic environment assessment.	Improved understanding of local baseline conditions and informed the design and assessment of the Proposed Scheme.
Local Authority technical meetings	Cheshire East Council	Meeting to discuss known and potential contaminated land, proposed assessment and mitigation measures for land quality.	Identified local areas of land contamination, potential impacts and proposed mitigation.
Local Authority technical meetings	Cheshire East Council	Meetings with technical leads to collate data and discuss landscape and visual impact impacts, viewpoint locations and site walkovers.	Informed the identification of viewpoint locations to be assessed and reported within the ES, as well as the extent of the landscape and visual study area. Obtained information to improve understanding of baseline conditions.



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Type	Stakeholder	Area of focus	How this has informed the design and assessment of the Proposed Scheme
Local Authority technical meetings	Cheshire East Council	Meeting to collate baseline data on socio-economic characteristics.	Information used to improve understanding of baseline conditions and provide an opportunity to consider any mitigation that may be required.
Local Authority technical meetings	Cheshire East Council	Meetings to provide information on the Proposed Scheme and obtain relevant baseline information and discuss transport survey requirements and assessment methodology relating to traffic and transport.	Improved understanding of local traffic flows, highways operations and future proposals, and informed the emerging design and assessment of the Proposed Scheme.
Local Authority technical meetings	Cheshire East Council	Meetings with the Lead Local Flood Authorities to provide information on the Proposed Scheme and obtain relevant baseline information related to water resources and flood risk.	Information used to improve understanding of baseline conditions and provide an opportunity to consider any mitigation that may be required. This includes the River Bollin, Blackburn's Brook, Birkin Brook (that flows from Rostherne Mere) and Timperley Brook crossing locations.
Local Authority technical meetings	Manchester City Council	Meetings to discuss the sound, noise and vibration and air quality assessments including proposed mitigation.	Information used to improve understanding of baseline conditions and provide an opportunity to consider any mitigation that may be required.
Local Authority technical meetings	Manchester City Council	Meetings with technical leads to collate data and discuss the historic environment assessment.	Information on local conditions and factors used to refine the design of the Proposed Scheme and assessment.
Local Authority technical meetings	Manchester City Council	Meetings with technical leads to collate data and discuss landscape and visual impacts, viewpoint locations and site walkovers.	Informed the identification of viewpoint locations to be assessed and reported within the ES, as well as the extent of the landscape and visual study area and obtaining information to improve understanding of baseline conditions.
Local Authority technical meetings	Manchester City Council	Meeting to discuss known and potential contaminated land, proposed assessment and mitigation measures for land quality.	Identified local areas of land contamination, potential impacts and proposed mitigation.
Local Authority technical meetings	Manchester City Council	Meeting to collate baseline data on socio-economic characteristics.	Information used to improve understanding of baseline conditions and provide an opportunity to consider any mitigation that may be required.
Local Authority technical meetings	Manchester City Council	Meetings to provide information on the Proposed Scheme and obtain relevant baseline information and discuss transport survey requirements and assessment methodology relating to traffic and transport.	Improved understanding of local traffic flows, highways operations and future proposals, and informed the emerging design and assessment of the Proposed Scheme.

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Type	Stakeholder	Area of focus	How this has informed the design and assessment of the Proposed Scheme
Local Authority technical meetings	Manchester City Council	Meetings with the Lead Local Flood Authorities to provide information on the Proposed Scheme and obtain relevant baseline information related to water resources and flood risk.	Information used to improve understanding of baseline conditions and provide an opportunity to consider any mitigation that may be required.
Local Authority technical meetings	Greater Manchester Combined Authority	Meetings with technical leads to collate data and discuss the historic environment assessment.	Improved understanding of local baseline conditions and informed the design and assessment of the Proposed Scheme.
Local Authority technical meetings	Greater Manchester Combined Authority	Meetings with technical leads to collate data and discuss landscape and visual impacts, viewpoint locations and site walkovers.	Informed the identification of viewpoint locations to be assessed and reported within the ES, as well as the extent of the landscape and visual study area and obtaining information to improve understanding of baseline conditions.
Local Authority technical meetings	Greater Manchester Combined Authority	Meeting to collate baseline data on socio-economic characteristics.	Information has been used to improve understanding of baseline conditions and provide an opportunity to consider any mitigation that may be required.
Local Authority technical meetings	Greater Manchester Combined Authority and Transport for Greater Manchester	Meetings to provide information on the Proposed Scheme and obtain relevant baseline information and discuss transport survey requirements and assessment methodology relating to traffic and transport.	Informed the development of passive provision for a Metrolink connection at Manchester Airport High Speed station, informed the design development of Manchester Airport High Speed station, the local road network and transport related activity at Manchester Airport High Speed station.
Statutory sub-national	Manchester Airports Group	Meetings with technical leads to collate data and discuss the historic environment assessment.	Improved understanding of local baseline conditions and informed the design and assessment of the Proposed Scheme.
Statutory sub-national	Manchester Airports Group	Meetings with technical leads to collate data and discuss landscape and visual impacts, viewpoint locations and site walkovers.	Informed the identification of viewpoint locations to be assessed and reported within the ES, as well as the extent of the landscape and visual study area and obtaining information to improve understanding of baseline conditions.
Statutory sub-national	Manchester Airports Group	Meetings to provide information on the Proposed Scheme and obtain relevant baseline information and discuss transport survey requirements and assessment methodology relating to traffic and transport.	Informed the development of passive provision for a Metrolink connection at Manchester Airport High Speed station, informed the design development of Manchester Airport High Speed station, the local road network and transport related activity at Manchester Airport High Speed station.

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Type	Stakeholder	Area of focus	How this has informed the design and assessment of the Proposed Scheme
Statutory sub-national	Manchester Airports Group	Meetings to provide information on the Proposed Scheme and obtain relevant baseline information and discuss Aerodrome Safeguarding requirements including wildlife strike risk and EMI.	Information has been used to improve understanding of baseline conditions associated with wildlife strike risk and EMI and provide an opportunity to consider any mitigation that may be required. Engagement with MAG is ongoing regarding the assessment of Aerodrome safeguarding.
Local Authority technical meetings	Trafford Metropolitan Borough Council	Meeting to discuss the sound, noise and vibration and air quality assessments including proposed mitigation.	Information has been used to improve understanding of baseline conditions and provide an opportunity to consider any mitigation that may be required.
Local Authority technical meetings	Trafford Metropolitan Borough Council	Meetings with technical leads to collate data and discuss the historic environment assessment.	Information has been used to improve understanding of baseline conditions and inform the design of the Proposed Scheme and the assessment. This included the Grade II listed Buckhall.
Local Authority technical meetings	Trafford Metropolitan Borough Council	Meeting to discuss known and potential contaminated land, proposed assessment and mitigation measures for land quality.	Identified local areas of land contamination, potential impacts and proposed mitigation.
Local Authority technical meetings	Trafford Metropolitan Borough Council	Meetings with technical leads to collate data and discuss landscape and visual impacts, viewpoint locations and site walkovers.	Informed the identification of viewpoint locations to be assessed and reported within the ES, as well as the extent of the landscape and visual study area and obtaining information to improve understanding of baseline conditions.
Local Authority technical meetings	Trafford Metropolitan Borough Council	Meeting to collate baseline data on socio-economic characteristics.	Information has been used to improve understanding of baseline conditions and provide an opportunity to consider any mitigation that may be required.
Local Authority technical meetings	Trafford Metropolitan Borough Council	Meetings to provide information on the Proposed Scheme and obtain relevant baseline information and discuss transport survey requirements and assessment methodology relating to traffic and transport.	Improved understanding of local traffic flows, highways operations and future proposals, and informed the emerging design and assessment of the Proposed Scheme.
Local Authority technical meetings	Trafford Metropolitan Borough Council	Meetings with the Lead Local Flood Authorities to provide information on the Proposed Scheme and obtain relevant baseline information related to water resources and flood risk.	Information has been used to improve understanding of baseline conditions and provide an opportunity to consider any mitigation that may be required.
Local Authority technical meetings	Transport for Greater Manchester	Meeting to provide information on the Proposed Scheme, with a focus on wider impacts relating to air quality.	Information used to improve understanding of baseline conditions and provide an opportunity to consider any mitigation that may be required.

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Type	Stakeholder	Area of focus	How this has informed the design and assessment of the Proposed Scheme
Local technical specialist group	Cheshire Archaeology Planning Advisory Service	Meetings with technical leads to collate data and discuss the historic environment assessment.	Improved understanding of local baseline conditions and informed the design and assessment of the Proposed Scheme.
Local technical specialist group	Cheshire Wildlife Trust	Meeting to discuss the Proposed Scheme, provide an update on consultation activities and to understand key areas of concern relating to impacts on local wildlife sites.	Identified sensitive ecological sites and appropriate mitigation and compensation for habitat loss associated with the Proposed Scheme.
Local technical specialist group	Greater Manchester Archaeological Advisory Service	Meetings with technical leads to collate data and discuss the historic environment assessment.	Improved understanding of local baseline conditions and informed the design and assessment of the Proposed Scheme.
Local technical specialist group	Greater Manchester Ecology Unit	Meeting to collate data related to the ecological assessment.	Information on local conditions and factors used to refine the Proposed Scheme design and assessment.
Utilities	Cadent Gas	Network provision of gas	Informed considerations relating to the utilities network and factors to be considered in the design and assessment of the Proposed Scheme, as well as mitigation requirements. This included the diversion of the existing high-pressure gas pipeline at various locations including Agden Brook viaduct, Millington Clough, the realigned Peacock Lane, Sunbank Lane overbridge, Ashley Road and Ashley IMB-R satellite compound.
Utilities	Electricity North West Limited	Network provision of electricity	Informed considerations relating to the utilities network and factors to be considered in the design and assessment of the Proposed Scheme. This comprised the provision of permanent District Network Operator (DNO) electricity substations to provide permanent power to several sites including Manchester Airport High Speed station and proposed construction/materials storage compounds including Manchester Airport High Speed station main compound, and permanent non-traction power requirements. Discussions were also held regarding assets at Runger Lane, Thorley Lane, Ringway Road, and the electricity distribution site at Styal Road in Moss Nook.

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Type	Stakeholder	Area of focus	How this has informed the design and assessment of the Proposed Scheme
Utilities	Mainline Pipelines	Network provision of fuel	Informed considerations relating to the utilities network and factors to be considered in the design and assessment of the Proposed Scheme including the diversion of a Mainline pipeline asset crossing Agden Brook viaduct, and protection works beneath Boothbank Lane.
Utilities	National Grid Transmission (Electric)	Network provision of electricity	Informed considerations relating to the utilities network and factors to be considered in the design and assessment of the Proposed Scheme including new permanent and temporary 400kV transmission towers at Peacock Lane grid supply point, the proposed diversion of the 400kV overhead powerline at Rycroft Covert, Mobberley Brook, Peacock Lane and the diversion of National Grid Electric Transmission assets at other locations, as well as mitigation requirements.
Utilities	Openreach	Network provision of telecommunications services	Identified telecommunication services and informed understanding of potential impacts of the Proposed Scheme and mitigation requirements. This included satellite compounds at Ashley IMB-R, M56 East, A556, Birkin Brook, Birkenheath Covert, Mobberley Road North and the main compound at Manchester Airport High Speed station. Discussions were also held regarding assets at locations including Millington Lane realignment, Peacock Lane viaduct, Cherry Tree Farm, the realigned Castle Mill Lane, Thorley Lane overbridge, along with provisions to re-connect the existing supplies for Orchard House on to the assets being diverted into the realigned Castle Mill Lane.
Utilities	Scottish Power Energy Networks	Network provision of electricity and gas	Informed considerations relating to the utilities network and factors to be considered in the design and assessment of the Proposed Scheme including the temporary electricity supplies to M56 East satellite compound and Manchester Airport High Speed station north satellite compound. Discussions were also held regarding the proposed diversion of assets at including 132kV overhead lines at Peacock Lane overbridge, 11kV cable diversion at Yarwood Heath Farm accommodation overbridge, the proposed realignment of Castle Mill Lane and 11kV overhead lines at Sunbank Lane.

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Type	Stakeholder	Area of focus	How this has informed the design and assessment of the Proposed Scheme
Utilities	United Utilities	Network provision of potable water and wastewater services	Informed considerations relating to the utilities network and factors to be considered in the design and assessment of the Proposed Scheme, as well as mitigation requirements. This included the provision of potable water and sewerage services to Manchester Tunnel Portal South compound, and to the satellite compounds at Sunbank Lane, M56 East, Manchester Airport High Speed station south, Birkin Brook, Manchester Airport High Speed station north as well as Manchester Airport High Speed station main compound. Discussions were also held relating to the impacts on assets at Millington Lane overbridge, A556 Chester Road overbridge, Ashley Road, realigned Mobberley Road and Castle Mill Lane.
Utilities	Vodafone and O2 Mobile Masts	Network provision of telecommunications services	Identified telecommunication services and informed understanding of potential impacts of the Proposed Scheme and mitigation requirements including relocation of the existing telecommunications mast at Manchester Tunnel south portal main compound.
Utilities	Vodafone Ltd (Below Ground Assets)	Network provision of telecommunications services	Identified telecommunication services and informed understanding of potential impacts of the Proposed Scheme and mitigation requirements including the proposed diversion of assets at Thorley Lane overbridge.
Utilities	National Grid Transmission (Gas)	Network provision of gas	Informed considerations relating to the utilities network and factors to be considered in the design and assessment of the Proposed Scheme including the diversion of the existing high-pressure gas pipeline at various locations including Agden Brook viaduct, Boothbank Lane, and at other locations, as well as mitigation requirements.

3.3.17 HS2 Ltd has pursued engagement with all affected utility and technical stakeholders across the Proposed Scheme. Where possible HS2 Ltd has obtained information and designs from these stakeholders to inform and promote the collaborative development of the scheme.

3.3.18 Further information about topic-specific engagement is provided in Sections 4 to 15, where relevant.

## **Directly affected individuals, farmers and growers**

3.3.19 This group includes those with land and property potentially affected by the Proposed Scheme, including individuals, farmers and growers within the Hulseheath to Manchester Airport area.

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- 3.3.20 As part of information events held in October 2018, June 2019, between October and November 2020 and between June and July 2021 (including using online channels where necessary), targeted engagement was also offered to those stakeholders who have land or property directly affected by the construction and operation of the Proposed Scheme. These appointments provided an opportunity to meet with technical experts, to gain a better understanding of the emerging design and share their thoughts on how this might affect them. Whilst these opportunities did not replace their right to respond formally to consultation, their feedback has also been considered during design development.
- 3.3.21 Information events provided affected individuals, farmers and growers with the opportunity to gain an understanding of compensation and assistance available for property owners. Facilities were available at the events to have private meetings with HS2 Ltd staff.
- 3.3.22 In addition, engagement has been offered via letter and through known land agents to all farmers and growers directly affected by the Proposed Scheme whether permanently or temporarily. Where offers have been accepted and it has been possible, visits have been made to the land and property affected although some interviews have needed to be undertaken virtually. The purpose of this engagement has been to obtain baseline information and provide the opportunity to raise issues and discuss mitigation in relation to the Proposed Scheme. Information gathered from farm interviews has informed the assessment presented in this ES. Key issues raised through this engagement include long-term viability of the farm holdings, holding severance, access to severed land parcels, impacts on land drainage and additional land requirements for ecological, landscape and other mitigation.
- 3.3.23 Engagement with directly affected individuals and growers will continue as the project develops and opportunities for engagement with farmers and growers will continue to be offered throughout the parliamentary process.
- 3.3.24 Engagement is also continuing with key representatives of the farmers and growers industry, in particular with the National Farmers Union and Country Land and Business Association.

## **Major asset owners and businesses**

- 3.3.25 This group includes those with property potentially affected by the Proposed Scheme, including major asset holders and businesses within the Hulseheath to Manchester Airport area.
- 3.3.26 As part of the information events held in October 2018, June 2019, between October and November 2020 and between June and July 2021 (including using online channels where necessary), targeted engagement was also offered to those stakeholders who have land, property or business operations directly affected by the construction and operation of the Proposed Scheme. These appointments provided an opportunity for these stakeholders to meet with technical experts, to gain a better understanding of the emerging design and share their thoughts on how this might affect them. Whilst these opportunities did not

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replace their right to respond formally to consultation, their feedback has also been considered during design development.

- 3.3.27 Engagement has been undertaken with major asset owners and businesses within the Hulseheath to Manchester Airport area including Airport Parking – Higher Thorns Green Farm, Ashley Plant Hire & Reclamation Ltd, Cherry Tree Farm, Cussons Properties Ltd, Holiday Inn Express, Manchester Airport Marriott Hotel, Manchester Airports Group, Oakcroft Guest House, Royal London Asset Management, Tatton Estate Group and Wythenshawe Hospital. The purpose of this engagement has been to obtain baseline information and provide these stakeholders with the opportunity to raise issues and discuss mitigation in relation to the Proposed Scheme.
- 3.3.28 Key issues raised during this engagement have included:
- impacts on local highways during peak morning and evening periods as a result of road closures;
  - extent of land required for construction;
  - distance of Manchester Airport High Speed station from Manchester Airport; and
  - concerns in regard to diversions and the additional volume of construction traffic during works to the M56 and the M6 and the impact of both in relation to potential delays for customers and deliveries.
- 3.3.29 Engagement with these stakeholders will continue as the project develops.



## 4 Agriculture, forestry and soils

### 4.1 Introduction

- 4.1.1 This section provides a description of the current baseline for agriculture, forestry and soils and the likely impacts and significant effects of the construction and operation of the Proposed Scheme within the Hulseheath to Manchester Airport area. Consideration is given to the extent and quality of the soil and land resources underpinning the primary land use activities of farming and forestry, and the physical and operational characteristics of enterprises engaged in these activities. Consideration is also given to diversification associated with the primary land uses, and to related land-based enterprises, notably equestrian activities.
- 4.1.2 Engagement with farmers and landowners has been undertaken. The purpose of the engagement has been to obtain baseline information on the scale and nature of the farm and forestry operations and related farm-based uses, and to provide farmers and landowners with the opportunity to raise issues and discuss mitigation in relation to the Proposed Scheme. Engagement undertaken with farmers and landowners will be documented in the farm pack for each farm holding as set out within a Phase 2b Farmers and Growers Guide<sup>13</sup>.
- 4.1.3 Details of published and publicly available information used in the assessment, and the results of surveys undertaken within this area, are contained in Volume 5: Appendix AG-001-0MA06 and shown on Map Series AG-01 (Agricultural Holdings), AG-02 (Soil Associations) and AG-04 (Agricultural Land Classification) (Volume 5, Agriculture, forestry and soils Map Book).
- 4.1.4 Maps showing the location of the key environmental features (Map Series CT-10) and the key construction (Map Series CT-05) and key operational (Map Series CT-06) features of the Proposed Scheme can be found in the Volume 2: MA06 Map Book. The Proposed Scheme is described in Section 2.

### 4.2 Scope, assumptions and limitations

- 4.2.1 The assessment scope, key assumptions and limitations for the agriculture, forestry and soils assessment are set out in Section 8 of Volume 1 and the EIA Scope and Methodology Report (SMR)<sup>14</sup>.
- 4.2.2 The study area for the agriculture, forestry and soils assessment covers all land required for the construction and operation of the Proposed Scheme. The resources and receptors that are assessed within this area are agricultural land, forestry land and soils, together with farm

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<sup>13</sup> To be prepared for Phase 2b in due course, as per previous Phases found here: <https://www.gov.uk/government/publications/hs2-guide-for-farmers-and-growers>.

<sup>14</sup> Volume 5: Appendix CT-001-00001, Environmental Impact Assessment Scope and Methodology Report.

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and rural holdings. The assessments of the impacts on agricultural land quality and forestry land are made with reference to the prevalence of best and most versatile (BMV) land and forestry land in the general locality, taken as a 4km corridor centred on the route of the Proposed Scheme.

- 4.2.3 The quality of agricultural land in England and Wales is assessed according to the Agricultural Land Classification (ALC)<sup>15</sup> system, which classifies agricultural land into five grades from excellent quality Grade 1 land to very poor quality Grade 5 land. Grade 3 is subdivided into Subgrades 3a and 3b. The main issue in the assessment of the impacts on agricultural land is the extent to which land of BMV agricultural quality (Grades 1, 2 and 3a) is affected by the Proposed Scheme.
- 4.2.4 Forestry is considered as a commercial land use feature providing resources such as timber and fuel. The impacts on this feature are calculated quantitatively in terms of the physical extent of commercial forestry land required. The qualitative effects on forestry land and woodland are addressed principally in Section 7, Ecology and biodiversity, and Section 11, Landscape and visual.
- 4.2.5 The primary functions provided by soils, other than for food and biomass production, include flood water attenuation, carbon storage or the support of ecological habitats. This section describes these functions and assesses the ability of the soils to fulfil their primary functions after construction of the Proposed Scheme. Soil attributes, other than for food and biomass production, are identified in this section, but the resulting function or service provided is assessed in other sections, notably Section 7, Ecology and biodiversity; Section 9, Historic environment; Section 11, Landscape and visual; and Section 15, Water resources and flood risk. The function of soil as a carbon store is described in Volume 3: Route-wide effects (Section 4, Climate change).
- 4.2.6 The main issue for farm holdings is disruption by the Proposed Scheme of the physical structure of agricultural holdings and the operations taking place upon them, during both construction and operational phases. Where any part of a farm or rural holding is required for the construction or operation of the Proposed Scheme, the whole land holding is part of the study area for impacts on this receptor.
- 4.2.7 Common assumptions that have been used in assessing the effects of the Proposed Scheme are set out in Volume 1 (Section 8). These assumptions include the restoration of agricultural land that is required temporarily for construction to agricultural use, and the handing back of land used temporarily to the original landowner. It is also assumed that buildings and other farm infrastructure on the land holding will not be replaced as this will ultimately be at the discretion of the landowner. For this reason, financial compensation is not a consideration in the assessment of effects on farm holdings, as set out under impacts on

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<sup>15</sup> Ministry of Agriculture, Fisheries and Food (1988), *Agricultural Land Classification of England and Wales – Revised guidelines and criteria for grading the quality of agricultural land*. Available online at: [Agricultural Land Classification of England and Wales: Revised criteria for grading the quality of agricultural land - ALC011 \(naturalengland.org.uk\)](https://naturalengland.org.uk).

holdings below. The details of land use have been obtained from face-to-face interviews wherever possible; elsewhere, information has been obtained from publicly available sources. Land use data have been collected since 2017 for the purposes of the assessment reported in this section.

## 4.3 Environmental baseline

### Existing baseline

- 4.3.1 This section sets out the main baseline features that influence the agricultural and forestry use of land within the Hulseheath to Manchester Airport area. These include the underlying soil resources that are used for food and biomass production, as well as providing other services and functions for society, and the associated pattern of agricultural and other rural land uses.

### Soil and land resources

#### Soil parent materials

- 4.3.2 A full description of the geological characteristics of the Hulseheath to Manchester Airport area is provided in Volume 5: Appendix AG-001-0MA06, Section 10, Land quality and Section 15, Water resources and flood risk. This section only considers geology as a soil parent material, which is a soil-science name for a weathered rock or deposit from and within which a soil has formed<sup>16</sup>. The soil association developed in each parent material is identified below. Individual soil associations are described under 'Description and distribution of soil types' below.
- 4.3.3 The most common soil parent material, which is present over the whole study area, comprises reddish glacial deposits such as till and glaciofluvial sand and gravel deposits, which are mainly overlying Bollin Mudstone. The soils developed from and within this parent material belong to the Salop association.
- 4.3.4 There are glaciofluvial deposits along the Agden Brook, Birkin Brook, Mobberley Brook and, to a lesser extent, in the valley of the River Bollin. Where this parent material, which comprises sand and gravel, is seasonally waterlogged by a fluctuating groundwater table, it produces soils in the Blackwood association. On river terraces, and in older glaciofluvial deposits, sands and gravels give rise to deep and well drained soils in the Wick 1 association.

### Topography and drainage

- 4.3.5 Topography in this study area is characterised by undulating land with mainly gentle to moderate gradients (angle of slope between two and seven degrees). There are some

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<sup>16</sup> British Geological Survey (2011), *Soil Parent Material Model*. Available online at: <https://www.bgs.ac.uk/datasets/soil-parent-material-model/>.

moderate to strong gradients (up to 11 degrees) on valley sides flanking the River Bollin, which is sufficient to limit the quality of the agricultural land to Subgrade 3b.

- 4.3.6 The quality of agricultural land adjacent to the Agden Brook, Birkin Brook, Blackburn's Brook, the River Bollin and Timperley Brook is downgraded where flooding occurs. The ALC grade varies depending on the season, and on the duration and frequency of the flooding. These watercourses are in floodplains classed predominantly as Flood Zone 3<sup>17</sup>, in which there is a 1 in 100 or greater annual probability of flooding. Further details are provided in Section 15, Water resources and flood risk.

### **Description and distribution of soil types**

- 4.3.7 The broad characteristics of the soils present in the study area are described by the Soil Survey of England and Wales<sup>18</sup> and their general distribution is shown on the National Soil Map<sup>19</sup> which is replicated in Volume 5, Agriculture, forestry and soils (Map AG-02-306 Soil Associations). The soils are grouped into soil associations of a range of soil types that are spatially related. They are described in more detail in Volume 5: Appendix AG-001-0MA06.
- 4.3.8 The Wetness Class (WC) of a soil is classified according to the depth and duration of waterlogging in the soil profile. There are six categories: from WC I, which is well drained, to WC VI which is permanently wet.
- 4.3.9 The soil association data have been supplemented by detailed soil surveys on all land where access has been granted. These surveys assist with ALC and the planning of soil handling and restoration. The detailed surveys and existing survey records have identified three soil associations within this study area.
- 4.3.10 The most prevalent group comprises slowly permeable and seasonally waterlogged clay loam soils over clay in the Salop association (WC III to IV). This group of soils is widespread over the whole study area and are developed in reddish glacial deposits, i.e., till and glaciofluvial sand and gravel deposits, mainly overlying Bollin Mudstone.
- 4.3.11 The next most prevalent group comprises deep, permeable sandy and sandy loam soils in the Blackwood association developed on variably stony, glacial river terrace deposits in the central part of the area between Blackburn's Brook and Ashley. Where undrained, the Blackwood soils are waterlogged for long periods during the winter (WC III and IV). The soil profiles experience fluctuating levels of groundwater. In parts where the water-table has been lowered, the soils are well drained (WC I) or only occasionally waterlogged (WC II).

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<sup>17</sup> Environment Agency (2021), *Flood map for planning*. Available online at: <https://flood-map-for-planning.service.gov.uk>.

<sup>18</sup> Soil Survey of England and Wales (1984), *Soils and their use in Midland and Western England*, Soil Survey of England and Wales, Bulletin No. 12, Harpenden.

<sup>19</sup> Cranfield University (2001), *The National Soil Map of England and Wales 1:250,000 scale*. Cranfield University: National Soil Resources Institute.

- 4.3.12 The least prevalent group comprises an isolated pocket of deep, well drained (WC I) sandy loam over loamy sand soils in the Wick 1 association in the south of the study area, to the east of Agden Brook near Millington Hall.
- 4.3.13 The sensitivity of the soils disturbed during construction activity is reflected by their textural characteristics, in the light of local Field Capacity Days (FCD), as set out in the SMR. FCD is a meteorological parameter which indicates an estimated duration of the period when the soil moisture deficit is zero. Soils usually return to field capacity (zero deficit) during the autumn or early winter and the field capacity period, measured in days, ends in the spring when evapotranspiration exceeds rainfall and a moisture deficit begins to accumulate. In areas of the highest number of FCD, and during the wettest times of the year, soils with high clay and silt fractions are most susceptible to the effects of handling during construction and the reinstatement of land; whereas soils with a high sand fraction in areas with the fewest FCD and during the driest times of the year are the least susceptible.
- 4.3.14 The soils in this study area are predominantly of medium sensitivity due to their medium clay content where FCD is between 193 days and 199 days. Soils of this sensitivity category make up 80% of the study area.

## Soil and land use interactions

### Agricultural land quality

- 4.3.15 The principal soil/land use interaction is the quality of the agricultural land resource. The ALC is based on the identification of physical limitations to the agricultural capability of land resulting from the interactions of soil, climate, topography and drainage.
- 4.3.16 The main soil properties that affect the cropping potential and management requirements of land are texture, structure, depth, stoniness and chemical fertility. The climatic properties that affect the cropping potential and management requirements of land are rainfall and temperature.
- 4.3.17 Local agro-climatic data have been interpolated from the Meteorological Office's standard 5km grid point dataset<sup>20</sup> for three points within the study area and are set out in Volume 5: Appendix AG-001-0MA06. The data show climate in the area to be cool and moist. The number of FCD, when the moisture deficit<sup>21</sup> is zero, ranges from 193 days to 199 days per annum. This is higher than average for lowland England (150 days) and generally constrains agricultural cultivation and soil handling for relatively long periods over winter. Moisture deficit, which gives an indication of the vulnerability of soils to drought, are moderate to moderately small.

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<sup>20</sup> Meteorological Office (1989), *Gridpoint Meteorological data for Agricultural Land Classification of England and Wales and other Climatological Investigations*.

<sup>21</sup> The moisture deficit is a crop-related meteorological variable which represents the balance between rainfall and potential evapotranspiration calculated over a critical portion of the growing season.

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- 4.3.18 Average annual rainfall and accumulated temperature within this area do not in themselves place any limitation on agricultural land quality. However, the interactions of climate with soil characteristics are important in determining the wetness and droughtiness limitations of the land. Droughtiness is a measure of the likely moisture stress in a crop arising from the crop's requirement for water exceeding the available water capacity in the soil.
- 4.3.19 Site factors and limitations include gradient and microrelief, which are limiting to agricultural land quality in some places within this study area. Where the angle of slope of the valley sides flanking the River Bollin is between seven and 11 degrees, agricultural land quality is limited to Subgrade 3b due to gradient. The quality of some agricultural land in the floodplain of Agden Brook, Birkin Brook, Blackburn's Brook, the River Bollin and Timperley Brook is predicted to be limited by seasonal flooding to Subgrade 3b. However, no land was flooded at the time the detailed soil surveys were carried out. Further details are provided in Section 15, Water resources and flood risk.
- 4.3.20 The main physical limitations that result from interactions between soil, climate and site factors are soil wetness, soil droughtiness and a localised susceptibility to erosion. For soil wetness, each soil can be allocated a WC based on soil structure, evidence of waterlogging and the number of FCD. The topsoil texture then determines its ALC grade. Vulnerability to drought is determined by the moisture retention of different soil textures and thicknesses of each soil horizon, soil structures, stone content and moisture deficits.
- 4.3.21 The most prevalent soil association, the Salop association, comprises slowly permeable soils, which are seasonally waterlogged for long periods during the winter (WC IV). In a climate area with a FCD between 193 days and 199 days, soil profiles with medium clay loam are limited by soil wetness to Subgrade 3b. Salop soil profiles in WC III are limited by soil wetness to Subgrade 3b where the topsoil is heavy clay loam, and to Subgrade 3a where the topsoil is medium clay loam. Survey data confirm that Salop soils near Ashley are Subgrade 3b.
- 4.3.22 The next most prevalent group is the Blackwood association comprising deep, permeable sandy and sandy loam soils. This group of soils is commonly seasonally waterlogged (WC IV) and limited by soil wetness to Subgrade 3b. Where the land is under-drained, and the soil profiles are in WC I or WC II, the quality of the agricultural land may be increased to Grade 2 or Subgrade 3a, depending on how droughty the soils are during the growing season. Survey data confirm that Blackwood soils north-east of Rostherne are Subgrade 3b.
- 4.3.23 The least prevalent group, comprising well-drained (WC I), sandy loam soils in the Wick 1 association, is limited by soil droughtiness to Grade 2 or Subgrade 3a. Survey data confirm that Wick 1 soils north-west of Rostherne are a mixture of Grade 2 and Subgrade 3a.
- 4.3.24 As set out in the SMR, the sensitivity of BMV land in the study area is determined relative to the abundance of such land in the locality, set as a 4km corridor centred on the route of the Proposed Scheme. Department for the Environment, Food and Rural Affairs (Defra)

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predictive mapping<sup>22</sup> shows that there is a moderate likelihood of encountering BMV agricultural land in the locality, which makes such land a resource of medium sensitivity in this study area.

4.3.25 The distribution of agricultural land quality in the study area is shown in Table 9, described in more detail in Volume 5: AG-001-0MA06 and shown on Map AG-04-319 to Map AG-04-322a (Volume 5, Agriculture, forestry and soils Map Book).

**Table 9: Distribution of grades of agricultural land in the study area**

Agricultural land quality	Area within study area (ha)	Percentage of agricultural land area within study area (%)
Grade 1	0	0
Grade 2	24.6	7.3
Subgrade 3a	31.2	9.2
<b>BMV subtotal</b>	<b>55.8</b>	<b>16.5</b>
Subgrade 3b	280.6	82.8
Grade 4	2.5	0.7
Grade 5	0	0
<b>Total agricultural land</b>	<b>338.9</b>	<b>100</b>

## Other soil interactions

4.3.26 Soil fulfils a number of functions and services for society, in addition to those of food and biomass production, that are central to social, economic and environmental sustainability. These are outlined in sources such as the Soil Strategy for England<sup>23</sup> and the Government's White Paper, *The Natural Choice: securing the value of nature*<sup>24</sup> and reinforced in the policies set out in the 25 year Environment Plan<sup>25</sup>, and include:

- the storage, filtration and transformation of water, carbon and nitrogen in the biosphere;
- the support of ecological habitats, biodiversity and gene pools;
- support for the landscape;
- the protection of cultural heritage;
- the provision of raw materials; and
- the provision of a platform for human activities, such as construction and recreation.

<sup>22</sup> Department for Environment, Food and Rural Affairs (2005), *Likelihood of Best and Most Versatile Agricultural Land (1:250,000)*.

<sup>23</sup> Department for Environment, Food and Rural Affairs (2009), *Soil Strategy for England*. Available online at: <https://www.gov.uk/government/publications/safeguarding-our-soils-a-strategy-for-england>.

<sup>24</sup> HM Government (2011), *The Natural Choice: securing the value of nature*.

<sup>25</sup> HM Government (2018), *A Green Future: Our 25 Year Plan to Improve the Environment*. Available online at: <https://www.gov.uk/government/publications/25-year-environment-plan>.

- 4.3.27 Forestry resources represent a potentially multifunctional source of productive timber, landscape amenity, biodiversity and carbon storage capacity. An assessment of the value and sensitivity of woodland resources is reported in Section 7, Ecology and biodiversity.
- 4.3.28 The floodplains of Agden Brook, Birkin Brook, Blackburn's Brook, the River Bollin and Timperley Brook occupy land where water has to flow or be stored in times of flood, as set out in Section 15, Water resources and flood risk. The soils and floodplains in this study area function as water stores for flood attenuation, as well as providing ecological habitat.

## Land use

### Land use description

- 4.3.29 Agricultural land use in this study area is mixed with large arable holdings interspersed with livestock holdings supporting dairy and beef cattle herds along with sheep. There are a few equestrian holdings also present. The fields are regular in shape and medium to large in scale, reflecting the size of the farm holdings.
- 4.3.30 Woodland is located predominantly adjacent to Agden Brook, to the north of Rostherne Mere, and alongside Blackburn's Brook and Birkin Brook. There are some small blocks of woodland to the south-east of Ashley, and alongside the River Bollin. There is ancient woodland on land required for the construction of the Proposed Scheme alongside Blackburn's Brook. A description of woodland habitats in the Hulseheath to Manchester Airport area is set out in Section 7, Ecology and biodiversity.
- 4.3.31 No areas of commercial forestry land have been identified in the study area. As such, no further assessment has been made of the effects on commercial forestry.
- 4.3.32 Some agricultural land is also subject to historical agri-environment management prescriptions that seek to retain and enhance the landscape and biodiversity qualities and features of farmland. These were associated with the Environmental Stewardship Scheme (the Entry Level Stewardship (ELS), the Organic Entry Level Stewardship (OELS) or the Higher Level Stewardship (HLS)). The Countryside Stewardship Scheme (CSS) has been the main agri-environment scheme in England since 2015. The CSS incorporates elements of the Environmental Stewardship Scheme, the English Woodlands Grant Scheme and Catchment Sensitive Farming Grants. Holdings that have land entered into an agri-environment scheme are identified in Table 10. These schemes are under review following the introduction of the Agriculture Act 2020<sup>26</sup>.

### Number, type and size of holdings

- 4.3.33 Table 10 sets out the main farm holdings within this study area. The details of holdings have been obtained from face-to-face interviews with farm owners and occupiers. The interviews

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<sup>26</sup> *Agriculture Act 2020*, London, Her Majesty's Stationery Office. Available online at: <https://www.legislation.gov.uk/ukpga/2020/21/contents/enacted>.



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undertaken account for holdings which collectively cover approximately 77% of the total study area. Publicly available sources have been used to obtain information about farm holdings where it has not been possible to arrange interviews.

- 4.3.34 Arable farming predominates in the Hulseheath to Manchester Airport area. Although dairy farming has been a predominant enterprise in the past, it is being replaced by beef cattle and arable enterprises. The majority of the holdings range between 50 and 300ha. The boundaries of the holdings are shown on maps AG-01-319 to AG-01-322a (Volume 5, Agriculture, forestry and soils Map Book) along with the location of the main farm buildings.
- 4.3.35 Table 10 also sets out the sensitivity of individual holdings to change. This is determined by the extent to which they have the capacity to absorb or adapt to impacts, which in turn is determined primarily by their nature and scale. In general terms, larger holdings have a greater capacity to change enterprise mix and scale, can better absorb impacts and are less sensitive. Units that rely on the use of buildings (such as intensive livestock and dairy farms, and horticultural units) are less able to accommodate change and have a higher sensitivity. Non-commercial land uses and units, such as pony paddocks associated with residential properties, have a low sensitivity. The holding reference provides a unique identifier and relates to maps AG-01-319 to AG-01-322a (Volume 5, Agriculture, forestry and soils Map Book) and Volume 5: Appendix AG-001-0MA06.

**Table 10: Summary characteristics of holdings**

Holding reference/ name	Holding type	Holding size (ha)	Diversification	Agri- environment scheme	Sensitivity to change
MA06/1 Land at Chapel Lane, Bucklow Hill (2)*	Grassland	0.5	Not known	None	Low
MA06/2 Moss House Farm	Beef cattle and sheep	47	Contract shepherding services	None	Medium
MA06/3 Land at Boothbank Lane, Millington*	Grassland	0.4	Not known	None	Low
MA06/4 Millington House Nursery	Glasshouse horticulture and grassland	2.6	None	None	Low <sup>27</sup>
MA06/5 Ivy House Farm	Equestrian livery and grazing	11	None	None	Medium
MA06/6 Millington Hall Farm	Arable and sheep	300	Commercial and residential properties let	CSS Mid-tier	Medium
MA06/7 Newhall Farm	Arable and dairy heifer rearing	85	None	None	Medium

<sup>27</sup> Glasshouses assessed as high sensitivity to change; grassland assessed as low sensitivity to change.

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Holding reference/ name	Holding type	Holding size (ha)	Diversification	Agri- environment scheme	Sensitivity to change
MA06/8 Yarwood Heath Farm, inc. Cherry Tree Farm	Arable and livestock grazing	300	Commercial buildings lets	CSS Mid-tier	Medium
MA06/9 Bowden View Farm	Arable and livestock grazing	7.0	None	None	Medium
MA06/10 Briddon Weir Farm	Beef cattle and sheep	32	Farm shop	None	Medium
MA06/11 Ryecroft Farm*	Arable and grassland	54	Not known	None	Medium
MA06/12 Bow Green Farm*	Arable and grassland	59	Not known	None	Medium
MA06/13 Birkin Farm	Equestrian livery and grazing	8.0	Holiday lets	None	Medium
MA06/14 Back Lane Farm	Dairy	105	Equestrian livery, caravan storage, commercial building lets	None	High
MA06/15 Birtles Farm*	Arable and grassland	50	Not known	None	Medium
MA06/16 Kell House Farm	Arable and livestock grazing	300	Agricultural contracting	None	Medium
MA06/17 Sugar Brook Farm	Arable, sheep, free-range poultry	50	Bed and breakfast	OELS	Medium
MA06/18 Lower House Farm*	Arable and grassland	14	Not known	None	Low
MA06/19 Higher Thorns Green Farm	Arable, beef cattle and equestrian liveries	44	Care farm providing learning and support opportunities for adults and children	ELS	Medium
MA06/20 Barnshaw Farm*	Grassland	4.3	Not known	None	Medium
MA06/21 Waugh Brow Farm*	Grassland	7.0	Not known	None	Medium
MA06/22 Land at Small Lane, Mobberley (1)*	Grassland	11	Not known	None	Medium
MA06/23 Land at Small Lane, Mobberley (2)*	Grassland	16	Not known	None	Medium
MA06/24 Chapel House Farm	Non-commercial equestrian grazing	24	None	None	Low

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Holding reference/ name	Holding type	Holding size (ha)	Diversification	Agri- environment scheme	Sensitivity to change
MA06/25 Lower Thorns Green Farm	Livestock grazing	3.5	None	None	Low
MA06/26 Hale Bank Farm*	Livestock grazing	21	Not known	None	Medium
MA06/27 Higher Doles Farm*	Grassland	2.3	Not known	None	Low
MA06/28 Land at Hale Barns	Forage grassland	16	None	None	Low
MA06/29 Land at Warburton Green*	Forage grassland	5.0	Not known	None	Low
MA06/30 Land west of A538 Hale Road, Hale*	Grassland	7.4	Not known	None	Low
MA06/31 Land east of A538 Hale Road, Hale*	Grassland	8.0	Not known	None	Low
MA06/32 Land at Checkley Hall*	Grassland	1.6	Not known	None	Low
MA06/33 Ash Farm*	Livestock grazing	108	Not known	None	Medium
MA06/34 Land at Davenport Green*	Livestock grazing	26	Not known	None	Low

\* It has not yet been possible to arrange farm impact assessment interviews with these holdings. Publicly available sources have been used to obtain the information presented.

## Future baseline

### Construction (2025)

- 4.3.36 Volume 5: Appendix CT-004-00000 provides details of the developments in the Hulseheath to Manchester Airport area that are assumed to have been implemented by 2025.
- 4.3.37 No committed developments have been identified in this study area that will materially alter the baseline conditions in 2025 for agriculture, forestry and soils.

### Operation (2038)

- 4.3.38 Volume 5: Appendix CT-004-00000 provides details of the developments in the Hulseheath to Manchester Airport area that are assumed to have been implemented by 2038.

4.3.39 No committed developments have been identified in this study area that will materially alter the baseline conditions in 2038 for agriculture, forestry and soils.

## 4.4 Effects arising during construction

### Avoidance and mitigation measures

- 4.4.1 During the development of the design, the following measures have been incorporated to avoid or mitigate adverse severance impacts on land holdings:
- provision of access to severed land for Ivy House Farm (MA06/5) (see Volume 2: MA06 Map Book, map CT-06-351, C9 to D7);
  - provision of Footpath Millington 7/4 accommodation overbridge to provide access to severed land at Newhall Farm (MA06/7) (see Volume 2: MA06 Map Book, map CT-06-352, F4 to F6);
  - provision of Yarwood Heath Farm accommodation access overbridge to provide access to severed land at Yarwood Heath Farm (MA06/8) (see Volume 2: MA06 Map Book, map CT-06-353, A4 to B6); and
  - provision of Back Lane Farm accommodation overbridge to provide access to severed land at Back Lane Farm (MA06/14) (see Volume 2: MA06 Map Book, map CT-06-355, D5 to D8).
- 4.4.2 The effect of severance of agricultural land will also be reduced by the ability of agricultural machinery to pass under:
- Agden Brook viaduct for Moss House Farm (MA06/2) and Millington Hall Farm (MA06/6) (see Volume 2: MA06 Map Book, map CT-06-351, E6 to F6);
  - Blackburn's Brook North viaduct for Yarwood Heath Farm (MA06/8) (see Volume 2: MA06 Map Book, map CT-06-353, G5 to I5); and
  - River Bollin East viaduct for Hale Bank Farm (MA06/26) (see Volume 2: MA06 Map Book, map CT-06-356, A5 to B5).
- 4.4.3 Other design refinements to limit the impact of the Proposed Scheme on agriculture, forestry and soil resources include:
- rationalisation of balancing ponds to seek to locate them in the least sensitive agricultural locations;
  - locally slackened slopes to improve agricultural land use or steepened slopes to limit the area of agricultural land required;
  - rationalisation of road realignments to limit the area of agricultural land required;
  - incorporation of agricultural tracks to gain access to severed land; and
  - rationalisation and relocation of mitigation planting to seek to limit the area of agricultural land required and reduce impacts on holdings.

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- 4.4.4 In addition, there is a need to avoid or reduce environmental impacts to soils during construction so that they will be in a suitable condition to support their proposed use for agricultural land, landscape planting and ecological mitigation following construction.
- 4.4.5 Compliance with the Code of Construction Practice (CoCP) will avoid or reduce environmental impacts during construction. Those measures that are particularly relevant to agriculture, forestry and soils are set out in the draft CoCP<sup>28</sup> and relate to:
- the reinstatement of agricultural land that is used temporarily during construction to agriculture, where this is the agreed end use (Section 6);
  - the provision of a method statement for stripping, handling, storing and replacing agricultural and woodland soils to reduce risks associated with soil degradation on areas of land to be returned to agriculture and woodland following construction, based on detailed soil survey work to be undertaken prior to construction. This will include any remediation measures necessary following the completion of works (Section 6);
  - a requirement for contractors to monitor and manage flood risk and other extreme weather events, insofar as reasonably practicable, that may affect agriculture, forestry and soil resources during construction (Sections 5 and 16);
  - arrangements for the maintenance of farm and field accesses affected by construction (Section 6);
  - the protection and maintenance of existing land drainage and livestock water supply systems, where reasonably practicable (Sections 6 and 16);
  - the protection of agricultural land adjacent to the construction site, including the provision and maintenance of appropriate stock-proof fencing (Sections 5, 6, 9 and 12);
  - the adoption of measures to control the deposition of dust on adjacent agricultural crops (Section 7);
  - the control of invasive and non-native species; and the prevention of the spread of weeds generally from the construction site to adjacent agricultural land (Section 9);
  - the adoption of measures to prevent, as far as reasonably practicable, the spread of soil-borne, tree, crop and animal diseases from the construction area (Sections 6 and 9); and
  - liaison and advisory arrangements with affected landowners, occupiers and agents, as appropriate (Sections 5 and 6).
- 4.4.6 Upon completion of construction, soils replaced for agricultural, forestry or landscape uses will be monitored to identify any unsatisfactory growing conditions during the five-year aftercare period.
- 4.4.7 Where agricultural uses are to be resumed on land disturbed during the construction of the Proposed Scheme, the design objective is to avoid any reduction in long-term capability, which would downgrade the quality of the disturbed land, through the adoption of good practice techniques in handling, storing and reinstating soils on that land.

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<sup>28</sup> Volume 5: Appendix CT-002-00000, draft Code of Construction Practice (CoCP).

## Assessment of impacts and effects

- 4.4.8 The acquisition and use of land for the Proposed Scheme will interfere with existing uses of that land, and in some locations preclude existing land uses or sever and fragment individual fields and operational units of agricultural and forestry land. This could result in potential effects associated with the ability of affected agricultural and forestry interests to access and effectively use residual parcels of land. There may also be the loss of, or disruption to, buildings and operational infrastructure such as drainage. The Proposed Scheme seeks to reduce this disruption, and where appropriate and reasonably practicable, incorporate residual parcels of land no longer effective for agricultural use due to their size and/or shape as part of environmental mitigation works, such as ecological habitat creation.
- 4.4.9 Land used to construct the Proposed Scheme will fall into the following main categories when work is complete:
- part of the operational railway or associated infrastructure and kept under the control of the operator;
  - highway, PRoW or utility diversion/realignment;
  - returned to agricultural use (with aftercare management to ensure effective field drainage and stabilisation of the soil structure);
  - used for drainage or replacement floodplain storage areas, which may also retain some agricultural use; or
  - used for ecological and/or landscape mitigation.

## Temporary effects during construction

### Impacts on agricultural land

- 4.4.10 During the construction phase, the total area of agricultural land used within the Hulseheath to Manchester Airport area will be approximately 339ha as shown in Table 11. Of this total, it is anticipated that approximately 181ha will be restored and available for agricultural use following construction.

**Table 11: Agricultural land required for the construction of the Proposed Scheme**

Agricultural land quality	Area required (ha)	Percentage of agricultural land (%)	Area to be restored (ha)
Grade 1	0	0	0
Grade 2	24.6	7.3	16.2
Subgrade 3a	31.2	9.2	11.9
<b>BMV subtotal</b>	<b>55.8</b>	<b>16.5</b>	<b>28.1</b>
Subgrade 3b	280.6	82.8	150.9
Grade 4	2.5	0.7	1.9
Grade 5	0	0	0
<b>Total agricultural land</b>	<b>338.9</b>	<b>100</b>	<b>180.9</b>

- 4.4.11 The disturbance during construction to approximately 56ha of BMV land is assessed as an impact of low magnitude, comprising approximately 17% of the agricultural land requirement. BMV land is assessed as a receptor of medium sensitivity because of its abundance in this locality. The effect of the Proposed Scheme on BMV land during the construction phase is, therefore, assessed as minor adverse, which is not significant.
- 4.4.12 Following completion of construction, temporary facilities will be removed, and the topsoil and subsoil reinstated in accordance with the agreed end use for the land. Some permanently displaced soils may be used to restore land to agriculture or other uses with slightly deeper topsoil and subsoil layers, where appropriate. This could improve the quality of agricultural land locally, for example where droughty soils are limited by soil depth, subject to the soil resource plans to be prepared during the detailed design stage.

### **Impacts on soils**

- 4.4.13 In areas of heaviest rainfall, and during the wettest times of the year, soils with high clay and silt fractions are most susceptible to the effects of handling during construction and the reinstatement of land; whereas soils with a high sand fraction in areas of lowest rainfall and during the driest times of the year are the least susceptible.
- 4.4.14 Successful soil handling is dependent upon movements being undertaken under appropriate weather and ground conditions using the appropriate equipment. The principles of soil handling are well established and set out in advisory material such as Defra's Code of Practice for the Sustainable Use of Soils<sup>29</sup>. These principles will be followed throughout the construction period.
- 4.4.15 Implementation of the measures set out in the draft CoCP will ensure displaced soils from the Proposed Scheme will mostly fulfil their pre-existing functions on-site, which are production of food, water stores for flood attenuation and providing ecological habitat. This is an impact of low magnitude on the displaced soils. The sensitivity of the majority of soil in the study area is medium, and therefore, the significance of the effect on the displaced soils is minor adverse, which is not significant.

### **Impacts on holdings**

- 4.4.16 Land may be required for the Proposed Scheme from holdings temporarily, during the construction period, or permanently. In most cases, the temporary and permanent land requirement will occur simultaneously at the start of the construction period and it is the combined effect of both that will have the most impact on the holding. During the construction period, some agricultural land will be restored and the impact on individual holdings will reduce.

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<sup>29</sup> Department for Environment, Food and Rural Affairs (2009), *Construction Code of Practice for the Sustainable Use of Soils on Construction Sites*. Available online at: <https://www.gov.uk/government/publications/code-of-practice-for-the-sustainable-use-of-soils-on-construction-sites>.

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- 4.4.17 The effects of the Proposed Scheme on individual agricultural and related interests during the construction period are summarised in Table 12. The table shows the total area of land required from a particular holding in absolute terms and as a percentage of the total area farmed. It also shows the area of land that could be returned to the holding following the construction period. The degree of impact is based on the proportion of the holding required rather than the absolute area of land.
- 4.4.18 The effects of severance during construction are judged on the ease and availability of access to severed land. The disruptive effects, principally of construction noise and dust, are assessed according to their effects on land uses and enterprises. Impacts on residential properties on farm holdings are assessed, as required, in Section 5, Air quality; Section 6, Community; and Section 13, Sound, noise and vibration. Full details of the nature and significance of effects are set out in Volume 5: Appendix AG-001-OMA06.
- 4.4.19 The potential scale of effect is determined by combining the highest impact on the farm holding with the sensitivity of that holding, as set out in the SMR.

**Table 12: Summary of temporary impacts and effects on holdings from construction**

Holding reference/ name	Sensitivity to change	Total area required from holding	Construction severance	Disruption	Scale of construction effect	Area to be restored
MA06/1 Land at Chapel Lane, Bucklow Hill (2)	Low	0.1ha (20%) Medium	Negligible	Negligible	Minor adverse	0.1ha
MA06/2 Moss House Farm	Medium	29.7ha (63%) High	Medium	Negligible	Major/moderate adverse due to the proportion of land required	17.5ha
MA06/3 Land at Boothbank Lane	Low	0.4ha (100%) High	Negligible	Negligible	Moderate adverse due to the proportion of land required	0.4ha
MA06/4 Millington House Nursery	Low	1.5ha (58%) High	Medium	Low	Moderate adverse due to the proportion of land required	0.6ha
MA06/5 Ivy House Farm	Medium	7.4ha (67%) High	Medium	Low	Major/moderate adverse due to the proportion of land required	5.4ha
MA06/6 Millington Hall Farm	Medium	54ha (18%) Medium	Medium	Negligible	Moderate adverse due to the proportion of land required and severance	34.6ha



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Holding reference/ name	Sensitivity to change	Total area required from holding	Construction severance	Disruption	Scale of construction effect	Area to be restored
MA06/7 Newhall Farm	Medium	31.1ha (37%) High	Low	Negligible	Major/moderate adverse due to the proportion of land required	12ha
MA06/8 Yarwood Heath Farm inc. Cherry Tree Farm	Medium	74.7ha (25%) High	Low	Negligible	Major/moderate adverse due to the proportion of land required	44ha
MA06/9 Bowden View Farm	Medium	6.8ha (97%) High	High	Low	Major/moderate adverse due to the proportion of land required and severance	2.7ha
MA06/10 Briddon Weir Farm	Medium	14.3ha (45%) High	Negligible	Negligible	Major/moderate adverse due to the proportion of land required	2ha
MA06/11 Ryecroft Farm	Medium	6ha (11%) Medium	Low	Negligible	Moderate adverse due to the proportion of land required	6ha
MA06/12 Bow Green Farm	Medium	0.3ha (1%) Negligible	Low	Negligible	Minor adverse	0.3ha
MA06/13 Birkin Farm	Medium	5.3ha (66%) High	Negligible	Low	Major/moderate adverse due to the proportion of land required	0.2ha
MA06/14 Back Lane Farm	High	10.6ha (10%) Medium	Low	Negligible	Major/moderate adverse due to the proportion of land required	5ha
MA06/15 Birtles Farm	Medium	4.3ha (9%) Low	Low	Negligible	Minor adverse	4.3ha
MA06/16 Kell House Farm	Medium	7.4ha (2%) Negligible	Negligible	Negligible	Negligible	5.7ha
MA06/17 Sugar Brook Farm	Medium	35.3ha (71%) High	Negligible	Low	Major/moderate adverse due to the proportion of land required	22.3ha
MA06/18 Lower House Farm	Low	1.8ha (13%) Medium	Negligible	Negligible	Minor adverse	0.3ha

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Holding reference/ name	Sensitivity to change	Total area required from holding	Construction severance	Disruption	Scale of construction effect	Area to be restored
MA06/19 Higher Thorns Green Farm	Medium	16.7ha (38%) High	Medium	Low	Major/moderate adverse due to the proportion of land required	3.4ha
MA06/20 Barnshaw Farm	Medium	1.7ha (40%) High	Low	Negligible	Major/moderate adverse due to the proportion of land required	1.7ha
MA06/21 Waugh Brow Farm	Medium	3.7ha (53%) High	Low	Negligible	Major/moderate adverse due to the proportion of land required	3.7ha
MA06/22 Land at Small Lane, Mobberley (1)	Medium	3.5ha (32%) High	Low	Negligible	Major/moderate adverse due to the proportion of land required	3.5ha
MA06/23 Land at Small Lane, Mobberley (2)	Medium	3.8ha (24%) High	Low	Negligible	Major/moderate adverse due to the proportion of land required	3.8ha
MA06/24 Chapel House Farm	Low	1.9ha (8%) Low	Negligible	Low	Negligible	1.9ha
MA06/25 Lower Thorns Green Farm	Low	0.6ha (17%) Medium	Negligible	Negligible	Minor adverse	0.4ha
MA06/26 Hale Bank Farm	Medium	20.4ha (97%) High	Negligible	Negligible	Major/moderate adverse due to the proportion of land required	3.2ha
MA06/27 Higher Doles Farm	Low	0.6ha (26%) High	Negligible	Negligible	Moderate adverse due to the proportion of land required	0.3ha
MA06/28 Land at Hale Barns	Low	14.5ha (91%) High	Negligible	Negligible	Moderate adverse due to the proportion of land required	5.5ha
MA06/29 Land at Warburton Green	Low	2ha (40%) High	Negligible	Negligible	Moderate adverse due to the proportion of land required	0.7ha
MA06/30 Land west of A538 Hale Road, Hale	Low	7.4ha (100%) High	Negligible	Negligible	Moderate adverse due to the proportion of land required	2.5ha

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Holding reference/ name	Sensitivity to change	Total area required from holding	Construction severance	Disruption	Scale of construction effect	Area to be restored
MA06/31 Land east of A538 Hale Road, Hale	Low	7.7ha (96%) High	Negligible	Negligible	Moderate adverse due to the proportion of land required	0.2ha
MA06/32 Land at Checkley Hall	Low	1.6ha (100%) High	Negligible	Negligible	Moderate adverse due to the proportion of land required	0ha
MA06/33 Land at Ash Farm	Medium	10.6ha (10%) Low	Negligible	Negligible	Minor adverse	3.4ha
MA06/34 Land at Davenport Green	Low	13.9ha (53%) High	Negligible	Negligible	Moderate adverse due to the proportion of land required	10.7ha

4.4.20 Overall, 34 holdings in the Hulseheath to Manchester Airport area will be affected during construction, of which 26 will experience moderate or moderate/major adverse effects, which are significant for each holding.

4.4.21 Although financial compensation will be available under existing statutory arrangements to offset these impacts, it is not a consideration in the assessment of environmental effects on farm holdings.

## Permanent effects of construction

### Impacts on agricultural land

4.4.22 Following construction and restoration, the area of agricultural land that will remain permanently required will be approximately 158ha, as shown in Table 13.

**Table 13: Agricultural land required permanently**

Agricultural land quality	Total area required (ha)	Percentage of agricultural land (%)
Grade 1	0	0
Grade 2	8.5	5.3
Subgrade 3a	19.3	12.2
<b>BMV subtotal</b>	<b>27.8</b>	<b>17.5</b>
Subgrade 3b	129.7	82.1
Grade 4	0.6	0.4
Grade 5	0	0
<b>Total agricultural land</b>	<b>158.1</b>	<b>100</b>

4.4.23 Of this total requirement, approximately 30ha (19%) will comprise newly planted woodland on agricultural land for visual screening and habitat creation to mitigate environmental

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effects arising from the Proposed Scheme. This mitigation is described in Section 7, Ecology and biodiversity and Section 11, Landscape and visual.

- 4.4.24 Replacement floodplain storage will occupy a total area of 1.3ha of agricultural land (see Volume 2: MA06 Map Book, maps CT-06-351, CT-06-353, and CT-06-357a. Some of this land is BMV and could be subject to marginal downgrading in agricultural land quality. This agricultural assessment assumes that this land will return to agricultural use.
- 4.4.25 The permanent requirement for approximately 28ha of BMV land within the Hulseheath to Manchester Airport area is assessed as an impact of low magnitude, comprising approximately 18% of the overall agricultural land requirement. BMV land is assessed as a receptor of medium sensitivity because of its relative abundance in this area. The permanent effect on BMV land is, therefore, assessed as minor adverse, which is not significant.

### Impacts on holdings

- 4.4.26 The permanent effects from the construction of the Proposed Scheme on individual agricultural and related interests are summarised in Table 14. The land required column refers to the area of land required to operate the Proposed Scheme in absolute terms and as a percentage of the overall area farmed. The scale of impact is based on the likely proportion of land required from the holding. The effects of severance are judged on the ease and availability of access to severed land once construction is completed. The impact on farm infrastructure refers mainly to the loss of or damage to farm capital, such as property, buildings and structures, and the consequential effects on land uses and enterprises. Full details of the nature and scale of effects are set out in Volume 5: Appendix AG-001-0MA06.
- 4.4.27 The potential scale of effect is determined by combining the highest impact on the farm holding with the sensitivity of that holding, as set out in the SMR.

**Table 14: Summary of permanent impacts and effects on holdings from construction**

Holding reference/ name	Sensitivity to change	Land required from holding	Severance	Infrastructure	Scale of effect
MA06/1 Land at Chapel Lane, Bucklow Hill (2)	Low	0ha (0%) Negligible	Negligible	Negligible	Negligible
MA06/2 Moss House Farm	Medium	12.2ha (26%) High	Medium	Negligible	Major/moderate adverse due to the proportion of land required
MA06/3 Land at Boothbank Lane	Low	0ha (0%) Negligible	Negligible	Negligible	Negligible

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Holding reference/ name	Sensitivity to change	Land required from holding	Severance	Infrastructure	Scale of effect
MA06/4 Millington House Nursery	Low	0.9ha (35%) High	Medium	Negligible	Moderate adverse due to the proportion of land required
MA06/5 Ivy House Farm	Medium	2ha (18%) Medium	Medium	Negligible	Moderate adverse due to the proportion of land required and severance
MA06/6 Millington Hall Farm	Medium	19.4ha (7%) Low	Medium	Negligible	Moderate adverse due to severance
MA06/7 Newhall Farm	Medium	19.1ha (22%) High	Low	Negligible	Major/moderate adverse due to the proportion of land required
MA06/8 Yarwood Heath Farm inc. Cherry Tree Farm	Medium	30.7ha (10%) Medium	Low	High	Major/moderate adverse due to property demolition at Cherry Tree Farm
MA06/9 Bowden View Farm	Medium	4.1ha (59%) High	Low	High	Major/moderate adverse due to the proportion of land required and property demolition
MA06/10 Briddon Weir Farm	Medium	12.3ha (38%) High	Negligible	Negligible	Major/moderate adverse due to the proportion of land required
MA06/11 Ryecroft Farm	Medium	0ha (0%) Negligible	Negligible	Negligible	Negligible
MA06/12 Bow Green Farm	Medium	0ha (0%) Negligible	Negligible	Negligible	Negligible
MA06/13 Birkin Farm	Medium	5.1ha (64%) High	Negligible	Negligible	Major/moderate adverse due to the proportion of land required
MA06/14 Back Lane Farm	High	5.6ha (5%) Low	Low	Negligible	Moderate adverse due to the proportion of land required and severance
MA06/15 Birtles Farm	Medium	0ha (0%) Negligible	Negligible	Negligible	Negligible

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Holding reference/ name	Sensitivity to change	Land required from holding	Severance	Infrastructure	Scale of effect
MA06/16 Kell House Farm	Medium	1.7ha (1%) Negligible	Negligible	Negligible	Negligible
MA06/17 Sugar Brook Farm	Medium	13ha (26%) High	Negligible	Negligible	Major/moderate adverse due to the proportion of land required
MA06/18 Lower House Farm	Low	1.5ha (11%) Medium	Negligible	Negligible	Minor adverse
MA06/19 Higher Thorns Green Farm	Medium	13.3ha (30%) High	Medium	High	Major/moderate adverse due to the proportion of land required and property demolition
MA06/20 Barnshaw Farm	Medium	0ha (0%) Negligible	Negligible	Negligible	Negligible
MA06/21 Waugh Brow Farm	Medium	0ha (0%) Negligible	Negligible	Negligible	Negligible
MA06/22 Land at Small Lane, Mobberley (1)	Medium	0ha (0%) Negligible	Negligible	Negligible	Negligible
MA06/23 Land at Small Lane, Mobberley (2)	Medium	0ha (0%) Negligible	Negligible	Negligible	Negligible
MA06/24 Chapel House Farm	Low	<0.1ha (<1%) Negligible	Negligible	Negligible	Negligible
MA06/25 Lower Thorns Green Farm	Low	0.2ha (6%) Low	Negligible	Negligible	Negligible
MA06/26 Hale Bank Farm	Medium	17.2ha (82%) High	Negligible	High	Major/moderate adverse due to the proportion of land required and property demolition
MA06/27 Higher Doles Farm	Low	0.3ha (13%) Medium	Negligible	Negligible	Minor adverse

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Holding reference/ name	Sensitivity to change	Land required from holding	Severance	Infrastructure	Scale of effect
MA06/28 Land at Hale Barns	Low	9ha (56%) High	Negligible	Negligible	Moderate adverse due to the proportion of land required
MA06/29 Land at Warburton Green	Low	1.3ha (26%) High	Negligible	Negligible	Moderate adverse due to the proportion of land required
MA06/30 Land west of A538 Hale Road, Hale	Low	4.9ha (66%) High	Negligible	Negligible	Moderate adverse due to the proportion of land required
MA06/31 Land east of A538 Hale Road, Hale	Low	7.5ha (94%) High	Negligible	Negligible	Moderate adverse due to the proportion of land required
MA06/32 Land at Checkley Hall	Low	1.6ha (100%) High	Negligible	Negligible	Moderate adverse due to the proportion of land required
MA06/33 Land at Ash Farm	Medium	7.2ha (7%) Low	Negligible	Negligible	Minor adverse
MA06/34 Land at Davenport Green	Low	3.2ha (12%) Medium	Negligible	Negligible	Minor adverse

4.4.28 Overall, the construction of the Proposed Scheme will permanently affect 25 holdings in the Hulseheath to Manchester Airport area, with 18 holdings predicted to experience moderate or major/moderate adverse permanent effects, which are significant for each holding. Nine holdings are only affected temporarily during construction with negligible permanent effects remaining. Four holdings will be affected by property demolition: Cherry Tree Farm (MA06/8); Bowden View Farm (MA06/9); Higher Thorns Green Farm (MA06/19); and Hale Bank Farm (MA06/26).

4.4.29 Although financial compensation will be available under existing statutory arrangements, there can be no certainty that this will be used to reduce the above adverse effects by the purchase of replacement land or the construction of replacement buildings. Therefore, the above assessment should be seen as the worst case, which could be reduced if the owner and/or occupier is able, and chooses, to use compensation payments to replace assets.

## Other mitigation measures

- 4.4.30 Other mitigation will incorporate climate change adaptation and resilience measures, as far as reasonably practicable. For example, restored soils in areas that could be prone to drought with climate change could potentially be replaced at greater depths than at present to make them resilient to drought.
- 4.4.31 A farm pack, as set out within the Phase 2b Farmers and Growers Guide, will be provided to all farmers and landowners, setting out baseline conditions on the land holding and the assurances and obligations that HS2 Ltd will accept upon entering the land. This will include advice and appropriate assistance where there is a need for the landowner to relocate or re-provide agricultural buildings displaced by the Proposed Scheme. In instances where replacement facilities need to be provided, HS2 Ltd will identify the likely impact on existing facilities and its timing, as soon as reasonably practicable.

## Summary of likely residual significant effects

- 4.4.32 Thirty-four holdings will be affected temporarily, of which 26 will experience temporary moderate or major/moderate adverse residual effects, which are significant for each holding.
- 4.4.33 Twenty-five holdings will be affected permanently, of which 18 will experience moderate or moderate/major permanent effects following construction, which is significant for each holding.

## Cumulative effects

- 4.4.34 There are no cumulative effects identified as arising from the construction of the Proposed Scheme as a consequence of other development projects affecting agricultural land in the locality.

## 4.5 Effects arising from operation

### Avoidance and mitigation measures

- 4.5.1 No measures are included to mitigate the operational effects of the Proposed Scheme on agriculture, forestry and soils.

### Assessment of impacts and effects

- 4.5.2 Potential impacts arising from the operation of the Proposed Scheme will include:
- noise emanating from moving trains; and
  - the propensity of operational land to harbour noxious weeds.



- 4.5.3 Farm livestock buildings at Moss House Farm (MA06/2, noise assessment reference: 612730) lie within approximately 100m of the route of the Proposed Scheme. Operational airborne sound at this location has been included in the assessment and the results are presented in Volume 5: Appendix SV-003-0MA06.
- 4.5.4 The predicted sound levels have been considered against the specific criteria defined in the Agriculture, forestry and soils section of the SMR. Taking into consideration the noise mitigation included within the Proposed Scheme, as shown on Map Series SV-02 (Volume 5, Sound, noise and vibration Map Book), no likely significant effects from noise on livestock are identified.
- 4.5.5 The propensity of linear transport infrastructure to harbour and spread noxious weeds is a consequence of:
- the management of the highway and railway land; and
  - the propensity of the weeds to spread onto such land from adjoining land, which could be exacerbated by the effects of climate change.
- 4.5.6 The presence of noxious weeds (particularly ragwort) will be controlled using an appropriate management regime that identifies and remedies areas of weed growth that might threaten adjoining agricultural interests.

## **Other mitigation measures**

- 4.5.7 No other mitigation measures have been identified.

## **Summary of likely residual significant effects**

- 4.5.8 No residual significant effects on agriculture, forestry and soils have been identified as a result of the operation of the Proposed Scheme.

## **Cumulative effects**

- 4.5.9 There are no cumulative effects identified as arising from the operation of the Proposed Scheme as a consequence of other development projects affecting agriculture, forestry or soil in the study area.

## **Monitoring**

- 4.5.10 Volume 1, Section 9 sets out the general approach to environmental monitoring during operation of the Proposed Scheme.
- 4.5.11 On the basis of there being no significant residual operational effects, there are no area-specific requirements for monitoring agriculture, forestry and soil effects during the operation of the Proposed Scheme in the Hulseheath to Manchester Airport area.

## 5 Air quality

### 5.1 Introduction

- 5.1.1 This section of the report provides an assessment of the impacts and likely significant effects on air quality arising from the construction and operation of the Proposed Scheme within the Hulseheath to Manchester Airport area. Oxides of nitrogen (NO<sub>x</sub>) including nitrogen dioxide (NO<sub>2</sub>), fine particulate matter (particles of size less than 2.5µm and 10µm in diameter, referred to as PM<sub>2.5</sub> and PM<sub>10</sub>, respectively) and dust have been considered in the assessment. Emissions of all or some of these air pollutants are likely to arise from construction activities, demolition, site preparation works and the use of site haul routes. Emissions will also arise from road traffic during construction and operation of the Proposed Scheme.
- 5.1.2 Engagement with Cheshire East Council (CEC), Manchester City Council (MCC), Trafford Metropolitan Borough Council (TMBC) and Transport for Greater Manchester (TfGM) has been undertaken. The purpose of this engagement has been to obtain relevant baseline information, which includes monitoring data in this area.
- 5.1.3 Detailed reports on the air quality data and assessments for this area are contained within Volume 5: Appendix AQ-001-0MA06. Additional information on air quality monitoring and traffic data used in the assessment is set out in Background Information and Data (BID), BID AQ-002-0MA06<sup>30</sup>.
- 5.1.4 Maps showing the location of the key environmental features and the key construction and operational features of the Proposed Scheme can be found in the Volume 2: MA06 Map Book. Air quality mapping is presented in the Volume 5, Air quality Map Book, map AQ-01-306.
- 5.1.5 The Proposed Scheme is described in Section 2.

### 5.2 Scope, assumptions and limitations

- 5.2.1 The scope, assumptions and limitations for the air quality assessment are set out in Volume 1 (Section 8), the EIA Scope and Methodology Report (SMR)<sup>31</sup> and Volume 5: Appendix AQ-001-0MA06.
- 5.2.2 The study areas for the air quality assessment have been determined on the basis of where impacts on local air quality may occur:

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<sup>30</sup> High Speed Two Ltd (2022), High Speed Rail (Crewe – Manchester), *Background Information and Data, Air quality*, BID AQ-002-0MA06. Available online at: <https://www.gov.uk/government/collections/hs2-phase-2b-crewe-manchester-environmental-statement>.

<sup>31</sup> Volume 5: Appendix CT-001-00001, Environmental Impact Assessment Scope and Methodology Report.

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- from construction activities;
- from changes in the nature of traffic during construction and operation; for example, increases in traffic flows during construction or where road closures or restrictions cause diversions and heavier traffic on adjacent roads; or
- from changes to road alignment.

- 5.2.3 The assessment of construction dust emissions has been undertaken for sensitive receptors located up to 350m from dust generating activities. The assessment of traffic emissions has been undertaken for sensitive receptors located up to 200m from roads screened in for further assessment.
- 5.2.4 The assessment has incorporated HS2 Ltd's policies on vehicle emissions<sup>32</sup>. These include the use of Euro VI heavy goods vehicles (HGV), Euro 4 petrol and Euro 6 diesel cars and light goods vehicles (LGV) during construction of the Proposed Scheme.
- 5.2.5 The assessment of construction traffic impacts has used traffic data based on an estimate of the average daily flows in the peak year during the construction period (2025-2037). Several construction scenarios have been assessed for air quality to capture peak construction traffic activity at different times in the construction period. It has been assumed that the changes in construction traffic will occur for the whole year. In some cases, this is a conservative approach, as the duration of the peak traffic flows may well be much shorter. These scenarios have been assessed against the relevant future baseline case without the Proposed Scheme. The assessment also assumes vehicle emission rates and background pollutant concentrations from year 2025. As both pollutant emissions from vehicle exhausts and background pollutant concentrations are anticipated to reduce year by year as a result of vehicle emission controls, the year 2025 represents the worst case for the construction assessment.
- 5.2.6 The predicted impacts across all assessed construction scenarios for each receptor are presented in Volume 5: Appendix AQ-001-0MA06. Predicted concentrations and significant effects are presented for the worst case construction traffic scenario assessed.
- 5.2.7 The Government has proposed that clean air zones (CAZ) will be implemented in various cities in the country for reducing NO<sub>2</sub> concentrations and improving local air quality. The future baseline traffic models have assumed no improvements in the vehicle fleet due to the implementation of the CAZ. HS2 Ltd's policies on vehicle emissions comply with the requirements of all CAZ.

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<sup>32</sup> High Speed Two Ltd (2022), *Phase 2b Western Leg Information Paper E14: Air quality*.

## 5.3 Environmental baseline

### Existing baseline

#### Background air quality

- 5.3.1 The main sources of air pollution in the Hulseheath to Manchester Airport area are emissions from road vehicles and agricultural activities. The main roads within the area are the M56, the A56 Church Street/Manchester Road/Dunham Road, the A538 Altrincham Road/Wilmslow Road/Hale Road, the A556 and the A560 Shaftesbury Avenue/Stockport Road/Woodlands Road.
- 5.3.2 There are two industrial installations (regulated by the Environment Agency) with permits for emissions to air for NO<sub>x</sub> and/or PM<sub>10</sub>, namely Harman Technology Limited and UK Power Reserve Limited. Their details are presented in BID AQ-002-0MA06. The contribution of these industrial processes to local air quality is included within the background concentrations.
- 5.3.3 Estimates of background air quality have been taken from the Department for Environment, Food and Rural Affairs (Defra)<sup>33</sup> for the baseline year of 2018. The data are estimated for 1km grid squares for NO<sub>x</sub>, NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub>. Background concentrations were within the air quality standards for all pollutants within the Hulseheath to Manchester Airport area.

#### Local monitoring data

- 5.3.4 There are currently six local authority diffusion tube sites located within the Hulseheath to Manchester Airport area for monitoring NO<sub>2</sub> concentrations. These are located near the B5166 Styal Road, the A538 Hale Road, in Bucklow Hill, near the A556, near the B5165 Stockport Road in Timperley and near the A56 Manchester Road in Sale.
- 5.3.5 HS2 Ltd has undertaken additional monitoring for the purpose of verifying the air quality assessment at five locations in this area.
- 5.3.6 Measurements of NO<sub>2</sub> were within the air quality standard at all locations in 2018.
- 5.3.7 Details of the location of all monitoring sites are presented in map AQ-01-306 and the monitoring data are presented in Volume 5: Appendix AQ-001-0MA06 and BID AQ-002-0MA06.

#### Air quality management areas

- 5.3.8 There is one air quality management area (AQMA) within the Hulseheath to Manchester Airport area: the Greater Manchester Combined Authority AQMA. It covers a number of areas in Greater Manchester, including the M56 north of Manchester Airport and the A538

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<sup>33</sup> Department for Environment, Food and Rural Affairs (2021), *Defra Background Pollutant Concentration Maps*. Available online at: <https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2018>.

Wilmslow Road, and was designated in May 2016 for exceedances in the annual mean NO<sub>2</sub> standard. Details of its location is presented in map AQ-01-306 and Volume 5: Appendix AQ-001-0MA06.

## Clean air zones

5.3.9 A Class C CAZ is proposed to be implemented in Manchester by 2022. This will cover the Greater Manchester Area. It will be a charging CAZ with the following vehicle emission standards:

- bus/coach Euro VI;
- minibus, taxi and private hire Euro 4 petrol and Euro 6 diesel;
- HGV Euro VI; and
- LGV Euro 4 petrol and Euro 6 diesel.

## Receptors

5.3.10 Several locations have been identified in the area as sensitive receptors, which are considered to be susceptible to changes in air quality due to their proximity to dust generating activities or traffic routes during construction or operation of the Proposed Scheme.

5.3.11 Most of the receptors which may be affected by the Proposed Scheme are residential. Other receptors include Elmridge Primary School, Rangemore Nursing Home, Alderley Edge School for Girls, Gorseley Bank Primary School, Saint Ambrose College, Chapel Grange Montessori Nursery, Cygnet Court Nursery, The Hawthorns Nursery and Kenmore Medical Centre.

5.3.12 The air quality assessment has also included receptors in ecological sites sensitive to nitrogen deposition and dust. There are seven international/national ecological site designations of relevance to the air quality assessment identified in the Hulseheath to Manchester Airport area, namely Rostherne Mere Ramsar, Site of Special Scientific Interest (SSSI) and National Nature Reserve (NNR), Cotteril Clough SSSI, the Midland Meres and Mosses Phase 1 Ramsar site, and Lindow Common SSSI. Other relevant local sensitive ecological sites identified close to the Proposed Scheme include Sugar Brook Local Wildlife Site (LWS) and Ancient Woodland (AW), Well and Double Woods Site of Biological Importance (SBI), Bollin Oxbow at Castle Hill LWS, Ashley Brickworks LWS, Ecclesfield Wood LWS, Wood near Arden House LWS, Arden House Wood AW, Birkinheath Covert LWS, Cotteril Clough AW, Millington Clough AW, Sunbank Wood AW, Hancock's Bank South LWS, Hancock's Bank AW, Hancock's Bank North LWS, Rossmill SBI, Ryecroft Covert LWS and SBI, Ryecroft Covert AW and LWS, Yarwood Heath Covert LWS, Ashley Mill Wood LWS, Brickhill Wood LWS and AW, Mill Wood LWS, Veteran Oak Tree, Thorns Green LWS, Wood near Chapel Lane SBI, Hennersley Bank AW, Warburton Wood AW and Davenport Green Wood AW and SBI.

## Future baseline

- 5.3.13 Volume 5: Appendix CT-004-00000 provides details of the developments in the Hulseheath to Manchester Airport area that are assumed to be implemented by 2025. The potential cumulative impact from committed developments on air quality in conjunction with the effects from the construction and operation of the Proposed Scheme has been considered as part of this assessment. The future air quality baselines are defined as the ‘without the Proposed Scheme’ scenarios at each stage.

### Construction (2025)

- 5.3.14 Future background pollutant concentrations have been sourced from the Defra background maps for the first year of construction in 2025, which predict NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> levels in 2025 to be lower than in the 2018 baseline and within the relevant air quality standards.
- 5.3.15 Committed developments that have been included as future receptors in the assessment of air quality impacts during construction of the Proposed Scheme are identified in Volume 5: AQ-001-0MA06. No additional committed developments have been identified in this study area that will materially alter the baseline conditions in 2025 for air quality.

### Operation (2038)

- 5.3.16 Future background pollutant concentrations have been sourced from the Defra background maps for 2030, which is the latest available year of data. These predict NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> levels in 2030 to be lower than in the 2018 baseline and within the relevant air quality standards. The 2030 background maps have been used as representative of the future baseline conditions during operation of the Proposed Scheme.
- 5.3.17 Committed developments that have been included as future receptors in the assessment of air quality impacts during operation of the Proposed Scheme are identified in Volume 5: AQ-001-0MA06. No additional committed developments have been identified in this study area that will materially alter the baseline conditions in 2038 for air quality.

## 5.4 Effects arising during construction

### Avoidance and mitigation measures

- 5.4.1 Emissions to the atmosphere will be controlled and managed during construction through the route-wide implementation of the Code of Construction Practice (CoCP). The draft CoCP<sup>34</sup> includes a range of mitigation measures that are accepted by the Institute of Air Quality Management (IAQM) as being suitable to reduce impacts to as low a level as is

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<sup>34</sup> Volume 5: Appendix CT-002-00000, draft Code of Construction Practice (CoCP).

reasonably practicable. These measures are generally sufficient to avoid any significant effects from dust during construction.

- 5.4.2 The assessment has assumed that the general measures detailed in Section 7 of the draft CoCP will be implemented. These include:
- contractors being required to manage dust, air pollution, odour and exhaust emissions during construction works;
  - inspection and visual monitoring, undertaken in consultation with the local authorities, to assess the effectiveness of the measures taken to control dust and air pollutant emissions;
  - cleaning (including watering) of vehicle routes and designated vehicle waiting areas to suppress dust;
  - the use of water spray systems on demolition sites to dampen down fugitive dust;
  - keeping soil stockpiles away from sensitive receptors where reasonably practicable, also taking into account the prevailing wind direction relative to sensitive receptors;
  - the use of enclosures to contain dust emitted from construction activities; and
  - soil spreading, seeding and planting of completed earthworks as soon as reasonably practicable following completion of earthworks.
- 5.4.3 The draft CoCP includes the requirement for site-specific traffic management measures, such as the use of site haul routes for construction vehicles to minimise the need to use public roads.
- 5.4.4 Prior to commencement of activities, there will be further detailed assessment for each worksite to determine site-specific dust mitigation.

## **Assessment of impacts and effects**

### **Temporary effects**

- 5.4.5 Impacts from construction of the Proposed Scheme could arise from dust generating activities and emissions from construction traffic. As such, the assessment of construction impacts has been undertaken for dust and exposure to NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> concentrations.

### **Construction dust effects**

- 5.4.6 The risks of demolition of existing buildings, earthworks, construction of new structures and trackout have been assessed for their effect on dust soiling, human health and ecological sites. Trackout refers to the transport of dust and dirt from the construction site(s) onto the public road network, where it may be deposited and then re-suspended by vehicles using the network. The human health effects of dust relate mainly to short-term exposure to PM<sub>10</sub>.
- 5.4.7 The identified risks potentially arising from construction dust within the Hulseheath to Manchester Airport area are shown in Table 15. The risks are dependent on the magnitude

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of dust generating activities and the location of sensitive receptors in relation to these activities. A range of risks is shown, as there are several construction locations in the area.

**Table 15: Summary of risks for construction dust assessment**

Activity	Dust soiling	Human health	Ecological effects
Demolition	Negligible to high	Negligible to high	Low to medium
Earthworks	Medium to high	Low to medium	Low to high
Construction	Medium to high	Low to medium	Low to high
Trackout	Medium to high	Low to medium	Low to high

5.4.8 With the application of the established national best practice mitigation measures contained in the draft CoCP, no significant effects are anticipated from the risks associated with the dust generating activities. Further details of the assessment can be found in Volume 5: Appendix AQ-001-0MA06 where the scale of dust emissions and the sensitivity of the area and receptors are fully described.

### Construction traffic effects

- 5.4.9 Construction activity could also affect local air quality through the additional traffic generated on the highway network and site haul routes as a result of construction vehicles and through changes to traffic patterns arising from temporary road diversions and realignments.
- 5.4.10 The assessment of construction traffic emissions has been undertaken for a 'without the Proposed Scheme' scenario and a 'with the Proposed Scheme' scenario. The traffic data for each scenario includes the additional traffic from future committed developments.
- 5.4.11 Construction traffic data in the study area have been screened to identify roads that required further assessment and to confirm the likely effect of the change in emissions from vehicles using those roads during construction of the Proposed Scheme. There were seven construction traffic scenarios assessed in this area.
- 5.4.12 Receptors expected to experience the greatest change in concentrations have been included in the air quality model. No significant effects are predicted at any modelled human receptors during construction of the Proposed Scheme. Concentrations of NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> are within the relevant air quality standards both with and without the Proposed Scheme.
- 5.4.13 Nitrogen deposition is predicted to increase by more than 1% of the critical load at only one ecological receptor in this area, Cotteril Clough SSSI, as a result of the Proposed Scheme. The potential for this increase to result in significant ecological effects is addressed in Section 7, Ecology and biodiversity of this report. No significant effects are anticipated at any of the other ecological receptors in this area.



## **Rail emissions at Ashley railhead**

- 5.4.14 The impact from diesel trains associated with Ashley railhead has been assessed and is considered to be negligible. Therefore, no significant effects are anticipated from the operation of diesel trains at this location during construction of the Proposed Scheme (see Volume 5: Appendix AQ-001-0MA06).

## **Permanent effects**

- 5.4.15 No permanent effects on local air quality are likely to arise during construction of the Proposed Scheme.

## **Other mitigation measures**

- 5.4.16 No other mitigation measures are considered necessary in relation to air quality during construction of the Proposed Scheme in this area.

## **Summary of likely residual significant effects**

- 5.4.17 The methods outlined within the draft CoCP are considered effective at reducing dust and traffic emissions, and therefore, no significant residual effects are anticipated.

## **Cumulative effects**

- 5.4.18 The data used in the air quality assessment take account of predicted changes in traffic as a result of committed developments in the area, and therefore, their impacts have been included within the assessment. It is assumed that dust emissions from construction of other developments in the area will be controlled by appropriate measures as set out within their respective environmental management controls, and therefore, no cumulative effects for air quality are anticipated.

# **5.5 Effects arising from operation**

## **Avoidance and mitigation measures**

- 5.5.1 No specific mitigation measures for air quality are proposed during operation of the Proposed Scheme.

## **Assessment of impacts and effects**

- 5.5.2 Impacts from the operation of the Proposed Scheme will arise from changes in the volume, composition and/or speed of road traffic and changes in road alignment.

- 5.5.3 There will be no direct atmospheric emissions from the operation of trains that will cause an impact on air quality, and therefore, no assessment is required. Indirect emissions from sources such as rail and brake wear have been assumed to be negligible.

## **Operational traffic effects**

- 5.5.4 The assessment of operational traffic emissions has been undertaken for a 'without the Proposed Scheme' scenario and a 'with the Proposed Scheme' scenario in 2038. The traffic data for each scenario include the additional traffic from future committed developments.
- 5.5.5 Traffic data in the study area have been screened to identify roads that required further assessment and to confirm the likely effect of the change in emissions from vehicles using those roads during operation of the Proposed Scheme. There were 23 roads screened in for further assessment in the Hulseheath to Manchester Airport area, including Ashley Road, Mobberley Road, the A556, the M56, Castle Mill Lane and Mill Lane.
- 5.5.6 Receptors expected to experience the greatest change in concentrations have been included in the air quality model. No significant effects are predicted at any modelled receptors during operation of the Proposed Scheme. Concentrations of NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> are within the relevant air quality standards both with and without the Proposed Scheme. No significant effects are anticipated at any of the ecological receptors in this area.

## **Other mitigation measures**

- 5.5.7 No other mitigation measures are proposed in relation to air quality during operation of the Proposed Scheme.

## **Summary of likely residual significant effects**

- 5.5.8 No significant residual effects are anticipated for air quality in this area during operation of the Proposed Scheme.

## **Cumulative effects**

- 5.5.9 The data used in the air quality assessment take account of predicted changes in traffic as a result of committed developments in the area, and therefore, their impacts have been included within the assessment.

## **Monitoring**

- 5.5.10 Volume 1, Section 9 sets out the general approach to environmental monitoring during operation of the Proposed Scheme.
- 5.5.11 On the basis of there being no significant residual operational effects, there are no area-specific requirements for monitoring air quality effects during operation of the Proposed Scheme in the Hulseheath to Manchester Airport area.

## 6 Community

### 6.1 Introduction

- 6.1.1 This section of the report describes the baseline, impacts and likely significant effects on local communities resulting from the construction and operation of the Proposed Scheme in the Hulseheath to Manchester Airport area.
- 6.1.2 The assessment draws on information gathered from engagement with the users and operators of community resources. Local authorities, parish councils and operators of community resources that have been engaged with are identified in Section 3, Stakeholder engagement and consultation. The purpose of this engagement has been to understand how the resources are used and to obtain relevant baseline information to inform the design development and assessment of the Proposed Scheme.
- 6.1.3 Further details of the community assessments undertaken within the Hulseheath to Manchester Airport area are contained in Volume 5: Appendix CM-001-0MA06.
- 6.1.4 Community assessment maps are provided in the Map Series CM-01 in Volume 5, Community Map Book. Maps showing the location of the key environmental features (Map Series CT-10) and the key construction (Map Series CT-05) and key operational (Map Series CT-06) features of the Proposed Scheme are provided in the Volume 2, MA06 Map Book. The Proposed Scheme is described in Section 2.
- 6.1.5 All distances, lengths and area measurements provided in this section are approximate.

### 6.2 Scope, assumptions and limitations

- 6.2.1 The assessment scope, key assumptions and limitations for the community assessment are set out in Volume 1, Section 8 and the EIA Scope and Methodology Report (SMR)<sup>35</sup>.
- 6.2.2 The study area includes the land required both temporarily and permanently for the construction and operation of the Proposed Scheme. It also includes a wider area including proposed construction traffic routes within which community resources could be affected by a combination of two or more significant residual effects arising from noise, vibration, poor air quality, heavy goods vehicles (HGV)<sup>36</sup> traffic, and visual intrusion. Overall, the study area is taken as the area of land that encompasses the likely significant community effects of the Proposed Scheme.

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<sup>35</sup> Volume 5: Appendix CT-001-00001, Environmental Impact Assessment Scope and Methodology Report.

<sup>36</sup> HGV traffic effects are where there is a 30% or more increase in HGV traffic movements which have been identified as significant by traffic and transport. The increase in HGV traffic results in a traffic-related severance effect for non-motorised users. They contribute to in-combination effects on community resources that are located adjacent to the routes that experience the increase in HGV movements.

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- 6.2.3 Effects relating to the severance of public rights of way (PRoW) (public footpaths and bridleways) and highway and pedestrian diversions are assessed in Section 14, Traffic and transport. However, where PRoW and other routes are a promoted destination in their own right as a recreation resource, they have been considered within this assessment. Where impacts on public open space and recreational routes are considered, these have been informed by open space and PRoW condition surveys, where it has been possible to undertake such surveys.
- 6.2.4 Where reasonably practicable, public footpaths and routes will be reinstated, or convenient alternatives provided. HS2 Ltd will seek to provide a temporary or permanent alternative route in advance of a closure of a road or PRoW. No significant effects on these routes are likely once the mitigation measures have been implemented. If a temporary or permanent alternative route cannot be provided in advance of any road or PRoW closure, then this will be discussed with the relevant local authority and local groups.
- 6.2.5 Isolation effects may arise from either physical islanding of properties or an increase in journey times and/or distance between residential areas and the community resources that residents use on a regular basis.
- 6.2.6 The assessment of in-combination effects draws upon: Section 5, Air quality; Section 11, Landscape and visual; Section 13, Sound, noise and vibration; and Section 14, Traffic and transport. Likely significant in-combination effects on community resources are reported in this section. Durations of in-combination effects on community resources have been identified where information on the duration of contributing effects is provided in the relevant source assessments.
- 6.2.7 No area-specific limitations or assumptions have been identified for this area.

## 6.3 Environmental baseline

### Existing baseline

- 6.3.1 The Hulseheath to Manchester Airport area covers a 10.7km section of the route of the Proposed Scheme in Cheshire and Greater Manchester. The route passes through the parishes of Millington, Rostherne, Mobberley, Ashley and Ringway. Cheshire East Council (CEC), Trafford Metropolitan Borough Council (TMBC), Manchester City Council (MCC) and the Greater Manchester Combined Authority (GMCA) are the local authorities in the area. The boundary between High Legh parish and Millington parish forms the south-western boundary of this area. The boundary between Trafford district and Manchester district forms the north-eastern boundary of this area.
- 6.3.2 The Hulseheath to Manchester Airport area is predominantly rural, characterised by small clusters of residential properties and individual farms, with few community facilities. In general, most community facilities are in Hale Barns, located within the study area, and Hale, located to the north-west and outside of the study area.

## **Hulseheath, Booth Bank, Rostherne and surrounds**

- 6.3.3 This area covers the settlements of Hulseheath, Booth Bank, Rostherne and surrounds, from Booth Bank Lane in the west to Ashley Road in the east.
- 6.3.4 Hulseheath comprises approximately 20 residential properties, the nearest of which are located 350m to the east of the route of the Proposed Scheme.
- 6.3.5 Booth Bank comprises approximately 15 residential properties. The nearest residential properties are located 350m north-east of the route of the Proposed Scheme. The area is characterised by areas of farmland and Agden Brook, which runs through the centre of the settlement. The Children's Adventure Farm Trust at Booth Bank Farm is located 425m north of the route of the Proposed Scheme. This facility is an open farm providing activities and holiday respite accommodation for terminally ill, disabled and disadvantaged children.
- 6.3.6 Rostherne comprises approximately 115 residential properties. This area is characterised by areas of farmland interspersed with individual residential properties, the nearest of which are located 1.4km south of the route of the Proposed Scheme and outside of the study area. Within the study area are St Marys Church and Bucklow Manor Care Home, located 680m south of the route of the Proposed Scheme at the junction of Millington Lane and the A556. The care home serves those with age-related care needs.
- 6.3.7 Rostherne Mere, a National Nature Reserve, SSSI and Ramsar site, is located 160m south of the route of the Proposed Scheme. The mere (a lake of approximately 80ha in area) and surrounding woodland is an important wildlife and wetland habitat. Rostherne Mere is not publicly accessible, although there is a public footpath and viewpoint to the west of the mere. Access is by a circular path that leads around the southern part of the reserve, linking back to the car park across Tatton estate land. The reserve can also be visited via the A. W. Boyd Memorial Observatory.
- 6.3.8 There is one promoted PRow in the area, the Cheshire Cycleway (Regional Route 70), which is a 282km on-road circular route. The cycleway passes through Rostherne via Rostherne Lane.

## **Ashley, Thorns Green, Ringway and surrounds**

- 6.3.9 This area covers the settlements of Ashley, Thorns Green, Ringway and surrounds, from Ashley Road in the west to the M56 (north of Halebank, Ringway) in the east.
- 6.3.10 Ashley comprises approximately 70 residential properties, the nearest of which are located 350m north of the route of the Proposed Scheme. Community facilities in Ashley include St Elizabeth's Church and Community Centre. Recreational facilities in Ashley include Ashley Cricket Club and the Greyhound public house.
- 6.3.11 Thorns Green comprises approximately 15 residential properties. The nearest residential properties are on the route of the Proposed Scheme. Higher Thorns Green Farm, which is also on the route of the Proposed Scheme, provides social and educational farm experiences for young people with autism and learning difficulties.

- 6.3.12 Halebank is in the parish of Ringway and comprises approximately 20 residential properties, the nearest of which is on the route of the Proposed Scheme. Sunbank Wood is a publicly accessible woodland area of 13ha located to the south of Halebank, Ringway.
- 6.3.13 Promoted PRoW in the area include the Cheshire Cycleway (Regional Route 70) and Manchester Airport Orbital Cycleway (Regional Route 85, a traffic-free, 13km route around Manchester Airport); both are part of the National Cycle Network. The Bollin Valley Way also runs through this area, parallel to the River Bollin, 300m to the east of Thorns Green. The Bollin Valley Way is a 40km (25 mile) walking route linking Macclesfield with Partington.

## **Warburton Green, Hale Barns, Davenport Green and surrounds**

- 6.3.14 This area covers the settlements of Warburton Green, Hale Barns, Davenport Green and surrounds, from the M56 in the south to Davenport Green in the north.
- 6.3.15 Hale Barns and Warburton Green (a settlement within Hale Barns) lie on the south-west outskirts of Altrincham and comprise approximately 1,500 residential properties. The nearest residential properties are on the route of the Proposed Scheme.
- 6.3.16 Community facilities in Hale Barns include several schools (Elmridge Primary School and St Ambrose Preparatory School) and places of worship (Holy Angels Church, All Saints Church and Hale Chapel Unitarian). Hale Barns has several other community facilities including nursery schools, a secondary school, places of worship and a care home; however, these are located outside of the study area.
- 6.3.17 There are a number of recreational facilities located in Hale Barns. Hale Golf Club and Ringway Golf Club are partially within the study area. Hale Barns Cricket Club and The Tennis Club Hale Barns are both within the study area.
- 6.3.18 Davenport Green is a settlement comprising approximately 30 residential properties. The nearest residential properties are located 400m north-west of the route of the Proposed Scheme. Ringway Golf Course is located to the south of the settlement.

## **Future baseline**

### **Construction (2025)**

- 6.3.19 Volume 5: Appendix CT-004-00000 provides details of the developments in the Hulseheath to Manchester Airport area that are assumed to have been implemented by 2025. No committed developments of relevance for the community assessment have been identified that would materially alter the future baseline in this area.

## Operation (2038)

6.3.20 Volume 5: Appendix CT-004-00000 provides details of the developments in the Hulseheath to Manchester Airport area that are assumed to have been implemented by 2038. No committed developments of relevance for the community assessment have been identified that would materially alter the future baseline in this area.

## 6.4 Effects arising during construction

### Avoidance and mitigation measures

6.4.1 The draft Code of Construction Practice (CoCP)<sup>37</sup> includes a range of provisions that will help mitigate community effects associated with construction of the Proposed Scheme within this area, including:

- implementation of a community engagement framework and the provision of appropriately experienced community relations personnel to implement the framework, to provide appropriate information and to be the first point of contact to resolve community issues (Section 5 of the draft CoCP);
- sensitive layout of construction sites to reduce nuisance as far as possible (Section 5 of the draft CoCP);
- maintenance of PRow during construction where reasonably practicable (Section 14 of the draft CoCP);
- monitoring and management of flood risk and other extreme weather events, where reasonably practicable, which may affect community resources during construction (Section 16 of the draft CoCP);
- specific measures in relation to air quality and noise will also serve to reduce impacts for the neighbouring communities including discretionary noise insulation for sensitive community resources and, in special circumstances, temporary rehousing (Sections 7 and 13 of the draft CoCP); and
- where practicable, the avoidance of HGVs operating adjacent to schools during drop off and pick-up periods (Section 14 of the draft CoCP).

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<sup>37</sup> Volume 5: Appendix CT-002-00000, draft Code of Construction Practice (CoCP).

## **Assessment of impacts and effects**

### **Hulseheath, Booth Bank, Rostherne and surrounds**

#### **Temporary effects**

##### **Residential properties**

- 6.4.2 Construction of the Proposed Scheme, including utility works and/or highways works, will be required on residential land in the area. Where the scale of impact will be small, and the duration short (up to three months), these works will result in minor adverse effects, which will not be significant at a community level. A description of the affected properties is included within Volume 5: Appendix CM-001-0MA06.
- 6.4.3 Chapel Lane in Bucklow Hill is a designated route for construction traffic and is expected to experience a significant increase in HGV traffic movements. These significant HGV traffic effects are expected to combine with significant traffic noise effects on approximately 20 residential properties on Chapel Lane (between Hulseheath Lane and the A5034 Chester Road) during the peak months of construction. Together these noise and HGV traffic effects will result in a moderate adverse in-combination effect on amenity for residents at these properties, which is significant.
- 6.4.4 There will be a significant adverse in-combination effect for some residents at Hulseheath. Hulseheath extends across the boundary between the Hulseheath to Manchester Airport area and the Pickmere to Agden and Hulseheath area (MA03). As the majority of the affected properties are in the Pickmere to Agden and Hulseheath area, the effect is reported in Volume 2, Community Area report: Pickmere to Agden and Hulseheath (MA03), Section 6 and Volume 5: Appendix CM-001-0MA03.

##### **Community facilities**

- 6.4.5 No temporary construction effects on community facilities are anticipated in this area.

##### **Recreational facilities**

- 6.4.6 No temporary construction effects on recreational facilities are anticipated in this area.

##### **Public open space and recreational routes**

- 6.4.7 No temporary construction effects on public open space or recreational routes are anticipated in this area.



## **Permanent effects**

### **Residential properties**

- 6.4.8 Construction of Rostherne cutting will require the demolition of three residential properties on Yarwoodheath Lane in Rostherne. These residential properties will be permanently lost.

### **Community facilities**

- 6.4.9 No permanent construction effects on community facilities are anticipated in this area.

### **Recreational facilities**

- 6.4.10 No permanent construction effects on recreational facilities are anticipated in this area.

### **Public open space and recreational routes**

- 6.4.11 No permanent construction effects on public open space or recreational routes are anticipated in this area.

## **Ashley, Thorns Green, Ringway and surrounds**

### **Temporary effects**

#### **Residential properties**

- 6.4.12 Construction of the Proposed Scheme, including utility works and/or highways works, will be required on residential land in the area. Where the scale of impact will be small, and the duration short (up to three months), these works will result in minor adverse effects, which will not be significant at a community level. A description of the affected properties is included within Volume 5: Appendix CM-001-0MA06.
- 6.4.13 Construction of the Proposed Scheme will be in proximity to approximately 10 residential properties in Ringway (at Sunbank Lane). The construction of Ringway cutting and Sunbank Lane overbridge will result in significant noise and visual effects on these properties. Significant noise effects from these works are likely to last for approximately two years and three months. Together these noise and visual effects will result in a major adverse in-combination effect on amenity for residents at these properties, which is significant.

#### **Community facilities**

- 6.4.14 No temporary construction effects on community facilities are anticipated in this area.

#### **Recreational facilities**

- 6.4.15 No temporary construction effects on recreational facilities are anticipated in this area.

## **Public open space and recreational routes**

- 6.4.16 No temporary construction effects on public open space or recreational routes are anticipated in this area.

## **Permanent effects**

### **Residential properties**

- 6.4.17 Construction of Ashley embankment will require the demolition of two residential properties on Lamb Lane in Ashley. These residential properties will be permanently lost.
- 6.4.18 Construction of Thorns Green cutting will require the demolition of five residential properties on Castle Mill Lane in Thorns Green. These residential properties will be permanently lost. This will result in a major adverse effect, which is significant.
- 6.4.19 Construction of Ringway cutting will require the demolition of five residential properties on Sunbank Lane in Ringway. These residential properties will be permanently lost. This will result in a major adverse effect, which is significant.

### **Community facilities**

- 6.4.20 Construction of Thorns Green cutting will require the demolition of Higher Thorns Green Farm on Castle Mill Lane. The farm hosts the Fairfield Farm Project, which is run by Fairfield Care Ltd. The Project provides a range of social and flexible educational opportunities for children and adults with complex learning difficulties, supported by qualified staff. Activities include animal husbandry, horticulture and farming skills, which can lead to recognised qualifications. There are no comparable facilities offering the same services and opportunities nearby. Therefore, the loss of the services provided by the Fairfield Farm Project in this location will result in a major adverse effect, which is significant.

### **Recreational facilities**

- 6.4.21 No permanent construction effects on recreational facilities are anticipated in this area.

## **Public open space and recreational routes**

- 6.4.22 No permanent construction effects on public open space or recreational routes are anticipated in this area.

## **Warburton Green, Hale Barns, Davenport Green and surrounds**

### **Temporary effects**

#### **Residential properties**

- 6.4.23 Construction of the Proposed Scheme, including utility works and/or highways works, will be required on residential land in the area. Where the scale of impact will be small, and the duration short (up to three months), these works will result in minor adverse effects, which will not be significant at a community level. A description of the affected properties is included within Volume 5: Appendix CM-001-0MA06.
- 6.4.24 Construction of the Proposed Scheme will be in proximity to approximately 40 residential properties on the eastern side of Warburton Green. The properties will be affected by the construction of Manchester Airport High Speed station cutting and associated retaining walls and the activities at M56 East satellite compound. These works will result in significant noise and visual effects. Significant noise effects will last for approximately four years and five months. Together these noise and visual effects will result in a major adverse in-combination effect on amenity for residents at these properties, which is significant.
- 6.4.25 Construction of the Proposed Scheme will be in proximity to approximately 30 residential properties in Hale Barns (in the vicinity of the A538 Hale Road and Hasty Lane). The construction of Manchester Airport High Speed station and use of Manchester Airport Station North and South satellite compounds will result in significant noise and visual effects. Significant noise effects from these works will last for approximately four years and two months. Together these noise and visual effects will result in a major adverse in-combination effect on amenity for residents at these properties, which is significant.

#### **Community facilities**

- 6.4.26 No temporary construction effects on community facilities are anticipated in this area.

#### **Recreational facilities**

- 6.4.27 No temporary construction effects on recreational facilities are anticipated in this area.

#### **Public open space and recreational routes**

- 6.4.28 No temporary construction effects on public open space or recreational routes are anticipated in this area.

## **Permanent effects**

### **Residential properties**

- 6.4.29 Construction of Manchester Airport High Speed station cutting retaining wall north will require the demolition of nine residential properties; four on Hasty Lane and five on the A538 Hale Road in Hale Barns. These residential properties will be permanently lost. This will result in a moderate adverse effect, which is significant.

### **Community facilities**

### **Recreational facilities**

- 6.4.30 No permanent construction effects on recreational facilities are anticipated in this area.

### **Public open space and recreational routes**

- 6.4.31 No permanent construction effects on public open space or recreational routes are anticipated in this area.

## **Other mitigation measures**

- 6.4.32 HS2 Ltd is continuing to engage with owners and operators of the Fairfield Farm Project at Higher Thorns Green Farm to identify reasonably practicable measures to help mitigate the likely significant effects identified in this assessment.

## **Summary of likely residual significant effects**

- 6.4.33 The construction of the Proposed Scheme will result in significant temporary residual effects on the following community resources:
- approximately 20 residential properties in Bucklow Hill, due to the combination of noise and HGV traffic effects;
  - approximately 10 residential properties in Ringway, due to the combination of noise and visual effects;
  - approximately 40 residential properties on the eastern side of Warburton Green, due to the combination of noise and visual effects; and
  - approximately 30 residential properties in Hale Barns, due to the combination of noise and visual effects.
- 6.4.34 The construction of the Proposed Scheme is likely to result in the following permanent residual significant effects:
- loss of five residential properties in Thorns Green;
  - loss of five residential properties in Ringway;
  - loss of nine residential properties in Hale Barns; and
  - loss of the Fairfield Farm Project at Higher Thorns Green Farm in Thorns Green.

## Cumulative effects

6.4.35 No temporary or permanent cumulative effects have been identified in the Hulseheath to Manchester Airport area.

## 6.5 Effects arising from operation

### Avoidance and mitigation measures

6.5.1 The following measures have been incorporated into the Proposed Scheme design as part of the design development process to avoid or reduce environmental impacts during operation:

- landscape mitigation planting along Hulseheath North embankment to provide visual screening for residents of properties along Back Lane, Thowler Lane and Boothbank Lane, and Booth Bank Farm;
- landscape earthworks and mitigation planting along Rostherne cutting, Rostherne East box structure and Rostherne East embankment to provide visual screening for residents of properties along Cherry Tree Lane, Birkin Farm and users of Tatton Park;
- landscape earthworks and mitigation planting along Birkin Brook embankment, Ashley infrastructure maintenance base-rail (IMB-R), Ashley embankment, and Thorns Green embankment to provide visual screening for residents of properties within Ashley and Ashley Cricket Club;
- landscape earthworks and mitigation planting along the north side of Thorns Green cutting to provide visual screening for residents of properties on Castle Mill Lane;
- landscape earthworks and mitigation planting along the south-eastern side of Ringway cutting and to the west and east of Manchester Airport High Speed station cutting to provide visual screening for residents of properties in Warburton Green, Halebank and along Sunbank Lane;
- landscape earthworks and mitigation planting north-west of the realigned A538 Hale Road providing visual screening for residents of properties along Brooks Drive; and
- landscape mitigation planting located around Manchester tunnel south portal to provide visual screening for residents of properties in Davenport Green.

## Assessment of impacts and effects

### Hulseheath, Booth Bank, Rostherne and surrounds

6.5.2 There will be a significant adverse in-combination effect for some residents at Hulseheath. Hulseheath is located across the boundary of the Hulseheath to Manchester Airport area and the Pickmere to Agden and Hulseheath area (MA03). As the majority of the affected properties are in the Pickmere to Agden and Hulseheath area, the effect is reported in

Volume 2, Community Area report: Pickmere to Agden and Hulseheath (MA03), Section 6 and Volume 5: Appendix CM-001-0MA03.

## **Ashley, Thorns Green, Ringway and surrounds**

6.5.3 No operational effects are anticipated in this area.

## **Warburton Green, Hale Barns, Davenport Green and surrounds**

6.5.4 No operational effects are anticipated in this area.

## **Other mitigation measures**

6.5.5 The above assessment has concluded there are no significant adverse effects arising during operation, therefore no further mitigation is proposed.

## **Summary of likely residual significant effects**

6.5.6 There will be no significant residual effects in the Hulseheath to Manchester Airport area.

## **Cumulative effects**

6.5.7 No cumulative effects have been identified in the Hulseheath to Manchester Airport area.

## **Monitoring**

6.5.8 Volume 1, Section 9 sets out the general approach to environmental monitoring during operation of the Proposed Scheme.

6.5.9 Any area-specific operational monitoring requirements in relation to air quality effects, noise and vibration effects, traffic effects and visual effects that have contributed to the in-combination assessments, are described in the relevant sections of this Volume 2 report.

## 7 Ecology and biodiversity

### 7.1 Introduction

- 7.1.1 This section of the report describes the ecological baseline and identifies the predicted impacts and likely significant effects on habitats and species that will arise from construction and operation of the Proposed Scheme in the Hulseheath to Manchester Airport area. This includes effects on sites recognised or designated on the basis of their importance for nature conservation.
- 7.1.2 Engagement has been undertaken with stakeholders including Natural England, the Environment Agency, the Forestry Commission, the Woodland Trust, Cheshire Wildlife Trust, Greater Manchester Ecology Unit, the National Trust and Cheshire East Council. The purpose of this engagement has been to obtain relevant baseline information and inform the design development and assessment of the Proposed Scheme.
- 7.1.3 Volume 5 contains supporting information to the ecological assessment reported in this section, including:
- ecological baseline data – designated sites (see Volume 5: Appendix EC-001-00001);
  - an ecological register of local level effects, which are not reported individually in Volume 2 (Volume 5: Appendix EC-015-0MA06); and
  - documents to support the Habitats Regulations Assessment (HRA) Screening Report and Appropriate Assessment for the Rostherne Mere Ramsar site and Tatton Mere component of the Midland Meres and Mosses Phase 1 Ramsar site (Volume 5: Appendix EC-016-00006).
- 7.1.4 Map Series EC-01 showing statutory and non-statutory designated sites of relevance to the assessment in the Hulseheath to Manchester Airport area is provided in the Volume 5, Ecology Map Book.
- 7.1.5 Maps showing the location of the key environmental features (Map Series CT-10) and the key construction (Map Series CT-05) and key operational (Map Series CT-06) features of the Proposed Scheme can be found in the Volume 2: MA06 Map Book.
- 7.1.6 In addition, ecological baseline information relating to habitats and species recorded in the Hulseheath to Manchester Airport area is set out in Background Information and Data (BID)<sup>38</sup> (BID EC-002-00001 to BID EC-014-00001<sup>39</sup>) and accompanying Map Series EC-02 and EC-04 to EC-12 (BID Ecology Map Books).

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<sup>38</sup> High Speed Two Ltd (2022), High Speed Rail (Crewe – Manchester), *Background Information and Data*. Available online at: <https://www.gov.uk/government/collections/hs2-phase-2b-crewe-manchester-environmental-statement>.

<sup>39</sup> Note that BID EC-014-00000 contains data on badgers and is not published.

- 7.1.7 The Proposed Scheme is described in Section 2.
- 7.1.8 All distances, lengths and area measurements in this section are approximate.

## 7.2 Scope, assumptions and limitations

- 7.2.1 The scope, assumptions and limitations for the ecological assessment are set out in Volume 1, Section 8 and the EIA Scope and Methodology Report (SMR)<sup>40</sup> and in the Field Survey Methods and Standards (FSMS), which is included as an annex to the SMR.
- 7.2.2 A route-wide Water Framework Directive (WFD) compliance assessment has been undertaken in conjunction with the environmental assessment (Section 15, Water resources and flood risk). Details of the assessment are set out in Volume 5: Appendix WR-003-0MA06 – Water resource assessment and WR-005-0MA06 – Flood assessment as per Section 15.
- 7.2.3 Appropriate surveys have been undertaken where access was obtained. No surveys have been undertaken at the following sites that have the potential to support key ecological features: Rostherne Mere Site of Special Scientific Interest (SSSI), Ashley Brickworks Local Wildlife Site (LWS), Ecclesfield Wood LWS, Ashley Mill Wood LWS, Castle Mill LWS, Brickhill Wood LWS and Ancient Woodland Inventory (AWI) site, Wood near Chapel Lane Site of Biological Interest (SBI), Hennersley Bank AWI site, and Davenport Green Wood SBI and AWI site. Further details are provided in Background Information and Data: BID EC-002-00001 to BID EC-014-00001.
- 7.2.4 Where data are limited, such as due to the absence of field surveys, a precautionary baseline has been built up according to the guidance reported in the SMR. This constitutes a ‘reasonable worst case’ basis for the subsequent assessment and development of mitigation.
- 7.2.5 BID EC-002-00001 to BID EC-014-00001 identifies these survey locations. Where the assessment has been based upon limited data, the ecological receptor is described as ‘of up to’ a specific value to indicate that a precautionary approach has been applied.
- 7.2.6 The precautionary approach to the assessment that has been adopted identifies the likely significant ecological effects of the Proposed Scheme. Use of the precautionary approach ensures that any limitations arising from the age of datasets are taken into account. Unless otherwise stated, the description of effects assumes that land within Bill limits will be subject to habitat loss resulting from development of the Proposed Scheme, with the land required for construction purposes only being reinstated following completion of construction. This includes areas identified specifically for habitat creation.
- 7.2.7 With respect to utility works, it is normally assumed that all habitat is lost from the land required for the Proposed Scheme. This is assumed to be temporary except for mature woodland and areas of high-quality habitat. However, for some utility works, such as

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<sup>40</sup> Volume 5: Appendix CT-001-00001, Environmental Impact Assessment Scope and Methodology Report.



decommissioning of existing utilities, the construction methods are such that it has been possible to exclude significant effects on receptors within the land required for the construction of the Proposed Scheme at the following sites:

- Brickhill Wood LWS; and
- Brickhill Wood AWI site.

## 7.3 Environmental baseline

### Existing baseline

#### Introduction

- 7.3.1 This section describes the ecological baseline relevant to the assessment: the designated sites, habitats and species recorded in this area. Further details are provided in the reports presented in Volume 5: Appendix EC-001-00001 and BID EC-002-00001 to BID EC-015-00001, and maps presented in Volume 5, Map Series EC-01 and BID Ecology Map Books: Map Series EC-02 and EC-04 to EC-12. Statutory and non-statutory designated sites are shown on Volume 5, maps EC-01-519 to EC-01-522a, more distant designated sites listed in this report are beyond the map extents. The extent of the EC-01 maps is such that some designated sites are identified on them that are not relevant to the assessment due to their distance from the Proposed Scheme. Such sites are not covered in this report.
- 7.3.2 Land required for and adjacent to the Proposed Scheme in the Hulseheath to Manchester Airport area consists mainly of agricultural land and farmsteads. The topography of the land along the route of the Proposed Scheme has mainly gentle to moderate gradients, with watercourses such as Agden Brook near Millington Hall and the River Bollin near Halebank within steep valleys. The route of the Proposed Scheme will follow the M56 between Booth Bank and Halebank. It will cross the M56 at Halebank before continuing towards Davenport Green.

#### Designated sites

- 7.3.3 There are two statutory designated sites of international importance of potential relevance to the assessment in the Hulseheath to Manchester Airport area. They are:
- Midland Meres and Mosses Phase 1 Ramsar site, covering an area of 510.9ha, is designated for nutrient-rich water bodies (meres), associated habitats of reed swamp, fen carr and damp pasture, and quaking peat bog. The wide range of habitats supports numerous associated rare species of plants and invertebrates. The Mere, Mere SSSI is the closest component unit of the Ramsar site, and is located 835m south of the land required for the construction of the Proposed Scheme in the Hulseheath to Manchester Airport area. Tatton Meres SSSI component unit of the Ramsar site is located north of Knutsford, and is 2.4km west of the land required for the construction of the Proposed Scheme in the Hulseheath to Manchester Airport area. The Ramsar site is also relevant to

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the assessment in the Pickmere to Agden and Hulseheath area (MA03) and Hough to Walley's Green area (MA01) due to the proximity of The Mere, Mere SSSI and further component of this Ramsar site, Wybunbury Moss SSSI; and

- Rostherne Mere Ramsar site covering an area of 79.8ha is designated because it is one of the deepest and largest of the meres of the Shropshire-Cheshire Plain. Marginal vegetation consists of a narrow fringe of common reed. It is also designated as Rostherne Mere SSSI and National Nature Reserve (NNR). The site is located west of Rostherne, adjacent to the land required for the construction of the Proposed Scheme in the Hulseheath to Manchester Airport area. It is also adjacent to a construction traffic route on Cherry Tree Lane. This Ramsar site is also relevant to the Pickmere to Agden and Hulseheath area (MA03) assessment, where it is located 1.2km east of the land required for the construction of the Proposed Scheme.

7.3.4 There are five nationally important SSSI that are of potential relevance to the assessment in the Hulseheath to Manchester Airport area. For two of these sites the land required for the construction of the Proposed Scheme in this area is within the Impact Risk Zone<sup>41</sup> relevant to railway infrastructure as identified by Natural England. The remaining sites are of relevance due to predicted changes in traffic flows on nearby roads as a result of the Proposed Scheme. They are:

- Dunham Park SSSI, covering an area of 78ha, comprises pasture-woodland that has been managed as such since mediaeval times. A large number of the oak and beech trees present are ancient, and this site is the only site in the north-west and one of the few remaining in Britain with a considerable number of veteran trees present. The saprophytic beetle fauna and fly fauna is especially rich at this site and includes rarities. The SSSI is located south of Dunham Town, where it is 690m north-west of the land required for the construction of the Proposed Scheme. It is also adjacent to the B5160 Smithy Lane on which traffic will be redistributed as a result of the Proposed Scheme;
- Rostherne Mere SSSI and NNR, covering an area of 152.9ha, is designated for nutrient-rich open water body with fringing reed swamp. Rostherne Mere occupies a large oval hollow formed by subsidence resulting from the removal in solution of underlying salt deposits. The area of the Rostherne Mere SSSI extends beyond the boundary of the Ramsar site and includes additional grassland and woodland habitats. It is a winter roost for large numbers of pochard and shoveler duck. The site's designation as an NNR is for woodland and wetland birds, mammals, butterflies and its importance for freshwater research. The SSSI and NNR is located to the south of Cherry Tree Lane partially within land required for the construction of the Proposed Scheme, which is required for mitigation comprising groundwater recharge trenches. It is also adjacent to a construction traffic route on Cherry Tree Lane. This SSSI is also relevant to the Pickmere

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<sup>41</sup> The Impact Risk Zones are a GIS tool developed by Natural England to make a rapid initial assessment of the potential risks to SSSIs posed by development proposals and indicate the types of development proposal which could potentially have adverse impacts.

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to Agden and Hulseheath area (MA03) assessment, where it is 1.1km east of the land required for the construction of the Proposed Scheme;

- Tatton Meres SSSI, covering an area of 90ha, comprises two meres that are among the best examples of meres with moderate fertility and a rich aquatic flora. It includes an extensive community of submerged macrophytes such as autumnal pondweed, stiff-leaved water-crowfoot, spiked water-milfoil, fennel pondweed and horned pondweed. The site also includes a large area of fen, flushed acidic grassland and woodland. The SSSI is located north of Knutsford, 2.4km west of the land required for the construction of the Proposed Scheme. It is also 110m from the B5085 Mobberley Road and 163m from the B5083 King Street on which traffic will be redistributed;
- Cotteril Clough SSSI, covering an area of 10.3ha, comprises lowland broadleaved woodland with three distinct zones on the upper slope, valley side and valley bottom. The upper slopes of the valley support oak, ash, sycamore and birch woodland with ground flora including dog's-mercury, wood anemone and bluebell. This grades into ash and wych elm woodland on the valley sides. Along the bottom of the valley is wet alder woodland with abundant ramsons and less common plants including wood vetch, thin-spiked wood sedge and giant bellflower. An embankment, which was created when the A538 Wilmslow Road was built, supports neutral grassland in which red fescue, sweet vernal grass and Yorkshire fog are the main grasses with tufted hair grass frequent in wetter areas. The SSSI is also of interest for its assemblage of invertebrates and woodland birds. It is located north-west of the Manchester Airport at Castle Hill, 140m east of the land required for the construction of the Proposed Scheme. It is also adjacent to a construction traffic route on the A538 Wilmslow Road and Mill Lane; and
- Lindow Common SSSI, covering an area of 17.4ha, represents one of the few remaining areas of lowland heath in Cheshire. The site comprises a mixture of wet and dry heath, bog, open water and scattered scrub and woodland. The SSSI is located north-west of Wilmslow, 3.6km east of the land required for the construction of the Proposed Scheme. It is also adjacent to the A538 Altrincham Road on which traffic will be redistributed as a result of the Proposed Scheme;

7.3.5 Wybunbury Moss SSSI and The Mere, Mere SSSI, as component sites of The Midland Meres and Mosses Phase 1 Ramsar site, are of relevance to the assessment of the Ramsar site, but the Proposed Scheme within the Hulseheath to Manchester Airport area is not within the Impact Risk Zones for these SSSI.

7.3.6 There are 19 LWS and 14 SBI that are of potential relevance to the assessment in the Hulseheath to Manchester Airport area, each of which is of county/metropolitan value. They are:

- Cicely Mill Pool LWS, covering an area of 4.8ha, is designated for wet woodland and fen and comprises a shallow, silty lake managed for sport fishing and wildlife conservation. The LWS is located along Cicely Mill Lane at Cicely Mill, 1.3km south of the land required for the construction of the Proposed Scheme. The LWS is also relevant to the Pickmere to Agden and Hulseheath (MA03) area, where it is located 730m east of the land required for the construction of the Proposed Scheme;

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- Yarwood Heath Covert LWS, covering an area of 2.8ha, is designated for lowland mixed deciduous woodland and several interconnecting pools along the site's southern boundary. The LWS is located between junctions 7 and 8 of the M56, partially within land required for the construction of the Proposed Scheme. It is also adjacent to a construction traffic route and site haul route at junctions 7 and 8 of the M56;
- Watch Hill SBI, covering an area of 5.3ha, is designated for lowland mixed deciduous woodland and also comprises woodland, scrub and running water habitats. The SBI is located at Watlingford, 59m east of land required for utility works associated with the Proposed Scheme on the A56 Durham Road. It is also 480m north of the land required for the construction of the Proposed Scheme;
- Hancock's Bank South LWS, covering an area of 5.7ha, is designated for wet hollows, lowland mixed deciduous woodland, including areas of ancient semi-natural woodland, and neutral and marshy grassland habitat along Blackburn's Brook. The LWS is located west of Birkin House, partially within land required for the construction of the Proposed Scheme. It is also adjacent to a construction traffic route along Cherry Tree Lane;
- Hancock's Bank North LWS, covering an area of 1.4ha, is designated for broadleaved woodland along Blackburn's Brook and includes areas of ancient semi-natural woodland. The LWS is located adjacent to the M56, at Ryecroft Farm and east of junction 7 of the M56, adjacent to the land required for utility works associated with the Proposed Scheme. It is also 105m north of the land required for the construction of the Proposed Scheme and land that has been identified for the purpose of habitat creation or enhancement, as part of the Proposed Scheme;
- Twiss's Wood LWS, covering an area of 7.4ha, is designated for lowland mixed deciduous woodland. The LWS is located north of Ashley Road and east of Rostherne, 449m south of the land required for the construction of the Proposed Scheme. It is also 145m north-west of a construction traffic route along Ashley Road;
- Ryecroft Covert LWS, covering an area of 4.2ha, is designated for lowland mixed deciduous woodland and marshy grassland. The LWS is located along Birkin Brook, on both sides of the M56 east of junction 7 of the M56 at Ryecroft Farm, and partially within land required for utility works involving the modification of an overhead power line;
- Old Deer Enclosure, Tatton Park LWS, covering an area of 86.9ha, is designated for river habitats along Tatton Mere Brook, frequent ponds and wet hollows, grassland habitats and small parcels of mixed plantation woodland. The site is used extensively by a managed population (400 breeding head) of red and fallow deer, which roam freely in over 1,000 acres of parkland. The LWS is located within the National Trust's Tatton Park estate north of Knutsford, 344m south of land required for utility works associated with the Proposed Scheme. It is also 765m west of land required for the construction of the Proposed Scheme and 125m south-east of a construction traffic route along Ashley Road;
- Hanging Bank Covert SBI, covering an area of 0.7ha, is designated for its oak and ash woodland with hawthorn and elder understorey. The woodland contains invasive

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*Rhododendron* species and Himalayan balsam<sup>42</sup> and extensive areas of giant hogweed. The site supports a diverse assemblage of woodland birds. The SBI is located along the River Bollin and south of Pool Bank Farm, 221m north of land required for the construction of the Proposed Scheme;

- Vicarage Gorse Covert SBI, covering an area of 1.9ha, is designated for its mature oak and ash woodland, with hazel and hawthorn understorey. The woodland contains invasive *Rhododendron* species, Himalayan balsam and giant hogweed. The site supports a diverse assemblage of woodland birds. The SBI is located along the River Bollin and north of Ryecroft Covert, 207m north of land required for the construction of the Proposed Scheme;
- The Priory Wood SBI, covering an area of 0.7ha, is designated for its ash and oak woodland on a steep slope above the River Bollin. The ground flora includes dog's mercury, red campion, bluebell, moschatel and tufted hair-grass. The woodland contains the invasive species Himalayan balsam and giant hogweed. The SBI is located along the River Bollin and north of Ryecroft Farm, 222m north of land required for the construction of the Proposed Scheme at Ashley Mill Lane, where works to the road are required to allow its use as a construction traffic route;
- Birkinheath Covert LWS, covering an area of 3.6ha, is designated for lowland mixed deciduous woodland. The LWS is located along Birkinheath Lane and Ashley Road, partially within land required for utility works involving the modification of an overhead power line. It is also adjacent to a construction traffic route along Birkinheath Lane and Ashley Road;
- Ashley Mill Wood LWS, covering an area of 0.5ha, is designated for lowland mixed deciduous woodland. The LWS is located north of Ashley Mill Lane along the River Bollin and west of Coppice Farm, adjacent to land required for utility works associated with the Proposed Scheme. It is also adjacent to a construction traffic route along Birkinheath Lane and Ashley Road;
- Wood near Arden House LWS, covering an area of 3ha, is designated for mixed semi-natural woodland including areas of ancient semi-natural woodland. The LWS is located east of Mobberley Road and north of Arden House, partially within land required for the construction of the Proposed Scheme. It is also adjacent to a site haul route coming from Mobberley Road;
- Sugar Brook LWS, covering an area of 2.9ha, is designated for lowland mixed deciduous woodland, hedgerows, neutral grassland, traditional orchards and veteran and ancient trees. The woodland is a small fragment of remaining ancient woodland. The LWS is located south of Ashley along Sugar Brook, partially within land required for the construction of the Proposed Scheme. It is also adjacent to land required for utility works associated with the Proposed Scheme;

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<sup>42</sup> *The Invasive Alien Species (Enforcement and Permitting) Order 2019*. Her Majesty's Stationery Office. London. Available online at: <http://www.legislation.gov.uk/uksi/2019/527/contents/made>.

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- Ashley Brickworks LWS (formally Erlam's Meadow LWS), covering an area of 3.1ha, is designated for lowland mixed deciduous woodland, rough meadow, ponds and stream habitat. The LWS is located south of Ashley, within the land required for the construction of the Proposed Scheme;
- Jackson's Bank West LWS, covering an area of 5.4ha, is designated for lowland mixed deciduous and wet woodland. The LWS is located east of Ashley Road along the River Bollin and west of Hale Golf Club, 399m east of the land required for the construction of the Proposed Scheme;
- Bentley and Tomfield Banks SBI, covering an area of 8.6ha, is designated for semi-natural broadleaved woodland including areas of ancient semi-natural woodland. The SBI is located north of Hale Golf Club, 639m north of the land required for the construction of the Proposed Scheme;
- Ecclesfield Wood LWS, covering an area of 3ha, is designated for lowland deciduous woodland and contains scattered ponds and a stream along its northern boundary. The LWS is located north of Lower House Farm, partially within land required for the construction of the Proposed Scheme. It is also adjacent to a site haul route coming from Back Lane;
- Jackson's Bank East LWS, covering an area of 1.9ha, is designated for lowland mixed deciduous woodland along the River Bollin. The LWS is located either side of the M56 and north of Castle Mill Lane, 108m north of land required for the construction of the Proposed Scheme at Castle Mill Lane, where works to the road are required to allow its use as a construction traffic route;
- Rossmill SBI, covering an area of 5.4ha, is designated for semi-natural broadleaved woodland including areas of ancient semi-natural woodland, and grassland and marsh. The SBI is located south of Carrwood Road along the River Bollin, adjacent to the land required for the construction of the Proposed Scheme;
- Brickhill Wood LWS, covering an area of 4.2ha, is designated for standing water and mixed semi-natural woodland including areas of ancient semi-natural woodland. The site also has a good assemblage of birds. The LWS is located south of Thorns Green, adjacent to land required for utility works associated with the Proposed Scheme and a construction traffic route along Brickhill Lane;
- Veteran Oak Tree, Thorns Green LWS, is designated for a veteran oak tree. The LWS is located east of Thorns Green, within the land required for the construction of the Proposed Scheme;
- Wood near Chapel Lane SBI, covering an area of 0.8ha, is designated for woodland which is linked to an extensive network of ancient woodland along the bank of the River Bollin. The SBI is located west of Halebank, partially within land required for the construction of the Proposed Scheme;
- Mill Wood, Castle Mill LWS, covering an area of 3.7ha, is designated for lowland mixed deciduous and wet woodland, hedgerows, grassland and veteran and ancient trees. The LWS is located west of Castle Hill, partially within land required for the construction of the Proposed Scheme. It is also adjacent to a construction traffic route along Mill Lane;

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- Sunbank Wood and Ponds SBI, covering an area of 23.7ha, is designated for woodland habitat including areas of ancient semi-natural woodland and ponds that support a range of amphibian species including great crested newt. The SBI is located north of Castle Hill, partially within land required for the construction of the Proposed Scheme. It is also adjacent to a construction traffic route along Mill Lane;
- Cotteril Clough SBI (part of which is also Cotteril Clough SSSI), covering an area of 11.2ha, is designated for woodland including areas of ancient semi-natural woodland. The SBI is located north-west of the Manchester Airport runways at Castle Hill, 140m east of the land required for the construction of the Proposed Scheme. It is also adjacent to a construction traffic route on the A538 Wilmslow Road and Mill Lane;
- Bollin Oxbow at Castle Hill LWS, covering an area of 4.7ha, is designated for lowland mixed deciduous woodland, hedgerows, grazing marsh and grassland habitats, ponds and ditches, and river habitat along the River Bollin. The LWS is located west of Castle Hill, 157m south of land required for the Proposed Scheme at Mill Lane where works to the road are required to allow its use as a construction traffic route;
- Well and Double Woods SBI, covering an area of 5.3ha, is designated for woodland habitat and woodland floor plant communities. The SBI is located north-west of the Manchester Airport, 139m south-east of land required for the construction of the Proposed Scheme at Mill Lane, where works to the road are required to allow its use as a construction traffic route;
- Road Cutting at Castle Hill SBI, covering an area of 0.6ha, is designated for calcareous grassland within its woodland and scrub habitat. It is the only known calcareous grassland site in Manchester. The SBI is located north-west of the Manchester Airport runways, adjacent to a construction traffic route on the A538 Wilmslow Road;
- Ponds near Manchester Airport Runway SBI, covering an area of 4.1ha, is designated for ponds that provide habitat for amphibians, including breeding great crested newt. The SBI is located north-west of Manchester Airport, 469m south of land required for the construction of the Proposed Scheme. It is also 100m east of a construction traffic route on the A538 Wilmslow Road;
- Ponds at Davenport Green SBI, covering an area of 34.2ha, is designated for grassland, aquatic invertebrates, ponds, hedgerows and amphibians. The ponds support great crested newt. The SBI is located north-west of Davenport Green, 110m north-west of the land required for the construction of the Proposed Scheme; and
- Davenport Green Wood SBI, covering an area of 3.6ha, is designated for semi-natural broadleaved woodland and bird assemblages. The SBI is located south of Davenport Green Hall, partially within the land required for the construction of the Proposed Scheme.

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- 7.3.7 The Proposed Scheme will cross an area of land adjacent to the M56 near Davenport Green which is identified to represent Wildlife Corridors by the City of Salford and Trafford Metropolitan Borough Council, as part of their planning framework<sup>43</sup>.
- 7.3.8 There are 17 AWI sites of potential relevance to the assessment in the Hulseheath to Manchester Airport area, each of which is of national value. They are:
- Millington Clough, covering an area of 1ha. The AWI site is located to the south of Moss House Farm, within the land required for utility works involving the modification of a high-pressure gas pipeline;
  - Harpers Bank Wood AWI site (which is also part of Rostherne Mere Ramsar site and Rostherne Mere SSSI), covering an area of 8.4ha. The AWI site is located east of Rostherne Lane, 280m west of the land required for the construction of the Proposed Scheme;
  - Wood Bongs AWI site (which is also part of the Rostherne Mere Ramsar site and Rostherne Mere SSSI), covering an area of 3.5ha. The AWI site is located north of Rostherne, 600m south-west of land required for the construction of the Proposed Scheme at Cherry Tree Lane where works to the road are required to allow its use as a construction traffic route;
  - Watch Hill AWI site (which is also part of Watch Hill SBI), covering an area of 3.5ha. The AWI site is located at Watlingford, 60m east of land required for utility works associated with the Proposed Scheme on the A56 Durham Road. It is also 480m north of the land required for the construction of the Proposed Scheme;
  - Hancock's Bank AWI site (which is also part of Hancock's Bank South LWS), covering an area of 3.2ha, including Plantation on Ancient Woodland Site (PAWS) covering an area of 0.7ha, with wet hollows to the south of the site. The AWI site is located west of Birkin House, partially within land required for the construction of the Proposed Scheme;
  - Birkin House AWI site (which is also part of Hancock's Bank South LWS), which is PAWS covering an area of 0.9ha. The AWI site is located south-west of Birkin House, 60m north of the land required for the construction of the Proposed Scheme;
  - Hancock's Bank North AWI site (which is also of Hancock's Bank North LWS), covering an area of 1.4ha. The AWI site is located adjacent to the M56, east of junction 7 of the M56 at Ryecroft Farm, adjacent to land required for utility works associated with the Proposed Scheme;
  - Ryecroft Covert (which is also part of Ryecroft Covert LWS), covering an area of 1.1ha. The AWI site is located north of Birkin House, partially within the land required for utility works involving the modification of an overhead power line;
  - Arden House Wood AWI site (which is also part of the Wood near Arden House LWS), which is PAWS covering an area of 2.6ha. The AWI site is located east of Mobberley Road

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<sup>43</sup> Trafford Metropolitan Borough Council (2021), *Unitary Development Plan*, Chapter 7 - Environment. Part II Proposal ENV10 – Wildlife Corridors. Available online at: <https://www.trafford.gov.uk/planning/strategic-planning/UDP-Interactive/chapter-7-environment.aspx>.



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and north of Arden House, partially within land required for the construction of the Proposed Scheme;

- Bentley/Tomfield Banks AWI site (which is also part of Bentley and Tomfield Banks SBI), covering an area of 4ha. The AWI site is located north of Hale Golf Club, the M56 and River Bollin, 639m north of the land required for the construction of the Proposed Scheme;
- Warburton Wood AWI site (which is also part of Rossmill SBI), covering an area of 2.2ha. The AWI site is located south of Carrwood Road along the River Bollin, 60m north of the land required for the construction of the Proposed Scheme;
- Brickhill Wood AWI site (which is also part of Brickhill Wood LWS), which is PAWS covering an area of 2.3ha. The AWI site is located south of Thorns Green adjacent to land required for utility works associated with the Proposed Scheme and a construction traffic route along Brickhill Lane;
- Hennersley Bank (which is also part of Wood near Chapel Lane SBI), covering an area of 0.7ha. The AWI site is located north-east of Thorns Green, along the River Bollin, adjacent to the land required for the construction of the Proposed Scheme;
- Bollin Bank (which is also part of Sunbank Wood and Ponds SBI), covering an area of 0.6ha. The AWI site is located to the east of Thorns Green, partially within land required for the construction of the Proposed Scheme;
- Sunbank Wood AWI site (which is also part of Sunbank Wood and Ponds SBI), covering an area of 12.4ha. The AWI site is located north of Castle Mill Farm, adjacent to the land required for the construction of the Proposed Scheme;
- Cotteril Clough AWI site (part of which is also part of Cotteril Clough SBI and Cotteril Clough SSSI), covering an area of 11ha. The AWI site is located either side of the A538 Wilmslow Road, 140m east of the land required for the construction of the Proposed Scheme. It is also adjacent to a construction traffic route on the A538 Wilmslow Road and Mill Lane; and
- Davenport Green Wood AWI site (which is also part of the Davenport Green Wood SBI), covering an area of 1.3ha. The AWI site is located south of Davenport Green Hall, partially within the land required for the construction of the Proposed Scheme.

7.3.9 Areas of semi-natural woodland within the AWI sites are likely to qualify as lowland mixed deciduous woodland, a habitat of principal importance in Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006<sup>44</sup> and a conservation priority of the Cheshire Biodiversity Action Plan<sup>45</sup> (local BAP).

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<sup>44</sup> *Natural Environment and Rural Communities Act 2006*. Her Majesty's Stationery Office, London. Available online at: <http://www.legislation.gov.uk/ukpga/2006/16/section/41>.

<sup>45</sup> Cheshire Biodiversity Trust (2020), *Cheshire Biodiversity Action Plan*. Available online at: <https://www.cheshirewildlifetrust.org.uk/sites/default/files/2018-06/BAP%20list%20-%20updated%20April%202011.pdf>.

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- 7.3.10 HS2 Ltd has carried out a heritage review of one woodland of potential relevance to the assessment in the Hulseheath to Manchester Airport area, which indicates that it could be ancient woodland and that it may be added to the AWI in due course, which is of up to national value. This is Sugar Brook (which is also part of the Sugar Brook LWS), covering an area of 0.2ha, comprising lowland mixed deciduous woodland. Canopy species in the woodland include oak, ash and beech, with understorey species of elder, holly and hazel. Ramsons, wood melick, wood speedwell, bluebell, wood anemone, primrose, lesser celandine and wood sage are present in the ground flora. The invasive species Himalayan balsam is present within the woodland. The woodland is located south of Ashley along Sugar Brook, partially within land required for the construction of the Proposed Scheme.
- 7.3.11 An additional woodland was recently identified as ancient woodland during consultation with the Woodland Trust and has not yet been added to the AWI. Birkin Bridge Lodge Wood, covering an area of 1.6ha, comprising semi-natural broadleaved woodland. It is located adjacent to Birkin Bridge Lodge, partially within the land required for utility works involving the modification of an overhead power line. The woodland is of national value.
- 7.3.12 An additional site was identified as ancient woodland, but this will not be added to the AWI. This is East Arden House Wood (which is also part of Ashley Brickworks LWS), covering an area of 0.1ha, comprising semi-natural broadleaved woodland. The woodland is located to the east of Arden House Wood and east of Mobberley Road, within the land required for the construction of the Proposed Scheme. This woodland habitat is of national value.

## Habitats

- 7.3.13 In addition to the ancient woodlands identified above, the following habitat types that occur in this area are relevant to the assessment.

## Woodland

- 7.3.14 There are 37 other areas of lowland deciduous woodland that qualify or are likely to qualify as lowland mixed deciduous woodland, a habitat of principal importance. They are:
- an unnamed broadleaved woodland located north of Millington Clough, covering an area of 3ha. The woodland canopy comprises silver birch, English oak, ash, hazel and rowan. The woodland is located partially within land required for utility works involving the modification of a high-pressure gas pipeline, east of Ivy House Farm. The woodland is of district/borough value;
  - an unnamed broadleaved woodland along Agden Brook, covering an area of 0.7ha and within an area identified as a potential LWS. The woodland canopy comprises pedunculate oak, hawthorn and beech. The woodland is located partially within land required for the construction of the Proposed Scheme, north of Millington Hall. On a precautionary basis, given that this woodland is within an area identified as a potential LWS, it is of up to county/metropolitan value;
  - an unnamed broadleaved woodland south of Booth Bank, covering an area of 0.4ha and within an area identified as a potential LWS. The woodland canopy comprises oak and

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ash. The woodland is located partially within land required for utility works involving modification of a fuel pipeline, north of Millington Hall. On a precautionary basis, given that this woodland is within an area identified as a potential LWS, it is of up to county/metropolitan value;

- lowland mixed deciduous woodland located within and adjacent to Yarwood Heath Covert LWS, south of Bowden roundabout near the A556, covering an area of 3.5ha. The canopy is dominated by birch, with oak and sycamore also present. The understorey is dominated by rowan and includes young birch and holly. Ground flora is species poor and dominated by broad buckler fern with abundant bramble. The woodland is located partially within land required for the construction of the Proposed Scheme, between junctions 7 and 8 of the M56. The woodland is of county/metropolitan value;
- an unnamed wet woodland located south-east of the junction between the A556 and Cherry Tree Lane within Rostherne Mere Ramsar site and SSSI, covering an area of 1.7ha. The woodland is dominated by grey willow with frequent crack willow and goat willow. There is no understorey. Lesser pond sedge and reed canary-grass are constant in the field layer. The species composition of this habitat is characteristic of W1 *Salix cinerea-Galium palustre* woodland. The woodland is located 80m south of the land required for the construction of the Proposed Scheme, along Cherry Tree Lane. The woodland is of district/borough value;
- Mere Covert, covering an area of 10.4ha, is located south of the junction between Cherry Tree Lane and Tom Lane within Rostherne Mere Ramsar site and SSSI. The woodland comprises abundant yew, pedunculate oak, frequent field maple and common beech. The shrub layer includes frequent broad buckler fern, raspberry, bramble and common nettle. The understorey contains enchanter nightshade, great willowherb and red campion. The woodland is located 65m south of the land required for the construction of the Proposed Scheme, along Cherry Tree Lane, which is a construction traffic route. The woodland is of county/metropolitan value;
- Ryecroft Covert lowland mixed deciduous woodland located at Ryecroft Covert LWS along Birkin Brook and adjacent to both carriageways of the M56, covering an area of 4.1ha. The canopy is dominated by oak, with frequent ash and sycamore. Goat willow and crack willow are present in damper areas towards Birkin Brook. The shrub layer is sparse with elder and hazel. Himalayan balsam is dominant in the ground flora, with native species present including wood avens, nettle, dog's mercury and great willowherb. Bracken is locally dominant in the understorey and bluebell is also present. The woodland is located partially within land required for utility works involving the modification of an overhead power line. The woodland is of county/metropolitan value;
- Arden House Wood lowland mixed deciduous woodland, located within Wood near Arden House LWS, covering an area of 3ha. The woodland is located east of Mobberley Road and north of Arden House, partially within land required for the construction of the Proposed Scheme. The woodland is of up to county/metropolitan value;
- Birkinheath Covert lowland mixed deciduous woodland, located at Birkinheath Covert LWS along Birkinheath Lane and Ashley Road, covering an area of 3.6ha. The woodland is located partially within land required for utility works involving the modification of an

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overhead power line and adjacent to a construction traffic route along Birkinheath Lane and Ashley Road. The woodland is of up to county/metropolitan value;

- The Rookery broadleaved woodland habitat located south of Ashley Hall and north of the M56, covering an area of 1.8ha. The woodland is located partially within land required for utility works involving the modification of an underground power line. The woodland is of up to district/borough value;
- lowland deciduous woodland located within Ashley Brickworks LWS, covering an area of 1.3ha. The woodland is located south of Ashley, within the land required for the construction of the Proposed Scheme. The woodland is of up to county/metropolitan value;
- Ecclesfield Wood lowland deciduous woodland located within Ecclesfield Wood LWS, covering an area of 3ha. The canopy is dominated by pedunculate oak, with ash and birch also present. Alder and crack willow are present around ponds and low-lying damp areas within the woodland. The understorey comprises dense hawthorn, elder, birch, holly and rowan. Himalayan balsam dominates the ground layer. The woodland is located north of Lower House Farm, partially within land required for the construction of the Proposed Scheme. The woodland is of county/metropolitan value;
- broadleaved woodland located partially within and adjacent to Mill Wood, Castle Mill LWS and along the River Bollin, covering an area of 4ha. Species present include alder, sycamore, ash, willow, hazel, beech, oak and hawthorn. Ground flora present includes wood avens, common-nettle, cleavers, butterbur, cow parsley, common hogweed, ivy, Himalayan balsam and bramble. The woodland is located partially within land required for the construction of the Proposed Scheme, east of Thorns Green. The woodland is of county/metropolitan value;
- Sunbank Wood broadleaved woodland located within Sunbank Wood and Ponds SBI north of Castle Hill, covering an area of 10.7ha. The woodland is partially within land required for the construction of the Proposed Scheme. It is also adjacent to a construction traffic route along Mill Lane. The woodland is of up to county/metropolitan value;
- Davenport Green Wood broadleaved woodland located within Davenport Green SBI west of Manchester Airport, covering an area of 2.3ha. The woodland is partially within land required for the construction of the Proposed Scheme, south of Davenport Green. The woodland is of up to county/metropolitan value; and
- a further 21 woodlands (each up to 1.5ha and none within wildlife site designations) at various locations throughout the Hulseheath to Manchester Airport area. These woodland habitats are of up to local/parish value.

## Grassland

- 7.3.15 Two areas of semi-improved grassland are located within Rostherne Mere SSSI<sup>46</sup>, south of junction 7 of the M56 and north of Gale Bog. A field containing 6.1ha of grassland is located on a slope and is MG11a *Festuca rubra-Agrostis stolonifera-Potentilla anserina* grassland *Lolium perenne* sub-community. In wetter areas it becomes MG10a *Holcus lanatus-Juncus effusus* rush-pasture, typical sub-community. A particularly steep section of the grassland is almost un-grazed and supports a rich-semi-improved MG5 *Cynosurus cristatus-Centaurea nigra* grassland habitat with knapweed, trailing tormentil and field woodrush present in the sward. A second field containing a further area of 2.6ha of grassland is largely MG11a *Festuca rubra-Agrostis stolonifera-Potentilla anserina* grassland *Lolium perenne* sub-community with areas of ponds and wet depressions that range from S22b *Glyceria fluitans* water-margin vegetation *Alopecurus geniculatus* sub-community to MG10a *Holcus lanatus-Juncus effusus* rush-pasture, typical sub-community. The grassland is located partially within the land required for the Proposed Scheme, which is required for the construction of groundwater recharge trenches. This grassland is of county/metropolitan value.
- 7.3.16 Marshy grassland, covering an area of 0.1ha, is located within a clearing in woodland north of Millington Clough. The site comprises reed canary-grass. Frequently present are meadowsweet, great willowherb, opposite-leaved golden-saxifrage with occasional wild angelica, bittersweet, soft rush and marsh thistle. The grassland is located within the land required for utility works involving modification of a high-pressure gas pipeline. The grassland is of district/borough value.
- 7.3.17 Marshy grassland, covering an area of 0.4ha, is located adjacent to Agden Brook, west of Stonedolph Farm, and contains various grass species and brooklime. The grassland is located within the land required for utility works involving the modification of a high-pressure gas pipeline. The grassland is of district/borough value.
- 7.3.18 Marshy grassland, covering an area of 0.2ha, located at Hulseheath and is dominated by soft rush and contains various grass species. The grassland is located within the land required for utility works involving the modification of a high-pressure gas pipeline. The grassland is of district/borough value.
- 7.3.19 Semi-improved neutral grassland, covering an area of 1.3ha, is located around the existing balancing pond at junction 8 of the M56. The grassland is located within the land required for the construction of the Proposed Scheme. The grassland is of up to district/borough value.
- 7.3.20 Marshy grassland, covering an area of 0.4ha, is present at Hancock's Bank South LWS, where it forms a narrow margin alongside Blackburn's Brook. Species present include common sorrel, greater bird's-foot trefoil, meadowsweet and ribwort plantain. This grassland is

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<sup>46</sup> JBA Consulting (2010), *Rostherne Mere NNR – National Vegetation Classification*.

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partially within land required for the construction of the Proposed Scheme and is of county/metropolitan value.

- 7.3.21 Species-rich marshy grassland, covering an area of 0.2ha, is located along Blackburn's Brook and is within Ryecroft Covert LWS. It has become established on a mound of excavated material created by the construction of the M56. Species include square-stalked St John's-wort, wild angelica, greater bird's-foot trefoil, marsh willowherb, hoary willowherb, reed canary-grass, pendulous sedge and remote sedge. The grassland is located adjacent to the land required for the construction of the Proposed Scheme and is of county/metropolitan value.
- 7.3.22 Semi-improved neutral grassland, covering an area of 10.9ha, identified as a potential LWS, is located adjacent to the eastern bank of Birkin Brook. The site is dominated by Yorkshire fog, cock's-foot, creeping bent and contains other grasses such as Timothy, crested dogs-tail and rough meadow grass. Other species include creeping buttercup, meadow buttercup, meadow vetchling, bush vetch, grass vetchling and bird's foot trefoil. The grassland is located partially within land required for the construction of the Proposed Scheme, east of Birkin House. On a precautionary basis, given that this grassland is within an area identified as a potential LWS, it is of up to county/metropolitan value.
- 7.3.23 Semi-improved neutral grassland, covering an area of 2ha, forming part of Sugar Brook LWS, is present south of Ashley along Sugar Brook. Good quality semi-improved neutral grassland is located in the western extent of the LWS, to the east of Primrose Hill Farm. Species including betony, common bird's-foot trefoil, common knapweed, orchid (*Dactylorhiza* species), meadow vetchling, rough hawkbit and meadowsweet are present in this area. This grassland is located adjacent to land required for the construction of the Proposed Scheme. It is of county/metropolitan value.
- 7.3.24 Semi-improved neutral grassland, covering an area of 0.4ha, is located within a field adjacent to Mobberley Road. Abundant grass species include false oat grass, perennial rye-grass, red fescue, Yorkshire fog and rough meadow grass. Other occasional species include tufted vetch, meadow vetchling, hairy-tare vetch and bird's-foot trefoil. The grassland is located within the land required for the construction of the Proposed Scheme. The grassland is of district/borough value.
- 7.3.25 Rough, semi-improved neutral grassland, covering an area of 1.7ha, is located south of Ashley and forms part of Ashley Brickworks LWS. The grassland is located within the land required for the construction of the Proposed Scheme and is of county/metropolitan value.
- 7.3.26 Semi-improved neutral grassland, covering an area of 7.9ha, is located south of Ashley Brickworks LWS and within an area identified as a potential LWS. The grassland is located within land required for the construction of the Proposed Scheme, east of Arden Lodge. On a precautionary basis, given that this grassland is within an area identified as a potential LWS, it is of up to county/metropolitan value.
- 7.3.27 Semi-improved grassland, covering an area of 2.1ha, is located between the River Bollin and Hale Bank Farm. Species include Yorkshire fog, cock's-foot, reed canary-grass, common bent,

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common knapweed, Himalayan balsam, common hogweed, bramble, ragwort species, broad-leaved dock and creeping buttercup. The grassland is located within land required for the construction of the Proposed Scheme. The grassland is of district/borough value.

- 7.3.28 Semi-improved grassland, covering an area of 3.5ha, is located between Hale Bank Farm and Keepers Cottage. Species include meadow foxtail, annual meadow-grass, Yorkshire fog, perennial rye-grass, red fescue, common couch grass, cock's-foot, Timothy, herb-robert, creeping buttercup, meadow buttercup, dandelion, common sorrel, ribwort plantain, common ragwort, rosebay willowherb, common hogweed, cleavers, greater plantain, common nettle, colt's-foot, redshank and hedge bindweed. The grassland is located within land required for the construction of the Proposed Scheme. The grassland is of district/borough value.
- 7.3.29 Semi-improved and marshy grassland, covering an area of 6.4ha, is located at Warburton Green. Species include cock's-foot, Yorkshire fog, perennial rye-grass, meadow foxtail, false oat-grass, red fescue, creeping bent, Timothy, creeping buttercup, common ragwort, meadow buttercup, creeping thistle and great willowherb are present, and damper areas contain purple moor-grass and rush. The grassland is located partially within land required for the construction of the Proposed Scheme. The grassland is of district/borough value.
- 7.3.30 Semi-improved neutral grassland, covering an area of 0.1ha, forms part of Cotteril Clough SSSI along the embankment of the A538 Wilmslow Road. Species include red fescue, sweet vernal grass and Yorkshire fog with tufted hair grass frequent in wetter areas. Other species within the grassland include coltsfoot, ribwort plantain, creeping buttercup and common spotted orchid. The grassland is located north-west of Manchester Airport at Castle Hill, adjacent to a construction traffic route on the A538 Wilmslow Road. The grassland is of county/metropolitan value;
- 7.3.31 Species-poor semi-improved and marshy grassland covers an area of 111.7ha within the land required for the Proposed Scheme in the Hulseheath to Manchester Airport area. Areas of species poor semi-improved and marshy grassland are of local/parish value.

## **Hedgerows**

- 7.3.32 In total, there is 58.1km of hedgerow within the land required for the construction of the Proposed Scheme in the Hulseheath to Manchester Airport area. Hedgerow with at least 80% cover of native woody species is a habitat of principal importance.
- 7.3.33 Of the 58.1km of hedgerow, 40.7km have not been surveyed. To accord with Phase 1 habitat descriptions these are mapped as native species-rich on map series EC-02 and they are included as native species-rich in the list below. Based on survey data, and on a precautionary basis, the hedgerow is assumed to consist of:
- 14.7km of native species-poor; and

- 43.4km of native species-rich of which 2.2km is also classified as 'Important' according to the 'Wildlife and Landscape' criteria in The Hedgerows Regulations 1997<sup>47</sup>.

7.3.34 As part of the precautionary assessment, it is assumed that further important hedgerows will be found within land that was not surveyed, but which will be required for the Proposed Scheme. The hedgerows within the area also function as wildlife corridors. The hedgerow network as a whole is of county/metropolitan value.

## Swamp

- 7.3.35 Swamp habitat, covering an area of 8.8ha, is present along the margins of Rostherne Mere within the Rostherne Mere Ramsar site, SSSI and NNR. Species present include bulrush, common reed, lesser pond-sedge, reed canary-grass, meadow sweet, bittersweet and greater willowherb. The species composition is most characteristic of S4a *Phragmites australis* swamp and reed-bed *Phragmites australis* sub-community. The swamp habitat is located 180m south of the land required for the construction of the Proposed Scheme, along Cherry Tree Lane. This swamp habitat is of international value.
- 7.3.36 Swamp habitat, covering an area of 0.1ha, is present in a clearing of broadleaved semi-natural woodland at Gale Bog, at the northern end of Rostherne Mere. It is overgrown with silver birch, but species associated with the peat bog remain including *Sphagnum* moss. Purple loosestrife and meadowsweet are present throughout. Frequently occurring species include purple small-reed and lesser pond sedge which are locally dominant, plus less abundant yellow loosestrife, reed canary-grass, reedmace and soft rush. The species composition is a transition between S7 *Carex acutiformis* swamp and M27c *Filipendula ulmaria-Angelica sylvestris* mire *Juncus effusus-Holcus lanatus* sub-community. Tall fen habitat S24 *Phragmites australis-Peucedanum palustris* is also present. The swamp habitat is located 115m south of land required for the construction of the Proposed Scheme, west of Mereside Cottage. This swamp habitat is of national value.

## Watercourses

- 7.3.37 Millington Clough, Agden Brook, Blackburn's Brook, Birkin Brook and the River Bollin will be crossed by the route of the Proposed Scheme. Millington Clough, Agden Brook, Blackburn's Brook, Birkin Brook and the River Bollin may qualify as habitats of principal importance and local BAP habitats. These watercourses and adjacent habitats are intrinsically important and provide corridors for wildlife dispersal, as such they are of up to county/metropolitan value.
- 7.3.38 Sections of Tributary of Birkin Brook 2 and Timperley Brook will be realigned and watercourse diversions are proposed at Tributary of Birkin Brook 1, Tributary of Birkin Brook 2 and Tributary of Birkin Brook 3. These tributaries of main watercourses provide corridors for wildlife dispersal and are of up to district/borough value.

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<sup>47</sup> *The Hedgerow Regulations 1997* (SI 1997 No. 1160). Her Majesty's Stationery Office, London.



7.3.39 Several smaller watercourses, including those associated with Birkin Brook, the River Bollin, Timperley Brook and Sugar Brook will also be crossed by the Proposed Scheme. These smaller watercourses are of up to district/borough value. The unnamed tributaries of these smaller watercourses are of up to local/parish value.

### **Water bodies**

7.3.40 There are 52 ponds located within, or partly within, the land required for the construction of the Proposed Scheme, and a further 174 ponds within 250m of the land required for the construction of the Proposed Scheme. On a precautionary basis it is assumed that all ponds could support habitats of principal importance or local BAP habitats and are of district/borough value unless surveys have shown that they are of local/parish value only.

### **Standing water – eutrophic**

7.3.41 Eutrophic standing water, covering an area of approximately 64ha, is present at Rostherne Mere Ramsar site, SSSI and NNR. The eutrophic standing water is located 187m south of land required for the construction of the Proposed Scheme. This area of eutrophic standing water habitat is of international value.

### **Ancient and veteran trees**

7.3.42 Ancient and veteran trees with potential relevance to the assessment in the Hulseheath to Manchester Airport area have been considered. An ancient tree is one that has passed maturity and is old, or aged, in comparison with other trees of the same species. Veteran trees are younger than ancient trees but have features found on ancient trees such as decay in the trunk, branches and/or roots.

7.3.43 There are two LWS designated, at least in part, for the presence of ancient or veteran trees that are partially within the land required for the construction of the Proposed Scheme. They are:

- Sugar Brook LWS, which has several specimens of veteran beech; and
- Mill Wood, Castle Mill LWS, which has several specimens of ancient oak and ash.

7.3.44 In addition to the potential presence of veteran trees in Sugar Brook LWS mentioned above, on the basis of surveys undertaken and desk study data there are six trees within the land required for the construction of the Proposed Scheme that are considered to be of a sufficient age and/or that support features to indicate they are of veteran status:

- two ash trees and an oak tree located south of Millington;
- a beech tree north of Hasty Lane, Hale Barns;
- an *Acer* or *Platanus* species tree located at Rose Cottage, Thorns Green; and
- an oak tree located within Thorns Green LWS, located east of Thorns Green.

7.3.45 The ancient and veteran trees within these sites are of national value.

## **Protected and/or notable species**

7.3.46 A summary of the likely value of protected and/or notable species of relevance to the assessment is provided in Table 16.

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**Table 16: Protected and/or notable species within the Hulseheath to Manchester Airport area**

Resource/feature	Value	Receptor	Baseline and rationale for valuation
Bats	Regional	Bat assemblage between the M6, the M56 and the A556 within the Pickmere to Agden and Hulseheath area (MA03) and the Hulseheath to Manchester Airport area	<p>Field surveys confirmed the presence of common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, brown long-eared bat, noctule, Leisler's bat, whiskered/Brandt's bat, Natterer's bat, Daubenton's bat and <i>Myotis</i> species within this assemblage:</p> <ul style="list-style-type: none"> <li>occasional roosts of common pipistrelle, soprano pipistrelle, <i>Pipistrellus</i> species, brown long-eared bat, whiskered bat and <i>Myotis</i> species;</li> <li>a soprano pipistrelle and brown long-eared bat possible maternity roost in a barn at Winterbottom Lane, High Legh, 10m west of land required for the construction of the Proposed Scheme within the Pickmere to Agden and Hulseheath area (MA03);</li> <li>a <i>Myotis</i> species possible maternity roost in a barn at Thowler Lane, High Legh, within the land required for the construction of the Proposed Scheme within the Hulseheath to Manchester Airport area;</li> <li>a whiskered bat possible maternity roost in a barn at Thowler Lane, High Legh, 10m north of land required for the construction of the Proposed Scheme within the Hulseheath to Manchester Airport area (MA03);</li> <li>field surveys identified occasional roosts of common pipistrelle, soprano pipistrelle and noctule in trees along the B5391 Pickmere Lane, Hoo Green Lane, Wrenshot Lane in High Legh, Chapel Lane and Boothbank Lane within the Pickmere to Agden and Hulseheath area (MA03); and</li> <li>Peacock Lane within the Pickmere to Agden and Hulseheath area (MA03) is considered an important commuting and foraging corridor due to the high levels of soprano pipistrelle, common pipistrelle and <i>Myotis</i> species activity recorded. The surrounding area contains a high number of bat roosts in buildings, a commuting and foraging corridor along Agden Brook and Rostherne Mere to the east which will be used for foraging by the bats in the assemblage.</li> </ul> <p>All bat species in the assemblage are a conservation priority within the Cheshire BAP. Nathusius' pipistrelle, noctule, and Leisler's bat, and <i>Myotis</i> species including whiskered bat, Brandt's bat, Natterer's bat and Daubenton's bat are considered to be 'rarer' species in England<sup>48</sup>. However, noctule is considered to be more common in Cheshire. Brown long-eared bat, noctule and soprano pipistrelle are species of principal importance<sup>49</sup>.</p> <p>The assemblage is considered to be of regional value on the basis that a possible maternity roost of whiskered bat and <i>Myotis</i> species was recorded and high levels of Nathusius' pipistrelle, noctule, Leisler's bat and <i>Myotis</i></p>

<sup>48</sup> Wray S, Wells D, Long E and Mitchell-Jones T (2010), *Valuing Bats in Ecological Impact Assessment*, IEEM In-Practice p 23-25.

<sup>49</sup> *Natural Environment and Rural Communities Act 2006*. Available online at: <http://www.legislation.gov.uk/ukpga/2006/16/section/41>.

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Resource/ feature	Value	Receptor	Baseline and rationale for valuation
			species bat activity were recorded, which are considered to be 'rarer' species in England. Maternity roosts, including those of the most common species, are relatively uncommon and are important in maintaining bat populations.
Bats	Regional	Bat assemblage between the A556 and junction 6 of the M56	<p>Field surveys confirmed the presence of common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, brown long-eared bat, serotine, noctule, Leisler's bat, whiskered/Brandt's bat, Natterer's bat, Daubenton's bat and <i>Myotis</i> species within this assemblage:</p> <ul style="list-style-type: none"> <li>occasional roosts of common pipistrelle, soprano pipistrelle, brown long-eared bat, whiskered bat and <i>Myotis</i> species;</li> <li>feeding perches of brown long-eared bat;</li> <li>a common pipistrelle possible maternity roost in a barn at Castle Mill Lane, Altrincham, within the land required for the construction of the Proposed Scheme;</li> <li>occasional roosts of common pipistrelle were recorded in a hybrid poplar tree at Bankside, Timperley, 50m south of land required for the construction of the Proposed Scheme;</li> <li>Rushy-pits Covert is considered an important commuting and foraging area due to the high levels of common pipistrelle, soprano pipistrelle, brown long-eared bat, noctule, Leisler's bat and <i>Myotis</i> species activity recorded. The woodland is close to a commuting corridor along Agden Brook and Rostherne Mere to the south which will be used for foraging by the bats in the assemblage; and</li> <li>the River Bollin is considered an important commuting and foraging area due to the high levels of soprano pipistrelle, common pipistrelle and <i>Myotis</i> species activity recorded. The watercourse provides connectivity between large woodland areas that are used for foraging by the bats in the assemblage.</li> </ul> <p>The assemblage is considered to be of regional value on the basis that high levels of Nathusius' pipistrelle, noctule, serotine, Leisler's bat, Natterer's bat, Daubenton's bat, Brandt's bat, whiskered bat and <i>Myotis</i> species activity were recorded, which are considered to be 'rarer' species in England. Maternity roosts, including those of the most common species, are relatively uncommon and are important in maintaining bat populations.</p>
Bats	Regional	Bat assemblage between junction 6 of the M56 and Manchester Airport	<p>Field surveys confirmed the presence of common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, brown long-eared bat, noctule, Leisler's bat, whiskered/Brandt's bat, Natterer's bat, Daubenton's bat and <i>Myotis</i> species within this assemblage:</p> <ul style="list-style-type: none"> <li>occasional roosts of common pipistrelle and brown long-eared bat; and</li> <li>high levels of common and rarer bat species were recorded foraging and commuting across the assemblage, including noctule, Leisler's bat and <i>Myotis</i> species.</li> </ul> <p>The assemblage is considered to be of regional value on the basis that high levels of noctule, Leisler's bat and <i>Myotis</i> species activity were recorded, which are considered to be 'rarer' species in England.</p>

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Resource/feature	Value	Receptor	Baseline and rationale for valuation
Birds	County/metropolitan	Wintering birds at Rostherne Mere	Field surveys recorded a total of ten species, including flights of seven target species that intersect the proposed structures at risk height of 0 to 25m and two of which are a red list species. Species recorded included corn bunting, goldeneye, lapwing and lesser redpoll, as well as large flocks of starling and black-headed gull. Although field survey data are limited, the site is known to support significant populations of various waterfowl in winter. Recent desk study records included up to 21,000 starlings, 3,000 black-headed gull and 147 shoveler at Rostherne Mere. <sup>50</sup>
Birds	Up to county/metropolitan	Potential barn owl populations in the Hulseheath to Manchester Airport area	The desk study data recorded barn owl in the Hulseheath to Manchester Airport area, including 26 records, three breeding sites and up to 2km of land required for the construction of the Proposed Scheme. Field surveys identified suitable foraging habitat for barn owl throughout the Hulseheath to Manchester Airport area and an incidental sighting of barn owl was recorded in the Booth Bank to Newhall Farm area. Field surveys identified suitable foraging habitat for barn owl throughout the Hulseheath to Manchester Airport area and two incidental sighting of barn owl were recorded during field surveys, one at Booth Bank and one near Thorns Green.
Birds	District/borough	Breeding bird assemblage between Booth Bank and Newhall Farm	Field surveys recorded a total of 44 species, 18 of which were notable. Breeding territories of 23 species were recorded, nine of which were notable, with six Red List species and eight species of principal importance and/or conservation priorities of the local BAP. Notable species in Cheshire recorded in this assemblage include bullfinch, grey partridge, house sparrow, lapwing, reed bunting, skylark, song thrush and yellowhammer. Habitats present within the land required for the construction of the Proposed Scheme are typical of the area and are widespread.
Birds	Local/parish	Breeding bird assemblage between Cherry Tree Farm and Mobberley Road	Field surveys recorded 44 species, including 15 notable species. Breeding territories of 24 species were recorded, seven of which were notable, with three Red List species and five species of principal importance.
Birds	Local/parish	Wintering bird assemblage between Ryecroft Farm and Mobberley Road	Field surveys recorded a total of 51 species, including 22 notable species, within and adjacent to the land required for the construction of the Proposed Scheme. This included 11 Red List species and nine species of principal importance and/or conservation priorities of the local BAP. An additional seven notable species were recorded during vantage point surveys at Blackburn's Brook viaduct, four of which are a red list species.
Birds	Local/parish	Wintering bird assemblage between	Field surveys recorded a total of 51 species, including 24 notable species, within and adjacent to the land required for the construction of the Proposed Scheme. This included 14 Red List species and 11 species of

<sup>50</sup> Cheshire and Wirral Ornithological Society (2016), *Cheshire and Wirral Bird Report 2014*. Swallowtail Print Ltd, Norwich.

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Resource/feature	Value	Receptor	Baseline and rationale for valuation
		Booth Bank and Newhall Farm	principal importance and/or conservation priorities of the local BAP. An additional three notable species were recorded during vantage point surveys at Agden Brook viaduct, one of which is a red list species.
Birds	Up to local/parish	Potential kingfisher populations in the Hulseheath to Manchester Airport area	Desk study data provided 43 records of kingfisher in the Hulseheath to Manchester Airport area, 2km from the land required for the construction of the Proposed Scheme. The closest record was within land required for the construction of the Proposed Scheme in the Cherry Tree Farm to Mobberley Road area. Kingfisher are a Schedule 1 species but are cited as uncommon in Cheshire (100-500 breeding pairs), which means that they are not considered to be rare or scarce at a County level. They are an amber listed species of conservation concern, so while notable, are not considered at high risk.
Vascular plants	County/metropolitan	Grass vetchling at Birkinheath Brook	Field surveys recorded grass vetchling within the land required for the construction of the Proposed Scheme in semi-improved grassland at Birkinheath Brook. The species is listed as Rare in Cheshire <sup>51</sup> .
Vascular plants	District/borough	Sanicle at Wood near Chapel Lane	Field surveys recorded sanicle adjacent to land required for the construction of the Proposed Scheme at Wood near Chapel Lane. This species is listed as Locally Scarce in Cheshire.
Vascular plants	Up to district/borough	Early-purple orchid at Rostherne Mere SSSI	Within the Hulseheath to Manchester Airport area there are desk study records of early-purple orchid at Rostherne Mere SSSI, within the land required for mitigation comprising groundwater recharge trenches. This species is listed as Locally Scarce in Cheshire. Although no confirmed evidence of this species has been observed during field surveys, it is possible that it is present in suitable habitat in the area.
Vascular plants	Up to district/borough	Tufted sedge within the Hulseheath to Manchester Airport area	Within the Hulseheath to Manchester Airport area there are desk study records of tufted sedge, within the land required for the construction of the Proposed Scheme at Yarwood Heath Covert. This species is listed as Locally Scarce in Cheshire. Although no confirmed evidence of this species has been observed during field surveys, it is possible that it is present in suitable habitat in the area.

<sup>51</sup> Botanical Society of Britain and Ireland (BSBI) (2015), *Cheshire VC58 County Rare Plant Register 2015*. Available online at: [https://bsbi.org/wp-content/uploads/dlm\\_uploads/Cheshire\\_RDB\\_2015.pdf](https://bsbi.org/wp-content/uploads/dlm_uploads/Cheshire_RDB_2015.pdf).

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Resource/feature	Value	Receptor	Baseline and rationale for valuation
Amphibians	Up to county/metropolitan	A meta-population (a group of at least four spatially separated populations which interact) <sup>52</sup> (GCNMP1.6.1) of great crested newt in a network of 179 ponds located south of Thorns Green and east of New Mills	An assumed large meta-population of great crested newt was identified across 179 ponds, which includes confirmed presence of great crested newt from positive eDNA <sup>53</sup> field survey results for one pond and positive desk study records for one pond. The ponds are all outside the land required for the construction of the Proposed Scheme and in some cases more than 500m from it. Great crested newt is an Annex 2 species, a species of principal importance, and a conservation priority of the local BAP.
Amphibians	Up to county/metropolitan	A meta-population (GCNMP1.6.4) of great crested newt in a network of 16 ponds located north-east of Rostherne	An assumed medium meta-population of great crested newt was identified across 16 ponds, which includes confirmed presence of great crested newt from positive eDNA field survey results for one pond and positive desk study records for one pond. The ponds are located within 250m and up to 500m from land required for the construction of the Proposed Scheme.
Amphibians	Up to county/metropolitan	A population (GCNP1.6.5) of great crested newt in a network of three ponds located north of New Mills	An assumed medium population of great crested newt was identified across three ponds, which includes confirmed presence of great crested newt from positive eDNA field survey results for one pond and positive desk study records for two ponds. The ponds are located within the land required for the construction of the Proposed Scheme.
Amphibians	Up to county/metropolitan	A meta-population (GCNMP1.6.6) of great crested newt in a network of nine ponds	An assumed medium meta-population of great crested newt was identified across nine ponds, which includes confirmed presence of great crested newt from positive desk study records for two ponds. The ponds are located within 250m and in some cases more than 500m from land required for the construction of the Proposed Scheme.

<sup>52</sup> Each great crested newt meta-population (GCNMP) has been given an identifying number. Meta-populations are described in BID EC-007-00001 Ecological baseline data - amphibian and pond and canal surveys.

<sup>53</sup> Natural England (2021), *Great crested newts: advice for local planning authorities*. Available online at: <https://www.gov.uk/guidance/great-crested-newts-surveys-and-mitigation-for-development-projects#survey-methods>.

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Resource/ feature	Value	Receptor	Baseline and rationale for valuation
		located south-east of High Legh	
Amphibians	Up to county/ metropolitan	A population (GCNP1.6.7) of great crested newt in a network of three ponds located south of Ashley	An assumed medium population of great crested newt was identified across three ponds, which includes confirmed presence of great crested newt from positive eDNA field survey results for one pond. The ponds are located within and up to 250m from land required for the construction of the Proposed Scheme.
Amphibians	Up to county/ metropolitan	A meta-population (GCNMP1.6.9) of great crested newt in a network of 17 ponds located north of New Mills	An assumed medium meta-population of great crested newt was identified across 17 ponds, which includes confirmed presence of great crested newt from positive eDNA field survey results for five ponds and positive desk study records for six ponds. The ponds are located within and up to 500m from land required for the construction of the Proposed Scheme.
Amphibians	Up to county/ metropolitan	A population (GCNP1.6.12) of great crested newt in a network of two ponds located east of Ashley and north of Thorns Green	An assumed medium population of great crested newt was identified across two ponds, which includes field surveys which recorded a small population in one pond. Surveys also recorded positive desk study records for great crested newt in one pond. The ponds are located within 250m from land required for the construction of the Proposed Scheme.
Amphibians	Up to county/ metropolitan	A meta-population (GCNMP1.6.14) of great crested newt in a network of seven ponds located north of Ashley	An assumed medium meta-population of great crested newt was identified across seven ponds, which includes confirmed presence of great crested newt from positive eDNA field survey results for one pond. The ponds are located within 250m from land required for the construction of the Proposed Scheme.
Amphibians	Up to county/ metropolitan	A population (GCNP1.6.16) of great crested newt in a network of two ponds	An assumed medium population of great crested newt was identified across two ponds, which includes confirmed presence of great crested newt from positive desk study records for one pond. The ponds are located within 250m from land required for the construction of the Proposed Scheme.



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Resource/feature	Value	Receptor	Baseline and rationale for valuation
		located east of Warburton Green	
Amphibians	Up to county/metropolitan	A meta-population (GCNP1.6.17) of great crested newt in a network of four ponds located west of Ashley	An assumed medium meta-population of great crested newt was identified across four ponds, which includes confirmed presence of great crested newt from positive eDNA field survey results for one pond. The ponds are located within 250m from land required for the construction of the Proposed Scheme.
Amphibians	Up to county/metropolitan	Populations of great crested newt within un-surveyed ponds	Ponds that have not been surveyed are assumed to support breeding populations of great crested newt of medium size class.
Amphibians	Local/parish	Populations of other amphibian species comprising smooth newt, palmate newt, common toad and common frog	These common amphibian species have been identified within ponds throughout the Hulseheath to Manchester Airport area during surveys and are assumed to be present within the ponds that have not been surveyed. Woodland, rough grassland and hedgerow habitats are likely to be utilised by these species during their terrestrial phase for foraging, dispersal and shelter. Each of these species is common and widespread throughout the UK. Common toad is a species of principal importance.
Fish	Up to county/metropolitan	Fish assemblage in Birkin Brook	The Environment Agency data identified brown trout, rainbow trout, stone loach, gudgeon, perch, roach, European eel, three-spined stickleback, bullhead, lamprey and minnow within Birkin Brook. Lamprey is an Annex 2 species. Lamprey, brown trout, and European eel are species of principal importance and their populations are declining across the UK. These species are not found in badly polluted rivers.
Fish	District/borough	Fish assemblage in the River Bollin	Field surveys recorded bullhead, stone loach, three-spined stickleback, chub, and brown trout within the River Bollin, and there were records of minnow in the desk study. Bullhead is an Annex 2 species <sup>54</sup> . This species is widespread in suitable habitat in England. Brown trout is a species of principal importance and its populations is declining across the UK. These species are not found in badly polluted rivers.
Fish	Local/parish	Fish assemblage in Agden Brook	Field surveys identified the presence of three-spined stickleback within Agden Brook. The presence of this species is indicative of 'fair' biological water quality.

<sup>54</sup> Annex 2 of the EU's Habitats Directive (1992) lists priority species whose conservation requires the designation of Special Areas of Conservation.

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Resource/feature	Value	Receptor	Baseline and rationale for valuation
Fish	Up to local/parish	Fish assemblage in Blackburn's Brook	The Environment Agency data included records of pike, perch, roach and minnow in Blackburn's Brook.
Water vole	Up to county/metropolitan	Water vole population in the Hulseheath to Manchester Airport area	Desk study data included water vole records at Rostherne Mere in 2008, adjacent to the land required for the construction of the Proposed Scheme. Suitable habitat is present along the watercourses in the Hulseheath to Manchester Airport area, but no water vole was recorded as being present during surveys. Water vole is a species of principal importance and a conservation priority of the local BAP. Water vole are largely absent in the north-west due to the presence of mink, encroachment of invasive plants and a lack of suitable burrowing sites <sup>55</sup> .
Otter	District/borough	Population of otter using the River Bollin	Field surveys identified five potential holts 48m, 61m, 102m (two holts) and 102m from land required for the construction of the Proposed Scheme along the River Bollin. Otter is an Annex 2 species, a species of principal importance, and a conservation priority of the local BAP.
Otter	Up to District/borough	Population of otter using watercourses in the Hulseheath to Manchester Airport area	Given the availability of suitable habitat, it is assumed that otters are using Sugar Brook, Mobberley Brook, Birkin Brook, tributaries 4 to 8 of Birkin Brook, Blackburn's Brook and Timperley Brook as well as other watercourses and water bodies within the Hulseheath to Manchester Airport area for foraging, breeding and dispersal.
Aquatic macro-invertebrates	District/borough	Aquatic macro-invertebrates in the River Bollin	The aquatic macro-invertebrate field surveys recorded 961 individual specimens from 35 taxa in spring, with a Community Conservation Index (CCI) <sup>56</sup> score indicating that the macro-invertebrate assemblage was of 'Low' conservation value. The field surveys recorded 319 individual specimens from 32 taxa in autumn, with a CCI score of 'Moderate' conservation value with a 'Moderate' WFD quality class. A variety of taxa were recorded, including flatworms, snails, mussels, worms, leeches, crustacea, damselfly, beetles, caddisfly and true bugs.
Aquatic macro-invertebrates	District/borough	Aquatic macro-invertebrates in Timperley Brook	The aquatic macro-invertebrate field survey recorded 143 individual specimens from 17 taxa in autumn, with a CCI score indicating that the macro-invertebrate assemblage was of 'Moderate' conservation value with a 'Moderate' WFD quality class. A variety of taxa were recorded including snails, worms, crustacea, mayfly and true bugs.

<sup>55</sup> Powell, A. and Milburn, K. (2011), *Northwest Lowlands Water Vole Project. Final Report, June 2011*.

<sup>56</sup> Chadd, R. and Extence, C. (2004). *The conservation of freshwater macroinvertebrate populations: a community-based classification scheme*. *Aquatic Conservation: Marine and Freshwater Ecosystems*, 14(6), pp.597-624.

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Resource/feature	Value	Receptor	Baseline and rationale for valuation
Aquatic macro-invertebrates	Up to district/borough	Potential aquatic macro-invertebrate assemblage within un-surveyed watercourses	Blackburn's Brook, Birkin Brook, Mobberley Brook, Sugar Brook and Tributary of Birkin Brook 1 have not been surveyed but desk study data has been obtained from the Environment Agency. No data from the Environment Agency on the WFD status or CCI scores is available for Tributary of Birkin Brook 1, Tributary of Birkin Brook 4 or Tributary of Birkin Brook 7. The current WFD status of macro-invertebrates in Blackburn's Brook is 'High'. No CCI scores were available for this watercourse. The current WFD status of macro-invertebrates in Birkin Brook is 'High'. The CCI score indicated the macro-invertebrate assemblage was of 'Moderate' conservation value. The current WFD status of macro-invertebrates upstream of Mobberley brook is 'Good'. No CCI scores were available for this watercourse. The current WFD status of macro-invertebrates in Sugar Brook is 'High'. No CCI scores were available for this watercourse.
Aquatic macro-invertebrates	Local/parish	Aquatic macro-invertebrates in Millington Clough	The aquatic macro-invertebrate field surveys recorded 1224 individual specimens from 18 taxa in spring, with a CCI score indicating that the macro-invertebrate assemblage was of 'Low' conservation value. The field surveys recorded 1952 individual specimens from 13 taxa in autumn, with a CCI score of 'Low' conservation value with a 'Poor' WFD quality class. A variety of taxa were recorded, including water beetles, mussels, worms, crustacea, leeches and true flies. The stretch surveyed was recorded as a small stream that flows through agricultural land with a substrate of cobbles, pebbles, gravel, sand and silt.
Aquatic macro-invertebrates	Local/parish	Aquatic macro-invertebrates in Agden Brook	The aquatic macro-invertebrate field surveys recorded 280 individual specimens from seven taxa in spring, with a CCI score indicating that the macro-invertebrate assemblage was of 'Low' conservation value. The field surveys recorded 900 individual specimens from 22 taxa in autumn, with a CCI score of 'Low' conservation value with a 'Poor' WFD quality class. A variety of taxa were recorded, including water beetles, worms, crustacea and true flies. The stretch surveyed flows through agricultural land with a substrate of boulder, cobble, pebble, gravel, sand and silt.
Aquatic macro-invertebrates	Local/parish	Aquatic macro-invertebrates in Tributary of Timperley Brook 1	The aquatic macro-invertebrate field surveys recorded 919 individual specimens from four taxa in autumn, with a CCI score indicating that the macro-invertebrate assemblage was of 'Low' conservation value with a 'Poor' WFD quality class. A variety of taxa were recorded including snails, worms, crustacea and true bugs. The stretch surveyed was channelised with little in-channel diversity and was culverted in sections. The substrate consisted of pebble, gravel, sand and silt with some woody debris present.

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Resource/feature	Value	Receptor	Baseline and rationale for valuation
Terrestrial Invertebrates	District/borough	Invertebrate assemblage north of Millington Clough	Field surveys north of Millington Clough recorded 53 terrestrial invertebrate species, including alder leaf beetle <sup>57</sup> . The remaining species recorded were common and widespread and typical of the habitat types present within the surveyed areas.
Terrestrial Invertebrates	District/borough	Invertebrate assemblage on the northern bank of the River Bollin	Field surveys at the River Bollin recorded 83 terrestrial invertebrate species, including alder leaf beetle and a scathophagic fly classified as Nationally Notable in the Red Data Book <sup>58</sup> . The remaining species recorded were common and widespread and typical of the habitat types present within the surveyed areas.
Reptiles	Local/parish	Potential small populations of common reptiles in the Hulseheath to Manchester Airport area	There are no desk study records of reptiles within the land required for the construction of the Proposed Scheme. No reptiles were found during field surveys at 13 sites within the land required for the Proposed Scheme. Suitable habitat that was surveyed was generally constrained to field margins, edges of woodland and scrub habitat or isolated small patches of overgrown grassland. These habitats are within a generally intensively farmed landscape, offering limited opportunities for reptiles. Following consultation with Manchester Biodiversity Partnership and Cheshire Wildlife Trust, the study area is not considered suitable to support a large or widespread population of reptiles and that any reptiles located within the land required for the construction of the Proposed Scheme are present in low numbers. Grass snake, slow-worm and common lizard are all species of principal importance. Grass snake is also a conservation priority of the local BAP.
Badger	Local/parish	Population of badgers at undisclosed locations in the Hulseheath to Manchester Airport area	Five badger main setts have been recorded during field surveys in the Hulseheath to Manchester Airport area, two within the land required for the construction of the Proposed Scheme. Other annex, subsidiary and outlier setts have been identified from desk study records and field surveys within land required for the construction of the Proposed Scheme. There is suitable habitat for badger throughout the land required for the construction of the Proposed Scheme in arable field margins and scrub within the area.

<sup>57</sup> The status of alder leaf beetle is unreliable as it awaits formal review. However, National Biodiversity Network (NBN, <https://nbnatlas.org/>) data show that the species has expanded significantly over the last 15 years and its distribution no longer qualifies it as nationally rare.

<sup>58</sup> International Union for Conservation of Nature (IUCN). (2020). *The IUCN Red List of Threatened Species*. Available online at: <http://www.iucnredlist.org/>.

## Future baseline

### Construction (2025)

- 7.3.47 Volume 5: Appendix CT-004-00000 provides details of the developments in the Hulseheath to Manchester Airport area that are assumed to have been implemented by 2025.
- 7.3.48 No committed developments have been identified in this study area that will materially alter the baseline conditions in 2025 for ecology and biodiversity.

### Operation (2038)

- 7.3.49 Volume 5: Appendix CT-004-00000 provides details of the developments in the Hulseheath to Manchester Airport area that are assumed to have been implemented by 2038.
- 7.3.50 No committed developments have been identified in this study area that will materially alter the baseline conditions in 2038 for ecology and biodiversity.

## 7.4 Effects arising during construction

### Avoidance and mitigation measures

- 7.4.1 The following measures have been included as part of the design of the Proposed Scheme, additional to the landscape planting as shown on the Map Series CT-06 along the route of the Proposed Scheme, which will be largely a mixture of woodland/scrub and grassland. These measures contribute towards limiting effects on habitats and species:
- provision of Agden Brook viaduct, Blackburn's Brook North viaduct and River Bollin East viaduct will avoid direct effects on Agden Brook, Blackburn's Brook, Birkin Brook and the River Bollin and will allow free passage for wildlife beneath the Proposed Scheme in these locations;
  - refinement of the location of Blackburn's Brook viaduct satellite compound to avoid additional impacts on Hancock's Bank South LWS and Hancock's Bank AWI site;
  - refinement of the location of Birkinheath Covert satellite compound to avoid additional impacts on Wood near Arden House LWS and Arden House Wood AWI site;
  - reduction in the land required for the construction of the Proposed Scheme within Brickhill Wood LWS and Brickhill Wood AWI site, avoiding the loss of woodland within this LWS and AWI site; and
  - reduction in the land required for the construction of the Proposed Scheme to avoid the direct loss of 13 ponds.

- 7.4.2 The assessment assumes implementation of the measures set out within the draft Code of Construction Practice<sup>59</sup> (CoCP), which includes sensitive construction practices and habitat management plans.
- 7.4.3 Section 9 of the draft CoCP requires contractors to implement a range of measures to protect ecological receptors including the following:
- manage impacts from construction, including the timing of works, on designated sites, protected and notable species and other features of ecological importance such as ancient woodlands and watercourses;
  - reduce habitat loss by keeping the working area to the reasonable minimum;
  - reinstatement of areas of temporary habitat loss;
  - restoration and replacement planting;
  - management measures for potential ecological impacts to control dust, water quality and flow, noise and vibration, and lighting;
  - provision of a watching brief, where relevant;
  - relocation or translocation of species, soil and/or plant material, as appropriate;
  - consultation with Natural England, the Environment Agency, local wildlife trusts and relevant planning authorities prior to and during construction; and
  - compliance with all wildlife licensing requirements, including those for protected and invasive species and designated sites.

## Assessment of impacts and effects

- 7.4.4 Effects arising during construction that are significant at the district/borough level or above are described below. Effects on ecological features of significance at the local/parish level are listed in Volume 5: Appendix EC-015-0MA06.

### Designated sites

- 7.4.5 A study to inform the HRA was undertaken for the Midlands Meres and Mosses Phase 1 Ramsar site during the Appraisal of Sustainability stage of the Proposed Scheme<sup>60</sup>. This was undertaken in consultation with Natural England and the Environment Agency. The HRA Screening Report concluded that there was a potentially significant effect due to changes in the hydrological regime of The Mere, Mere SSSI, which is a component of the Ramsar site, as a result of the Proposed Scheme. However, mitigation measures to convey groundwater to the SSSI were proposed to protect the integrity of the Ramsar site. Further documents to inform the Appropriate Assessment for hybrid Bill design have been completed as set out in Volume 5: Appendix EC-016-00003. They include a detailed study of the potential

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<sup>59</sup> Volume 5: Appendix CT-002-00000, draft Code of Construction Practice (CoCP).

<sup>60</sup> High Speed Two Ltd (2012), *HS2 Phase 2: HRA Screening Report for Midland Meres and Mosses Phase 1 Ramsar Site*.

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hydrological impacts of the Proposed Scheme on groundwater flows in glaciofluvial deposits which contribute groundwater to The Mere, Mere SSSI. This study demonstrates that groundwater flows to the SSSI could be intercepted by Hoo Green North cutting and Hoo Green North cutting retaining wall (located within Pickmere to Agden and Hulseheath area (MA03)). Aquatic and fringing macrophyte communities and invertebrates, which are a primary reason for the Ramsar site designation, are reliant on the maintenance of a suitable hydrological regime. This incorporates both water quality and water resource elements. Consequently, the interruption of groundwater could prompt damaging changes to the extent, species composition, abundance and/or distribution of wetland communities. Therefore, mitigation comprising groundwater recharge trenches in the superficial deposits will be provided to reinstate groundwater flows to the mere. The potential impacts of nitrogen deposition at the Ramsar site, caused by changes in traffic flows during construction of the Proposed Scheme, has also been assessed. There will be no adverse effects at The Mere, Mere SSSI<sup>61</sup> or at two further components of the Ramsar Site. Tatton Meres SSSI is situated in the Hulseheath to Manchester Airport area and is 110m from the B5085 Mobberley Road and 163m from the B5083 King Street. Traffic will be redistributed on these roads, but there will not be an adverse effect on the SSSI as critical loads for nitrogen deposition are not exceeded in the SSSI. There will be no adverse effects from changes in air quality at Wybunbury Moss SSSI<sup>61</sup> which is located in the Hough to Walley's Green area (MA01). The documents to inform the Appropriate Assessment conclude that, with implementation of the proposed mitigation measures, there will be no adverse effects on the integrity of the Midlands Meres and Mosses Phase 1 Ramsar site arising from the Proposed Scheme, alone or in combination with other projects and plans.

- 7.4.6 A study to inform the HRA Screening Report was undertaken for the Rostherne Mere Ramsar site during the Appraisal of Sustainability stage of the Proposed Scheme<sup>62</sup>. This was undertaken in consultation with Natural England and the Environment Agency. The HRA Screening Report concluded that there was a potentially significant effect on the Ramsar site due to changes in the hydrological regime. However, mitigation measures to convey groundwater to the Ramsar site were proposed to protect the integrity of the Ramsar site. Subsequently, new documents to inform the Appropriate Assessment for hybrid Bill design have been completed as set out in Volume 5: Appendix EC-016-00003. They include a detailed study of hydrological impacts of Hoo Green North cutting, Hoo Green North cutting retaining wall (both located within Pickmere to Agden and Hulseheath area (MA03)), and Millington cutting and Rostherne cutting which are located within the Hulseheath to Manchester Airport area. The cuttings will interrupt the sub-surface flows to the Ramsar site and potentially prompt adverse changes to the extent, abundance and/or distribution of wetland communities that are a reason for designation of the site. Therefore, mitigation comprising groundwater recharge trenches in the superficial deposits to the south and east

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<sup>61</sup> Wybunbury Moss SSSI, reported in Volume 2, Community Area report: Hough to Walley's Green (MA01), Section 7 and The Mere, Mere SSSI, reported in Volume 2, Community Area report: Pickmere to Agden and Hulseheath (MA03), Section 7.

<sup>62</sup> High Speed Two Ltd (2012), *HRA Screening Report for Rostherne Ramsar Site*.

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of the zone of influence of the cuttings will be provided along Cherry Tree Lane and groundwater recharge trenches in the superficial deposits to the east of Hoo Green North cutting and Hoo Green North cutting retaining wall (located within Pickmere to Agden and Hulseheath area (MA03)). The documents to inform the Appropriate Assessment also consider the potential impacts of nitrogen deposition caused by changes in traffic flows during construction of the Proposed Scheme. They conclude that there will be no adverse effects on the integrity of the Ramsar site. The documents to inform the Appropriate Assessment include the conclusion that, with implementation of the proposed mitigation measures comprising groundwater recharge trenches, there will be no adverse effects on the integrity of Rostherne Mere Ramsar site arising from the Proposed Scheme, alone or in combination with other projects and plans.

- 7.4.7 Dunham Park SSSI is located adjacent to the B5160 Smithy Lane on which traffic will be redistributed as a result of the Proposed Scheme, but there will not be an adverse effect on the SSSI as critical loads for nitrogen deposition are not exceeded in the SSSI. Therefore, there will be no adverse effect on the structure and function of the SSSI.
- 7.4.8 Rostherne Mere SSSI and NNR is designated because it is one of the deepest and largest of the meres of the Shropshire-Cheshire Plain. The SSSI is also designated for bird interest and the NNR is noted for its woodland and wetland birds, mammals and butterflies. Construction of groundwater recharge trenches in grassland along Cherry Tree Lane will result in the permanent loss of 0.5ha (0.3%) of Rostherne Mere SSSI and NNR. The loss of a small area of grassland is not significant as the habitat does not contribute to the special interest of the SSSI and NNR, nor will it adversely affect the supporting function of the grassland in maintaining hydrological processes and favourable condition of the SSSI, NNR or Ramsar site. As described above for the Rostherne Mere Ramsar site, with the proposed mitigation, there will be no adverse effects arising from changes in water levels in the mere, and there will be no adverse effects arising from changes in air quality. It is not considered that the bird assemblage using Rostherne Mere and associated habitats will be adversely affected by construction of the Proposed Scheme. The standing water habitat of Rostherne Mere is 100m south of the construction traffic route along Cherry Tree Lane and 180m south of land required for the construction of the Proposed Scheme at its closest point. Any disturbance impacts to birds during construction will be short-term, with the construction of Rostherne cutting taking three years and six months. The implementation of measures in the draft CoCP will reduce the magnitude of noise, vibration and visual disturbance impacts to a level where there will be no significant effects.
- 7.4.9 As described in relation to the Midland Meres and Mosses Phase 1 Ramsar site the wetland habitats forming the reasons for designation of Tatton Mere SSSI will not be affected by changes in air quality, and there are no hydrological impacts. Therefore, there will be no adverse effect on the structure and function of the SSSI.
- 7.4.10 Cotteril Clough SSSI and SBI (which is also an AWI site) is designated for lowland broadleaved woodland, including wet woodland. There will be no adverse effects on surface water flow through Cotteril Clough as a result of the construction of the Proposed Scheme. All springs in the SSSI are well outside the zone of influence of effects of cuttings on groundwater. As



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such, there will be no impact on the site's special interest features from changes in ground and surface water flows. Cotteril Clough is located adjacent to the A538 Wilmslow Road and Mill Lane, which will both be used as construction traffic routes, and will be affected by increased traffic volumes once the Proposed Scheme is complete. Air quality modelling demonstrated a small exceedance in nitrogen deposition at the edge of the woodland though this is not expected to result in an adverse effect on the structure and function of the SSSI. Cotteril Clough SSSI, SBI and AWI site will therefore not be affected by the construction of the Proposed Scheme.

- 7.4.11 Lindow Common SSSI is located adjacent to the A538 Altrincham Road on which traffic will be redistributed as a result of the Proposed Scheme, but there will not be an adverse effect on the SSSI as critical loads for nitrogen deposition are not exceeded in the SSSI. Therefore, there will be no adverse effect on the structure and integrity of the SSSI.
- 7.4.12 Modification of a high-pressure gas pipeline will result in the permanent loss of 0.2ha (20%) of Millington Clough AWI site and the remaining area will be isolated from other woodland habitats. This will result in a permanent adverse effect on the structure and function of irreplaceable ancient woodland habitat at Millington Clough, which will be significant at the national level.
- 7.4.13 Construction of Yarwood Heath Farm accommodation access overbridge will result in the permanent loss of 0.3ha (11%) of Yarwood Heath Covert LWS. The loss of lowland mixed deciduous woodland and several interconnecting pools will have an adverse effect on the structure and function of the site, which will be significant at the county/metropolitan level.
- 7.4.14 Construction of Blackburn's Brook North viaduct and Blackburn's Brook viaduct satellite compound will result in the permanent loss of 1.3ha of woodland in Hancock's Bank South LWS (18%) and Hancock's Bank AWI site (41%). The loss of lowland mixed deciduous including areas of ancient semi-natural woodland will result in an adverse effect on the structure and function of the site, which will be significant at the county/metropolitan level at Hancock's Bank South LWS and at the national level at Hancock's Bank AWI site.
- 7.4.15 Construction of Blackburn's Brook North viaduct and the modification of an overhead power line will result in the permanent loss of 0.4ha (10%) of woodland in Ryecroft Covert LWS, of which 0.2ha (18%) is Ryecroft Covert AWI site. The loss of lowland mixed deciduous woodland, marshy grassland and ancient woodland will have an adverse effect on the structure and function of the site, which will be significant at the county/metropolitan level at Ryecroft Covert LWS and at the national level at Ryecroft Covert AWI site.
- 7.4.16 Temporary widening works to Ashley Road will result in the permanent loss of 300m<sup>2</sup> (0.8%) of Birkinheath Covert LWS. The loss of lowland mixed deciduous woodland will have an adverse effect on the structure and function of the site, which will be significant up to the county/metropolitan level.
- 7.4.17 Modification of an overhead power line will result in the permanent loss of 0.4ha (25%) of Birkin Bridge Lodge Wood ancient woodland. This will result in a permanent adverse effect

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on the structure and function of irreplaceable and recently identified ancient woodland habitat at the site, which will be significant at the national level.

- 7.4.18 Construction of Ashley railhead will result in the permanent loss of 0.3ha (10%) of Wood near Arden House LWS, of which 0.1ha (3%) is Arden House Wood AWI site. The loss of mixed semi-natural woodland including areas of ancient semi-natural woodland will have an adverse effect on the structure and function of the site, which will be significant at the county/metropolitan level at Wood near Arden House LWS and at the national level at Arden House Wood AWI site.
- 7.4.19 Construction of Ashley railhead will result in the loss of 0.2ha (7%) of Sugar Brook LWS, of which 0.1ha (50%) is Sugar Brook ancient woodland. The loss of lowland mixed deciduous woodland, hedgerows, neutral grassland and traditional orchards that make up the LWS, and loss of ancient woodland, will have an adverse effect on the structure and function of the site which will be significant at the county/metropolitan level at Sugar Brook LWS and national level at Sugar Brook ancient woodland.
- 7.4.20 Construction of Ashley railhead, realigned Mobberley Road and Mobberley Road offline overbridge will result in the permanent loss of 3.1ha (100%) of Ashley Brickworks LWS, of which 0.1ha (100%) is East Arden House Wood ancient woodland. The loss of lowland mixed deciduous woodland, rough meadow, ponds, stream habitat and ancient woodland will have an adverse effect on the structure and function of the site, which will be significant at the county/metropolitan level at Ashley Brickworks and national level at East Arden House Wood ancient woodland.
- 7.4.21 Construction of Thorns Green embankment will result in the permanent loss of 0.5ha (17%) of Ecclesfield Wood LWS. The loss of lowland deciduous woodland, scattered ponds and a stream, will have an adverse effect on the structure and function of the site, which will be significant at the county/metropolitan level.
- 7.4.22 Construction of Thorns Green cutting will result in the permanent loss of the veteran tree at Veteran Oak Tree, Thorns Green LWS, which will be significant at the national level.
- 7.4.23 Realignment of a section of the M56 will result in the permanent loss of 700m<sup>2</sup> of woodland habitat forming Hennersley Bank AWI site (10%) and Wood near Chapel Lane SBI (9%). The loss of woodland habitat will have an adverse effect on the structure and function of the site, which will be significant at the county/metropolitan level at Wood near Chapel Lane SBI and national level at Hennersley Bank AWI site.
- 7.4.24 Construction of River Bollin East viaduct will result in the permanent loss of 0.4ha (11%) of Mill Wood, Castle Mill LWS. The loss of lowland mixed deciduous and wet woodland, hedgerows, grassland and veteran trees will have an adverse effect on the structure and function of the site, which will be significant at the county/metropolitan level.
- 7.4.25 Construction of River Bollin East viaduct will result in the permanent loss of 0.3ha (1%) of Sunbank Wood and Ponds SBI, of which 0.1ha (17%) is from Bollin Bank AWI site. The loss of mixed semi-natural woodland and ponds supporting a range of amphibian species including great crested newt will have an adverse effect on the structure and function of the site,

which will be significant up to the county/metropolitan level at Sunbank Wood and Ponds SBI and national level at Bollin Bank AWI site.

- 7.4.26 Construction of Manchester Airport High Speed station will result in the permanent loss of 1.7ha (50%) of Davenport Green Wood SBI, of which 0.7ha (54%) is ancient woodland habitat from Davenport Green Wood AWI site. The loss of semi-natural broadleaved woodland, bird assemblages and ancient woodland will have an adverse effect on the structure and function of the site, which will be significant up to the county/metropolitan level at Davenport Green Wood SBI and national level at Davenport Green Wood AWI site.

## Habitats

### Woodland

- 7.4.27 As well as the effects on ancient woodland described in the designated sites section, there are a number of other woodlands that will be affected by the construction of the Proposed Scheme.
- 7.4.28 Construction of Hulseheath North embankment will result in the permanent loss of 1.3ha (43%) of broadleaved woodland north of Millington Clough. The loss of woodland will have a permanent adverse effect, which will be significant at the district/borough level.
- 7.4.29 Construction of Agden Brook viaduct will result in the permanent loss of 200m<sup>2</sup> (3%) of an unnamed woodland along Agden Brook. The loss of woodland will have a permanent adverse effect, which will be significant up to county/metropolitan level.
- 7.4.30 Construction of Agden Brook viaduct will result in the permanent loss of 300m<sup>2</sup> (8%) of an unnamed broadleaved woodland south of Booth Bank. The loss of woodland will have a permanent adverse effect, which will be significant up to county/metropolitan level.
- 7.4.31 Construction of Rostherne cutting will result in the permanent loss of 0.8ha (23%) of lowland mixed deciduous woodland, that also forms Yarwood Heath Covert LWS. The loss of woodland will have a permanent adverse effect, which will be significant at county/metropolitan level.
- 7.4.32 Construction of Blackburn's Brook North viaduct and the modification of an overhead power line will result in the permanent loss of 0.2ha (5%) of lowland mixed deciduous woodland at Ryecroft Covert LWS. The loss of woodland will have a permanent adverse effect, which will be significant at the county/metropolitan level.
- 7.4.33 Temporary widening works to Ashley Road will result in the permanent loss of 300m<sup>2</sup> (0.8%) of lowland mixed deciduous woodland at Birkinheath Covert LWS. The loss of woodland will have a permanent adverse effect, which will be significant at the county/metropolitan level.
- 7.4.34 Construction of Ashley railhead will result in the permanent loss of 0.3ha (10%) of lowland deciduous woodland at Wood near Arden House LWS. The loss of woodland will have a permanent adverse effect, which will be significant at the county/metropolitan level.

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- 7.4.35 Modification of an overhead power line will result in the permanent loss of 0.1ha (6%) broadleaved woodland habitat located at The Rookery. The loss of woodland will have a permanent adverse effect, which will be significant up to district/borough level.
- 7.4.36 Construction of Ashley railhead, the realigned Mobberley Road and Mobberley Road offline overbridge will result in the permanent loss of 1.3ha (100%) of lowland deciduous woodland at Ashley Brickworks LWS. The loss of woodland will have a permanent adverse effect, which will be significant at the county/metropolitan level.
- 7.4.37 Construction of Thorns Green embankment will result in the permanent loss of 0.5ha (17%) lowland deciduous woodland, which also forms Ecclesfield Wood LWS. The permanent loss of woodland will have a permanent adverse effect that will be significant at the county/metropolitan level.
- 7.4.38 Construction of River Bollin East viaduct will result in the permanent loss of 1.1ha (28%) of broadleaved woodland along the River Bollin. Mill Wood, Castle Mill LWS is partially within this woodland. The permanent loss of woodland will have a permanent adverse effect that will be significant at the county/metropolitan level.
- 7.4.39 Construction of River Bollin East viaduct will result in the permanent loss of 0.2ha (2%) of broadleaved woodland at Sunbank Wood and Ponds SBI. The permanent loss of woodland will have a permanent adverse effect that will be significant at the county/metropolitan level.
- 7.4.40 Construction of Manchester Airport High Speed station will result in the permanent loss of 1ha (43%) of broadleaved woodland at Davenport Green Wood SBI. The permanent loss of woodland will have a permanent adverse effect that will be significant at the county/metropolitan level.

## **Grassland**

- 7.4.41 Construction of mitigation in Rostherne Mere SSSI and NNR, comprising the groundwater recharge trenches for Rostherne Mere Ramsar site, will result in the permanent loss of 0.5ha (0.3%) of Rostherne Mere SSSI and NNR, which comprises species-rich semi-improved grassland. The loss of grassland will be significant up to the county/metropolitan level.
- 7.4.42 Modification of a high-pressure gas pipeline will result in the temporary loss of 200m<sup>2</sup> (25%) of marshy grassland within a clearing in woodland north of Millington Clough. The loss of marshy grassland will result in an adverse effect, which will be significant at the district/borough level.
- 7.4.43 Modification of a high-pressure gas pipeline will result in the temporary loss of 0.1ha (25%) of marshy grassland adjacent to Agden Brook, west of Stonedelph Farm. The loss of marshy grassland will result in an adverse effect, which will be significant at the district/borough level.
- 7.4.44 Modification of a high-pressure gas pipeline will result in the temporary loss of 0.2ha (100%) of marshy grassland located at Hulseheath. The loss of marshy grassland will result in an adverse effect, which will be significant at the district/borough level.

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- 7.4.45 Construction of Millington cutting will result in the permanent loss of 1.3ha (100%) semi-improved neutral grassland around the existing balancing pond at junction 8 of the M56. The loss of semi-improved neutral grassland will result in an adverse effect, which will be significant up to the district/borough level.
- 7.4.46 Construction of Blackburn's Brook North viaduct will result in the permanent loss of 0.1ha (25%) of marshy grassland forming part of Hancock's Bank South LWS. The loss of marshy grassland will result in an adverse effect, which will be significant at the county/metropolitan level.
- 7.4.47 Construction of Birkin Brook embankment and Ashley railhead will result in the permanent loss of 10.2ha (94%) of semi-improved neutral grassland adjacent to the eastern bank of Birkin Brook and within an area identified as a potential LWS. The loss of semi-improved neutral grassland will result in an adverse effect, which will be significant up to the county/metropolitan level.
- 7.4.48 Construction of Ashley embankment and Mid-Cheshire (Railway) and Mobberley Road viaduct will result in the temporary loss of 0.5ha (100%) semi-improved neutral grassland within a field adjacent to Mobberley Road. The loss of semi-improved neutral grassland will result in an adverse effect, which will be significant up to the district/borough level.
- 7.4.49 Construction of Ashley railhead, realigned Mobberley Road and Mobberley Road offline overbridge will result in the permanent loss of 1.7ha (100%) of rough, semi-improved neutral grassland at Ashley Brickworks LWS. The loss of semi-improved neutral grassland will result in an adverse effect, which will be significant at the county/metropolitan level.
- 7.4.50 Construction of Ashley railhead will result in the permanent loss of 7.9ha (100%) of semi-improved neutral grassland south of Ashley Brickworks LWS and within an area identified as a potential LWS. The loss of semi-improved neutral grassland will result in an adverse effect, which will be significant up to the county/metropolitan level.
- 7.4.51 Construction of the realigned Sunbank Lane will result in the permanent loss of 0.5ha of semi-improved neutral grassland between the River Bollin and Hale Bank Farm. The loss of semi-improved neutral grassland will result in an adverse effect, which will be significant at the district/borough level.
- 7.4.52 Construction of Ringway cutting will result in the permanent loss of 3.2ha of semi-improved neutral grassland between Hale Bank Farm and Keepers Cottage. The loss of semi-improved grassland will result in an adverse effect, which will be significant at the district/borough level.
- 7.4.53 Construction of Manchester Airport High Speed station cutting retaining wall south, Manchester Airport High Speed station cutting and Manchester Airport High Speed station cutting retaining wall north will result in the permanent loss of 1.2ha of semi-improved neutral grassland at Warburton Green. In addition, M56 East satellite compound will result in the temporary loss of 2.6ha of semi-improved neutral grassland at Warburton Green. The loss of semi-improved grassland will result in an adverse effect, which will be significant at the district/borough level.

## **Hedgerows**

- 7.4.54 On a precautionary basis, it is assumed that all hedgerows (58.1km) within the land required for the construction of the Proposed Scheme in the Hulseheath to Manchester Airport area will be permanently lost and the remaining hedgerow network will be fragmented. This total, however, includes some hedgerows that are likely to be retained, such as those located within land required for overhead line diversions/realignments and those located within land required for habitat creation. The combined loss and severance of hedgerows within the land required for the construction of the Proposed Scheme will have a permanent adverse effect that is significant at county/metropolitan level.

## **Watercourses**

- 7.4.55 The route of the Proposed Scheme will cross Agden Brook on Agden Brook viaduct, Blackburn's Brook and Birkin Brook on Blackburn's Brook North viaduct, and the River Bollin on River Bollin East viaduct. These watercourses will not be directly affected, and indirect adverse effects will not be significant as they will be controlled through the implementation of measures that are described in the draft CoCP. However, Timperley Brook, Tributary of Birkin Brook 1, Tributary of Birkin Brook 2, Tributary of Birkin Brook 3, Tributary of Birkin Brook 4 and a series of smaller watercourses will be permanently realigned, diverted or culverted, reducing the connectivity of the habitat corridors that follow these watercourses. The habitat loss and reduction in connectivity will result in a permanent adverse effect that is significant up to the district/borough level.

## **Water bodies**

- 7.4.56 On a precautionary basis it is assumed that all 52 ponds located within the land required for the construction of the Proposed Scheme in the Hulseheath to Manchester Airport area will be permanently lost. This total, however, includes some ponds that are likely to be retained, such as those located within the land required for overhead line diversions/realignments. Where survey has not been possible, a precautionary approach to the assessment has been applied. The loss of ponds within the land required for construction of the Proposed Scheme will lead to a permanent adverse effect on the conservation status of water bodies that will be significant, in each case, at up to district/borough level.

## **Ancient and veteran trees**

- 7.4.57 On a precautionary basis, it is assumed that works associated with River Bollin South embankment, will result in the loss of at least six veteran trees recorded within the land required for the construction of the Proposed Scheme in the Hulseheath to Manchester Airport area will result in the permanent loss. The loss of veteran trees is significant at the national level. Where reasonably practicable, measures will be taken to protect and retain ancient and veteran trees within and adjacent to the proposed works area to reduce the number that will be permanently lost.

## Species

### Bats

- 7.4.58 The removal or disturbance of habitat features that are utilised by bats during breeding, hibernation or migrating between roosts is considered to have the potential to result in adverse effects on the bat populations or assemblages during construction. However, the point at which such impacts are considered likely to result in significant adverse effects on the conservation status of a population will differ depending on the status of the species concerned.
- 7.4.59 The impact of disturbance on bat populations will generally be localised and limited to the period of construction. Bats utilising retained habitats may be subject to irregular and localised disturbance from lighting and noise during the construction period where works in autumn, winter and spring may be carried out for short periods after dusk or prior to dawn. These impacts will only temporarily deter bats from using foraging and commuting habitats and the implementation of measures that are described in the draft CoCP will reduce potential disturbance effects to a level that is not significant.
- 7.4.60 The Proposed Scheme will cross the A556 near Booth Bank and the M56 near Warburton Green. The A556 is a dual carriageway and the M56 has six lanes, both of which have regular and heavy traffic flows. Consequently, their presence is likely to have an existing effect on the activity of the bats in this area, influencing their flight lines and limiting crossing points between habitats to the east and west. The movement of bats west-east between roosting and foraging habitat is likely to be restricted due to the presence of these roads.
- 7.4.61 An assemblage of both common and rarer bat species, including Nathusius' pipistrelle, noctule, Leisler's bat and *Myotis* species utilise the habitats (watercourses, woodland and grassland) between the M6, the M56 and the A556 within the Pickmere to Agden and Hulseheath area (MA03) and the Hulseheath to Manchester Airport area. Construction of Hulseheath North embankment and Millington cutting within the Hulseheath to Manchester Airport area will result in removal and fragmentation of habitat along Peacock Lane. The loss of connectivity in this area will result in a permanent adverse effect on this assemblage of bats. Construction of the Proposed Scheme in the Hulseheath to Manchester Airport area will result in the loss of a *Myotis* species possible maternity roost and could cause disturbance of a whiskered bat possible maternity roost. Both roosts are in buildings on Thowler Lane, High Legh. Maternity roosts are important to the continued breeding success of bat populations. The proximity of construction activities to the whiskered bat roost and the resulting level of noise and vibration is likely to result in it becoming unviable for continued use. On a precautionary basis, it is assumed the roost will be lost. Construction of the Proposed Scheme in this area will also result in the loss of common and soprano pipistrelle, *Pipistrellus* species, brown long-eared bat, whiskered bat and *Myotis* species occasional roosts. The combined effect from the loss of a *Myotis* species possible maternity roost, and disturbance of a whiskered bat, soprano pipistrelle and brown long-eared bat possible maternity roost and the loss and fragmentation of foraging and commuting habitat

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of rarer species including Nathusius' pipistrelle, noctule, serotine, Leisler's bat and *Myotis* species, in the Pickmere to Agden and Hulseheath area (MA03) and Hulseheath to Manchester Airport area will result in a permanent adverse effect on the bat assemblage that is significant at the regional level.

- 7.4.62 An assemblage of both common bat species and rarer bat species, including noctule, Leisler's bat and *Myotis* species, utilise the habitats (watercourses, woodland and grassland) between the A556 and junction 6 of the M56. Construction of the Proposed Scheme will result in the removal and fragmentation of foraging and commuting habitat, including near Rushy-pits Covert and at Birkin Brook and the River Bollin. The loss of connectivity in these areas will result in a permanent adverse effect on the assemblage of bats in this area. Construction of the Proposed Scheme will also result in the loss of a common pipistrelle possible maternity roost in a barn on Castle Mill Lane, Altrincham, within the land required for the construction of the Proposed Scheme. Maternity roosts are important to the continued breeding success of bat populations. Construction of the Proposed Scheme will also result in the loss and disturbance of common pipistrelle, soprano pipistrelle, brown long-eared bat, whiskered bat and *Myotis* species occasional roosts. The fragmentation of foraging and commuting habitat of rarer species including noctule, Leisler's bat and *Myotis* species will result in a permanent adverse effect on the bat assemblage that is significant at the regional level.
- 7.4.63 An assemblage of both common and rarer bat species, including noctule, Leisler's bat and *Myotis* species, utilise the habitats (watercourses, woodland and grassland) between junction 6 of the M56 and Manchester Airport. Construction of Ringway cutting and Manchester Airport High Speed station cutting and associated retaining walls will affect species that are component of the bat assemblage between junction 6 of the M56 and Manchester Airport. Taking a precautionary approach, it is considered that construction of the Proposed Scheme could result in the loss of maternity roosts that may be present in woodland habitats. Construction of the Proposed Scheme will result in the loss of common pipistrelle and brown long-eared bat occasional roosts, and the loss of maternity roosts that may be present in woodland habitat which has not been accessible for survey. The loss of maternity roosts, which are important to the continued breeding success of bat populations and the impacts on foraging and commuting habitat of rarer species, including noctule, Leisler's bat and *Myotis* species, represent an adverse effect on the bats utilising the habitats between junction 6 of the M56 and Manchester Airport, which will be significant at the regional level.
- 7.4.64 Loss of other suitable habitats within the land required for the construction of the Proposed Scheme may require some bats to travel further and expend more energy during day to day foraging and movement throughout their home range for the duration of construction. However, such effects alone are for all species considered unlikely to result in sufficient disturbance of the populations or assemblages concerned to result in an adverse effect on their conservation status.



## **Birds**

- 7.4.65 Construction of Millington cutting, Birkin Brook embankment and Ashley embankment will result in the permanent loss of potential barn owl foraging habitats. These habitats take the form of arable fields, semi-improved and improved fields, and associated field margins. These habitats are of value to the barn owl population identified in land required for the construction of the Proposed Scheme in the Booth Bank to Newhall Farm area, Cherry Tree Farm and Mobberley Road area and Newhall Farm to Manchester Airport area. This loss represents a permanent adverse effect on the barn owl population, which will be significant up to county/metropolitan level.

## **Vascular plants**

- 7.4.66 Construction of Birkin Brook embankment will result in loss of grass vetchling from land at Birkinheath Brook. Loss of this species will be significant at the county/metropolitan level.
- 7.4.67 Construction of River Bollin North embankment could result in loss of sanicle at Wood near Chapel Lane. Loss of this species will be significant at the district/borough level.
- 7.4.68 On a precautionary basis, it is assumed that early-purple orchid is present within land required for mitigation comprising groundwater recharge trenches in Rostherne Mere SSSI and tufted sedge is present within land required for the construction of the Proposed Scheme. Loss of each species will be significant up to the district/borough level.

## **Amphibians**

- 7.4.69 There are six assumed meta-populations and four assumed populations of great crested newts within the Hulseheath to Manchester Airport area where habitat loss resulting from the construction of the Proposed Scheme will result in significant adverse effects up to the county/metropolitan level. These are as follows:
- GCNMP1.6.1 in a network of 179 ponds located south of Thorns Green and east of New Mills;
  - GCNMP1.6.4 in a network of 16 ponds located north-east of Rostherne;
  - GCNP1.6.5 in a network of three ponds located north of New Mills;
  - GCNMP1.6.6 in a network of nine ponds located south-east of High Legh;
  - GCNP1.6.7 in a network of three ponds located south of Ashley;
  - GCNMP1.6.9 in a network of 17 ponds located north of New Mills;
  - GCNP1.6.12 in a network of two ponds located east of Ashley and north of Thorns Green;
  - GCNMP1.6.14 in a network of seven ponds located north of Ashley;
  - GCNP1.6.16 in a network of two ponds located east of Warburton Green; and
  - GCNMP1.6.17 in a network of four ponds located west of Ashley.
- 7.4.70 Of the 52 water bodies within the land required for the construction of the Proposed Scheme that require survey within the Hulseheath to Manchester Airport area, three have

been confirmed as supporting great crested newt, 11 have been assessed as being unsuitable for this species, and five have been found not to support the species. The remaining 33 have not been surveyed due to access constraints and are assumed to support populations of great crested newts and the loss of the ponds supporting these populations could result in a permanent adverse effect on amphibian populations that will be, in each case, significant up to county/metropolitan level.

## Other mitigation measures

- 7.4.71 This section describes other mitigation measures designed to reduce or compensate for significant ecological effects. These include habitat creation and habitat enhancement.

### Habitats

#### Woodland

- 7.4.72 The Proposed Scheme will result in the combined loss of 3.3ha of ancient woodland, which is irreplaceable, from Millington Clough, Hancock's Bank, Ryecroft Covert, Birkin Bridge Lodge Wood, Arden House Wood, Sugar Brook, East Arden House Wood, Hennesley Bank, Bollin Bank and Davenport Green Wood, each of which is significant at the national level.
- 7.4.73 In addition, the Proposed Scheme will result in the combined loss of 3.8ha of lowland mixed deciduous woodland at Yarwood Heath Covert LWS, Ryecroft Covert LWS, Birkinheath Covert LWS, Wood near Arden House LWS, Ashley Brickworks LWS, Ecclesfield Wood LWS, Mill Wood, Castle Mill LWS, Sunbank Wood and Ponds SBI and Davenport Green Wood SBI, each of which is significant at the county/metropolitan level, and 2.7ha of lowland mixed deciduous woodland north of Millington Clough, along Agden Brook, south of Booth Bank, adjacent to Yarwood Heath Covert LWS, at The Rookery and adjacent to Mill Wood, Castle Mill LWS along the River Bollin, each of which is significant at the district/borough level.
- 7.4.74 There is further loss and fragmentation from 21 small woodlands across the Hulseheath to Manchester Airport area, including loss of 8.7ha of lowland mixed deciduous, as reported within the register of local/parish effects (Volume 5: Appendix EC-015-0MA06). The combined loss and fragmentation of habitat from these woodlands is significant at the district/borough level.
- 7.4.75 In accordance with the Ecological Principles of Mitigation in the SMR, a route-wide, integrated strategic approach has been developed to compensate for the loss of woodland. The woodland habitat creation in this area is to compensate for the loss of woodland habitat in the local area as well as to ensure that the populations of protected and notable species including bats are maintained. With these objectives in mind, where reasonably practicable, the locations of woodland habitat creation have been selected so as to increase the size of existing higher quality habitat and to increase connectivity.

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- 7.4.76 The loss of ancient woodland will be partly compensated through a range of measures, including planting of native broadleaved woodland as follows:
- 2.9ha adjacent to Millington Clough AWI site. This will partly compensate for the loss of 0.2ha from Millington Clough AWI site and adjacent woodland habitats;
  - 10.2ha around Hancock's Bank AWI site, at Birkin Farm and to the west and east of the River Bollin, which will be created in nine locations. This will partly compensate for the loss of 1.4ha from Hancock's Bank AWI site. The planting will enhance connectivity of habitat around Hancock's Bank and the River Bollin. It will also mitigate the effects of habitat loss on bats;
  - 1.6ha to the east of Ryecroft Covert. This will partly compensate for the loss of 0.2ha from Ryecroft Covert AWI site and adjacent woodland habitats;
  - 0.9ha to the north of Arden House Wood AWI. This will partly compensate for the loss of 0.1ha from Arden House Wood AWI site and adjacent woodland habitats;
  - 1.5ha to the north of Arden House Wood AWI. This will partly compensate for the loss of 0.2ha from Sugar Brook ancient woodland and LWS;
  - 0.9ha to the west of Sugar Brook Farm. This will partly compensate for the loss of 0.1ha from East Arden House Wood ancient woodland;
  - 0.6ha to the east of the River Bollin. This will partly compensate for the loss of 700m<sup>2</sup> from Hennesley Bank AWI site;
  - 0.9ha to the east of the River Bollin. This will partly compensate for the loss of 0.1ha from Bolin Bank ancient woodland;
  - 5.1ha at Warburton Green and at Davenport Green Wood which will be created in three locations. This will partly compensate for the loss of 0.7ha from Davenport Green Wood AWI. The planting will increase the connectivity of Davenport Green Wood and Flaxhigh Covert; and
  - 1.9ha of wood will be planted near Fairywell Brook and 0.3ha west of the River Bollin. This will partly compensate for the loss of 0.4ha from Birkin Bridge Lodge Wood ancient woodland. The planting will enhance connectivity of habitat between Fairywell Brook and Davenport Green Wood. It will also mitigate the effects of habitat loss on bats. This site was identified as ancient woodland towards the end of the assessment process and further opportunities for compensation will be explored.
- 7.4.77 Woodland planting to partly compensate for the loss of ancient woodland will include further measures such as translocation of ancient woodland soil with its associated seed bank where appropriate. Other measures such as planting native trees and shrubs of local provenance and translocation of coppice stools and dead wood will be undertaken in accordance with the Ecological Principles of Mitigation within the SMR.

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- 7.4.78 Within the Hulseheath to Manchester Airport area, a further 10.6ha of woodland habitat creation will be undertaken to compensate primarily for adverse effects upon non-ancient woodland at locations including the following:
- 1.4ha of woodland will be planted in five locations around Millington. The planting will enhance connectivity of habitats around Agden Brook and Millington Clough. It will also mitigate the effects of habitat loss on bats;
  - 0.9ha of woodland will be planted to the east of Cherry Tree Farm, increasing habitat connectivity with Rostherne Mere;
  - 0.1ha of woodland will be planted north of Birkin Farm, increasing habitat connectivity to Arden House Wood;
  - 1.1ha of woodland will be planted around Ecclesfield Wood. The planting will enhance connectivity of habitat around Ecclesfield Wood;
  - 3ha of woodland will be planted in three locations between Ashley and the River Bollin. The planting will enhance connectivity of habitats around Ecclesfield Wood, Brickhill Wood and woodland habitats along the River Bollin;
  - 1.4ha of woodland will be planted in two locations east of the River Bollin. This planting will enhance connectivity along the River Bollin and Sunbank Wood. It will also mitigate the effects of habitat loss on bats; and
  - 1.1ha of wood will be planted in four locations near Fairywell Brook. The planting will enhance connectivity of habitat between Fairywell Brook and Davenport Green Wood. It will also mitigate the effects of habitat loss on bats.
- 7.4.79 The target habitat type for woodland planting is mixed deciduous woodland habitat of principal importance. The new areas of woodland habitat will connect and help maintain the integrity of remaining areas of woodland. A temporary adverse effect is expected until these areas have become established, after which these measures will reduce the overall effect on woodland to a level that is not significant.
- 7.4.80 Landscape mitigation planting will provide some additional benefits to wildlife and will help to connect areas of higher quality habitats.

## **Grassland**

- 7.4.81 In accordance with the Ecological Principles of Mitigation in the SMR a route-wide, integrated strategic approach has been developed to compensate for loss of grassland. The species-rich grassland creation in this area is required to compensate for the loss of grassland habitat in the local area as well as to ensure that the populations of protected and notable species including great crested newts, bats and barn owls are maintained. With these objectives in mind, where reasonably practicable, the locations of grassland creation have been located so as to increase the size of existing higher quality habitat and to increase connectivity.
- 7.4.82 There will be creation of 0.5ha of species-rich and marshy grassland south of Stock Farm, in response to loss of 0.5ha of grassland for the construction of groundwater recharge

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trenches at Rostherne Mere SSSI and NNR and loss of 200m<sup>2</sup> of marshy grassland within a clearing in woodland north of Millington Clough.

- 7.4.83 There will be creation of 0.2ha of species-rich and marshy grassland south of Stock Farm and 1.3ha of species-rich grassland in two locations east of the River Bollin in response to the loss of 1.3ha grassland around the existing balancing pond at junction 8 of the M56.
- 7.4.84 There will be creation of 0.2ha of species-rich and marshy grassland south of Stock Farm in response to the loss of 0.1ha of grassland at Hancock's Bank South LWS.
- 7.4.85 There will be creation of 8.3ha of species-rich grassland in 10 locations around Mobberley Road, in response to loss of 5.8ha of grassland adjacent to the eastern bank of Birkin Brook, which is within an area identified as a potential LWS and 1.7ha of grassland at Ashley Brickworks LWS.
- 7.4.86 There will be creation of 1.7ha of species-rich and damp grassland at four locations around Agden Brook, 3ha in four locations around Blackburn's Brook and Birkin Brook, 0.7ha adjacent to ditches at two locations adjacent to Tributary of Birkin Brook 2 and Tributary of Birkin Brook 3 and 1ha to the east of the River Bollin. This is in response to the loss of 1.7ha semi-improved neutral grassland south of Ashley Brickworks LWS.
- 7.4.87 There will be creation of 5.2ha of species-rich and marshy grassland in three locations south of Ashlar, east of the River Bollin and south of Davenport Green Wood. This is in response to the loss of 0.5ha of grassland between the River Bollin and Hale Bank Farm, 3.2ha between Hale Bank Farm and Keepers Cottage and 1.2ha of marshy grassland at Warburton Green. In areas of temporary grassland loss resulting from the construction of the Proposed Scheme, land required for construction will be reinstated. This will include marshy grassland at Hulseheath, semi-improved neutral grassland within a field adjacent to Mobberley Road and semi-improved neutral grassland at Warburton Green.
- 7.4.88 Grassland creation areas are likely to have similar soils, drainage and topography to the affected areas at Rostherne Mere SSSI and NNR, Hancock's Bank LWS and Ashley Brickworks LWS. Therefore, they are likely to be suitable for replicating the grassland for which the sites are designated. They will also be used as a receptor site for grassland that will be translocated from the designated sites. Details of approaches to grassland habitat creation and translocation are provided in the Ecological Principles of Mitigation in SMR. Due to the extent of habitat creation and measures to ensure the establishment there will be no significant effect on the conservation status of grassland habitats.

## **Hedgerows**

- 7.4.89 New hedgerows will be planted as replacement for those lost as a result of the Proposed Scheme. A total of 12km of new hedgerows will be planted and the species composition will be characteristic of the surrounding area. This represents a net reduction in hedgerow of 46.1km after mitigation, which is a residual adverse effect that is significant at the county/metropolitan level.

## Watercourses

- 7.4.90 Where smaller watercourses are realigned, the channel will be naturalised, where reasonably practicable, with a profile to promote the establishment of marginal vegetation and pools. Once the vegetation has developed, the adverse effect on these watercourses will be reduced to a level that is not significant.

## Water bodies

- 7.4.91 At least one pond will be created for every pond lost within the land required for the construction of the Proposed Scheme. New ponds will be established in accordance with the Ecological Principles of Mitigation in the SMR. Once established, it is anticipated that any adverse effect on pond habitats will be reduced to a level that is not significant.

## Ancient and veteran trees

- 7.4.92 Where practicable, measures will be taken to protect the veteran trees that are assumed to be lost. Where loss is unavoidable, the trees will be soft-felled and sections placed within retained habitats to provide a continued deadwood resource. Veteran trees are irreplaceable and the loss of each of these trees represents a residual adverse effect that is significant at the national level.

## Species

### Bats

- 7.4.93 To replace roosts that will be lost to construction, artificial roosts will be provided across the Proposed Scheme in accordance with the Ecological Principles of Mitigation within the SMR. The habitat creation measures detailed above in response to habitat loss, including creation of grasslands, hedgerows, new ponds and semi-natural woodlands will compensate for those bat foraging habitats lost within the land required for the construction of the Proposed Scheme as detailed below.
- 7.4.94 The loss of foraging and commuting habitat used by the bat assemblage between the M6, the M56 and the A556 within the Pickmere to Agden and Hulseheath area (MA03) and the Hulseheath to Manchester Airport area will be addressed by provision of woodland planting and creation of hedgerows, grassland, wetland habitat and ponds throughout both areas. It will include hedgerow planting around Millington Clough and grassland habitat along Agden Brook within the Hulseheath to Manchester Airport area. The loss of a *Myotis* bat possible maternity roost and the disturbance and potential loss of a whiskered bat possible maternity roost from buildings on Thowler Lane, High Legh will be addressed through the provision of suitable replacement roosts within habitat creation and enhancement areas adjacent to Millington Clough within the Hulseheath to Manchester Airport area. Following the implementation of these measures, the effects on the bat assemblage in this area will be reduced to a level that is not significant.

- 7.4.95 The loss of occasional roosts will be addressed through the provision of alternative roosting facilities in retained areas as close to the roost being lost as possible. Following the implementation of these measures, the effects on the bat assemblage in this area will be reduced to a level that is not significant. The loss of foraging and commuting habitat used by the bat assemblage between the A556 and junction 6 of the M56 will be addressed by provision of woodland planting and creation of hedgerows, grassland habitat and ponds throughout this area. This will include hedgerow planting around the realigned Castle Mill Lane, and woodland planting around Hancock's Bank AWI site. The loss of a common pipistrelle possible maternity roost in a barn on Castle Mill Lane, Altrincham will be addressed through the provision of suitable replacement roosts within habitat creation and enhancement areas adjacent to River Bollin East viaduct. The loss of occasional roosts, which will affect species that are component of the bat assemblage between the A556 and junction 6 of the M56, will be addressed through the provision of alternative roosting facilities in retained areas as close to the roost being lost as possible. Following the implementation of these measures, the effects on the bat assemblage in this area will be reduced to a level that is not significant.
- 7.4.96 The loss of foraging and commuting habitat used by the bat assemblage between junction 6 of the M56 and Manchester Airport will be addressed by provision of hedgerows, woodland planting and creation of grassland habitat and ponds within this area. This will include woodland planting at Warburton Green and at Davenport Green Wood. The loss of occasional roosts, which will affect species that are component of the bat assemblage between junction 6 of the M56 and Manchester Airport, will be addressed through the provision of alternative roosting facilities in retained areas as close to the roost being lost as possible. Following the implementation of these measures, the effects on the bat assemblage in this area will be reduced to a level that is not significant.

## **Birds**

- 7.4.97 Habitat creation measures to address the adverse effects on barn owl in the Hulseheath to Manchester Airport area will include the provision of grassland, woodland and hedgerow habitat adjacent to Ashley embankment. These habitat creation measures will provide foraging and nesting opportunities for barn owl populations in the Hulseheath to Manchester Airport area. Once the habitats have become established, the adverse effect on barn owl populations resulting from the loss of foraging habitat in the Hulseheath to Manchester Airport area will be reduced to a level that is not significant.

## **Vascular plants**

- 7.4.98 To address the adverse effect on county rare and locally scarce vascular plants, where appropriate, translocation will be undertaken. This will include grass vetchling, sanicle, early-purple orchid and tufted sedge to suitable areas of new planting that form part of the wider habitat creation measures. New areas of habitat planting will also include these species where the conditions are suitable. Following the implementation of these measures, the

adverse effects on the populations of these species will be reduced to a level that is not significant.

## **Amphibians**

- 7.4.99 Ponds, species-rich grassland and broadleaved woodland included as part of the Proposed Scheme will be designed to compensate for the loss of breeding sites, foraging habitat and places of shelter used by great crested newts and other amphibians. Compensation will be provided within ecological habitat creation areas at Birkin Farm, Mobberley Road, south of Ashlar, east of the River Bollin and south of Davenport Green. Ponds, grassland and woodland will be established in accordance with the Ecological Principles of Mitigation within the SMR. Following implementation, the adverse effects on amphibian populations in the Hulseheath to Manchester Airport area will be reduced to a level that is not significant. HS2 Ltd will continue to survey ponds for great crested newt populations, and where it is confirmed that populations are absent then pond and terrestrial habitat provision will be re-assessed.

## **Badger**

- 7.4.100 Although there will be no significant effects on badger populations in this area, mitigation measures to address the potential disturbance of badgers will be provided in accordance with the Ecological Principles of Mitigation within the SMR and the implementation of measures in the draft CoCP. This will include the provision of badger proof fencing and replacement setts where necessary.

## **Summary of likely residual significant effects**

- 7.4.101 This section describes likely significant residual ecological effects during construction, taking account of the mitigation and compensation proposed.
- 7.4.102 Ancient woodland is irreplaceable and the loss of 3.3ha of ancient woodland habitat will result in a permanent adverse residual effect at each location where this habitat is lost. This will be significant at the national level. In response to the loss of newly identified ancient woodland at Birkin Bridge Lodge Wood, opportunities will be sought to provide additional compensatory measures.
- 7.4.103 On a precautionary basis, it is assumed that there will be a net loss in hedgerows of 46.1km, which will result in a permanent adverse residual effect, which will be significant at the county/metropolitan level. In addition to the mitigation described, opportunities will be sought for additional retention and replacement of hedgerow within the land required for the construction of the Proposed Scheme.
- 7.4.104 The assumed loss of at least six veteran trees will result in a permanent adverse residual effect that is significant at national level in each case.



## Cumulative effects

- 7.4.105 No cumulative effects on ecological receptors have been identified in the Hulseheath to Manchester Airport area.

## 7.5 Effects arising from operation

### Avoidance and mitigation measures

- 7.5.1 Within this section of the Proposed Scheme the following elements of the design will avoid or reduce impacts on features of ecological value during operation:
- Agden Brook viaduct, Blackburn's Brook North viaduct, Mobberley Road viaduct, Mid-Cheshire (Railway) viaduct and River Bollin East viaduct will provide ecological connectivity beneath the route of the Proposed Scheme and adjacent habitats. Ecological connectivity beneath the route of the Proposed Scheme will be maintained for a combined length of 870m of viaducts in the Hulseheath to Manchester Airport area. This will reduce habitat fragmentation and barrier effects, allowing free passage of wildlife at these locations;
  - ten overbridges (Millington Lane, Footpath Millington 7/4 accommodation, A556, Yarwood Heath Farm accommodation, Back Lane Farm accommodation, Castle Mill Lane, Sunbank Lane, A538 Hale Road (south), A538 Hale Road (north), and Thorley Lane) will maintain farm access and/or public access on footpaths or bridleways across the Proposed Scheme. These structures will be of a sufficient size to also allow for the passage of a range of wildlife species, and their primary purpose will not discourage use by most wildlife species. These overbridges will reduce barrier effects by facilitating wildlife movement over the Proposed Scheme; and
  - where the route of the Proposed Scheme will cross a watercourse, a culvert or dry tunnel will be provided to allow passage for mammals such as otter and water vole.

### Assessment of impacts and effects

- 7.5.2 Significant effects arising during operation at the district/borough level or above are described below. Significant effects on ecological features at the local/parish level are listed in Volume 5: Appendix EC-015-0MA06.

## Species

### Bats

- 7.5.3 The operation of the Proposed Scheme has the potential to result in a variety of impacts on bat populations including those as a result of collision with passing trains, turbulence and noise. The point at which such impacts are considered to result in a significant adverse effect on the conservation status of the population concerned will differ between species. As a

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consequence, the following assessment of operational impacts takes into account the differing character and nature of the bat populations and/or assemblages concerned in determining the likely effects of the Proposed Scheme on each of these receptors.

- 7.5.4 Due to the large areas over which bats forage it is likely that any loss of, or displacement from, suitable foraging habitat in the vicinity of the Proposed Scheme will in itself amount to only a small proportion of the wider available resource. However, the impact of any such disturbance or displacement could be greatly increased if bats are hampered in moving between breeding sites, hibernation sites and other roosts which they commonly utilise.
- 7.5.5 Noise, vibration and lighting associated with passing trains have the potential to disturb bat species foraging and commuting within habitats close to the Proposed Scheme. Understanding of the impact of noise on bats caused by passing trains is limited. Research suggests that gleaning bats, such as brown long-eared bat, will have reduced foraging success within areas where there is persistent noise from busy roads<sup>63</sup>. However, noise generated from passing trains will be regular but temporary and as such will differ from that resulting from a busy road.
- 7.5.6 Where the route of the Proposed Scheme bisects, or is located in proximity to existing features known to be utilised regularly by foraging or commuting bats, there is an increased risk that bats could be killed or injured as a result of collisions with passing trains or associated turbulence. The significance of any such effect will be dependent on both the flight height range of the species and the vertical alignment of the Proposed Scheme (i.e. whether the route of the Proposed Scheme is in cutting, at ground level or on embankment) at the point the impact occurs.
- 7.5.7 Woodland and grassland habitat creation alongside Millington Clough will increase connectivity to Agden Brook. Bats flying west-east across the route of the Proposed Scheme will be encouraged by this planting to cross beneath the route of the Proposed Scheme at Agden Brook viaduct.
- 7.5.8 Woodland and grassland habitat creation alongside Blackburn's Brook and Birkin Brook will increase connectivity along the watercourses and to Ryecroft Covert. Bats flying north-south across the route of the Proposed Scheme will be encouraged by this planting to cross beneath the route of the Proposed Scheme at Blackburn's Brook North viaduct.
- 7.5.9 Woodland habitat creation alongside the River Bollin will increase connectivity to Rossmill SBI, Warburton Wood AWI site, Mill Wood, Castle Mill LWS, Sunbank Wood and Ponds SBI, Sunbank Wood AWI site, Henersley Bank AWI site and Bollin Bank AWI site. Bats flying north-south along the River Bollin and across the route of the Proposed Scheme will be encouraged by this planting to cross beneath the route of the Proposed Scheme at River Bollin East viaduct.

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<sup>63</sup> Schaub, A., Ostwald, J. & Simers, B.M. (2008), *Foraging bats avoid noise*. Journal of Experimental Biology, 211, 3174-3180.

- 7.5.10 Although it is possible that there may be infrequent incidental mortality of individual bats, due to the avoidance measures described above and the availability of alternative foraging and commuting habitat on either side of the Proposed Scheme, this is unlikely to result in a significant adverse effect on the conservation status of the bat assemblages present in the Hulseheath to Manchester Airport area.

## **Birds**

- 7.5.11 The majority of bird species that are known to be present in the area are not considered to be particularly vulnerable to collision with trains. However, barn owls hunt low over the rough grassland habitats that are associated with embankments and are slow moving and are, therefore, likely to be subject to collision with high speed trains. Research undertaken by the British Trust for Ornithology on behalf of HS2 Ltd suggests that there may be effects on barn owls up to 3km away<sup>64</sup>. This means that more barn owls are likely to be affected than those in the vicinity of the Proposed Scheme identified above. This will result in a permanent adverse effect, which will be significant at the county/metropolitan level.

## **Other mitigation measures**

- 7.5.12 A Barn Owl Mitigation Plan will be prepared to identify the measures that can be implemented to help offset the effects on barn owls. As the availability of nesting sites is a limiting factor for this species the provision of additional nest boxes would be likely to increase numbers of barn owls within the wider landscape and thus offset the adverse effect.

## **Summary of likely residual significant effects**

- 7.5.13 The mitigation, compensation and enhancement measures described above are likely to reduce the residual ecological effects during operation to a level that is not significant, except for barn owl. Train strike is likely to result in the loss of barn owls that nest within 3km of the route of the Proposed Scheme resulting in a residual significant effect at the county/metropolitan level. However, if the proposed mitigation measures for barn owl are implemented through liaison with landowners and other relevant stakeholders, the residual effect on barn owl would be reduced to a level that is not significant.

## **Cumulative effects**

- 7.5.14 No cumulative effects on ecology receptors have been identified from other committed developments in the Hulseheath to Manchester Airport area.

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<sup>64</sup> Pringle, H., Siriwardena, G. & Toms, M. (2016), *Informing best practice for mitigation and enhancement measures for Barn Owls*. British Trust for Ornithology, Thetford.

## **Monitoring**

- 7.5.15 Volume 1, Section 9 sets out the general approach to environmental monitoring during operation of the Proposed Scheme.
- 7.5.16 There are no area-specific requirements for monitoring ecology and biodiversity effects or mitigation during the operation of the Proposed Scheme in the Hulseheath to Manchester Airport area.

## 8 Health

### 8.1 Introduction

- 8.1.1 This section identifies the communities within the Hulseheath to Manchester Airport area that will be subject to impacts associated with the Proposed Scheme and describes how these impacts are likely to affect the health and wellbeing of people within these communities, where these effects are considered to be consequential.
- 8.1.2 Engagement with key public health bodies, including Public Health England and local Directors of Public Health, has been undertaken to inform the health assessment process. Consultation with communities, local authorities and parish councils has been ongoing throughout the route design and assessment process, as described in Volume 1, Section 3. This has contributed to the measures identified to avoid and mitigate adverse health effects.
- 8.1.3 The assessment also draws on health-related information and views expressed in consultation responses from the owners and operators of Fairfield Farm Project at Higher Thorns Green Farm, an affected resource within the study area.
- 8.1.4 This section deals specifically with impacts at a local level within the Hulseheath to Manchester Airport area. Health effects assessed across the Proposed Scheme as a whole are reported in Volume 3, Route-wide effects, Section 8.
- 8.1.5 Further details of the health assessment, including the criteria used to assess effects on population health as described in the EIA Scope and Methodology Report (SMR)<sup>65</sup>, are contained in Volume 5: Appendix HA-001-0MA06 Health assessment matrix.
- 8.1.6 Maps showing the location of the key environmental features (Map Series CT-10), construction features (Map Series CT-05), and key operational features (Map Series CT-06) of the Proposed Scheme can be found in the Volume 2, MA06 Map Book. The Proposed Scheme is described in Section 2.

### 8.2 Scope, assumptions and limitations

- 8.2.1 The scope, assumptions and limitations for the health assessment are set out in Volume 1, Section 8 and the SMR.
- 8.2.2 As set out in the SMR, the health assessment is based on a broad understanding of health, consistent with the World Health Organization (WHO) definition of health as 'a state of complete physical, mental and social well-being and not merely an absence of disease or infirmity'. An individual's health is mostly determined by genetics and lifestyle factors, but for a large enough population many other factors, or 'health determinants', are known to be important, and these factors may be affected by the Proposed Scheme.

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<sup>65</sup> Volume 5: Appendix CT-001-00001, Environmental Impact Assessment Scope and Methodology Report.

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- 8.2.3 The impacts of the Proposed Scheme on a range of environmental and socio-economic 'health determinants' could result in adverse or beneficial effects on health and wellbeing. This process of assessing these effects is documented in the health assessment matrices in Volume 5: Appendix HA-001-0MA06. Based on this a professional judgement has been made to identify those effects on population health and wellbeing that are sufficiently important to report within the health assessment sections found in this report and Volume 3, Route-wide effects.
- 8.2.4 The health determinants of relevance within the Hulseheath to Manchester Airport area during construction (temporary and permanent impacts) are:
- neighbourhood quality;
  - access to services, health and social care;
  - access to green space, recreation and physical activity; and
  - social capital.
- 8.2.5 No specific operational health effects have been identified for the Hulseheath to Manchester Airport area.
- 8.2.6 Additionally, health effects that are relevant along the route of the Proposed Scheme as a whole are reported in Volume 3, Route-wide effects, Section 8.
- 8.2.7 The geographic extent of the health assessment covers those areas where impacts on health determinants are predicted to occur. Health effects arising from impacts on a particular resource may affect communities across a wide area. These effects are described in the report section corresponding to the location of the resource itself. Health effects arising from reduced access to resources, for example as a result of traffic delays, are described in the report section corresponding to the community whose access is restricted.
- 8.2.8 The health assessment methodology is based on a review of published evidence showing how impacts on health determinants are linked to health effects in a large population. The health assessment is based on a review of evidence linking changes in health determinants to potential health outcomes. This information is presented in Volume 5: Appendix HA-002-00000. The strength of evidence varies; for example, the evidence linking physical activity to health outcomes is strong, whereas the evidence linking social capital with health outcomes is moderate. The strength of evidence does not necessarily determine the importance of a health effect but is an indication of the level of certainty in the assessment. Additionally, there is greater certainty in the prediction of an impact on a health determinant than the consequent effect on health.
- 8.2.9 There is no established or widely accepted framework for assessing the significant health effects of a development proposal. The SMR sets out a methodology for describing the impacts on health determinants in terms of the magnitude and duration of the change and the extent of the population exposed to this change. It also draws attention to the strength of evidence that links a change in health determinant with health effects. This framework permits the assessment to describe the impacts on determinants in a largely qualitative manner, with some structure to the relative scale of these impacts to give a sense of the

importance of the potential health effects. This does not, however, provide a clear basis for drawing conclusions as to whether a health effect is likely to be 'significant'.

## 8.3 Environmental baseline

### Existing baseline

#### Description of communities in the Hulseheath to Manchester Airport area

8.3.1 The route of the Proposed Scheme passes through the parishes of Millington, Rostherne, Mobberley, Ashley and Ringway. Cheshire East Council (CEC), Trafford Metropolitan Borough Council (TMBC), Manchester City Council (MCC) and the Greater Manchester Combined Authority (GMCA) are the local authorities in the area. The Hulseheath to Manchester Airport area is predominantly semi-rural, characterised by small clusters of residential properties and individual farms, with few community facilities. In general, most community facilities are in Hale Barns, located within the study area, and Hale, located to the north-west and outside of the study area. A more detailed description of community facilities is provided in Section 6, Community.

#### Hulseheath, Booth Bank, Rostherne and surrounds

- 8.3.2 This area covers the settlements of Hulseheath, Booth Bank, Rostherne and surrounds, from Booth Bank Lane in the west to Ashley Road in the east.
- 8.3.3 Hulseheath comprises approximately 20 residential properties, the nearest of which are located 350m to the east of the route of the Proposed Scheme.
- 8.3.4 Booth Bank comprises approximately 15 residential properties. The nearest residential properties are located 350m north-east of the route of the Proposed Scheme. The area is characterised by areas of farmland and Agden Brook, which runs through the centre of the settlement. The Children's Adventure Farm Trust at Booth Bank Farm is located 425m north of the route of the Proposed Scheme. This facility is an open farm providing activities and holiday respite accommodation for terminally ill, disabled and disadvantaged children.
- 8.3.5 Rostherne comprises approximately 115 residential properties. This area is characterised by areas of farmland interspersed with individual residential properties, the nearest of which are located 1.4km south of the route of the Proposed Scheme and outside of the study area. Within the study area is Bucklow Manor Care Home. The care home serves those with age-related care needs.
- 8.3.6 Rostherne Mere, a National Nature Reserve, is located 160m south of the route of the Proposed Scheme. The mere (a lake of approximately 80ha in area) and surrounding woodland is an important wildlife and wetland habitat. Rostherne Mere is not publicly accessible, although there is a public footpath and viewpoint to the west of the mere. Access

is by a circular path that leads around the southern part of the reserve, linking back to the car park across Tatton estate land. The reserve can also be visited via the A. W. Boyd Memorial Observatory.

- 8.3.7 There is one promoted public right of way (PRoW) in the area, the Cheshire Cycleway (Regional Route 70), which is a 282km on-road circular route. The cycleway passes through Rostherne via Rostherne Lane.

### **Ashley, Thorns Green, Ringway and surrounds**

- 8.3.8 This area covers the settlements of Ashley, Thorns Green, Ringway and surrounds, from Ashley Road in the west to the M56 (north of Halebank, Ringway) in the east.
- 8.3.9 Ashley comprises approximately 70 residential properties, the nearest of which are located 350m north of the Proposed Scheme. Community facilities in Ashley include St Elizabeth's Church and Community Centre. Recreational facilities in Ashley include Ashley Cricket Club and the Greyhound public house.
- 8.3.10 Thorns Green comprises approximately 15 residential properties. The nearest residential properties are located on the route of the Proposed Scheme. Higher Thorns Green Farm, which is also on the route of the Proposed Scheme, provides social and educational farm experiences for young people with autism and learning difficulties.
- 8.3.11 Halebank is in the parish of Ringway and comprises approximately 20 residential properties, the nearest of which are located on the route of the Proposed Scheme. Sunbank Wood is a publicly accessible woodland area of 13ha located to the south of Halebank, Ringway.
- 8.3.12 Promoted PRoW in the area include the Cheshire Cycleway (Regional Route 70) and Manchester Airport Orbital Cycleway (Regional Route 85, a traffic-free, 13km route around Manchester Airport); both are part of the National Cycle Network. The Bollin Valley Way also runs through this area, parallel to the River Bollin, 300m to the east of Thorns Green. The Bollin Valley Way is a 40km (25 mile) walking route linking Macclesfield with Partington.

### **Warburton Green, Hale Barns, Davenport Green and surrounds**

- 8.3.13 This area covers the settlements of Warburton Green, Hale Barns, Davenport Green and surrounds, from the M56 in the south to Davenport Green in the north.
- 8.3.14 Hale Barns and Warburton Green (a settlement within Hale Barns) lie on the south-west outskirts of Altrincham and comprise approximately 1,500 residential properties. The nearest residential properties are on the route of the Proposed Scheme.
- 8.3.15 Community facilities in Hale Barns include several schools (Elmridge Primary School and St Ambrose Preparatory School) and places of worship (Holy Angels Church, All Saints Church and Hale Chapel Unitarian). Hale Barns has several other community facilities including nursery schools, a secondary school, places of worship and a care home; however, these are located outside of the study area.



- 8.3.16 There are a number of recreational facilities located in Hale Barns. Hale Golf Club and Ringway Golf Club are partially within the study area. Hale Barns Cricket Club and The Tennis Club Hale Barns are both within the study area.
- 8.3.17 Davenport Green is a settlement comprising approximately 30 residential properties. The nearest residential properties are located 400m north-west of the route of the Proposed Scheme. Ringway Golf Course is located to the south of the settlement.

## **Demographic and health profile of the Hulseheath to Manchester Airport area**

- 8.3.18 A review of publicly available health and demographic information has been undertaken to inform the health assessment. The information gathered describes the populations that could be affected by the Proposed Scheme in terms of their key characteristics such as size, distribution, age structure, socio-economic status and health. It enables consideration of the nature of the populations affected and their sensitivity to potential health effects, as well as indicating the prevalence of specific vulnerable groups.
- 8.3.19 The communities affected by the Proposed Scheme in the Hulseheath to Manchester Airport area have a relatively low population density compared to the national average.
- 8.3.20 Public health indicators have been benchmarked by Public Health England<sup>66</sup> to show how a local authority compares to England for each specific indicator. The benchmark is presented on a three-point scale: worse than, similar to and better than the English average. The data provided by Public Health England show that this population has a slightly better health status compared with the English average.
- 8.3.21 The English Indices of Deprivation<sup>67</sup> rank neighbourhoods from most to least deprived, according to a range of criteria and an overall (combined) ranking. The neighbourhoods in the Hulseheath to Manchester Airport area are generally less deprived than the national average, falling mainly within the 10% to 50% least deprived bands.
- 8.3.22 This area as a whole is considered to be slightly more resilient than the national average with regard to changes in the relevant health determinants. However, there are some vulnerabilities in terms of the health status of the population.
- 8.3.23 The available data provide detail down to local authority and ward level and enable a profile to be made of the population within the Hulseheath to Manchester Airport area. The description of the whole population, and the populations within wards, does not preclude

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<sup>66</sup> Public Health England (2019), *Local Authority health profiles*. Available online at: <https://fingertips.phe.org.uk/profile/health-profiles/data#page/1/gid/1938132701/pat/6/par/E12000003/ati/102/are/E08000035/iid/90366/age/1/sex/1>.

<sup>67</sup> Department for Housing, Communities and Local Government (2019), *English indices of deprivation 2019*. Available online at: <https://www.gov.uk/government/statistics/english-indices-of-deprivation-2019>.

the possibility that there will be individuals or groups of people who do not conform to the overall profile.

## **Future baseline**

### **Construction (2025)**

- 8.3.24 Volume 5: Appendix CT-004-00000 provides details of the developments in the Hulseheath to Manchester Airport area that are assumed to have been implemented by 2025. No committed developments of relevance for the health assessment have been identified that would materially alter the future baseline in this area.

### **Operation (2038)**

- 8.3.25 Volume 5: Appendix CT-004-00000 provides details of the developments in the Hulseheath to Manchester Airport area that are assumed to have been implemented by 2038. No committed developments of relevance for the health assessment have been identified that would materially alter the future baseline in this area.

## **8.4 Effects arising during construction**

### **Avoidance and mitigation measures**

- 8.4.1 Consideration of potential health issues is an integral part of the planning and design of the Proposed Scheme, alongside consideration of other environmental, community and economic issues. Insofar as reasonably practicable, mitigation measures have been incorporated into the design of the Proposed Scheme with the aim of avoiding or reducing adverse effects on people. The locations of construction compounds and site haul routes have been selected to reduce the number of people exposed to construction impacts insofar as reasonably practicable. The mitigation measures incorporated into the design of the Proposed Scheme in the Hulseheath to Manchester Airport area are described in Section 2.
- 8.4.2 Contractors will be required to comply with the environmental management regime for the Proposed Scheme, set out in the draft Code of Construction Practice (CoCP)<sup>68</sup>, which provides a general basis for route-wide construction environmental management. Contractors will also be required to comply with the measures set out in Local Environmental Management Plans (LEMP), which will apply the environmental management strategies at a local level.
- 8.4.3 The draft CoCP will be the means of controlling the construction works associated with the Proposed Scheme to ensure that the effects of the works upon people and the natural environment are reduced or avoided so far as reasonably practicable.

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<sup>68</sup> Volume 5: Appendix CT-002-00000, draft Code of Construction Practice (CoCP).

- 8.4.4 The draft CoCP will require contractors to produce and implement a community engagement framework, provide appropriately experienced community relations personnel to implement the framework, provide appropriate information and to be the first point of contact to resolve community issues. Contractors will be required to take reasonable steps to engage with the community, focusing on those who may be affected by construction impacts, including local residents, businesses, landowners and community resources, while taking into account the specific needs of protected groups (as defined in the Equality Act 2010).
- 8.4.5 In the event of any loss of a community facility, the options for mitigating significant community effects to be explored by HS2 Ltd would include:
- improving or altering the remaining portion of the community facility;
  - improving other existing community facilities in the area that could reduce the effect;
  - improving accessibility to other community facilities; and/or
  - identifying land owned by the relevant local authority that could be brought into use as a community facility with its agreement.

## Assessment of impacts and effects

- 8.4.6 Impacts on health determinants resulting from the construction of the Proposed Scheme are presented in the health assessment matrix in Volume 5: Appendix HA-001-0MA06. The health assessment criteria are described within the SMR. Within the assessment matrix, the assessment criteria are applied to determine which impacts are likely to lead to health and wellbeing effects at the population level. These effects are reported in the assessment sections below.

## Neighbourhood quality

- 8.4.7 The neighbourhood quality assessment identifies changes in the character and amenity of neighbourhoods along the route of the Proposed Scheme. It includes public realm such as streets, footpaths, public squares, parks and playing fields. It does not include residential or other private property. The assessment identifies combinations of impacts on two or more of the following environmental factors within the public realm: traffic, noise and vibration, landscape and visual impacts. When these factors are altered people's levels of satisfaction with their living environment may change, which in turn may affect their mental wellbeing. This may include reduced feelings of attachment to, and pride in, their neighbourhood and reduced enjoyment of outside space.
- 8.4.8 A review of published research evidence linking neighbourhood quality with health and wellbeing can be found in Volume 5: Appendix HA-002-00000. The evidence linking the various aspects of neighbourhood quality with health outcomes ranges from moderate to strong.
- 8.4.9 The neighbourhood quality assessment uses information from other topics but does not apply the same assessment thresholds, as it is focused on neighbourhoods rather than

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individual receptors. The construction of the Proposed Scheme will affect neighbourhood quality through impacts such as noise, visual impacts and additional traffic, including heavy goods vehicles (HGVs)<sup>69</sup>. These impacts are described in Section 11, Landscape and visual, Section 13, Sound, noise and vibration and Section 14, Traffic and transport.

- 8.4.10 Chapel Lane in Bucklow Hill is a designated route for construction traffic to enable access to Chapel Lane satellite compound. Chapel Lane is expected to experience an increase in HGV traffic movements. Significant HGV traffic effects are expected to combine with significant traffic noise effects on some properties along Chapel Lane between Hulseheath Lane and the A5034 Chester Road during the peak months of construction. People in this community are likely to experience these effects as changing the quality of their neighbourhood and to regard that change as adverse, in diminishing the amenity of the settlement.
- 8.4.11 There will be a neighbourhood quality health effect at Hulseheath, which extends across the boundary between the Hulseheath to Manchester Airport area and the Pickmere to Agden and Hulseheath area (MA03). As the majority of the affected properties are in the Pickmere to Agden and Hulseheath area, the effect is reported in Volume 2, This effect is reported in Volume 2, Community Area report: Pickmere to Agden and Hulseheath (MA03), Section 8 and Volume 5: Appendix HA-001-0MA03.
- 8.4.12 The construction of Ringway cutting and Sunbank Lane overbridge, and vehicles on construction traffic routes will be visible from street level in Ringway. Construction noise will be noticeable in outdoor areas, specifically Sunbank Lane (which is also a designated construction traffic route), for approximately two years and three months. People in this community are likely to experience these features of the Proposed Scheme as changing the quality of their neighbourhoods and to regard that change as adverse by diminishing the amenity of the area.
- 8.4.13 The presence and use of M56 East satellite compound and construction of Manchester Airport High Speed station cutting and associated retaining walls will be visible from street level on the eastern side of Warburton Green. Construction noise will be noticeable in outdoor areas in the eastern parts of Warburton Green, for approximately four years and five months. People in this community are likely to experience these features of the Proposed Scheme as changing the quality of their neighbourhoods and to regard that change as adverse by diminishing the amenity of the area.
- 8.4.14 The construction of Manchester Airport High Speed station and use of Manchester Airport High Speed station North and South satellite compounds will be visible from street level in the east of Hale Barns. Construction noise will be noticeable in the vicinity of the A538 Hale Road and Hasty Lane for approximately four years and two months. People in this community are likely to experience these features of the Proposed Scheme as changing the

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<sup>69</sup> HGV traffic effects are where there is a 30% or more increase in HGV traffic movements which have been identified as significant by traffic and transport. The increase in HGV traffic results in a traffic-related severance effect for non-motorised users. They contribute to neighbourhood quality effects on health resources that are located adjacent to the routes that experience the increase in HGV movements.

quality of their neighbourhoods and to regard that change as adverse by diminishing the amenity of the area.

## **Access to services, health and social care**

- 8.4.15 There is strong evidence linking access to health and social care services with mental and physical health outcomes, both directly, through access to treatment and care, or access to fresh food retailers, and indirectly through issues such as access to social networks. There is also weak to moderate evidence to suggest that transport problems are a key barrier to people's ability to access these services. There is moderate evidence to suggest that access to shops and other local facilities can affect health. This is based on a range of factors affecting quality of life, and includes mental health issues such as reducing feelings of isolation and enabling participation in society, and physical health issues such as food shopping and other basic needs. A review of published research evidence linking access to services, health and social care with health and wellbeing can be found in Volume 5: Appendix HA-002-00000.
- 8.4.16 Construction of Thorns Green cutting will require the demolition of a property at Higher Thorns Green Farm. Higher Thorns Green Farm makes use of a working farm environment to provide social and educational opportunities based around animal husbandry and the growing and cooking of food. Higher Thorns Green Farm hosts the Fairfield Farm Project, which is run by Fairfield Care Ltd. The Fairfield Farm Project provides a range of social and flexible educational opportunities for children and adults with complex learning difficulties, supported by qualified staff. Activities include animal husbandry, horticulture and farming skills, which can lead to recognised qualifications for service users. Any reduction in the range and quality of activities available at Higher Thorns Green Farm is likely to result in a permanent loss of opportunities for vulnerable groups to engage in activities that are beneficial for their education, health and wellbeing. Therefore, the permanent loss of the services provided by Fairfield Care Services' farm project will result in an adverse health effect.

## **Access to green space, recreation and physical activity**

- 8.4.17 There is moderate evidence to show that access to green space contributes to good mental health, including reduced stress and improved cognitive function and resilience. There is also moderate evidence that environmental factors such as access to high quality green space, safety and amenity can influence participation in physical activity. Physical activity is strongly linked to health outcomes. A review of published research evidence linking access to green space, recreation and physical activity with health and wellbeing can be found in Volume 5: Appendix HA-002-00000.
- 8.4.18 The Proposed Scheme will intersect some public rights of way (PRoW) in the Hulseheath to Manchester Airport area. Effects relating to the severance and diversion of PRoW (public footpaths and bridleways) are described in Section 14, Traffic and transport. Surveys of the user numbers and condition of PRoW have been undertaken and are reported in

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Background Information and Data<sup>70</sup> (see BID TR-004-00001: Transport Assessment policy and data report). Where PRoW and other routes are a 'promoted' destination in their own right as a recreational resource, they are also assessed within Section 6, Community. Effects on views from PRoW are assessed in Section 11, Landscape and visual effects. PRoW are not identified as sensitive receptors in the assessment of sound, noise and vibration (Section 13) as they are, by their nature, transitory in their use, with users not staying in any one location for any length of time. However, during construction, the amenity and recreational value of some PRoW will be temporarily reduced due to their proximity to construction activities, as well as other aspects such as changes in the length and appearance, and the addition of features such as underpasses. This may result in some people using alternative routes or, where a suitable alternative is not available, being deterred from using PRoW, leading to adverse effects on wellbeing for some individuals. However, the impacts on PRoW are not considered to reduce access to green space and levels of physical activity to a level that would lead to adverse health effects on the population in the Hulseheath to Manchester Airport area.

- 8.4.19 Construction traffic, including HGVs, will be present on local roads within the Hulseheath to Manchester Airport area as described in Section 14, Traffic and transport. The presence of HGVs is likely to deter some non-motorised users (pedestrians, cyclists and equestrians) from using the affected routes, due to concerns about safety and amenity. In the case of recreational users, it is considered that alternative routes will be available. However, for those using these routes for active travel to work or to access shops and services, there is the possibility that people will choose instead to travel by car, temporarily reducing levels of physical activity and associated health and wellbeing benefits. Given the location of construction traffic routes and the number of HGV movements, it is considered that any reduction in physical activity would be small, and would not lead to adverse health effects on the population in the Hulseheath to Manchester Airport area.

## Social capital

- 8.4.20 The term 'social capital' refers to the connections between individuals within communities, and the increased likelihood that arises through these networks for individuals to feel valued, to feel a sense of belonging, to have companionship and to support each other. The Office for National Statistics<sup>71</sup> defines social capital as follows:

"In general terms, social capital represents social connections and all the benefits they generate. Social capital is also associated with civic participation, civic-minded attitudes and values which are important for people to cooperate, such as tolerance or trust."

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<sup>70</sup> High Speed Two Ltd (2022), High Speed Rail (Crewe – Manchester), *Background Information and Data*. Available online at: <https://www.gov.uk/government/collections/hs2-phase-2b-crewe-manchester-environmental-statement>.

<sup>71</sup> Office for National Statistics (2014), *Measuring social capital*. Available online at: [https://webarchive.nationalarchives.gov.uk/20160107115718/http://www.ons.gov.uk/ons/dcp171766\\_371693.pdf](https://webarchive.nationalarchives.gov.uk/20160107115718/http://www.ons.gov.uk/ons/dcp171766_371693.pdf).

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- 8.4.21 There is moderate evidence for a link between social capital and mental and physical health outcomes. A change in social capital has the potential to influence the mental health effects that are gained through social contact and support, social participation, reciprocity and trust. Adverse effects on health from changes in social capital could be experienced as a reduction in mental wellbeing or as physiological effects on the body's hormonal and immune systems, with increased susceptibility to mental and physical illness. A review of published research evidence linking social capital with health and wellbeing can be found in Volume 5: Appendix HA-002-00000.
- 8.4.22 The settlements along the route of the Proposed Scheme support small, well-established communities. The assessment has identified potential wellbeing effects within these communities associated with the temporary construction workforce, which will be substantial relative to the size of these communities. During the day, the workforce will be present on construction sites and compounds throughout the Hulseheath to Manchester Airport area, including work sites and satellite compounds in the vicinity of Hulseheath, Booth Bank, Ashley, Thorns Green, Warburton Green, Halebank and Davenport Green. The daily average number of workers at each site will typically be between 60 and 200, and the duration of the works at each site will range from two years to nine years. The presence of construction workers is likely to be noticeable, with construction vehicles using assigned local roads to access compounds, and workers using facilities within local settlements.
- 8.4.23 The introduction of a temporary construction workforce into established communities has the potential to negatively alter people's perceptions of, and interactions with, their communities, modifying behaviour and the value they place on social capital. Such a reduction in social capital has the potential to adversely affect wellbeing, and may influence behaviours that are beneficial to wellbeing such as the use of community facilities.
- 8.4.24 The draft CoCP includes a commitment to produce and implement a community engagement framework and provide appropriately experienced community relations personnel to implement the framework and provide a first point of contact. HS2 Ltd will engage with local authorities and community representatives to identify measures aimed at fostering and maintaining good relationships between the workforce and local communities. Any measures identified will be included within the community engagement framework as appropriate.
- 8.4.25 Loss of residential properties can cause changes to the social environment within the remaining community. This could involve the direct loss of contacts in the local area and/or a noticeable reduction in the number of people using local facilities. For this to have an adverse impact on overall levels of social capital, the loss of homes would need to make up a sizeable proportion of the local community. This has been judged on a case-by-case basis, taking account of the size of the community and its characteristics. Therefore, not all of the significant effects from residential demolitions identified in Section 6, Community will result in adverse effects on social capital.
- 8.4.26 The Proposed Scheme will result in the demolition of five properties in the village of Thorns Green and five properties in Ringway. These demolitions represent a relatively sizable

proportion of the two local communities. The erosion of social networks resulting from these demolitions will have the potential to reduce social capital, reducing the beneficial health effects that are gained through social contact and support.

## Other mitigation measures

- 8.4.27 HS2 Ltd will engage with local authorities and community representatives to identify measures aimed at fostering and maintaining good relationships between the workforce and local communities. Any measures identified will be included within the community engagement framework as appropriate.
- 8.4.28 HS2 Ltd is continuing to engage with the owners and occupiers of Higher Thorns Green Farm to identify reasonably practicable measures to help mitigate potential significant effects identified in the assessment.

## Cumulative effects

- 8.4.29 The assessment has considered whether the cumulative effects of the Proposed Scheme and other committed developments are likely to give rise to additional health effects. No cumulative health effects have been identified.
- 8.4.30 Cumulative effects may also occur where a number of individual health effects come together within a location, such that a considerable proportion of the population is likely to experience more than one type of health effect. This will place increased stress on those individuals affected and may exacerbate health outcomes associated with the individual effects.
- 8.4.31 In Halebank, Ringway, the construction of the Proposed Scheme will affect neighbourhood quality and social capital. It is expected that the majority of the population at Halebank, Ringway will experience impacts on two or more health determinants during the construction of the Proposed Scheme, and this may therefore result in a cumulative effect on health.
- 8.4.32 In Hale Barns, the construction of the Proposed Scheme will affect neighbourhood quality, access to services and social capital. It is expected that the majority of the population at Hale Barns will experience impacts on two or more health determinants during the construction of the Proposed Scheme, and this may therefore result in a cumulative effect on health.

## 8.5 Effects arising from operation

### Avoidance and mitigation measures

- 8.5.1 Consideration of potential health issues is an integral part of the planning and design of the Proposed Scheme, alongside consideration of other environmental, community and economic issues. Insofar as reasonably practicable, mitigation measures have been incorporated into the design of the Proposed Scheme with the aim of avoiding or reducing



adverse effects on people. The mitigation measures incorporated into the design of the Proposed Scheme in the Hulseheath to Manchester Airport area are described in Section 2 and include:

- landscape mitigation planting along Hulseheath North embankment to provide visual screening for residents of properties along Back Lane, Thowler Lane and Boothbank Lane, Booth Bank Farm and residents of properties in Millington;
- landscape earthworks and mitigation planting along the south-eastern side of Ringway cutting and to the west and east of Manchester Airport High Speed station cutting to provide visual screening for residents of properties in Warburton Green, Halebank and along Sunbank Lane; and
- landscape mitigation planting located around Manchester tunnel south portal (located in the Davenport Green to Ardwick area (MA07) to provide visual screening for residents of properties in Davenport Green.

## Assessment of impacts and effects

- 8.5.2 Impacts on health determinants resulting from the operation of the Proposed Scheme are presented in the health assessment matrix in Volume 5: Appendix HA-001-0MA06. The health assessment criteria are detailed within the SMR. Within the assessment matrix, the assessment criteria are applied to determine which impacts are likely to lead to health and wellbeing effects at population level.

## Neighbourhood quality

- 8.5.3 There will be a neighbourhood quality health effect at Hulseheath, which extends across the boundary between the Hulseheath to Manchester Airport area and the Pickmere to Agden and Hulseheath area (MA03). As the majority of the affected properties are in the Pickmere to Agden and Hulseheath area, the effect is reported in Volume 2, Community Area report: Pickmere to Agden and Hulseheath (MA03), Section 8 and Volume 5: Appendix HA-001-0MA03.

## Other mitigation measures

- 8.5.4 Avoidance and mitigation measures are described above. No other mitigation measures have been identified.

## Cumulative effects

- 8.5.5 No cumulative effects have been identified.

## Monitoring

- 8.5.6 Volume 1, Section 9 sets out the general approach to environmental monitoring during operation of the Proposed Scheme.

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- 8.5.7 Proposals for monitoring of precursors to health effects, such as air quality and noise, are reported in Sections 5 and 13.
- 8.5.8 Any area-specific operational monitoring requirements in relation to air quality effects, noise and vibration effects, traffic effects and visual effects that have contributed to the health assessment are described in the relevant sections of this Volume 2 report.

## 9 Historic environment

### 9.1 Introduction

- 9.1.1 This section of the report provides a description of baseline conditions for heritage assets and the identified impacts and likely significant effects resulting from the construction and operation of the Proposed Scheme within the Hulseheath to Manchester Airport area. Consideration is given to the extent and value of heritage assets including archaeological and palaeoenvironmental remains, historic buildings, the built environment and historic landscape.
- 9.1.2 Engagement has been undertaken with Historic England, Cheshire East Council, Trafford Metropolitan Borough Council, Greater Manchester Combined Authority, the Greater Manchester Archaeological Advisory Service, Cheshire Archaeology Planning Advisory Service and the National Trust. The purpose of this engagement has been to discuss the assessment approach, to obtain relevant baseline information and to inform the design development and assessment of the Proposed Scheme.
- 9.1.3 Appendices and Background Information and Data (BID<sup>72</sup>) reports accompany this section of the report. These are:
- Volume 5: Appendix HE-002-0MA06 – Summary gazetteer, impact assessment table and archaeological character areas;
  - Volume 5: Appendix HE-003-0MA06 – Historic landscape character areas;
  - Volume 5, map book HE-01 and HE-02 – Heritage assets within the study area and map book HE-03- Archaeological sub-zones;
  - BID HE-001-0MA06 – Historic environment baseline report (including a full gazetteer of heritage assets);
  - BID HE-004-0MA06 – Historic environment field survey report (geophysical survey), and map book HE-004; and
  - BID HE-005-0MA06 – Historic environment remote sensing survey report (aerial photograph and LiDAR<sup>73</sup> assessment), and map book HE-005.
- 9.1.4 Heritage assets have been given a Unique gazetteer identifier (UID), for example MA06\_0001. These have been allocated to all heritage assets within the gazetteer and are referenced throughout the ES, BID reports and in map books.

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<sup>72</sup> High Speed Two Ltd (2022), *High Speed Rail (Crewe – Manchester), Background Information and Data*. Available online at: <https://www.gov.uk/government/collections/hs2-phase-2b-crewe-manchester-environmental-statement>.

<sup>73</sup> LiDAR (meaning ‘light detection and ranging’) is a surveying method that measures distance to a target by illuminating the target with pulsed laser light and measuring the reflected pulses with a sensor, this can be used to identify archaeological earthwork evidence.

9.1.5 Maps showing the location of the key environmental features (Map Series CT-10), and the key construction (Map Series CT-05) and key operational (Map Series CT-06) features of the Proposed Scheme can be found in the Volume 2: MA06 Map Book. The Proposed Scheme is described in Section 2.

## 9.2 Scope, assumptions and limitations

9.2.1 The general scope, assumptions and limitations for the historic environment assessment are set out in full in Volume 1, Section 8 and the EIA Scope and Methodology Report (SMR)<sup>74</sup>, including the method for determining the value of a heritage asset and magnitude of impact.

9.2.2 The assessment focuses on the extent to which the Proposed Scheme will affect designated and non-designated heritage assets. The Proposed Scheme could impact heritage assets through the alteration, demolition or removal of the asset, or as a result of changes within the asset's setting, where setting contributes to the heritage value of the asset.

9.2.3 The study area for the assessment of effects on designated and non-designated heritage assets is the land required for the construction of the Proposed Scheme plus 500m on each side in rural areas. This is referred to in the remainder of this section as the 500m study area.

9.2.4 Designated heritage assets within a study area of up to 2km from the land required for the construction and operation of the Proposed Scheme have been considered in relation to potential effects arising from changes within an asset's setting. This is referred to in the remainder of this section as the 2km study area.

9.2.5 The historic environment methodology includes the consideration of the relevant interactions with other topics, including ecology and biodiversity, landscape and visual, socio-economics, sound noise and vibration, water resources and flood risk, and in-combination climate change impacts. These interactions have been included in the assessment of baseline conditions, impacts and effects.

9.2.6 Where noise is considered, this is within the context of the way in which sound and noise currently contribute to the heritage value of the assets and is not a reference to absolute noise levels or sound, or the noise or vibration impacts on the health and quality of life of people who live in or visit the area.

9.2.7 For the purpose of this assessment, it is generally assumed that heritage assets within the land required for the construction of the Proposed Scheme will be removed. Exceptions to this are:

- linear heritage assets (canals and railways) which although partially located within the land required for the construction of the Proposed Scheme will not be removed; and

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<sup>74</sup> Volume 5: Appendix CT-001-00001, Environmental Impact Assessment Scope and Methodology Report.

- Tatton Park (MA06\_0002), Ashley Castle Mill Bridge, Ringway, Manchester (MA06\_0017), Birkin Bridge, North Lodge and railing attached (MA06\_0058), Birkin Bridge South Lodge and railing attached (MA06\_0059) and Pigleystair Bridge across River Bollin (MA06\_0097), which although partially or wholly within the land required for the construction of the Proposed Scheme will not be removed.

## 9.3 Environmental baseline

### Existing baseline

9.3.1 A full list of data sources used in establishing baseline conditions is provided in BID HE-001-0MA06. In addition to the desk-based assessment, the following surveys have been undertaken in the Hulseheath to Manchester Airport area:

- walkover and site reconnaissance from areas of public access or in locations where site access was granted. This was carried out in order to understand the character of the historic landscape; review the nature, condition and setting of known heritage assets; and identify previously unknown assets;
- desk-top analysis of remote sensing data, including LiDAR and aerial photographs (BID HE-005-0MA06); and
- a programme of non-invasive geophysical survey in areas identified as suitable for this survey method and where access was granted (BID HE-004-0MA06).

### Designated assets

9.3.2 Designated heritage assets within the 2km study area are described in Volume 5: Appendix HE-002-0MA06. The following designated heritage assets are located partially or wholly within the land required for the construction of the Proposed Scheme:

- Buckhall, The Four Seasons Hotel (MA06\_0015, also known as the Manchester Airport Marriott Hotel), a Grade II listed building of moderate heritage value;
- Ashley Castle Mill Bridge, Ringway, Manchester (MA06\_0017), a Grade II listed bridge of moderate heritage value;
- Birkin Bridge, North Lodge and railing attached (MA06\_0058), a Grade II listed building of moderate heritage value;
- Birkin Bridge, South Lodge and railing attached (MA06\_0059), a Grade II listed building of moderate heritage value; and
- Tatton Park (MA06\_0002), a Grade II\* registered park and garden of high heritage value.

9.3.3 The assets summarised below are located outside of the land required for the construction of the Proposed Scheme but are partially or wholly within the 2km study area. Only assets where a significant effect is predicted, as described in Section 9.4 and 9.5, are named below:

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- three scheduled monuments, all of which are high heritage value, comprising the remains of a deserted medieval settlement, a motte and bailey castle and a standing cross;
- four Grade I listed buildings, all of which are high heritage value, comprising two churches, a domestic detached house and an old hall;
- eight Grade II\* listed buildings all of which are high heritage value. These comprise churches and a chapel, domestic detached houses and structures associated with country houses;
- there are 178 Grade II listed buildings of moderate heritage value, including domestic farmhouses such as Davenportgreen Farmhouse (MA06\_0012), Yewtree House, Sunbank Lane (MA06\_0016) and Hough Green Farmhouse (MA06\_0040), agricultural and subsistence building types including Barn, Roaring Gate Lane (also known as Davenportgreen Barn) (MA06\_0011) and Paddy's Hut, Roaring Gate Lane (MA06\_0013), and cottages including Mere Covert Cottage (MA06\_0069) as well as other domestic, religious, commercial, transport and industrial structures;
- one Grade II\* registered park and garden of high heritage value and one Grade II registered park and garden of moderate heritage value; and
- 10 conservation areas of moderate heritage value.

## Non-designated assets

- 9.3.4 The non-designated heritage assets summarised below lie wholly or partially within the land required for the construction of the Proposed Scheme. Only assets where a significant effect is predicted, as described in Section 9.4 and 9.5, are named below.
- 9.3.5 There are 14 assets of low heritage value within the land required for the construction of the Proposed Scheme. These date from the Roman, post-medieval and modern periods and relate to domestic, agricultural, industrial and transportation activity in the area. The assets include Fern Cottage, A538 Hale Road (MA06\_0088), Hale Bank Farm, Sunbank Lane (MA06\_0095), No. 56 Sunbank Lane, Ringway (MA06\_0096), Group of Four Cottages, Castle Mill Lane (MA06\_0101), Higher Thorns Green Farm, Castle Mill Lane (MA06\_0102), Arden Lodge North, Lamb Lane (MA06\_0108), Bowdon View Cottage and Pembroke House, Yarwoodheath Lane (MA06\_0118), Bowdon View Farm, Yarwoodheath Lane (MA06\_0119), Post-medieval Brickyard, Cherry Tree Farm (site of) and Two Post-medieval buildings, east of Cherry Tree Farm (site of) (MA06\_0120 and MA06\_0121), Cherry Tree Farm, Cherry Tree Lane (MA06\_0122), Millington Mill (site of) (MA06\_0137), Possible building and enclosure, Millington (site of) (MA06\_0140) and Linear archaeological features at M56 junction 6, Warburton Green (MA06\_0331).
- 9.3.6 The non-designated heritage assets summarised below lie wholly or partially within the 500m study area.
- 9.3.7 There are 56 assets of low heritage value within the 500m study area. These include farms and properties which reflect the rural landscape of the area, bridges, archaeological remains of a ring ditch, industrial sites, a deserted medieval settlement and former field boundaries.

There are no non-designated assets of high or moderate heritage value within the land required for the construction of the Proposed Scheme.

## Historic environment overview

- 9.3.8 The bedrock of the Hulseheath to Manchester Airport area mainly comprises mudstone and siltstone. This was historically quarried for brick making. The bedrock is generally overlain by glacial till comprising sandy, silty clay with gravel. The River Bollin valley and its associated tributaries, Agden Brook, Birkin Brook, Mobberley Brook and Sugar Brook form the central band of low-lying level land with accumulations of alluvial deposits along its course. The narrow floodplains and glacial sands which are drier have shaped the area and would have been most suited for early prehistoric activity.
- 9.3.9 Evidence for Palaeolithic activity in north-west England is scarce, possibly because much of the region at this time was at the edge of, or under, glacial ice. At the end of the glacial period a dramatic environmental change began in Britain. Climatic warming led to a rise in sea levels and a change in vegetation patterns. At this time, the open landscapes were replaced by forests of beech and pine, and other species such as arctic hare and reindeer gave way to boar and deer. These changes encouraged the emergence of Mesolithic people who survived by hunting and gathering natural resources and exploiting the wetland meres of the Cheshire Plains.
- 9.3.10 Archaeological evidence from the Mesolithic and Neolithic periods is usually characterised by discoveries of isolated stone or flint tools during excavations at sites such as Tatton Park (MA06\_0002). Tatton Mere was occupied by a small early Mesolithic community as a base camp centred on a ridge of open land between surrounding woodland, where natural resources were exploited. Evidence of post-built wooden structures excavated at Oversley Farm, Styal, prior to the construction of a second runway at Manchester Airport, is an indication that Neolithic people had a settled presence in the study area (MA06\_0081).
- 9.3.11 The Bronze Age is nationally defined by the introduction of bronze metalwork, changes in pottery style and the increase of single burials. People continued to live in small settlements of wooden structures and farmed on a subsistence basis. Knowledge of the period is generally gained from archaeological evidence of land division, settlement and burial practices. Very little trace of these activities exists in the study area. At Oversley Farm, Styal (MA06\_0081), there is evidence of early Bronze Age use of a routeway (known as a hollow way), which may have been formed during an earlier phase of occupation. Later Bronze Age activity revealed evidence of structures on top of the hollow way. Other evidence is limited to finds such as a stone adze (a tool for shaping wood) from the edge of Tatton Mere within Tatton Park (MA06\_0002).
- 9.3.12 There is little evidence for the Iron Age in the study area. Only a limited number of sites have been excavated. As the lives of the indigenous people continued largely unchanged in the Roman period it is often difficult to distinguish the difference between archaeological remains.

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- 9.3.13 Although Britain came under Roman control after AD 43, it was not until AD 70 that the Romans began to occupy the area north of the Midlands that is now Cheshire. Military roads were essential during this period. The Roman road from Chester to Manchester (MA06\_0145) is aligned roughly north to south within the study area. It is common for settlements, cemeteries and other activity to be found along and close to the routes of Roman roads; however none have been identified within the study area.
- 9.3.14 After the withdrawal of Roman rule in the 5th century AD, social, monetary, economic and political organisation broke down. The region fragmented into small kingdoms. Increasing influence came from the expansion of the Anglo-Saxon kingdoms of Mercia who took control of the region south of the Mersey, and Northumbria who extended their influence from the north. In the early medieval period, archaeological evidence becomes increasingly scarce and knowledge of the period is largely dependent on documentary sources. The first parishes were established in the early medieval period. Christian churches were founded under the patronage of the Mercian kings. The earliest evidence for Christianity comes from fragments of 8th century sculptures in the Church of St Mary the Virgin, Altrincham (MA06\_0064). Definite archaeological evidence of settlement has been uncovered at Tatton Park (MA06\_0002). A large timber-framed building was uncovered within a fenced enclosure beneath the later deserted medieval village.
- 9.3.15 The patterns of hamlets (MA06\_0331) and farmsteads were generally established in the Anglo-Saxon period. At the time of the Norman Conquest in 1066, north-west England was relatively thinly populated compared to other parts of the country. The Domesday Survey provides a record of settlement and land use shortly after the Norman conquest. It records the settlements of Millington, Rostherne, Tatton, Ashley, Mobberley, Bowdon and Hale and that the east of Cheshire had a population of under 2.5 people per square mile. The arrival of the Normans marked a change in the political landscape. A new class of Norman lords emerged, and the church became an increasingly important landholder.
- 9.3.16 Land was distributed under an elite of lords who controlled isolated farmsteads and lived in halls often surrounded by moats. Moated sites are common further west but almost entirely absent in the study area. Instead lords lived in halls outside the small villages and hamlets such as Tatton Hall (MA06\_0293). These parks were mainly used for deer-keeping and hunting. The cultivated area expanded in the lowlands of Cheshire as new farms and hamlets with their own field systems were established. The nature of agriculture within the county was influenced by soil and climate. The glacial till was seen as difficult to cultivate and more adapted to grass, while sand with lighter free draining soils was easy to plough and more suited to cultivation, resulting in a mixed arable economy during the medieval period. Populations began to decline in the 14th and 15th centuries due to the Black Death (bubonic plague). The reduction in population led to social change and shrinking or abandonment of villages, for example archaeological remains at Tatton Park (MA06\_0216) and Dunham Massey (MA06\_0225).
- 9.3.17 By the 18th century wealthy landowners such as the Egertons in north-west England commissioned new houses. Deer keeping became less important as families sought out more tailored and landscaped parks for new houses. Tatton Park (MA06\_0002) was bought



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in 1598 by Sir Thomas Egerton. It was not until the time of Thomas's grandson, John Egerton, between 1679 and 1724 that the family built a new country house. The design of a formal landscape park began in the 1740s at Tatton.

- 9.3.18 The post-medieval period witnessed the transformation of north-west England. It went from a relatively impoverished and sparsely populated area to a key region in the early stages of Britain's industrialisation and globalisation. This led to changes in agriculture in the study area including an increase in dairy farming. Farmland was enclosed and improved including many of the farms in the study area which were owned by Tatton Estate. Improvements in brick production technology and the ready availability of brick making material locally meant that buildings were increasingly built in brick. Bricks were supplied by local brick yards such as the post-medieval Brickyard at Cherry Tree Farm (MA06\_0120). Brick prevailed at buildings, such as at Buckhall, The Four Seasons Hotel (MA06\_0015), Higher Thorns Green Farm (MA06\_0102), Bowdon View Farm (MA06\_0119) and Cherry Tree Farm (MA06\_0122). Initially brick was often used in conjunction with timber framing as an infill material between the timbers, as at Mere Covert Cottage (MA06\_0069).
- 9.3.19 During the modern period the landscape within north-west England largely reflected agricultural changes from the post-medieval period. Within the study area this meant that the rural landscape was retained but with increased transportation links and the decline of the country house. Residential expansion continued within the emerging suburbs including the widespread adaptation and reuse of former agricultural buildings to residential use such as at Davenportgreen Farmhouse (MA06\_0012), Yewtree House, Sunbank Lane (MA06\_0016) and Hough Green Farmhouse (MA06\_0040). The biggest change within the character of the area was the construction of Manchester Airport (MA06\_HLCA01), which opened in the 1930s under the name of Ringway Aerodrome. Railways survived the rationalisation of the 1960s and 1970s and the connecting routes which served suburbs of Manchester and Liverpool were electrified. The main transport innovations in the second half of the 20th century were the motorways. The M56 was constructed in the 1970s and cut across pre-existing landscapes but following an alignment broadly similar to that of the pre-railway road system. At Buckhall, The Four Seasons Hotel (MA06\_0015), also known as the Manchester Airport Marriott Hotel, the mid-18th century farmhouse became part of a hotel complex in the 1980s associated with Manchester Airport.

## Future baseline

### Construction (2025)

- 9.3.20 Volume 5: Appendix CT-004-00000 provides details of the developments in the Hulseheath to Manchester Airport area that are assumed to have been implemented by 2025. No committed developments have been identified in this study area that will materially alter the baseline conditions in 2025 for historic environment.

## Operation (2038)

- 9.3.21 Volume 5: Appendix CT-004-00000 provides details of the developments in the Hulseheath to Manchester Airport area that are assumed to have been implemented by 2038. No additional committed developments have been identified in this study area that will materially alter the baseline conditions in 2038 for historic environment.

## 9.4 Effects arising during construction

### Avoidance and mitigation measures

- 9.4.1 The design of the Proposed Scheme has sought to avoid adverse effects on heritage assets within the land required for construction insofar as reasonably practicable.
- 9.4.2 Section 8 of the draft Code of Construction Practice (CoCP<sup>75</sup>) sets out the measures that will be adopted, insofar as reasonably practicable, to control effects on heritage assets. These include:
- management measures that will be implemented for heritage assets that are to be retained within the land required for the Proposed Scheme;
  - route-wide principles, standards and techniques for works affecting heritage assets; and
  - a programme of historic environment investigation and recording (including archaeology and historic buildings) to be undertaken prior to or during construction works affecting the heritage assets.
- 9.4.3 Landscape mitigation planting will help reduce impacts on Mere Covert Cottage (MA06\_0069).

### Assessment of impacts and effects

- 9.4.4 Impacts on all heritage assets described above have been assessed and are set out in the Impact Assessment Table (Volume 5: Appendix HE-002-0MA06). Only impacts on heritage assets resulting in significant effects are described in the assessment set out below. Effects on Historic Landscape Character Areas are set out in Volume 5: Appendix HE-003-0MA06, and again only the significant effects are described below.

### Temporary effects

- 9.4.5 The temporary construction works, such as excavations and earthworks for construction compounds, storage areas, and diversions of existing roads and services, have the potential to affect heritage assets during the construction period. Heritage assets could be affected as a result of changes within the assets' settings, where setting contributes to the heritage

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<sup>75</sup> Volume 5: Appendix CT-002-00000, draft Code of Construction Practice (CoCP).

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value of the asset. The duration of the activities giving rise to the temporary effects described below are set out in the indicative construction programme in Section 2.3.

- 9.4.6 The following significant effects are expected to occur as a result of temporary impacts on designated or non-designated heritage assets due to changes that affect the contribution made by setting to the asset's heritage value.
- 9.4.7 Davenportgreen Farmhouse (MA06\_0012), Barn, Roaring Gate Lane (also known as Davenportgreen Barn) (MA06\_0011) and Paddy's Hut, Roaring Gate Lane (MA06\_0013) are Grade II listed buildings of moderate heritage value. They are located adjacent to the land required for the construction of the Proposed Scheme. The assets date to the 18th century and form part of the Davenportgreen farmstead. Paddy's Hut, Roaring Gate Lane (MA06\_0013) is a rare example of an Irish farm-labourers sleeping quarters and the relationship between the buildings can still be understood despite conversion to a residential property. The buildings' setting includes surrounding farmland, which was historically worked by their former occupants, and makes a positive contribution to its heritage value. These agricultural fields will be temporarily removed for the introduction of the Manchester tunnel south portal main compound. This will reduce the ability to understand that these buildings were a former farmstead associated with the surrounding farmland. This will constitute a temporary medium impact and result in a moderate adverse significant effect.
- 9.4.8 Yewtree House, Sunbank Lane (MA06\_0016) is a Grade II listed building of moderate heritage value. It is located adjacent to the land required for the construction of the Proposed Scheme. The setting of the former farmhouse is its garden, surrounding fields and the other rural buildings on Sunbank Lane that form the hamlet of Ringway. These buildings are of the same period and share common materials and methods of construction. The setting of Yewtree House positively contributes to its heritage value. The presence of construction machinery associated with the construction of Ringway cutting and Sunbank Lane overbridge along with the use of Sunbank Lane as a route for construction traffic will temporarily change the setting of the asset. Construction activity will disrupt the legibility of the association between the farmhouse and the hamlet setting, which contributes to the asset's heritage value. This will constitute a temporary medium impact and result in a moderate adverse significant effect.

## **Permanent effects**

- 9.4.9 Permanent construction phase effects can occur either as a result of physical impacts on heritage assets within the land required for the Proposed Scheme, or through changes to the setting of heritage assets that affect the contribution made by setting to the asset's heritage value.
- 9.4.10 The following significant effects will occur as a result of permanent physical impacts on heritage assets within the land required for the construction of the Proposed Scheme.

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- 9.4.11 Buckhall, The Four Seasons Hotel (MA06\_0015), also known as the Manchester Airport Marriott Hotel, a Grade II listed building of moderate heritage value, is located within the land required for the construction of the Proposed Scheme. This 18th century former farmhouse will be demolished as a result of the construction of Manchester Airport High Speed station cutting retaining wall north. This will constitute a high impact and result in a major adverse significant effect.
- 9.4.12 Fern Cottage, A538 Hale Road (MA06\_0088), a non-designated asset of low heritage value, is located within the land required for the construction of the Proposed Scheme. The early 19th century cottage will be demolished as a result of the construction of Manchester Airport High Speed station cutting retaining wall north. This will constitute a high impact and result in a moderate adverse significant effect.
- 9.4.13 Hale Bank Farm, Sunbank Lane (MA06\_0095), a non-designated asset of low heritage value, is located within the land required for the construction of the Proposed Scheme. The early 19th century farmhouse with flanking 1950s extensions will be demolished as a result of the construction of Ringway cutting. This will constitute a high impact and result in a moderate adverse significant effect.
- 9.4.14 Number 56 Sunbank Lane, Ringway (MA06\_0096), a non-designated asset of low heritage value, is located within the land required for the construction of the Proposed Scheme. The early 19th century white rendered brick-built agricultural building, associated with Hale Bank Farm, will be demolished as a result of the construction of Ringway cutting. This will constitute a high impact and result in a moderate adverse significant effect.
- 9.4.15 Group of Four Cottages, Castle Mill Lane (MA06\_0101) is a non-designated asset of low heritage value and located within the land required for the construction of the Proposed Scheme. The asset comprises Pigley Stair Cottage, Magnolia Cottage, Rose Cottage and Thorn Cottage. These form a cluster of small cottages dating from the 19th century, which will be demolished as a result of the construction of Thorns Green cutting. This will constitute a high impact and result in a moderate adverse significant effect.
- 9.4.16 Higher Thorns Green Farm, Castle Mill Lane (MA06\_0102), a non-designated asset of low heritage value, is located within the land required for the construction of the Proposed Scheme. The post-medieval farmstead, including the farmhouse and courtyard stable block, will be demolished as a result of the construction of Thorns Green cutting. This will constitute a high impact and result in a moderate adverse significant effect.
- 9.4.17 Arden Lodge North, Lamb Lane (MA06\_0108), a non-designated asset of low heritage value, is located within the land required for the construction of the Proposed Scheme. The 19th century lodge, now a pair of semi-detached cottages, will be demolished as a result of the construction of Ashley embankment. This will constitute a high impact and result in a moderate adverse significant effect.
- 9.4.18 Bowdon View Cottage and Pembroke House, Yarwoodheath Lane (MA06\_0118), a non-designated asset of low heritage value, is located within the land required for the construction of the Proposed Scheme. The early 19th century farm workers' cottages will be

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demolished as a result of the construction of Rostherne cutting retaining wall east. This will constitute a high impact and result in a moderate adverse significant effect.

- 9.4.19 Bowdon View Farm, Yarwoodheath Lane (MA06\_0119), a non-designated asset of low heritage value, is located within the land required for the construction of the Proposed Scheme. The early 19th century farmstead, including farmhouse and two-storey traditional brick-built farm buildings, will be demolished as a result of the construction of Rostherne cutting. This will constitute a high impact and result in a moderate adverse significant effect.
- 9.4.20 Post-medieval Brickyard, Cherry Tree Lane (site of) (MA06\_0120) and Two post-medieval buildings, east of Cherry Tree Farm (site of) (MA06\_0121) are non-designated assets of low heritage value located within the land required for the construction of the Proposed Scheme. Potential archaeological remains of the brickyard and buildings will be removed as a result of the construction of Rostherne cutting. This will constitute a high impact and result in a moderate adverse significant effect.
- 9.4.21 Cherry Tree Farm, Cherry Tree Lane (MA06\_0122) is a non-designated asset of low heritage value. The asset includes the farmhouse and a group of late-19th century farm buildings. The group of late-19th century farm buildings is located within the land required for construction of the Proposed Scheme. They will be demolished as a result of the construction of Millington cutting. The farm buildings will be removed but the farmhouse will be retained. This will constitute a high impact and result in a moderate adverse significant effect.
- 9.4.22 Millington Mill (site of) (MA06\_0137) is a non-designated asset of low heritage value located within the land required for the construction of the Proposed Scheme. The earthwork and associated archaeological remains of the mill will be removed as a result of the construction of Agden Brook viaduct. This will constitute a high impact and result in a moderate adverse significant effect.
- 9.4.23 Possible building and enclosure, Millington (site of) (MA06\_0140) is a non-designated asset of low heritage value located within the land required for construction of the Proposed Scheme. Potential archaeological remains of the possible building and enclosure will be removed as a result of utilities work associated with Hulseheath North embankment and Agden Brook viaduct. This will constitute a high impact and result in a moderate adverse significant effect.
- 9.4.24 Linear archaeological features at M56 junction 6, Warburton Green (MA06\_0331) is a non-designated asset of low heritage value located within the land required for construction of the Proposed Scheme. Potential archaeological remains will be removed as a result of the construction of Manchester Airport High Speed station cutting retaining wall north. This will constitute a high impact and result in a moderate adverse significant effect.
- 9.4.25 The following significant effects will occur as a result of permanent physical impacts on historic landscape character areas within the land required for the construction of the Proposed Scheme.

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- 9.4.26 Ringway Historic Landscape Character Area (MA06\_HLCA02) comprises a rural landscape, which includes the small hamlet of Ringway concentrated along Sunbank Lane in between Manchester Airport and Hale Barns. There is a mixture of fields within the HLCA. They comprise irregular shaped fields indicative of post-medieval enclosure to the south of the River Bollin and more regular piecemeal enclosure fields, of apparent medieval date, to the north of the river. A block of large 20th century fields at the western side of the HLCA, are influenced by the development of Manchester Airport. The HLCA provides evidence of a relatively unaltered historic rural landscape from the medieval period onwards despite the proximity to the M56 and Manchester Airport. The Proposed Scheme will run through the centre of the HLCA and involve demolition of several properties within Ringway and remove stretches of field boundaries including some of apparent medieval date and small parts of woodland. This will adversely impact the HLCA by removing elements of its historic field systems and affect how its historic character can be perceived and understood. This will constitute a medium impact and result in a moderate adverse significant effect.
- 9.4.27 The following significant effects will occur as a result of permanent impacts on designated or non-designated heritage assets due to changes to their settings.
- 9.4.28 Yewtree House, Sunbank Lane (MA06\_0016) is a Grade II listed building of moderate heritage value (as described under temporary effects above). It is located adjacent to the land required for the construction of the Proposed Scheme. The construction of Ringway cutting will involve the demolition of several properties within the hamlet of Ringway. This, along with the construction of Sunbank Lane overbridge to the west of the farmhouse, will alter the setting of the asset as it will remove farmland and demolish several properties in the west of the small settlement. This will alter the ability to appreciate that this is a former farmhouse in a small hamlet and reduce the contribution the setting makes to the heritage value of the asset. This will cause a medium impact and result in a moderate adverse significant effect.
- 9.4.29 Hough Green Farmhouse (MA06\_0040) is a Grade II listed building of moderate heritage value. It is located approximately 65m north of the realigned Mobberley Road and approximately 220m north of the route of the Proposed Scheme. The asset's setting includes the agricultural fields to the south, which make a positive contribution to its heritage value. Although no longer a working farm, these fields had the same owner when the farmhouse was built in the 17th century and have a historic relationship. Mid-Cheshire (Railway) and Mobberley Road viaduct, realigned Mobberley Road and Thorns Green embankment will be located within these fields. The Proposed Scheme will create a visual barrier, and the relationship between the farmhouse and agricultural fields to the south will no longer be legible. This will reduce the contribution made by the setting to the heritage value of the asset. This will cause a medium impact and result in a moderate adverse significant effect.
- 9.4.30 Mere Covert Cottage (MA06\_0069) is a Grade II listed building of moderate heritage value. It is located approximately 270m south of the route of the Proposed Scheme. It is a 17th century timber cottage and has historic interest as a former estate workers cottage. The setting of the cottage includes the garden on three sides, which is surrounded by farmland with views across this farmland towards Bowdon View Farm. Together the relationship

between the cottage, farmland and Bowdon View Farm (which were all owned by Wilbraham Egerton) make a positive contribution to the heritage value. The construction of Rostherne cutting will require property demolition at Bowdon View Farm. This will remove the relationship the cottage has with the farm and reduce the ability to understand and appreciate that it was a traditional farm estate workers cottage associated with Bowdon View Farm. This will cause a medium impact and result in a moderate adverse significant effect.

## **Other mitigation measures**

- 9.4.31 Potential opportunities for further mitigation measures will continue to be considered through detailed design to reduce further the significant effects described above where practicable. These may include the identification of:
- suitable locations for advance planting, to reduce the effects of changes within the assets' setting where setting contributes to the heritage value of the asset; and
  - locations where the physical impacts on below ground heritage assets can be reduced through the design of earthworks.

## **Summary of likely residual significant effects**

- 9.4.32 The temporary effects of construction activity on the setting of heritage assets have been considered. However, as these effects result from temporary construction activities they are restricted to the duration of those activities and are reversible.
- 9.4.33 Mitigation measures have been incorporated as set out above and taken into account during assessment. Therefore, the residual effects are the same as those reported under permanent construction phase effects.

## **Cumulative effects**

- 9.4.34 No cumulative effects on heritage assets during construction have been identified in the Hulseheath to Manchester Airport area.

## **9.5 Effects arising from operation**

### **Avoidance and mitigation measures**

- 9.5.1 Some of the design measures, as shown on the Map Series CT-06 within the Volume 2: MA06 Map Book, could reduce the operational impacts and effects on heritage assets. Landscape mitigation planting could increasingly reduce the effect of changes within the assets' setting within the study area as it matures at Mere Covert Cottage (MA06\_0069).

## Assessment of impacts and effects

- 9.5.2 The assessment considers the Proposed Scheme once operational; all effects are permanent.
- 9.5.3 During the operation of the Proposed Scheme no further ground works are anticipated. As such, there would be no further physical impacts on heritage assets arising from the operation of the Proposed Scheme.
- 9.5.4 Impacts on heritage assets due to changes in their settings are reported as permanent construction effects. These effects are not repeated but will continue throughout the operation of the Proposed Scheme.
- 9.5.5 It predicted that there will be no additional significant effects on these assets during operation.

## Other mitigation measures

- 9.5.6 The Proposed Scheme includes a number of design measures to address potential impacts and significant effects. No additional operational mitigation measures beyond those included within the Proposed Scheme design have been identified. Potential opportunities for further mitigation such as additional planting and noise fencing will be considered as part of the detailed design process.

## Summary of likely residual significant effects

- 9.5.7 No mitigation beyond that described above has been identified. As a result, it is currently anticipated that residual effects will be the same as those reported in the assessment of effects during operation.

## Cumulative effects

- 9.5.8 No cumulative effects on heritage assets during operation have been identified in the Hulseheath to Manchester Airport area.

## Monitoring

- 9.5.9 Volume 1, Section 9 sets out the general approach to environmental monitoring during operation of the Proposed Scheme.
- 9.5.10 No area-specific heritage monitoring requirements during operation of the Proposed Scheme have been identified.



## 10 Land quality

### 10.1 Introduction

- 10.1.1 This section of the report presents the baseline conditions along the route of the Proposed Scheme in the Hulseheath to Manchester Airport area in relation to land quality and reports the likely impacts and significant effects resulting from construction and operation of the Proposed Scheme. Consideration is given to land that potentially contains contamination and land that has special geological significance, either from a scientific, historical, mining and mineral exploitation or mineral resources point of view including geological Sites of Special Scientific Interest (SSSI) and Local Geological Sites (LGS), and areas of designated mineral resources. Consideration is also given to petroleum (including gas) prospects and licensing.
- 10.1.2 Engagement has been undertaken with Cheshire East Council (CEC), Manchester City Council (MCC), Trafford Metropolitan Borough Council (TMBC), the Environment Agency, the Animal and Plant Health Agency (APHA) and a local geological interest group. The purpose of this engagement has been to discuss the Proposed Scheme and potential effects and obtain relevant baseline information. Engagement will continue as part of the development of the Proposed Scheme.
- 10.1.3 Details of baseline information, conceptual site models (CSM) and risk assessments are outlined in Volume 5: Appendix LQ-001-0MA06. Baseline data relevant to land quality are presented on maps LQ-01-319 to LQ-01-322a (in the Volume 5, Land quality Map Book).
- 10.1.4 Maps showing the location of the key environmental features (map Series CT-10), key construction (map series CT-05) and key operational (map Series CT-06) features of the Proposed Scheme can be found in the Volume 2: MA06 Map Book.
- 10.1.5 Land contamination issues are closely linked with those involving water resources and waste. Issues regarding water resources are addressed in Section 15, Water resources and flood risk. Issues regarding the disposal of waste materials, including contaminated soils, are addressed in Volume 3: Route-wide effects (Section 15).
- 10.1.6 The Proposed Scheme is described in Section 2.
- 10.1.7 All distances, lengths and area measurements in this section are approximate.

### 10.2 Scope, assumptions and limitations

- 10.2.1 The scope, assumptions and limitations for the land quality assessment are set out in Volume 1, Section 8 and the EIA Scope and Methodology Report (SMR)<sup>76</sup>.

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<sup>76</sup> Volume 5: Appendix CT-001-00001, Environmental Impact Assessment Scope and Methodology Report.

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- 10.2.2 In accordance with the SMR, a risk-based approach was undertaken to identify contamination that may have an impact in relation to construction of the Proposed Scheme. To support this, a desk-based assessment has been undertaken for the study area, defined as the land required for the construction of the Proposed Scheme plus a 250m buffer. In the case of groundwater abstractions, this buffer is increased to 1 km.
- 10.2.3 For major above ground utilities work, a pre-screening exercise has been completed to determine where these may break ground, or otherwise interact with land quality. In such cases, these are considered in the land quality assessment.
- 10.2.4 The majority of new and diverted minor utilities will be laid in the boundaries of existing highways within normal road construction layers and soils below. These have been considered in the context of the CSM approach. The lack of contact with nearby potentially contaminated sites, the usual approach to ensuring services are protected from contamination by design and choice of materials and the absence of sensitive receptors within the roadways, reduces the risk of an impact occurring. The potential impacts of laying these new and diverted utilities has, therefore, been scoped out of the assessment as they are unlikely to cause any significant land quality effects.
- 10.2.5 Potentially contaminated areas of land have been identified that could affect, or be affected by, the construction of the Proposed Scheme (e.g. contaminated soils may need to be removed or construction may alter existing contamination pathways). Each of these areas has been studied to evaluate the scale of potential impacts caused by existing contamination (if present) and what needs to be done to avoid significant consequences to people and the wider environment.
- 10.2.6 The location of the Proposed Scheme was viewed from points of public access initially. No detailed site visits have been undertaken in the Hulseheath to Manchester Airport, owing to limited access and the limited number of potentially higher risk land contamination sites.
- 10.2.7 A CSM approach has been used to provide an understanding of the sources and types of contaminants that may be present, the likely sources and/or pathways by which contamination can spread and the potential receptors (i.e. people and the wider environment) that could be affected. It indicates the types of impacts that existing contamination may be having at present and may have during and after construction.
- 10.2.8 The minerals assessment is based upon the mineral resources<sup>77</sup> identified in published mineral plans, and existing planning or licensed areas. Any inference of minerals provided by geological maps/reports is excluded (except where these are covered by a published mineral plan).
- 10.2.9 The geoconservation assessment is based upon local authority and publicly available local geological trust records.

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<sup>77</sup> Defined in the SMR as 'mineral body including aggregates, salt, coal and other hydrocarbons, Petroleum Extraction and Development Licences (PEDL), Shale Prospective Area (SPA)'.

## 10.3 Environmental baseline

### Existing baseline

10.3.1 Baseline data have been collected from a range of sources including Ordnance Survey mapping, the British Geological Survey (BGS), Coal Authority, Oil and Gas Authority (OGA), CEC, MCC, GMCA, TMBC, Public Health England (PHE), the Environment Agency, Natural England and the APHA records, as well as online sources such as local geological trusts. Further details are given in Volume 5: Appendix LQ-001-0MA06 and BID LQ-002-0MA06 and presented on Maps LQ-01-319 to LQ-01-322a (Volume 5, Land quality Map Book).

### Geology

10.3.2 This section describes the underlying ground conditions within the Hulseheath to Manchester Airport area. Recent changes in lithostratigraphic classifications by the BGS have been incorporated where appropriate<sup>78</sup>.

10.3.3 Table 17 provides a summary of the geology (made ground, superficial and bedrock units) in the study area.

**Table 17: Summary of the geology underlying the land quality study area**

Category	Geology	Distribution	Formation description	Aquifer classification
Made ground	Made ground	Made ground is not shown in the study area on the BGS artificial ground mapping. However, although not recorded, localised deposits of made ground are likely to be present between Warburton Green and Manchester Airport associated with previously developed areas. The depth and nature of fill or reworked ground will depend on historical land uses. There may also be deposits associated with landfilling activities.	Artificial ground comprising variable deposits of reworked natural and man-made materials	Not designated
Superficial	Alluvium	Identified on BGS mapping <sup>79</sup> along the valleys of Agden Brook, Birkin Brook, Blackburn's Brook, Mobberley Brook and along the River Bollin as well as within Rostherne Mere.	Organic rich clay, silt, sand and gravel	Secondary A

<sup>78</sup> British Geological Survey (2014), *Lithostratigraphy of the Sherwood Sandstone*. Research Report RR/14/01. Available online at: <http://pubs.bgs.ac.uk/publications.html?pubID=B07318>.

<sup>79</sup> British Geological Survey (2019), *BGS Geology 50k DiGMapGN-50 WMS, superficial deposits and bedrock geology*. Available online at: [https://www.bgs.ac.uk/products/digitalmaps/digmapgb\\_50.html](https://www.bgs.ac.uk/products/digitalmaps/digmapgb_50.html).

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Category	Geology	Distribution	Formation description	Aquifer classification
Superficial	River terrace deposits	To the south of Hale and the River Bollin. To the north-west of Hale Golf Club. Also to the east of Mobberley Brook, close to Mobberley Station.	Sand and gravel	Secondary A
Superficial	Shirdley Hill Sand Formation	Located at the north-western extent of the study area at Arthill, between Agden Brook and River Bollin. To the north-east of Mobberley Brook around New Mills.	Sand	Secondary A
Superficial	Glaciofluvial deposits	Surrounding the alluvium along Agden Brook, and isolated patches along the River Bollin.	Sand and gravel	Secondary A
Superficial	Glaciofluvial sheet deposits	Surrounding the alluvium along Mobberley Brook, Birkin Brook and the River Bollin.	Sand and gravel	Secondary A
Superficial	Glacial till	Located across the majority of the study area where other superficial deposits not described.	Sandy, silty clay with gravel	Secondary (Undifferentiated)
Bedrock	Mercia Mudstone Group - Sidmouth Mudstone Formation - Northwich Halite Member	Underlying the study area around Rostherne Mere.	Halite and mudstone	Unproductive
Bedrock	Mercia Mudstone Group - Sidmouth Mudstone Formation - Bollin Mudstone Member	Located across the majority of the study area.	Mudstone and siltstone	Secondary B
Bedrock	Mercia Mudstone Group - Tarporley Siltstone Formation	Underlying the study area from Hulseheath to the Agden Brook. Also present to the north of junction 8 of the M56, and where the route of the Proposed Scheme will intersect the Mid-Cheshire Line at Ashley in a strip south to New Mills.	Siltstone, mudstone and sandstone	Secondary B
Bedrock	Sherwood Sandstone Group - Helsby Sandstone Formation	Underlying the study area from Agden Brook to approximately 80m north-east of Millington Lane.	Pebbly sandstone	Principal

10.3.4 Bedrock faults are recorded underlying the route of the Proposed Scheme in five locations:

- to the north of Millington Hall, comprising a fault oriented north-west to south-east between the boundaries of the Helsby Sandstone Formation and the Bollin Mudstone Member;

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- to the north of Rostherne Mere, comprising a fault oriented north-east to south-west between two areas of the Bollin Mudstone Member;
- to the south of Ashley, comprising a fault oriented north-west to south-east between the boundaries of the Tarporley Siltstone Formation and Bollin Mudstone Member;
- at Thorns Green, comprising a fault oriented north to south between two areas of the Bollin Mudstone Member; and
- to the south-east of Davenport Green, comprising a fault north-west to south-east between two areas of the Bollin Mudstone Member.

10.3.5 Based on Local Authority and APHA records, no known farm burial or pyre sites associated with the 1967/8 and 2001/2 outbreaks of foot and mouth disease (FMD) are known to be present within the Hulseheath to Manchester Airport area; however, unrecorded sites may be present from the 1967/8 outbreak. The 2001/2 FMD outbreak risk assessment map<sup>80</sup> identifies the study area to lie within an 'at risk' county. Similarly, anthrax infected cattle burial sites may be present, generally relating to burials over 50 to 100 years ago. However, no records have been found of such burials. In all cases, the records do not provide an exact location for the burial or pyre sites and other, unrecorded sites may be present.

## Radon

- 10.3.6 Radon is a radioactive gas formed by the radioactive decay of naturally occurring uranium in rocks and soils. The occurrence of radon gas is shown in the BGS Radon Potential Dataset<sup>81</sup>.
- 10.3.7 The study area lies within a lower probability radon area, where less than 1% of homes are estimated to be at or above the action level of 200 becquerels per cubic metre of air (Bq/m<sup>3</sup>) for residential properties.

## Groundwater

10.3.8 Five aquifer designations have been identified within the study area, as defined by the Environment Agency. These are as follows:

- the Helsby Sandstone Formation is designated as a Principal aquifer;
- the alluvium, river terrace deposits, Shirdley Hill Sand Formation, glaciofluvial deposits and the glaciofluvial sheet deposits are designated as Secondary A aquifers;
- the Bollin Mudstone Member and Tarporley Siltstone Formation, which underlie the majority of the study area, have been designated as Secondary B aquifers;
- the glacial till is designated as a Secondary (Undifferentiated) aquifer; and
- the Northwich Halite Member is designated as Unproductive Strata.

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<sup>80</sup> Animal and Plant Health Agency (2001), *Foot and Mouth Disease 2001 County Status Map 08.10.2001*.

<sup>81</sup> British Geological Survey (2020), *Radon Potential Dataset*. Available online at: <http://www.bgs.ac.uk/radon/hpa-bgs.html>. This dataset underpins Miles J.C.H. et al. (2007), *Indicative Atlas of Radon in England and Wales*. Available online at: [www.ukradon.org/information/ukmaps](http://www.ukradon.org/information/ukmaps).

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10.3.9 Table 18 sets out the groundwater abstractions and designations in the land quality study area of 1km from the land required for construction of the Proposed Scheme in the Hulseheath to Manchester Airport area.

**Table 18: Groundwater designations and abstractions in the land quality study area**

Feature	Details
Source Protection Zones (SPZ) associated with licensed public water supplies	None
Private licensed groundwater abstractions	None
Registered unlicensed private groundwater abstractions	Four, including one at Lower House Farm for non-domestic purposes and one at Birtles Farm for unknown use. Details of other abstractions are unknown.

10.3.10 Further information on the groundwater in the Hulseheath to Manchester Airport area is provided in Section 15, Water resources and flood risk.

## Surface water

10.3.11 The route of the Proposed Scheme will cross a number of main rivers, as described in Section 15, Water resources and flood risk. The main rivers and watercourses, including unnamed streams, tributaries, drains, ponds and culverts located within the study area are described in Volume 5: WR-003-0MA06.

10.3.12 Table 19 sets out the surface water abstractions and designations in the land quality study area of 250m from the land required for construction of the Proposed Scheme in the Hulseheath to Manchester Airport area.

**Table 19: Surface water designations and abstractions in the land quality study area**

Feature	Details
Surface water abstraction	One from River Bollin at Home Farm, Dunham Massey.
Surface water abstraction	One from Birkin Brook at Mereside Farm, Mere (Estate Office at Rostherne).
Private water supplies from surface water sources	Ringway Golf Club (tank fed by surface water drainage), for the purposes of direct spray irrigation.
Environment Agency Drinking Water Protected Area – Surface water Safeguard Zone	None

10.3.13 Further information on surface water in the Hulseheath to Manchester Airport area is provided in Section 15, Water resources and flood risk.

## Current and historical land use

10.3.14 Current potentially contaminative land uses within the study area include 74 industrial and commercial sites.

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- 10.3.15 Historical land uses identified within the study area with the potential to have caused contamination include three landfill sites, seven mining sites and 97 industrial and commercial sites. Infilled pits and ponds may have been filled with a variety of waste materials but have not been licensed.
- 10.3.16 Table 20 to Table 22 summarise the key current and historical contaminative land uses in the Hulseheath to Manchester Airport area. These are categorised into:
- landfill sites;
  - mining and mineral sites; and
  - industrial, commercial and other sites identified with a high risk of potential contamination.

**Table 20: Current and historical landfill sites located within the study area**

Name and area reference	Location	Description
EAHLD17244 (Pool Bank Farm) and EAHLD17245 (Bow Lane No.2) (historical landfills) MA06-196	Pool Bank Farm and Bow Lane No.2, Hale, Greater Manchester. Located within the land required for the construction of the Proposed Scheme (site access route for utilities only).	Pool Bank Farm: first waste received 1988, last waste received 1992. Licence holder J Shanks and Son Limited, issued 1990. The landfill accepted inert waste. Bow Lane No.2: date of first and last waste not provided. Licence holder and issue date not provided. The landfill accepted household waste.
EAHLD16963 (historical landfill) MA06-197	Bank of River Bollin, Bow Lane, Bowden, Trafford 150m north-east of the land required for the construction of the Proposed Scheme.	Date of first and last waste received not given. Licence holder J Shanks and Son Limited, issued 1991. The landfill accepted inert waste.
EAHLD17246 (historical landfill) MA06-198	Bow Lane, Hale. Located within the land required for the construction of the Proposed Scheme (site access route for utilities only).	First waste received 1967, last waste received 1972. Site operated by Hale/Urban District Council. Licence issued 1974. Landfill accepted inert, commercial, household, and liquid sludge wastes.

**Table 21: Current and historical mining, mineral sites and colliery spoil sites located within the study area**

Name and area reference	Location	Description
Sand and gravel pit and quarry near Boothbank Lane MA06-05	South-west of Booth Bank, adjacent to the land required for the construction of the Proposed Scheme.	Historical gravel pit (also marked as a sand pit), approximately 2.8ha, present on mapping between 1878 and 1938.
Brick fields on Cherry Tree Lane and Mobberley Road MA06-34, MA06-52	North of Rostherne Mere, within the land required for the construction of the Proposed Scheme.	Historical brick fields and yards on Cherry Tree Lane and Mobberley Road.

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**Table 22: Current and historical industrial, commercial and other sites identified with a high risk of potential contamination located within the study area**

Name and area reference	Location	Description
Manchester Airport MA06-110	South-east of Davenport Green. In the study area, approximately 50m from the land required for the construction of the Proposed Scheme.	Manchester Airport opened in 1938. Incremental changes to the area of land covered by the airport have occurred with most substantial changes associated with passenger terminal and runway developments that occurred during the 1990s and early 2000s.
Unspecified depot MA06-92	In Warburton Green, located approximately 190m from the land required for the construction of the Proposed Scheme.	Former depot, marked on mapping since 1975-1995. Since redeveloped into residential housing.
Unspecified depot MA06-101	Off junction 6 of the M56, adjacent to the land required for the construction of the Proposed Scheme.	Active depot, marked on mapping since 1975. Currently a Highways England maintenance compound.
Unspecified depot MA06-109	North of junction 6 of the M56, 10m from the land required for the construction of the Proposed Scheme.	Former depot, marked on mapping since 1975-1995. Currently a car park.
Brick and tile works, Mobberley Road MA06-53	South of Ashley, on the land required for the construction of the Proposed Scheme.	Former brick and tile works with kiln, present on mapping between 1882 and 1909. Now an agricultural field.
Smithy MA06-58	Off Mobberley Road in Ashley, located outside of the land required for the construction of the Proposed Scheme.	Former smithy with garages, now a derelict building and outbuildings.

10.3.17 Contaminants commonly associated with sites in Table 20, Table 21 and Table 22 could include metals, semi-metals, asbestos, organic and inorganic compounds. In addition, infilled pits and landfills could give rise to landfill gases such as methane or carbon dioxide, and leachate.

## Other regulatory data

10.3.18 The regulatory data reviewed include pollution incidents (major, significant and minor categories), radioactive and hazardous substances consents, ecological sites and environmental permits (previously landfill, integrated pollution control and integrated pollution prevention and control licences).

10.3.19 In the Hulseheath to Manchester Airport area, this includes:

- three significant (Category 2) pollution incidents;
  - organic waste (cattle slurry) released into a Tributary of Birkin Brook in 1995;
  - crude sewage released into Timperley Brook in 1995; and
  - fuel oil released into unknown watercourse (although likely to be Fairywell Brook based on the location) in 1994;



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- one internationally important ecological designation, as defined in the land quality section of the SMR. Rostherne Mere is a SSSI, National Nature Reserve (NNR) and Ramsar site, located approximately 250m south of junction 8 of the M56; and
- thirteen Local Wildlife Sites (LWS) and nine Sites of Biological Interest (SBI). These include 12 located within, or partially within, the land required for the construction of the Proposed Scheme.

- 10.3.20 Further details of relevant regulatory data in the Hulseheath to Manchester Airport area is provided in Section 5.4 of BID LQ-002-0MA06.
- 10.3.21 Further information on ecological designations in the Hulseheath to Manchester Airport area is provided in Section 7, Ecology and biodiversity.

## Mineral resources

- 10.3.22 There are a range of mining and mineral resources located within the study area that have the potential to be affected by the Proposed Scheme. These include sand, gravel, salt and coal, which can be protected via local or county level minerals plans and by the Coal Authority, as well as other forms of petroleum hydrocarbons, such as shale gas and oil, which are regulated by OGA via the issue of Petroleum Exploration and Development Licences (PEDL).

## Minerals plans

- 10.3.23 Cheshire County Council (CCC) was responsible for the overall mineral and waste local plans for the study area. The Cheshire Replacement Minerals Local Plan<sup>82</sup> was adopted in June 1999 and sets out the policies aimed at controlling mineral related developments within the CEC and Cheshire West and Chester Council administrative areas up to the year 2006. No further revisions of the plan were published by CCC prior to its dissolution in 2009. No replacement plans have been supplied by CEC to date, although it is noted that the Minerals and Waste Development Plan Document of the new Cheshire East Local Plan is currently in preparation.
- 10.3.24 The GMCA is responsible for the minerals local plan in the administrative areas of TMBC and MCC. The adopted minerals plan was published in April 2013<sup>83</sup>.

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<sup>82</sup> Cheshire County Council (1999), *The Cheshire Replacement Minerals Local Plan*. Available online at: <https://www.cheshireeast.gov.uk/pdf/planning/spatial-planning/strategic-planning/en-ldf-crepmlp-99.pdf>.

<sup>83</sup> Manchester City Council (2013), *Greater Manchester Joint Minerals Development Plan*. Available online at: [https://secure.manchester.gov.uk/downloads/download/5550/greater\\_manchester\\_joint\\_minerals\\_development\\_plan\\_documents](https://secure.manchester.gov.uk/downloads/download/5550/greater_manchester_joint_minerals_development_plan_documents).

- 10.3.25 The Cheshire Mineral Resource Information map<sup>84</sup> and Greater Manchester Minerals Plan presents the extent of all mineral extraction planning permissions and brinefields. No mineral extraction sites are recorded within the study area.
- 10.3.26 The locations of specific mineral and mining resources within the study are described below.

### **Sand and gravel deposits**

- 10.3.27 There are four sand and gravel Minerals Safeguarding Area (MSA) present in the study area along the southern fringes of Hale, and a further MSA in the study area within Manchester Airport. Three of these MSA fall partially within the land required for the construction of the Proposed Scheme.

### **Salt**

- 10.3.28 Salt is identified as a resource in the study area around Rostherne Mere. However, there are no active brinefields or salt extraction permissions in the study area. The resource is therefore not considered further as part of the assessment.

### **Coal**

- 10.3.29 Deep coal (in some cases, located at more than 1.2km below ground level) is recorded as a mineral resource in the study area. However, available records from the Coal Authority show that the Proposed Scheme will not be located in areas of current or historical underground coal mining activities.
- 10.3.30 As a low value resource, without a specific designation (e.g. MSA), coal is not considered further as part of the assessment.
- 10.3.31 The study area is not located within a Coal Mining Reporting Area or Development High Risk Area.

### **Petroleum Exploration and Development Licences/Hydrocarbons**

- 10.3.32 The OGA<sup>85</sup> indicates that the route of the Proposed Scheme will pass through PEDL 296 (onshore award, 14th round). The PEDL area is associated with extraction wells for conventional oil and gas. However, none of the extraction wells associated with the PEDL are located in the study area. The study area is also within a shale prospective area (SPA).

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<sup>84</sup> Norton et al (2006), *Mineral Resources Information for National, Regional and Local Planning: Cheshire (comprising Cheshire and the Boroughs of Halton and Warrington)*. British Geological Survey Commissioned Report CR/05/090N.

<sup>85</sup> Oil and Gas Authority (2019), *Onshore Interactive Maps*. Available online at: <https://ogauthority.maps.arcgis.com/apps/webappviewer/index.html?id=29c31fa4b00248418e545d222e57dda>.

## Geoconservation resources

- 10.3.33 One geological SSSI has been identified within the study area. Rostherne Mere geological SSSI is located approximately 250m south of junction 8 of the M56 to the north of Rostherne. Rostherne Mere is a lake occupying a hollow formed by the dissolution of underlying salt rich rocks and subsidence of the overlying glacial deposits.

## Receptors

- 10.3.34 The sensitive receptors that have been identified within the study area are summarised in Table 23. A definition of receptor sensitivity is given in the SMR.

**Table 23: Summary of sensitive receptors**

Issue	Receptor type	Receptor description	Receptor sensitivity
Land contamination	People	Residents at existing properties	High
Land contamination	People	Employees and visitors at commercial areas, retail parks and areas, hotels properties and recreational land users	Moderate
Land contamination	People	Workers at and visitors to industrial premises	Low
Land contamination	Groundwater	Principal aquifer (Sherwood Sandstone Group)	High
Land contamination	Groundwater	Secondary A aquifers (alluvium, river terrace deposits, Shirdley Hill Sand Formation and glaciofluvial sheet deposits)	Moderate
Land contamination	Groundwater	Secondary (Undifferentiated) aquifer (glacial till), Secondary B aquifer (Mercia Mudstone Group)	Low
Land contamination	Surface waters	Millington Clough, Agden Brook, Sugar Brook, Mobberley Brook, River Bollin and its tributaries, Timperley Brook and its tributary, and Fairywell Brook (all WFD status moderate)	Moderate
Land contamination	Surface waters	Birkin Brook and its tributaries (WFD status poor), Blackburn's Brook (WFD status bad)	Low
Land contamination	Ecological designations	Rostherne Mere SSSI, NNR and Ramsar	High
Land contamination	Ecological designations	Various LWS and SBI*	Low
Land contamination	Built environment	Underground structures and buried services	Low
Impacts on mineral and petroleum (gas) sites (severance and sterilisation)	Mineral sites	PEDL	High
Impacts on mineral and petroleum (gas) sites (severance and sterilisation)	Mineral sites	Sand and gravel MSA, SPA	Medium
Impact on protected geological site	Geological SSSI	Rostherne Mere geological SSSI	High

\* SBI and LWS are equivalent terms.

## Future baseline

### Construction (2025)

- 10.3.35 Volume 5: Appendix CT-004-00000 provides details of the developments in the Hulseheath to Manchester Airport area that are assumed to have been implemented by 2025.
- 10.3.36 No committed developments have been identified in this study area that will materially alter the baseline conditions in 2025 for land quality.

### Operation (2038)

- 10.3.37 Volume 5: Appendix CT-004-00000 provides details of the developments in the Hulseheath to Manchester Airport area that are assumed to have been implemented by 2038.
- 10.3.38 No committed developments have been identified in this study area that will materially alter the baseline conditions in 2038 for land quality.

## 10.4 Effects arising during construction

### Avoidance and mitigation measures

- 10.4.1 The construction assessment takes into account the mitigation measures described in the draft Code of Construction Practice (CoCP)<sup>86</sup>. The draft CoCP sets out the measures and standards of work that will be applied to the construction of the Proposed Scheme and includes requirements to ensure the effective management and control of work in contaminated areas.
- 10.4.2 The requirements in the draft CoCP relating to work in contaminated areas will ensure the effective management and control of the work. These requirements include:
- methods to control noise, waste, dust, odour, gases and vapours (Sections 5, 7, 11, 13, 14 and 15);
  - methods to control spillage and prevent contamination of adjacent areas (Sections 5, 11 and 16);
  - the management of human exposure for both construction workers and people living and working nearby (Sections 5, 7, 11, 13 and 14);
  - methods for the storage and handling of excavated materials (both contaminated and uncontaminated) (Sections 6, 7, 11 and 15);
  - management of any unexpected contamination found during construction (Sections 11 and 15);
  - a post-remediation permit to work system (Section 11);

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<sup>86</sup> Volume 5: Appendix CT-002-00000, draft Code of Construction Practice (CoCP).

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- storage requirements for hazardous substances such as oil (Sections 5, 11 and 16);
- traffic management to ensure that there is a network of designated site haul routes to reduce compaction/degradation of soils (Sections 5, 6 and 14);
- methods to monitor and manage flood risk and other extreme weather events which may affect land quality during construction (Sections 5 and 16); and
- methods to manage discovery of unknown animal burial pits (Section 6).

- 10.4.3 The draft CoCP will require that prior to and during construction, a programme of further detailed investigations, which may include both desk based and site based work, takes place in order to confirm the full extent of areas of contamination. It also requires a risk assessment to be undertaken to determine what, if any, site specific remediation measures are required to allow the Proposed Scheme to be constructed safely and to prevent harmful future migration of contaminants. The investigation and assessment of potentially contaminated sites will be undertaken in accordance with Environment Agency's Land Contamination Risk Management (LCRM) framework<sup>87</sup>, based on CLR11<sup>88</sup> and British Standards BS10175<sup>89</sup> and BS8576<sup>90</sup>.
- 10.4.4 A remedial options appraisal will be undertaken to define the most appropriate remediation techniques. Where appropriate, this appraisal will be undertaken based on multi-criteria attribute analysis that considers environmental, resource, social and economic factors in line with the framework set out by the Sustainable Remediation Forum UK<sup>91</sup>. The preferred option will then be developed into a remediation strategy.
- 10.4.5 Contaminated soils excavated within the site, where reasonably practicable, will be treated to remove or render contamination inactive and reused within the Proposed Scheme where needed and suitable for use. Treatment techniques are likely to include stabilisation, soil washing and bio-remediation. Contaminated soil removed off-site will be taken to a soil treatment facility, another construction site (for treatment and reuse) or to an appropriately permitted landfill.

## Assessment of impacts and effects

- 10.4.6 Construction of the Proposed Scheme in this area will require earthworks, utility diversions, deep foundations and other activities, including the construction of Manchester Airport High

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<sup>87</sup> Environment Agency (2021), *Land Contamination Risk Management (LCRM)*. Available online at: <https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm>.

<sup>88</sup> Environment Agency (2004), *CLR11 Model Procedures for the Management of Land Contamination*. Available online at: <https://webarchive.nationalarchives.gov.uk/ukgwa/20140328084622/http://cdn.environment-agency.gov.uk/scho0804bibr-e-e.pdf>.

<sup>89</sup> British Standards Institution (2011), *BS10175:2011 Investigation of potentially contaminated sites. Code of practice (+A2:2017)*, BSi.

<sup>90</sup> British Standard (2013), *BS8576:2013 Guidance on Investigations for Ground Gas – Permanent gases and Volatile Organic Compounds (VOCs)*.

<sup>91</sup> Sustainable Remediation Forum UK (2010), *A Framework for Assessing the Sustainability of Soil and Groundwater Remediation*.

Speed station, Ashley Infrastructure Maintenance Base - Rail (IMB-R), various viaducts, cuttings, embankments and road infrastructure works. These aspects of the Proposed Scheme, along with other construction features, are shown on the CT-05 map series in the Volume 2: MA06 Map Book.

## Land contamination

- 10.4.7 In line with the assessment methodology, as set out in the SMR, an initial screening process has been undertaken to identify areas of current or historical contaminative use within the study area and to consider which of these areas might pose contaminative risks in relation to the Proposed Scheme. Sites that present a low risk have not been taken further in the assessment. Any moderate to higher risk sites have been taken forward to more detailed risk assessments, in which the potential risks are assessed more fully. All areas assessed are shown on Maps LQ-01-319 to LQ-01-322a (Volume 5, Land quality Map Book) and those considered as potentially posing a risk in relation to the Proposed Scheme are labelled with a reference number (site ID). In this report the site ID are presented as MA06-54 and on the related maps as 06-54.
- 10.4.8 In the Hulseheath to Manchester Airport area, 20 sites remain following initial screening to go through to detailed risk assessment and require CSM. The majority of the sites that have undergone the more detailed risk assessments are historical or current landfills, industrial, mining and commercial sites.
- 10.4.9 CSM have been produced for those areas taken to detailed risk assessments. The following factors determine the need for detailed risk assessments:
- whether the site is located within the land required for the construction of the Proposed Scheme;
  - the vertical profile of the Proposed Scheme in the vicinity of the site;
  - the presence of underlying sensitive groundwater aquifers (Principal or Secondary A) or nearby watercourses; and
  - the presence of adjacent residential properties or sensitive ecological receptors.
- 10.4.10 Clusters of potentially contaminated sites of a similar nature have been grouped and assessed together, where appropriate.
- 10.4.11 A simple summary of the baseline CSM is provided in Table 24. A more detailed assessment of baseline risk is provided in Volume 5: Appendix LQ-001-0MA06. The baseline risks quoted are those before any mitigation is applied. The assessed baseline risk is based on the information provided at the time of the assessment. Where limited information is available, the assessment is based on precautionary, worst case assumptions and may, therefore, report a higher risk than that which actually exists. A screening assessment of the effects of contamination has been completed by comparing the detailed CSM developed for potential contaminated areas at baseline with construction and post-construction stages. For clarity, 'on-site' means within the land required for the construction of the Proposed Scheme and 'off-site' refers to land beyond this boundary, but within the study area.

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10.4.12 Not all sites referenced in Table 20 to Table 22 have been taken further in the assessment following the initial screening. Sites were not taken through to detailed assessment due to a predicted low risk resulting from the distance to the land required for the construction of the Proposed Scheme and the types of works to be undertaken in the vicinity of the site, for instance shallow utilities. Professional judgement or evidence of redevelopment have also been used. These sites include shallow mineral extraction sites (MA06-34 and MA06-52), metal works (MA06-58), depots (MA06-92 and MA06-101), and historical landfills (MA06-197).

**Table 24: Summary of baseline CSM for sites which may pose a contaminative risk in relation to the Proposed Scheme**

Category	Site group/ID	Human health risk	Groundwater risk	Surface water risk	Ecosystem risk	Buildings risk
On-site	Railway land MA06-54	Low to moderate/low	Low to moderate/low	Moderate/low	Very low	Very low
On-site	Tanks, likely for fuel storage MA06-103, MA06-104	Low	Very low	N/A	N/A	Low
On-site	Farms MA06-29, MA06-36, MA06-86, MA06-89	Low to moderate/low	Low	Low	Low	Low
On-site	Electrical substation MA06-105	Low to moderate/low	Low	Very low	N/A	Low
On-site	Brick works/marl pits, quarries and pits MA06-05, MA06-53	Low to moderate/low	Low to moderate/low	Low to moderate/low	Low	Very low to low
On-site	Landfill MA06-196, MA06-198	Low to moderate	Moderate/low to moderate	Moderate/low	N/A	Low
On-site	Sewage works MA06-128	Low to moderate/low	Low to moderate/low	Moderate/low	N/A	Very low to low
Off-site	Airport MA06-110	Low to moderate/low	Low to moderate/low	Low to moderate/low	N/A	Very low to low
Off-site	Farms MA06-17, MA06-27, MA06-42, MA06-48, MA06-88	Low to moderate/low	Low to moderate/low	Low to moderate/low	Very low to low	Very low to low
Off-site	Depot MA06-109	Low	Low	Low	N/A	Very low

*N/A means receptor/pathway not present*

## **Temporary effects**

- 10.4.13 In order to identify potential temporary effects, the baseline and construction CSM have been compared to determine the change in level of risk at receptors during the construction stage, and thus to define the level of effect at the construction stage.
- 10.4.14 Where there is no change between the main baseline risk and the main construction risk, the temporary effect significance is deemed to be neutral even if the risk is deemed to be high. For example, this will be the case where the construction of the Proposed Scheme does not alter the risks from an existing potentially contaminated site that is off-site (i.e. outside the area required for construction).
- 10.4.15 A worsening risk at the construction stage compared to baseline will result in a negative effect, and conversely, an improvement will result in a positive effect. The assessment assumes that contamination will be controlled through the general measures in the draft CoCP.
- 10.4.16 All of the sites set out in Table 24 have been assessed for the change in impact associated with the construction stage of the work and were found to have no significant effects.
- 10.4.17 In the event that unexpected contamination is encountered during the construction of the Proposed Scheme in this area, this will be remediated as described in the draft CoCP resulting in an overall beneficial effect.
- 10.4.18 The application of the measures set out in the draft CoCP makes it unlikely that there will be significant adverse effects, but it is considered that there may still be some temporary minor adverse effects during the construction period from ground disturbance in these areas. These temporary minor adverse impacts at the construction stage are not regarded as significant in line with the methodology set out in the SMR.
- 10.4.19 Construction compounds and the Ashley railhead located in this study area could include the storage of potentially hazardous substances, such as fuels and lubricating oils, and may also be used for temporary storage of potentially contaminated soils. Control and mitigation measures are contained within the draft CoCP and include measures to manage the risks associated with the storage of such materials resulting in no significant effects.

## **Permanent effects**

- 10.4.20 In order to identify potential permanent effects, a screening assessment has been undertaken comparing the baseline and post-construction CSM to assess the permanent (post-construction) effects.
- 10.4.21 The magnitude of the permanent effects and their significance have been determined by assessing the change in risk between the main baseline risk and the main post-construction risk. Therefore, where there is no change between the main baseline risk and the main post-construction risk, the permanent effect significance is deemed to be neutral even if the risk is assessed to remain as high. This will be the case where the construction of the Proposed Scheme will not alter the risks from an existing potentially contaminated site that is outside



the land required for the construction of the Proposed Scheme. As noted above, a worsening will result in negative effects and an improvement will result in positive effects.

- 10.4.22 All of the sites set out in Table 24 have been assessed for the change in impact associated with the post-construction stage of the work and were found to have no significant effects.

## **Mineral resources**

- 10.4.23 Construction of the Proposed Scheme has the potential to affect existing mineral resources, and proposed areas of mineral exploitation. This could occur by sterilisation of the resource through direct excavation during construction of the Proposed Scheme or through temporary and/or permanent severance or isolation that may occur during the construction phase of the Proposed Scheme, possibly continuing through to its operation.
- 10.4.24 There are four sand and gravel MSAs present in the study area along the southern fringes of Hale, and a further MSA in the study area within Manchester Airport. Three of these MSA fall partially within the land required for the construction of the Proposed Scheme. These are located within areas of proposed temporary works in existing highways and are therefore not considered further.
- 10.4.25 The Proposed Scheme will pass through PEDL 296 and a SPA.

## **Temporary effects**

- 10.4.26 The following section outlines the potential temporary effects arising during the construction of the Proposed Scheme.
- 10.4.27 Temporary adverse effects may occur where construction compounds are proposed within the PEDL. In such cases, there will be a temporary sterilisation of the resource during construction works, but this is not considered to represent a significant effect and the resource will not be lost permanently.

## **Petroleum Exploration and Development Licences/Hydrocarbons**

- 10.4.28 The effect of construction of the Proposed Scheme on the identified PEDL and SPA will be negligible as it is unlikely that construction of the Proposed Scheme would place a constraint on future exploitation of potential sources of shale gas or other forms of hydrocarbon resource.

## **Summary of temporary effects**

- 10.4.29 Table 25 sets out a summary of the temporary effects identified for mineral resources.

**Table 25: Summary of temporary effects for mineral resources**

Mineral resource	Status	Description	Sensitivity/ value	Magnitude of impact	Effect and significance (Y/N)
PEDL 296	PEDL	Petroleum exploration and development licence area	High	Negligible	Negligible (N)
Shale gas	SPA	SPA for Shale gas	Medium	Negligible	Negligible (N)

10.4.30 There will be negligible temporary effects on the mineral resources, which are not significant.

### Permanent effects

10.4.31 The following section outlines the potential permanent effects resulting from the construction of the Proposed Scheme.

### Petroleum Exploration and Development Licences/Hydrocarbons

10.4.32 The permanent effects of the Proposed Scheme on the identified PEDL and SPA will be negligible as it is unlikely that the Proposed Scheme would place a constraint on future exploitation of potential sources of shale gas or other forms of hydrocarbon resource. This is due to the large extent of the PEDL and SPA, and the limited area of land that will restrict potential well locations.

### Summary of permanent effects

10.4.33 Table 26 sets out a summary of the permanent effects identified for mineral resources

**Table 26: Summary of permanent effects for mineral resources**

Site name	Status	Description	Sensitivity/ value	Magnitude of impact	Effect and significance (Y/N)
PEDL296	PEDL	Petroleum exploration and development licence area	High	Negligible	Negligible (N)
Shale gas	SPA	SPA for Shale gas	Medium	Negligible	Negligible (N)

10.4.34 There will be negligible permanent effects on the mining and mineral resources, which are not significant.

### Geoconservation sites

10.4.35 Rostherne Mere, a geological SSSI, is located adjacent to the land required for the construction of the Proposed Scheme to the north of Rostherne. This has been classified as a site of high sensitivity.

- 10.4.36 There will be no loss of this resource and a negligible impact upon its setting and accessibility during construction and operation of the Proposed Scheme. There will be negligible temporary or permanent effects, which are not significant.
- 10.4.37 Further information is provided in Section 15, Water resources and flood risk.

## **Other mitigation measures**

- 10.4.38 No additional measures are considered necessary to mitigate risks from land contamination during the construction stage beyond those that are set out in the draft CoCP and/or instigated as part of the site-specific remediation strategies that will be developed at the detailed design stage. These measures will ensure that risks to people, property and environmental receptors from contaminants in the ground will be controlled such that they will not be significant. For example, measures might include excavation and treatment of contaminated soils or controls to manage movement of ground gas and leachate.
- 10.4.39 Mitigation of the effects on mineral resources could include extraction of the resource within the land required for the construction of the Proposed Scheme adjacent to, rather than beneath the structural footprint of the Proposed Scheme. A plan will be discussed in advance of the construction works with the landowner, the mineral planning departments at CEC and GMCA, and any other relevant parties to assist in achieving an effective management of minerals within the affected locations.

## **Summary of likely residual significant effects**

- 10.4.40 Based on the information currently available and with the application of the mitigation measures detailed above, no likely significant residual effects are anticipated with respect to land quality.
- 10.4.41 Where remediation at contaminated land sites is undertaken there may be significant beneficial residual effects.

## **Cumulative effects**

- 10.4.42 Volume 5: Appendix CT-004-00000 sets out the committed developments that have been considered in the assessment of cumulative effects.
- 10.4.43 Based upon the review of committed development sites, it is assessed that there will be no significant cumulative effects arising from the construction of the Proposed Scheme with respect to land quality.

## **10.5 Effects arising from operation**

- 10.5.1 Users of the Proposed Scheme (i.e. rail passengers) will be at all routine times within a controlled environment (i.e. within trains), and have therefore, been scoped out of the assessment.

## Avoidance and mitigation measures

- 10.5.2 Maintenance and operation of the Proposed Scheme will be in accordance with environmental legislation and good practice. Spillage and pollution response procedures similar to those to be outlined in the draft CoCP will be established for all high risk activities and employees will be trained in responding to such incidents.

## Assessment of impacts and effects

- 10.5.3 The Proposed Scheme within this area will include Ashley Road auto-transformer station, to the south-west of Ashley, and Ashley IMB-R. Auto-transformer stations can, in principle, be a source of contamination through accidental discharge or leaks of coolant or other contaminants. However, in common with other modern infrastructure development, secondary containment appropriate to the level of risk will be included in the installed designs.
- 10.5.4 The operation of the trains may give rise to minor contamination through leakage of hydraulic or lubricating oils. However, such leakage or spillage is expected to be very small and unlikely to result in significant contamination.

## Other mitigation measures

- 10.5.5 No other mitigation measures are expected to be required beyond what has already been outlined relating to land quality in the study area.

## Summary of likely residual significant effects

- 10.5.6 No significant residual effects are anticipated associated with the operation of the Proposed Scheme.

## Cumulative effects

- 10.5.7 There are anticipated to be no significant cumulative residual effects from the operation of the Proposed Scheme.

## Monitoring

- 10.5.8 Volume 1, Section 9 sets out the general approach to environmental monitoring during operation of the Proposed Scheme. Requirements for monitoring will be determined as part of the investigation, treatment and validation of contamination on a site specific basis as part of the detailed design process. During the operational phase, monitoring works for groundwater will continue, where required. Monitoring requirements may include water quality, air quality and/or landfill bulk and trace gases, depending on the site being considered.

# 11 Landscape and visual

## 11.1 Introduction

- 11.1.1 This section of the report presents the assessment of the likely significant landscape and visual effects within the Hulseheath to Manchester Airport area. It summarises the baseline conditions found within and around the route of the Proposed Scheme and describes the likely impacts and significant effects during construction and operation on landscape and visual receptors.
- 11.1.2 The operational assessment section refers not just to the running of the trains, vehicles on roads and any associated lighting but also the presence of the new permanent infrastructure associated with the Proposed Scheme.
- 11.1.3 Engagement with Cheshire East Council, Trafford Metropolitan Borough Council, Manchester City Council, Greater Manchester Combined Authority, the National Trust and Manchester Airports Group has been undertaken. The purpose of this engagement has been to discuss the assessment methodology, the extent of the landscape and visual study area, the extent of the landscape character boundaries and the locations of visual assessment and verifiable photomontage viewpoints.
- 11.1.4 Further details on the landscape and visual assessment, including engagement, baseline information and assessment findings, are presented in the Volume 5, Landscape and visual Map Book and Volume 5: Appendix LV-001-0MA06, which comprises the following:
- Part 1: Engagement with technical stakeholders;
  - Part 2: Landscape character assessment;
  - Part 3: Visual assessment;
  - Part 4: Assessment matrices; and
  - Part 5: References.
- 11.1.5 The Proposed Scheme is described in Section 2. The Volume 2: MA06 Map Book shows the locations of key environmental features (Map Series CT-10) and the key construction (Map Series CT-05) and operational (Map Series CT-06) features of the Proposed Scheme. It also shows the locations of landscape and visual impact mitigation measures (Map Series CT-06), viewpoints that will be significantly affected at the construction (Map Series LV-03) and operation (Map Series LV-04) phases and landscape character areas (LCA) that will be significantly affected at the construction and operation phases (Map Series LV-02).
- 11.1.6 A separate, but related, assessment of effects on the setting of heritage assets is reported in Section 9, Historic environment.

## 11.2 Scope, assumptions and limitations

- 11.2.1 The scope, key assumptions and limitations for the landscape and visual assessment are set out in full in Volume 1 (Section 8) and the EIA Scope and Methodology Report (SMR)<sup>92</sup>.
- 11.2.2 Surveys were undertaken during the following periods to inform the landscape and visual assessment:
- summer surveys from July to September in 2018 and 2019; and
  - winter surveys from November to February 2018 and 2019.
- 11.2.3 The extent of the study area has been informed by construction and operational phase zones of theoretical visibility (ZTV). The ZTV have been produced in line with the methodology described in the SMR and are an indication of the theoretical visibility of the Proposed Scheme. In some locations, extensive vegetation cover means that the actual extent of visibility will be substantially less than that shown in the ZTV, and professional judgement has been used to further refine the study area to focus on likely significant effects.
- 11.2.4 Tall construction plant (for example cranes and piling rigs) is excluded from the ZTV for the construction phase, as there is a great degree of variability in the extent and timeframes of the visibility of construction activity and plant. Overhead line equipment rarely gives rise to significant effects if it is the only element visible and has, therefore, been excluded from the ZTV to give a better indication of the possible spread of significant effects to aid the assessment. However, overhead line equipment as well as tall construction plant are taken into account in the assessment of effects on LCA and visual receptors.
- 11.2.5 Landscape and visual receptors within approximately 1.5km of the centre line of the route of the Proposed Scheme have been assessed as part of the study area. Where important receptors fall just beyond the ZTV, professional judgement has been used in recording and assessing these. Long distance views of up to 2km have been considered at settlement edges, such as at Bowdon and Hale and from Dunham Massey and Tatton Park.
- 11.2.6 This assessment is based on preliminary design information and makes reasonable worst-case assumptions on the nature of potentially significant effects where these can be substantiated. The assessment of visual effects during construction covers the situation in winter at peak activity. The assessment of operational visual effects covers the situation in winter and summer of year 1 and summer of year 15 and year 30. The assessment of landscape effects is undertaken for the construction phase and for the operational phase at year 1, year 15 and year 30. The landscape assessment does not consider seasonal variations e.g. winter/summer, since these do not affect character.
- 11.2.7 Professional judgements on landscape value are provided in the baseline descriptions and judgements on susceptibility of the landscape to the Proposed Scheme and overall

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<sup>92</sup> Volume 5: Appendix CT-001-00001, Environmental Impact Assessment Scope and Methodology Report.

landscape sensitivity are provided as part of the assessment of effects on each significantly affected LCA.

- 11.2.8 The assessment has been carried out on the basis that design of structures will, insofar as reasonably practicable, integrate with existing skyline features and will make use of a simple, clean and coherent palette of materials to help structures fit in the landscape.
- 11.2.9 The assessment has also been carried out on the basis that the station and surrounding public realm associated with the Proposed Scheme will be subject to a high quality architectural and landscape design.
- 11.2.10 Within urban areas, it is assumed that 'land returned to suitable development' will have construction compounds removed and hoardings retained.
- 11.2.11 It has been assumed that all vegetation within the land required for construction of the Proposed Scheme will be removed during construction unless stated otherwise. This excludes areas included only for the purpose of mitigation planting. Removed vegetation will be reinstated insofar as is reasonably practicable and would provide screening and integration benefits by year 15.
- 11.2.12 It has also been assumed that with respect to utilities and utility decommissioning, it is likely that the majority of existing vegetation can be retained. Vegetation will be removed along new utility lines, based on easement guidance from specific utility companies. All vegetation removed during utilities construction work will be reinstated insofar as is reasonably practicable. The assessment has been based on the assumption that any reinstatement planting will provide integration benefits by year 15. Works associated with underground utilities within highways will follow the principles set out in the draft Code of Construction Practice (CoCP)<sup>93</sup> and existing street trees and property boundary vegetation will be retained insofar as is reasonably practicable.

## 11.3 Environmental baseline

### Existing baseline

#### Landscape baseline

- 11.3.1 The study area includes the area between Hulseheath in the west, the urban edge of Greater Manchester in the north, Mobberley in the south and Manchester Airport in the east.
- 11.3.2 Tree-lined watercourses, including the River Bollin, Blackburn's Brook, Birkin Brook and Timperley Brook, have cut shallow valleys into an otherwise flat or gently undulating landscape. Around Ashley, the pattern of small-scale fields, hedgerows and mature hedgerow oak trees is typical of the Cheshire Plain landscape, whereas the eastern and western parts of the area have a more wooded quality. Ancient woodland includes

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<sup>93</sup> Volume 5: Appendix CT-002-00000, draft Code of Construction Practice (CoCP).

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Hancock's Banks Wood, Sunbank Wood and Davenport Green Wood. Estate woodland and a long boundary wall delineate the extent of Tatton Park.

- 11.3.3 Nutrient-rich, natural water bodies known as meres are common in the area. These features, a large-scale example of which is Rostherne Mere, are the result of glacial processes and typical of the Cheshire landscape. Rostherne Mere lies in a bowl-shaped valley with wooded sides and it is consequently not clearly apparent in the wider landscape.
- 11.3.4 Towards Manchester Airport, the character of the landscape changes, with the urban influences of the airport, Hale and Wythenshawe. Manchester Airport is surrounded by industrial and commercial development. South Hale is a low density, quiet residential suburb with wide, tree-lined streets and detached and semi-detached houses, set in substantial wooded gardens. Wythenshawe is predominantly residential, with higher-density estates of semi-detached and terraced post-war housing. Small settlements in the area, including Hulseheath, Boothbank, Rostherne, Ashley, Thorns Green and Davenport Green, generally retain a rural character despite their proximity to major roads and Greater Manchester.
- 11.3.5 Very few places are free from the sound of traffic noise; there are several busy roads including: the M56, the A538 Hale Road and the A556, which pass through the area. Noise and activity are generated by Manchester Airport, at ground level and in the sky above, and also by trains on the Mid-Cheshire Line, which runs through Ashley.
- 11.3.6 A key feature that contributes to the character of the landscape is Tatton Park, an important 18th century designed landscape (Grade II\* on Historic England's Register of Historic Parks and Gardens). Conservation areas include the Rostherne Conservation Area, which covers the estate village of Rostherne (part of the Tatton Estate) and the South Hale Conservation Area, which includes part of Hale where there are examples of local architect Edgar Wood's late 19th and early 20th century housing.
- 11.3.7 Cheshire East Local Plan Strategy 2010-2030 classifies most of the study area as Green Belt and Open Countryside<sup>94</sup>.
- 11.3.8 Landscape Character Areas (LCA) have been determined as part of an integrated process of environmental characterisation, informed by a review of historic mapping, historic landscape characterisation datasets and the outcome from other topic assessments including ecological assessments. Use has been made of published landscape character assessments and a wide range of supporting GIS data, aerial photography and Ordnance Survey mapping, plus desk study and fieldwork. Landscape character assessments reviewed include: the relevant National Landscape Character Areas<sup>95</sup>, the Cheshire Landscape Character

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<sup>94</sup> Cheshire East Council (2017), *Adopted Cheshire East Local Plan Strategy 2010 - 2030*. Available online at: [https://www.cheshireeast.gov.uk/planning/spatial-planning/cheshire\\_east\\_local\\_plan/local-plan-strategy/local\\_plan\\_strategy.aspx](https://www.cheshireeast.gov.uk/planning/spatial-planning/cheshire_east_local_plan/local-plan-strategy/local_plan_strategy.aspx).

<sup>95</sup> Natural England (2014), *National Character Area profiles*. Available online at: <https://www.gov.uk/government/publications/national-character-area-profiles-data-for-local-decision-making/national-character-area-profiles>.



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Assessment<sup>96</sup>, the Trafford Metropolitan Borough Landscape Strategy<sup>97</sup> and the Greater Manchester Landscape Character and Sensitivity Assessment<sup>98</sup>.

- 11.3.9 These published LCA have been adapted for this assessment to provide LCA of an appropriate, consistent scale. Minor amendments have been made to some published LCA boundaries to reflect existing conditions, as verified on-site, or to draw out specific aspects susceptible to change from the Proposed Scheme.
- 11.3.10 For the purposes of this assessment, the study area for the Hulseheath to Manchester Airport area has been subdivided into six LCA. Full descriptions of these LCA are provided in Volume 5: Appendix LV-001-0MA03 or Volume 5: Appendix LV-001-0MA06.
- 11.3.11 Four of the six LCA will not be significantly affected by the Proposed Scheme on account of their distance from the Proposed Scheme and/or screening by existing retained vegetation and topography, which will contain effects to a relatively narrow corridor along the route of the Proposed Scheme.
- 11.3.12 A summary of the two LCA that will be significantly affected within the Hulseheath to Manchester Airport area is provided in Figure 25 and Figure 26 and described below.
- 11.3.13 In addition to the six LCA in this area, the Arley Lower Wooded Farmland LCA will be significantly affected by the Proposed Scheme and is included in Volume 2, Community Area report: Pickmere to Agden and Hulseheath (MA03) as it is located mostly in the Pickmere to Agden and Hulseheath area (MA03).

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<sup>96</sup> Cheshire East Council (2018), *Cheshire Landscape Character Assessment*. Available online at: [http://www.cheshireeast.gov.uk/environment/heritage\\_natural\\_environment/landscape/landscape\\_character\\_assessment.aspx](http://www.cheshireeast.gov.uk/environment/heritage_natural_environment/landscape/landscape_character_assessment.aspx).

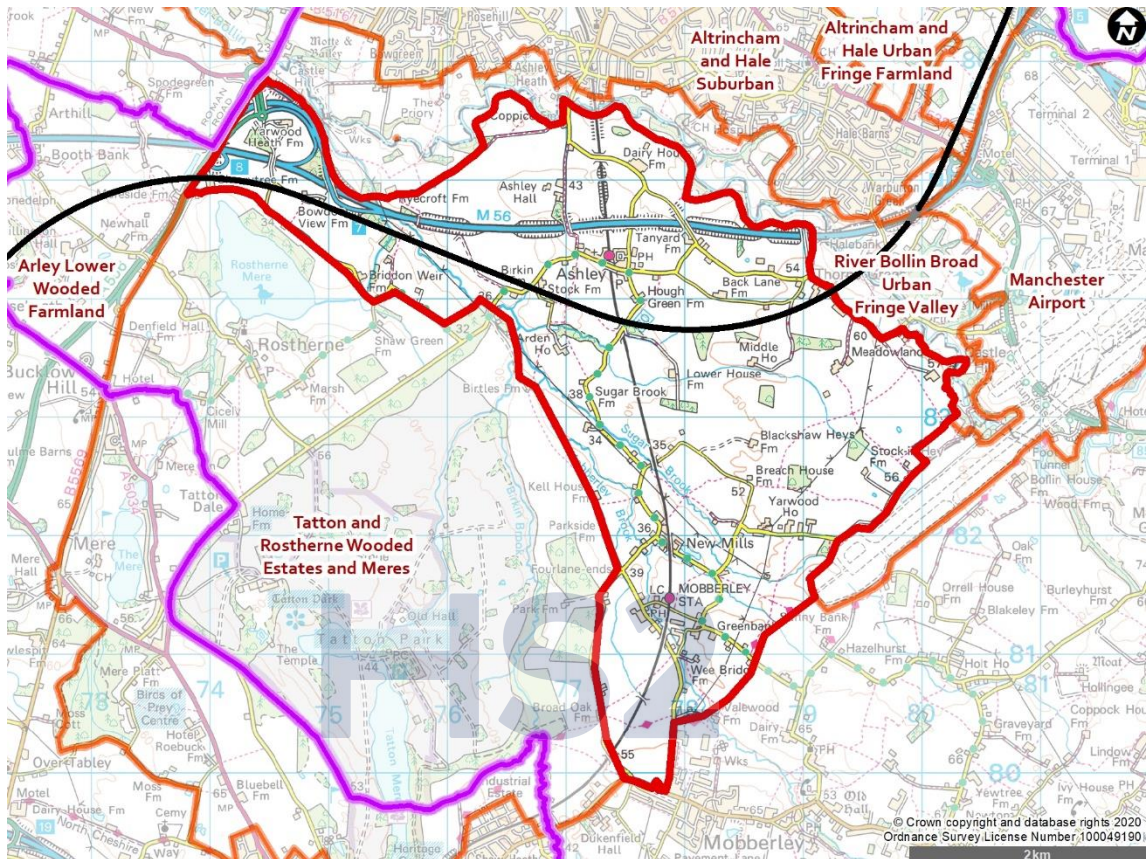
<sup>97</sup> Trafford Metropolitan Borough (2004), *Supplementary Planning Guidance, Landscape Strategy*. Available online at: <https://www.trafford.gov.uk/planning/strategic-planning/docs/spg-2004-landscape-strategy.pdf>.

<sup>98</sup> Greater Manchester Combined Authority (2018), *Greater Manchester Landscape Character and Sensitivity Assessment*. Available online at: <https://www.greatermanchester-ca.gov.uk/media/1727/greater-manchester-landscape-character-and-sensitivity-report.pdf>.

## Significantly affected landscape character areas

### Ringway Lower Wooded Farmland

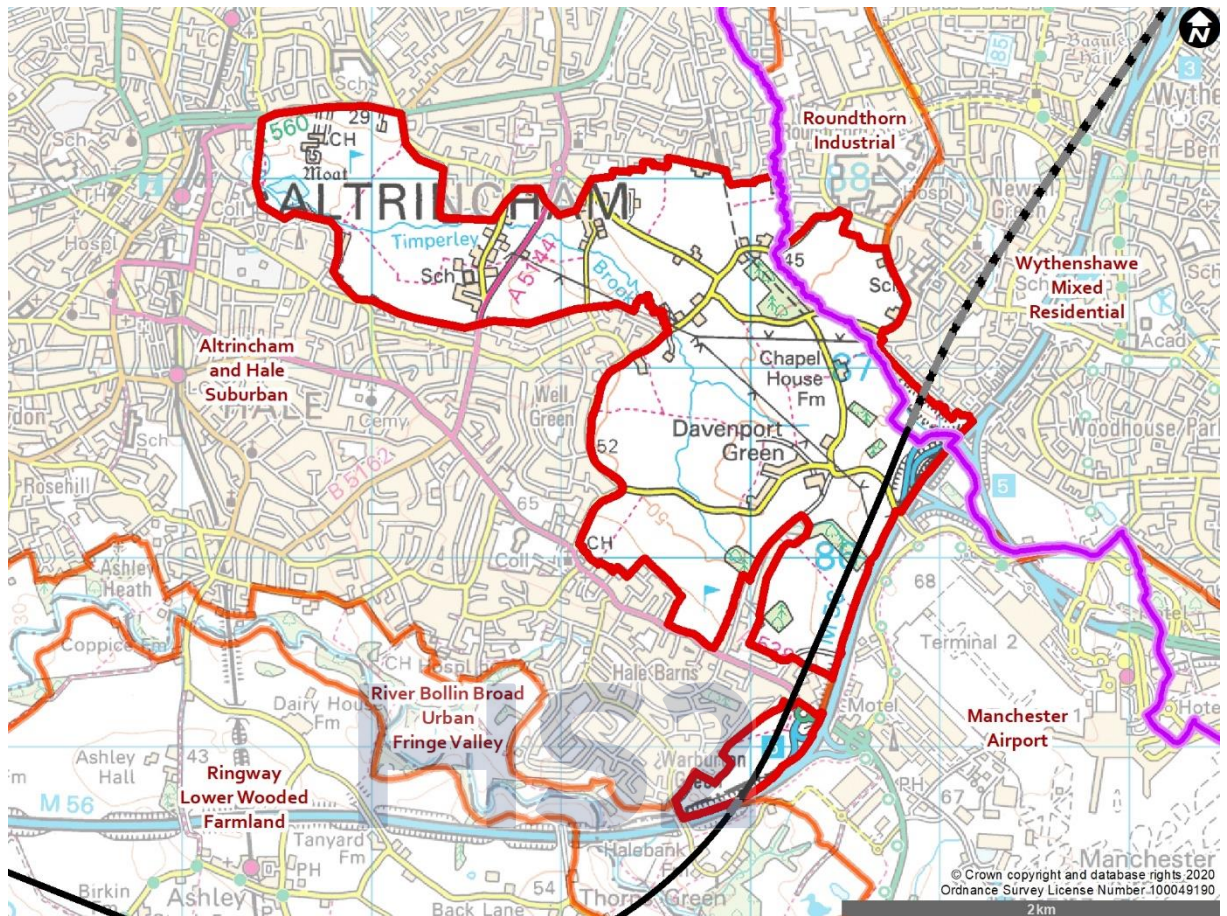
Figure 25: Ringway Lower Wooded Farmland LCA



- 11.3.14 The Ringway Lower Wooded Farmland LCA is a low lying, rural landscape predominantly used for arable and dairy farming. The area is characterised by farmland, hedgerows, tree-lined streams and narrow country lanes. There are many fine mature trees, especially hedgerow oaks. Overall, the area is well wooded, but the landscape in the north of the LCA has a more open character than in the south. Settlements include Ashley, New Mills and Thorns Green, with isolated farms and residential properties present throughout the area. There is an extensive public rights of way (PRoW) network and National Cycle Network Route 70 passes through the centre of the LCA. The infrastructure of Manchester Airport is well screened from the area, but planes are frequently visible and audible in the sky above. Rural roads are narrow and tree-lined but often busy with traffic. The Mid-Cheshire Line runs north-south through Ashley and the M56 passes close to the north of the village, effectively severing it from the landscape to the north. Noise, movement and light generated by traffic, trains and aircraft reduce tranquillity in much of the LCA. Overhead power lines are prominent in both the eastern and western parts of the LCA.
- 11.3.15 The Ringway Lower Wooded Farmland LCA is assessed as having an overall medium landscape value based on its partly rural character, recreational route network, landscape severance and the presence of transport infrastructure.

## Altrincham and Hale Urban Fringe Farmland

Figure 26: Altrincham and Hale Urban Fringe Farmland LCA



- 11.3.16 The Altrincham and Hale Urban Fringe Farmland LCA is surrounded by urban areas that have experienced substantial change since the mid-20th century with the expansion of Greater Manchester and Manchester Airport. Urban development on its boundaries is apparent almost everywhere in the LCA, but despite this, due to its predominantly agricultural land-use, it retains a rural character. Arable and pasture fields are small to medium in size and surrounded by tree-lined hedgerows and woodland. The land is low-lying, with clay soils and a high-water table, which feeds the numerous streams and watercourses, including Timperley Brook and Fairywell Brook. Woodland around Davenport Green and along the M56 gives the area a verdant character. Davenport Green Wood is partly designated as ancient woodland. The built form includes the settlement of Davenport Green and individual farmhouses and dwellings. The timber framed 17th century Davenport Green Hall, situated in wooded grounds, is Grade II listed. There is a good PRow network north of Davenport Green. Other recreational land uses include a golf course and a cricket ground. The M56 and Manchester Airport are sources of noise and activity, reducing tranquillity throughout much of the LCA. The proximity of Greater Manchester and the airport contributes to sky glow in the night-time environment.

- 11.3.17 The Altrincham and Hale Urban Fringe Farmland LCA is assessed as having an overall medium landscape value based on its partly rural character, ancient woodland and the urbanising influence of nearby development and large-scale transport infrastructure.

## Visual baseline

- 11.3.18 A summary description of the distribution and types of receptors most likely to be affected is provided below. The viewpoints are numbered to identify their locations and are shown on the viewpoint location maps (see Volume 2, MA06 Map Book, Map Series LV-03 and LV04). In each case, the middle number (xxx.xx.xxx) identifies the type of receptor that is present in this area – 1: Protected views (none within this area), 2: Residential, 3: Recreational<sup>99</sup>, 4: Transport, 5: Hotels/healthcare/schools and 6: Employment.
- 11.3.19 The landform of the Hulseheath to Manchester Airport area is largely flat, but the terrain becomes more undulating at Thorns Green and steeper along the tree-lined River Bollin valley and Hale Bank. The area is well vegetated with woodland, hedgerow trees and planting along the M56 and in domestic gardens. The landscape is open north of Rostherne Mere, around Ashley and on the southern boundary of Hale where there are larger fields and less intervening vegetation. Long distance views from the lower lying areas around Hale, Manchester Airport, Tatton and Rostherne are restricted by the screening effect of intervening vegetation and urban development on the outskirts of Greater Manchester.
- 11.3.20 Views from PRow and other recreational paths are often restricted by hedgerows and trees, but there are more distant views where the landscape is open, such as around Ashley, along the A556, and north of Rostherne Mere. The Pennines are visible in the distance from the western end of the Hulseheath to Manchester Airport area. Views experienced by visitors to Tatton Park are mainly contained by the estate woodland, but there are longer views from the northern part of the deer park, towards Ashley.
- 11.3.21 Views experienced by road users in the area are generally limited by woodland, field boundary hedges, roadside vegetation and the relatively flat nature of the landform in much of the area.

## Future baseline

### Construction (2025)

- 11.3.22 Volume 5: Appendix CT-004-00000 provides details of the developments in the Hulseheath to Manchester Airport area that are assumed to have been implemented by 2025.
- 11.3.23 No committed developments have been identified in this study area that will materially alter the baseline conditions in 2025 for landscape and visual.

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<sup>99</sup> Reference to specific civil parish numbers for footpaths is provided where available; otherwise the adjacent road name is used as a reference to the footpath.

## Operation (2038)

- 11.3.24 Volume 5: Appendix CT-004-00000 provides details of the additional developments in the Hulseheath to Manchester Airport area that are assumed to have been implemented by 2038.
- 11.3.25 No committed developments have been identified in this study area that will materially alter the baseline conditions in 2038 for landscape and visual.

## 11.4 Temporary effects arising during construction

- 11.4.1 As is commonplace with major infrastructure works, the scale of the construction activities means they will be visible from many locations and will have the potential to give rise to significant temporary effects that cannot practicably be mitigated. Such effects will vary over the construction period depending on the intensity and scale of the works at the time. The assessment of landscape and visual effects has been based on the activities occurring during the peak construction phase, which is defined as the period during which the main construction works will take place, including the presence of compounds, main earthworks and structure works.
- 11.4.2 The effects associated with the peak construction stage in this area are generally considered to be medium-term, based on the indicative construction programme in Section 2.3. Effects during other stages of works are likely to be less intensive due to less construction equipment being required at the time and a reduced intensity of construction activity.
- 11.4.3 Section 2.2 sets out the key permanent features of the Proposed Scheme and Section 2.3 describes the construction compounds and associated temporary works that have been considered in this assessment.

## Avoidance and mitigation measures

- 11.4.4 Effects during the construction period may be reduced by establishing planting early in the construction programme. Advance planting is proposed on farmland east of Brooks Drive at Davenport Green. The planting will provide additional screening for visual receptors during construction (as well as into operation) and will also help better integrate the Proposed Scheme into the landscape.
- 11.4.5 Measures that have been incorporated into sections 12 and 14 of the draft CoCP to avoid or reduce landscape and visual effects, where reasonably practicable, during construction include the following:
- avoidance of unnecessary tree and vegetation removal, and protection of existing trees in accordance with BS 5837: Trees in relation to design, demolition and construction<sup>100</sup>;

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<sup>100</sup> British Standards Institution (2012), *BS 5837:2012 Trees in relation to design, demolition and construction – Recommendations*.

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- use of well-maintained hoardings and fencing;
- prevention of damage to the landscape features adjacent to the construction sites due to movement of construction vehicles;
- designing lighting to avoid unnecessary intrusion onto adjacent buildings and other land uses; and
- replacement of any trees intended to be retained should they die as a consequence of nearby construction works.

11.4.6 Implementation of these measures has been taken into account in the assessment of the construction effects.

## **Assessment of temporary impacts and effects**

11.4.7 The most apparent changes to the landscape and to the views experienced by visual receptors during construction will relate to the presence of construction plant, construction compounds and temporary materials stockpiles. Key construction activities that will give rise to the most apparent changes to landscape and visual receptors are the excavation of cuttings and the construction of viaducts, embankments, overbridges, underbridges, Ashley IMB-R, Ashley railhead, Manchester Airport High Speed station and Manchester tunnel south portal in Davenport Green to Ardwick (MA07). Other construction activities include the operation of Ashley railhead, property demolitions and the closure, diversion, and realignment of utilities, public highways and PRow. The removal of existing landscape elements such as trees and hedgerows will open up new views.

11.4.8 Non-significant effects are reported in Volume 5: Appendix LV-001-0MA06.

## **Landscape assessment**

11.4.9 The LCA set out in Table 27 will be significantly affected during construction of the Proposed Scheme.

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**Table 27: Summary description and assessment of effects on LCA**

Location	
<p><b>Ringway Lower Wooded Farmland LCA</b></p> <p>The Ringway Lower Wooded Farmland LCA, of <b>medium</b> value, will be directly affected by the introduction of construction activity, plant and satellite compounds into a predominantly rural landscape, particularly affecting the setting of the village of Ashley. There will be large-scale changes due to construction of A556 Chester Road overbridge, Rostherne cutting, embankments and box structure, Tom Lane telecommunications site, Blackburn’s Brook North viaduct, Ashley infrastructure maintenance base-rail (IMB-R) and auto-transformer station, Mid-Cheshire (Railway) and Mobberley Road viaduct, Mobberley Road offline overbridge, Thorns Green embankment and cutting, Castle Mill Lane realignment, telecommunications site and overbridge and Brickhill Lane diversion. Ashley railhead will temporarily occupy a substantial area of land between Mobberley Road and the Mid-Cheshire Line, as far as Breach House Lane in the south. There will be changes to the local landform due to large-scale earthworks and the presence of temporary material stockpiles. Temporary road closures and diversions of PRoW will reduce connectivity within the area. The landscape will be affected by construction vehicle movements, construction activity and noise, further reducing tranquillity throughout the LCA. A large part of the LCA will be affected during construction.</p> <p>Due to the <b>medium</b> value, seclusion, overall rural character and the presence of detracting transport infrastructure, the landscape has a <b>medium-high</b> susceptibility to change arising from the Proposed Scheme. The introduction of large-scale construction works over a wide area will result in a <b>high</b> magnitude of change to the landscape.</p> <p>The <b>high</b> magnitude of change for the Ringway Lower Wooded Farmland and its <b>medium-high</b> sensitivity will result in a <b>major</b> adverse significant effect.</p>	<p>Level of effect:  <b>Major</b> adverse (significant)</p>
<p><b>Altrincham and Hale Urban Fringe Farmland LCA</b></p> <p>The Altrincham and Hale Urban Fringe Farmland, of <b>medium</b> value, will be directly affected by the introduction of construction activity, plant and satellite compounds into a partly rural, wooded landscape. There will be large-scale changes due to the construction of Manchester Airport High Speed station and cutting, Manchester tunnel south portal (in the adjoining Davenport Green to Ardwick area (MA07)), A538 Hale Road overbridge (north) and Thorley Lane overbridge. Hedgerows, mature trees and ancient woodland will be removed from the land required for construction of the Proposed Scheme. There will be changes to the local landform due to large-scale earthworks, the presence of temporary material stockpiles and the construction of Timperley Brook diversion. Temporary closures and diversions of PRoW will reduce connectivity within the area. Tranquillity in the eastern end of the LCA, already low due to the noise and activity generated by Manchester Airport and the M56, will be further reduced.</p> <p>Due to the <b>medium</b> value, ancient woodland, watercourses, rural character and the presence of the detracting influence of transport infrastructure, the landscape has a <b>medium-high</b> susceptibility to change arising from the Proposed Scheme. The removal of vegetation and the introduction of construction works will result in a high magnitude of change to the landscape.</p> <p>The <b>high</b> magnitude of change for the Altrincham and Hale Urban Fringe Farmland and its medium-high sensitivity will result in a <b>major</b> adverse significant effect.</p>	<p>Level of effect:  <b>Major</b> adverse (significant)</p>

## Visual assessment

### Introduction

- 11.4.10 The following section describes the likely significant effects on visual receptors during construction. The construction assessment has been undertaken for the winter period, in line with best practice guidance, to ensure a robust assessment. However, in some cases, visibility of construction activities may be reduced during summer when vegetation, if

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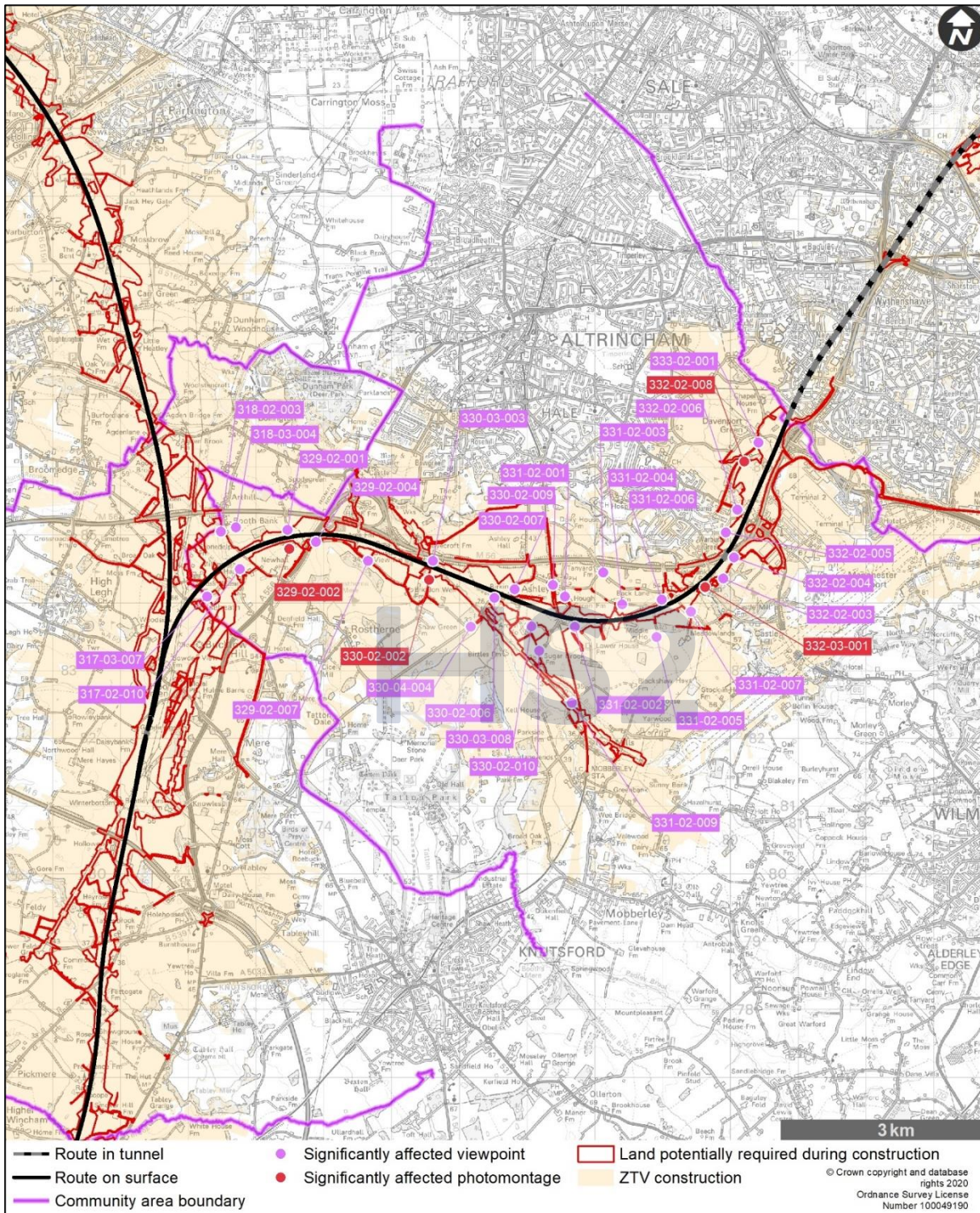
present in a view, will be in leaf. Where visual receptors are predicted to experience significant effects at night-time arising from additional lighting, these are also presented in this section.

- 11.4.11 Where a viewpoint represents multiple types of receptor, the assessment is based on the most sensitive receptor. Effects on other receptor types with lower sensitivity will be lower than those reported.
- 11.4.12 The visual assessment has identified locations where continuous night working and/or overnight working during construction will result in significant effects on visual receptors (summarised in Table 28 and described in detail in Volume 5: Appendix LV-001-0MA06, Part 3).
- 11.4.13 Table 28 describes the construction phase potentially significant visual effects. Viewpoint locations are shown in Map Series LV-03 in the Volume 2: MA06 Map Book.



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**Table 28: Construction phase significant visual effects**



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<b>View north-west from Footpath Millington 2/1 (High sensitivity receptors) (VP 317-03-007)</b>	
<p>Users of Footpath Millington 2/1, of <b>high</b> susceptibility and with <b>medium</b> value views, will experience a substantial change to near and middle-distance views due to the construction of Hulseheath South embankment and Peacock Lane viaduct (in the Pickmere to Agden and Hulseheath area (MA03)) and Hulseheath North embankment, Millington Clough underbridge and Millington Clough offline underbridge (in the Pickmere to Agden and Hulseheath area (MA03) and the Hulseheath to Manchester Airport area) from Footpath Millington 2/1. The footpath will be temporarily diverted during construction. The large-scale components associated with construction, including Chapel Lane satellite compound, machinery, earthworks and material stockpiles, will be prominent in the view over the valley and the open farmland to the north and south. Construction traffic using Peacock Lane, the Peacock Lane realignment and Ivy House Farm accommodation access will introduce uncharacteristic traffic movements into views.</p> <p>The combination of the construction works outlined above will result in a <b>high</b> magnitude of visual change.</p> <p>The <b>high</b> magnitude of visual change and <b>high</b> sensitivity will result in a <b>major</b> adverse significant effect.</p>	<p>Level of effect:  <b>Major</b> adverse (significant)</p>

<b>View north-west from Millington Hall (High sensitivity receptors) (VP 317-02-010)</b>	
<p>Residents at Millington Hall and on Millington Hall Lane and users of Footpath Millington 5/1, all of <b>high</b> susceptibility and with <b>medium</b> value views, will experience a substantial change to near and middle-distance views due to the construction of Hulseheath North embankment, Agden Brook viaduct, Millington Lane realignment, Millington Lane overbridge and Millington cutting. Laying a new high-pressure gas pipeline will result in the removal of woodland along Millington Clough, further opening up views of the construction works from Footpath Millington 5/1. The large-scale components associated with construction, including the Agden Brook viaduct satellite compound, machinery, earthworks and temporary stockpiles, will be prominent in the view over the valley and the open farmland to the north-east. The components will be partially screened from Millington Hall by intervening farm buildings. Construction traffic using Millington Lane will introduce additional traffic movements into views.</p> <p>The combination of the construction works outlined above will result in a <b>high</b> magnitude of visual change.</p> <p>The <b>high</b> magnitude of visual change and <b>high</b> sensitivity will result in a <b>major</b> adverse significant effect.</p>	<p>Level of effect:  <b>Major</b> adverse (significant)</p>
<p><b>Night-time effects:</b></p> <p>The additional night-time lighting required for the Agden Brook viaduct satellite compound will create a lit area close to the viewpoint. It will be seen against the dark backdrop of Millington Clough, resulting in a noticeable change in the existing view. The controls on light spill set out in the draft CoCP will limit the change these new light sources introduce to the wider view.</p> <p>There will be a <b>high</b> magnitude of visual change and a <b>major</b> adverse effect.</p>	<p>Level of effect:  <b>Major</b> adverse (significant)</p>

<b>View south from Millington Lane (High sensitivity receptor) (VP 318-02-003)</b>	
<p>Residents on Millington Lane and users on Footpath Millington 4/1, of <b>high</b> susceptibility and with <b>medium</b> value views, will experience a substantial change to views due to the construction of Hulseheath North embankment, Agden Brook viaduct, Millington Lane realignment, Millington Lane overbridge and Millington cutting. Woodland will be removed during the laying of a new high-pressure gas main through Millington Clough, opening up</p>	<p>Level of effect:  <b>Major</b> adverse (significant)</p>

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View south from Millington Lane (High sensitivity receptor) (VP 318-02-003)	
<p>views of construction to the south-west. Views from Millington Lane will be partially screened by the raised landform of the western side of the valley and by vegetation lining the lane. Views from Footpath Millington 4/1 will be partially screened by vegetation lining the Agden Brook but will become more open nearer the land required for the construction of the Proposed Scheme. The large-scale elements associated with construction, including machinery and earthworks, will be prominent in the view over the valley and farmland. Construction traffic using Millington Lane will introduce uncharacteristic movement into views.</p> <p>The combination of the construction works outlined above will result in a <b>high</b> magnitude of visual change.</p> <p>The <b>high</b> magnitude of visual change and <b>high</b> sensitivity will result in a <b>major</b> adverse significant effect.</p>	
<p><b>Night-time effects:</b></p> <p>The additional night-time lighting required for the Agden Brook viaduct satellite compound will create a localised area of lighting in the background of the view, filtered or partly screened from residential properties on Millington Lane by intervening vegetation. Where apparent, the lit compound will be seen in the context of the dark valley of Millington Clough. The controls on light spill set out in the draft CoCP will limit the change these new light sources introduce to the wider view.</p> <p>There will be a <b>medium</b> magnitude of visual change and a <b>moderate</b> adverse significant effect.</p>	<p>Level of effect:  <b>Moderate</b> adverse (significant)</p>

View south-east from Footpath Millington 11/1 (High sensitivity receptor) (VP 318-03-004)	
<p>PRoW users and visitors to Booth Bank Farm, of <b>high</b> susceptibility and with <b>medium</b> value views, will experience a noticeable change to views due to the construction of the Millington Lane realignment and overbridge, Millington Lane telecommunications site and Millington cutting. Views of construction from Footpath Millington 11/1 will be partially screened by the rise in the landform between the viewpoint and construction works and by Rushy-pits Covert. Trees will be removed along Millington Lane, opening up views of the Millington Lane realignment and overbridge construction works. The use of Millington Lane as a construction traffic route will introduce uncharacteristic levels of traffic movement into the view. Cranes and taller construction machinery will be apparent on the skyline. Views of construction from the farmhouse of Booth Bank Farm will be screened by intervening vegetation and the rising landform, but there could be views from the eastern boundary of the farmland. The combination of the construction works outlined above will result in a <b>medium</b> magnitude of visual change.</p> <p>The <b>medium</b> magnitude of visual change and <b>high</b> sensitivity will result in a <b>moderate</b> significant adverse effect.</p>	<p>Level of effect:  <b>Moderate</b> adverse (significant)</p>

View south-east from Footpath Millington 7/2 (High sensitivity receptors) (VP 329-02-001)	
<p>Residents at Hope Cottage and PRoW users, of <b>high</b> susceptibility and with <b>medium</b> value views, will experience substantial changes to near and middle-distance views due to the construction of Millington cutting, Millington North cutting, Manchester to Liverpool junction and Footpath Millington 7/4 diversion and accommodation overbridge. Views from Hope Cottage will be filtered by garden vegetation, but there will be clear views from parts of the PRoW. The large-scale components associated with construction, including the A556 Chester</p>	<p>Level of effect:  <b>Major</b> adverse (significant)</p>

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<b>View south-east from Footpath Millington 7/2 (High sensitivity receptors) (VP 329-02-001)</b>	
<p>Road satellite compound, machinery, earthworks and temporary stockpiles, will be prominent in views over the open farmland.</p> <p>The combination of the construction works outlined above will result in a <b>high</b> magnitude of visual change.</p> <p>The <b>high</b> magnitude of visual change and <b>high</b> sensitivity will result in a <b>major</b> adverse significant effect.</p>	
<p><b>Night-time effects:</b></p> <p>At night, the lighting associated with the A556 Chester Road satellite compound will introduce a lit area into the relatively dark middle distance, resulting in a noticeable change in the night-time characteristics of the existing view. However, the lit area will be seen in the context of lighting at Junction 8 of the M56. The controls on light spill set out in the draft CoCP will limit the change these new light sources introduce to the wider view. There will be a <b>medium</b> magnitude of visual change and a <b>moderate</b> adverse significant effect.</p>	<p>Level of effect:  <b>Moderate</b> adverse (significant)</p>
<b>View north from Footpath Millington 6/2 (High sensitivity receptors) (VP 329-02-002)</b>	
<p>Residents at Newhall Cottages and Mereside Farm and PRoW users, of <b>high</b> susceptibility and with <b>medium</b> value views, will experience substantial changes to views due to the construction of Millington cutting, Millington North cutting, Manchester to Liverpool junction, Millington Footpath 7/4 diversion and accommodation overbridge and A556 Chester Road overbridge. There will be clear views of construction activity from the footpath, but views from Newhall Cottages and Mereside Farm will be filtered by garden vegetation and partly screened by the rolling landform. There will be more distant views of construction over open farmland from Newhall Farm and other residential properties at the southern end of Millington Lane. The large-scale components associated with construction, including the A556 Chester Road satellite compound, machinery, earthworks and temporary stockpiles, will be prominent in views over the open farmland.</p> <p>The combination of the construction works outlined above will result in a <b>high</b> magnitude of visual change.</p> <p>The <b>high</b> magnitude of visual change and <b>high</b> sensitivity will result in a <b>major</b> adverse significant effect.</p> <p>A photomontage illustrating this scenario is included in Volume 5: Appendix LV-001-0MA06, Part 3.</p>	<p>Level of effect:  <b>Major</b> adverse (significant)</p>
<b>View west from Cherry Tree Lane (High sensitivity receptors) (VP 329-02-004)</b>	
<p>Residents at Mereside Cottage of <b>high</b> susceptibility, road users along Cherry Tree Lane and workers at Cherry Tree Farm of lower susceptibility, all with <b>medium</b> value views will experience substantial changes to near-distance views due to the construction of Rostherne cutting and A556 Chester Road overbridge. The demolition of Cherry Tree Farm business units and removal of vegetation along Cherry Tree Lane and the A556, will open up views of the construction works taking place to the north and west. The large-scale elements associated with construction, including the machinery, earthworks and material stockpiles, will be prominent in the view. Construction traffic using Cherry Tree Lane will introduce increased traffic movement into views.</p> <p>The combination of the construction works outlined above will result in a <b>high</b> magnitude of visual change.</p> <p>The <b>high</b> magnitude of visual change and <b>high</b> sensitivity will result in a <b>major</b> adverse significant effect.</p>	<p>Level of effect:  <b>Major</b> adverse (significant)</p>

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View north from Cherry Tree Lane (High sensitivity receptors) (VP 329-02-007)	
<p>Residents at Covert Cottage and users of the diverted Footpath Rostherne 4/1, of <b>high</b> susceptibility and road users along Cherry Tree Lane of lower susceptibility, all with <b>medium</b> value views, will experience substantial changes to near and middle-distance views due to the demolition of Bowden View Farm and the construction of Yarwood Heath Farm accommodation overbridge, Rostherne cutting, Rostherne West embankment, Tom Lane telecommunications site and Rostherne East box structure. The large-scale components associated with construction, including the Rostherne cutting satellite compound, Blackburn's Brook satellite compound, machinery, earthworks and material stockpiles, will be prominent in the view over the open farmland to the north-east. The components will extend across most of the view from Cherry Tree Lane and the diverted Footpath Rostherne 4/1 but will be partially screened from Covert Cottage by intervening vegetation. Construction traffic using Cherry Tree Lane will introduce uncharacteristic traffic movement into views.</p> <p>The combination of the construction works outlined above will result in a <b>high</b> magnitude of visual change.</p> <p>The <b>high</b> magnitude of visual change and <b>high</b> sensitivity will result in a <b>major</b> adverse significant effect.</p>	<p>Level of effect:  <b>Major</b> adverse (significant)</p>
<p><b>Night-time effects:</b></p> <p>The additional night-time lighting required for the Rostherne cutting satellite compound and the Blackburn's Brook viaduct satellite compound will add to the existing sky glow caused by traffic on the M56 and from light sources on the urban edge of Greater Manchester. The controls on light spill set out in the draft CoCP will limit the change these new light sources introduce to the wider view. There will be a noticeable change in the character of the existing view at night-time. There will be a <b>medium</b> magnitude of visual change and a <b>moderate</b> adverse significant effect.</p>	<p>Level of effect:  <b>Moderate</b> adverse (significant)</p>
View north from Footpath Rostherne 5/1 (High sensitivity receptors) (VP 330-02-002)	
<p>Residents of Birkin House, Birkinheath Cottage and Briddon Weir Farm and users of Footpath Rostherne 5/1 (temporarily diverted during construction), of <b>high</b> susceptibility and with <b>medium</b> value views, will experience substantial changes to near and middle-distance views due to the construction of Blackburn's Brook North viaduct, Birkin Brook embankment, Manchester to Liverpool junction and Ashley IMB-R. They will also see the diversion of an overhead power line. Residents at Briddon Weir Farm will have oblique, distant views of the construction of route of the Proposed Scheme, Rostherne cutting and Rostherne East box structure. The large-scale components associated with construction, including the Blackburn's Brook satellite compound and Birkin Brook satellite compound, machinery, earthworks and temporary stockpiles, will be prominent in views over farmland. The components will extend across most of the view from the footpath but will be partially screened from Birkin House by intervening vegetation and from Briddon Weir Farm by the intervening farm buildings.</p> <p>The combination of the construction works outlined above will result in a <b>high</b> magnitude of visual change.</p> <p>The <b>high</b> magnitude of visual change and <b>high</b> sensitivity will result in a <b>major</b> adverse significant effect.</p> <p>A photomontage illustrating this scenario is included in Volume 5: Appendix LV-001-OMA06, Part 3.</p>	<p>Level of effect:  <b>Major</b> adverse (significant)</p>
<p><b>Night-time effects:</b></p> <p>At night, the lighting associated with Blackburn's Brook viaduct satellite compound and Birkin Brook viaduct satellite compound will be visible in the middle distance through</p>	<p>Level of effect:  <b>Moderate</b> adverse (significant)</p>

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<b>View north from Footpath Rostherne 5/1 (High sensitivity receptors) (VP 330-02-002)</b>	
<p>existing vegetation in a predominantly rural and unlit area. There will be a noticeable change in the character of the existing view at night-time. The controls on light spill set out in the draft CoCP will limit the change these new light sources introduce to the wider view. There will be a <b>medium</b> magnitude of visual change and a <b>moderate</b> adverse significant effect.</p>	
<b>View south-west from Footpath Rostherne 5/1 (High sensitivity receptors) (VP 330-03-003)</b>	
<p>Users of Footpath Rostherne 5/1 (temporarily diverted during construction), Ashley 2/3 and Ashley 3/1 of <b>high</b> susceptibility and with <b>medium</b> value views, will experience substantial changes to near and middle-distance views due to the construction of Rostherne East box structure, Blackburn's Brook North viaduct, Birkin Brook embankment and Ashley IMB-R and the diversion of an overhead power line. The large-scale components associated with construction including Blackburn's Brook and Birkin Brook satellite compounds, machinery, earthworks and temporary stockpiles will be prominent in views over farmland.</p> <p>The combination of the construction works outlined above will result in a <b>high</b> magnitude of visual change.</p> <p>The <b>high</b> magnitude of visual change and <b>high</b> sensitivity will result in a <b>major</b> adverse significant effect.</p>	<p>Level of effect:  <b>Major</b> adverse (significant)</p>
<b>View north-east from Ashley Road (Medium sensitivity receptors) (VP 330-04-004)</b>	
<p>Users of Ashley Road, of <b>medium</b> susceptibility and with <b>medium</b> value views, will experience noticeable changes to views as a result of the Proposed Scheme. Ashley Road will be a construction traffic route, introducing additional traffic movements into the existing view of a country road. An existing power line will be diverted, resulting in a loss of vegetation from the northern end of Birkinheath Covert, opening up views north from the road.</p> <p>The combination of the construction works outlined above will result in a <b>medium</b> magnitude of visual change.</p> <p>The <b>medium</b> magnitude of visual change and <b>medium</b> sensitivity will result in a <b>moderate</b> adverse significant effect.</p>	<p>Level of effect:  <b>Moderate</b> adverse (significant)</p>
<b>View north from Ashley Road at Birkin Farm (High sensitivity receptors) (VP 330-02-006)</b>	
<p>Residents at Birkin Farm and users of Footpath Ashley 3/1, of <b>high</b> susceptibility and with <b>medium</b> value views, will experience substantial changes to near and middle-distance views as a result of the Proposed Scheme. Users of the permanently diverted Footpath Ashley 3/1 and residents will have clear views of the construction of Birkin Brook embankment, Ashley IMB-R and Ashley Road diversion. The construction of Ashley embankment will be partly screened by a woodland block adjacent to Birkin Farm which includes a high proportion of evergreen trees. The diversion of an overhead power line closer to Birkin Farm will also be visible. The large-scale components associated with construction, including Ashley IMB-R satellite compound, machinery, earthworks and temporary stockpiles, will be prominent in views north over open farmland. The components will extend across the majority of the view. Ashley Road will be a construction traffic route, introducing additional traffic movements into the existing view of a country road.</p> <p>The combination of the construction works outlined above will result in a <b>high</b> magnitude of visual change.</p>	<p>Level of effect:  <b>Major</b> adverse (significant)</p>

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<b>View north from Ashley Road at Birkin Farm (High sensitivity receptors) (VP 330-02-006)</b>	
The <b>high</b> magnitude of visual change and <b>high</b> sensitivity will result in a <b>major</b> adverse significant effect.	
<p><b>Night-time effects:</b></p> <p>At night, the lighting associated with Ashley IMB-R satellite compound will be visible within a predominantly unlit landscape. There will be a noticeable change in the character of the existing view at night-time. The controls on light spill set out in the draft CoCP will limit the change these new light sources introduce to the wider view. There will be a <b>medium</b> magnitude of visual change and a <b>moderate</b> adverse significant effect.</p>	<p>Level of effect:  <b>Moderate</b> adverse (significant)</p>

<b>View south-east from Ashley Road at Stock Farm (High sensitivity receptors) (VP 330-02-007)</b>	
<p>Residents at Stock Farm and Sycamore Cottage and users of Footpath Ashley 6/5, of <b>high</b> susceptibility and visitors to Ashley Cricket club of lower susceptibility, all with <b>medium</b> value views, will experience substantial changes to near and middle-distance views as a result of the Proposed Scheme. Residents and guests at Stock Farm will have clear views of the construction of Birkin Brook embankment, Ashley embankment, Ashley IMB-R, and the diversion of overhead power lines. Views of construction from Ashley Cricket Club and Sycamore Cottage will be more distant and filtered through intervening vegetation. The large-scale components associated with construction, including Ashley IMB-R satellite compound, Ashley railhead, machinery, earthworks and temporary stockpiles, will be prominent in views east, south-east and south over open farmland. The components will extend across the majority of the view from Stock Farm. Ashley Road will be a construction traffic route, introducing additional traffic movements into the existing view of a country road.</p> <p>The combination of the construction works outlined above will result in a <b>high</b> magnitude of visual change.</p> <p>The <b>high</b> magnitude of visual change and <b>high</b> sensitivity will result in a <b>major</b> adverse significant effect.</p>	<p>Level of effect:  <b>Major</b> adverse (significant)</p>
<p><b>Night-time effects:</b></p> <p>At night, the lighting associated with Ashley IMB-R satellite compound and Ashley railhead will be visible in the near distance in a predominantly rural and unlit area. The controls on light spill set out in the draft CoCP will limit the change these new light sources introduce to the wider view. There will be a <b>high</b> magnitude of visual change and a <b>major</b> adverse significant effect.</p>	<p>Level of effect:  <b>Major</b> adverse (significant)</p>

<b>View north-east from Footpath Ashley 6/3 at Arden House (High sensitivity receptors) (VP 330-03-008)</b>	
<p>Users of Footpaths Ashley 6/3, 6/4, 7/1 and 8/1 and residents of Arden House, of <b>high</b> susceptibility and with <b>medium</b> value views, will experience noticeable changes to views as a result of the Proposed Scheme. Footpaths Ashley 6/4 and 8/1 will be temporarily closed during construction, but Footpaths Ashley 6/3 and 7/1 will pass close to the edge of Ashley railhead for two short sections and views from these locations will be near-distance and uninterrupted. Removal of woodland vegetation on Mobberley Road will open up middle-distance views from Footpath Ashley 6/3 and distant views from Arden House of the construction of Mobberley Road offline overbridge and Mobberley Road realignment. Views of the construction of Ashley embankment, Mid-Cheshire (Railway) and Mobberley Road viaduct, diverted Ashley Road and the construction and functioning of Ashley railhead will be filtered through intervening woodland from Arden House. There will be clear views of the</p>	<p>Level of effect:  <b>Moderate</b> adverse (significant)</p>

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<p><b>View north-east from Footpath Ashley 6/3 at Arden House (High sensitivity receptors) (VP 330-03-008)</b></p>	
<p>works associated with a power line diversion from Footpath Ashley 7/1 and Arden House. The large-scale components associated with construction, including Mobberley Road South satellite compound, Birkinheath Covert satellite compound, machinery, earthworks and material stockpiles, will be uncharacteristic of existing views north and east over the farmed landscape. Mobberley Road and Ashley Road will be construction traffic routes, introducing additional traffic movement into views.</p> <p>The combination of the construction works outlined above will result in a <b>medium</b> magnitude of visual change.</p> <p>The <b>medium</b> magnitude of visual change and <b>high</b> sensitivity will result in a <b>moderate</b> adverse significant effect.</p>	
<p><b>Night-time effects:</b></p> <p>At night, the lighting associated with Ashley railhead and Mobberley Road south satellite compound will be visible in filtered views east within a predominantly rural and unlit area. The controls on light spill set out in the draft CoCP will limit the change these new light sources introduce to the wider view. There will be a <b>medium</b> magnitude of visual change and a <b>moderate</b> adverse significant effect.</p>	<p>Level of effect:  <b>Moderate</b> adverse (significant)</p>
<p><b>View south from Ashley Road bridge over Mid-Cheshire Line (High sensitivity receptors) (VP 330-02-009) and view south from Mobberley Road, Ashley (High sensitivity receptors) (VP 331-02-001)</b></p>	
<p>Residents of Ashley Road and Mobberley Road and PRoW users of <b>high</b> susceptibility, and road users of lower susceptibility, all with <b>medium</b> value views, will experience substantial changes to middle-distance and distant views as a result of the Proposed Scheme. Residents and road users will have clear views of the construction of Ashley embankment, Mid-Cheshire (Railway) and Mobberley Road viaduct, Mobberley Road offline overbridge, Mobberley Road realignment and Thorns Green embankment. The large-scale elements associated with construction, including Mobberley Road North satellite compound, machinery, earthworks and material stockpiles, will be highly visible and out of character with existing views over farmland. The elements will extend across the majority of the view. Ashley Road will be a construction traffic route, introducing uncharacteristic levels of movement into the existing view of a country road.</p> <p>The combination of the construction works outlined above will result in a <b>high</b> magnitude of visual change.</p> <p>The <b>high</b> magnitude of visual change and <b>high</b> sensitivity will result in a <b>major</b> adverse effect.</p>	<p>Level of effect:  <b>Major</b> adverse (significant)</p>
<p><b>Night-time effects:</b></p> <p>At night, the lighting at Mobberley Road north satellite compound and Ashley railhead will be visible in the middle distance within a rural and unlit area. The controls on light spill set out in the draft CoCP will limit the change these new light sources introduce to the wider view. Both compounds and the railhead will be lit. There will be a <b>medium</b> magnitude of visual change and a <b>moderate</b> adverse significant effect.</p>	<p>Level of effect:  <b>Moderate</b> adverse (significant)</p>
<p><b>View east from Arden Lodge on Mobberley Road (High sensitivity receptor) (VP 330-02-010)</b></p>	
<p>Residents at Arden Lodge and Sugar Brook Farm and users of Footpath Ashley 6/5, of <b>high</b> susceptibility, and road users along Mobberley Road of lower susceptibility, all with <b>medium</b> value views, will experience substantial changes to near and middle-distance views as a result of the Proposed Scheme. Residents and recreational users will have clear views of Mobberley Road south satellite compound and the construction and operation of Ashley</p>	<p>Level of effect:  <b>Major</b> adverse (significant)</p>



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<b>View east from Arden Lodge on Mobberley Road (High sensitivity receptor) (VP 330-02-010)</b>	
<p>railhead. They will also see the construction of Mobberley Road offline overbridge in the distance. The large-scale elements associated with construction, including the machinery, earthworks and material stockpiles, will be prominent in views east over open farmland. The elements will extend across the majority of the view.</p> <p>The combination of these factors will result in a <b>high</b> magnitude of visual change.</p> <p>The <b>high</b> magnitude of visual change and <b>high</b> sensitivity will result in a <b>major</b> adverse significant effect.</p>	
<p><b>Night-time effects:</b></p> <p>At night, the lighting associated with Mobberley Road south satellite compound will create a lit area close to residential receptors and road users. It will be seen within a predominantly rural and unlit area. The controls on light spill set out in the draft CoCP will limit the change these new light sources introduce to the wider view. Both compounds and the railhead will be lit. There will be a <b>high</b> magnitude of visual change and a <b>major</b> adverse significant effect.</p>	<p>Level of effect:  <b>Major</b> adverse (significant)</p>

<b>View north from track to Lower House Farm (High sensitivity receptor) (VP 331-02-002)</b>	
<p>Residents at Lower House Farm, of <b>high</b> susceptibility and with <b>medium</b> value views, will experience a substantial alteration to views as a result of the Proposed Scheme. They will have filtered views of the construction of Mid-Cheshire (Railway) and Mobberley Road viaduct, Mobberley Road offline overbridge and Thorns Green embankment and the construction and operation of Ashley railhead. The large-scale components associated with construction, including machinery, earthworks and temporary stockpiles, will be prominent in views north and west over open farmland. The components will extend across the majority of the view.</p> <p>The combination of the construction works outlined above will result in a <b>high</b> magnitude of visual change.</p> <p>The <b>high</b> magnitude of visual change and <b>high</b> sensitivity will result in a <b>major</b> adverse significant effect.</p>	<p>Level of effect:  <b>Major</b> adverse (significant)</p>
<p><b>Night-time effects:</b></p> <p>At night, the lighting for Mobberley Road north satellite compound and Ashley railhead will be visible in the middle distance within a rural and unlit area. The controls on light spill set out in the draft CoCP will limit the change these new light sources introduce to the wider view. There will be a <b>medium</b> magnitude of visual change and a <b>moderate</b> adverse effect.</p>	<p>Level of effect:  <b>Moderate</b> adverse (significant)</p>

<b>View south from Tanyard Lane (High sensitivity receptor) (VP 331-02-003)</b>	
<p>Residents in Tanyard Lane, of <b>high</b> susceptibility and with <b>medium</b> value views, will experience a noticeable alteration to views as a result of the Proposed Scheme. The use of Tanyard Lane, Castle Mill Lane and Back Lane as construction traffic routes will introduce additional traffic movement into views. However, the majority of the construction works will be screened or filtered by intervening vegetation. Taller construction machinery used for the construction of Thorns Green embankment and Back Lane Farm accommodation overbridge will be visible in the distance but will not be a prominent component of the view as perceived in the wider panorama.</p> <p>The combination of the construction works outlined above will result in a <b>medium</b> magnitude of visual change.</p> <p>The <b>medium</b> magnitude of visual change and <b>high</b> sensitivity will result in a <b>moderate</b> adverse significant effect.</p>	<p>Level of effect:  <b>Moderate</b> adverse (significant)</p>

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<p><b>View south from Back Lane (High sensitivity receptor) (VP 331-02-004)</b></p>	
<p>Residents at Back Lane Farm and Ashlar on Back Lane, of <b>high</b> susceptibility and road users along Back Lane of lower susceptibility, all with <b>medium</b> value views, will experience a substantial alteration to views as a result of the Proposed Scheme. The removal of vegetation from the garden of Ashlar will open up clear views of the works from the house. The construction of Thorns Green embankment, Thorns Green cutting, and Back Lane Farm accommodation overbridge and access diversion will be visible in the near and middle distance. The large-scale components associated with construction, including machinery, earthworks and temporary stockpiles, will be visible across the majority of the view. The use of Back Lane as a construction traffic route will introduce additional traffic movement into views.</p> <p>The combination of the construction works outlined above will result in a <b>high</b> magnitude of visual change.</p> <p>The <b>high</b> magnitude of visual change and <b>high</b> sensitivity will result in a <b>major</b> adverse significant effect.</p>	<p>Level of effect:  <b>Major</b> adverse (significant)</p>
<p><b>View north-west from Brickhill Lane (High sensitivity receptor) (VP 331-02-005)</b></p>	
<p>Residents at Middle Cottage, of <b>high</b> susceptibility and with <b>medium</b> value views, will experience a noticeable change to views as a result of the Proposed Scheme. There will be filtered, and partially screened views of the taller parts associated with the construction of Back Lane Farm accommodation overbridge and Thorns Green cutting. The large-scale machinery and structures associated with construction will be visible in views west and north-west over open farmland. The components associated with construction will be visible over part of the view.</p> <p>The combination of the construction works outlined above will result in a <b>medium</b> magnitude of visual change.</p> <p>The <b>medium</b> magnitude of visual change and <b>high</b> sensitivity will result in a <b>moderate</b> adverse significant effect.</p>	<p>Level of effect:  <b>Moderate</b> adverse (significant)</p>
<p><b>View south-east from Back Lane in Thorns Green (High sensitivity receptor) (VP 331-02-006)</b></p>	
<p>Residents at Thorns Green, of <b>high</b> susceptibility and with <b>medium</b> value views, will experience a substantial alteration to views as a result of the Proposed Scheme. The property demolition at Higher Thorns Green Farm and removal of hedgerows and trees in proximity to properties will allow open views of the construction of Thorns Green cutting and Castle Mill Lane realignment and overbridge. The large-scale structures associated with construction including machinery, earthworks and temporary stockpiles will be visible across the majority of the near and middle distance. The use of Back Lane as a construction traffic route will introduce additional traffic movement into views.</p> <p>The combination of the construction works outlined above will result in a <b>high</b> magnitude of visual change.</p> <p>The <b>high</b> magnitude of visual change and <b>high</b> sensitivity will result in a <b>major</b> adverse significant effect.</p>	<p>Level of effect:  <b>Major</b> adverse (significant)</p>
<p><b>Night-time effects:</b></p> <p>At night, the lighting for Castle Mill Lane satellite compound will be visible in the middle distance within a rural and generally unlit area. The controls on light spill set out in the draft CoCP will limit the extent of change introduced by these new light sources in the wider view.</p>	<p>Level of effect:  <b>Moderate</b> adverse (significant)</p>

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<b>View south-east from Back Lane in Thorns Green (High sensitivity receptor) (VP 331-02-006)</b>	
There will be a <b>medium</b> magnitude of visual change and a <b>moderate</b> adverse significant effect.	
<b>View north from Castle Mill Lane (High sensitivity receptor) (VP 331-02-007)</b>	
<p>Residents on Castle Mill Lane and users of Footpaths Ashley 15/1 and 11/1, of <b>high</b> susceptibility and with <b>medium</b> value views, will experience a substantial alteration to views as a result of the Proposed Scheme. Residents at Hunters Close and users of Footpath Ashley 15/1 will experience a substantial alteration to views. The demolition of Higher Thorns Green Farm and cottages on Castle Mill Lane and the construction of Thorns Green cutting, Castle Mill Lane realignment, Castle Mill Lane overbridge, Castle Mill Lane telecommunications site and Brickhill Lane diversion will be clearly visible in the near and middle distance. The removal of boundary vegetation close to Chapel House Farm will open up views to the north and west. The large-scale structures associated with construction including Castle Mill Lane satellite compound, machinery, earthworks and temporary stockpiles will be visible across the majority of the view. The use of Castle Mill Lane and Brickhill Lane as a construction traffic route will introduce additional traffic movement into views.</p> <p>The combination of the construction works outlined above will result in a <b>high</b> magnitude of visual change.</p> <p>The <b>high</b> magnitude of visual change and <b>high</b> sensitivity will result in a <b>major</b> adverse significant effect.</p>	Level of effect: <b>Major</b> adverse (significant)
<p><b>Night-time effects:</b></p> <p>At night, the lighting for Castle Mill Lane satellite compound will be visible in the near distance of views from Chapel House Farm and middle distance views from Hunters Close within a rural and generally unlit landscape. The controls on light spill set out in the draft CoCP will limit the change these new light sources introduce to the wider view. There will be a <b>high</b> magnitude of visual change and a <b>major</b> adverse significant effect.</p>	Level of effect: <b>Major</b> adverse (significant)
<b>View north-west from Breach House Lane (High sensitivity receptor) (VP 331-02-009)</b>	
<p>Residents on Mobberley Road near the junction with Breach House Lane and on Breach House Lane, of <b>high</b> susceptibility and with <b>medium</b> value views, will experience noticeable changes to near and middle-distance views as a result of the Proposed Scheme. They will have clear views of the works to the existing overhead power line in the near and middle distance. Residents on Breach House Lane will have glimpsed views of the works above intervening vegetation. The construction and operation of Ashley railhead will be screened in summer from Mobberley Road and Breach House Lane by existing intervening vegetation along Sugar Brook and Mobberley Road but may be visible in filtered views in winter. The works to the overhead power line will be prominent in views for the short construction period required for this specific work.</p> <p>The combination of the construction works outlined above will result in a <b>medium</b> magnitude of visual change.</p> <p>The <b>medium</b> magnitude of visual change and <b>high</b> sensitivity will result in a <b>moderate</b> adverse significant effect.</p>	Level of effect: <b>Moderate</b> adverse (significant)

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<p><b>View north-west from Ringway Footpath 13, near Pigleystair Bridge (High sensitivity receptor) (VP 332-03-001)</b></p>	
<p>Users of Footpaths Ringway 12, 13, and 14 and Footpaths Ashley 10/1 and 11/1, of <b>high</b> susceptibility and with <b>medium</b> value views, will experience a substantial alteration to views as a result of the Proposed Scheme. There will be near views of the construction of River Bollin South embankment, River Bollin East viaduct and River Bollin North embankment. Removal of vegetation during construction will open up wider views of the construction works. The large-scale components associated with construction, including River Bollin East viaduct satellite compound, machinery, earthworks and temporary stockpiles, will be visible across the majority of views in the near and middle distance.</p> <p>The combination of the construction works outlined above will result in a <b>high</b> magnitude of visual change.</p> <p>The <b>high</b> magnitude of visual change and <b>high</b> sensitivity will result in a <b>major</b> adverse significant effect.</p> <p>A photomontage illustrating this scenario is included in Volume 5: Appendix LV-001-0MA06, Part 3.</p>	<p>Level of effect:  <b>Major</b> adverse (significant)</p>
<p><b>View west by Yew Tree House on Sunbank Lane (High sensitivity receptor) (VP 332-02-003) and view west from Sunbank Lane by Keepers Cottage (High sensitivity receptor) (VP 332-02-004)</b></p>	
<p>Residents and users of Footpath Ringway 10 and 11, of <b>high</b> (residents) susceptibility, and road users along Sunbank Lane with lower susceptibility, all with <b>medium</b> value views will experience a substantial alteration to views as a result of the Proposed Scheme. There will be near-distance views of the construction of Ringway cutting, Sunbank Lane overbridge, Sunbank Lane realignment, M56 East tunnel and Manchester Airport High Speed cutting. Footpath Ringway 10 will be temporarily diverted. Removal of vegetation, together with demolition of properties, will open up wide views of the construction works and the emerging structures. The large-scale components associated with construction, including Sunbank Lane satellite compound, machinery, earthworks and temporary stockpiles, will be visible across the majority of views in the near and middle distance. The use of Sunbank Lane as a construction traffic route will introduce additional traffic movements into views.</p> <p>The combination of the construction works outlined above will result in a <b>high</b> magnitude of visual change.</p> <p>The <b>high</b> magnitude of visual change and <b>high</b> sensitivity will result in a <b>major</b> adverse significant effect.</p>	<p>Level of effect:  <b>Major</b> adverse (significant)</p>
<p><b>Night-time effects:</b></p> <p>At night, the lighting in Sunbank Lane satellite compound will create a brightly lit area in near-distance views. Lighting will be introduced into a relatively dark view, despite skyglow caused by lighting along the M56 and the urban areas nearby. The controls on light spill set out in the draft CoCP will limit the change these new light sources introduce to the wider view. There will be a <b>high</b> magnitude of visual change and a <b>major</b> adverse significant effect.</p>	<p>Level of effect:  <b>Major</b> adverse (significant)</p>
<p><b>View east from Burnside, Warburton Green (High sensitivity receptor) (VP 332-02-005)</b></p>	
<p>Residents and users of Footpaths Hale 12 and 13 and Footpath Ringway 9, of <b>high</b> susceptibility and with <b>medium</b> value views, will experience a substantial alteration to views as a result of the Proposed Scheme. There will be near-distance views of the demolition of houses on the A538 Hale Road and the construction of M56 East tunnel, Manchester Airport High Speed station cutting and A538 Hale Road realignment and overbridge (south). The large-scale components associated with construction, including the M56 East satellite</p>	<p>Level of effect:  <b>Major</b> adverse (significant)</p>

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View east from Burnside, Warburton Green (High sensitivity receptor) (VP 332-02-005)	
<p>compound, machinery, earthworks and temporary stockpiles, will be visible in the near and middle distance.</p> <p>The combination of above will result in a <b>high</b> magnitude of visual change.</p> <p>The <b>high</b> magnitude of visual change and <b>high</b> sensitivity will result in a <b>major</b> adverse significant effect.</p>	
<p><b>Night-time effects:</b></p> <p>Lighting for M56 East satellite compound will create a brightly lit area in near-distance views. These views are currently unlit, but the darkness of the night sky is reduced by skyglow caused by lighting along the M56 and the urban areas nearby. The controls on light spill set out in the draft CoCP will limit the change these new light sources introduce to the wider view. There will be a <b>high</b> magnitude of visual change and a <b>major</b> adverse significant effect.</p>	<p>Level of effect:  <b>Major</b> adverse (significant)</p>

View east from the A538 Hale Road (High sensitivity receptor) (VP 332-02-006)	
<p>Residents on the A538 Hale Road, of <b>high</b> susceptibility and road users of lower susceptibility, both with <b>medium</b> value views, will experience a substantial alteration to views as a result of the Proposed Scheme. There will be clear and filtered views of the demolition of buildings along A538 Hale Road and the construction of the A538 Hale Road service road (north), A538 Hale Road (south), A538 Hale Road realignment, Manchester Airport High Speed station cutting, A538 Hale Road/Station Access gyratory and A538 Hale Road overbridges (south), A538 Hale Road overbridge (north). Removal of roadside and garden vegetation will open up views of construction and the emerging structures. The large-scale components associated with construction, including the M56 East satellite compound and Manchester Airport High Speed station south satellite compound, machinery and earthworks, will be visible in the near and middle distance.</p> <p>The combination of the construction works outlined above will result in a <b>high</b> magnitude of visual change.</p> <p>The <b>high</b> magnitude of visual change and <b>high</b> sensitivity will result in a <b>major</b> adverse significant effect</p>	<p>Level of effect:  <b>Major</b> adverse (significant)</p>
<p><b>Night-time effects:</b></p> <p>The M56 East satellite compound and Manchester Airport High Speed station south satellite compound will add to the existing high light levels in this urban night-time environment. The demolition of buildings and removal of vegetation during construction will open up views of the lighting at the M56 junction 6 in the distance. The controls on light spill set out in the draft CoCP will limit the change these new light sources introduce to the wider view. There will be a <b>medium</b> magnitude of visual change and a <b>moderate</b> adverse significant effect.</p>	<p>Level of effect:  <b>Moderate</b> adverse (significant)</p>

View south-east from Brooks Drive (High sensitivity receptor) (VP 332-02-008)	
<p>Residents on Brooks Drive, of <b>high</b> susceptibility and with <b>medium</b> value views, will experience substantial changes to views as a result of the Proposed Scheme. Manchester Airport High Speed Station north satellite compound will occupy the middle distance of the view and the eastern end of Davenport Green Wood will be felled, opening up distant views towards the M56 and Manchester Airport. An area of woodland habitat creation will be planted between Davenport Green and Flaxhigh Covert. This area will be planted early in the construction period and will act as a buffer zone between Brooks Drive and the construction works on the station, car parks, access road and the diversion of Timperley Brook. It will gradually become more established as construction continues. Residents will have views over this intervening planting zone of the construction of Manchester Airport High Speed station and the car parks and western access road. Most will be filtered or screened by</p>	<p>Level of effect:  <b>Major</b> adverse (significant)</p>

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View south-east from Brooks Drive (High sensitivity receptor) (VP 332-02-008)	
<p>garden vegetation, but from some properties, where the existing view is more open, there will be clear views of the Proposed Scheme in construction. The large-scale components associated with construction, including machinery, earthworks and temporary material stockpiles, will be extend across the majority of the view from Brooks Drive.</p> <p>The combination of the construction works outlined above will result in a <b>high</b> magnitude of visual change.</p> <p>The <b>high</b> magnitude of visual change and <b>high</b> sensitivity will result in a <b>major</b> adverse significant effect.</p> <p>A photomontage illustrating this scenario is included in Volume 5: Appendix LV-001-0MA06, Part 3.</p>	
<p><b>Night-time effects:</b></p> <p>Manchester Airport High Speed station north satellite compound will introduce a lit area into the middle distance and add to existing light levels in the urban night-time environment. The removal of vegetation during construction will open up distant views of the lighting on the M56 and at Manchester Airport. The controls on light spill set out in the draft CoCP will limit the change these new light sources introduce to the wider view. There will be a <b>medium</b> magnitude of visual change and a <b>moderate</b> adverse significant effect.</p>	<p>Level of effect:  <b>Moderate</b> adverse (significant)</p>

View east from Davenport Green Hall on Brooks Drive (High sensitivity receptor) (VP 333-02-001)	
<p>Residents on Roaring Gate Lane and at Davenport Green Hall, of <b>high</b> susceptibility and with <b>medium</b> value views, will experience substantial changes to views as a result of the Proposed Scheme. Construction will take place close to the boundary of Davenportgreen Farmhouse and Davenport Green Hall. Existing intervening woodland in the grounds of Davenportgreen Farmhouse and Davenport Green Hall will filter views of the construction of Manchester Airport High Speed station, Manchester tunnel south portal and auto-transformer station and Thorley Lane overbridge from this viewpoint. The large-scale components associated with construction, including the Manchester tunnel south portal main compound, machinery, earthworks and temporary material stockpiles, will extend across filtered views from the two properties.</p> <p>The combination of the construction works outlined above will result in a <b>high</b> magnitude of visual change.</p> <p>The <b>high</b> magnitude of visual change and <b>high</b> sensitivity will result in a <b>major</b> adverse significant effect</p>	<p>Level of effect:  <b>Major</b> adverse (significant)</p>
<p><b>Night-time effects:</b></p> <p>Manchester Airport High Speed station north satellite compound will introduce a lit area into the middle distance and add to existing light levels in the urban night-time environment. The controls on light spill set out in the draft CoCP will limit the change these new light sources introduce to the wider view. There will be a <b>medium</b> magnitude of visual change and a <b>moderate</b> adverse significant effect.</p>	<p>Level of effect:  <b>Moderate</b> adverse (significant)</p>

## Other mitigation measures

- 11.4.14 No other mitigation measures are considered reasonably practicable during construction. Not all landscape and visual effects can be mitigated due to the visibility of construction activity and the sensitivity of surrounding receptors.

11.4.15 However, consideration will be given during the detailed design stage to where additional mitigation planting can be established early in the construction programme to help achieve landscape integration or visual screening at an earlier time.

## **Summary of likely residual significant effects**

11.4.16 The temporary residual significant effects during construction remain as described above. These effects will be temporary and reversible in nature lasting only for the duration of the construction works. These residual effects will generally arise from the widespread presence of construction activity and construction plant within the landscape and viewed by surrounding residents, and users of PRow and main roads within the study area.

11.4.17 The significant effects that will remain after implementation of construction phase mitigation are summarised below:

- major adverse effects in relation to two LCA;
- major adverse visual effects at 22 representative residential viewpoint locations;
- moderate adverse visual effects at three representative residential viewpoint locations;
- major adverse night-time visual effects at seven representative residential viewpoint locations;
- moderate adverse night-time visual effects at 12 representative residential viewpoint locations;
- moderate adverse night-time visual effects for residents represented at one recreational viewpoint location;
- major adverse visual effects at three recreational viewpoint locations;
- moderate adverse visual effects at two recreational viewpoint location; and
- moderate adverse visual effects at one transport viewpoint location.

## **Cumulative effects**

### **Cumulative landscape effects**

11.4.18 No significant cumulative temporary effects during construction are anticipated.

### **Cumulative visual effects**

11.4.19 No significant cumulative temporary effects during construction are anticipated.

## **11.5 Permanent effects arising from operation**

11.5.1 The permanent features of the Proposed Scheme that have been taken into account in determining the effects arising during operation on landscape and visual receptors are presented in Section 2.2 of this report.

## Avoidance and mitigation measures

11.5.2 The operational assessment of impacts and effects is based on year 1 (2038), year 15 (2053) and year 30 (2068) of the Proposed Scheme. A process of iterative design and assessment has been employed, and is ongoing, to avoid or reduce adverse effects during the operation of the Proposed Scheme. Measures that will be integrated into the design of the Proposed Scheme include:

- design of earthworks to tie the engineering earthworks for embankments (such as Ashley and Thorns Green embankments) and cuttings into their wider landscape context and to mitigate views of structures and overhead line equipment from sensitive receptors, where reasonably practicable. Earthworks design also takes account of the relationship to surrounding land uses and management, such as agriculture;
- compensatory woodland planting in areas of loss, using the same species composition and planting types (and appropriate planting density) where reasonably practicable, such as mitigation planting at Millington Clough, Blackburn's Brook, along the River Bollin, and at Davenport Green and to provide habitat connectivity, enhanced landscape/green infrastructure connectivity, as well as connectivity of historic landscape features, where reasonably practicable, and to soften embankments and viaduct abutments; and
- hedgerow replacement and restoration in areas of loss to restore connectivity and landscape pattern, where reasonably practicable, and using an appropriate palette of hedgerow types and species to tie the Proposed Scheme mitigation into the wider landscape character; compensation for loss of field ponds with new wetlands, ecological ponds and biodiversity wetland features.

## Assessment of impacts and effects

11.5.3 The likely effects on landscape and visual receptors during operation of the Proposed Scheme relate to the presence of new structures and elements in the landscape including:

- Peacock Lane viaduct (located in the Pickmere to Agden and Hulseheath area (MA03)), Agden Brook, Blackburn's Brook North, Mid-Cheshire (Railway) and Mobberley Road and River Bollin East viaducts and Rostherne East box structure;
- Hulseheath North, Blackburn's Brook, Rostherne West, Rostherne East, Birkin Brook, Ashley, Thorns Green, River Bollin North and River Bollin South embankments;
- Millington Lane, Mobberley Road offline, A556, Castle Mill Lane, Sunbank Lane, A538 Hale Road (north), A538 Hale Road (south), and Thorley Lane overbridges and Footpath Millington 7/4, Yarwood Heath Farm and Back Lane Farm accommodation overbridges;
- Millington, Millington North, Rostherne, Rostherne North, Thorns Green, Ringway and Manchester Airport High Speed station cuttings;
- Ashley IMB-R;



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- Peacock Lane realignment (in the Pickmere to Agden and Hulseheath area (MA03)) and Millington Lane, Mobberley Road, Castle Mill Lane, Sunbank Lane, A538 Hale Road and Thorley Lane realignments;
- Ashley Road and Brickhill Lane diversions;
- Manchester Airport High Speed station, Metrolink provision and Manchester tunnel south portal building (in the Davenport Green to Ardwick area (MA07));
- Millington Lane, Tom Lane and Castle Mill Lane telecommunications sites and Ashley and Manchester tunnel south portal auto-transformer stations;
- A538 Hale Road south and north service roads;
- moving trains, overhead line equipment and new areas of public realm at Manchester Airport High Speed station; and
- loss of trees, woodland, farmland and hedgerows during construction.

11.5.4 Non-significant effects are reported in Volume 5: Appendix LV-001-0MA06.

## Landscape assessment

11.5.5 The LCA described in Table 29 will be significantly affected during operation of the Proposed Scheme.

**Table 29: Operational phase significant landscape effects**

Location	
<b>Ringway Lower Wooded Farmland LCA</b>	
<p>Year 1:            This LCA will be directly affected by the introduction of large-scale linear infrastructure, including Rostherne West and East embankments and Rostherne East box structure, Blackburn's Brook North viaduct, Mid-Cheshire (Railway) and Mobberley Road viaduct, Mobberley Road offline overbridge, Thorns Green embankment, Castle Mill Lane overbridge and Brickhill Lane diversion, into the rural landscape. These will be prominent structures in the low-lying landscape. Ashley and Thorns Green will be isolated from their landscape setting. The connectivity of the PRoW network will be maintained through the introduction of new overbridges, but several PRoW will have been diverted, lengthening walking distances, especially around Ashley. There will be a loss of characteristic landscape features including farmland, trees and hedgerows, and ancient woodland and proposed landscape mitigation planting will not be mature enough to contribute to landscape character. Tranquillity will be reduced due to the intermittent presence of moving trains and the operation of Ashley IMB-R.</p> <p>Due to the <b>medium</b> value, seclusion, overall rural character and the presence of detracting existing infrastructure, the landscape has a <b>medium-high</b> susceptibility to change arising from the Proposed Scheme. The introduction into the landscape of large-scale linear elements, loss of farmland, reduction of woodland character and severance of the landscape will result in a <b>high</b> magnitude of change to the landscape.</p> <p>The <b>high</b> magnitude of change for the Ringway Lower Wooded Farmland LCA and its <b>medium-high</b> sensitivity will result in a <b>major</b> adverse significant effect.</p>	<p>Level of effect:  <b>Major</b> adverse (significant)</p>
<p>Year 15:            The landscape character of the area will remain substantially changed due to</p>	<p>Level of effect:  <b>Major</b> adverse (significant)</p>

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Location	
<p>severance and disruption of the existing landscape pattern, the loss of key features and the introduction of large-scale infrastructure elements into the rural landscape. Mitigation planting, partly on landscape earthworks, between Rostherne Mere and Stock Farm will largely integrate the Proposed Scheme into the landscape, although Rostherne East box structure and Blackburn's Brook North viaduct will remain apparent above or between the vegetation. Ashley IMB-R (at ground level), Ashley and Thorns Green embankments and Thorns Green cutting will be screened by a combination of landscape mitigation planting and landscape earthworks, but Mid-Cheshire (Railway) and Mobberley Road viaduct and Mobberley Road offline overbridge will continue to be prominent structures in the LCA between Ashley and Thorns Green.</p> <p>The magnitude of change will remain <b>high</b> and there will be a <b>major</b> adverse significant effect.</p>	
<p>Year 30:  Mid-Cheshire (Railway) and Mobberley Road viaduct and Mobberley Road offline overbridge will remain prominent in the landscape, but the further maturity of landscape mitigation planting, some on landscape earthworks, will screen the majority of the of the Proposed Scheme from the wider area. The combination of earthworks and planting will form a wooded corridor through the LCA, providing integration with the existing woodland and tree belts which are characteristic of the landscape.</p> <p>The magnitude of change will therefore reduce to <b>medium</b> and there will be a <b>moderate</b> adverse significant effect.</p>	<p>Level of effect:  <b>Moderate</b> adverse (significant)</p>
<b>Altrincham and Hale Urban Fringe Farmland LCA</b>	
<p>Year 1:  The LCA will be directly affected by the loss of features during construction including farmland, woodland (some ancient), trees and hedgerows that contribute to the existing character of the rural landscape. Manchester Airport High Speed station (and associated car parks) will be structures of a scale and function not currently present in the LCA, where buildings are mainly residential and two to three storeys high. The multi-lane access roads and wide junctions will be uncharacteristic of the existing narrow lanes. Manchester Airport High Speed station (and associated car parks), Manchester Airport High Speed cutting, Thorley Lane overbridge, A538 Hale Road overbridge (north), Manchester tunnel south portal building and Manchester tunnel south portal auto-transformer station will be new structures in the landscape that will substantially alter its character. The landscape around the station will become more open and less wooded and proposed landscape mitigation planting will not be mature enough to contribute to landscape character. Tranquillity will also be affected, although traffic and aircraft noise are already perceptible across most parts of the LCA. Pedestrian connectivity will be maintained with Thorley Lane overbridge, A538 Hale Road overbridge (north), M56 Hasty Lane underpass extension, and M56/A538 Wilmslow Road offline non-motorised-user underpass. The tree-lined hedgerows and woodlands of the LCA will limit effects to the eastern end of the area.</p> <p>Due to the <b>medium</b> value, ancient woodland, watercourses and rural character of the area, together with the detracting influence of transport infrastructure, the landscape has a <b>medium-high</b> susceptibility to change arising from the Proposed Scheme. The introduction into the landscape of large-scale linear elements, and loss of trees, hedgerows, farmland and woodland will result in a medium magnitude of change to the landscape.</p> <p>The medium magnitude of change for the Altrincham and Hale Urban Fringe Farmland LCA and its <b>medium-high</b> sensitivity will result in a <b>moderate</b> adverse significant effect.</p>	<p>Level of effect:  <b>Moderate</b> adverse (significant)</p>

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Location	
<p>Year 15:            The landscape character will remain substantially changed due to loss of woodland and farmland. Mitigation planting will provide some landscape integration of Manchester Airport High Speed station (and associated car parks), Manchester Airport High Speed station access roads (east and west), Thorley Lane overbridge, A538 Hale Road overbridge (north) and Manchester tunnel south portal building, but the large-scale of the new structures will mean that they will remain uncharacteristic elements in the landscape.</p> <p>The magnitude of change will remain <b>medium</b> and there will be a <b>moderate</b> adverse significant effect.</p>	<p>Level of effect: <b>Moderate</b> adverse (significant)</p>
<p>Year 30:            Mitigation planting will be sufficiently established to provide some integration of the Proposed Scheme into the landscape. However, the tops of Manchester Airport High Speed station (and associated car parks) and Manchester tunnel south portal building will remain visible above the vegetation. The extensive areas of new woodland will partly restore the wooded character of the LCA.</p> <p>The magnitude of change will remain <b>medium</b> and there will be a <b>moderate</b> adverse significant effect.</p>	<p>Level of effect: <b>Moderate</b> adverse (significant)</p>

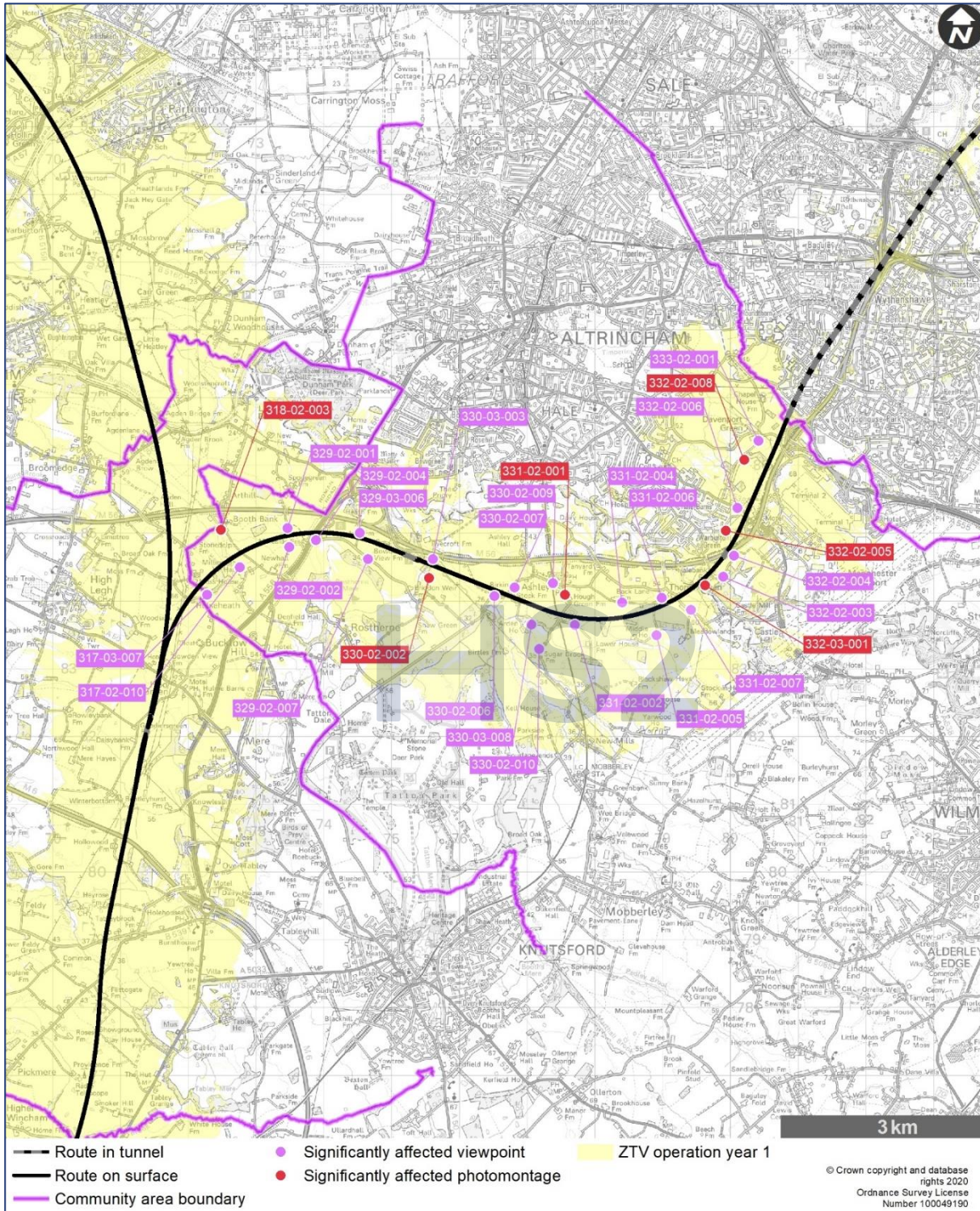
## Visual assessment

### Introduction

- 11.5.6 The following section describes the likely significant effects on visual receptors during operation in the winter and summer of year 1 and in the summer of both year 15 and year 30. The year 1 assessment includes the winter period, in line with best practice guidance, to ensure a robust assessment. In some cases, visibility of the operational Proposed Scheme may be reduced during summer when vegetation, if present in a view, will be in leaf. Where visual receptors are predicted to experience significant effects at night-time arising from additional lighting, these are also presented in this section.
- 11.5.7 Where a viewpoint represents multiple types of receptor, the assessment is based on the most sensitive receptor. Effects on other receptor types with a lower sensitivity will be lower than those reported.
- 11.5.8 The visual assessment has identified locations where additional lighting during operation will result in significant effects on visual receptors (summarised in Table 30 and described in detail in Volume 5: Appendix LV-001-OMA06, Part 3).
- 11.5.9 Table 30 identifies the locations where the operation of the Proposed Scheme will potentially result in significant effects. Viewpoint locations are shown in Map Series LV-04 in the Volume 2 MA06 Map Book.

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**Table 30: Operation phase significant visual effects**



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<b>View north-west from Footpath Millington 2/1 (High sensitivity receptor) (VP 317-03-007)</b>	
<p>Year 1 – winter and summer:</p> <p>PRoW users, of <b>high</b> susceptibility and with <b>medium</b> value views, will experience substantial changes to near and middle-distance views as a result of the Proposed Scheme. The removal of woodland during construction along Millington Clough will open up clear views of Hulseheath South embankment, Hulseheath North embankment, Millington Clough underbridge, Millington Clough offline underbridge and Peacock Lane viaduct which will be large-scale linear structures, uncharacteristic of the existing small-scale landscape of Millington Clough. Hulseheath North embankment will screen Moss House Farm in the distance. The presence of trains passing across the embankments will introduce uncharacteristic movement into the view. The mitigation woodland and hedgerow planting will not be sufficiently mature to contribute to any visual integration or enclosure at this stage. The combination of the above will result in a <b>high</b> magnitude of visual change. The <b>high</b> magnitude of visual change and <b>high</b> sensitivity will result in a <b>major</b> adverse effect.</p>	<p>Level of effect: <b>Major</b> adverse (significant)</p>
<p>Year 15 – summer:</p> <p>Growth of woodland habitat creation between Footpath Millington 2/1 and the Proposed Scheme as well as landscape mitigation planting along Hulseheath South embankment and Hulseheath North embankment will largely screen the embankments from this location. However, Peacock Lane viaduct, Millington Clough underbridge, Millington Clough offline underbridge and train movements will remain visible in filtered views. The magnitude of visual change will be reduced to <b>medium</b> and there will be a <b>moderate</b> adverse effect.</p>	<p>Level of effect: <b>Moderate</b> adverse (significant)</p>
<p>Year 30 – summer:</p> <p>Further growth of woodland habitat creation and landscape mitigation planting will fully screen Hulseheath South embankment and Hulseheath North embankment from this location. However, Peacock Lane viaduct, Millington Clough underbridge, Millington Clough offline underbridge and train movements will remain visible in filtered views. The magnitude of visual change will remain <b>medium</b> with a <b>moderate</b> adverse effect.</p>	<p>Level of effect: <b>Moderate</b> adverse (significant)</p>

<b>View north-west from Millington Hall (High sensitivity receptors) (VP 317-02-010)</b>	
<p>Year 1 – winter and summer:</p> <p>Residents at Millington Hall and Millington Hall Lane and users of Footpath Millington 5/1, of <b>high</b> susceptibility and with <b>medium-high</b> value views, will experience substantial changes to near and middle-distance views as a result of the Proposed Scheme. Hulseheath North embankment, Agden Brook viaduct, Millington Lane overbridge and Millington cutting will be large-scale linear structures, uncharacteristic of the existing small-scale landscape of the Agden Brook valley. The embankment and viaduct will screen long views to the north and north-west. Footpaths Millington 3/1 and 4/1 will pass directly underneath the viaduct. The loss of woodland during construction will remove a key landscape feature, which contributes to the secluded and wooded quality of the existing view. Train movements will be uncharacteristic within the view. Mitigation woodland and hedgerow planting will not be sufficiently mature to contribute to any visual integration or enclosure at this stage. The combination of the above will result in a <b>high</b> magnitude of visual change. The <b>high</b> magnitude of visual change and high sensitivity will result in a <b>major</b> adverse effect.</p>	<p>Level of effect: <b>Major</b> adverse (significant)</p>
<p>Year 15 – summer:</p> <p>Growth of landscape mitigation planting around Hulseheath North embankment will screen views to the embankment, but Agden Brook viaduct, overhead line equipment and train movements will remain prominent in views. The Proposed Scheme will remain a strong, linear feature in the landscape, blocking distant views along Millington Clough. The magnitude of visual change will remain <b>high</b> with a <b>major</b> adverse effect.</p>	<p>Level of effect: <b>Major</b> adverse (significant)</p>

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<b>View north-west from Millington Hall (High sensitivity receptors) (VP 317-02-010)</b>	
<p>Year 30 – summer:</p> <p>The further growth of the landscape mitigation planting will screen views to Hulseheath North embankment but Agden Brook viaduct, overhead line equipment and train movements will remain prominent in the view.</p> <p>The magnitude of visual change will reduce to <b>medium</b> and there will be a <b>moderate</b> adverse effect.</p>	<p>Level of effect:  <b>Moderate</b> adverse (significant)</p>

<b>View south from Millington Lane (High sensitivity receptor) (VP 318-02-003)</b>	
<p>Year 1 – winter and summer:</p> <p>Residents and users of Footpath Millington 4/1, of <b>high</b> susceptibility and with <b>medium-high</b> value views, will experience substantial changes to views due to the Proposed Scheme. Hulseheath North embankment, Agden Brook viaduct, Millington overbridge and Millington cutting will be large-scale linear structures uncharacteristic of the existing small-scale landscape of the Agden Brook valley. These components will be visible in open views from the PRoW but partially screened from Millington Lane by the raised landform on the western side of the valley and intervening vegetation. Train movements across the viaduct will be uncharacteristic within the view and will be seen against the skyline. The loss of woodland during construction will remove key features, which currently contribute to the wooded quality of the existing view. Landscape mitigation planting will not be sufficiently mature to contribute to any visual integration or screening at this stage.</p> <p>The combination of the above will result in a <b>high</b> magnitude of visual change.</p> <p>The <b>high</b> magnitude of visual change and <b>high</b> sensitivity will result in a <b>major</b> adverse effect. A photomontage illustrating this scenario is included in Volume 5: Appendix LV-001-0MA06, Part 3.</p>	<p>Level of effect:  <b>Major</b> adverse (significant)</p>
<p>Year 15 – summer:</p> <p>Growth of the landscape mitigation planting will largely screen Hulseheath North embankment, Millington overbridge and Millington cutting, but Agden Brook viaduct, overhead line equipment and train movements will remain prominent in narrow views from the PRoW. The Proposed Scheme will remain a strong, linear element in the landscape.</p> <p>The magnitude of visual change will be reduced to <b>medium</b> and there will be a <b>moderate</b> adverse significant effect.</p>	<p>Level of effect:  <b>Moderate</b> adverse (significant)</p>
<p>Year 30 – summer:</p> <p>The further growth of the landscape mitigation planting will partly restore the wooded character of the view, but Agden Brook viaduct, train movements and overhead line equipment on the viaduct will remain clearly visible from the PRoW.</p> <p>The magnitude of visual change will remain <b>medium</b> with <b>moderate</b> adverse significant effects.</p>	<p>Level of effect:  <b>Moderate</b> adverse (significant)</p>

<b>View south-east from Footpath Millington 7/2 (High sensitivity receptor) (VP 329-02-001)</b>	
<p>Year 1 – winter and summer:</p> <p>Residents and PRoW users, of <b>high</b> susceptibility and with <b>medium</b> value views, will experience substantial changes to views due to the Proposed Scheme. Millington cutting and Millington North cutting will combine to form a large-scale linear element, out of character with views over the existing farmed landscape. Footpath Millington 7/4 accommodation overbridge will be slightly raised as it crosses Millington cutting and Millington North cutting and consequently will be a new element in the view. It will not be uncharacteristic of the landscape setting as there are existing bridges accommodating farm access over the M56</p>	<p>Level of effect:  <b>Major</b> adverse (significant)</p>

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<b>View south-east from Footpath Millington 7/2 (High sensitivity receptor) (VP 329-02-001)</b>	
<p>nearby. Landscape mitigation planting will not be sufficiently mature to contribute to any visual integration or screening at this stage.</p> <p>The combination of the above will result in a <b>high</b> magnitude of visual change.</p> <p>The <b>high</b> magnitude of visual change and <b>high</b> sensitivity will result in a <b>major</b> adverse significant effect.</p>	
<p>Year 15 – summer:</p> <p>Growth of the landscape mitigation planting along the northern side of the cuttings and around the approaches to Footpath Millington 7/4 accommodation overbridge means that views of the new structures will be screened by landscape mitigation planting; however, the planting will reduce the openness of the existing view.</p> <p>The magnitude of visual change will be reduced to <b>medium</b> and there will be a <b>moderate</b> adverse significant effect.</p>	<p>Level of effect:  <b>Moderate</b>            adverse            (significant)</p>
<p>Year 30 – summer:</p> <p>The magnitude of visual change will be reduced to non-significant by year 30 due to the growth and maturity of the landscape mitigation planting (reported in detail in Volume 5).</p>	<p>Level of effect:            Non-significant</p>

<b>View north from Footpath Millington 6/2 (High sensitivity receptor) (VP 329-02-002)</b>	
<p>Year 1 – winter and summer:</p> <p>Residents at Newhall Cottages and Mereside Farm and PRoW users, of <b>high</b> susceptibility and with <b>medium</b> value views, will experience changes to near and middle-distance views due to the Proposed Scheme. Millington cutting and Millington North cutting will form a large-scale linear element, out of character with views over the existing farmed landscape. There will be clear views of the cuttings from the PRoW, but views from Newhall Cottages will be filtered by garden vegetation and partly screened by the rolling landform in the intervening landscape. Millington cutting will be screened from Mereside Farm by an intervening landscape earthwork. The A556 Chester Road overbridge will be slightly raised above its existing level but will be inconspicuous in the view. Millington Footpath 7/4 accommodation overbridge will also be raised as it crosses Millington cutting and Millington North cutting and will be a new element in the view. However, it will not be uncharacteristic of the landscape setting as there are bridges accommodating farm access over the M56 nearby. Train movements and overhead line equipment will be screened by the cutting slopes. The cuttings will not be apparent in views from Newhall Farm and the residential properties at the southern end of Millington Lane. The new overbridges will be visible from these locations, but they will be inconspicuous in the distant view. The landscape mitigation planting will not be sufficiently mature to contribute to any visual integration or screening at this stage.</p> <p>The combination of the above will result in a <b>medium</b> magnitude of visual change.</p> <p>The <b>medium</b> magnitude of visual change and <b>high</b> sensitivity will result in a <b>moderate</b> adverse significant effect.</p>	<p>Level of effect:  <b>Moderate</b>            adverse            (significant)</p>
<p>Year 15 and year 30 – summer:</p> <p>The magnitude of visual change will be reduced to non-significant by year 15 and remain so for year 30 due to the growth and maturity of the landscape mitigation planting (reported in detail in Volume 5).</p>	<p>Level of effect:            Non-significant</p>

<b>View west from Cherry Tree Lane (High sensitivity receptors) (VP 329-02-004)</b>	
<p>Year 1 – winter and summer:</p> <p>Residents at Mereside Cottage of <b>high</b> susceptibility, road users along Cherry Tree Lane and workers at Cherry Tree Farm of lower susceptibility, all with <b>medium</b> value views, will experience noticeable changes to views due to the Proposed Scheme. Rostherne cutting will</p>	<p>Level of effect:  <b>Moderate</b>            adverse            (significant)</p>

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<b>View west from Cherry Tree Lane (High sensitivity receptors) (VP 329-02-004)</b>	
<p>be a large-scale linear structure introduced across near views looking north from Mereside Cottage, Cherry Tree Farm and Cherry Tree Lane. The loss of vegetation during construction, will open up new views of the A556, currently screened, and A556 Chester Road overbridge. These new structures will be out of character with existing views north over a narrow, tree and hedgerow-lined country lane, but less so in views to the west which already include the A556. The loss of business units to the north of Cherry Tree Farm, will open up views of the Proposed Scheme to the north. The landscape earthwork along the top of the cutting will provide partial screening, but landscape mitigation planting will not be sufficiently mature to contribute to any visual integration or screening at this stage.</p> <p>The combination of the above will result in a <b>medium</b> magnitude of visual change.</p> <p>The <b>medium</b> magnitude of visual change and <b>high</b> sensitivity will result in a <b>moderate</b> adverse significant effect.</p>	
<p>Year 15 and year 30 – summer:</p> <p>The magnitude of visual change will be reduced to non-significant by year 15 and remain so for year 30 due to the growth and maturity of the landscape mitigation planting (reported in detail in Volume 5).</p>	<p>Level of effect: Non-significant</p>

<b>View west from Footpath Rostherne 13/1 (High sensitivity receptors) (VP 329-03-006)</b>	
<p>Year 1 – winter and summer:</p> <p>PRoW users, of <b>high</b> susceptibility and with <b>medium</b> value views, will experience a noticeable change in the view as a result of the Proposed Scheme. Rostherne North cutting, Rostherne West embankment and Tom Lane telecommunications site will be new, large-scale structures in near-distance views from a short section of Footpaths Rostherne 13/1 and 4/1. Footpath users approaching Yarwood Heath Farm accommodation access overbridge and those on the bridge will see the cutting, embankment, train movements and overhead line equipment in near-distance, uninterrupted views. The new structures will be out of character with existing views south over farmland and the wooded backdrop of Rostherne Mere, but less uncharacteristic in views to the west and north-west, which already include the A556 and the M56. Loss of vegetation during construction will increase the visibility of the M56. Landscape mitigation planting and woodland habitat creation will not be sufficiently mature to provide any screening. The combination of the above will result in a <b>medium</b> magnitude of visual change.</p> <p>The <b>medium</b> magnitude of visual change and <b>high</b> sensitivity will result in a <b>moderate</b> adverse significant effect.</p>	<p>Level of effect: <b>Moderate</b> adverse (significant)</p>
<p>Year 15 and year 30 – summer:</p> <p>The magnitude of visual change will be reduced to non-significant by year 15 and remain so for year 30 due to the growth and maturity of the landscape mitigation planting (reported in detail in Volume 5).</p>	<p>Level of effect: Non-significant</p>

<b>View north from Cherry Tree Lane (High sensitivity receptors) (VP Viewpoint 329-02-007)</b>	
<p>Year 1 – winter and summer:</p> <p>Residents at Covert Cottage and users of diverted Footpath Rostherne 4/1 of <b>high</b> susceptibility and road users along Cherry Tree Lane of lower susceptibility, all with <b>medium</b> value views, will experience noticeable changes to middle-distance views as a result of the Proposed Scheme. Yarwood Heath Farm accommodation access overbridge will be a new structure in the view but will not be uncharacteristic, as there is an existing farm access bridge over the M56 nearby. Rostherne West embankment and Rostherne East box structure, Tom Lane telecommunications site and overhead line equipment will be new structures, uncharacteristic of existing views over farmland. Landscape earthworks along the southern</p>	<p>Level of effect: <b>Moderate</b> adverse (significant)</p>



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<b>View north from Cherry Tree Lane (High sensitivity receptors) (VP Viewpoint 329-02-007)</b>	
<p>side of Rostherne cutting will partially screen Rostherne West embankment and Rostherne East box structure, but the landscape mitigation planting will not be sufficiently mature to contribute to any visual integration or screening. The combination of the above will result in a <b>medium</b> magnitude of visual change.</p> <p>The <b>medium</b> magnitude of visual change and <b>high</b> sensitivity will result in a <b>moderate</b> adverse significant effect.</p>	
<p>Year 15 and year 30 – summer:</p> <p>The magnitude of visual change will be reduced to non-significant by year 15 and remain so for year 30 due to the growth and maturity of the landscape mitigation planting (reported in detail in Volume 5).</p>	<p>Level of effect: Non-significant</p>

<b>View north from Footpath Rostherne 5/1 (High sensitivity receptors) (VP-330-02-002)</b>	
<p>Year 1 – winter and summer:</p> <p>Residents of Birkin House, Birkinheath Cottage and Briddon Weir Farm and users of Footpath Rostherne 5/1, of <b>high</b> susceptibility and with <b>medium</b> value views, will experience substantial changes to middle-distance and distant views as a result of the Proposed Scheme. Removal of woodland and intervening vegetation during construction will open up views from Footpath Rostherne 5/1 and Birkin House and Birkinheath Cottage towards Rostherne East box structure and Rostherne West embankment, Blackburn's Brook North viaduct, Birkin Brook embankment and Ashley IMB-R, which will be conspicuous in the middle distance. Residents at Briddon Weir Farm will have oblique, distant views of Rostherne West embankment and Rostherne East box structure, partially screened by intervening vegetation. The large-scale new structures, along with train movements on embankment and viaduct, will be uncharacteristic of existing views over farmland. The landscape earthworks along the southern side of Rostherne cutting and Rostherne East box structure will provide immediate screening of the lower parts of both structures. However, landscape mitigation planting and woodland habitat creation will not be sufficiently mature to contribute to any visual integration or screening of the upper parts of the Proposed Scheme at this stage.</p> <p>The combination of the above will result in a <b>high</b> magnitude of visual change.</p> <p>The <b>high</b> magnitude of visual change and <b>high</b> sensitivity will result in a <b>major</b> adverse significant effect.</p>	<p>Level of effect: <b>Major</b> adverse (significant)</p>
<p>Year 15 – summer:</p> <p>Growth of the landscape mitigation planting on landscape earthworks and woodland habitat creation will further screen the lower levels of Rostherne West embankment, Rostherne East box structure, Blackburn's Brook North viaduct, Birkin Brook embankment and Ashley IMB-R. However, the large-scale of the structures means that they will remain visible above the vegetation, along with the train movements and overhead line equipment. The magnitude of visual change will be reduced to <b>medium</b> and there will be a <b>moderate</b> adverse significant effect.</p> <p>A photomontage illustrating this scenario is included in Volume 5: Appendix LV-001-OMA06, Part 3.</p>	<p>Level of effect: <b>Moderate</b> adverse (significant)</p>
<p>Year 30 – summer:</p> <p>The magnitude of visual change will be reduced to non-significant by year 30 as a result of maturing planting (reported in Volume 5).</p>	<p>Level of effect: Non-significant</p>

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<b>View south-west from Footpath Rostherne 5/1 (High sensitivity receptors) (VP 330-03-003)</b>	
<p>Year 1 – winter and summer:</p> <p>PRoW users of Footpaths Rostherne 5/1, Ashley 2/1 and Ashley 3/1, of <b>high</b> susceptibility and with <b>medium</b> value views, will experience substantial changes to near and middle-distance views as a result of the Proposed Scheme. Removal of woodland and intervening vegetation during construction will open up views from the footpath towards Rostherne East box structure, Blackburn’s Brook North viaduct, Birkin Brook embankment and Ashley IMB-R. These will be large-scale new structures, which along with train movements visible on the embankment and viaduct, will be uncharacteristic of existing views over wooded farmland. The landscape mitigation planting and woodland habitat creation will not be sufficiently mature to have any visual integration or screening effect at this stage.</p> <p>The combination of the above will result in a <b>high</b> magnitude of visual change.</p> <p>The <b>high</b> magnitude of visual change and <b>high</b> sensitivity will result in a <b>major</b> adverse significant effect.</p>	<p>Level of effect:  <b>Major</b> adverse (significant)</p>
<p>Year 15 – summer:</p> <p>The growth of the landscape mitigation planting and woodland habitat creation will filter views of the lower levels of Rostherne East box structure, Blackburn’s Brook North viaduct, Birkin Brook embankment and Ashley IMB-R from much of the PRoW. However, the large-scale of the structures means that they will remain visible above the vegetation, along with moving trains and overhead line equipment. PRoW users will have clear, near-distance views of the underside of the viaduct as they pass under the structure. The magnitude of visual change will be reduced to <b>medium</b> and there will be a <b>moderate</b> adverse significant effect.</p>	<p>Level of effect:  <b>Moderate</b> adverse (significant)</p>
<p>Year 30 – summer:</p> <p>The magnitude of visual change will be reduced to non-significant by year 30 as a result of maturing planting (reported in Volume 5).</p>	<p>Level of effect:  Non-significant</p>

<b>View north from Ashley Road at Birkin Farm (High sensitivity receptors) (VP 330-02-006)</b>	
<p>Year 1 – winter and summer:</p> <p>Residents at Birkin Farm and users of Footpath Ashley 3/1, of <b>high</b> susceptibility and with <b>medium</b> value views, will experience substantial changes to near and middle-distance views as a result of the Proposed Scheme. Residents at Birkin Farm and users of the diverted Footpath Ashley 3/1 will have clear views of the Birkin Brook embankment, Ashley IMB-R, Ashley Road diversion and part of Ashley embankment. The Proposed Scheme will be at, or just above, ground level as it passes Birkin Farm and moving trains and overhead line equipment will be highly visible and uncharacteristic new structures in existing views over farmland. An overhead power line south of Birkin Farm will have been diverted closer to the viewpoint. The landscape mitigation planting or woodland habitat creation will not be sufficiently mature to contribute to any visual integration or screening at this stage.</p> <p>The combination of the above will result in a <b>high</b> magnitude of visual change.</p> <p>The <b>high</b> magnitude of visual change and <b>high</b> sensitivity will result in a <b>major</b> adverse significant effect.</p>	<p>Level of effect:  <b>Major</b> adverse (significant)</p>
<p>Year 15 – summer:</p> <p>The growth of the landscape mitigation planting and woodland habitat creation will largely screen Birkin Brook embankment, Ashley IMB-R, Ashley Road diversion and part of Ashley embankment but will change existing views over open farmland to near-distance views of woodland. Train movements and overhead line equipment will remain visible above the trees.</p> <p>The magnitude of visual change will reduce to <b>medium</b> and there will be a <b>moderate</b> adverse significant effect.</p>	<p>Level of effect:  <b>Moderate</b> adverse (significant)</p>

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<b>View north from Ashley Road at Birkin Farm (High sensitivity receptors) (VP 330-02-006)</b>	
<p>Year 30 – summer:</p> <p>The growth of the landscape mitigation planting and woodland habitat creation will largely screen the Proposed Scheme and limit existing views over the open landscape.</p> <p>The magnitude of visual change will remain <b>medium</b> and there will be a <b>moderate</b> adverse significant effect.</p>	<p>Level of effect:</p> <p><b>Moderate</b> adverse (significant)</p>

<b>View south-east from Ashley Road at Stock Farm (High sensitivity receptors) (VP 330-02-007)</b>	
<p>Year 1 – winter and summer:</p> <p>Residents at Stock Farm and Sycamore Cottage and users of Footpath Ashley 6/5, of <b>high</b> susceptibility and visitors to Ashley Cricket club of lower susceptibility, all with <b>medium</b> value views, will experience substantial changes to near and middle-distance views as a result of the Proposed Scheme. Ashley IMB-R and Ashley embankment will form a large-scale linear structure, highly visible and uncharacteristic in views over the existing farmed landscape. The embankments and Ashley IMB-R will be partially screened by landscape earthworks, but train movements and overhead line equipment will be visible and uncharacteristic within views. The landscape mitigation planting will not be sufficiently mature to contribute to any visual integration or screening.</p> <p>The combination of the above will result in a <b>high</b> magnitude of visual change.</p> <p>The <b>high</b> magnitude of visual change and <b>high</b> sensitivity will result in a <b>major</b> adverse significant effect.</p>	<p>Level of effect:</p> <p><b>Major</b> adverse (significant)</p>
<p>Year 15 – summer:</p> <p>Growth of the landscape mitigation planting on landscape earthworks will screen Birkin Brook embankment, Ashley IMB-R and Ashley embankment, but will change existing views over open farmland to near-distance views of woodland. Train movements and overhead line equipment will remain clearly visible above the vegetation.</p> <p>The magnitude of visual change will remain <b>high</b> with <b>major</b> adverse significant effects.</p>	<p>Level of effect:</p> <p><b>Major</b> adverse (significant)</p>
<p>Year 30 – summer:</p> <p>The continued growth of the landscape mitigation planting will largely screen the Proposed Scheme and limit existing views over the open landscape.</p> <p>The magnitude of visual change will be reduced to <b>medium</b> and there will be a <b>moderate</b> adverse significant effect.</p>	<p>Level of effect:</p> <p><b>Moderate</b> adverse (significant)</p>

<b>View north-east from Footpath Ashley 6/3 at Arden House (High sensitivity receptors) (VP 330-03-008)</b>	
<p>Year 1 – winter and summer:</p> <p>Users of Footpaths Ashley 6/3, 6/4, 7/1 and 8/1 and residents of Arden House, of <b>high</b> susceptibility and with <b>medium</b> value views, will experience noticeable changes to views as a result of the Proposed Scheme. Views from diverted Footpaths Ashley 6/4, 7/1 and 8/1 of Ashley embankment, train movements, overhead line equipment, Ashley Road auto-transformer station, Ashley Road diversion and Mid-Cheshire (Railway) and Mobberley Road viaduct will be near-distance and uninterrupted where the PRoW is adjacent to the Proposed Scheme. Mobberley Road offline overbridge and Mobberley Road realignment will be large-scale structures, out of character with existing mid-distance and distant views to the east over farmland from Arden House and Footpath Ashley 6/3. Trains travelling along Ashley embankment and Mid-Cheshire (Railway) and Mobberley Road viaduct and vehicles on Mobberley Road offline overbridge will introduce uncharacteristic movement into views. The landscape mitigation planting or woodland habitat creation will not be sufficiently mature to contribute to any visual integration or screening at this stage.</p> <p>The combination of the above will result in a <b>medium</b> magnitude of visual change.</p>	<p>Level of effect:</p> <p><b>Moderate</b> adverse (significant)</p>

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<b>View north-east from Footpath Ashley 6/3 at Arden House (High sensitivity receptors) (VP 330-03-008)</b>	
The <b>medium</b> magnitude of visual change and <b>medium</b> sensitivity will result in a <b>moderate</b> adverse significant effect.	
Year 15 and year 30 – summer: The magnitude of visual change will be reduced to non-significant by year 15 and remain so for year 30 due to the growth and maturity of the landscape mitigation planting (reported in detail in Volume 5).	Level of effect: Non-significant

<b>View south from Ashley Road bridge over the Mid-Cheshire Line (High sensitivity receptors) (VP 330-02-009)</b>	
Year 1 – winter and summer: Residents in Ashley Road of <b>high</b> susceptibility and road users of lower susceptibility, all with <b>medium</b> value views, will experience noticeable changes to middle and far-distance views as a result of the Proposed Scheme. The Proposed Scheme will form a high, linear structure which, along with trains and overhead line equipment, will be visible across the majority of the view and be perceived above the existing skyline. Much of Ashley embankment will be screened from view by landscape earthworks, but Mid-Cheshire (Railway) and Mobberley Road viaduct will be clearly visible. Mobberley Road offline overbridge will be apparent in the distance. Mid-Cheshire Line is visible in existing views, but is integrated discreetly into the landscape, whereas the Proposed Scheme, on embankment and viaduct, will have a greater presence and will foreshorten views to the south. The landscape mitigation planting will not be sufficiently mature to contribute to any visual integration or screening at this stage. The combination of the above will result in a <b>medium</b> magnitude of visual change. The <b>medium</b> magnitude of visual change and <b>high</b> sensitivity will result in a <b>moderate</b> adverse significant effect.	Level of effect: <b>Moderate</b> adverse (significant)
Year 15 – summer: Growth of landscape mitigation planting, partly on landscape earthworks, will largely screen Ashley embankment but Mid-Cheshire (Railway) and Mobberley Road viaduct, train movements and overhead line equipment will remain visible. The magnitude of visual change will remain <b>medium</b> and there will be a <b>moderate</b> adverse significant effect.	Level of effect: <b>Moderate</b> adverse (significant)
Year 30 – summer: The further growth of the landscape mitigation planting will largely screen the Proposed Scheme, apart from the Mid-Cheshire (Railway) and Mobberley Road viaduct, which will remain visible in the middle distance. The existing long and open views over the farmed landscape will be foreshortened by the wooded embankment of the Proposed Scheme crossing the view. The magnitude of visual change will remain <b>medium</b> and there will be a <b>moderate</b> adverse significant effect.	Level of effect: <b>Moderate</b> adverse (significant)

<b>View east from Arden Lodge on Mobberley Road (High sensitivity receptors) (VP 330-02-010)</b>	
Year 1 – winter and summer: Residents at Arden Lodge and Sugar Brook Farm and users of Footpath Arden 6/5 of <b>high</b> susceptibility and road users along Mobberley Road of lower susceptibility, all with <b>medium</b> value views, will experience noticeable changes to views as a result of the Proposed Scheme. The removal of trees and hedgerows from farmland will change the pattern of the landscape in views to the east. Mobberley Road offline overbridge will be a large-scale, elevated structure in the distance, which is out of character with existing views over the flat, farmed landscape. Traffic movement on the overbridge will introduce uncharacteristic movement into views in an elevated situation. The landscape mitigation planting on the overbridge	Level of effect: <b>Moderate</b> adverse (significant)

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<b>View east from Arden Lodge on Mobberley Road (High sensitivity receptors) (VP 330-02-010)</b>	
<p>embankments will not be sufficiently mature to contribute to any visual integration or screening at this stage.</p> <p>The combination of the above will result in a <b>medium</b> magnitude of visual change.</p> <p>The <b>medium</b> magnitude of visual change and <b>high</b> sensitivity will result in a <b>moderate</b> adverse significant effect.</p>	
<p>Year 15 and year 30 – summer:</p> <p>The magnitude of visual change will be reduced to non-significant by year 15 and remain so for year 30 due to the growth and maturity of the landscape mitigation planting (reported in detail in Volume 5).</p>	<p>Level of effect: Non-significant</p>

<b>View south from Mobberley Road, Ashley (High sensitivity receptors) (VP 331-02-001)</b>	
<p>Year 1 – winter and summer:</p> <p>Residents at Hough Green Farm, Swallow Barns and on Mobberley Road and users of Footpath Ashley 20/1 of <b>high</b> susceptibility and road users on Mobberley Road of lower susceptibility, all with <b>medium</b> value views, will experience substantial changes to near and middle-distance views as a result of the Proposed Scheme. Ashley embankment, Mid-Cheshire (Railway) and Mobberley Road viaduct and Thorns Green embankment will form a high, large-scale linear structure, highly visible and out of character with existing views over the farmed landscape. Views to the south will be foreshortened by the embankments and viaduct, although Ashley and Thorns Green embankments will be partially screened by intervening landscape earthworks from Mobberley Road. Mobberley Road offline overbridge will be visible in the distance of the view. Overhead line equipment and moving trains will be seen across the skyline and will be more prominent in the view than the partially screened diesel trains on the Mid-Cheshire Line. The landscape mitigation planting will not be sufficiently mature to contribute to any visual integration or screening at this stage.</p> <p>The combination of the above will result in a <b>high</b> magnitude of visual change.</p> <p>The <b>high</b> magnitude of visual change and <b>high</b> sensitivity will result in a <b>major</b> adverse significant effect.</p> <p>A photomontage illustrating this scenario is included in Volume 5: Appendix LV-001-OMA06, Part 3.</p>	<p>Level of effect: <b>Major</b> adverse (significant)</p>
<p>Year 15 – summer:</p> <p>Growth of hedgerows and landscape mitigation planting (partly on landscape earthworks) will screen the lower levels of Ashley and Thorns Green embankments, but Mid-Cheshire (Railway) and Mobberley Road viaduct, train movements and overhead line equipment will remain visible above the vegetation.</p> <p>The magnitude of visual change will remain <b>high</b> with a <b>major</b> adverse significant effect.</p> <p>A photomontage illustrating this scenario is included in Volume 5: Appendix LV-001-OMA06, Part 3.</p>	<p>Level of effect: <b>Major</b> adverse (significant)</p>
<p>Year 30 – summer:</p> <p>The further growth of the landscape mitigation planting will screen the Proposed Scheme where it is on embankment but Mid-Cheshire (Railway) and Mobberley Road viaduct and the moving trains and overhead line equipment on the viaduct, will remain visible. The existing expansive views of farmland will be foreshortened by introduction of the Proposed Scheme which will form the background of the view.</p> <p>The magnitude of visual change will reduce to <b>medium</b> with a <b>moderate</b> adverse significant effect.</p>	<p>Level of effect: <b>Moderate</b> adverse (significant)</p>

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<b>View north from track to Lower House Farm (High sensitivity receptors) (VP 331-02-002)</b>	
<p>Year 1 – winter and summer:</p> <p>Residents at Lower House Farm, of <b>high</b> susceptibility and with <b>medium</b> value views, will experience a substantial alteration to views as a result of the Proposed Scheme. Mobberley Road offline overbridge, Thorns Green embankment and overhead line equipment will form a large-scale linear structure which will be visible across the majority of the view. Mid-Cheshire (Railway) and Mobberley Road viaduct will be partly screened by the overbridge. Train movements on the embankment and traffic movements on the overbridge will be visible above the existing skyline. The landscape mitigation planting will not be sufficiently mature to contribute to any visual integration or screening at this stage.</p> <p>The combination of the above will result in a <b>high</b> magnitude of visual change.</p> <p>The <b>high</b> magnitude of visual change and <b>high</b> sensitivity will result in a <b>major</b> adverse significant effect.</p>	<p>Level of effect: <b>Major</b> adverse (significant)</p>
<p>Year 15 – summer:</p> <p>Landscape mitigation and hedgerow planting will screen the embankments of Mobberley Road offline overbridge and Thorns Green embankment. Trains and overhead line equipment on the embankment and traffic movements on the overbridge will still be visible above the vegetation.</p> <p>The magnitude of visual change will therefore reduce to <b>medium</b> with a <b>moderate</b> adverse significant effect.</p>	<p>Level of effect: <b>Moderate</b> adverse (significant)</p>
<p>Year 30 – summer:</p> <p>The magnitude of visual change will be reduced to non-significant by year 30 due to the growth and maturity of the landscape mitigation planting (reported in detail in Volume 5).</p>	<p>Level of effect: Non-significant</p>

<b>View south from Back Lane (High sensitivity receptors) (VP 331-02-004)</b>	
<p>Year 1 – winter and summer:</p> <p>Residents at Back Lane Farm and Ashlar on Back Lane, of <b>high</b> susceptibility and road users along Back Lane of lower susceptibility, all with <b>medium</b> value views, will experience a substantial alteration to views as a result of the Proposed Scheme. Views of Thorns Green embankment, trains and overhead line equipment will be partially screened from Back Lane Farm by landscape earthworks. However, Back Lane Farm accommodation overbridge and access diversion will be clearly visible from properties on Back Lane. Trees removed in construction from the back garden of Ashlar will open up clear views of a landscape earthwork between the property and the Proposed Scheme. The landscape earthwork will screen views of Thorns Green cutting from Ashlar but overhead line equipment and trains will remain visible. The Proposed Scheme will be a new large-scale, linear feature, out of character with existing open views of the rural landscape. Landscape mitigation planting will not be sufficiently mature to contribute to any visual integration or screening. Landscape mitigation planting will not be sufficiently mature to contribute to any visual integration or screening at this stage.</p> <p>The combination of the above will result in a <b>high</b> magnitude of visual change.</p> <p>The <b>high</b> magnitude of visual change and <b>high</b> sensitivity will result in a <b>major</b> adverse significant effect.</p>	<p>Level of effect: <b>Major</b> adverse (significant)</p>
<p>Year 15 – summer:</p> <p>Landscape mitigation planting on landscape earthworks will screen views of Thorns Green embankment and cutting from Back Lane. However, the movement of trains and overhead line equipment will remain visible above the vegetation. The landscape mitigation planting close to the southern boundary of Ashlar will add to the screening effect of retained existing</p>	<p>Level of effect: <b>Moderate</b> adverse (significant)</p>

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<b>View south from Back Lane (High sensitivity receptors) (VP 331-02-004)</b>	
<p>planting in the garden. The embankments of Back Lane Farm accommodation overbridge will be vegetated, integrating the structure into the woodland in the distance.</p> <p>The magnitude of visual change will reduce to <b>medium</b> with a <b>moderate</b> adverse significant effect.</p>	
<p>Year 30 – summer:</p> <p>The Proposed Scheme will remain a linear structure in the landscape, but the movement of trains and overhead line equipment will be largely screened by maturing landscape mitigation planting on landscape earthworks along the northern side of the Thorns Green embankment and cutting.</p> <p>The magnitude of visual change will remain <b>medium</b> with a <b>moderate</b> adverse significant effect.</p>	<p>Level of effect:  <b>Moderate</b>            adverse            (significant)</p>

<b>View north-west from Brickhill Lane (High sensitivity receptors) (VP 331-02-005)</b>	
<p>Year 1 – winter and summer:</p> <p>Residents at Middle Cottage, of <b>high</b> susceptibility and with <b>medium</b> value views, will experience a noticeable change to views as a result of the Proposed Scheme. Back Lane Farm accommodation overbridge will be visible in a limited portion of the view, between Ecclesfield Wood and the tree belt east of the overbridge. Thorns Green cutting will be screened by intervening vegetation, but the movement of trains and overhead line equipment will be visible above the line of the cutting in places where the cutting is relatively shallow. The loss of trees during construction will change the skyline in the north.</p> <p>The combination of the above will result in a <b>medium</b> magnitude of visual change.</p> <p>The <b>medium</b> magnitude of visual change and <b>high</b> sensitivity will result in a <b>moderate</b> adverse significant effect.</p>	<p>Level of effect:  <b>Moderate</b>            adverse            (significant)</p>
<p>Year 15 and year 30 – summer:</p> <p>The magnitude of visual change will be reduced to non-significant by year 15 and remain so for year 30 due to the growth and maturity of the landscape mitigation planting (reported in detail in Volume 5).</p>	<p>Level of effect:            Non-significant</p>

<b>View south-east from Back Lane in Thorns Green (High sensitivity receptors) (VP 331-02-006)</b>	
<p>Year 1 – winter and summer:</p> <p>Residents at Thorns Green, of <b>high</b> susceptibility and with <b>medium</b> value views, will experience a substantial alteration to views as a result of the Proposed Scheme. Views of Thorns Green cutting will be partially screened by landscape earthworks, but Castle Mill Lane realignment, overbridge and telecommunications site will be clearly visible. However, train movements and overhead line equipment will not be visible because they will be in deep cutting. Views will become more open due to the removal of vegetation and property demolition at Higher Thorns Green Farm during construction. The presence of Castle Mill Lane overbridge and Thorns Green cutting will be out of character with existing views over the rural landscape. Landscape mitigation planting will not be sufficiently mature to contribute to any visual integration or screening at this stage.</p> <p>The combination of the above will result in a <b>high</b> magnitude of visual change.</p> <p>The <b>high</b> magnitude of visual change and <b>high</b> sensitivity will result in a <b>major</b> adverse significant effect.</p>	<p>Level of effect:  <b>Major</b> adverse            (significant)</p>
<p>Year 15 – summer:</p> <p>Landscape mitigation planting on landscape earthworks will screen views of Thorns Green cutting from Thorns Green, but it will also partially screen existing middle-distance</p>	<p>Level of effect:  <b>Moderate</b> adverse            (significant)</p>

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<b>View south-east from Back Lane in Thorns Green (High sensitivity receptors) (VP 331-02-006)</b>	
<p>and distant views over the landscape. The realigned Castle Mill Lane will be largely screened by hedgerows along both sides of Castle Mill Lane and landscape mitigation planting will largely screen Castle Mill Lane telecommunications site.</p> <p>The magnitude of visual change will be reduced to <b>medium</b> and there will be a <b>moderate</b> adverse significant effect.</p>	
<p>Year 30 – summer:</p> <p>The maturing landscape mitigation planting will further integrate the structures into the landscape. However, mitigation planting will continue to foreshorten middle and far distant views over the landscape. The magnitude of visual change will remain <b>medium</b> with a <b>moderate</b> adverse significant effect.</p>	<p>Level of effect:  <b>Moderate</b> adverse (significant)</p>

<b>View north from Castle Mill Lane (High sensitivity receptors) (VP 331-02-007)</b>	
<p>Year 1 – winter and summer:</p> <p>Residents on Castle Mill Lane and users of Footpaths Ashley 15/1 and 11/1, of <b>high</b> susceptibility and with <b>medium</b> value views, will experience a substantial alteration to views as a result of the Proposed Scheme. Residents at Chapel House Farm will have near-distance views of Castle Mill Lane telecommunications site, Thorns Green cutting, Castle Mill Lane realignment, Castle Mill Lane overbridge and Brickhill Lane diversion. There will be a new staggered road junction on Castle Mill Lane just north of the farmhouse. However, train movements and overhead line equipment will be not be visible because they will be in deep cutting. Residents of Hunters Close and users of Footpaths Ashley 11/1 and 15/1 will have views, filtered through intervening vegetation, of the new structures. Views will become more open due to removal of vegetation during construction and the presence of the overbridge and cutting will be uncharacteristic of existing views over the rural landscape. Landscape mitigation planting will not be sufficiently mature to contribute to any visual integration or screening at this stage.</p> <p>The combination of the above will result in a <b>high</b> magnitude of visual change. The <b>high</b> magnitude of visual change and <b>high</b> sensitivity will result in a <b>major</b> adverse significant effect.</p>	<p>Level of effect:  <b>Major</b> adverse (significant)</p>
<p>Year 15 – summer:</p> <p>Maturing woodland habitat creation and landscape mitigation planting will screen views of Brickhill Lane diversion, Thorns Green cutting and Castle Mill Lane overbridge. Castle Mill Lane telecommunications site will remain visible above intervening vegetation in the middle distance and the realigned Castle Mill Lane and staggered junction will be visible in the near-distance.</p> <p>The magnitude of visual change will be reduced to <b>medium</b> and there will be a <b>moderate</b> adverse significant effect.</p>	<p>Level of effect:  <b>Moderate</b> adverse (significant)</p>
<p>Year 30 – summer:</p> <p>The magnitude of visual change will have reduced to non-significant as a result of maturing planting (reported in Volume 5).</p>	<p>Level of effect:  Non-significant</p>

<b>View north-west from Footpath Ringway 13, near Pigleystair Bridge (High sensitivity receptors) (VP 332-03-001)</b>	
<p>Year 1 – winter and summer:</p> <p>Users of Footpaths Ringway 12, 13, and 14 and Footpaths Ashley 10/1 and 11/1, of <b>high</b> susceptibility and with <b>medium</b> value views, will experience a substantial alteration to views as a result of the Proposed Scheme. The removal of vegetation during construction will open up clear views of River Bollin South embankment, River Bollin East viaduct and River Bollin</p>	<p>Level of effect:  <b>Major</b> adverse (significant)</p>



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<b>View north-west from Footpath Ringway 13, near Pigleystair Bridge (High sensitivity receptors) (VP 332-03-001)</b>	
<p>North embankment, which will form an elevated, wide linear element across the narrow, enclosed Bollin Valley. Trains and overhead line equipment will be visible across the top of the embankments and viaduct. These structures will be partially screened from more distant sections of Footpath Ashley 10/1, Footpath Ashley 11/1 and Footpath Ringway 14 by intervening woodland. Ringway cutting will be clearly visible from the Footpath Ringway 12 realignment and partially screened from Footpath Ringway 11 and Footpath Ringway 13 by landscape earthworks. The large-scale new structures and train movements will be uncharacteristic new elements introduced into existing views towards Sunbank Wood and the River Bollin from the above PRow and Pigleystair Bridge. Landscape mitigation planting will not be sufficiently mature to contribute to any visual integration or screening at this stage.</p> <p>The combination of the above will result in a <b>high</b> magnitude of visual change.</p> <p>The <b>high</b> magnitude of visual change and <b>high</b> sensitivity will result in a <b>major</b> adverse significant effect.</p> <p>A photomontage illustrating this scenario is included in Volume 5: Appendix LV-001-0MA06, Part 3.</p>	
<p>Year 15 – summer:</p> <p>Woodland habitat creation and landscape mitigation planting will filter views from most of the PRow network except from: Footpath Ashley 10/1 and Footpath Ringway 14, which will pass under River Bollin East viaduct; from the realigned Footpath Ringway 12, which will overlook Ringway cutting; and from Footpath Ringway 13 which will cross the Pigleystair Bridge. The viaduct, embankments, passing trains and overhead line equipment will remain prominent in these views. The planting will not be sufficiently matured to restore the wooded character of views from Sunbank Wood.</p> <p>The magnitude of visual change will be reduced to <b>medium</b> and there will be a <b>moderate</b> adverse significant effect.</p> <p>A photomontage illustrating this scenario is included in Volume 5: Appendix LV-001-0MA06, Part 3.</p>	<p>Level of effect:  <b>Moderate</b> adverse (significant)</p>
<p>Year 30 – summer:</p> <p>The magnitude of visual change will have reduced to non-significant as a result of maturing planting (reported in Volume 5).</p>	<p>Level of effect: Non-significant</p>

<b>View west by Yew Tree House on Sunbank Lane (High sensitivity receptors) (VP 332-02-003) and view west from Sunbank Lane by Keepers Cottage (High sensitivity receptors) (VP 332-02-004)</b>	
<p>Year 1 – winter and summer:</p> <p>Residents and users of Footpath Ringway 10 and 11 of <b>high</b> susceptibility and road users along Sunbank Lane with lower susceptibility, all with <b>medium</b> value views, will experience a substantial alteration to views as a result of the Proposed Scheme. The removal of all vegetation between Sunbank Lane and Ringway cutting during construction will open up views north to cutting, Sunbank Lane overbridge, Sunbank Lane realignment and the M56. The cutting will be partially screened by landscape earthworks. The cutting and overbridge will, due to their large-scale, be uncharacteristic elements within existing views over a narrow, tree-lined lane and wooded farmland. The formerly tree-lined view along Sunbank Lane will become more open due to loss of trees during construction. The movement of trains and overhead line equipment will be in deep cutting and will not be visible from Sunbank Lane. Landscape mitigation planting will not be sufficiently mature to contribute to any visual integration or screening at this stage.</p> <p>The combination of the above will result in a <b>high</b> magnitude of visual change.</p>	<p>Level of effect:  <b>Major</b> adverse (significant)</p>

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<b>View west by Yew Tree House on Sunbank Lane (High sensitivity receptors) (VP 332-02-003) and view west from Sunbank Lane by Keepers Cottage (High sensitivity receptors) (VP 332-02-004)</b>	
The <b>high</b> magnitude of visual change and <b>high</b> sensitivity will result in a <b>major</b> adverse significant effect.	
Year 15 – summer: Maturing landscape mitigation planting on landscape earthworks and hedgerow planting along the realigned Sunbank Lane will partially filter or screen Ringway cutting, Sunbank Lane realignment, Sunbank Lane overbridge and M56 from views. The magnitude of visual change will be reduced to <b>medium</b> and there will be a <b>moderate</b> adverse significant effect.	Level of effect: <b>Moderate</b> adverse (significant)
Year 30 – summer: The magnitude of visual change will have reduced to non-significant as a result of maturing planting (reported in Volume 5).	Level of effect: Non-significant

<b>View east from Burnside, Warburton Green (High sensitivity receptors) (VP 332-02-005)</b>	
Year 1 - winter and summer: Residents and users of Footpaths Hale 12 and 13 and Footpath Ringway 9, of <b>high</b> susceptibility and with <b>medium</b> value views, will experience a substantial alteration to views as a result of the Proposed Scheme. Views of Manchester Airport High Speed station cutting will be partly screened by a landscape earthwork, extending the length of the cutting. However, some views of the cutting will be possible. The loss of vegetation during construction will open up distant views towards junction 6 of the M56, the A538 Hale Road realignment, the raised A538 Hale Road overbridge (north) and the car parks at the southern end of Manchester Airport High Speed station. The cutting, overbridges and car parks will be uncharacteristic new elements introduced into existing views of fields and woodland. The combination of the above will result in a <b>high</b> magnitude of visual change. The <b>high</b> magnitude of visual change and <b>high</b> sensitivity will result in a <b>major</b> adverse significant effect. A photomontage illustrating this scenario is included in Volume 5: Appendix LV-001-OMA06, Part 3.	Level of effect: <b>Major</b> adverse (significant)
Year 15 – summer: Woodland habitat creation and landscape mitigation planting in association with landscape earthworks will largely screen Manchester Airport High Speed station cutting and the realigned A538 Hale Road. Traffic using the raised A538 Hale Road overbridge (north) and car parks at the southern end of Manchester Airport High Speed station will be visible above the intervening mitigation planting. The magnitude of visual change will be reduced to <b>medium</b> and there will be a <b>moderate</b> adverse significant effect.	Level of effect: <b>Moderate</b> adverse (significant)
Year 30 – summer: The magnitude of visual change will have reduced to non-significant as a result of maturing planting (reported in Volume 5).	Level of effect: Non-significant

<b>View east from A538 Hale Road (High sensitivity receptors) (VP 332-02-006)</b>	
Year 1 – winter and summer: Residents on the A538 Hale Road, of <b>high</b> susceptibility and road users of lower susceptibility, both with <b>medium</b> value views, will experience a substantial alteration to views as a result of the Proposed Scheme. There will be uninterrupted, near-distance views of the A538 Hale Road service roads (north and south) and A538 Hale Road realignment, due to the loss of garden and roadside vegetation during construction. The service roads, constructed in the gardens of properties along the road, will bring traffic closer to residents	Level of effect: <b>Major</b> adverse (significant)

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<b>View east from A538 Hale Road (High sensitivity receptors) (VP 332-02-006)</b>	
<p>at the eastern end of the A538 Hale Road. Demolition of houses on Hasty Lane and A538 Hale Road will allow open views of A538 Hale Road overbridge (south), A538 Hale Road/station access gyratory, A538 Hale Road overbridge (north) and Manchester Airport High Speed station car parks. The multi-lane A538 Hale Road realignment will be wider than the existing two-way A538 Hale Road and will require barriers and increased signage that will be out of character with views of the existing tree-lined suburban road. The multi-story car parks will be similarly uncharacteristic within views of the domestic-scale architecture of the existing buildings on the A538 Hale Road. Landscape mitigation planting will not be sufficiently mature to contribute to any visual integration or screening at this stage.</p> <p>The combination of the above will result in a <b>high</b> magnitude of visual change. The <b>high</b> magnitude of visual change and <b>high</b> sensitivity will result in a <b>major</b> adverse significant effect.</p>	
<p>Year 15 – summer:  Hedgerows planted along the A538 Hale Road service roads (north and south) and A538 Hale Road realignment will largely screen the service roads but will not restore the screening effect of the trees and mature garden vegetation removed from residential gardens during construction. Traffic using the roads will be clearly visible from the properties. The magnitude of visual change will remain <b>high</b> with <b>major</b> adverse significant effects.</p>	Level of effect: <b>Major</b> adverse (significant)
<p>Year 30 – summer:  Effects in year 30 will remain similar to those in year 15 owing to the requirement to regularly maintain hedgerows to retain their structure. The magnitude of visual change will remain <b>high</b> with <b>major</b> adverse significant effects.</p>	Level of effect: <b>Major</b> adverse (significant)

<b>View south-east from Brooks Drive (High sensitivity receptors) (VP 332-02-008)</b>	
<p>Year 1 – winter and summer:  Residents on Brooks Drive, of <b>high</b> susceptibility and with <b>medium</b> value views, will experience substantial changes to views as a result of the Proposed Scheme. Manchester Airport High Speed station car parks and access road (west), cars and buses at the transport interchange and Manchester Airport High Speed station will be visible in the middle-distance in views from dwellings on Brooks Drive beyond the intervening woodland habitat creation. Most views will be filtered or screened by garden vegetation but from some properties, where the existing view is more open, there will be clear views of the Proposed Scheme. The car parks and station will be large-scale new structures, highly visible across much of the view and out of character with existing views over pasture and woodland. Immature woodland habitat creation will provide an element of visual integration for the lower sections of the Proposed Scheme only.</p> <p>The combination of the above will result in a <b>high</b> magnitude of visual change. The <b>high</b> magnitude of visual change and <b>high</b> sensitivity will result in a <b>major</b> adverse significant effect.</p> <p>A photomontage illustrating this scenario is included in Volume 5: Appendix LV-001-0MA06, Part 3.</p>	Level of effect: <b>Major</b> adverse (significant)
<p>Year 15 – summer:  Maturing woodland habitat creation will be close to these receptors and will therefore provide an effective screen between Brooks Drive and the Proposed Scheme. Views from some properties where existing views are open will change from views of farmland to woodland. The magnitude of visual change will reduce to <b>medium</b> and there will be a <b>moderate</b> adverse significant effect.</p>	Level of effect: <b>Moderate</b> adverse (significant)

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<b>View south-east from Brooks Drive (High sensitivity receptors) (VP 332-02-008)</b>	
<p>Year 30 – summer:            The magnitude of visual change will have reduced to non-significant as a result of maturing planting (reported in Volume 5).</p>	<p>Level of effect:            Non-significant</p>
<p>Night-time effects year 1:            Lighting along the elevated Manchester Airport High Speed station access road (west) and on the western forecourt, within the station building and car parks will introduce a wide area of illumination across a currently relatively dark middle-distance view. The lighting required for Manchester Airport High Speed station, multi-storey car parks and cars and buses on the western access road will be clearly visible from dwellings on Brooks Drive. The loss of woodland during construction and the lighting required for operation of the Proposed Scheme will extend the existing lit areas of the M56 and Manchester Airport towards the viewpoint. The lights and their support systems will be designed to reduce the visual impact of the lighting installation.            The combination of the above will result in a <b>medium</b> magnitude of visual change.            The <b>medium</b> magnitude of visual change and <b>high</b> sensitivity will result in a <b>moderate</b> adverse significant effect.</p>	<p>Level of effect:  <b>Moderate</b>            adverse            (significant)</p>
<p>Night-time effects year 15:            Maturing woodland habitat creation will partially screen the lighting along the elevated access road to Manchester Airport High Speed station and on the station forecourt. The lighting within the elevated station and car parks will remain visible across a currently relatively dark middle-distance view.            The magnitude of visual change will remain <b>medium</b> with <b>moderate</b> adverse significant effects.</p>	<p>Level of effect:  <b>Moderate</b>            adverse            (significant)</p>
<p>Night-time effects year 30:            Effects will reduce to non-significant due to the growth and maturity of mitigation planting. This will screen the majority of the lighting arising from the Proposed Scheme (reported in detail in Volume 5).</p>	<p>Level of effect:            Non-significant</p>

<b>View east from Davenport Green Hall on Brooks Drive (High sensitivity receptors) (VP 333-02-001)</b>	
<p>Year 1 – winter and summer:            Residents on Roaring Gate Lane and at Davenport Green Hall, of <b>high</b> susceptibility and with <b>medium</b> value views, will experience noticeable changes to views as a result of the Proposed Scheme. The loss of trees and woodland removed during construction will allow more open views over wooded farmland. Manchester Airport High Speed station, a section of viaduct to enable future provision of Metrolink, Manchester tunnel south portal building and auto-transformer station and Thorley Lane overbridge will be visible in the distance, partially screened by intervening garden vegetation. The large-scale new structures will be out of character with existing views over the pastoral landscape. Woodland habitat creation and landscape mitigation planting will not be sufficiently mature to contribute to any visual integration or screening at this stage.            The combination of the above will result in a <b>medium</b> magnitude of visual change.            The <b>medium</b> magnitude of visual change and <b>high</b> sensitivity will result in a <b>moderate</b> adverse significant effect.</p>	<p>Level of effect:  <b>Moderate</b>            adverse            (significant)</p>
<p>Year 15 and year 30 – summer:            The magnitude of visual change will be reduced to non-significant by year 15 and remain so for year 30 due to the growth and maturity of the landscape mitigation planting (reported in detail in Volume 5).</p>	<p>Level of effect:            Non-significant</p>

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<b>View east from Davenport Green Hall on Brooks Drive (High sensitivity receptors) (VP 333-02-001)</b>	
<p>Night-time effects year 1:</p> <p>Lighting along the elevated Manchester Airport High Speed station access road (west) and in the station building will introduce an illuminated area into a currently relatively dark and unlit view. The loss of woodland during construction and the lighting required for operation of the Proposed Scheme will extend the existing lighting associated with the M56 and Manchester Airport towards the viewpoint. The lights and their support systems will be designed to reduce the visual impact of the lighting installation.</p> <p>The combination of the above will result in a <b>medium</b> magnitude of visual change.</p> <p>The <b>medium</b> magnitude of visual change and <b>high</b> sensitivity will result in a <b>moderate</b> adverse significant effect.</p>	<p>Level of effect:</p> <p><b>Moderate</b> adverse (significant)</p>
<p>Night-time effects year 15 and year 30:</p> <p>Effects will reduce to non-significant in years 15 and 30 due to the growth and maturity of mitigation planting. This will screen the majority of the lighting arising from the Proposed Scheme (reported in detail in Volume 5).</p>	<p>Level of effect:</p> <p>Non-significant</p>

## Other mitigation measures

- 11.5.10 The permanent effects of the Proposed Scheme on landscape and visual receptors have been reduced through integration of the measures described in this section. Effects in year 1 may also be further reduced through establishing planting early or in advance of the main construction programme.

## Summary of likely residual significant effects

- 11.5.11 In many cases, significant effects will reduce over time as the proposed mitigation planting matures and reaches its designed intention. However, the following likely residual significant effects will remain at year 15 of operation:
- major adverse effects in relation to one LCA;
  - moderate adverse effects in relation to one LCA;
  - major adverse visual effects at four representative residential viewpoint locations;
  - moderate adverse visual effects at 13 representative residential viewpoint locations;
  - moderate adverse visual effects at three representative recreational viewpoint locations; and
  - moderate adverse night-time visual effects at one representative residential viewpoint location.

## Cumulative effects

### Cumulative landscape effects

- 11.5.12 No significant cumulative temporary effects during operation are anticipated.

## **Cumulative visual effects**

- 11.5.13 No significant cumulative permanent effects during operation are anticipated.

## **Monitoring**

- 11.5.14 Volume 1, Section 9 sets out the general approach to environmental monitoring during operation of the Proposed Scheme.
- 11.5.15 There are no area-specific requirements for monitoring landscape and visual mitigation during the operation of the Proposed Scheme in the Hulseheath to Manchester Airport area.

## 12 Socio-economics

### 12.1 Introduction

- 12.1.1 This section reports on the environmental baseline, likely economic and employment impacts as well as significant effects during construction and operation of the Proposed Scheme within the Hulseheath to Manchester Airport area. The assessment considers existing businesses, community organisations, local employment and local economies, including planned growth and development.
- 12.1.2 Engagement with Cheshire East Council (CEC), Trafford Metropolitan Borough Council (TMBC), Manchester City Council (MCC) and the strategic authority of Greater Manchester Combined Authority (GMCA) has been undertaken as part of the development of the Proposed Scheme. The purpose of the engagement was to increase the understanding of socio-economic characteristics identified through a review of publicly available data.
- 12.1.3 The socio-economic effects on employment at a route-wide level are reported in Volume 3, Route-wide effects (Section 12). Maps showing the location of the key environmental features (Map Series CT-10) and the key construction (Map Series CT-05) and operational (Map Series CT-06) features of the Proposed Scheme can be found in the Volume 2: MA06 Map Book. The Proposed Scheme is described in Section 2.

### 12.2 Scope, assumptions and limitations

- 12.2.1 The scope, assumptions and limitations for the socio-economics assessment are set out in Volume 1 (Section 8) and the EIA Scope and Methodology Report (SMR)<sup>101</sup>. The assessment of in-combination effects draws upon the findings of other technical disciplines (e.g. air quality, sound, noise and vibration, landscape and visual and traffic and transport).
- 12.2.2 It is assumed that existing business resources can be retained within areas of land required for some utility works including the raising or lowering of pylons, the re-stringing of cables, utility decommissioning or the provision of access routes to such works. On the basis of this assumption, no direct assessment has been undertaken in relation to the following business resources:
- Contracting at Moss House Farm, Millington; and
  - Glasshouse Let at Millington House, Millington.

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<sup>101</sup> Volume 5: Appendix CT-001-00001, Environmental Impact Assessment Scope and Methodology Report.

## 12.3 Environmental baseline

### Existing baseline

#### Study area description

- 12.3.1 The following provides a brief overview of employment, economic structure, labour market and business premises availability within the Hulseheath to Manchester Airport area which lies within the administrative areas of CEC, TMBC and MCC and within the North West region. The southern section of the study area falls within the Cheshire and Warrington Local Enterprise Partnership (LEP). The northern section of the study area falls within the Greater Manchester LEP area and the GMCA area.

#### Business and labour market

- 12.3.2 Within the CEC, TMBC and MCC administrative areas there is a wide spread of business types reflecting a diverse range of commercial activities. In the CEC area in 2020, the professional, scientific and technical sector accounted for the largest proportion of businesses (19%), with construction the second largest (9%), followed by business administration and support services (9%) and retail (8%).
- 12.3.3 In the TMBC area in 2020, the professional, scientific and technical sector accounted for the largest proportion of businesses (20%), with business administration and support services the second largest (11%), followed by information and communication (9%) and retail (9%).
- 12.3.4 In the MCC area in 2020, the professional, scientific and technical (18%) and retail (18%) sectors accounted for the two largest proportions of businesses, followed by business administration and support services (9%) and accommodation and food services (8%), as shown in Figure 27. For comparison within the North West region, the largest sectors were professional, scientific and technical (14%) and retail (11%), followed by construction (10%) and businesses administration and support services (9%)<sup>102</sup>.

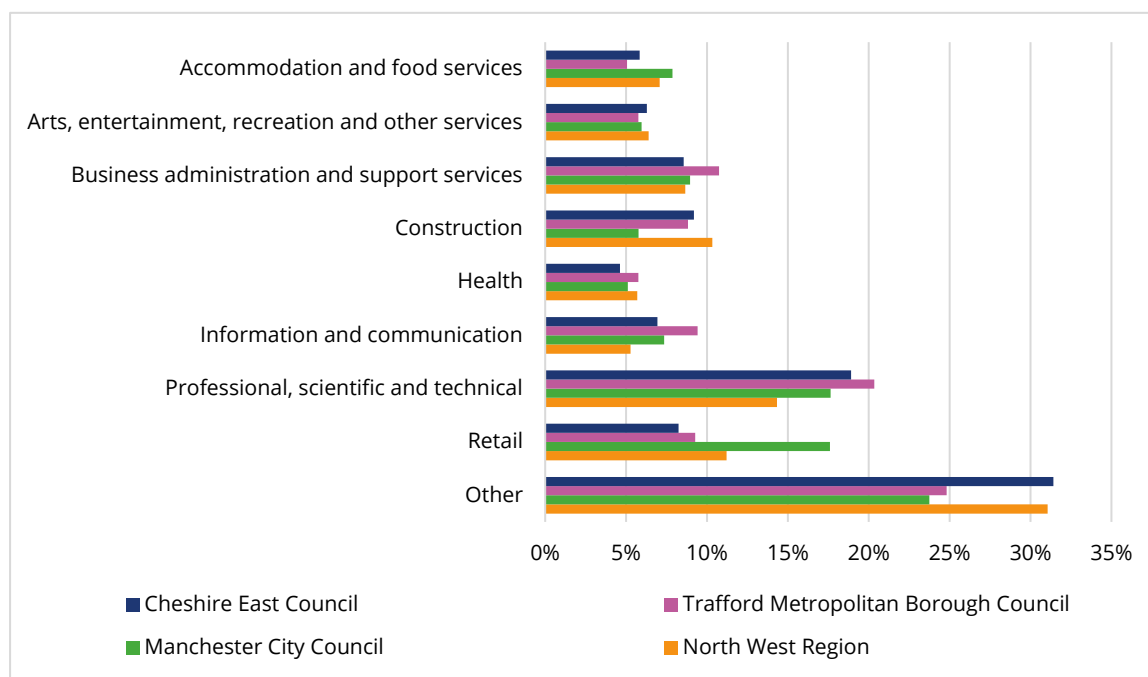
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<sup>102</sup> Office for National Statistics (2020), *UK Business Counts 2020 - Local units by industry and employment size band*. Available online at: <http://www.nomisweb.co.uk/datasets/idbrlu>.



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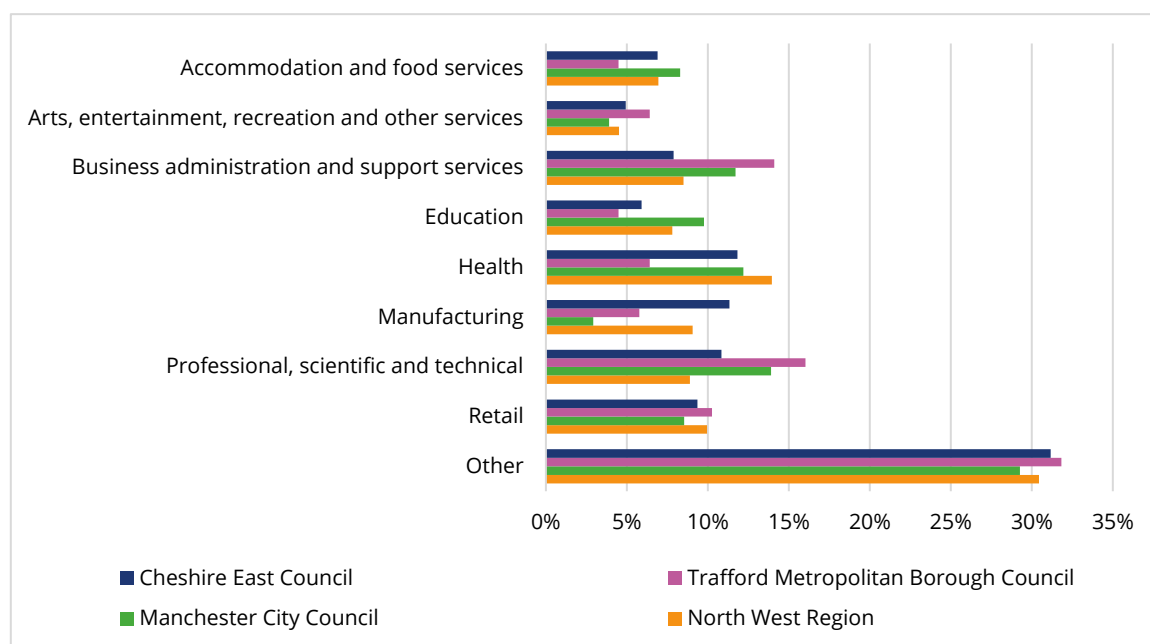
**Figure 27: Business sector composition in the Cheshire East Council, Trafford Metropolitan Borough Council and Manchester City Council areas and the North West region**



12.3.5 In 2019<sup>103</sup>, approximately 203,000 people worked in the CEC area. According to the Office for National Statistics Business Register and Employment Survey 2019, the top four sectors in terms of share of employment in the CEC area were: health (12%); manufacturing (11%); professional, scientific and technical (11%); and retail (9%). In 2019, approximately 156,000 people worked in the TMBC area. The top five sectors in terms of share of employment in the TMBC area were: professional, scientific and technical (16%); business administration and support services (14%); retail (10%); health (6%); and arts, entertainment, recreation and other services (6%). In 2019, approximately 410,000 people worked in the MCC area. The top four sectors in terms of share of employment were: professional, scientific and technical (14%); health (12%); business administration and support services (12%); and education (10%). These compare with the top four sectors for the North West region, which were: health (14%); retail (10%); manufacturing (9%); and professional, scientific and technical (9%), as shown in Figure 28.

<sup>103</sup> Office for National Statistics (2019), *Business Register and Employment Survey*. Available online at: <http://www.nomisweb.co.uk/datasets/newbres6pub>. This number includes both residents and non-residents of CEC and TMBC who work within their boundaries.

**Figure 28: Employment by industrial sector in the Cheshire East Council, Trafford Metropolitan Borough Council and Manchester City Council areas and the North West region**



12.3.6 According to the Annual Population Survey (2020)<sup>104</sup>, the employment rate<sup>105</sup> within the CEC area was 76% (171,300 people), 78% (114,800 people) in the TMBC area, and 66% (257,800 people) in the MCC area. This compares with an employment rate of 74% recorded for the North West region and 76% for England. In 2020, unemployment in the CEC area was 3.9%, 4.5% in the TMBC area and 8.6% in the MCC area which compares to the North West region (4.3%) and England (4.8%).

12.3.7 The Annual Population Survey (2020)<sup>106</sup> also shows that 42% of CEC residents, 51% of TMBC residents, and 48% of MCC residents aged 16-64 were qualified to National Vocational Qualification Level 4 (NVQ4) and above, which compares to the 39% recorded in the North West region and 43% in England, while 4.5% of CEC residents, 4.3% of TMBC residents, and 7.8% of MCC residents had no qualifications, compared to the North West region (7.5%) and England (6.2%).

<sup>104</sup> Office for National Statistics (2020), *Annual Population Survey*. NOMIS. Available online at: <http://www.nomisweb.co.uk/datasets/apsnew>. This number includes the jobs held by residents of CEC, TMBC and MCC irrespective of where they work.

<sup>105</sup> The proportion of working age (16-64 year olds) residents that is in employment.

<sup>106</sup> Office for National Statistics, *Annual Population Survey 2020*. Available online at: <http://www.nomisweb.co.uk/datasets/apsnew>. This number includes the jobs held by residents of CEC, TMBC and MCC irrespective of where they work.

## Property

- 12.3.8 A review of employment land in 2012<sup>107</sup> identified a need by 2030 for up to 323.7ha of additional employment land in the CEC area. It was estimated that CEC had an identified employment land supply of 272.4ha across the borough. The employment land shortfall compared to identified supply was up to 51.3ha to 2030. Across the rural parts of the CEC area there was found to be a lack of modern, industrial space but good availability of high-quality office space in business parks, though fewer budget options in more rural locations.
- 12.3.9 A review of employment land in 2009<sup>108</sup> identified the need for up to 170ha of employment land in the TMBC area between 2007 and 2026, amounting to 8.9ha a year. The recent 2021 Employment Land Review update estimated that TMBC had only 78.4ha of realistic employment land supply across the borough, which was less than the projected need<sup>109</sup>. It is important to note that the 2009 Employment Land Review is still relied upon for TMBC's employment land need requirement. This highlights that there is insufficient economic land supply within Trafford (as of April 2020) up to 2037.
- 12.3.10 According to the latest Economy and Employment Space Study (2010), the MCC area has a need for up to 249ha of employment land to 2027 and has a current supply of 259ha (of which 233ha is allocated for office use, 15ha for industrial, 10ha for general employment and less than 1ha for distribution). Whilst this indicates a slight over-supply, the study assumes that some sites are unlikely to be fully developed in the plan period and that there is an estimated shortfall of employment land to 2027 of up to 50ha<sup>110</sup>.
- 12.3.11 Following the decision of Stockport Council on 03 December 2020, Greater Manchester's Plan for Homes, Jobs and the Environment (the Spatial Framework)<sup>111</sup> is no longer being progressed. Although the draft Greater Manchester Spatial Framework (GMSF) is no longer being progressed, the employment land evidence base prepared for that Framework remains valid.
- 12.3.12 The draft GMSF (2020) provides more recent data on the MCC employment land requirements. This identified a need for 245ha of employment land between 2020 and 2037 within the MCC area. The MCC area had an existing supply of 240ha (of which 232ha is allocated for office use, along with 8ha for industrial and warehousing). It identified the Manchester Airport area as one of the main areas of economic growth and development in

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<sup>107</sup> Ove Arup and Partners Ltd (2012), *Cheshire East Employment Land Review*. Based on upper range covering 2009-2030. This includes a 30% flexibility factor, which acts as a buffer to ensure that future land supply is flexible enough to provide a range and choice of land to meet demand and in case there are issues such as sites no longer being delivered.

<sup>108</sup> Ove Arup and Partners Ltd (2009), *Trafford Employment Land Study: Final Report*. Based on upper range.

<sup>109</sup> Trafford Metropolitan Borough Council (2020), *Employment Land Review Update – as at 1st April 2020*.

<sup>110</sup> Nathaniel Lichfield and Partners (2010), *Manchester Economy and Employment Space Study*. Based on upper range and including a 20% flexibility factor, which is a buffer to ensure that future land supply is flexible enough to account for uncertainties in certain sites being developed.

<sup>111</sup> Greater Manchester Combined Authority (2020), *Greater Manchester's Plan for Homes, Jobs and the Environment: Greater Manchester Spatial Framework Publication Plan 2020*.

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Greater Manchester. The importance of developing adequate employment sites was considered necessary for the GMCA's strategy to support economic growth.

- 12.3.13 Based on the latest available data from the Estates Gazette (February 2021), the average vacancy rates for industrial and warehousing property in the CEC, TMBC and MCC areas have been assessed as 15%, 16% and 9.4%, respectively, based on marketed space against known stock<sup>112</sup>.
- 12.3.14 Based on the latest available data from the Estates Gazette (February 2021), the average vacancy rate for office space in the CEC, TMBC and MCC areas is 12%, 14% and 21%, respectively<sup>113</sup>.

## Future baseline

### Construction (2025)

- 12.3.15 Volume 5: Appendix CT-004-00000 provides details of the developments in the Hulseheath to Manchester Airport area that are assumed to have been implemented by 2025. The following committed developments of relevance to socio-economics that would materially alter the future baseline during construction of the Proposed Scheme in this area, are set out in Table 31.

**Table 31: Committed developments of relevance to socio-economics during construction**

Map book reference <sup>114</sup>	Planning reference	Description	How this is considered in the assessment
MA06/071	122060/MO/2018	Location: (part of) Plot 308 World Logistics Hub, Sunbank Lane, Manchester. Reserved Matters (Access, Appearance, Landscaping, Layout and Scale) application for the erection of a Class B8 warehouse (8,826m <sup>2</sup> ) with ancillary office accommodation (697m <sup>2</sup> ), service yard, surface car park for 141 vehicles, with associated landscaping and boundary treatments.	Informing future baseline.
MA06/072	122112/MO/2018	Location: (part of) Plot 308 World Logistics Hub, Sunbank Lane, Manchester. Reserved Matters (Access, Appearance, Landscaping, Layout and Scale) application for the erection of a Class B8 warehouse with ancillary office accommodation (totalling 12,855m <sup>2</sup> ), service yard, surface car park with associated landscaping and boundary treatments.	Informing future baseline.

<sup>112</sup> Vacant space is based on marketed space identified from Estates Gazette data (EGi) (February 2021).

<sup>113</sup> Based on marketed space identified from Estates Gazette data (EGi) (February 2021).

<sup>114</sup> Volume 5: Planning Data/Committed Development Map Book: Maps CT-13-319 to CT-13-322a.

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Map book reference <sup>14</sup>	Planning reference	Description	How this is considered in the assessment
MA06/073	122731/OO/2019	Location: Holiday Inn Express, Runger Lane, Manchester Airport. Outline application (access only) for the erection of a four-storey extension to provide an additional 79-bedroom spaces.	Informing future baseline.
MA06/156	125848/FO/2020	Location: land at Chicago Avenue to the north of the Airport Station and to the south of the M56 Spur Manchester Airport, M90 3RA. Erection of a nine storey 412 bedroom hotel.	Informing future baseline.
MA06/157	124266/FO/2019	Location: Unit 2, Icon World Logistics Hub, Sunbank Lane, Manchester. Erection of a Class B8 warehouse (40,625m <sup>2</sup> ) with ancillary office accommodation (2,241m <sup>2</sup> ), service yards, surface car park for 382 vehicles, with associated landscaping and boundary treatments.	Informing future baseline.
MA06/158	124264/FO/2019	Location: Unit 2, Icon World Logistics Hub, Sunbank Lane, Manchester. Erection of a Class B8 warehouse (34,861m <sup>2</sup> ) with ancillary office accommodation (2,112m <sup>2</sup> ), service yards, surface car park for 330 vehicles, with associated landscaping and boundary treatments.	Informing future baseline.
MA06/159	119802/FO/2018	Location: Plot P1, land at Palma Avenue to the east of Terminal 2, Manchester, M90 4ZY. Erection of a seven storey 262 bed hotel (Use Class C1) and a seven storey 280 bed hotel (Use Class C1) with associated landscaping, car parking, cycle storage, substation and service area.	Informing future baseline.
MA06/192	100538/FUL/20	Location: Ringway Golf Club, Hale Road, Hale Barns, Altrincham, WA15 8SW. Realignment of covered teaching facility approved under planning permission reference 93601/FUL/18, provision of new Multi-Shot Driving Range and associated ecological enhancements.	Informing future baseline.
MA06/261	121680/MO/2018	Location: Plot 319, World Logistics Hub, Sunbank Lane, Manchester, WA15 8XL. Reserved Matters (Access, Appearance, Landscaping, Layout and Scale) application for the erection of a Class B8 warehouse with ancillary office accommodation and up to three mezzanines (totalling 42,287m <sup>2</sup> ); four storey Class B1 office block (11,128m <sup>2</sup> floorspace); a six floor 300 space multi-storey car park; a 460 space surface car park with associated landscaping and boundary treatment.	Informing future baseline.

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Map book reference <sup>114</sup>	Planning reference	Description	How this is considered in the assessment
MA06/133	121323/FO/2018	Location: Land bounded by Enterprise Way to the north and west of the M56, to the south of Manchester. Erection of: two six storey office buildings (Class B1(a) comprising 8,567 sqm of net internal floorspace in Plot E2 and 8,581 sqm of net internal floorspace in Plot E3) and ground floor commercial space (Class A1,A2,A3,A4,A5, B1(a) or D1 (excluding Places of Worship) uses only; nine storey multi-storey car park (1,497 spaces) including 1,812 sqm of ground floor commercial space (Class A1-A5, B1(a) or D1 (excluding Places of Worship) uses only), pedestrian and vehicular access arrangements, temporary (five years) surface level car parking (202 spaces) and associated infrastructure works including brook diversion and landscaping.	Informing future baseline.

12.3.16 Implementation of all committed developments listed above could result in approximately 4,330 additional jobs, altering the future baseline against which the Proposed Scheme is assessed. As such, these committed developments have been included as part of the future baseline and considered within this assessment. The existing composition and numbers of employers, employees and economic sectors in the area is likely to change over time in ways that cannot be accurately forecast.

## Operation (2038)

12.3.17 Volume 5: Appendix CT-004-00000 also provides details of the developments in the Hulseheath to Manchester Airport area that are assumed to have been implemented by 2038. No additional committed developments of relevance for socio-economics have been identified that would materially alter the future baseline in this area.

## 12.4 Effects arising during construction

### Avoidance and mitigation measures

12.4.1 The draft Code of Construction Practice (CoCP)<sup>115</sup> includes a range of provisions that will help mitigate socio-economic effects associated with construction within this area, including:

- reducing nuisance through the sensitive layout of construction sites (Section 5);
- consulting businesses located close to hoardings on the design, materials used and construction of the hoarding, to reduce impacts on access to and visibility of their premises (Section 12);
- applying best practicable means during construction works to reduce noise (including vibration) at sensitive receptors (including local businesses) (Section 13);

<sup>115</sup> Volume 5: Appendix CT-002-00000, draft Code of Construction Practice (CoCP).

- monitoring and managing flood risk and other extreme weather events that may affect socio-economic resources during construction (Section 16);
- site specific traffic management measures including requirements relating to the movement of traffic from business and commercial operators of road vehicles, including goods vehicles (Section 14); and
- maintaining access to businesses for the duration of construction works where reasonably practicable (Section 14).

## Assessment of impacts and effects

### Temporary effects

#### In-combination effects

- 12.4.2 Businesses within the Hulseheath to Manchester Airport area may experience a number of effects as a result of the construction of the Proposed Scheme, for example, air quality, landscape and visual, noise and vibration or construction traffic impacts. Taken in-combination, these multiple residual effects could amount to a significant change in the ambiance at these businesses leading to a possible loss of trade for the following affected businesses. Durations of in-combination effects have been identified in this Section where information on the duration of contributing effects is provided in the relevant source assessments. The assessment of in-combination effects draws upon: Section 5, Air quality; Section 11, Landscape and visual; Section 13, Sound, noise and vibration; and Section 14, Traffic and transport.
- 12.4.3 A management company operating from Cherry Tree Farm, located on Cherry Tree Lane, will experience significant visual effects and noise effects (for one year and 11 months) as a result of the construction of the Proposed Scheme. The sensitivity of this establishment is assessed to be medium, as customers and staff may be sensitive to impacts on the local environment and setting. The construction works may discourage them from using this facility. Given the duration of effects and the medium level of sensitivity, the Proposed Scheme is assessed to have an adverse significant in-combination effect on this business.
- 12.4.4 Birkin Farm Holiday Let, run by Tatton Stays and located on Ashley Road, will experience significant visual effects and noise effects (for seven years and nine months) as a result of the construction of the Proposed Scheme. The sensitivity of this establishment is assessed to be high, as customers are considered to be sensitive to impacts on the local environment and setting. The construction works may discourage them from using this facility. Given the duration of effects and the high level of sensitivity, the Proposed Scheme is assessed to have an adverse significant in-combination effect on this business.
- 12.4.5 South Arden Lodge and Little Lodge Holiday Lets, both run by Tatton Stays, located on Mobberley Road, will experience significant visual effects and noise effects (for seven years and nine months) as a result of the construction of the Proposed Scheme. The sensitivity of these establishments is assessed to be high, as customers are considered to be sensitive to

impacts on the local environment and setting. The construction works may discourage them from using this facility. Given the duration of effects and the high level of sensitivity, the Proposed Scheme is assessed to have an adverse significant in-combination effect on these businesses.

- 12.4.6 A bed and breakfast at Sugar Brook Farm, Mobberley Road, will experience significant visual effects and noise effects (for three years and eight months) as a result of the construction of the Proposed Scheme. The sensitivity of this establishment is assessed to be high, as customers are considered to be sensitive to impacts on the local environment and setting. The construction works may discourage them from using this facility. Given the duration of effects and the high level of sensitivity, the Proposed Scheme is assessed to have an adverse significant in-combination effect on this business.

### **Isolation**

- 12.4.7 No businesses have been identified within the Hulseheath to Manchester Airport area that are expected to experience significant isolation effects as a result of the Proposed Scheme.

### **Construction employment**

- 12.4.8 There will be two main civil engineering compounds (Manchester Airport High Speed station main compound and Manchester Tunnel South portal main compound), and 16 civil engineering satellite compounds in the Hulseheath to Manchester Airport area. Both of the main compounds will continue to be used as railway systems main compounds and two of the satellite compounds will continue to be used as railway systems satellite compounds following the completion of civil engineering works. There will be two additional satellite compounds used for railway systems works only. Ashley railhead will also be used to receive and stockpile materials by rail that will be required for the construction of the railway tracks, signals, and electrification systems for the Proposed Scheme.
- 12.4.9 Up to 14,800 person years of construction employment opportunities will be created at these sites<sup>116</sup>, broadly equivalent to 1,480 full time jobs<sup>117</sup>. Depending on the skill levels required and the skills of local people, these jobs are potentially accessible to residents in the locality and to others living further afield. The impact of the direct construction employment creation has been considered as part of the route-wide assessment (see Volume 3, Route-wide effects).
- 12.4.10 Direct construction employment could lead to opportunities for local businesses to supply the Proposed Scheme or to benefit from expenditure of construction workers. The impact of indirect construction employment creation has been considered as part of the route-wide assessment (see Volume 3, Route-wide effects).

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<sup>116</sup> Construction labour is reported in construction person years, where one construction person year represents the work done by one person in a year composed of a standard number of working days.

<sup>117</sup> Based on the convention that 10 employment years is equivalent to one full time equivalent job.



12.4.11 The resulting effects on employment are reported in aggregate at a route-wide level (see Volume 3, Route-wide effects).

## Permanent effects

### Businesses

12.4.12 Businesses directly affected, comprising those that lie within land required for the Proposed Scheme, are reported in groups, where possible, to form defined resources based on their location and operational characteristics. A group could contain either one or a number of businesses reflecting the fact that a building may have more than one occupier or that similar businesses and resources are clustered together.

12.4.13 Overall, 10 resources in the study area will experience direct impacts as a result of the Proposed Scheme. These are as follows:

- units on Cherry Tree Lane, Rostherne (four resources);
- wedding venue at Stock Farm;
- airport parking and storage at Higher Thorns Green Farm;
- Fairfield Farm Project at Higher Thorns Green Farm;
- Holiday Inn Express Manchester Airport (including committed development MA06/073);
- Manchester Airport Marriott Hotel; and
- Oakcroft Guest House on Hasty Lane.

12.4.14 The resources listed above are those that are anticipated to experience job losses or displacement as a result of construction of the Proposed Scheme. Additionally, land required for the construction of the Proposed Scheme will directly impact other business resources. These businesses are not listed above, as minor effect upon them is not expected to result in job losses or displacement.

12.4.15 Three of the resources are subject to potentially significant effects on business activities and employment. These resources are listed in Table 32.

**Table 32: Resources which will potentially experience significant direct effects**

Resource	Description of business activity
Fairfield Farm Project at Higher Thorns Green Farm	The farm hosts the Fairfield Farm Project, which is run by Fairfield Care Ltd. The project provides a range of social and flexible educational opportunities for children and adults with complex learning difficulties. Activities include animal husbandry, horticulture and farming skills.
Holiday Inn Express Manchester Airport	Large hotel with associated restaurant and bar.
Manchester Airport Marriott Hotel	Large hotel with associated restaurant and bar, hair boutique and spa on-site.

12.4.16 The magnitude of impact focuses on the number of jobs that will be affected by the Proposed Scheme, either through displacement or possible job loss. It also considers the

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implications of this impact in relation to the scale of economic activity and opportunity in the area.

12.4.17 The following factors were taken into account when considering the sensitivity of resources:

- availability of alternative, suitable premises;
- size of the local labour market;
- skill levels and qualifications of local people; and
- levels of unemployment.

12.4.18 Taking account of the sensitivity of the resource and the magnitude of impact, the significance of the resultant effects is set out in Table 33.

**Table 33: Significance of effects**

Resource	Impact magnitude	Sensitivity	Significance of effect
Fairfield Farm Project at Higher Thorns Green Farm	Medium	Medium	Moderate adverse - significant
Holiday Inn Express Manchester Airport	High	Medium	Major adverse - significant
Manchester Airport Marriott Hotel	High	High	Major adverse - significant

12.4.19 The construction of the Proposed Scheme will require the acquisition of land and buildings. An overview of the resources expected to be significantly affected has been included below.

12.4.20 Construction of Thorns Green cutting will require the demolition of farm buildings and barns as well as the loss of farmland at Higher Thorns Green Farm. These facilities are used by the Fairfield Farm Project, which offers residential, educational and care services for children and adults with complex learning difficulties. The sensitivity is assessed as medium as the farm has been expressly adapted to the specific needs of its users, which may be difficult to replicate elsewhere. The magnitude is medium based on the number of jobs affected. The effect is assessed to be moderate adverse and will therefore be significant.

12.4.21 The construction of the realigned A538 Hale Road and A538 Hale Road overbridge (south) will require approximately 50% of the 160 car parking spaces associated with the Holiday Inn Express at Manchester Airport. It is considered likely that the hotel is dependent on its prominent location adjacent to the Manchester Airport and the M56, along with its customer parking provision. The sensitivity is assessed as medium, as it is considered that the operator may have difficulty in adequately filling rooms given the loss of car parking for customers. The magnitude is high based on the number of jobs affected including those that will additionally be created at this location by committed development MA06/073. The effect is assessed to be major adverse and will therefore be significant.

12.4.22 The construction of Manchester Airport High Speed station cutting and associated retaining walls will require the demolition of Manchester Airport Marriott Hotel. It is likely that the hotel and associated facilities are dependent on the hotel's prominent location adjacent to the Manchester Airport and the M56. The sensitivity is assessed as high, as it is considered

that the operator may have difficulty in finding suitable alternative premises or a suitable site in the locality on which to rebuild the hotel. The magnitude is high based on the number of jobs affected. The effect is assessed to be major adverse and will therefore be significant.

- 12.4.23 Across all of the employment areas reviewed, it is expected that an estimated 320 jobs<sup>118</sup> will either be displaced or possibly lost within the Hulseheath to Manchester area. The impact from the relocation or loss of jobs is considered to be minor in the context of the total number of people employed in the CEC, TMBC and MCC areas (approximately 203,000, 156,000 and 410,000 jobs, respectively) and the scale of economic activity and opportunity in the area. There is a reasonable probability that most businesses will be able to relocate to places that will still be accessible to residents within the local area due to the general availability of vacant premises. However, there may be cases where alternative locations are problematic, and the businesses may be unable to relocate on a like-for-like basis within the area.

## **Isolation**

- 12.4.24 Businesses within the Hulseheath to Manchester Airport area may experience significant isolation effects as a result of the Proposed Scheme. As a consequence, this could lead to a loss of trade for the affected businesses.
- 12.4.25 The construction and operation of the Proposed Scheme requires the permanent closure of a section of Ashley Road, where it intersects the Proposed Scheme. The road will be realigned 880m to the south-east, and road users approaching from the direction of Hale and Ashley will have an increased journey length of 2.7km. A farm shop at Fentons Farm, located south of the Proposed Scheme, is expected to rely on trade coming from Hale and Ashley via Ashley Road. A diversion of this length may discourage customers from using the business. For the reasons stated above, the disruption as a result of the Proposed Scheme is considered to represent a moderate adverse significant isolation effect on this business, which commences part way through the construction phase but continues into operation.

## **Other mitigation measures**

- 12.4.26 Businesses displaced by the Proposed Scheme will be compensated in accordance with the Compensation Code. HS2 Ltd recognises the importance of businesses displaced from their existing premises being able to relocate to suitable alternative premises and will, therefore, offer additional support over and above statutory requirements to facilitate this

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<sup>118</sup> Employment within businesses has been estimated through a combination of sources, for example, surveys of businesses, the Experian employment dataset, employment floor space and the Homes and Communities Agency (HCA) Employment Densities Guide 3rd Edition (2015). The estimate is calculated using standard employment density ratios and estimates of floor areas and may vary significantly from actual employment at the sites.

process<sup>119,120</sup>. Businesses with an interest in land that is either being acquired or possessed temporarily may also be eligible for compensation in accordance with the Compensation Code.

- 12.4.27 The construction of the Proposed Scheme offers considerable opportunities to businesses and residents along the line of route in terms of supplying goods and services and obtaining employment. HS2 Ltd is committed to working with its suppliers to build a skilled workforce that promotes further economic growth across the UK.
- 12.4.28 The nominated undertaker will seek to deliver appropriate signage to inform users of the continued operation of the farm shop at Fentons Farm, subject to securing all relevant consents.

## Summary of likely residual significant effects

- 12.4.29 Likely significant residual effects are shown in Volume 5, Socio-economics Map Book: Maps SE-01-319 to SE-01-322a.
- 12.4.30 The Proposed Scheme will require the demolition of two socio-economic resources: Fairfield Farm Project at Higher Thorns Green Farm and Manchester Airport Marriott Hotel. Additionally, the Proposed Scheme will require the loss of land from Holiday Inn Express Manchester Airport. The adverse effect on all of these resources will be significant.
- 12.4.31 During construction of the Proposed Scheme, customers may also be discouraged from using Birkin Farm, South Arden and Little Lodge Holiday Lets, and a bed and breakfast at Sugar Brook Farm. The staff of a management company on Cherry Tree Lane are expected to be affected by construction works associated with the Proposed Scheme. The adverse in-combination effect on all these resources will be significant.
- 12.4.32 During construction and continuing into operation of the Proposed Scheme, Fentons Farm Shop will experience permanent adverse residual significant isolation effects as a result of road closure.

## Cumulative effects

- 12.4.33 No significant cumulative temporary or permanent effects during construction have been identified.

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<sup>119</sup> High Speed Two Ltd (2022), *Phase 2b Western Leg Information Paper C7: Business relocation*.

<sup>120</sup> High Speed Two Ltd (2022), *Phase 2b Western Leg Information Paper C8: Compensation code for compulsory purchase*.

## 12.5 Effects arising from operation

### Avoidance and mitigation measures

- 12.5.1 No mitigation measures are proposed in relation to business resources during operation of the Proposed Scheme.

### Assessment of impacts and effects

#### Businesses

##### In-combination effects

- 12.5.2 Businesses within the Hulseheath to Manchester Airport area may experience a number of effects as a result of the operation of the Proposed Scheme, for example, air quality, landscape and visual, or noise and vibration impacts. Taken in-combination, these multiple residual effects could amount to a significant change in the ambiance at these businesses leading to a possible loss of trade for the following affected businesses. Durations of in-combination effects have been identified in this Section where information on the duration of contributing effects is provided in the relevant source assessments above. The assessment of in-combination effects draws upon: Section 5, Air quality; Section 11, Landscape and visual; and Section 13, Sound, noise and vibration.
- 12.5.3 Birkin Farm Holiday Let, run by Tatton Stays and located on Ashley Road, will experience significant visual effects (through to year 30) and significant noise effects (permanent) during the operational phase of the Proposed Scheme. The sensitivity of this establishment is considered to be high, as customers are considered to be sensitive to effects on the local environment and setting. This is likely to discourage customers from choosing this business. Given the duration of effects and the high level of sensitivity, the Proposed Scheme is assessed to have an adverse significant in-combination effect on this business.

##### Isolation

- 12.5.4 No businesses have been identified within the Hulseheath to Manchester Airport area that are expected to experience significant isolation effects as a result of the Proposed Scheme.

### Operational employment

- 12.5.5 Operational employment will be created at locations along the route of the Proposed Scheme including stations, train crew facilities and infrastructure/maintenance depots. Within the Hulseheath to Manchester Airport area there will be a station at Manchester

Airport creating 160 HS2 related jobs and a further 60 concourse retail jobs<sup>121</sup>. These employment opportunities will be accessible to residents in the locality.

- 12.5.6 The Manchester Airport High Speed station is likely to encourage further investment in the surrounding area seeking to capture the benefits of increased activity around the station.
- 12.5.7 Direct operational employment created by the Proposed Scheme could also lead to indirect employment opportunities for local businesses in terms of supplying the project or benefiting from expenditure of directly employed workers on goods and services.
- 12.5.8 Some of these employment opportunities will be accessible to residents in the locality and, given the transport accessibility within the local area, to residents living further afield.
- 12.5.9 The impact of operational employment creation has been assessed as part of the route-wide assessment (see Volume 3).

## Other mitigation measures

- 12.5.10 The landscape and visual, and sound, noise and vibration assessments have not identified potential mitigation measures in relation to the significant in-combination effect at Birkin Farm Holiday Let.

## Summary of likely residual significant effects

- 12.5.11 Likely significant residual effects are shown on Volume 5, Socio-economic Map Book: Maps SE-01-319 to SE-01-322a. Customers may be discouraged from using Birkin Farm Holiday Let as a result of the residual significant adverse in-combination effect during operation of the Proposed Scheme.

## Cumulative effects

- 12.5.12 No significant cumulative effects on socio-economic receptors have been identified in the Hulseheath to Manchester Airport area during operation.

## Monitoring

- 12.5.13 Volume 1, Section 9 sets out the general approach to environmental monitoring during operation of the Proposed Scheme.
- 12.5.14 There are no area-specific requirements for monitoring socio-economic effects during the operation of the Proposed Scheme in the Hulseheath to Manchester Airport area. Where there are likely residual significant effects at Birkin Farm Holiday Let, the specific operational

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<sup>121</sup> These employment figures are estimates based on the current design and knowledge gained from previous phases of HS2.

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monitoring requirements in relation to visual and noise effects, which will contribute to the in-combination effect, are described in the relevant topic sections.

## 13 Sound, noise and vibration

### 13.1 Introduction

- 13.1.1 This section reports the assessment of the noise and vibration likely significant effects arising from the construction and operation of the Proposed Scheme within the Hulseheath to Manchester Airport area on:
- ‘residential receptors’: people, primarily where they live, in terms of individual dwellings and on a wider community basis including any shared community open areas; and
  - ‘non-residential receptors’ such as:
    - community facilities including schools, hospitals, places of worship and ‘quiet areas’; and
    - commercial properties such as hotels.
- 13.1.2 ‘Shared community open areas’ are amenity spaces that the Planning Practice Guidance<sup>122</sup> identifies may partially offset a noise effect experienced by residents at their dwellings and are either a) relatively quiet nearby external amenity spaces for sole use by a limited group of residents as part of the amenity of their dwellings or b) a relatively quiet external publicly accessible amenity space (e.g. park or local green space) that is nearby.
- 13.1.3 Non-residential receptors with multiple uses were assessed either based on the most noise sensitive use or were subject to multiple assessments as appropriate.
- 13.1.4 ‘Quiet areas’ are defined in the EIA Scope and Methodology Report (SMR)<sup>123</sup> as:
- areas designated under Local Plans as being prized for their tranquillity;
  - areas designated under Local Plans or Neighbourhood Development Plans as Local Green Spaces; and
  - areas identified as Quiet Areas through implementation of the Environmental Noise (England) Regulations<sup>124,125</sup>.

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<sup>122</sup> Department for Communities and Local Government (2019), *Planning Practice Guidance – Noise*. Available online at: <https://www.gov.uk/guidance/noise--2>.

<sup>123</sup> Volume 5: Appendix CT-001-00001, Environmental Impact Assessment Scope and Methodology Report.

<sup>124</sup> *The Environmental Noise (England) Regulations 2006*. Her Majesty's Stationery Office. London. Available online at: <https://www.legislation.gov.uk/uksi/2006/2238>.

<sup>125</sup> *The Environmental Noise (England) (Amendment) Regulations 2009*. (SI 2009/1610). Available online at: <https://www.legislation.gov.uk/uksi/2009/1610>.



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- 13.1.5 The methodology for the assessment of likely significant noise and vibration effects was developed in line with Government noise policy<sup>126</sup>, planning policy, planning practice guidance on noise<sup>122</sup> and EIA Regulations as described in the SMR.
- 13.1.6 Engagement has been undertaken with Trafford Metropolitan Borough Council (TMBC), Cheshire East Council (CEC) and Manchester City Council (MCC) with respect to the sound, noise and vibration assessment. The purpose of this engagement has been twofold. Firstly, engagement has been undertaken on a route-wide basis covering matters including process, scope, method, approach to baseline and mitigation strategy. Secondly, local engagement has been undertaken to obtain relevant information regarding residential and non-residential receptors, existing baseline sound levels and to discuss the development of the mitigation to be included in the Proposed Scheme. Officers from local authorities have been invited to attend and witness baseline sound measurements. Where appropriate, relevant information identified by the authorities has been taken into account in the assessment.
- 13.1.7 More detailed information regarding the sound, noise and vibration assessment for the Hulseheath to Manchester Airport area is available in the relevant appendices in Volume 5:
- Sound, noise and vibration, route-wide assumptions and methodology (Appendix SV-001-00000);
  - Sound, noise and vibration baseline and construction assessment (Appendix SV-002-0MA06); and
  - Sound, noise and vibration operation assessment (Appendix SV-003-0MA06).
- 13.1.8 Maps showing the location of the key environmental features (Map Series CT-10) and the key construction (Map Series CT-05) and operational (Map Series CT-06) features of the Proposed Scheme can be found in the Volume 2: MA06 Map Book. Mapping to support the sound, noise and vibration assessment is presented in Map Series SV-05 (Volume 2: MA06 Map Book) and Map Series SV-02, SV-03, SV-08 and SV-09 (Volume 5, Sound, noise and vibration Map Book).
- 13.1.9 The assessment of likely significant effects from noise and vibration on agricultural, community, ecological, health, heritage and socio-economic receptors and the assessment of tranquillity are presented in Section 4, Agriculture, forestry and soils; Section 6, Community; Section 7, Ecology and biodiversity; Section 8, Health; Section 9, Historic environment; Section 12, Socio-economic; and Section 11, Landscape and visual of this report respectively. The Proposed Scheme is described in Section 2.

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<sup>126</sup> Department for Environment, Food and Rural Affairs (2010), *Noise Policy Statement for England (NPSE)*. Available online at: [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/69533/pb13750-noise-policy.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/69533/pb13750-noise-policy.pdf).

## 13.2 Scope, assumptions and limitations

- 13.2.1 The approach to assessing sound, noise and vibration and identifying envisaged mitigation is outlined in Volume 1 (Section 8 and Section 9) and the SMR.
- 13.2.2 In this assessment 'sound' is used to describe the acoustic conditions that people experience as a part of their everyday lives. Noise is taken as unwanted sound and hence adverse effects are noise effects.
- 13.2.3 Effects can either be temporary from construction or permanent from the operation of the Proposed Scheme. These effects may be direct, resulting from the construction or operation of the Proposed Scheme, and/or indirect, resulting from changes in traffic patterns on existing roads or railways that result from the construction or operation of the Proposed Scheme.
- 13.2.4 It is likely that the majority of receptors adjacent to the Proposed Scheme in the Hulseheath to Manchester Airport area are not currently subject to appreciable vibration<sup>127</sup>. The predicted vibration levels at all receptors as a result of the Proposed Scheme has, therefore, been assessed using specific absolute thresholds, below which receptors will not be affected by vibration, rather than vibration change criteria. Further information is provided in Volume 1 (Section 8).

## 13.3 Environmental baseline

### Existing baseline

- 13.3.1 The Hulseheath to Manchester Airport area is characterised by a mix of villages, hamlets and isolated residential properties and becomes predominantly urban towards Hale in the north-east of the area along with Manchester Airport and associated commercial premises. The sound environment is generally dominated by local and distant road traffic. There are also contributions from trains, low flying aircraft to and from Manchester Airport, commercial vehicles operating around the industrial areas and natural and agricultural sounds.
- 13.3.2 There are several main roads that contribute to the sound environment near to the route of the Proposed Scheme within the Hulseheath to Manchester Airport area. These include: the M56 affecting Booth Bank, Ashley, Thorns Green, Ringway, Warburton Green, Hale Barns and Davenport Green; the A556, which affects Bucklow Hill; and the A538 Hale Road, which affects Hale Barns. Railway sound from the Mid-Cheshire Line also contributes to the sound environment near to the route of the Proposed Scheme within the Ashley area.

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<sup>127</sup> Further information is available in the Volume 5: Appendix SV-001-00000, Sound, noise and vibration. methodology, assumptions and assessment report and the Volume 5: Appendix CT-001-00001, Environmental Impact Assessment Scope and Methodology Report.

- 13.3.3 Sound levels close to these main transportation routes are high during the daytime and are generally lower at night. Sound levels decrease with increasing distance from the main transportation routes. Manchester Airport restricts the operations permitted at night so that the aircraft noise levels are lower than during the daytime.
- 13.3.4 Further information on the existing baseline, including baseline sound levels and baseline monitoring results, is provided for the Hulseheath to Manchester Airport area in Volume 5: Appendix SV-002-0MA06.

## Future baseline

- 13.3.5 Without the Proposed Scheme, existing sound levels in this area are likely to increase slowly over time. This is primarily due to road traffic growth, which may be as a result of local or national trends or due to specific committed developments. Changes in car technology may offset some of the expected sound level increases due to traffic growth on low speed roads. On higher speed roads, tyre sound dominates and hence the expected growth in traffic is likely to continue to increase ambient sound levels.
- 13.3.6 The future operational baseline takes account of proposed and likely noise reduction provided in Important Areas identified in Defra's Noise Action Plans for agglomerations<sup>128</sup>, roads<sup>129</sup> or railways<sup>130</sup>. Following engagement with Highways England, trunk roads, likely to be resurfaced under future routine maintenance programmes, before the opening of the Proposed Scheme, are assumed to have a low noise surface. Airborne noise levels from railways in Important Areas are assumed to be controlled, where necessary, to the level where there is no Noise Action Plan requirement to investigate further mitigation. Map Series SV-05 (Volume 2: MA06 Map Book) shows any noise Important Areas in the Hulseheath to Manchester Airport area. Further information is reported for the Hulseheath to Manchester Airport area in Volume 5: Appendix SV-002-0MA06.
- 13.3.7 Committed developments involving sound or vibration sensitive uses within the relevant study area have been included within the assessment and are reported for the Hulseheath to Manchester Airport area in Volume 5: Appendix SV-002-0MA06<sup>131</sup>.

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<sup>128</sup> Department for Environment, Food and Rural Affairs (2019), *Noise Action Plan: Agglomerations (Urban Areas)*. Available online at: [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/813663/noise-action-plan-2019-agglomerations.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/813663/noise-action-plan-2019-agglomerations.pdf).

<sup>129</sup> Department for Environment, Food and Rural Affairs (2019), *Noise Action Plan: Roads (including major roads)*. Available online at: [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/813666/noise-action-plan-2019-roads.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/813666/noise-action-plan-2019-roads.pdf).

<sup>130</sup> Department for Environment, Food and Rural Affairs (2019), *Noise Action Plan: Railways (including major railways)*. Available online at: [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/813664/noise-action-plan-2019-railways.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/813664/noise-action-plan-2019-railways.pdf).

<sup>131</sup> Volume 5: Appendix CT-004-00000 provides details of all of the developments assumed to be implemented.

## Construction (2025)

- 13.3.8 The assessment of noise from construction activities assumes a future construction baseline year of 2025, which represents the period immediately prior to the start of the construction period. As a reasonable worst case, it has been assumed that no change in baseline sound levels will occur between the existing baseline year of 2018 and the future construction baseline year.

## Operation (2038)

- 13.3.9 The operational assessment is based upon the absolute sound level and/or predicted change in sound levels that will result from operation of the Proposed Scheme. The future operational baseline is the sound environment that would exist in 2038 without the Proposed Scheme. This is presented in Table 1 in Volume 5: Appendix SV-002-0MA06.

# 13.4 Effects arising during construction

## Assumptions and limitations

### Local assumptions

- 13.4.1 The construction arrangements that form the basis of the assessment are presented in Section 2.3 of this report, in Volume 1 (Section 8) and in the draft CoCP<sup>132</sup>.
- 13.4.2 The following activities have been assumed to be undertaken during the evening and night-time for reasons of safety, engineering practicability or to reduce the impact on existing transport:
- rail movements from the Ashley railhead will utilise available train paths during the day and night; and
  - activities to support the construction of Manchester tunnel and Manchester tunnel south portal in the Davenport Green to Ardwick area (MA07) (including erection of the tunnel boring machine (TBM), support for the TBM as it excavates, excavated material handling, installation of the tunnel lining and tunnel fit-out) will require 24 hour working.
- 13.4.3 Piling and vibratory compaction is likely to result in short-term appreciable ground-borne vibration at a small number of receptors, situated very close to these activities. These receptors will also be exposed to appreciable noise from the construction of the Proposed Scheme. The significance of the identified vibration effects has been assessed in combination with the airborne noise effects also identified at these receptors. The assessment is presented in Volume 5: Appendix SV-002-0MA06.

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<sup>132</sup> Volume 5: Appendix CT-002-00000, draft Code of Construction Practice (CoCP).

13.4.4 Track laying, power system and signalling installation works are unlikely to result in significant construction noise effects, given the short duration close to any communities, and where included in the Proposed Scheme, the presence of the permanent noise fence barriers.

## Avoidance and mitigation measures

- 13.4.5 The assessment assumes the implementation of the principles and management processes set out in the noise and vibration section of the draft CoCP (Section 13), which are:
- best practicable means (BPM) as defined by the Control of Pollution Act 1974 (CoPA) and Environmental Protection Act 1990 (EPA), which will be applied during construction activities to reduce noise (including vibration) at neighbouring residential properties and other sensitive receptors (including local businesses and quiet areas designated by the local authority).
  - as part of BPM, mitigation measures are applied in the following order:
    - noise and vibration control at source: for example, the selection of quiet and low vibration equipment, review of construction methodology to consider quieter methods, location of equipment on-site, control of working hours, the provision of acoustic enclosures and the use of less intrusive alarms, such as broadband vehicle reversing warnings;
    - screening: for example, local screening of equipment or 2.4m high perimeter hoarding or the use of temporary stockpiles; and
    - where, despite the implementation of BPM, the noise exposure exceeds the criteria defined in the draft CoCP, noise insulation or ultimately temporary re-housing will be offered at qualifying properties.
  - lead contractors will seek to obtain prior consent from the relevant local authority under Section 61 of the CoPA for the proposed construction works. The consent application will set out BPM measures to reduce construction noise and vibration, including control of working hours, and provide a further assessment of construction noise and vibration, including confirmation of noise insulation/temporary re-housing provision.
  - contractors will undertake and report such monitoring as is necessary to assure and demonstrate compliance with all noise and vibration commitments. Monitoring data will be provided regularly to, and be reviewed by, the nominated undertaker and made available to the local authorities.
  - contractors will be required to comply with the terms of the CoCP and appropriate action will be taken by the nominated undertaker as required to ensure compliance.
- 13.4.6 In addition to this mitigation, to avoid or reduce likely community significant effects, taller screening (provided by solid temporary hoarding, temporary stockpiles, screening close to activities or other means to provide equivalent noise reductions), as described in the draft CoCP, has been assumed at the following construction sites and compounds or land required for construction of the Proposed Scheme:

- around works associated with Ashley railhead;
- Sunbank Lane satellite compound near Ringway;
- M56 East satellite compound near Warburton Green;
- Manchester Airport High Speed station south satellite compound; and
- around works associated with A538 Hale Road overbridge (south) and highway works near Hale Barns.

13.4.7 Noise insulation will be offered for qualifying buildings as defined in the draft CoCP. Noise insulation or, where appropriate, temporary re-housing will avoid residents being significantly affected by levels of construction noise inside their dwellings. The assessment reported in this section provides an estimate of the buildings that are likely to qualify for noise insulation. None are predicted to qualify for temporary rehousing.

13.4.8 Qualification for noise insulation and, where appropriate, temporary re-housing will be confirmed, as part of seeking prior consent from the local authority under Section 61 of the CoPA. Qualifying buildings will be identified, as required in the draft CoCP, so that noise insulation can be installed, or where appropriate any temporary re-housing provided, before the start of the works predicted to exceed noise insulation or temporary re-housing criteria.

## Assessment of impacts and effects

### Residential receptors: direct effects – individual dwellings

13.4.9 Taking account of the avoidance and mitigation measures set out in the previous paragraphs, the following eight residential properties are forecast to experience noise above the eligibility criteria for noise insulation, but below the eligibility criteria for temporary rehousing, as defined in the HS2 noise insulation and temporary rehousing policy<sup>133</sup>. The location of these dwellings are indicated on Map Series SV-03 (Volume 5, Sound, noise and vibration Map Book):

- Moss House Farm, Thowler Lane, Millington (assessment location ref.: 612730);
- Mereside Cottage at Cherry Tree Lane, Rostherne (assessment location ref.: 612781);
- Mere Covert Cottage, Cherry Tree Lane, Rostherne (assessment location ref.: 612759);
- Sycamore Cottage, Ashley Road, Ashley (assessment location ref.: 612738);
- two properties (Arden House and The Lodge) at Lamb Lane, Ashley (assessment location ref.: 612693);
- Chapel House Farm, Castle Mill Lane, Ashley (assessment location ref.: 612708); and
- Halebank Cottage, Sunbank Lane, Ringway (assessment location ref.: 612741).

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<sup>133</sup> Further information is provided in High Speed Two Ltd (2022), *Phase 2b Western Leg Information Paper E13: Control of construction noise and vibration*. Available online at: <https://www.gov.uk/government/collections/hs2-phase-2b-crewe-manchester-environmental-statement>.

- 13.4.10 For daytime construction, the threshold for eligibility for noise insulation is 75dB measured outdoors as specified in the draft CoCP. For evening and night-time construction, the corresponding thresholds for eligibility for noise insulation are 65dB and 55dB measured outdoors.
- 13.4.11 The mitigation measures, including noise insulation for the eight residential properties, will reduce noise inside all dwellings such that it does not reach a level where it will significantly affect residents.

### **Residential receptors: direct effects – communities**

- 13.4.12 The avoidance and mitigation measures to be implemented during construction will reduce airborne construction noise adverse effects on receptors and communities. Residual temporary noise or vibration effects are identified later in this section.
- 13.4.13 In locations with lower existing sound levels<sup>134</sup>, construction noise effects are likely to be caused by changes to noise levels outside dwellings relative to existing sound levels. These may be considered by the local community as an effect on the acoustic character of the area and hence be perceived as a change in the quality of life for that community. These effects are considered to be significant when assessed on a community basis taking account of the local context.
- 13.4.14 The temporary adverse effects on the residential areas identified in Table 34, including shared open areas, are considered to be significant on a community basis. The duration of impact is the period where the relevant assessment category is exceeded. The predicted monthly construction noise level will vary throughout this period and as a guide the typical and highest monthly noise levels at the closest properties in the community identified are presented in the 'cause' column of this table.

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<sup>134</sup> Further information is presented in Volume 5: Appendix SV-001-00000.

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**Table 34: Direct adverse construction effects on residential communities and shared open areas that are considered to be significant on a community basis**

Significant effect number (and map reference) <sup>135</sup>	Type of significant effect	Time of day	Location	Cause (construction activities) <sup>136</sup>	Assumed approximate duration of impact
MA06-C-C1 (SV-03-321)	Construction noise	Daytime	Ringway: Approximately 10 dwellings in the vicinity of Sunbank Lane.	Earthworks and overbridge construction. The typical and highest monthly noise levels are approximately 65dB to 70dB and 70dB to 75dB <sup>137</sup> .	Up to two years and three months.
MA06-C-C2 (SV-03-321)	Construction noise and vibration	Daytime	Warburton Green: Approximately 40 dwellings in the vicinity of Hale Road, Burnside, Warburton Close and Warburton Drive.	Earthworks and site compound operation. The typical and highest monthly noise levels are approximately 65dB to 70dB and 70dB to 75dB <sup>137</sup> . Vibratory rollers associated with site set-up are predicted to create a moderate vibration impact at properties near to the Proposed Scheme.	Noise for up to four years and five months. Vibration for up to two months.
MA06-C-C3 (SV-03-321)	Construction noise and vibration	Daytime	Hale Barns: Approximately 30 dwellings in the vicinity of the A538 Hale Road and Hasty Lane.	Construction of overbridge and site compound operation. The typical and highest monthly noise levels are approximately 60dB to 70dB and 70dB to 75dB <sup>137</sup> . Vibratory rollers associated with earthworks are predicted to create a minor vibration impact at properties near to the Proposed Scheme.	Noise for up to four years and two months. Vibration for up to three months.
There is a significant effect at Hulseheath (MA03-C-C2) which extends across the boundary between the Hulseheath to Manchester airport area and the Pickmere to Agden and Hulseheath area (MA03) with the majority of properties in the Hulseheath to Manchester airport area. For further information, see Volume 2, Community Area report: Pickmere to Agden and Hulseheath (MA03), Section 13 and Volume 5: Appendix SV-002-0MA03.					

<sup>135</sup> See Volume 5: Appendix SV-002-0MA06, Sound, noise and vibration report (MA06) and Volume 5, Map Book SV-03.

<sup>136</sup> The construction activity giving rise to the highest predicted noise or vibration level is reported. Multiple construction activities may contribute to the typical noise levels and the approximate duration of impact.

<sup>137</sup> Equivalent continuous sound level at the facade,  $L_{pAeq,0700-1900}$ .



## Residential receptors: indirect effects

- 13.4.15 Construction traffic is likely to cause adverse noise effects on residential receptors along Chapel Lane between the B5569 Chester Road and Hulseheath Lane which extends into the Pickmere to Agden and Hulseheath area (MA03). Approximately 20 dwellings located immediately adjacent to the road are forecast to experience an increase in road traffic noise levels during the typical and peak months for one or more months of around 5dB and 9dB  $L_{pAeq,0700-2300}$  respectively, due to additional construction vehicles using this route. This is considered to be a likely significant effect on a community basis at the dwellings on this road, denoted as MA06-C-C4 in Volume 5: Appendix SV-002-0MA06. This temporary adverse effect represents a change in the acoustic character of the area, which may be perceived as a change in the quality of life for that community.
- 13.4.16 Construction traffic is likely to cause adverse noise effects on residential receptors along Rostherne Lane between Marsh Lane and Chester Road. Approximately 40 dwellings located immediately adjacent to the road are forecast to experience an increase in road traffic noise levels of around 4dB  $L_{pAeq,0700-2300}$  for one or more months during the peak months, due to traffic diverting away from construction routes on nearby roads. This is considered to be a likely significant effect on a community basis at the dwellings on this road, denoted as MA06-C-C5 in Volume 5: Appendix SV-002-0MA06. This temporary adverse effect represents a change in the acoustic character of the area, which may be perceived as a change in the quality of life for that community.
- 13.4.17 A significant effect is identified at Hulseheath (MA03-C-C2) on Chapel Lane and Peacock Lane between Hulseheath Lane and Back Lane due to additional construction vehicles using this route, which extends across the boundary between the Hulseheath to Manchester airport area and the Pickmere to Agden and Hulseheath area (MA03) with the minority in the Hulseheath to Manchester airport area. Further information is set out in Volume 2, Community Area report: Pickmere to Agden and Hulseheath (MA03), Section 13 and Volume 5: Appendix SV-002-0MA03.

## Non-residential receptors: direct effects

- 13.4.18 The assessment has identified the following non-residential receptors where the predicted airborne noise levels exceed both the relevant screening criteria and the noise change criterion (typically a change of greater than 3dB<sup>138</sup> compared with the existing baseline sound level):
- Cherry Tree House (office), Cherry Tree Lane, Rostherne (assessment location ref.: 612789);

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<sup>138</sup> The exception is where the use and sensitivity of the receptor or land use is very sensitive to noise and have been included in the detailed assessment where there is a change less than 3dB. Further information can be found in Volume 5: Appendix SV-002-0MA06.

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- Tatton Stays Holiday Lets (Birkin Farm and Stock Farm) (assessment location ref.: 612714, 612718); and
  - Sugar Brook Farm, Bed and Breakfast, Mobberley Road (assessment location ref.: 612680).
- 13.4.19 The assessment has identified predicted airborne noise and vibration levels that exceed both the relevant noise and vibration screening criteria and the noise change criterion (typically a change of greater than 3dB compared with the existing baseline sound level) at Tatton Stays Holiday Lets (Little Lodge and South Arden Lodge) (assessment location ref.: 613079).
- 13.4.20 These locations are identified in the Hulseheath to Manchester Airport area, as shown in Map Series SV-03 (Volume 5, Sound, noise and vibration Map Book). At each of the non-residential receptors identified above an assessment has been undertaken to determine if this impact would result in a significant effect, using the significance criteria set out in Annex A of Volume 5: Appendix SV-001-000.
- 13.4.21 Cherry Tree House, part of the Cherry Tree Farm site, contains office units and is located on Cherry Tree Lane, Rostherne. The office units are located approximately 30m from the land required for the construction of Rostherne cutting. The business occupying the buildings has been assessed under the office category. The typical and highest predicted daytime monthly construction noise levels at this building are 10dB and 16dB respectively above the screening criteria defined in the SMR for this use<sup>139</sup> for up to a period of one year and 11 months. The building is a three-storey brick building with large single-glazed sash windows on all facades, and it is assumed that the building occupants rely on opening the windows for ventilation. The northern facade of the building faces the Proposed Scheme. Cherry Tree House is identified, on the basis of a precautionary assessment, as being subject to a likely significant adverse effect (denoted by MA06-C-N1 in Table 6 of Volume 5: Appendix SV-002-0MA06). This temporary adverse effect from combined construction site and traffic noise (see below) may take the form of activity disturbance to office users.
- 13.4.22 The Tatton Stays Holiday Lets are a group of holiday lets which include Birkin Farm, Stock Farm and Little Lodge and South Arden Lodge. Stock Farm currently also hosts weddings and events, although the planning permission for the use as a wedding venue/events business was granted on the basis that it halts prior to construction of the Proposed Scheme. Birkin Farm and Stock Farm are located along Ashley Road. Little Lodge and South Arden Lodge are located along Mobberley Road. Birkin Farm and Stock Farm are located adjacent to the land required for the construction of Ashley embankment and Ashley infrastructure maintenance base-rail (IMB-R). Little Lodge and South Arden Lodge are located adjacent to the land required for the Mobberley Road south satellite compound. The buildings have been assessed under the hotel category. The typical and highest predicted daytime monthly construction noise levels at these buildings are up to 12dB and 19dB respectively above the

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<sup>139</sup> 55dB L<sub>pAeq,0700-2300</sub> (free-field) during the day which is equivalent to 58dB L<sub>pAeq,0700-2300</sub> (façade).

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screening criteria defined in the SMR for this use<sup>140</sup> for a period of up to seven years and nine months. The typical and highest predicted night-time monthly noise levels at Stock Farm, Little Lodge and South Arden Lodge from use of Ashley railhead are up to 9dB above the screening criteria defined in the SMR for this use<sup>141</sup> for a period of up to two years and nine months. The predicted night-time monthly noise levels at Birkin Farm are below the screening criteria defined in the SMR for this use. The brick buildings are one or two-storeys high and have single-glazed windows, and it is assumed that the building occupants rely on opening the windows for ventilation. Each of the buildings has a facade that faces the Proposed Scheme. The typical predicted daytime monthly construction vibration levels at Little Lodge and South Arden Lodge are below the screening criteria defined in the SMR for this use<sup>142</sup>. The highest predicted daytime monthly construction vibration levels at these buildings are above the screening criteria defined in the SMR for this use for a period of up to three months. The Tatton Stays Holiday Lets are identified, on the basis of a precautionary assessment, as being subject to a likely significant adverse effect (denoted by MA06-C-N2 in Table 6 of Volume 5: Appendix SV-002-0MA06). This temporary adverse effect may take the form of activity disturbance during the daytime and sleep disturbance at night to guests at the holiday lets.

- 13.4.23 Sugar Brook Farm Bed and Breakfast is a farm with bed and breakfast accommodation located on Mobberley Road. Sugar Brook Farm is located adjacent to the land required for the Mobberley Road south satellite compound and Ashley railhead. The buildings have been assessed under the hotel category. The typical and highest predicted daytime monthly construction noise levels at these buildings are 12dB and 17dB respectively above the screening criteria defined in the SMR for this use<sup>143</sup> for a period of up to three years and eight months. The typical and highest predicted night-time monthly noise levels at this building from use of the Ashley railhead are 5dB above the screening criteria defined in the SMR for this use<sup>144</sup> for a period of up to three years and eight months. The brick buildings are all two-storeys high and have single-glazing windows, and it is assumed that the building occupants rely on opening the windows for ventilation. Each of the buildings has a facade that faces the Proposed Scheme. Sugar Brook Farm Bed and Breakfast is identified, on the basis of a precautionary assessment, as being subject to a likely significant adverse effect (denoted by MA06-C-N3 in Table 6 of Volume 5: Appendix SV-002-0MA06). This temporary adverse effect may take the form of activity disturbance during the daytime and sleep disturbance at night to guests at the bed and breakfast.

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<sup>140</sup> 50dB  $L_{pAeq,0700-2300}$  (free-field) during the day which is equivalent to 53dB  $L_{pAeq,0700-2300}$  (façade).

<sup>141</sup> 45dB  $L_{pAeq,2300-0700}$  (free-field) during the night which is equivalent to 48dB  $L_{pAeq,2300-0700}$  (façade).

<sup>142</sup> A vibration dose value  $0.2 \text{ m/s}^{1.75}$  VD.V.

<sup>143</sup> 50dB  $L_{pAeq,2300-0700}$  (free-field) during the day which is equivalent to 53dB  $L_{pAeq,2300-0700}$  (façade).

<sup>144</sup> 45dB  $L_{pAeq,2300-0700}$  (free-field) during the night which is equivalent to 48dB  $L_{pAeq,2300-0700}$  (façade).

## Non-residential receptors: indirect effects

- 13.4.24 Construction traffic is likely to cause an adverse noise effect on Bucklow Manor Care Home which is located adjacent to Chester Road. Road traffic noise levels due to additional construction vehicles using this route are predicted to be above the daytime screening criteria defined in the SMR for residential use during the typical and peak months for one or more months, with an increase of around 12dB and 14dB  $L_{pAeq,0700-2300}$  respectively. A likely significant effect, denoted as MA06-C-N4 as presented in Volume 5: Appendix SV-002-0MA06, has been identified at Bucklow Manor Care Home. This temporary adverse effect may take the form of activity disturbance to residents and staff of the care home.
- 13.4.25 Construction traffic is likely to cause an adverse noise effect on Cherry Tree House (office) which is located adjacent to Cherry Tree Lane. Road traffic noise levels due to additional construction vehicles using this route are predicted to be above the daytime screening criteria defined in the SMR for office use<sup>145</sup> during the typical and peak months for one or more months, with an increase of around 10dB and 14dB  $L_{pAeq,0700-2300}$  respectively. A likely significant effect has been identified at Cherry Tree House (office). This temporary adverse effect will combine with the effects from construction site noise denoted as MA06-C-N1 as presented in Volume 5: Appendix SV-002-0MA06. This combined effect may take the form of activity disturbance to office users.
- 13.4.26 Construction traffic is likely to cause an adverse noise effect on Egerton Hall which is located adjacent to Rostherne Lane. Road traffic noise levels due to additional traffic diverting away from nearby construction routes are predicted to be above the daytime screening criteria defined in the SMR for community hall use<sup>146</sup> during the peak months for one or more months, with an increase of around 5dB  $L_{pAeq,0700-2300}$ . A likely significant effect, denoted as MA06-C-N5 as presented in Volume 5: Appendix SV-002-0MA06, has been identified at Egerton Hall. This temporary adverse effect may take the form of activity disturbance to users of the hall.
- 13.4.27 Construction traffic is likely to cause an adverse noise effect on Tatton Stays Holiday Lets (Virginia Cottage and Rose Cottage) which are located adjacent to Rostherne Lane. Road traffic noise levels due to additional traffic diverting away from nearby construction routes are predicted to be above the daytime screening criteria defined in the SMR for community hotel use<sup>147</sup> during the peak months for one or more months, with an increase of around 5dB  $L_{pAeq,0700-2300}$ . A likely significant effect, denoted as MA06-C-N6 as presented in Volume 5: Appendix SV-002-0MA06, has been identified at Virginia Cottage and Rose Cottage. This temporary adverse effect may take the form of activity disturbance to guests at the holiday lets.

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<sup>145</sup> 55dB  $L_{pAeq,0700-2300}$  (free-field) during the day which is equivalent to 58dB  $L_{pAeq,0700-2300}$  (façade).

<sup>146</sup> 50dB  $L_{pAeq,0700-2300}$  (free-field) during the day which is equivalent to 53dB  $L_{pAeq,0700-2300}$  (façade).

<sup>147</sup> 50dB  $L_{pAeq,0700-2300}$  (free-field) during the day which is equivalent to 53dB  $L_{pAeq,0700-2300}$  (façade).

## Other mitigation measures

13.4.28 No other mitigation measures are proposed in this area.

## Summary of likely residual significant effects

- 13.4.29 The proposed avoidance and mitigation measures will reduce construction noise inside all individual dwellings from the construction activities such that residents will not be significantly affected<sup>148</sup>.
- 13.4.30 The measures will also reduce the construction noise and vibration effects on the acoustic character in the majority of residential communities. Despite these measures, the noise and vibration effects on the acoustic character in the following local residential community areas are considered likely to be significant:
- Ringway (noise effects only);
  - Warburton Green; and
  - Hale Barns.
- 13.4.31 Construction traffic in this area is likely to cause significant noise effects on adjacent residential properties on:
- Chapel Lane between the B5569 Chester Road and Hulseheath Lane; and
  - Rostherne Lane between Marsh Lane and Chester Road.
- 13.4.32 Noise from specific construction activities has been identified as resulting in significant residual temporary effects on the non-residential buildings at:
- Tatton Stays Holiday Lets (Birkin Farm and Stock Farm); and
  - Sugar Brook Farm Bed and Breakfast, Mobberley Road.
- 13.4.33 Noise and vibration from specific construction activities has been identified as resulting in significant residual temporary effects at Tatton Stays Holiday Lets (Little Lodge and South Arden Lodge).
- 13.4.34 Construction traffic in this area is likely to cause significant noise effects on the adjacent non-residential properties:
- Bucklow Manor Care Home on Chester Road; and
  - Egerton Hall and Tatton Stays Holiday Lets (Virginia Cottage and Rose Cottage) on Rostherne Lane.
- 13.4.35 Noise from specific construction activities and from construction traffic has also been identified as resulting in a significant residual temporary effect on Cherry Tree House (office), Cherry Tree Lane.

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<sup>148</sup> Refer to Volume 5: Appendix SV-001-00000.

13.4.36 HS2 Ltd will continue to seek reasonably practicable measures to further reduce or avoid these significant effects. In doing so HS2 Ltd will continue to engage with stakeholders to fully understand the receptors, their use and the benefit of the measures.

## Cumulative effects

13.4.37 This assessment has considered the potential cumulative construction noise effects of the Proposed Scheme and other committed developments<sup>149</sup>. It is not anticipated that there will be any significant cumulative noise effects during construction of the Proposed Scheme.

## 13.5 Effects arising from operation

### Assumptions and limitations

#### Local assumptions

- 13.5.1 The assessment of the effects of noise and vibration from the operation of the Proposed Scheme is based on the envisaged design as described in Section 2.2 of this report and in Volume 1 (Sections 4 and 8) and the highest likely train flows, assuming the service pattern including Phase One and Phase Two services. The expected passenger service frequency for the Proposed Scheme is described in Volume 1 (Section 4) and is outlined below for the Hulseheath to Manchester Airport area.
- 13.5.2 For the purpose of the operational sound, noise and vibration assessment it is assumed that passenger services in this area will start around 05:00. Services will increase to the number of trains per hour in each direction on the lines set out in Table 35<sup>150</sup>. This number of services is generally assumed to operate throughout the day then decrease as trains are stabled with services typically finishing by midnight. The number of trains, shown in Table 35, takes account of HS2 Phase One, Phase 2a and the Proposed Scheme in operation, and other services using HS2 as a result of connections to other conventional lines, including Northern Powerhouse Rail (NPR). Assumptions for maximum operational train speeds are also shown in Table 35. Further information is presented in Volume 1 (Section 8).

**Table 35: Local passenger service assumptions**

Description of line	No. of trains per hour in each direction	Speed
Route of the Proposed Scheme (east of NPR junction)	10	145mph (230kph)
Route of the Proposed Scheme (west of NPR junction)	6	145mph (230kph)
NPR (Liverpool to Manchester junction)	4	110mph (180kph)

<sup>149</sup> Refer to Volume 5: Appendix CT-004-00000, Planning data.

<sup>150</sup> The effects of noise and vibration from the operation of the Proposed Scheme are assessed based on the reasonably foreseeable worst case train flows which differ from the train flows described in Section 2. For further information see Volume 1 (Section 8).

## Local assumptions – Ashley IMB-R

- 13.5.3 Ashley (IMB-R) will be a satellite facility which will provide support to the centralised facility at Stone IMB-R, as well as Crewe North rolling stock depot (RSD) as required. For the purpose of assessing the impact of noise from railway maintenance vehicles travelling from Ashley IMB-R, it has been assumed that two trains would depart the IMB-R as soon as possible after the close of passenger services and travel to the location where maintenance is required. Railway maintenance vehicles would return to Ashley IMB-R or the core facility at Stone before the start of passenger services. Further information about the railway maintenance activities along the route of the Proposed Scheme and the use of Ashley IMB-R is provided in Section 2.4 of this report and in Section 4 of Volume 1.

## Avoidance and mitigation measures

- 13.5.4 The development of the Proposed Scheme has sought to reduce noise impact as far as reasonably practicable.
- 13.5.5 Envisaged avoidance and mitigation measures that apply route-wide are described in Volume 1 (Section 9).

## Airborne noise

- 13.5.6 Through the procurement process for the trains and the track, the use of proven international technology will enable the railway to be quieter than implied by current minimum UK<sup>151</sup> and European standards<sup>152</sup>.
- 13.5.7 In other specific locations along the route of the Proposed Scheme, where there are no noise barriers envisaged, noise will be reduced by landscape earthworks provided to avoid or reduce significant visual effects and engineering structures such as cuttings and safety fences on viaducts. The location of the landscape earthworks and relevant engineering structures is shown on Map Series SV-05 (Volume 2: MA06 Map Book).
- 13.5.8 Significant noise effects from the operational static sources, such as line-side equipment, will be avoided through their design and the specification of noise emission requirements. Further information is presented in Volume 5: Appendix SV-001-00000.
- 13.5.9 As required by statute, noise insulation measures would be offered for qualifying buildings as defined in the Noise Insulation (Railways and Other Guided Transport Systems)

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<sup>151</sup> Department for Transport (2021), *National Technical Specification Notice (NTSN) Rolling Stock – Noise (NOI)*. Available online at: <https://www.gov.uk/government/publications/railway-interoperability-national-technical-specification-notices-ntsns>.

<sup>152</sup> European Commission (2014), *Technical Specification for Interoperability (TSI) Noise – Regulation No 1304/2014*.

Regulations 1996<sup>153</sup> and the Noise Insulation Regulations 1975<sup>154</sup> ('the NI Regulations'). Additionally, HS2 Ltd will apply criteria, to provide the same mitigation as defined in 'the NI Regulations' at residential buildings where noise from the use of the Proposed Scheme measured outside a dwelling exceeds the Interim Target defined by the World Health Organization's Night Noise Guidelines for Europe<sup>155</sup> or the maximum noise level criteria<sup>156</sup> defined in the SMR. Noise insulation is designed to avoid residents experiencing any residual significant effect on health and quality of life from resulting noise inside their dwelling.

- 13.5.10 Ashley IMB-R will be designed and operated to control noise and vibration and hence avoid significant effects. Mitigation may include: limiting the sounding of train horns; control of noise from train movements along tightly curved tracks including wheel squeal; control of train equipment such as heating, ventilation and air-conditioning (HVAC) units while vehicles are stabled; control of noise from maintenance and cleaning through the design of the enclosures for the carriage wash and wheel lathe; and boundary noise barriers as necessary.

## Ground-borne noise and vibration

- 13.5.11 Significant ground-borne noise or vibration effects from the operational railway will be reduced or avoided through the design of the track and track-bed.

## Assessment of impacts and effects

### Residential receptors: direct effects – individual dwellings

- 13.5.12 Taking account of the avoidance and mitigation measures incorporated into the Proposed Scheme, the assessment has identified that at Keepers Cottage, Thorley Lane, Ringway (assessment location ref.: 612855), the noise levels are predicted to exceed the daytime trigger threshold set out in the Regulations. It is, therefore, anticipated that this building is likely to qualify for noise insulation under the Regulations. This residential dwelling is indicated on Map Series SV-05 (Volume 2: MA06 Map Book).
- 13.5.13 The avoidance and mitigation measures, set out in the previous section, including noise insulation, will reduce noise inside all dwellings such that it will not reach a level where it will significantly affect residents.

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<sup>153</sup> *The Noise Insulation (Railways and Other Guided Transport Systems) Regulations 1996*. Her Majesty's Stationery Office, London.

<sup>154</sup> *The Noise Insulation Regulations 1975*. Her Majesty's Stationery Office, London. Available online at: <http://www.legislation.gov.uk/ukxi/1975/1763/contents/made>.

<sup>155</sup> World Health Organization (2010), *Night Noise Guidelines for Europe*. Available online at: [http://www.euro.who.int/\\_data/assets/pdf\\_file/0017/43316/E92845.pdf](http://www.euro.who.int/_data/assets/pdf_file/0017/43316/E92845.pdf).

<sup>156</sup> Dependent on the number of train passes.



## **Residential receptors: direct effects – communities**

- 13.5.14 The proposed mitigation measures in the Hulseheath to Manchester Airport area will avoid or reduce adverse effects due to airborne noise on the majority of receptors, and in the following communities:
- Warburton Green; and
  - Hale Barns.
- 13.5.15 Taking account of the envisaged mitigation, Map Series SV-05 (Volume 2, MA06 Map Book) shows the long-term 40dB<sup>157</sup> night-time and the 50dB daytime sound level contours. In general, below these levels adverse effects are not expected.
- 13.5.16 Above 40dB during the night and 50dB during the day the community effect of noise is dependent on the baseline sound levels in that area and the change in sound level (magnitude of effect) brought about by the Proposed Scheme. The airborne noise impacts and effects forecast for the operation of the Proposed Scheme are presented on Map Series SV-05 (Volume 2: MA06 Map Book). The changes in noise levels shown on these maps are likely to affect the acoustic character of the area such that taking account of the local context<sup>158</sup>, there may be a significant effect when assessed on a community basis<sup>159</sup>.
- 13.5.17 Approximately 35 isolated properties within the area have been identified as being subject to a likely adverse noise effect. These effects are likely to be received as an effect on the acoustic character of the area. However, as the affected properties are spatially remote from larger defined residential areas, are subject to smaller magnitudes of noise effect, or are small in number, the effects are not considered to be significant on a community basis.
- 13.5.18 The assessment of operational noise and vibration indicates that there will be a significant adverse effect at Hulseheath (MA03-O-C4), which extends across the boundary between the Hulseheath to Manchester Airport area and the Pickmere to Agden and Hulseheath area (MA03) with the majority in the Pickmere to Agden and Hulseheath area. Further information is presented in Volume 2, Community Area report: Pickmere to Agden and Hulseheath (MA03), Section 13 and Volume 5: Appendix SV-002-0MA03. No additional significant adverse operational sound, noise or vibration effects are likely to occur on communities in this area.
- 13.5.19 In this study area, the direct beneficial effects on the acoustic character of the areas of the residential community identified in Table 36 is considered to be significant on a community basis.

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<sup>157</sup> Defined as the equivalent continuous sound level from 23:00 to 07:00 or  $L_{pAeq,night}$ .

<sup>158</sup> Further information is provided in Volume 5: Appendices SV-001-00000 and SV-003-0MA06.

<sup>159</sup> Further information is contained in Volume 1.

**Table 36: Direct beneficial effects on residential communities and shared open areas that are considered significant on a community basis**

Significant effect number <sup>160</sup> and Map reference	Source of significant effect	Time of day	Location and details
MA06-O-C1 (SV-05-320)	Airborne noise decrease from road diversion	Daytime and night-time	Ashley Approximately 10 dwellings in the vicinity of Ashley Road. Forecast decreases in sound from road traffic are likely to cause a moderate airborne noise decrease affecting the acoustic character of the area around the properties.

## Residential receptors: indirect effects

13.5.20 The assessment of operational noise and vibration indicates that significant indirect effects on residential receptors are unlikely to occur in this area.

## Non-residential receptors: direct effects

13.5.21 The assessment has identified airborne sound levels greater than the screening criteria relevant to the particular building use<sup>161</sup> and typically a change of greater than 3dB<sup>162</sup> compared to the future baseline sound level at the following non-residential receptors in the Hulseheath to Manchester Airport area, as shown in Map Series SV-02 (Volume 5, Sound, noise and vibration Map Book):

- Cherry Tree House (office), Cherry Tree Lane, Rostherne (assessment location ref.: 612789); and
- Tatton Stays Holiday Lets (Birkin Farm and Stock Farm) (assessment location ref.: 612714 and 612718).

13.5.22 The assessment has identified no ground-borne noise or vibration levels greater than the relevant impact screening criteria in the Hulseheath to Manchester Airport area.

13.5.23 At each of the non-residential receptors identified, an assessment has been undertaken to determine if this impact will result in a significant effect using the significance criteria defined in Section A, Volume 5: Appendix SV-001-00000.

13.5.24 Cherry Tree House, Cherry Tree Lane, Rostherne is an office. An adverse operational noise effect has been identified at Cherry Tree House, Cherry Tree Lane, Rostherne based on the change in operational airborne sound level outside of the receptor of up to 6dB compared to the future baseline sound level. Daytime operational noise levels at the office are predicted

<sup>160</sup> See Map Series SV-05 (Volume 2: MA03 Map Book).

<sup>161</sup> As defined in the Volume 5: Appendix CT-001-00001, Environmental Impact Assessment Scope and Methodology Report and Volume 5: Appendix SV-001-0000.

<sup>162</sup> The exception is where the use and sensitivity of the receptor or land use is very sensitive to noise and have been included in the detailed assessment where there is a change less than 3dB. Further information can be found in Volume 5: Appendix SV-001-00000.

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to exceed the impact screening criterion for offices of 55dB  $L_{pAeq,16hr}$  by 5dB. The office is contained in a brick building with single-glazed openable windows and is naturally ventilated. The office windows in the northern façade face the route of the Proposed Scheme. Cherry Tree House, Cherry Tree Lane, Rostherne is identified, on a precautionary basis, as being subject to a likely significant adverse effect (denoted by MA06-O-N1 on Map Series SV-05 (Volume 2: MA06 Map Book)).

- 13.5.25 Tatton Stays Holiday Lets, which includes Birkin Farm and Stock Farm, are holiday homes for let. Stock Farm currently also hosts weddings and events, although the planning permission for the use as a wedding venue/events business was granted on the basis that it halts prior to construction of the Proposed Scheme. The screening criteria for hotels set out in the SMR has been used for the purposes of the assessment of noise impacts. An adverse operational noise effect has been identified at Birkin Farm and Stock Farm based on the change in operational airborne sound level outside of the receptor of up to 9dB compared to the future baseline sound level. Daytime operational noise levels at the serviced accommodation are predicted to exceed the impact screening criterion for hotels of 50dB  $L_{pAeq,16hr}$  by up to 14dB. Night-time operational noise levels at the serviced accommodation are predicted to exceed the impact screening criterion for hotels of 45dB  $L_{pAeq,8hr}$  by up to 14dB. The buildings are brick built with single-glazed sash windows including bedroom windows facing the Proposed Scheme. There is an outdoor yard and garden for residents. Tatton Stays Holiday Lets (Birkin Farm and Stock Farm) is identified, on a precautionary basis, as being subject to a likely significant adverse effect (denoted by MA06-O-N2 on Map Series SV-05 (Volume 2: MA06 Map Book)).
- 13.5.26 The assessment of effects on non-residential receptors has been undertaken on a reasonable worst-case basis. Further information can be found in Volume 5: Appendix SV-003-0MA06. The non-residential receptors, where direct significant effects are likely, are summarised in Table 37.

**Table 37: Likely significant noise or vibration effects on non-residential receptors arising from operation of the Proposed Scheme**

Significant effect number <sup>163</sup> and map reference	Type of significant effect and source	Time of day	Location and details
MA06-O-N1 (SV-05-319)	Activity disturbance of offices resulting from operational airborne noise.	Daytime	Cherry Tree House (office), Cherry Tree Lane, Rostherne
MA06-O-N2 (SV-05-320)	Activity disturbance and sleep disturbance of residents of serviced accommodation resulting from operational airborne noise.	Daytime and night-time	Tatton Stays Holiday Lets (Birkin Farm and Stock Farm)

<sup>163</sup> See Map Series SV-05 (Volume 2: MA06 Map Book).

## **Non-residential receptors: indirect effects**

- 13.5.27 The assessment of operational noise and vibration indicates that significant indirect effects are unlikely to occur on non-residential receptors in this area.

## **Other mitigation measures**

- 13.5.28 No other mitigation measures are proposed in this area.

## **Summary of likely residual significant effects**

- 13.5.29 At the individual residences, the proposed mitigation measures will reduce operational noise inside all dwellings such that it does not reach a level where it will significantly affect residents, and therefore, no likely residual significant effects are identified.
- 13.5.30 At the community level, the envisaged mitigation, including landscape earthworks and noise mitigation, described in this section, and presented in Map Series SV-05 (Volume 2: MA06 Map Book), will substantially reduce the potential airborne sound impacts and noise effects that would otherwise arise from the Proposed Scheme.
- 13.5.31 The assessment of operational noise and vibration indicates that significant adverse operational sound, noise or vibration effects are unlikely to occur on communities in this area.
- 13.5.32 Likely residual significant beneficial airborne noise effects due to decreased noise levels have been identified at Ashley including occupants of residential properties on Ashley Road identified by MA06-O-C1 on Map SV-01-320 (Volume 2: MA06 Map Book).
- 13.5.33 The assessment has identified a likely residual significant operational airborne noise effect at the following non-residential receptors, identified in Map Series SV-05 (Volume 2: MA06 Map Book):
- Cherry Tree House (office), Cherry Tree Lane, Rostherne, identified by MA06-O-N1 on Map SV-05-319; and
  - Tatton Stays Holiday Lets (Birkin Farm and Stock Farm), identified by MA06-O-N2 on Map SV-05-320.
- 13.5.34 HS2 Ltd will continue to seek reasonably practicable measures to further reduce or avoid these significant effects. In doing so HS2 Ltd will continue to engage with stakeholders to fully understand the receptors, their use and the benefit of any identified measures.

## **Cumulative effects**

- 13.5.35 It is not anticipated that there will be any significant cumulative noise effects during operation of the Proposed Scheme.

## Monitoring

- 13.5.36 Volume 1 (Section 9) sets out the general approach to environmental monitoring during operation of the Proposed Scheme.
- 13.5.37 Operational noise and vibration monitoring will be carried out at different times during the lifetime of the Proposed Scheme at a combination of carefully selected monitoring locations including: adjacent or attached to moving vehicles, at fixed positions or in the vicinity of individual assets; and locations within the surrounding areas and communities alongside the railway corridor.
- 13.5.38 The expected noise and vibration performance of the Proposed Scheme, operational noise and vibration measurement data, associated asset information, description of corrective actions, results of measured performance compared to expected conditions, and monitoring reports will be shared with the relevant local authorities at appropriate intervals.

## 14 Traffic and transport

### 14.1 Introduction

- 14.1.1 This section considers the likely impacts on all forms of transport and the consequential potential significant effects on transport users arising from the construction and operation of the Proposed Scheme through the Hulseheath to Manchester Airport area. The effects on traffic and transport are assessed quantitatively, based on existing baseline traffic conditions and future scenarios.
- 14.1.2 Engagement with Highways England, Cheshire East Council (CEC), Trafford Metropolitan Borough Council (TMBC), Manchester City Council (MCC), Greater Manchester Combined Authority (GMCA), Transport for Greater Manchester (TfGM), Transport for the North (TfN) and Manchester Airports Group (MAG) has been undertaken. An important focus of this engagement has been to obtain relevant baseline information and discuss transport survey requirements and assessment methodology.
- 14.1.3 A detailed report on traffic and transport impacts within the Hulseheath to Manchester Airport is contained in the Transport Assessment (see Volume 5: Appendices TR-001, 002, 003 and 005).
- 14.1.4 Maps showing the location of the key environmental features (Map Series CT-10) and the key construction (Map Series CT-05) and key operational (Map Series CT-06) features of the Proposed Scheme can be found in the Volume 2, MA06 Map Book.
- 14.1.5 Maps showing traffic and transport significant effects during construction (Map series TR-03) and operation (Map series TR-04) and construction HGV routes to compounds (Map Series TR-08) can be found in Volume 5, Traffic and transport Map Book.
- 14.1.6 In addition, further traffic and transport data are set out in Background Information and Data (BID)<sup>164</sup> (see BID TR-004-00001 Transport Assessment policy and data report).
- 14.1.7 The Proposed Scheme is described in Section 2.

### 14.2 Scope, assumptions and limitations

- 14.2.1 The scope, key assumptions and limitations for the traffic and transport assessment are set out in Volume 1 (Section 8) and the EIA Scope and Methodology Report (SMR)<sup>165</sup>.
- 14.2.2 The peak level of construction traffic activity is expected to be 2030 and the opening year to be 2038. The forecasts used in the assessment have been produced prior to the

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<sup>164</sup> High Speed Two Ltd (2022), High Speed Rail (Crewe – Manchester), *Background Information and Data*. Available online at: <https://www.gov.uk/government/collections/hs2-phase-2b-crewe-manchester-environmental-statement>.

<sup>165</sup> Volume 5: Appendix CT-001-00001, Environmental Impact Assessment Scope and Methodology Report.

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development of a full understanding of the likely impact of COVID-19 on economic growth and travel behaviour. The full impact of COVID-19 is not yet known but is considered likely to result in lower travel demand in the medium term than the forecasts used in the assessment for background traffic and rail, including HS2.

- 14.2.3 Consequently, the assessment is considered to overstate travel demand for both construction and operation scenarios and therefore to present a robust case for traffic and transport. This also means that the operational assessment for 2046 is likely to include a level of growth more representative of 2048 or later, representing likely impacts at least 10 years post-opening of the Proposed Scheme.
- 14.2.4 The study area for traffic and transport includes Altrincham, Timperley, Ashley, Hale, Hale Barns, Mobberley, New Mills, Rostherne and Warburton Green. It also includes rail stations at Mobberley, Ashley, Hale, Altrincham, Navigation Road, Manchester Airport and Styal. In addition, it includes stops on the Metrolink Altrincham Line at Timperley, Navigation Road and Altrincham and stops on the Metrolink Airport Line at Manchester Airport. Manchester Airport is positioned towards the eastern extent of the Hulseheath to Manchester Airport area, approximately 1.5km south-east of the Proposed Scheme.
- 14.2.5 The study area for traffic and transport also includes all strategic and local roads potentially affected by the Proposed Scheme, including the strategic routes: the M56 (junctions 5 to 8 inclusive) and the A556 (between Chapel Lane and the M56 junction 7 and 8).
- 14.2.6 Forecast future transport movements by road and public transport, with and without the Proposed Scheme, have been derived from a number of sources including the Department for Transport's (DfT) traffic forecasting tool, Trip End Model Presentation Program (TEMPro), the M6 junction 19 model, the Greater Manchester SATURN Model, and the Greater Manchester Public Transport Model. The M6 junction 19 model has been developed by Highways England and covers the more rural western part of the Hulseheath to Manchester Airport area, south of the River Bollin. It extends to cover an area from Oughtrington in the north to Pickmere in the south, and the M56 junction 9 in the west to Rostherne in the east. The Greater Manchester SATURN Model and the Greater Manchester Public Transport Model have been developed by TfGM and cover the more urban eastern part of the Hulseheath to Manchester Airport area, north of the River Bollin. The models extend to cover an area approximating to Greater Manchester. These models represent the average weekday morning (08:00-09:00) and evening (17:00-18:00) peak hours.
- 14.2.7 For operation, passenger demand for future year HS2 and long-distance rail passengers is derived from DfT's PLANET Framework Model (PFMv9.6).
- 14.2.8 Junction assessments for construction have been undertaken against the peak month of construction traffic and include robust assumptions on the level of construction traffic in the peak hours. The assessments also address the impact of highway interventions. The effects identified are considered to be a reasonable worst case.
- 14.2.9 Where the effects vary through the construction programme the highest magnitude significant effects are reported. Where there are both adverse and beneficial effects at

different times, the highest magnitude adverse and highest magnitude beneficial are both reported.

## 14.3 Environmental baseline

### Existing baseline

- 14.3.1 Existing conditions in the study area have been determined through site visits, traffic and transport surveys, liaison with Highways England, CEC, MCC, TMBC, TfGM and MAG (including provision of information on public transport, public rights of way (PRoW) and accident<sup>166</sup> data) and desktop analysis.

### Surveys

- 14.3.2 Traffic surveys, comprising junction turning counts, manual classified counts, queue length surveys and automatic traffic counts, were undertaken in June 2017 with additional surveys undertaken in November 2017, February 2018, July 2018 and March 2020. These data have been supplemented by existing traffic data from other sources, including from Highways England, CEC, TMBC, TfGM and MAG. Assessment of the data indicates that the weekday peak hours in the area are generally 08:00-09:00 and 17:00-18:00 which correspond to the Proposed Scheme assessment hours.
- 14.3.3 PRoW surveys were undertaken in August and September 2017 to establish their nature and usage by non-motorised users (pedestrians, cyclists and equestrians). The surveys included PRoW and roads that will be crossed by the route of the Proposed Scheme, and any additional PRoW and roads that may be affected by the Proposed Scheme. The majority of the PRoW surveys were undertaken during the weekend, at times when recreational use is expected to be highest, but where routes are likely to be used for non-leisure uses such as commuting, surveys were undertaken on a weekday.

### Strategic and local highway network

- 14.3.4 The strategic routes in this area are the M56 and the A556. The strategic road network in and around the Hulseheath to Manchester Airport area is generally busy during peak hours and delays can be experienced.
- 14.3.5 The local roads include (ordered by road class from south to north):
- A538 Water Lane/Altrincham Road/Wilmslow Road/Hale Road;
  - A56 Dunham Road (also known locally as Roman Road)/Church Street/Manchester Road/Washway Road;

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<sup>166</sup> The term accident in this report refers to injury related collisions reported to/recorded by the police. This data, known as STATS19, relate only to personal injury accidents on public roads that are reported to the police, and subsequently recorded, using the STATS19 accident reporting form.



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- A5144 Delahays Road/Thorley Lane;
- B5569 Chester Road;
- B5162 South Downs Road/Heather Road/Park Road;
- B5161 Langham Road;
- Birkinheath Lane;
- Brickhill Lane;
- Rostherne Lane;
- Mobberley Road;
- Ashley Road;
- Back Lane;
- Tanyard Lane;
- Sunbank Lane;
- Chester Road;
- Cherry Tree Lane;
- Tom Lane;
- Millington Lane;
- Castle Mill Lane;
- Cow Lane;
- Yarwoodheath Lane;
- High Elm Road;
- Runger Lane;
- Avro Way;
- Thorley Lane;
- Hasty Lane;
- Chapel Lane;
- World Way;
- Enterprise Way;
- Sydney Avenue;
- Palma Avenue; and
- Roaring Gate Lane.

14.3.6 The local road network in this area generally operates well, although some localised delays can be experienced, particularly at peak times.

14.3.7 Relevant accident data for the road network subject to assessment have been obtained from DfT<sup>167</sup>. Data for the three-year period July 2016 to June 2019 have been assessed and any

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<sup>167</sup> Department for Transport (2021), *STATS19 Road Safety Data July 2016 - June 2019*, <https://www.gov.uk/government/collections/road-accidents-and-safety-statistics>.

identified clusters (i.e. where there are nine or more accidents in the three-year period) have been examined.

- 14.3.8 No accident clusters were identified within the Hulseheath to Manchester Airport area.
- 14.3.9 The route of the Proposed Scheme will cross four roads with footways within the Hulseheath to Manchester Airport area. These are the A538 Hale Road, Ashley Road, Hasty Lane and Thorley Lane.

## **Parking and loading**

- 14.3.10 There is on-street marked and unmarked parking on some roads within the Hulseheath to Manchester Airport area that may be impacted by the Proposed Scheme. This includes Millington Lane (informal parking adjacent to The Children’s Adventure Farm Trust car park), Brickhill Lane (informal parking adjacent to Ashley Plant Hire and Reclamation Ltd) and the layby on Mill Lane.
- 14.3.11 There is off-street parking within the Hulseheath to Manchester Airport area that may be impacted by the Proposed Scheme. This includes parking at the Holiday Inn Express Manchester Airport, located off Runger Lane, and parking at Manchester Airport (Building 319 World Cargo Centre), located off Avro Way.

## **Public transport network**

- 14.3.12 Twelve bus services operate on five roads that will be crossed or could be affected by the route of the Proposed Scheme in the Hulseheath to Manchester Airport area. There are also bus stops primarily located to serve the main built-up areas. The bus routes that could be affected by the Proposed Scheme include:
- A538 Wilmslow Road: route 88 (Altrincham - Wilmslow - Knutsford - Macclesfield);
  - A538 Hale Road: route 88 (Altrincham - Wilmslow - Knutsford - Macclesfield); route 283 (Altrincham - Hale - Hale Barns - Well Green Circular); route 288 (East Didsbury - Altrincham - Manchester Airport); route 741 (Bowdon - Hale Barns - Bowker Vale - Cheetham Hill); route 760 (Warburton - Loreto Grammar School); route 766 (Davyhulme - Flixton - Chorlton); route 763 (Burnage - St Ambrose College); route 782 (Bowden Vale - Sale Grammar School); and route 869 (Burnage - Didsbury - Gatley - Wythenshawe - Hale Barns );
  - Runger Lane/Thorley Lane: route 103 (Manchester - Moss Side - Wythenshawe - Peel Hall - Manchester Airport); route 288 (East Didsbury - Altrincham - Manchester Airport); and route 313 (Stockport - Adswold - Cheadle Hulme - Manchester Airport - World Freight Terminal);
  - Enterprise Way (at the junction with Thorley Lane): route 43 (Manchester - Withington - Northenden - Wythenshawe - Manchester Airport); route 103 (Manchester - Moss Side - Wythenshawe - Peel Hall - Manchester Airport); and route 313 (Stockport - Adswold - Cheadle Hulme - Manchester Airport - World Freight Terminal); and

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- High Elm Road: route 760 (Warburton - Loreto Grammar School); and route 782 (Hale Barns - Sale Grammar School).
- 14.3.13 National and local rail services are accessible via Manchester Airport Station and local rail services are accessible via Mobberley, Ashley, Hale, Altrincham Navigation Road and Styal stations within the Hulseheath to Manchester Airport area. Manchester Airport, Mobberley, Ashley, Hale, Altrincham, and Navigation Road stations provide access to local and national services on the Mid-Cheshire Line and Styal Station provides access to local services on the Styal Line.
- 14.3.14 There are a number of Metrolink stops in the Hulseheath to Manchester Airport area including all stops on the Altrincham Line between Edge Lane and Altrincham, and Manchester Airport on the Airport Line.

## **Non-motorised users**

- 14.3.15 There are pedestrian footways adjacent to many of the roads in the built-up areas of Mobberley, Rostherne, Ashley, Warburton Green, Hale Barns, Hale, Altrincham and Timperley. Footways vary in width and condition within these areas. Where there is no formal footway provision adjacent to a road, non-motorised user numbers are generally low.
- 14.3.16 The route of the Proposed Scheme will cross the route of five PRow within the Hulseheath to Manchester Airport area. Further PRow and roadside footways in the Hulseheath to Manchester Airport area could be affected by the Proposed Scheme and have been included in the assessment.
- 14.3.17 The surveys undertaken to inform the assessment showed that the routes with the greatest daily usage during the survey period were: Footpath Hale 16, which was used by 46 pedestrians and 26 cyclists; and Footpath Ringway 7, which was used by 10 pedestrians and 11 cyclists.

## **Waterways and canals**

- 14.3.18 There are two navigable waterways in the Hulseheath to Manchester Airport area: the Bridgewater Canal and the River Bollin. It is not expected that there will be any effects on these navigable waterways and this topic is not considered further in this assessment.

## **Air transport**

- 14.3.19 Manchester Airport is located within the Hulseheath to Manchester Airport area. The airport is primarily accessed from the strategic road network via the M56 junctions 5 and 6. It is not expected that there will be any effects on air transport and this topic is not considered further in this assessment.

## Future baseline

- 14.3.20 The future baseline traffic volumes have been calculated for the future years of 2030, 2038 and 2046. These have been used to support the assessment of construction and operation of the Proposed Scheme, reflecting the assumed route-wide construction peak (2030), opening year (2038) and a future assessment year (2046). Growth factors have been checked to ensure that committed developments are appropriately reflected in the growth forecasts. The assumptions underlying committed developments and transport schemes for each assessment year have been discussed with CEC, TMBC, MCC, and TfGM and are considered to be appropriately reflected in the traffic forecasts.
- 14.3.21 The TfGM transport models include assumptions on how public transport and highway infrastructure are expected to change in the future. At the time of the assessment, major committed changes to the transport network relevant to the assessment of the area that have been taken into account in the future baseline include:
- Airport City Manchester infrastructure (opened 2017);
  - A6 to Manchester Airport Relief Road (A6MARR) (opened 2018);
  - new Metrolink zonal fare system (implemented 2019);
  - new Metrolink trams as part of Metrolink Capacity Improvement Programme (all new trams expected to be in service by 2022);
  - Poynton Bypass (expected to open 2022); and
  - junction capacity improvements at M56 junction 6 associated with the Manchester Airport Rainbow Works Scheme (expected to open 2025).
- 14.3.22 Future year baseline forecasts have been interpolated and extrapolated as necessary from available TfGM model forecasts.
- 14.3.23 In the Hulseheath to Manchester Airport area, there are no known substantial committed changes to parking facilities.
- 14.3.24 The future baseline takes into account changes to pedestrian and cycling facilities associated with TfGM's plan to introduce a network of active travel routes across Greater Manchester, known as the Bee Network. However, there are no committed Bee Network schemes in the Hulseheath to Manchester Airport area.
- 14.3.25 The future baseline takes into account changes to pedestrian facilities associated with the Manchester Airport Rainbow Works scheme which is expected to open in 2025.

## Construction

- 14.3.26 Construction of the Proposed Scheme is expected to commence in 2025 with construction activity continuing to 2038 (although activity in 2038 will be limited to testing and commissioning). Construction activities have been assessed against 2030 baseline traffic flows, irrespective of when they occur during the construction period.

- 14.3.27 The year 2030 is the common future baseline year and the impact of individual or overlapping activities are considered against this single year.
- 14.3.28 Future baseline traffic volumes in the peak hours are forecast to grow by an average of 8% by 2030 compared to a baseline year of 2018 in the more rural western part of the Hulseheath to Manchester Airport area, south of the River Bollin.
- 14.3.29 In the more urban eastern part of the Hulseheath to Manchester Airport area, north of the River Bollin, future baseline traffic volumes in the peak hours are forecast to grow by an average of 17% by 2030 compared to a baseline year of 2018.

## Operation

- 14.3.30 Future baseline traffic volumes in the peak hours are forecast to grow by an average of 13% by 2038 compared to the baseline year of 2018 in the western part of the Hulseheath to Manchester Airport area.
- 14.3.31 In the eastern part of the Hulseheath to Manchester Airport area, future baseline traffic volumes in the peak hours are forecast to grow by an average of 25% by 2038 compared to the baseline year of 2018.
- 14.3.32 Future baseline traffic volumes in the peak hours are forecast to grow by an average of 20% by 2046 compared to the baseline year of 2018 in the western part of the Hulseheath to Manchester Airport area.
- 14.3.33 In the eastern part of the Hulseheath to Manchester Airport area, future baseline traffic volumes in the peak hours are forecast to grow by an average of 34% by 2046 compared to the baseline year of 2018.

## 14.4 Effects arising during construction

### Avoidance and mitigation measures

- 14.4.1 The following measures are currently proposed to avoid or reduce effects on transport users:
- new highways (roads and PRoW) will be constructed and will be operational prior to the permanent closure of any existing highways, insofar as reasonably practicable;
  - the majority of roads crossed by the route of the Proposed Scheme will be maintained or locally diverted during construction;
  - traffic management measures will be implemented to limit any disruption;
  - road closures will be restricted to overnight and weekends, insofar as reasonably practicable;
  - temporary alternative routes for roadside footways and PRoW will be provided during construction, insofar as reasonably practicable, where either the existing or final proposed route is not available;

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- where reasonably practicable, site haul routes will be created adjacent to the route of the Proposed Scheme to transport construction materials and equipment to reduce heavy goods vehicle (HGV) movements on public roads with access taken via the main road network;
- HGVs will be routed, insofar as reasonably practicable, along the strategic and/or primary road network;
- the use of the local road network will, insofar as reasonably practicable, be limited to use for site set-up, access for surveys and on-going servicing (including refuse collection and general deliveries to compounds) during construction;
- the reuse of excavated material along the route of the Proposed Scheme, insofar as reasonably practicable;
- highway measures including junction improvements, passing places and carriageway widening will be provided, as required, to manage the safe and efficient movement of vehicles on construction HGV routes;
- on-site welfare facilities will be provided, which will reduce daily travel by site workers; and
- introduction of a temporary railhead at Ashley which will connect with the existing railway network for the movement of excavated materials to reduce the volume of construction vehicles using the public road system.

14.4.2 Section 14 of the draft Code of Construction Practice (CoCP)<sup>168</sup> includes measures that aim to reduce the adverse impacts and effects on local communities and maintain public access. This includes the impacts of deliveries of construction materials and equipment.

14.4.3 The measures in the draft CoCP include controls on vehicle types, hours of site operation and routes for HGVs to reduce the impact of road-based construction traffic. In order to achieve this, general and site-specific traffic management measures will be implemented during the construction of the Proposed Scheme on or adjacent to public roads and PRow affected by the Proposed Scheme.

14.4.4 The draft CoCP includes the requirement to develop local traffic management plans in consultation with the highway and traffic authorities and the emergency services. These will consider the local traffic management strategy including consideration of sensitive receptors, such that adverse impacts will be reduced, insofar as reasonably practicable.

14.4.5 Specific measures include core site operating hours of 08:00 to 18:00 on weekdays and 08:00 to 13:00 on Saturdays with site staff and workers generally arriving before the morning peak hour and departing after the evening peak hour. Activities such as major concrete pours may involve extended working hours for reasons of engineering practicability. Tunnelling and directly associated activities may be carried out on a 24-hour, seven days a week basis, with very few workers travelling within the peak traffic hours.

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<sup>168</sup> Volume 5: Appendix CT-002-00000, draft Code of Construction Practice (CoCP).

- 14.4.6 The number of private car trips to and from the construction compounds (both workforce and visitors) will be reduced by encouraging alternative sustainable modes of transport or vehicle sharing. This will be supported by an overarching framework travel plan that will require construction workforce travel plans to be produced that will include a range of potential measures to mitigate the impacts of workers' traffic and transport movements associated with construction of the Proposed Scheme. The travel plans will promote the use of sustainable transport modes as appropriate to the location and types of trip. They will include measures such as: provision of information on and promotion of public transport services; provision of good cycle and pedestrian facilities; liaison with public transport operators; promotion of car sharing; and the appointment of a travel plan coordinator to ensure suitable measures are in place and are effective.
- 14.4.7 Where works potentially affect Network Rail assets, disruption to travelling passengers and freight movements will be reduced as far as reasonably practicable. This includes measures such as:
- programming the construction works to coincide with the possessions that are required and planned by Network Rail for the general maintenance of their railway;
  - planning the required construction works so that they can be undertaken in short overnight stages so that passenger services are not disrupted; and
  - programming longer closures at the weekend and on bank holidays to reduce as far as reasonably practicable the number of passengers affected.

## Assessment of impacts and effects

### Temporary effects

- 14.4.8 The following section considers the impacts on traffic and transport and the likely consequential significant effects resulting from the construction of the Proposed Scheme.

### Key construction transport issues

- 14.4.9 The assessment takes account of all of the impacts of the Proposed Scheme in the Hulseheath to Manchester Airport area. The main traffic and transport impacts during the construction period within this area will include:
- construction vehicle movements to and from the various construction compounds;
  - road closures, realignments and diversions;
  - associated major highway works at the M56 junction 6 including a new gyratory to the north of the A538 Hale Road;
  - alternative routes for PRow and roadside footways; and
  - possessions on the conventional rail network.

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- 14.4.10 The construction assessment has also considered any impacts in the Hulseheath to Manchester Airport area that arise from construction of the Proposed Scheme in the adjoining community areas.
- 14.4.11 Construction vehicle movements required to construct the Proposed Scheme will include the delivery of plant and materials, movement of excavated materials and site worker trips. Works will include utility works, earthworks, tunnelling, underpass, viaduct, bridge and highway construction.
- 14.4.12 Details of the construction compounds are provided in Section 2.3. Table 38 provides details of the compound set up date and the duration of active use. The duration of active use excludes any period where there are no substantial workforce trips or movement of materials to and from the compound.
- 14.4.13 Table 38 also provides a summary of the HGV and car/light goods vehicle (LGV) access trips at each compound in the peak month of activity and during the busy period. For each compound, the peak month of activity is the month within which HGV traffic is at its highest for that compound. The busy period is the period during which HGV traffic serving that compound will be greater than 50% of the HGV traffic in the peak month. Two-way trips refer to the total number of vehicle movements in both directions (e.g. with 200 westbound vehicles and 100 eastbound, there would be 300 two-way trips). The average daily combined two-way vehicle trips for the busy period is the lower end of the range shown in Table 38 and the average daily combined two-way vehicle trips for the peak month is the upper end of the range shown. The estimated duration of busy period is also provided.

**Table 38: Typical vehicle trip generation for construction compounds in the Hulseheath to Manchester Airport area**

Compound type	Compound name	Indicative start/set up date (years/quarter)	Estimated duration of active use (years/months)	Average daily combined two-way car/LGV trips during busy period and within peak month of activity	Average daily combined two-way HGV trips during busy period and within peak month of activity	Estimated duration of busy period (months)
Satellite	Chapel Lane satellite compound	2027 Q2	3 years	251-310	87-102	6
Satellite	Agden Brook viaduct satellite compound	2027 Q2	3 years and 6 months	164-210	88-104	6
Satellite	A556 Chester Road satellite compound	2027 Q2	4 years and 6 months	229-306	433-520	15
Satellite	Rostherne cutting satellite compound	2027 Q2	5 years	233-320	437-486	11
Satellite	Blackburn's Brook satellite compound	2027 Q2	4 years and 3 months	196-278	91-114	9
Satellite	Birkin Brook satellite compound	2027 Q3	2 years and 9 months	135-184	70-90	5



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Compound type	Compound name	Indicative start/set up date (years/quarter)	Estimated duration of active use (years/months)	Average daily combined two-way car/LGV trips during busy period and within peak month of activity	Average daily combined two-way HGV trips during busy period and within peak month of activity	Estimated duration of busy period (months)
Satellite	Ashley IMB-R satellite compound	2027 Q2	6 years	187-268	196-258	20
Rail Systems	Ashley railhead	2031 Q3	4 years	247-302	53-64	39
Satellite	Birkenheath Covert satellite compound	2027 Q3	6 years	235-354	224-252	20
Satellite	Mobberley Road north satellite compound	2027 Q2	4 years and 9 months	144-194	94-114	6
Satellite	Mobberley Road south satellite compound	2027 Q2	5 years and 3 months	130-182	224-266	22
Rail systems	Mobberley Road satellite compound	2031 Q1	1 year	148-148	4-4	4
Rail systems	Ashley Station satellite compound	2030 Q3	1 year and 3 months	122-122	4-4	4
Satellite	Castle Mill Lane satellite compound	2027 Q2	4 years	209-270	107-136	6
Satellite	River Bollin East viaduct satellite compound	2027 Q2	1 year and 9 months	203-220	40-48	6
Satellite	Sunbank Lane satellite compound	2027 Q2	4 years and 6 months	203-290	477-526	5
Satellite	M56 East satellite compound	2027 Q2	4 years and 6 months	211-294	243-312	3
Satellite	Manchester Airport High Speed station south satellite compound	2027 Q2	6 years and 3 months	133-166	49-78	16
Main	Manchester Airport High Speed station main compound	2025 Q2	8 years and 3 months	264-346	214-318	13
Satellite	Manchester Airport High Speed station north satellite compound	2027 Q2	6 years and 3 months	188-238	126-166	47
Main	Manchester tunnel south portal main compound	2025 Q2	9 years	555-750	543-614	16

14.4.14 The locations of the compounds and the associated construction HGV routes are shown in Map Series TR-08 (Volume 5, Traffic and transport Map Book). Table 39 summarises the

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construction HGV routes to and from each compound to the main road network. For some compounds, Table 39 includes multiple construction HGV routes. This is either because the construction HGV route varies depending on the origin/destination of the trip or because the construction HGV route varies over time to account for changes to the highway network through the construction period.

14.4.15 The average daily combined two-way HGV trips reported in Table 38 represent the total number of HGV movements to and from each compound during the busy period and in the peak month of activity on all of the available construction HGV routes combined. Where multiple construction HGV routes are shown in Table 39, the split of construction traffic between the available construction HGV routes will vary based on the point in the construction programme and the origin/destination of the construction HGV traffic.

**Table 39: Construction HGV routes for construction compounds in the Hulseheath to Manchester Airport area**

Compound name(s)	Access routes to/from compound(s) to main road network
Chapel Lane satellite compound	<ul style="list-style-type: none"> <li>Chapel Lane, A5034 Chester Road, B5569 Chester Road, Old Hall Lane and A556 (to be used before and after the Chapel Lane temporary slip roads are open)</li> <li>A556, A5034 Chester Road and Chapel Lane (incoming from the north only, to be used before and after the Chapel Lane temporary slip roads are open)</li> <li>Chapel Lane, Chapel Lane temporary slip roads and A556 (to be used while the Chapel Lane temporary slip roads are open)</li> </ul>
Agden Brook viaduct satellite compound	<ul style="list-style-type: none"> <li>On-site construction traffic route, Millington Lane, Chester Road, B5569 Chester Road, Old Hall Lane and A556</li> </ul>
A556 Chester Road satellite compound	<ul style="list-style-type: none"> <li>On-site construction traffic route, A556 (access to/from A556 northbound carriageway only)</li> </ul>
Rosterne cutting satellite compound Blackburn's Brook satellite compound	<p>Route to/from north:</p> <ul style="list-style-type: none"> <li>On-site construction traffic route, Cherry Tree Lane, Birkinheath Lane, Ashley Road, A5034 Mereside Road, A50 Warrington Road, B5569 Chester Road, Old Hall Lane and A556 (outgoing only, to be used before opening and after closure of the M56 temporary overbridge)</li> <li>A556, Chester Road, Cherry Tree Lane and on-site construction traffic route (incoming only, to be used before opening and after closure of the M56 temporary overbridge)</li> <li>On-site construction traffic route, Tom Lane, M56 temporary overbridge, Yarwoodheath Lane and M56 junction 7-8 (to be used while the M56 temporary overbridge is open)</li> </ul> <p>Route to/from south:</p> <ul style="list-style-type: none"> <li>On-site construction traffic route, Cherry Tree Lane, Birkinheath Lane, Ashley Road, A5034 Mereside Road, A50 Warrington Road, B5569 Chester Road, Old Hall Lane and A556 (outgoing only, to be used before opening and after closure of the M56 temporary overbridge)</li> <li>A556, Old Hall Lane, B5569 Chester Road, Chester Road and Cherry Tree Lane and on-site construction traffic route (incoming only, to be used before opening and after closure of the M56 temporary overbridge)</li> <li>On-site construction traffic route, Tom Lane, M56 temporary overbridge, Yarwoodheath Lane and M56 junction 7-8 (to be used while the M56 temporary overbridge is open)</li> </ul>

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Compound name(s)	Access routes to/from compound(s) to main road network
Birkin Brook satellite compound Ashley IMB-R satellite compound	<ul style="list-style-type: none"> <li>On-site construction traffic route, Ashley Road and A5034 Mereside Road, A50 Warrington Road, B5569 Chester Road, Old Hall Lane and A556 (to be used before opening and after closure of the M56 temporary overbridge)</li> <li>On-site construction traffic route, Tom Lane, M56 temporary overbridge, Yarwoodheath Lane and M56 junction 7-8 (to be used while the M56 temporary overbridge is open)</li> </ul>
Ashley railhead	<ul style="list-style-type: none"> <li>Mobberley Road, On-site construction traffic route, Ashley Road, A5034 Mereside Road, A50 Warrington Road, B5569 Chester Road, Old Hall Lane and A556 (to be used before opening of the M56 temporary overbridge)</li> <li>Mobberley Road, On-site construction traffic route, Ashley Road, on-site construction traffic route, Tom Lane, M56 temporary overbridge, Yarwoodheath Lane and M56 junction 7-8 (to be used while the M56 temporary overbridge is open and before opening of the Ashley Road diversion and Mobberley Road realignment)</li> <li>Mobberley Road realignment, Ashley Road diversion, on-site construction traffic route, Tom Lane, M56 temporary overbridge, Yarwoodheath Lane and M56 junction 7/8 (to be used while the M56 temporary overbridge is open and after opening of the Ashley Road diversion and Mobberley Road realignment)</li> <li>Mobberley Road realignment, Ashley Road diversion, Ashley Road, A5034 Mereside Road, A50 Warrington Road, B5569 Chester Road, Old Hall Lane and A556 (to be used after closure of the M56 temporary overbridge)</li> </ul>
Birkenheath Covert satellite compound	<ul style="list-style-type: none"> <li>On-site construction traffic route, Ashley Road, A5034 Mereside Road, A50 Warrington Road, B5569 Chester Road, Old Hall Lane and A556 (to be used before opening of the M56 temporary overbridge)</li> <li>On-site construction traffic route, Ashley Road, on-site construction traffic route, Tom Lane, M56 temporary overbridge, Yarwoodheath Lane and M56 junction 7-8 (to be used while the M56 temporary overbridge is open and before opening of the Ashley Road diversion and Mobberley Road realignment)</li> <li>Ashley Road diversion, on-site construction traffic route, Tom Lane, M56 temporary overbridge, Yarwoodheath Lane and M56 junction 7/8 (to be used while the M56 temporary overbridge is open and after opening of the Ashley Road diversion and Mobberley Road realignment)</li> <li>Ashley Road diversion, Ashley Road, A5034 Mereside Road, A50 Warrington Road, B5569 Chester Road, Old Hall Lane and A556 (to be used after closure of the M56 temporary overbridge)</li> </ul>
Mobberley Road north satellite compound	<p>Route to/from the west:</p> <ul style="list-style-type: none"> <li>Mobberley Road, Ashley Road and A5034 Mereside Road (to be used before opening of the M56 temporary overbridge)</li> <li>Mobberley Road, Ashley Road, on-site construction traffic route, M56 temporary overbridge, Yarwoodheath Lane and the A556 (to be used while the M56 temporary overbridge is open and before opening of the Ashley Road diversion and Mobberley Road realignment)</li> <li>Mobberley Road realignment, Ashley Road diversion, on-site construction traffic route, M56 temporary overbridge, Yarwoodheath Lane and the A556 (to be used while the M56 temporary overbridge is open and after opening of the Ashley Road diversion and Mobberley Road realignment)</li> <li>Mobberley Road realignment, Ashley Road diversion, Ashley Road, A5034 Mereside Road, A50 Warrington Road, B5569 Chester Road, Old Hall Lane and A556 (to be used after closure of the M56 temporary overbridge)</li> </ul> <p>Route to/from the east:</p> <ul style="list-style-type: none"> <li>Mobberley Road, Back Lane, Tanyard Lane, Castle Mill Lane, Mill Lane and the A538 Wilmslow Road (to be used before opening of and while the M56 temporary overbridge is open)</li> </ul>

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Compound name(s)	Access routes to/from compound(s) to main road network
Mobberley Road south satellite compound	<ul style="list-style-type: none"> <li>• Mobberley Road, Ashley Road, A5034 Mereside Road, A50 Warrington Road, B5569 Chester Road, Old Hall Lane and A556 (to be used before opening of the M56 temporary overbridge)</li> <li>• Mobberley Road, Ashley Road, on-site construction traffic route, Tom Lane, M56 temporary overbridge, Yarwoodheath Lane and M56 junction 7-8 (to be used while the M56 temporary overbridge is open and before opening of the Ashley Road diversion and Mobberley Road realignment)</li> <li>• Mobberley Road realignment, Ashley Road diversion, on-site construction traffic route, Tom Lane, M56 temporary overbridge, Yarwoodheath Lane and M56 junction 7/8 (to be used while the M56 temporary overbridge is open and after opening of the Ashley Road diversion and Mobberley Road realignment)</li> <li>• Mobberley Road realignment, Ashley Road diversion, Ashley Road, A5034 Mereside Road (to be used after closure of the M56 temporary overbridge)</li> </ul>
Mobberley Road satellite compound	<p>Route to/from the west:</p> <ul style="list-style-type: none"> <li>• Mobberley Road, Ashley Road, A5034 Mereside Road, A50 Warrington Road, B5569 Chester Road, Old Hall Lane and A556 (to be used before opening of the M56 temporary overbridge)</li> <li>• Mobberley Road, Ashley Road, on-site construction traffic route, Tom Lane, M56 temporary overbridge, Yarwoodheath Lane and the A556 (to be used while the M56 temporary overbridge is open and before opening of the Ashley Road diversion and Mobberley Road realignment)</li> <li>• Mobberley Road realignment, Ashley Road diversion, on-site construction traffic route, M56 temporary overbridge, Yarwoodheath Lane and the A556 (to be used while the M56 temporary overbridge is open and after opening of the Ashley Road diversion and Mobberley Road realignment)</li> <li>• Mobberley Road realignment, Ashley Road diversion, Ashley Road, A5034 Mereside Road, A50 Warrington Road, B5569 Chester Road, Old Hall Lane and A556 (to be used after closure of the M56 temporary overbridge)</li> </ul> <p>Route to/from the east:</p> <ul style="list-style-type: none"> <li>• Mobberley Road, Back Lane, Tanyard Lane, Castle Mill Lane, Mill Lane and the A538 Wilmslow Road (to be used before opening of and while the M56 temporary overbridge is open)</li> </ul>
Ashley Station satellite compound	<ul style="list-style-type: none"> <li>• Hough Green, Cow Lane, Ashley Road, A5034 Mereside Road, A50 Warrington Road, B5569 Chester Road, Old Hall Lane and A556 (to be used before opening of and while the M56 temporary overbridge is open)</li> <li>• Hough Green, Cow Lane, Ashley Road, on-site construction traffic route, Tom Lane, M56 temporary overbridge, Yarwoodheath Lane and M56 junction 7-8 (to be used while the M56 temporary overbridge is open and before opening of the Ashley Road diversion and Mobberley Road realignment)</li> <li>• Hough Green, Cow Lane, Mobberley Road realignment, Ashley Road diversion, on-site construction traffic route, Tom Lane, M56 temporary overbridge, Yarwoodheath Lane and M56 junction 7-8 (to be used while the M56 temporary overbridge is open and after opening of the Ashley Road diversion and Mobberley Road realignment)</li> <li>• Hough Green, Cow Lane, Mobberley Road realignment, Ashley Road diversion, Ashley Road, A5034 Mereside Road, A50 Warrington Road, B5569 Chester Road, Old Hall Lane and A556 (to be used after closure of the M56 temporary overbridge)</li> </ul>
Castle Mill Lane satellite compound	<ul style="list-style-type: none"> <li>• Castle Mill Lane, Mill Lane and A538 Wilmslow Road</li> </ul>
River Bollin East viaduct satellite compound Sunbank Lane satellite compound	<ul style="list-style-type: none"> <li>• Sunbank Lane and A538 Wilmslow Road</li> </ul>

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Compound name(s)	Access routes to/from compound(s) to main road network
M56 East satellite compound Manchester Airport High Speed station south satellite compound Manchester Airport High Speed station main compound Manchester Airport High Speed station north satellite compound	<ul style="list-style-type: none"> <li>• A538 Hale Road (to/from M56 junction 6)</li> </ul>
Manchester tunnel south portal main compound	<p>Route to/from east:</p> <ul style="list-style-type: none"> <li>• Thorley Lane, Enterprise Way and A555 Ringway Road West</li> </ul> <p>Route to/from west:</p> <ul style="list-style-type: none"> <li>• Thorley Lane, Enterprise Way and M56 Airport Spur</li> </ul> <p>Route to/from south:</p> <ul style="list-style-type: none"> <li>• Thorley Lane, Runger Lane and A538 Wilmslow Road</li> </ul>

- 14.4.16 Information on the indicative construction programme is provided in Section 2.3 and the construction methodology is summarised in Volume 1 (Section 6). This illustrates how the phasing of activities at different compounds will generally be staggered and that construction activities at individual compounds may not occur over the whole duration presented in Table 38.
- 14.4.17 The effects of construction of the Proposed Scheme on the highway network in the Hulseheath to Manchester Airport area have been assessed by undertaking strategic model runs for a number of 'with HS2' construction scenarios, and by comparing the flows and delays against the 2030 future baseline scenario. The assessment is based on the highest volume of construction traffic on each construction HGV route in each construction scenario. Where construction HGV routes will serve more than one construction compound, the assessment is based on the highest combined volume of construction traffic on each section of each construction HGV route in each construction scenario.
- 14.4.18 In using the strategic models, the impacts and effects have been considered in a number of scenarios representing the different construction phases. These scenarios ensure that the assessment addresses the different combinations and interactions of advance works, utility works, temporary highway closures and diversions and construction lorry movements through the construction period.
- 14.4.19 In the west of the Hulseheath to Manchester Airport area there are four scenarios representing the main construction phases. These scenarios are:
- scenario 1, peak between 2025 Q1 and 2027 Q2. This corresponds with the construction compound set up. This scenario equates to 60% of the overall peak in construction traffic across the whole construction period;

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- scenario 2, peak between 2027 Q3 and 2029 Q1. This corresponds with the peak in construction traffic movements prior to the installation of M56 temporary overbridge at Yarwoodheath Lane. This scenario equates to 98% of the overall peak in construction traffic across the whole construction period;
- scenario 3, peak between 2029 Q2 and 2031 Q3. This corresponds with the peak in construction traffic following the opening of M56 temporary overbridge at Yarwoodheath Lane. This scenario equates to 100% of the overall peak in construction traffic across the whole construction period; and
- scenario 4, peak after 2031 Q3. This corresponds with the peak in construction traffic movements following the removal of M56 temporary overbridge at Yarwoodheath Lane and decommissioning of construction compounds following the completion of all construction works. This scenario also includes opening of the Ashley Road diversion and Mobberley Road realignment. This scenario equates to 46% of the overall peak in construction traffic across the whole construction period.

14.4.20 In the east of the Hulseheath to Manchester Airport area there is a utilities scenario and four scenarios representing the main construction phases. These scenarios are:

- utilities scenario, 2025 Q1. This corresponds with the utility works in the area including any works to low voltage overhead or underground lines, gas pipes, sewers and telecommunication cables. Whilst there will be some construction traffic during this period, it is likely to be minimal;
- scenario 1, peak between 2025 Q2 and 2029 Q3. This corresponds with the peak in construction traffic movements following the construction of the temporary realignment of the A538 Hale Road. This scenario equates to 96% of the overall peak in construction traffic across the whole construction period;
- scenario 2, peak between 2029 Q4 and 2030 Q2. This corresponds with the peak in construction traffic movements during the main construction works at the M56 junction 6. This scenario equates to 100% of the overall peak in construction traffic across the whole construction period;
- scenario 3, peak between 2030 Q3 and 2031 Q2. This corresponds with the peak in construction traffic movements following the opening of the modified M56 junction 6 and the associated A538 Hale Road/Station Access gyratory. This scenario equates to 74% of the overall peak in construction traffic across the whole construction period; and
- scenario 4, peak after 2031 Q2. This corresponds with the peak in construction traffic movements following the decommissioning of construction compounds and the completion of all construction works. This scenario equates to 57% of the overall peak in construction traffic across the whole construction period.

14.4.21 The construction works and construction traffic movements associated with the Proposed Scheme differ for each of these scenarios. The assessment considers the impacts in all scenarios and reports the highest magnitude of significant effects, regardless of which scenario they arise in. The most relevant highway interventions and works for each scenario are shown in Table 40 and Table 41.

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**Table 40: Construction highway interventions by scenario (Hulseheath to Manchester Airport area, west)**

Type	Intervention	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Utility works	Minor works	Not included	Not included	Not included	Not included
Main works	Old Hall Lane access, direct accesses from the A556 in the Hulseheath to Manchester Airport area and temporary slip-roads at Chapel Lane.	Not included	Included	Included	Included
Main works	M56 temporary overbridge over the at Yarwoodheath Lane in the Hulseheath to Manchester Airport area (MA06).	Not included	Not included	Included	Not included
	<b>Construction HGV traffic as percentage of peak construction HGV traffic</b>	<b>60%</b>	<b>98%</b>	<b>100%</b>	<b>46%</b>

**Table 41: Construction highway interventions by scenario (Hulseheath to Manchester Airport area, east)**

Type	Intervention	Utilities scenario	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Utilities	Shuttle working on the A538 Hale Road, Runger Lane reduced capacity, and shuttle working on the A50 Warrington Road.	Included	Not included	Not included	Not included	Not included
Main works	A538 Hale Road temporary two-way realignment	Not included	Included	Not included	Not included	Not included
Main works	Temporary closure of Castle Mill Lane and Sunbank Lane	Not included	Not included	Included	Included	Not included
Key construction activities	Modified M56 junction 6 and A538 Hale Road/Station Access gyratory	Not included	Not included	Not included	Not included	Included
	<b>Construction HGV traffic as percentage of peak construction HGV traffic</b>	<b>Minimal</b>	<b>96%</b>	<b>100%</b>	<b>74%</b>	<b>57%</b>

14.4.22 The strategic models have been used to assess these construction scenarios taking account of the construction traffic movements and any road closures, traffic management or changes to junction operations in each scenario. The strategic model outputs for each of these scenarios are only relevant to the assessment of the effects on traffic delays to vehicle occupants, traffic related severance and public transport delay.

## Highway network

### Strategic and local highway network

14.4.23 The primary HGV access routes for construction vehicles will be the strategic and/or primary road network with the use of the local road network limited, so far as reasonably practicable. The construction HGV routes will also provide access to compounds. Where reasonably practicable, site haul routes alongside the route of the Proposed Scheme will be used to reduce the impact on the local road network. In this area, the main construction HGV routes will be (ordered by road class from south to north):

- M56 (including junctions 5 to 8);
- A556 (between Chapel Lane and the M56 junction 7 and 8);
- A538 Wilmslow Road/Hale Road (between Mill Lane and Hasty Lane);
- B5569 Chester Road (between the A556 and the A5034 Mereside Road);
- Thowler Lane (between Back Lane and Boothbank Lane);
- Millington Lane (between Chester Road and Boothbank Lane);
- Chester Road (between the B5569 Chester Road and Cherry Tree Lane);
- Cherry Tree Lane (between Chester Road and Marsh Lane);
- Yarwoodheath Lane (between Tom Lane and the A556);
- Tom Lane (between Cherry Tree Lane and Yarwoodheath Lane);
- Birkinheath Lane (between Marsh Lane and Ashley Road);
- Ashley Road (between the A5034 Mereside Road and Back Lane);
- Mobberley Road (between Sugar Brook Farm and Ashley Road);
- Cow Lane (between Back Lane and Ashley Road);
- Back Lane (between Ashley Road and Castle Mill Lane);
- Tanyard Lane (between Back Lane and Castle Mill Lane);
- Castle Mill Lane (between Tanyard Lane and Ashley Road);
- Brickhill Lane (between Ashley Plant Hire & Reclamations Ltd and Back Lane);
- Mill Lane (between Mill Lane and the A538 Wilmslow Road);
- Sunbank Lane (between Chapel Lane and the A538 Wilmslow Road);
- Runger Lane (between the A538 Wilmslow Road and Thorley Lane);
- Hasty Lane (between the A538 Hale Road and the M56);
- Thorley Lane (between Roaring Gate Lane and Enterprise Way);
- Roaring Gate Lane (between Thorley Lane and Manchester tunnel south portal main compound); and
- Enterprise Way (between Outwood Lane West and the A555 Ringway West).

14.4.24 In addition to changes in traffic flows due to construction traffic, temporary highway closures and diversions or realignments will be required in a number of locations as set out



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in Section 2.3. The works to construct both temporary and permanent highway diversions/realignments could also result in disruption to highway users. In most cases, these works will be restricted to short-term overnight and/or weekend closures, and are not, therefore, considered significant. Where works will have a longer duration, these are described below.

14.4.25 As part of the construction of the modified junction at the M56 junction 6 and the associated A538 Hale Road/Station Access gyratory, there will be temporary highway changes to facilitate the construction of the permanent highway diversions and realignments, which are as follows:

- M56 south of junction 6 – temporary realignment of a 1.4km section of the M56 south of junction 6 for three years and three months to accommodate the construction of M56 East tunnel, resulting in a negligible change in journey length; and
- A538 Hale Road – temporary realignment of a 300m section of the A538 Hale Road for a period of two years and eight months during the phased construction of Manchester Airport High Speed station with users being diverted along the temporary A538 Hale Road, resulting in a negligible change in journey length.

14.4.26 There will also be temporary highway changes associated with the construction of the other permanent highway diversions and realignments, which are as follows:

- Millington Lane – temporary closure of Millington Lane for one year and nine months to facilitate the construction of Millington Lane overbridge and associated highway works. A diversion via Peacock Lane and the B5569 Chester Road will be in place during the closure, increasing journey length by up to 4km;
- A556 – temporary realignment of the northbound carriageway of the A556 to facilitate the construction of A556 Chester Road overbridge, which will be in use for a period of one year and seven months. The realignment will be constructed 25m north-west of the existing alignment for 400m resulting in a negligible change in journey length;
- Yarwoodheath Lane (no through road) – temporary closure of Yarwoodheath Lane for one year. Traffic travelling from Cherry Tree Lane to Yarwood Heath Farm will be diverted along Cherry Tree Lane, the B5569 Chester Road, the A50 Warrington Road and the A556, increasing the overall journey length by up to 9.6km. Traffic from Yarwood Heath Farm to Cherry Tree Lane will be diverted along the A556, the B5569 Chester Road and Cherry Tree Lane, increasing the overall journey length for users of this farm access by up to 3.3km;
- Castle Mill Lane – temporary closure of Castle Mill Lane for one year and three months to facilitate the construction of Castle Mill Lane overbridge. Traffic will be diverted via the existing and diverted Brickhill Lane, increasing journey length by up to 415m; and
- Sunbank Lane – temporary closure of Sunbank Lane for six years and three months to facilitate construction of the realigned Sunbank Lane and Sunbank Lane overbridge. Traffic will be diverted via Chapel Lane, Greengate, High Elm Road, the A538 Hale Road, the A538 Wilmslow Road, before re-joining Sunbank Lane, increasing journey length by up to 3.3km.

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14.4.27 The temporary diversions or realignments will change journey length for vehicle occupants. Some of the diversions or realignments are less than 1km in length and will not result in any significant effects with regard to changes to journey times for vehicle occupants. Most of the diversion or realignments are greater than 1km which may result in significant effects for vehicle occupants. They may also affect non-motorised users, which is considered separately below. The effects, which are significant, will be:

- Millington Lane – moderate adverse effect from increase in journey length of up to 4km; and
- Sunbank Lane – moderate adverse effect from increase in journey length of up to 3.3km.

14.4.28 The movement of excavated or fill material and construction vehicles accessing construction compounds during the construction of the Proposed Scheme together with temporary road closures and diversions is expected to result in changes in daily traffic flows.

14.4.29 These changes in traffic flow will lead to changes in delays to vehicle occupants and congestion, which are significant. The significant effects with the highest magnitude at each junction will be:

- A538 Water Lane/A538 Alderley Road/B5086 Alderley Road - minor adverse effect during scenarios 2, 3 and 4;
- A538 Manchester Road/A538 Alderley Road/Station Road/Swan Street - major adverse effect during scenarios 1, 2, 3 and 4;
- A538 Altrincham Road/Mobberley Road - major adverse effect during scenarios 1, 2 and 3;
- Morley Green Road/Mobberley Road - minor adverse effect during scenario 1;
- A538 Altrincham Road/Morley Green Road - moderate adverse effect during scenarios 1 and 2 and moderate beneficial effect during scenario 3;
- B5358 Wilmslow Road/B5358 Station Road/Bulkeley Road - moderate adverse effect during scenarios 1, 2 and 3;
- A538 Wilmslow Road/Mill Lane - major adverse effect during scenario 2;
- Ashley Road/Back Lane/Mobberley Road/Cow Lane - major adverse effect during scenarios 1 and 2;
- M56 junction 6/A538 Wilmslow Road/Runger Lane - major adverse effect during utilities scenario and scenario 1;
- M56 Junction 6/A538 Wilmslow Road/A538 Hale Road - major adverse effect during utilities scenario and scenario 1;
- World Way/Chicago Avenue/Palma Avenue - minor adverse effect during scenarios 2, 3 and 4;
- A538 Hale Road/Tithebarn Road - minor adverse effect during scenarios 2, 3 and 4;
- A56 Dunham Road/B5160 Park Road/B5160 Dunham Road/B5160 Charcoal Road - moderate adverse effect during scenarios 1, 2 and 3;
- A538 Hale Road/Shay Lane - major adverse effect during scenarios 1, 2 and 3;

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- A5144 Delahays Road/A538 Hale Road/B5162 Park Road - major adverse effect during scenario 1;
- A538 Hale Road/Westminster Road - minor adverse effect during scenario 1;
- A538 Hale Road/Ashfield Road/Victoria Road - minor adverse effect during scenario 1;
- Whitecarr Lane/Roaring Gate Lane - minor adverse effect during scenario 1;
- A56 Dunham Road/Regent Road/Booth Road - moderate beneficial effect during scenario 3;
- A5144 Thorley Lane/Clay Lane/Wood Lane - minor adverse effect during scenarios 1, 2, 3 and 4;
- A560 Woodlands Road/B5164 Barrington Road - minor adverse effect during scenarios 1, 2, 3 and 4;
- A560 Stockport Road/A538 Stockport Road/A560 Woodlands Road/Woodlands Parkway - minor adverse effect during scenario 1;
- Oldfield Road/Gorse Lane - minor adverse effect during scenarios 1, 2, 3 and 4;
- A56 Manchester Road/A56 Church Street/Oldfield Road - moderate adverse effect during scenario 1;
- Moss Lane/Grove Lane - minor adverse effect during scenarios 1, 2 and 3;
- A56 Manchester Road/B5165 Park Road/Woodcote Road - major adverse effect during scenarios 1, 2 and 3;
- A56 Washway Road/Woodhouse Lane/Eastway - minor adverse effect during scenarios 1, 2, 3 and 4; and
- A56 Washway Road/A6144 Marsland Road/A6144 Harboro Way - minor adverse effect during scenarios 1, 2 and 3.

14.4.30 Construction of the Proposed Scheme will result in substantial changes in traffic flows (i.e. more than 30% for HGVs or for all vehicles) in some locations, which can lead to changes in traffic-related severance for non-motorised users, which are significant. The significant effects with the highest magnitude in each location are set out in Table 42 and Table 43.

**Table 42: Roads with changes in daily all vehicle movements (more than 30%) resulting in significant effects on traffic-related severance for non-motorised users, 2030**

Road name	Significant effect	Construction scenario
Rostherne Lane (between Marsh Lane and Ashley Road)	Moderate adverse	Scenarios 3 and 4
Rostherne Lane (between New Road and Marsh Lane)	Moderate adverse	Scenarios 3 and 4
Birkinheath Lane (between Marsh Lane and Ashley Road)	Moderate adverse	Scenarios 1, 2 and 4
Chester Road (between A556 southbound off-slip and Millington Lane)	Major adverse	Scenarios 2 and 3
Millington Lane (between Booth Bank Lane and Chester Road)	Moderate adverse	Scenarios 1, 2, 3 and 4
Cherry Tree Lane (between Chester Road and Marsh Lane)	Moderate adverse	Scenarios 1, 2, 3 and 4
Greengate (between High Elm Road and Chapel Lane)	Moderate adverse	Scenarios 1, 2, 3 and 4
Chapel Lane (between Tithebarn Road and Wicker Lane)	Moderate adverse	Scenario 1
Palma Avenue (between Sydney Avenue and World Way)	Moderate adverse	Scenarios 2, 3 and 4
South Downs Road (between Ashley Road and B5162 Heather Road)	Moderate adverse	Scenario 1

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**Table 43: Roads with changes in daily HGV movements (more than 30%) resulting in significant effects on traffic-related severance for non-motorised users, 2030**

Road name	Significant effect	Construction scenario
Ashley Road (between Rostherne Lane and A5034 Mereside Road)	Major adverse	Scenarios 1, 2, 3 and 4
Ashley Road (between Birkinheath Lane and Rostherne Lane)	Major adverse	Scenarios 1, 2, 3 and 4
Mobberley Road (between Back Lane and Breach House Lane)	Major adverse	Scenarios 3 and 4
Birkinheath Lane (between Marsh Lane and Ashley Road)	Major adverse	Scenarios 1, 2 and 4
B5569 Chester Road (between Chapel Lane and A556 southbound off-slip)	Major adverse	Scenarios 1, 2 and 3
Chapel Lane/Sunbank Lane (between Greengate and A538 Wilmslow Road)	Major adverse	Scenarios 1 and 3
Millington Lane (between Booth Bank Lane and Chester Road)	Major adverse	Scenario 1, 2 and 3
Cherry Tree Lane (between Chester Road and Marsh Lane)	Major adverse	Scenarios 1, 2 and 4
Runger Lane (between A538 Wilmslow Road and Avro Way)	Major adverse	Scenarios 1, 2 and 3
Runger Lane (between Avro Way and Thorley Lane)	Major adverse	Scenarios 1, 2 and 3
Elmridge Drive (between A538 Hale Road and High Elm Road)	Moderate adverse	Scenarios 1, 2, 3 and 4
Chapel Lane (between Tithebarn Road and Wicker Lane)	Moderate adverse	Scenarios 1, 2 and 3
Hawley Lane (between Broad Lane and Wicker Lane)	Moderate adverse	Scenarios 1, 2, 3 and 4
Bankhall Lane (between Arthog Road and Broad Lane)	Moderate adverse	Scenarios 1, 2, 3 and 4
Arthog Road (between Bankhall Lane and B5162 Park Road)	Major adverse	Scenario 1
B5162 Park Road (between Arthog Road and B5357 Ashley Road)	Moderate adverse	Scenario 1
Heather Road (between South Downs Road and Ashley Road)	Major adverse	Scenario 1
Thorley Lane (between Shay Lane and Runger Lane)	Major adverse	Scenarios 1, 2, 3 and 4
South Downs Road (between Grange Road and Heather Road)	Major adverse	Scenarios 1, 2, 3 and 4
South Downs Road (between B5351 Langham Road and Grange Road)	Major adverse	Scenarios 1, 2, 3 and 4
B5161 Langham Road (between Vicarage Lane and South Downs Road)	Moderate adverse	Scenarios 1, 2, 3 and 4
B5161 Langham Road (between Richmond Road and Vicarage Lane)	Moderate adverse	Scenarios 1, 2, 3 and 4
B5161 Langham Road (between B5161 Bow Green Road and Richmond Road)	Moderate adverse	Scenarios 1, 2, 3 and 4
B5161 Langham Road (between Church Brow and B5161 Bow Green Road)	Moderate adverse	Scenarios 1, 2, 3 and 4
B5160 Park Road (between A56 Dunham Road and B5160 Langham Road)	Moderate adverse	Scenarios 1 and 4

14.4.31 Utility works have been included in the assessment where they are major and where the traffic or transport impacts from the works separately, or in combination with other works, will be greater than other construction activities arising within the area. Most utility works are expected to result in only localised traffic and pedestrian diversions, which will be of short-term duration and are not expected to result in significant effects.

## **Accidents and safety**

14.4.32 There will be no significant effects on accidents and safety as there are no locations where there are both accident clusters and substantial changes in traffic during construction.

## **Parking and loading**

14.4.33 The Proposed Scheme will have impacts on parking in the local area. This is likely to result in the following effects, which are significant:

- Holiday Inn Express Manchester Airport – major adverse effect as a result of the temporary loss of 79 off-street spaces for a period of four years due to construction of the Proposed Scheme. Two blue badge bays will be relocated; and
- Manchester Airport (Building 319 World Cargo Centre) – major adverse effect as a result of the temporary loss of nine off-street spaces for a period of four years due to construction of the Proposed Scheme. Four blue badge bays will be relocated.

14.4.34 HS2 Ltd will work with the businesses affected to identify opportunities where reasonably practicable to mitigate effects on parking.

14.4.35 Permanent loss of parking is reported under the operational assessment.

## **Public transport network**

14.4.36 Construction of the Proposed Scheme will require temporary bus route diversions and traffic management, with consequential changes in journey times and the need to relocate bus stops. This will result in changes in public transport delays with effects, which are significant, on the users of:

- bus routes 88, 283, 741 and 869 operating on the A538 Hale Road and the A538 Wilmslow Road between Delahays Road and Mill Lane – moderate adverse effect; and
- bus routes 103, 288 and 313 operating on the A538 Hale Road and Runger Lane between Delahays Road and Manchester Airport – moderate adverse effect.

14.4.37 There are interfaces with the existing rail network in this area, in particular on the operation of the Mid-Cheshire Line and its passenger and rail freight services.

14.4.38 The construction of the Proposed Scheme is expected to require a number of rail possessions over a period of up to eight years in this area. Overall, there will be 18 possessions comprising eight possessions of up to 27 hours, nine possessions up to 54 hours, and one possession of up to 72 hours. The possessions will be required to enable the construction of Proposed Scheme elements including Mid-Cheshire (Railway) and Mobberley Road viaduct, Mobberley Road offline overbridge and Ashley railhead.

14.4.39 Disruption to rail users will be reduced by limiting possessions, where reasonably practicable, to existing maintenance periods. Possessions will affect users of the Mid-Cheshire Line and will be managed through a combination of measures that could include rail service diversions or replacement bus services, which will reduce the disruption to the

travelling public. However, while individually these possessions are not considered significant, the possessions will occur over a lengthy period and their cumulative impact is considered to have a moderate adverse effect, which is significant.

- 14.4.40 HS2 Ltd will work with Network Rail and the train and freight operating companies to ensure that any need for additional possessions can be reduced with good planning and communication (including appropriate advanced notice).

### **Non-motorised users**

- 14.4.41 The construction works associated with the Proposed Scheme will require the temporary closure, diversion or realignment of PRow and roads in the vicinity of the Proposed Scheme, including, where necessary, around construction compounds. In most cases, these will be of a short duration and/or distance and will not have a significant effect on users.

- 14.4.42 Nonetheless, there will be temporary effects, which are significant, on non-motorised users during construction as a result of changes to journey length and/or hindrances such as substantial changes in levels for non-motorised users due to temporary PRow and road realignments or diversions at:

- Footpath Millington 2/1 – minor adverse effect from increase in journey length of up to 359m;
- Footpath Millington 3/3 – moderate adverse effect from increase in journey length of up to 566m;
- Footpath Millington 7/4 – minor adverse effect from increase in journey length of up to 144m;
- Footpath Rostherne 13/1 – major adverse effect as a result of there being no viable alternative route during the temporary closure. Footpath Rostherne 13/1 will be temporarily closed for a period of three years;
- Footpath Rostherne 5/1 – minor adverse effect from increase in journey length of up to 244m;
- Footpath Ashley 3/1 – moderate adverse effect from increase in journey length of up to 1.3km;
- Footpath Ashley 6/5 – moderate adverse effect from increase in journey length of up to 1.7km;
- Footpath Ashley 8/1 – minor adverse effect from increase in journey length of up to 157m;
- Footpath Ashley 8/2 – major adverse effect as a result of there being no viable alternative route during the temporary closure. Footpath Ashley 8/2 will be temporarily closed for a period of five years and two months;
- Footpath Ashley 6/4 – major adverse effect as a result of there being no viable alternative route during the temporary closure. Footpath Ashley 6/4 will be temporarily closed for a period of five years and two months;

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- Footpath Ashley 10/1 – major adverse effect as a result of there being no viable alternative route during the temporary closure. Footpath Ashley 10/1 will be temporarily closed for a period of one year and two months;
- Footpath Ringway 14 – major adverse effect as a result of there being no viable alternative route during the temporary closure. Footpath Ringway 14 will be temporarily closed for a period of one year and two months;
- Footpath Ringway 12 – major adverse effect as a result of there being no viable alternative route during the temporary closure. Footpath Ringway 12 will be temporarily closed for a period of one year and two months;
- Footpath Ringway 11 – major adverse effect as a result of there being no viable alternative route during the temporary closure. Footpath Ringway 11 will be temporarily closed for a period of three years and three months;
- Millington Lane – minor adverse effect from increase in journey length of up to 399m;
- Castle Mill Lane – moderate adverse effect from increase in journey length of up to 538m;
- Sunbank Lane – moderate adverse effect from increase in journey length of up to 2.8km; and
- Hasty Lane – minor adverse effect from increase in journey length of up to 435m.

14.4.43 Permanent diversions to PRow and roads are reported under the operational assessment.

## Permanent effects

14.4.44 Any permanent effects of construction are considered in the assessment of operation for traffic and transport. This is because the impacts and effects of ongoing changes in travel demand and the wider impacts and effects of the operational phase need to be considered together.

## Other mitigation measures

14.4.45 The implementation of the measures in the draft CoCP, including travel plans, will help mitigate the transport-related effects during construction of the Proposed Scheme.

14.4.46 No further appropriate traffic and transport mitigation measures have been identified. HS2 Ltd will, however, continue to work with the relevant highway authorities to identify whether further mitigation measures should be provided.

## Summary of likely residual significant effects

14.4.47 The temporary residual significant effects during construction remain as described above. These effects will be temporary and reversible in nature lasting only for the duration of the construction works.

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- 14.4.48 Temporary diversions or realignments will result in changes in journey length for vehicle occupants, which will result in moderate adverse effects, which are significant, on two roads.
- 14.4.49 The most intensive periods of construction of the Proposed Scheme will cause changes in traffic that will result in the following temporary effects, which are significant, through changes to congestion and/or delays for road users:
- major adverse effects at nine junctions;
  - moderate adverse effects at four junctions;
  - minor adverse effects at 14 junctions; and
  - moderate beneficial effect at two junctions.
- 14.4.50 Changes in traffic during the construction period will result in the following temporary effects, which are significant, on traffic-related severance for non-motorised users:
- major adverse effects on 16 roads; and
  - moderate adverse effects on 18 roads.
- 14.4.51 The loss of parking during the construction period will result in temporary major adverse effects, which are significant, at two locations.
- 14.4.52 Changes in bus journey times resulting in public transport delays during the construction period will result in temporary moderate adverse effects, which are significant, on two bus corridors.
- 14.4.53 Rail possessions will result in a moderate adverse effect, which is significant, for users of one railway line.
- 14.4.54 Increased journey length for non-motorised users during the construction period will result in the following temporary effects, which are significant:
- Major adverse effects on users of seven PRoW;
  - moderate adverse effects on users of three PRoW and two roads; and
  - minor adverse effects on users of four PRoW and two roads.

## **Cumulative effects**

- 14.4.55 The assessment includes the cumulative effects of planned and committed development during construction by taking this into account within the background traffic growth.
- 14.4.56 The assessment also takes into account Proposed Scheme construction traffic and transport impacts of works to construct the Proposed Scheme being undertaken in neighbouring community areas.



## 14.5 Effects arising from operation

14.5.1 This section presents the likely significant environmental effects of the operation of the Proposed Scheme in 2038 and 2046.

### Avoidance and mitigation measures

14.5.2 The design of Manchester Airport High Speed station will avoid or reduce impacts on transport users through the following measures:

- provision of sufficient concourse and platform space to accommodate growth in rail passenger demand up to 2046, allowing for additional loading of train services and for growth beyond 2046, including passive provision and capacity for Northern Powerhouse Rail (NPR) and Metrolink services;
- provision for access by sustainable modes, including walking and cycling to promote non-car access, including: a new shared pedestrian/cycle route to the west of Manchester Airport High Speed station; a new underpass at M56 junction 6/A538 Hale Road/Station Access gyratory, known as the M56/A538 Wilmslow Road offline non-motorised-user underpass; an extension to the M56 Hasty Lane underpass; and provision of bicycle parking spaces;
- provision of dedicated taxi, private hire vehicle and private vehicle drop-off and pick-up facilities;
- provision of two new multi-storey car parks;
- changes to the highway network, including a new gyratory to the north of the A538 Hale Road with access to Manchester Airport High Speed station, to be known as the A538 Hale Road/Station Access gyratory; and
- changes to the public transport network to provide dedicated bus bays, including four public bus bays and one airport shuttle bus bay.

14.5.3 In addition, the following measures have been included in the area around Manchester Airport High Speed station:

- reinstatement of roads on or close to their existing alignments, where reasonably practicable;
- replacement, diversion or realignment of PRow; and
- a modified junction at the M56 junction 6 associated with the new A538 Hale Road/Station Access gyratory.

14.5.4 A station travel plan for Manchester Airport High Speed station will be developed and will include measures that aim to reduce the impacts and effects of traffic and transport movements.

## Assessment of impacts and effects

14.5.5 The following section considers the impacts on traffic and transport and the consequential effects resulting from the operational phase of the Proposed Scheme in 2038 and 2046.

### Key operation transport issues

14.5.6 The assessment takes account of all of the impacts of the Proposed Scheme in the Hulseheath to Manchester Airport area. The main impacts of the operation of the Proposed Scheme can be summarised as:

- improved journey times between Manchester, north Cheshire, the Midlands and the south of England, increases to rail capacity, reduced pressure and lower crowding on the conventional rail network and improved local connectivity through Metrolink; and
- impacts on the highway and public transport networks within this area due to increased rail users and traffic associated with Manchester Airport High Speed station. However, the maintenance of the Proposed Scheme will generate limited vehicular trips and their effect will not be significant.

14.5.7 The operational impacts will, therefore, primarily relate to the improved public transport provision together with changes to traffic due to highway changes and reconfiguration and traffic associated with passenger access to Manchester Airport High Speed station and the permanent diversion, realignment and stopping up of roads. This includes a modified junction at the M56 junction 6 and access to Manchester Airport High Speed station.

### Public transport network

14.5.8 The design of the Proposed Scheme and its operation will create a number of beneficial effects, which are significant, including substantially improved journey times between Manchester, north Cheshire, the Midlands and the south of England, as detailed in Volume 1, which is a major beneficial effect.

14.5.9 Annual HS2 passenger use of Manchester Airport High Speed station is forecast to be 5.5 million passengers in 2038, increasing to 5.9 million in 2046. Forecast use of Manchester Airport High Speed station, as set out in Table 44, Table 45 and Table 46 for daily, morning peak and evening peak periods respectively.

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**Table 44: Daily rail passengers – Proposed Scheme**

Type	Boarding, alighting or total	2038 Proposed Scheme	2046 Proposed Scheme
Long distance rail: HS2	Boarding	8,783	9,354
Long distance rail: HS2	Alighting	8,791	9,355
<b>Long distance rail: HS2</b>	<b>Total</b>	<b>17,574</b>	<b>18,709</b>
Long distance rail: other	Boarding	-	-
Long distance rail: other	Alighting	-	-
<b>Long distance rail: other</b>	<b>Total</b>	<b>-</b>	<b>-</b>
<b>Total long distance rail</b>	<b>Total</b>	<b>17,574</b>	<b>18,709</b>
Suburban rail	Boarding	-	-
Suburban rail	Alighting	-	-
<b>Suburban rail</b>	<b>Total</b>	<b>-</b>	<b>-</b>
Total rail	Boarding	8,783	9,354
Total rail	Alighting	8,791	9,355
<b>Total rail</b>	<b>Total</b>	<b>17,574</b>	<b>18,709</b>

**Table 45: Morning peak hour (08:00-09:00) rail passengers – Proposed Scheme**

Type	Boarding, alighting or total	2038 Proposed Scheme	2046 Proposed Scheme
Long distance rail: HS2	Boarding	853	908
Long distance rail: HS2	Alighting	837	890
<b>Long distance rail: HS2</b>	<b>Total</b>	<b>1,690</b>	<b>1,798</b>
Long distance rail: other	Boarding	-	-
Long distance rail: other	Alighting	-	-
<b>Long distance rail: other</b>	<b>Total</b>	<b>-</b>	<b>-</b>
<b>Total long distance rail</b>	<b>Total</b>	<b>1,690</b>	<b>1,798</b>
Suburban rail	Boarding	-	-
Suburban rail	Alighting	-	-
<b>Suburban rail</b>	<b>Total</b>	<b>-</b>	<b>-</b>
Total rail	Boarding	853	908
Total rail	Alighting	837	890
<b>Total rail</b>	<b>Total</b>	<b>1,690</b>	<b>1,798</b>

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**Table 46: Evening peak hour (17:00-18:00) rail passengers – Proposed Scheme**

Type	Boarding, alighting or total	2038 Proposed Scheme	2046 Proposed Scheme
Long distance rail: HS2	Boarding	869	926
Long distance rail: HS2	Alighting	970	1,032
<b>Long distance rail: HS2</b>	<b>Total</b>	<b>1,839</b>	<b>1,958</b>
Long distance rail: other	Boarding	-	-
Long distance rail: other	Alighting	-	-
<b>Long distance rail: other</b>	<b>Total</b>	<b>-</b>	<b>-</b>
<b>Total long distance rail</b>	<b>Total</b>	<b>1,839</b>	<b>1,958</b>
Suburban rail	Boarding	-	-
Suburban rail	Alighting	-	-
<b>Suburban rail</b>	<b>Total</b>	<b>-</b>	<b>-</b>
Total rail	Boarding	869	926
Total rail	Alighting	970	1,032
<b>Total rail</b>	<b>Total</b>	<b>1,839</b>	<b>1,958</b>

14.5.10 The forecast onward mode share for HS2 passengers in 2038 and 2046 is set out in Table 47.

**Table 47: HS2 onward mode share**

Mode	Mode share % alighting from trains. AM peak hour (08:00-09:00)	Mode share % boarding trains. AM peak hour (08:00-09:00)	Mode share % alighting from trains. PM peak hour (17:00-18:00)	Mode share % boarding trains. PM peak hour (17:00-18:00)
Bus	17%	5%	5%	17%
Local rail	0%	0%	0%	0%
Metrolink	0%	0%	0%	0%
Taxi	23%	3%	3%	22%
Private car (park and ride)	16%	85%	84%	17%
Private car (kiss and ride)	34%	4%	5%	33%
Walk/cycle	10%	3%	3%	11%

14.5.11 Table 47 indicates that the largest onward mode share for passengers boarding in the AM peak and alighting in the PM peak is private car (park and ride), whilst private car (kiss and ride) is the largest for passengers alighting in the AM peak and boarding in the PM peak.

14.5.12 The Proposed Scheme includes provision for good bus access, including the provision of four public bus bays and one airport shuttle bus bay located at Manchester Airport High Speed station. It is expected that as a result of the Proposed Scheme use of buses will increase but that bus operators will adjust their services to match this change in demand and the impact will not be significant.

14.5.13 The operation of the Proposed Scheme in the Hulseheath to Manchester Airport area will result in the permanent re-routing of several bus routes due to road closures, diversions etc. The effect of these bus route changes and diversions, as well as some additional bus

delay on routes due to changes in the traffic flows on the network, will result in the following effects, which are significant:

- bus routes 88, 283, 741 and 869 operating on the A538 Hale Road and the A538 Wilmslow Road between Delahays Road and Mill Lane – moderate adverse effect in 2038 and 2046; and
- bus routes 103, 288 and 313 operating on the A538 Hale Road and Runger Lane between Delahays Road and Manchester Airport – moderate adverse effect in 2038 and 2046.

14.5.14 Demand for taxis, private hire and private vehicles will increase as a result of the operation of the Proposed Scheme. The Proposed Scheme includes the provision of enhanced taxi, private hire and private vehicle facilities to accommodate the forecast use of these access modes and there will be no significant effects arising from the increased use.

## Highway network

### Strategic and local highway network

- 14.5.15 The Proposed Scheme will involve the remodelling of the road network around the M56 junction 6, which will require the permanent widening, diversion, closure or realignment of:
- A538 Hale Road – realignment of a section of the A538 Hale Road, 285m north-east of its current alignment for 725m. Eastbound traffic will cross the route of the Proposed Scheme via A538 Hale Road overbridge (north) and follow the new A538 Hale Road/Station Access gyratory to the north of the A538 Hale Road, increasing journey length by up to 368m. Westbound traffic will cross the route of the Proposed Scheme via A538 Hale Road overbridge (south) and follow the existing A538 Hale Road with no change in journey length;
  - A538 Wilmslow Road – widening between the western and eastern sides of the M56 junction 6 from two lanes in each direction to four lanes in each direction. There will be no change in journey length on this section for eastbound or westbound traffic; and
  - Hasty Lane – closure of Hasty Lane, 135m north-west of A538 Hale Road overbridge (south). The A538 Hale Road service road (north) will be provided to maintain access to residential properties, resulting in no change in journey length.
- 14.5.16 In addition, the Proposed Scheme will require the permanent widening, diversion, closure or realignment of (ordered by road class from south to north):
- A556 – realignment of the A556, up to 1m above ground level for 300m, crossing the route of the Proposed Scheme on A556 Chester Road overbridge, resulting in a negligible change in journey length;
  - Millington Lane – 285m Lane up to 5m above ground level for 296m, crossing the route of the Proposed Scheme on Millington Lane overbridge, resulting in a negligible change in journey length;

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- Tom Lane – closure of Tom Lane for motorised vehicles where it crosses the route of the Proposed Scheme. Tom Lane will be retained as a private access road for Yarwood Heath Farm, resulting in a negligible change in journey length;
- Ashley Road – closure of Ashley Road where it crosses the Proposed Scheme, with users to be diverted up to 850m south-east of its current alignment for 1km. Users of the diverted Ashley Road will join the realigned Mobberley Road before crossing the route of the Proposed Scheme underneath the Mid-Cheshire (Railway) and Mobberley Road viaduct, increasing journey length by up to 2.7km;
- Lamb Lane – closure of Lamb Lane where it crosses the route of the Proposed Scheme west of the Ashley Road auto-transformer station. Users will be diverted along the diverted Ashley Road, increasing journey length by up to 2.2km;
- Mobberley Road – realignment of Mobberley Road, up to 142m east of its current alignment for 824m. The realigned Mobberley Road will cross over the Mid-Cheshire Line via Mobberley Road offline overbridge, resulting in a negligible change in journey length;
- Brickhill Lane – permanent diversion of Brickhill Lane, up to 360m east of its current alignment for 454m and closure of Brickhill Lane where it crosses the route of the Proposed Scheme. Users will be diverted along Back Lane, realigned Castle Mill Lane, and diverted Brickhill Lane, crossing the route of the Proposed Scheme on Castle Mill Lane overbridge, increasing journey length by up to 856m;
- Castle Mill Lane – realignment of Castle Mill Lane, up to 50m north of its current alignment for 440m, crossing the route of the Proposed Scheme on Castle Mill Lane overbridge, increasing journey length by up to 215m;
- Sunbank Lane – realignment of Sunbank Lane, up to 20m west of its current alignment for 316m, crossing the route of the Proposed Scheme on Sunbank Lane overbridge, resulting in a negligible change in journey length; and
- Thorley Lane – realignment of Thorley Lane, 55m to the south of its current alignment for 456m, crossing the route of the Proposed Scheme over Thorley Lane overbridge, resulting in a negligible change in journey length.

14.5.17 The permanent diversions or realignments will change journey length for vehicle occupants. Many of the diversions or realignments are less than 1km in length and will not result in any significant effects with regard to changes to journey times for vehicle occupants. However, some of the diversion or realignments are greater than 1km, which may result in significant effects for vehicle occupants. There will be a moderate adverse effect, which is significant, for users of Ashley Road as a result of an increase in journey length of up to 2.7km. The temporary closure of Lamb Lane will result in an increase in journey length of more than 1km for vehicle occupants. However, because vehicle flows are less than 100 vehicles/day, this change in journey length is not predicted to result in any significant effects with regard to changes to delays for vehicle occupants or traffic-related severance for non-motorised users. The temporary diversions or realignments may also affect non-motorised users, which is considered separately below.

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- 14.5.18 The operation of Manchester Airport High Speed station will lead to changes to traffic levels in the Hulseheath to Manchester Airport area due to passengers accessing the station, particularly by car or taxi.
- 14.5.19 The diversion of traffic associated with highway changes, including the new A538 Hale Road/Station Access gyratory combined with changes in traffic due to passengers and staff accessing Manchester Airport High Speed station will result in changes to congestion and delays at junctions. The junctions with changes in delay in 2038, which are significant, will be:
- M56 junction 6/A538 Wimslow Road/Runger Lane - minor adverse effect;
  - M56 Junction 6/A538 Wilmslow Road/A538 Hale Road - major adverse effect;
  - A538 Water Lane/A538 Alderley Road/B5086 Alderley Road - moderate adverse effect;
  - A34 MacLean Way/A34 Birrell Way/A538 Bollin Valley Link (A34 Bollin Valley Roundabout) - minor adverse effect;
  - A538 Altrincham Road/Mobberley Road - minor beneficial effect;
  - A538 Wilmslow Road/Mill Lane - major adverse effect;
  - A538 Hale Road/Shay Lane - moderate adverse effect;
  - A5144 Delahays Road/A538 Hale Road/B5162 Park Road - moderate adverse effect;
  - A538 Hale Road/Westminster Road - moderate adverse effect;
  - A56 Dunham Road/B5160 Park Road/B5160 Dunham Road/B5160 Charcoal Road - minor adverse effect;
  - A538 Hale Road/Ashfield Road/Victoria Road - moderate adverse effect;
  - A56 Dunham Road/Regent Road/Booth Road - moderate beneficial effect;
  - A56 Old Market Place/Kingsway - minor adverse effect;
  - A560 Shaftesbury Avenue/Aimson Road East - minor adverse effect;
  - A560 Shaftesbury Avenue/A560 Stockport Road/Moss Lane/Wood Lane - minor adverse effect;
  - A56 Manchester Road/B5165 Park Road/Woodcote Road - minor adverse effect.
  - B5086 Alderley Road/B5086 Knutsford Road/Alderley Road/Alderley Lodge/Bedells Lane (B5086 Fulshaw Cross Roundabout) - major adverse effect;
  - Chicago Avenue/Malaga Avenue - moderate adverse effect;
  - World Way/Chicago Avenue/Palma Avenue - minor adverse effect;
  - Tithebarn Road/High Elm Road/Chapel Lane - moderate beneficial effect;
  - Enterprise Way/World Way/Airport Spur - major adverse effect; and
  - Oldfield Road/Gorse Lane - minor adverse effect.
- 14.5.20 The junctions with changes in delay in 2046, which are significant, will be:
- B5086 Knutsford Road/B5085 Brook Lane/Russet Way/B5085 Knutsford Road - moderate adverse effect;

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- B5086 Alderley Road/B5086 Knutsford Road/Alderley Road/Alderley Lodge/Bedells Lane (B5086 Fulshaw Cross Roundabout) - major adverse effect;
- A538 Water Lane/A538 Alderley Road/B5086 Alderley Road - minor adverse effect;
- A538 Manchester Road/A538 Alderley Road/Station Road/Swan Street - minor beneficial effect;
- A34 MacLean Way/A34 Birrell Way/A538 Bollin Valley Link (A34 Bollin Valley Roundabout) - minor adverse effect;
- A538 Wilmslow Road/Mill Lane - major adverse effect;
- M56 junction 6/A538 Wilmslow Road/Runger Lane - major adverse effect;
- M56 Junction 6/A538 Wilmslow Road/A538 Hale Road - major adverse effect;
- A538 Hale Road/A538 Hale Road realignment – major adverse effect;
- A538 Hale Road realignment/station access west – major adverse effect;
- Chicago Avenue/Malaga Avenue - major beneficial effect;
- World Way/Chicago Avenue/Palma Avenue - major adverse effect;
- Tithebarn Road/High Elm Road/Chapel Lane - major adverse effect;
- A538 Hale Road/Elmridge Drive - major adverse effect;
- Enterprise Way/World Way/Airport Spur - moderate adverse effect;
- A538 Hale Road/Shay Lane - minor adverse effect;
- A5154 Delahays Road/Grove Lane - minor adverse effect;
- A538 Hale Road/Ashfield Road/Victoria Road - moderate adverse effect;
- A5144 Thorley Lane/Clay Lane/Wood Lane - moderate adverse effect;
- A56 Old Market Place/Kingsway - minor adverse effect;
- A560 Shaftesbury Avenue/A560 Stockport Road/Moss Lane/Wood Lane - minor adverse effect;
- A56 Manchester Road/B5164 Barrington Road - minor adverse effect; and
- A560 Shaftesbury Avenue/Aimson Road East - minor adverse effect.

14.5.21 A change in traffic levels can result in changes to traffic-related severance for non-motorised road users, particularly pedestrians using or seeking to cross a road. The permanent highway changes which are forecast to result in changes in peak hour traffic flow (more than 10% for all vehicles) and that will result in changes in traffic-related severance for non-motorised users, which are significant, are set out in Table 48. Where there is no significant effect on a road during a particular time period it is represented by a dash.



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**Table 48: Roads with changes in traffic flow resulting in significant effects on traffic-related severance for non-motorised users, 2038 and 2046**

Road name	2038 AM peak hour	2038 PM peak hour	2046 AM peak hour	2046 PM peak hour
Ashley Road (between Rostherne Lane and A5034 Mereside Road)	Major beneficial	Major beneficial	Major beneficial	Major beneficial
Ashley Road (between Birkinheath Lane and Rostherne Lane)	Moderate beneficial	Major beneficial	Moderate beneficial	Major beneficial
A538 Wilmslow Road (between Mill Lane and Altrincham Road)	Moderate adverse	-	Moderate adverse	-
Mobberley Road (between Back Lane and Breach House Lane)	Major adverse	Major adverse	Major adverse	Major adverse
B5166 Hollin Lane (between Altrincham Road and Station Road)	-	Moderate adverse	-	-
B5166 Hollin Lane (between Holly Lane and Altrincham Road)	-	Moderate adverse	-	-
A538 Wilmslow Road (between Sunbank Lane and Mill Lane)	Moderate adverse	-	Moderate adverse	-
Mill Lane/Castle Mill Lane/Tanyard Lane/Back Lane (between A538 Wilmslow Road and Mobberley Road)	Moderate beneficial	Moderate beneficial	Moderate beneficial	-
B5166 Hollin Lane (between Moss Lane and Holly Lane)	-	Moderate adverse	-	-
Chapel Lane/Sunbank Lane (between Greengate and A538 Wilmslow Road)	-	Moderate adverse	-	Moderate adverse
A538 Wilmslow Road (between Sunbank Lane and Runger Lane)	Moderate adverse	-	Moderate adverse	-
Runger Lane (between A538 Wilmslow Road and Avro Way)	Moderate adverse	Moderate adverse	Moderate beneficial	-
A538 Wilmslow Road (between Runger Lane and A538 Hale Road)	Major adverse	Major adverse	Moderate adverse	Major adverse
Terminal Road North (between Malaga Avenue and Outwood Lane)	-	-	-	Moderate adverse
Malaga Avenue (between Chicago Avenue and Terminal Road North)	-	-	-	Major adverse
Chicago Avenue (between World Way and Malaga Avenue)	Moderate adverse	Major adverse	Moderate adverse	Major adverse
Car park access (between Chicago Avenue and Area 2 car park)	Major adverse	Major adverse	Major adverse	Major adverse
Outwood Lane (between Terminal Road North and A555 Ringway Road West)	-	-	-	Moderate adverse
World Way (between Terminal 2 Roundabout and Chicago Avenue)	Major adverse	Major adverse	Moderate adverse	Major adverse
A538 Hale Road (between Elmridge Drive and High Elm Road)	Moderate beneficial	Moderate beneficial	-	Moderate beneficial
Runger Lane (between Avro Way and Thorley Lane)	Major adverse	Moderate adverse	Moderate adverse	Moderate adverse

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Road name	2038 AM peak hour	2038 PM peak hour	2046 AM peak hour	2046 PM peak hour
Elmridge Drive (between A538 Hale Road and High Elm Road)	Moderate beneficial	-	Moderate adverse	-
Chapel Lane (between Tithebarn Road and Wicker Lane)	Moderate adverse	-	Moderate beneficial	-
Tithebarn Road (between A538 Hale Road and Chapel Lane)	Major adverse	-	-	-
A538 Hale Road (between Tithebarn Road and Elmridge Drive)	Moderate beneficial	Moderate beneficial	-	Moderate beneficial
Hawley Lane (between Broad Lane and Wicker Lane)	Moderate adverse	-	Major beneficial	-
A538 Hale Road (between Wicker Lane and Tithebarn Road)	Moderate beneficial	-	-	-
Bankhall Lane (between Arthog Road and Broad Lane)	-	-	Major beneficial	-
Enterprise Way (between Thorley Lane and Terminal 2 Roundabout)	Major adverse	Major adverse	Major adverse	Major adverse
Palma Avenue (between Sydney Avenue and World Way)	Major adverse	Major adverse	-	Moderate adverse
Arthog Road (between Bankhall Lane and B5162 Park Road)	-	-	-	Moderate beneficial
Thorley Lane (between Sydney Avenue and Jet Parks 1)	Major adverse	Major adverse	Major adverse	Major adverse
A538 Hale Road (between Wicker Lane and Shay Lane)	Moderate beneficial	-	-	-
Thorley Lane (between Etrop Grange Hotel access and Bailey Lane)	Major adverse	Major adverse	Major adverse	Major adverse
Ashley Road (between Bankhall Lane and B6162 Park Road)	-	Moderate adverse	-	Moderate adverse
B5162 Park Road (between Arthog Road and B5357 Ashley Road)	-	-	Moderate adverse	-
Thorley Lane (between Runger Lane and Sydney Avenue)	Major adverse	Major adverse	Major adverse	Major adverse
Thorley Lane (between Shay Lane and Runger Lane)	Major adverse	Major adverse	Major adverse	Major adverse
B5357 Ashley Road (between Harrop Road and B5162 Park Road)	-	Moderate beneficial	-	Moderate beneficial
Shay Lane (between Thorley Lane and Ash Lane)	Moderate adverse	Minor adverse	Minor adverse	Minor adverse
B5162 Park Road (between Arthog Road and A538 Hale Road)	-	-	Moderate adverse	-
Ash Lane (between Shay Lane and Clay Lane)	-	-	Major adverse	-
B5161 Langham Road (between South Downs Road and B5163 Ashley Road)	-	Minor adverse	-	Minor adverse

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Road name	2038 AM peak hour	2038 PM peak hour	2046 AM peak hour	2046 PM peak hour
B5357 Ashley Road (between B5163 Victoria Road and Leigh Road)	-	Moderate beneficial	-	-
Church Brow (between Stamford Road and B5160 Park Road)	Minor adverse	-	-	-
B5163 Victoria Road (between B5163 Broomfield Lane and B5163 Ashley Road)	-	Moderate beneficial	Moderate beneficial	Moderate beneficial
Victoria Road (between A538 Hale Road and B5163 Broomfield Lane)	-	Moderate beneficial	Moderate beneficial	Moderate beneficial
Grove Lane (between Wellfield Lane and Ash Lane)	-	Moderate adverse	Major adverse	-
Grove Lane (between A5144 Delahays Road and Wellfield Lane)	Moderate adverse	Moderate adverse	Moderate adverse	-
Clay Lane (between Grove Lane and Whitecarr Lane)	-	Moderate adverse	Major adverse	-
Ashfield Road (between Stamford Park Road and A538 Hale Road)	-	-	-	Minor adverse
A538 Lloyd Street (between Stamford Park Road and A538 Ashley Road)	-	Moderate beneficial	-	-
A538 Manor Road (between Hamon Road and A538 Lloyd Street)	Moderate adverse	-	-	Moderate adverse
Green Lane (between Wood Lane and A5144 Thorley Lane)	-	-	Minor beneficial	Moderate adverse
A538 Manor Road (between Moss Lane and Hamon Road)	Moderate adverse	-	-	-
Wood Lane (between Green Lane and A5144 Thorley Lane)	-	-	-	Moderate adverse
B5165 Thorley Lane (between Granville Road and B5165 Stockport Road)	-	-	Moderate adverse	-
Atlantic Street (between Lyon Road and Baltic Road)	Minor adverse	-	-	-
Baltic Road (between Atlantic Street and George Richards Way)	-	-	-	Moderate adverse
Dairyhouse Lane (between Sinderland Road and George Richards Way)	-	-	-	Moderate adverse
Sinderland Road (between Craven Road and Barlow Road)	-	-	-	Moderate adverse

## Accidents and safety

- 14.5.22 There will be no significant effects on accidents and safety as there are no locations where there are both accident clusters and substantial changes in traffic due to the operation of the Proposed Scheme.

## **Parking and loading**

- 14.5.23 No significant effects on parking and loading have been identified during operation in the Hulseheath to Manchester Airport area.
- 14.5.24 Long-stay and short-stay car parking will be provided for Manchester Airport High Speed station.

## **Non-motorised users**

- 14.5.25 The layout of Manchester Airport High Speed station will provide good permeability and connectivity through the station and enhance connectivity across the Hulseheath to Manchester Airport area and will provide pedestrian connectivity between Manchester Airport High Speed station entrances and South Manchester. The Proposed Scheme includes the following changes for pedestrians:
- a new pedestrian and cycle route to the west of Manchester Airport High Speed station which will run parallel to Manchester Airport High Speed station access road (west) and will connect the realigned A538 Hale Road to the realigned Thorley Lane;
  - a new underpass at M56 junction 6/A538 Hale Road/Station Access gyratory, known as the M56/A538 Wilmslow Road Offline Non-Motorised-User Underpass; and
  - an extension of the M56 Hasty Lane underpass.
- 14.5.26 It is expected that the Proposed Scheme will generate additional pedestrian movements on existing non-motorised user routes around Manchester Airport High Speed station, particularly in the morning and evening peak hour. However, it is considered that these will not affect the level of crowding on these routes.
- 14.5.27 There will be permanent realignment, diversion or extension of 20 PRow and 11 roads in the Hulseheath to Manchester Airport area that will have an impact on journey lengths or introduce hindrances such as substantial changes in levels for non-motorised users. The Proposed Scheme will also result in a number of permanent highway changes that will affect pedestrians and cyclists.
- 14.5.28 There will be effects, which are significant, on non-motorised users of 13 of these PRow and three of these roads as a result of severance from changes in journey length and/or hindrances. These are:
- Footpath Millington 3/3 – minor adverse effect from increase in journey length of up to 405m;
  - Footpath Millington 3/1 – minor adverse effect from increase in journey length of up to 405m;
  - Footpath Millington 5/2 – minor adverse effect from increase in journey length of up to 325m;
  - Footpath Millington 8/1 – minor adverse effect from increase in journey length of up to 364m;

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- Footpath Rostherne 4/1 – moderate adverse effect from increase in journey length of up to 615m;
- Footpath Rostherne 5/1 – minor adverse effect from increase in journey length of up to 244m;
- Footpath Ashley 3/1 – moderate adverse effect from increase in journey length of up to 624m;
- Footpath Ashley 6/5 – moderate adverse effect from increase in journey length of up to 921m;
- Footpath Ashley 10/1 – minor adverse effect from increase in journey length of up to 114m;
- Footpath Ringway 12 – minor adverse effect from increase in journey length of up to 142m;
- Footpath Ringway 11 – minor adverse effect from increase in journey length of up to 303m;
- Footpath Ringway 7 – moderate adverse effect from increase in journey length of up to 640m;
- Footpath Hale 16 – moderate adverse effect from increase in journey length of up to 676m;
- Ashley Road – moderate adverse effect from increase in journey length of up to 1.9km;
- Lamb Lane – moderate adverse effect from increase in journey length of up to 1.5km; and
- Brickhill Lane – moderate adverse effect from increase in journey length of up to 849m.

## Other mitigation measures

- 14.5.29 No further appropriate traffic and transport mitigation measures have been identified. HS2 Ltd will, however, continue to work with the relevant highway authorities to identify whether further mitigation measures should be provided.

## Summary of likely residual significant effects

- 14.5.30 The residual significant effects during operation remain as described above. The highest magnitude effects are summarised below. For traffic-related effects, where there are adverse and beneficial effects in different time periods in the same year, only the adverse effects are reported in this summary.
- 14.5.31 The Proposed Scheme will generate significant major beneficial effects for rail passengers as a result of the introduction of HS2 services at Manchester Airport High Speed station, including improved journey times between Manchester Airport, the Midlands and the south of England and released capacity on the network easing pressure on other passenger rail services.

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- 14.5.32 Permanent diversions or realignments will result in changes in journey lengths for vehicle occupants, which will result in a moderate adverse effect, which is significant, on one road.
- 14.5.33 The operation of the Proposed Scheme will cause changes in traffic that will result in the following effects, which are significant, through changes to congestion and/or delays for road users in 2038:
- major adverse effects at four junctions;
  - moderate adverse effects at six junctions;
  - minor adverse effects at nine junctions;
  - moderate beneficial effects at two junctions; and
  - minor beneficial effect at one junction.
- 14.5.34 The residual significant effects of changes in congestion and/or delays for road users in 2046 will be:
- major adverse effects at nine junctions;
  - moderate adverse effects at four junctions;
  - minor adverse effects at eight junctions;
  - major beneficial effect at one junction; and
  - minor beneficial effect at one junction.
- 14.5.35 Changes in traffic during operation of the Proposed Scheme will result in the following effects, which are significant, on traffic-related severance for non-motorised users in 2038:
- major adverse effects on 13 roads;
  - moderate adverse effects on 17 roads;
  - minor adverse effects on three roads;
  - major beneficial effects on two roads; and
  - moderate beneficial effects on 11 roads.
- 14.5.36 The residual significant effects on traffic-related severance for non-motorised users in 2046 will be:
- major adverse effects on 14 roads;
  - moderate adverse effects on 20 roads;
  - minor adverse effects on three roads;
  - major beneficial effects on four roads;
  - moderate beneficial effects on nine roads; and
  - minor beneficial effects on one road.
- 14.5.37 Changes in bus journey times resulting in public transport delays during operation of the Proposed Scheme will result in moderate adverse effects, which are significant, on two bus corridors in 2038 and 2046.

- 14.5.38 Changes in journey lengths for non-motorised users during operation of the Proposed Scheme will result in the following effects, which are significant, in 2038 and 2046:
- moderate adverse effects on users of five PRow and three roads; and
  - minor adverse effects on users of eight PRow.

## **Cumulative effects**

- 14.5.39 The assessment includes cumulative effects of planned and committed development during operation, by taking into account background traffic growth in the future baseline.

## **Monitoring**

- 14.5.40 Volume 1, Section 9 sets out the general approach to environmental monitoring during operation of the Proposed Scheme.
- 14.5.41 A station travel plan will detail monitoring of travel associated with operation of Manchester Airport High Speed station.
- 14.5.42 There are no other area-specific monitoring requirements currently proposed for traffic and transport.

## 15 Water resources and flood risk

### 15.1 Introduction

- 15.1.1 This section provides a description of the current baseline for water resources and flood risk in the Hulseheath to Manchester Airport area. The likely impacts and significant effects identified arising from the construction and operation of the Proposed Scheme on surface water and groundwater bodies and their associated water resources are reported. The likely impacts and significant effects of the Proposed Scheme on flood risk and land drainage are also reported.
- 15.1.2 Engagement has been undertaken with:
- the Environment Agency;
  - Natural England;
  - Cheshire East Council (CEC), Trafford Metropolitan Borough Council (TMBC) and Manchester City Council (MCC), which are the Lead Local Flood Authorities (LLFA);
  - Canal & River Trust; and
  - United Utilities Group plc (the local water and sewerage undertaker).
- 15.1.3 The purpose of this engagement has been to obtain relevant baseline information and to discuss the Proposed Scheme and potential impacts and effects. The engagement has informed the assessments, including issues such as flood risk and associated mitigation at Timperley Brook, and the potential impact of the Proposed Scheme on Rostherne Mere Ramsar site, Site of Special Scientific Interest (SSSI) and National Nature Reserve (NNR).
- 15.1.4 Maps showing the location of the key environmental features (Map Series CT-10), and the key construction (Map Series CT-05) and key operational (Map Series CT-06) features of the Proposed Scheme can be found in the Volume 2: MA06 Map Book.
- 15.1.5 Map Series WR-01, WR-02, WR-03, WR-05 and WR-06, showing details of the water features referred to in this section, are contained in the Volume 5, Water resources and flood risk Map Book.
- 15.1.6 Detailed information on the water resources and flood risk issues specific to the Hulseheath to Manchester Airport area are contained in the Volume 5 appendices. These comprise:
- Appendix WR-003-0MA06, Water resources assessment;
  - Appendix WR-005-0MA06, Flood risk assessment;
  - Appendix WR-006-00001, Hydraulic modelling report – Millington Clough and tributaries; and
  - Appendix WR-006-00007, Hydraulic modelling report – Timperley Brook.



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- 15.1.7 Volume 5 also includes a detailed route-wide, stand-alone Water Framework Directive (WFD) compliance assessment (Appendix WR-001-00000) and a draft route-wide water resources and flood risk operation and maintenance plan (Appendix WR-007-00000).
- 15.1.8 In addition, the following documents are provided as Background Information and Data (BID)<sup>169</sup>:
- BID WR-004-0MA06 – Water resources baseline; and
  - BID WR-002-00001 – Water Framework Directive compliance assessment baseline data.
- 15.1.9 Volume 3, Route-wide effects, Water resources and flood risk (Section 16) covers the following at a route-wide level:
- the risk to water resources associated with accidents or spillages from trains during operation of the Proposed Scheme;
  - a summary of how the Proposed Scheme aims to demonstrate compliance with the statutory requirements of the WFD; and
  - route-wide flood risk issues related to route of the Proposed Scheme with the Sequential Test and Exception Test policies in the National Planning Policy Framework (NPPF)<sup>170</sup>.
- 15.1.10 The Proposed Scheme is described in Section 2.
- 15.1.11 All distances, lengths and area measurements in this section are approximate.

## 15.2 Scope, assumptions and limitations

- 15.2.1 The scope, assumptions and limitations for the water resources and flood risk assessment are set out in Volume 1, Section 8 and the EIA Scope and Methodology Report (SMR)<sup>171</sup>.
- 15.2.2 Unless indicated otherwise, the spatial scope of the assessment (the study area) is based upon the identification of surface water and groundwater features within 1km of the route of the Proposed Scheme, as described in Section 2 of this report. In the Hulseheath to Manchester Airport area, the study area has been extended to include the springs and watercourses that feed into Rostherne Mere Ramsar site, SSSI and NNR.
- 15.2.3 This assessment is based on desk study information, including information provided to date by consultees and stakeholders, as well as surveys of accessible water features.

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<sup>169</sup> High Speed Two Ltd (2022), High Speed Rail (Crewe – Manchester), *Background Information and Data*. Available online at: <https://www.gov.uk/government/collections/hs2-phase-2b-crewe-manchester-environmental-statement>.

<sup>170</sup> Department for Communities and Local Government (2019), *National Planning Policy Framework*. Available online at: [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/779764/NPPF\\_Feb\\_2019\\_web.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/779764/NPPF_Feb_2019_web.pdf).

<sup>171</sup> Volume 5: Appendix CT-001-00001, Environmental Impact Assessment Scope and Methodology Report.

- 15.2.4 A precautionary approach has been used in the assessment to identify impacts and effects where there is limited information. Where surveys have not been undertaken due to land access constraints, a precautionary approach has been adopted in the assessments of receptor value and impact magnitude. Where this precautionary approach indicates the requirement for mitigation, preliminary mitigation is described, which may include further data collection and/or assessment.
- 15.2.5 Hydraulic analysis has been undertaken of watercourses and key structures within flood risk areas. This includes modelling/analysis of flood risk impacts on Agden Brook, Blackburn's Brook, Birkin Brook, the River Bollin and Timperley Brook. Interpretation of the hydraulic modelling and details of the analysis carried out can be found in Volume 5: Appendix WR-005-0MA06, Flood risk assessment.
- 15.2.6 Groundwater levels have been inferred from the available Environment Agency groundwater level monitoring boreholes, historic borehole logs and topographic data, as well as from spring and watercourse locations.
- 15.2.7 The hydrological impacts on biological receptors such as aquatic fauna and flora are referred to in the Volume 5: Appendix WR-003-0MA06, Water resources assessment and the Volume 5: Appendix WR-001-00000, WFD compliance assessment. Where these impacts have the potential to result in significant effects these are described in Section 7, Ecology and biodiversity, together with any other mitigation required.
- 15.2.8 Impacts from existing land contamination which lead to significant effects on groundwater quality are presented in Section 10, Land quality.

## 15.3 Environmental baseline

### Existing baseline - Water resources

#### Surface water

- 15.3.1 All surface water bodies in the study area fall within the Mersey Upper management catchment of the North West river basin district (RBD).
- 15.3.2 The current river basin management plan<sup>172</sup> identifies the chemical and ecological status of surface water bodies, and the quantitative and chemical status of groundwater bodies within this RBD.

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<sup>172</sup> Environment Agency (2015), *Water for life and livelihoods Part 1: North West river basin district: River basin management plan*. Available online at: [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/718335/North\\_West\\_RBD\\_Part\\_1\\_river\\_basin\\_management\\_plan.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/718335/North_West_RBD_Part_1_river_basin_management_plan.pdf).

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- 15.3.3 The statutory objective of the WFD<sup>173</sup> is to achieve 'good status' for all designated water bodies. The purpose of the WFD compliance assessment<sup>174</sup> is to demonstrate that the Proposed Scheme does not result in a deterioration in current water body status, and that water bodies are not prevented from achieving status objectives.
- 15.3.4 Specialist field surveys have been undertaken, where access has been available. Receptor values have been adjusted to reflect the outputs from these surveys, in close consultation with the Environment Agency. In the absence of field surveys, surface water bodies, other than minor ditches or ponds, have been identified within this assessment as being of either moderate, high or very high value based on various criteria including watercourse flow and taking into account any habitat which the watercourse may support.
- 15.3.5 Summary information relating to the surface water bodies potentially affected by the Proposed Scheme within the study area is provided in Table 49. The receptor value attributed to each individual water body is based on the methodologies set out in the SMR. The feature locations are indicated by the grid coordinates on the relevant Volume 5, Water resources and flood risk Map Book: Map Series WR-01, at the point closest to the Proposed Scheme.

**Table 49: Surface water body receptors**

Water body name and location	Type (at point closest to the Proposed Scheme) <sup>175</sup>	Q95 value (m <sup>3</sup> /s) <sup>176</sup>	Receptor value	Parent WFD water body name and identification number <sup>177</sup>	Current WFD status/ Objective <sup>178</sup>	Crossed by the Proposed Scheme?
Millington Clough WR-01-308b - B6	Main river	0.004	High	River Bollin (Ashley Mill to Manchester Ship Canal) GB1120690613 82	Moderate/ moderate by 2015	Yes

<sup>173</sup> *The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (SI 2017 No. 407).*

<sup>174</sup> Volume 5: Appendix WR-001-00000, Water Framework Directive compliance assessment.

<sup>175</sup> The term 'minor ditch' has been used to denote a small trench or drain that has been constructed for the purpose of draining water from the land or roads and is isolated from the wider river network.

<sup>176</sup> This is the flow within the watercourse that is exceeded for 95% of the time. The Q95 has been provided as an indication of watercourse size but is only one of several criteria used to inform receptor value. Other criteria include the WFD watercourse classification which takes into account the value of any habitat which the watercourse supports. Details are provided in the Volume 5: Appendix CT-001-00001, Environmental Impact Assessment Scope and Methodology Report.

<sup>177</sup> The Environment Agency has attributed each surface water and groundwater body a unique water body identification (ID) number.

<sup>178</sup> Status and objectives are based on those set out in the 2015 river basin management plan (RBMP). The 2015 RBMP is the most up to date and will be updated in 2021.

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<b>Water body name and location</b>	<b>Type (at point closest to the Proposed Scheme)<sup>175</sup></b>	<b>Q95 value (m<sup>3</sup>/s)<sup>176</sup></b>	<b>Receptor value</b>	<b>Parent WFD water body name and identification number<sup>177</sup></b>	<b>Current WFD status/ Objective<sup>178</sup></b>	<b>Crossed by the Proposed Scheme?</b>
Agden Brook WR-01-308b - B5	Main river	0.01	Moderate	River Bollin (Ashley Mill to Manchester Ship Canal) GB1120690613 82	Moderate/ moderate by 2015	Yes
Tributary of River Bollin 10 WR-01-308b - D4	Ordinary watercourse	<0.002	Moderate	River Bollin (Ashley Mill to Manchester Ship Canal) GB1120690613 82	Moderate/ moderate by 2015	No
Tributary of River Bollin 11 WR-01-308b - D4	Main river	0.003	Moderate	River Bollin (Ashley Mill to Manchester Ship Canal) GB1120690613 82	Moderate/ moderate by 2015	No
Rostherne Mere WR-01-308b - D6	Static water body	N/A	High	Rostherne Mere GB1120690613 70	Bad/good by 2027	No
Rostherne Brook WR-01-308b - D8	Main river	0.01	Moderate	Birkin Brook - Mobberley Brook to River Bollin (including Rostherne Brook) GB1120690613 70	Bad/ moderate by 2027	No
Yarwood Heath Drain WR-01-308b - D4	Minor ditch	<0.002	Low	Birkin Brook - Mobberley Brook to River Bollin (including Rostherne Brook) GB1120690613 70	Bad/ moderate by 2027	No
Blackburn's Brook WR-01-308b - E6	Main river	0.02	Moderate	Birkin Brook - Mobberley Brook to River Bollin (including Rostherne Brook) GB1120690613 70	Bad/ moderate by 2027	Yes

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<b>Water body name and location</b>	<b>Type (at point closest to the Proposed Scheme)<sup>175</sup></b>	<b>Q95 value (m<sup>3</sup>/s)<sup>176</sup></b>	<b>Receptor value</b>	<b>Parent WFD water body name and identification number<sup>177</sup></b>	<b>Current WFD status/ Objective<sup>178</sup></b>	<b>Crossed by the Proposed Scheme?</b>
Tributary of Blackburn's Brook WR-01-308b - E6	Main River	<0.002	Moderate	Birkin Brook - Moberley Brook to River Bollin (including Rostherne Brook) GB1120690613 70	Bad/ moderate by 2027	No
Birkin Brook WR-01-308b - F6	Main river	0.1	High	Birkin Brook - Source to Moberley Brook GB1120690613 40	Poor/ moderate by 2027	Yes
Tributary of Birkin Brook 9 WR-01-308b - F5	Main river	<0.002	Low	Birkin Brook - Moberley Brook to River Bollin (including Rostherne Brook) GB1120690613 70	Bad/ moderate by 2027	No
Tributary of Birkin Brook 8 WR-01-308b - F6	Ordinary watercourse	<0.002	Low	Birkin Brook - Moberley Brook to River Bollin (including Rostherne Brook) GB1120690613 70	Bad/ moderate by 2027	No
Tributary of Birkin Brook 7 WR-01-308b - F6	Ordinary watercourse	<0.002	Low	Birkin Brook - Moberley Brook to River Bollin (including Rostherne Brook) GB1120690613 70	Bad/ moderate by 2027	No
Tributary of Birkin Brook 6 WR-01-308b - F6	Ordinary watercourse	<0.002	Low	Birkin Brook - Moberley Brook to River Bollin (including Rostherne Brook) GB1120690613 70	Bad/ moderate by 2027	No

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Water body name and location	Type (at point closest to the Proposed Scheme) <sup>175</sup>	Q95 value (m <sup>3</sup> /s) <sup>176</sup>	Receptor value	Parent WFD water body name and identification number <sup>177</sup>	Current WFD status/ Objective <sup>178</sup>	Crossed by the Proposed Scheme?
Tributary of Birkin Brook 5 WR-01-308b - F6	Ordinary watercourse	<0.002	Low	Birkin Brook - Mobberley Brook to River Bollin (including Rostherne Brook) GB1120690613 70	Bad/ moderate by 2027	No
Tributary of Birkin Brook 4 WR-01-308b - G6	Ordinary watercourse	<0.002	Low	Birkin Brook - Mobberley Brook to River Bollin (including Rostherne Brook) GB1120690613 70	Bad/ moderate by 2027	No
Tributary of Birkin Brook 1 WR-01-308b - G7	Main river	<0.002	Moderate	Birkin Brook - Mobberley Brook to River Bollin (including Rostherne Brook) GB1120690613 70	Bad/ moderate by 2027	Yes
Mobberley Brook WR-01-308b - G8	Main river	0.04	Moderate	Mobberley Brook GB1120690613 30	Moderate/ moderate by 2015	No
Tributary of Sugar Brook WR-01-308b - H9	Main river	<0.002	Moderate	Sugar Brook GB1120690613 50	Moderate/ good for 2027	No
Sugar Brook WR-01-308b - H9	Main river	0.01	Moderate	Sugar Brook GB1120690613 50	Moderate/ good for 2027	No
Tributary of Mobberley Brook WR-01-308b - H10	Main river	<0.002	Moderate	Mobberley Brook GB1120690613 30	Moderate/ moderate by 2015	No
Tributary of Birkin Brook 3 WR-01-308b - G8	Ordinary watercourse	<0.002	Low	Birkin Brook - Mobberley Brook to River Bollin (including Rostherne Brook) GB1120690613 70	Bad/ moderate by 2027	Yes

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<b>Water body name and location</b>	<b>Type (at point closest to the Proposed Scheme)<sup>175</sup></b>	<b>Q95 value (m<sup>3</sup>/s)<sup>176</sup></b>	<b>Receptor value</b>	<b>Parent WFD water body name and identification number<sup>177</sup></b>	<b>Current WFD status/ Objective<sup>178</sup></b>	<b>Crossed by the Proposed Scheme?</b>
Tributary of Birkin Brook 2 WR-01-308b - H6	Ordinary watercourse	<0.002	Low	Birkin Brook - Mobberley Brook to River Bollin (including Rostherne Brook) GB1120690613 70	Bad/ moderate by 2027	Yes
Brickhill Wood Drains WR-01-308b - I7	Minor ditch	<0.002	Low	Birkin Brook - Mobberley Brook to River Bollin (including Rostherne Brook) GB1120690613 70	Bad/ moderate by 2027	No
Tributary of River Bollin 7 WR-01-308b - H5	Ordinary watercourse	<0.002	Moderate	Bollin (River Dean to Ashley Mill) GB1120690613 81	Moderate/ moderate by 2015	Yes
Tributary of River Bollin 6 WR-01-308b - I5	Ordinary watercourse	<0.002	Moderate	Bollin (River Dean to Ashley Mill) GB1120690613 81	Moderate/ moderate by 2015	Yes
River Bollin WR-01-309a - B7	Main river	0.3	Very high	Bollin (River Dean to Ashley Mill) GB1120690613 81	Moderate/ moderate by 2015	Yes
Tributary of River Bollin 4 WR-01-309a -B6	Ordinary watercourse	<0.002	Moderate	Bollin (River Dean to Ashley Mill) GB1120690613 81	Moderate/ moderate by 2015	Yes
Tributary of River Bollin 8 WR-01-309a -B5	Ordinary watercourse	<0.002	Moderate	Bollin (River Dean to Ashley Mill) GB1120690613 81	Moderate/ moderate by 2015	Yes
Tributary of River Bollin 3 WR-01-309a - B7	Ordinary watercourse	<0.002	Moderate	Bollin (River Dean to Ashley Mill) GB1120690613 81	Moderate/ moderate by 2015	No

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<b>Water body name and location</b>	<b>Type (at point closest to the Proposed Scheme)<sup>175</sup></b>	<b>Q95 value (m<sup>3</sup>/s)<sup>176</sup></b>	<b>Receptor value</b>	<b>Parent WFD water body name and identification number<sup>177</sup></b>	<b>Current WFD status/ Objective<sup>178</sup></b>	<b>Crossed by the Proposed Scheme?</b>
Tributary of River Bollin 2 WR-01-309a - B7	Ordinary watercourse	<0.002	Moderate	Bollin (River Dean to Ashley Mill) GB112069061381	Moderate/moderate by 2015	No
Tributary of River Bollin 1 WR-01-309a - B7	Ordinary watercourse	<0.002	Moderate	Bollin (River Dean to Ashley Mill) GB112069061381	Moderate/moderate by 2015	No
Cotterill Clough Brook WR-01-309a - B8	Ordinary watercourse	0.003	Moderate	Bollin (River Dean to Ashley Mill) GB112069061381	Moderate/moderate by 2015	No
Tributary of River Bollin 5 WR-01-309a - B6	Ordinary watercourse	<0.002	Moderate	Bollin (River Dean to Ashley Mill) GB112069061381	Moderate/moderate by 2015	No
Drain to M56 1 WR-01-309a - B7	Minor ditch	<0.002	Low	Timperley Brook GB112069061260	Moderate/good by 2027	Yes
Drain to M56 2 WR-01-309a - B8	Minor ditch	<0.002	Low	Timperley Brook GB112069061260	Moderate/good by 2027	No
Tributary of River Bollin 9 WR-01-309a - C5	Ordinary watercourse	<0.002	Moderate	Bollin (River Dean to Ashley Mill) GB112069061381	Moderate/moderate by 2015	No
Tributary of Timperley Brook 1 WR-01-309a - D6	Ordinary watercourse	<0.002	Low	Timperley Brook GB112069061260	Moderate/good by 2027	Yes
Drain to M56 3 WR-01-309a - D6	Minor ditch	<0.002	Low	Bollin (River Dean to Ashley Mill) GB112069061381	Moderate/moderate by 2015	No



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Water body name and location	Type (at point closest to the Proposed Scheme) <sup>175</sup>	Q95 value (m <sup>3</sup> /s) <sup>176</sup>	Receptor value	Parent WFD water body name and identification number <sup>177</sup>	Current WFD status/ Objective <sup>178</sup>	Crossed by the Proposed Scheme?
Timperley Brook WR-01-309a - D5	Main river	0.003	Moderate	Timperley Brook GB112069061260	Moderate/ good by 2027	Yes
Tributary of Timperley Brook 2 WR-01-309a - D5	Ordinary watercourse	<0.002	Moderate	Timperley Brook GB112069061260	Moderate/ good by 2027	No
Tributary of Timperley Brook 3 WR-01-309a - D5	Ordinary watercourse	<0.002	Low	Timperley Brook GB112069061260	Moderate/ good by 2027	No

### Abstractions and permitted discharges (surface water)

15.3.6 Table 50 sets out the surface water abstractions and permitted discharges located within 1km of the route of the Proposed Scheme in the Hulseheath to Manchester Airport area.

**Table 50: Surface water abstraction and permitted discharges in the study area**

Feature	Details	Value
Licensed surface water abstractions	One abstraction from Birkin Brook, located at Estate Office, Rostherne for private water supply (use unknown), with a maximum annual abstraction quantity of 4,500m <sup>3</sup> . This abstraction is within the land required for construction of the Proposed Scheme.	High
Licensed surface water abstractions	One located at Ringway Golf Club for private irrigation water supply, with a maximum annual abstraction quantity of 5,000m <sup>3</sup> . Water stored from local surface water drainage.	Moderate
Registered private unlicensed surface water abstractions	None	None
Consented discharges to surface water	Twenty-one, of which one is within the land required for construction of the Proposed Scheme.	Low

15.3.7 Private unlicensed surface water abstractions comprise those for quantities of less than 20m<sup>3</sup> per day. There is no obligation to register private water supplies, but available records have been obtained from the local authorities. Unregistered private surface water supplies may be present. Private water supplies are assumed to be high value receptors unless details obtained from supply owners indicated otherwise.

15.3.8 The number of abstractions and permitted discharges listed in Section 10, Land quality may be different to that stated here, due to different definitions of spatial scope. This is because the water resources and flood risk study area comprises all land within 1km of the route of the Proposed Scheme, whereas the default land quality study area comprises all land within

250m from the boundary of the Proposed Scheme. The default study areas may be extended where the potential for pathways to more remote receptors exists.

## Groundwater

- 15.3.9 The location of abstractions, geological formations and indicative groundwater levels, where available, are shown in Volume 5, Water resources and flood risk Map Book: Map Series WR-02.
- 15.3.10 The geology of the study area, including distribution and formation description, is described in Section 10, Land quality. The aquifer classification, WFD status and receptor value of the superficial and bedrock hydrogeology is summarised in Table 51 (for superficial deposits) and Table 52 (for bedrock). Unless stated otherwise, the geological groups listed will all be crossed by the Proposed Scheme. The current overall status of, and objective for, the WFD groundwater body is as stated in the current river basin management plan. Where the Environment Agency has not assigned an individual water body ID to a unit, it has been assumed that it is connected to the overlying water body.

**Table 51: Summary of geology and hydrogeology in the study area – superficial deposits**

Geology	Aquifer classification	WFD body (ID) and current overall status	WFD status objective	Receptor value
Alluvium	Secondary A	Weaver and Dane Quaternary Sand and Gravel Aquifer (GB41202G991700) Poor	Good by 2027	Moderate
River terrace deposits Not crossed by the Proposed Scheme	Secondary A	Weaver and Dane Quaternary Sand and Gravel Aquifer (GB41202G991700) Poor	Good by 2027	Moderate
Shirdley Hill Sand Formation	Secondary A	Weaver and Dane Quaternary Sand and Gravel Aquifer (GB41202G991700) Poor	Good by 2027	Moderate
Glaciofluvial deposits	Secondary A	Weaver and Dane Quaternary Sand and Gravel Aquifer (GB41202G991700) Poor	Good by 2027	Moderate
Glaciofluvial sheet deposits	Secondary A	Weaver and Dane Quaternary Sand and Gravel Aquifer (GB41202G991700) Poor	Good by 2027	Moderate
Glacial till	Secondary (Undifferentiated)	Weaver and Dane Quaternary Sand and Gravel Aquifer (GB41202G991700) Poor	Good by 2027	Moderate

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**Table 52: Summary of geology and hydrogeology in the study area - bedrock**

<b>Geology</b>	<b>Aquifer classification</b>	<b>WFD body (ID) and current overall status</b>	<b>WFD status objective</b>	<b>Receptor value</b>
Mercia Mudstone Group – Sidmouth Mudstone Formation – Northwich Halite Member Not crossed by the Proposed Scheme	Unproductive	Not assessed by the Environment Agency	Not assessed by the Environment Agency	Low
Mercia Mudstone Group – Sidmouth Mudstone Formation – Bollin Mudstone Member	Secondary B	Not assessed by the Environment Agency	Not assessed by the Environment Agency	Moderate
Mercia Mudstone Group – Tarporley Siltstone Formation	Secondary B	Not assessed by the Environment Agency	Not assessed by the Environment Agency	Moderate
Sherwood Sandstone Group – Helsby Sandstone Formation	Principal	Lower Mersey Basin and North Merseyside Permo-Triassic Sandstone aquifers (GB41201G101700) Poor	Good by 2027	High

### Superficial deposit aquifers

15.3.11 The basis of the receptor values attributed to the superficial deposit aquifers present within the study area, as shown in Table 51, is outlined briefly as follows:

- alluvium, river terrace deposits, Shirdley Hill Sand Formation, glaciofluvial deposits and glaciofluvial sheet deposits are classified as Secondary A aquifers. These aquifers may be capable of supporting water supplies at a local rather than regional scale and may also form an important source of baseflow to surface watercourses. They have, therefore, been assessed as moderate value receptors; and
- glacial till is classified as a Secondary (Undifferentiated) aquifer and may supply baseflow to watercourses or store and yield limited amounts of groundwater. It has, therefore, been assessed as a moderate value receptor.

### Bedrock aquifers

15.3.12 The basis of the receptor values attributed to the bedrock aquifers present within the study area, as shown in Table 52, is outlined briefly as follows:

- the Sherwood Sandstone Group (locally comprising sandstone of the Helsby Sandstone Formation) has been classified as a Principal aquifer by the Environment Agency. This aquifer can provide an important component of baseflow to rivers. It has, therefore, been assessed as a high value receptor;

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- the Bollin Mudstone Member of the Sidmouth Mudstone Formation and the Tarporley Siltstone Formation both form part of the Mercia Mudstone Group which has been classified as a Secondary B aquifer by the Environment Agency. These bedrock units have traditionally been regarded as predominantly impermeable or, at best, as poor aquifers. Limited quantities of groundwater suitable for domestic or agricultural use are, however, occasionally obtainable within these bedrock units. They have, therefore, been assessed as moderate value receptors; and
- the Northwich Halite Member of the Sidmouth Mudstone Formation within the Mercia Mudstone Group is considered to be unproductive. It has, therefore, been assessed as a low value receptor.

### WFD status of groundwater bodies

- 15.3.13 A summary of locations, current overall WFD status, and future overall status objectives associated with the designated bedrock and superficial groundwater bodies within the study area is provided in Table 51 and Table 52. The value attributed to each of these receptors is also indicated.
- 15.3.14 Some of the bedrock aquifers in the study area are not formally designated as WFD groundwater bodies but may be hydraulically connected to the overlying WFD superficial or adjacent WFD bedrock groundwater bodies.

### Abstraction and permitted discharges (groundwater)

- 15.3.15 Table 53 sets out the groundwater abstraction and permitted discharges located within 1km of the route of the Proposed Scheme in the Hulseheath to Manchester Airport area.

**Table 53: Groundwater abstraction and permitted discharges in Water resources and flood risk study area**

Feature	Details	Value
Source Protection Zones (SPZ) associated with licensed public water supplies	None	None
Private licensed groundwater abstractions	None	None
Registered unlicensed private groundwater abstractions	One at Lower House Farm for non-domestic purposes.	Moderate
Registered unlicensed private groundwater abstractions	One at Birtles Farm, unknown purpose (assumed for potable supply).	High
Registered unlicensed private groundwater abstractions	Two abstractions within the land required for construction of the Proposed Scheme, unknown purpose (assumed for potable supply).	High
Consented discharges to groundwater	None	None

## **Groundwater – surface water interactions**

- 15.3.16 A desk-based assessment using Ordnance Survey maps and detailed river network data provided by the Environment Agency identified 49 features within the study area that had the potential to be springs or sinks. Access was possible to inspect 30 of these features. The value of these features has been determined based on consideration of the feature's importance as a water resource as well as any ecological, heritage, cultural or community asset importance. Further details on these features can be found in BID WR-004-0MA06<sup>169</sup>. Of the 30 features inspected:
- one feature was confirmed to be a spring supporting a tributary feeding into a high value watercourse. It has, therefore, been assessed as a high value receptor;
  - one feature was confirmed to be a spring supporting high value wetland habitat (Sunbank Wood and Ponds Site of Biological Importance (SBI) and ancient woodland). It has, therefore, been assessed as a high value receptor;
  - surveys were unable to locate a feature at one potential spring location shown on OS mapping and potentially feeding into Rostherne Mere Ramsar site, SSSI and NNR. Since this potential feature could support Rostherne Mere it has been assessed as a high value receptor on a precautionary basis;
  - three features were confirmed to be seasonal springs, which do not support any wetland habitat, discharging into the River Bollin, a very high value watercourse. They have, therefore, been assessed as moderate value receptors;
  - one feature was confirmed to be a spring supporting an undesignated water dependent habitat. It has, therefore, been assessed as a moderate value receptor;
  - two features were confirmed to be springs supporting a moderate value watercourse. They have, therefore, been assessed as moderate value receptors;
  - two features were confirmed to be springs supporting low value watercourses. They have, therefore, been assessed as low value receptors;
  - surveys were unable to identify any evidence of groundwater at three potential features shown as 'collects' on OS mapping, and no water dependent habitat was observed. Features described as 'collects' are located where groundwater emerges at the surface across a small area (rather than at a single point). These potential features have, therefore, been assessed as low value receptors;
  - eleven potential features were verified as land drainage and are included in the surface water assessment;
  - two features were identified to be a constructed ditch or drain connected to the local drainage network and not groundwater features; and
  - three features were identified to be culverts, and not groundwater features.
- 15.3.17 The remaining 19 potential spring or sink features are assumed to be high value receptors on a precautionary basis, pending site inspection. Two of these features are located within the land required for construction of the Proposed Scheme. Another feature (potential spring east of the B5569 Chester Road) is located outside of the land required for

construction of the Proposed Scheme but is potentially a spring which feeds into Rostherne Mere Ramsar site, SSSI and NNR.

- 15.3.18 There are 52 ponds within the land required for the construction of the Proposed Scheme. Where there is the potential for the Proposed Scheme to have significant effects on these features the assessment, and any mitigation required, is presented in Section 7, Ecology and biodiversity.

## **Water dependent habitats**

- 15.3.19 The following nature conservation sites within the study area are potentially groundwater dependent:
- Rostherne Mere Ramsar site, SSSI and NNR is located immediately adjacent to land required for the construction of the Proposed Scheme, towards the western end of the Hulseheath to Manchester Airport area. Harpers Bank Wood and Wood Bongs ancient woodland are also located within the Ramsar site, SSSI and NNR and are 280m west and 600m south-west of land required for the construction of the Proposed Scheme respectively. The main inflow to Rostherne Mere is from Rostherne Brook, which is supported by spring discharges in the upstream catchment. Inflows also occur from seepages and springs in hillsides around the mere (including in Harpers Bank Wood and Wood Bongs) and, occasionally, reversal of flow in the outflow channel (Blackburn's Brook) in wet weather. This habitat has, therefore, been assessed as groundwater and surface water dependent; and
  - Cotteril Clough SSSI, ancient woodland and SBI is located 140m east of the land required for the construction of the Proposed Scheme towards the eastern end of the Hulseheath to Manchester Airport area. Cotteril Clough Brook flows through the SSSI habitat and is fed by springs potentially originating from the glacial till. The stream habitat forms part of the SSSI site designation.
- 15.3.20 The following non-statutory designated nature conservation sites are potentially hydrologically impacted by the Proposed Scheme:
- Hancock's Bank South local wildlife site (LWS), SBI and ancient woodland (including Birkin House ancient woodland) is partially within land required for the construction of the Proposed Scheme. The citation for this site includes habitats associated with wet hollows, and a margin of marshy grassland along the brook. These hollows and marshy margins to the brook may be supported by groundwater from the underlying alluvium, glaciofluvial deposits and glacial till as well as surface water. Therefore, this site has been included on a precautionary basis;
  - Mill Wood, Castle Mill LWS is located partly within land required for the construction of the Proposed Scheme. The site may be supported by groundwater from the alluvium and glacial till which underlie the site. It is currently unclear whether this habitat is dependent on rainfall or groundwater and it has therefore been included on a precautionary basis;
  - Yarwood Heath Covert LWS is located partially within land required for the construction of the Proposed Scheme. The citation for this site includes habitat in a series of

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interconnected pools. Although it is currently unclear whether these pools are supported by groundwater from the underlying glaciofluvial deposits, the site has therefore been included on a precautionary basis;

- Ryecroft Covert SBI, LWS and ancient woodland is located partially within land required for construction of the Proposed Scheme for a 1.9km diversion of a National Grid transmission 400kV overhead power line. It is currently unclear whether this habitat is dependent on rainfall or groundwater and it has therefore been included on a precautionary basis;
- Ecclesfield Wood LWS and SBI is partially located within land required for the construction of the Proposed Scheme. The citation for this site includes some wet woodland species associated with ponds and low-lying damp areas. These may be supported by groundwater from the underlying glacial till. It is currently unclear whether the habitat is dependent on rainfall or groundwater and it has therefore been included on a precautionary basis;
- Wood Near Chapel Lane SBI is located adjacent to the land required for the construction of the Proposed Scheme. The habitat consists of woodland located alongside a tributary of the River Bollin flowing through the site. While surveys suggest the site is more likely to be dependent on land drainage, it is unclear if this drainage is largely sourced from groundwater. The site has, therefore, been included on a precautionary basis;
- Sunbank Wood and Ponds SBI and ancient woodland (including Bollin Bank ancient woodland) will be crossed by the Proposed Scheme. The habitat consists of several ponds and two watercourses, including Tributary of River Bollin 1 and Tributary of River Bollin 2. The streams are supported by springs discharging from the glacial till. Wetter areas of the site support wet woodland and ground flora and these may also be supported by groundwater from the underlying glacial till. As a result, this habitat is assessed to be at least partially groundwater and surface water dependent; and
- Davenport Green Wood SBI and ancient woodland will be crossed by the Proposed Scheme. Timperley Brook flows through this site and a small pond is also present. It is currently unclear whether the pond and the habitat around the watercourse could be supported by groundwater from the glacial till underlying the site or by surface water. The site has therefore been included as a groundwater and surface water dependent habitat on a precautionary basis.

15.3.21 No designated nature conservation sites within the study area that are dependent on surface water flows have the potential to be affected by the Proposed Scheme.

15.3.22 A detailed description of the ecology of these sites is provided in Volume 5 reports relating to Ecology and biodiversity.

## Existing baseline – flood risk and land drainage

- 15.3.23 The Environment Agency's Flood map for planning (rivers and sea)<sup>179</sup> has been used to scope the baseline flood risk for fluvial flooding from main rivers and ordinary watercourses. These plans define Flood Zone 2 (land assessed as having between a 1 in 100 (1%) and 1 in 1,000 (0.1%) annual probability of river flooding) and Flood Zone 3 (land assessed as having a 1 in 100 (1%) or greater annual probability of river flooding). The Risk of Flooding from Surface Water map<sup>180</sup> has been used to scope surface water flood risks and potential fluvial flood risk for the tributaries of Birkin Brook 1 to 4 where no Environment Agency Flood map for planning (rivers and sea) is available. All of these flood zones are shown in Volume 5, Water resources and flood risk Map Book: Map Series WR-01.
- 15.3.24 Infrastructure failure flood risks have been scoped using the Environment Agency Risks of flooding from reservoirs national dataset<sup>181</sup>. The British Geological Survey (BGS) Susceptibility to groundwater flooding dataset<sup>182</sup> has been used to assess the future risk of groundwater flooding.
- 15.3.25 The following reports were used to help determine the baseline flood risk within the study area:
- CEC Preliminary Flood Risk Assessment (PFRA) (2011)<sup>183</sup> and TMBC PFRA (2011)<sup>184</sup>;
  - CEC Strategic Flood Risk Assessment (SFRA) (2013)<sup>185</sup> and TMBC SFRA (2010)<sup>186</sup>; and
  - CEC Local Flood Risk Management Strategy (LFRMS) (2017)<sup>187</sup> and TMBC LFRMS (2014)<sup>188</sup>.

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<sup>179</sup> Environment Agency (2021), *Flood map for planning*. Available online at: <https://flood-map-for-planning.service.gov.uk>.

<sup>180</sup> Environment Agency (2021), *Long term flood risk information*. Available online at: <https://flood-warning-information.service.gov.uk/long-term-flood-risk/>.

<sup>181</sup> Environment Agency (2021), *Long term flood risk information*. Available online at: <https://flood-warning-information.service.gov.uk/long-term-flood-risk/>.

<sup>182</sup> British Geological Survey (2021), *Susceptibility to groundwater flooding dataset*. Available online at: <http://www.bgs.ac.uk/products/hydrogeology/groundwaterFlooding.html>.

<sup>183</sup> Jacobs (2011), *Cheshire East Council Preliminary Flood Risk Assessment*. Available online at: <https://www.cheshireeast.gov.uk/planning/spatial-planning/research-and-evidence/preliminary-flood-risk.aspx>.

<sup>184</sup> JBA Consulting (2011), *Trafford Council Preliminary Flood Risk Assessment*. Available online at: <https://webarchive.nationalarchives.gov.uk/20140328094439/http://www.environment-agency.gov.uk/research/planning/135532.aspx>.

<sup>185</sup> JBA Consulting (2013), *Cheshire East Council Strategic Flood Risk Assessment*. Available online at: <https://www.cheshireeast.gov.uk/pdf/planning/spatial-planning/researchand-evidence/strategic-flood-assessment/cheshire-east-council-sfra-final-report-v4.0.pdf>.

<sup>186</sup> JBA Consulting (2011), *Manchester City, Salford City and Trafford Councils Level 2 Hybrid Strategic Flood Risk Assessment (SFRA)*. Available online at: <https://www.trafford.gov.uk/planning/strategic-planning/docs/manchester-salford-and-trafford-councils-level-2-hybrid-sfra-level-1-sfra-march-2011.pdf>.

<sup>187</sup> Cheshire East Council (2017), *Cheshire East Council Local Flood Risk Management Strategy*. Available online at: <https://moderngov.cheshireeast.gov.uk/ecminutes/documents/s59547/Local%20Flood%20Risk%20Management%20Strategy%20-%20app%202.pdf>.

<sup>188</sup> Trafford Council (2014), *Trafford Local Flood Risk Management Strategy (LFRMS)*. Available online at: <https://beta.trafford.gov.uk/planning/strategic-planning/docs/lfrms-trafford-final-2014.pdf>.



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15.3.26 Historical flood investigation reports undertaken by the Lead Local Flood Authority (LLFA), under Section 19 of the Flood and Water Management Act<sup>189</sup>, relevant to this area have been reviewed (see Appendix WR-005-0MA06 – Flood risk assessment for further details). None of these reports include details of any historical flooding within the study area.

## River flooding

15.3.27 The study area includes substantial areas of floodplain (Flood Zones 2 and 3) associated with Agden Brook, Blackburn’s Brook, Birkin Brook, the River Bollin and Timperley Brook. Other floodplains that will be crossed by the route of the Proposed Scheme include those associated with tributaries of Birkin Brook 1, 3 and 4. Table 54 shows all relevant watercourses within the study area with receptors that would potentially be affected by any changes in the level and extent of flooding. The value of these receptors, based on the definitions in Section 21 of the SMR, is also indicated. The location description and figure/coordinate is the location at which the source intersects the Proposed Scheme, as indicated by the grid coordinates on the relevant Volume 5, Water resources and flood risk Map Book: Map Series WR-01.

**Table 54: River flood risk sources and receptors**

Source	Location description and figure/coordinate	Receptor potentially affected	Receptor value/ sensitivity to flooding
Agden Brook	Millington Hall WR-05-319 - B5 and B6	Residential property at Millington Hall	High
Blackburn’s Brook and Birkin Brook	M56 east of junction 7 WR-01-308b - E5	M56	Very high
Blackburn’s Brook and Birkin Brook	South of M56 near Hancock’s Bank WR-01-308b - E5	Agricultural land	Moderate
Blackburn’s Brook and Birkin Brook	South of M56, Hancock’s Bank WR-01-308b - E5	Woodland	Low
River Bollin	East of Thorns Green WR-01-309a - B7	Agricultural land	Moderate
River Bollin	East of Thorns Green WR-01-309a - B7	Woodland	Low
River Bollin	Castle Mill Lane, east of Thorns Green WR-01-309a - B8	Residential property along Castle Mill Lane	High
River Bollin	Castle Mill Lane, east of Thorns Green WR-01-309a - B8	Castle Mill Lane	Moderate
Tributaries of Birkin Brook 1, 2 and 3	Mobberley Road, east of Arden House WR-01-308b - G6, G7, H7	Agricultural land	Moderate
Tributaries of Birkin Brook 1, 2 and 3	Mobberley Road, east of Arden House WR-01-308b - G7	Mobberley Road	Moderate

<sup>189</sup> *Flood and Water Management Act 2010*. Her Majesty’s Stationery Office, London. Available online at: <http://www.legislation.gov.uk/ukpga/2010/29/contents>.

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Source	Location description and figure/coordinate	Receptor potentially affected	Receptor value/ sensitivity to flooding
Timperley Brook	Manchester Airport WR-01-309a - D7	Manchester Airport	Very high
Timperley Brook	Runger Lane WR-01-309a - D7	Runger Lane	Moderate
Timperley Brook	Davenport Green Wood WR-01-309a - D6	Woodland	Low
Timperley Brook	Brook's Drive WR-01-309a - D6	Brook's Drive	Moderate
Timperley Brook	Brook's Drive WR-01-309a - D6	Residential properties on Brook's Drive	High

## Surface water flooding

15.3.28 There is one area that is susceptible to surface water flooding within the study area. The key source and receptor with potential to be affected by the Proposed Scheme is shown in Table 55. The value of this receptor, based on Section 21 of the SMR, is also indicated. The location description and figure/coordinate is the location at which the source intersects the Proposed Scheme, as indicated by the grid coordinates on the relevant Volume 5, Water resources and flood risk Map Book: Map Series WR-01.

**Table 55: Surface water flood risk sources and receptors**

Source	Location description and figure/coordinate	Receptor potentially affected	Receptor value
Surface water flow path south of Yarwood Heath Covert	Yarwood Heath Covert WR-01-308b - D5	Tom Lane	Moderate

## Artificial water bodies

- 15.3.29 Flooding from artificial water bodies may occur due to failure of an impounding structure, such as a dam or canal embankment. Artificial water bodies with potential implications for flood risk within the study area include:
- Tatton Mere and Melchett Mere (3.5km west of the route of the Proposed Scheme); and
  - Radnor Mere and Lamaload Reservoirs (2km west of the route of the Proposed Scheme).
- 15.3.30 Tatton Park Mere, Melchett Mere, Radnor Mere and Lamaload Reservoirs are shown on the Environment Agency's Flood risk from reservoirs mapping dataset<sup>180</sup>. These large meres and reservoirs are subject to the requirements of the Reservoirs Act 1975<sup>190</sup>, and as such are inspected annually. This increases the likelihood that any degradation in the operational performance of a reservoir will be identified and addressed before there is an increased risk

<sup>190</sup> Department for Communities and Local Government (2014), *Reservoirs: owner and operator requirements*. Available online at: <https://www.gov.uk/guidance/reservoirs-owner-and-operator-requirements>.

of failure. Whilst the consequences of failure are potentially very high, this inspection and maintenance regime means that the overall risk of flooding from this source is considered low and very unlikely to change as a result of the Proposed Scheme.

## Groundwater flooding

- 15.3.31 Information related to historical incidents of groundwater flooding Hulseheath to Manchester Airport area is provided within the SFRA<sup>185,186</sup> and LFRMS<sup>187,188</sup>. The SFRA and LFRMS state that there is no history of groundwater flooding within the area.
- 15.3.32 The BGS susceptibility to groundwater flooding dataset indicates that there is some potential for groundwater flooding to occur in the Birkin Brook and River Bollin floodplains, near Millington, Ashley and in the area close to Hale Barns where the land required for the construction of the Proposed Scheme is underlain by susceptible superficial deposits (glacial till).

## Land drainage

- 15.3.33 Existing topography, soils and land drainage systems within the study area are described in Section 4, Agriculture, forestry and soils. The rivers and watercourses within the area are connected to an extensive network of existing open drains. Subsurface drainage systems are also likely to be present in fields used for agriculture. The land drainage function of these systems, which is important for crop productivity, is potentially sensitive to increases in water levels within the receiving watercourses.

## Future baseline

### Construction (2025)

- 15.3.34 Volume 5: Appendix CT-004-00000 provides details of the developments in the Hulseheath to Manchester Airport area that are assumed to have been implemented by 2025. The committed developments, local authority planning policy or development policies relevant to water resources and flood risk during construction in this area are set out in Table 56.

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**Table 56: Committed developments of relevance to water resources and flood risk during construction**

Map book reference <sup>191</sup>	Planning reference	Description	How this is considered in the assessment
MA07/026	Manchester Core Strategy (2012)	Location: Wythenshawe Allocation applies to Wythenshawe (key locations include Manchester Airport; University Hospital South Manchester; and Existing employment sites along West/East Wythenshawe Development Corridors). Allocation for the proposed delivery of 55ha of employment land within B1a offices, B1b/c research and development and light industry and B8 logistics and distribution.	Informing future baseline for water resources
MA07/027	Manchester Core Strategy (2012)	Location: Wythenshawe Allocation for the proposed delivery of approximately 1830 residential units. High density development will be encouraged within the district centres of Northenden, Baguley and Wythenshawe.	Informing future baseline for water resources

15.3.35 Implementation of the committed developments MA07/026 and MA07/027 will result in the introduction of water resources receptors within the water resources and flood risk study area. As such, these committed developments have been included as part of the future baseline and considered within this assessment.

## Operation (2038)

15.3.36 Volume 5: Appendix CT-004-00000 also provides details of the developments in the Hulseheath to Manchester Airport area that are assumed to have been implemented by 2038. No additional committed developments have been identified in this study area that will materially alter the baseline conditions in 2038 for water resources and flood risk.

## Climate change

15.3.37 Detailed analysis of the potential impacts of climate change on the Proposed Scheme has been undertaken and is reported in Volume 3, Route-wide effects (Section 4). In general, the design of the Proposed Scheme has adopted a precautionary approach to potential future increase in peak river flows and rainfall intensities.

15.3.38 Although no definitive guidance is available, climate change may also affect future surface water and groundwater resources. However, any such changes are unlikely to alter the significance of the effects identified in this assessment.

<sup>191</sup> Volume 5: Planning Data/Committed Development Map Book: Maps CT13-319 to CT-13-322a.

## 15.4 Effects arising during construction

### Avoidance and mitigation measures

15.4.1 The principal strategy adopted to limit the temporary and permanent effects of the Proposed Scheme is through avoidance of sensitive receptors wherever reasonably practicable. Where receptors could not be avoided, mitigation measures have been incorporated where appropriate and reasonably practicable, to limit the potential effects. Section 16 of the draft Code of Construction Practice (CoCP)<sup>192</sup> includes a range of mitigation measures that reduce construction impacts as far as is reasonably practicable. The avoidance and mitigation measures that are of particular relevance to water resources and flood risk during construction are described in the following sections of this report.

#### Water resources

15.4.2 The avoidance of sensitive receptors has reduced the risks associated with the Proposed Scheme not complying with the requirements of the WFD. Examples of this strategy include:

- avoidance of channels and floodplain areas, where reasonably practicable – the route of the Proposed Scheme will avoid passing along river or stream valleys, such as that of Agden Brook, Blackburn's Brook, Birkin Brook and the River Bollin and their associated floodplains. Instead it will pass over these larger watercourses on viaducts spanning the floodplain, with piers set back from the channel;
- avoidance, where reasonably practicable, of water dependent habitats, including natural springs that can play a key role in the hydrology and hydrogeology of such ecosystems; and
- avoidance, where reasonably practicable, of major public water supplies and smaller licensed and unlicensed abstractions of surface water and groundwater.

15.4.3 The presence of any unregistered private water supplies, their function and the means of protecting or if necessary replacing them would be discussed with any landowners potentially affected by the Proposed Scheme.

15.4.4 The temporary works shown on Map Series CT-05 in the Volume 2: MA06 Map Book have been informed by a detailed consideration of the water resources constraints and have sought to avoid sensitive features wherever reasonably practicable.

15.4.5 Watercourse realignments are proposed at the following locations:

- Timperley Brook (two realignments: one 300m in length (including 80m of culvert and a 170m long inverted siphon) and one 330m open channel in length); and
- Tributary of Birkin Brook 2 (30m in length).

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<sup>192</sup> Volume 5: Appendix CT-002-00000, draft Code of Construction Practice.

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- 15.4.6 Realignment will be designed to have equivalent hydraulic capacity to the existing channel, as far as reasonably practicable. Where such watercourses are natural channels, appropriate design features will be incorporated to replicate and, where reasonably practicable, enhance their hydromorphological condition. The hydromorphological condition reflects the extent to which water flow, sediment composition and movement, continuity (in rivers) and the structure of physical habitats departs from that expected of a natural river or stream system. The design of these realignments will be developed in consultation with the Environment Agency and LLFA, with due consideration of WFD status objectives. The design of the Proposed Scheme will also ensure that existing drainage outfalls can be adapted to discharge into the new channel.
- 15.4.7 Watercourse diversions, which would result in changes in flow regime within discrete sections of channel, have been avoided wherever reasonably practicable. There are three diversions proposed within this study area at:
- Tributary of Birkin Brook 1 (910m in length including 45m of culvert);
  - Tributary of Birkin Brook 2 (20m in length); and
  - Tributary of Birkin Brook 3 (45m in length, existing channel is in culvert).
- 15.4.8 For watercourses that are not in their natural condition, the watercourse diversion design will, where reasonably practicable, incorporate measures to improve their hydromorphological condition. The design of these diversions will be developed in consultation with the Environment Agency and LLFA, with due consideration of WFD status objectives.
- 15.4.9 Infrastructure required within or in proximity to an existing channel (including bridge abutments, intermediate piers and outfalls) will be designed to reduce impacts on the natural hydromorphology of watercourse channels, insofar as reasonably practicable.
- 15.4.10 The draft CoCP includes requirements to protect water bodies and their associated water resources from the potential impacts of pollution from construction site runoff, including where appropriate:
- provision of maps showing sensitive areas and buffer zones where no pollutants are to be stored or used; and
  - preparation of method statements for silt management, site drainage at compounds and satellite compounds, for the storage and control of oils and chemicals and the prevention of accidental spillages, in consultation with the Environment Agency, and if appropriate, the LLFA and other relevant authorities as part of the approvals process. These method statements will cover, where applicable:
    - the avoidance of discharges of site runoff to ditches, watercourses, drains, sewers or soakaways without the prior approval of the appropriate authority;
    - measures to prevent silt-laden runoff and other pollutants entering the water environment; and

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- restrictions or controls on excavation within watercourses to limit effects on water quality, sedimentation, fisheries and aquatic ecology.
- 15.4.11 Method statements will be required for all watercourse crossings and channel realignments required for site haul routes. The method statements will describe how potential changes to flood risk, water quality and channel hydromorphology will be managed during the establishment, use and decommissioning of all site haul routes.
- 15.4.12 Permanent culverts proposed on the smaller watercourse crossings within the Hulseheath to Manchester Airport area include those on:
- Tributary of Birkin Brook 4 (Ashley Road offline west culvert 45m in length);
  - Tributary of Birkin Brook 1 (Ashley Road offline east culvert 25m in length);
  - Tributary of Birkin Brook 3 (Mobberley Road offline culvert 5m in length); and
  - Timperley Brook (part of Hasty Lane offline culvert (80m of culvert, as an extension to existing motorway culvert)).
- 15.4.13 The design of these culverts will be developed in general accordance with Construction Industry Research and Information Association (CIRIA) and Environment Agency guidance and in consultation with Environment Agency specialists. The design has sought to mitigate the impact on the hydromorphology of the affected watercourses, as follows:
- culvert lengths have been made as short as reasonably practicable;
  - invert levels will be set below the firm bed of the watercourse to allow a natural substrate to develop along the bed of the culvert; and
  - an inverted siphon of 170m in length is proposed on Timperley Brook, to minimise the amount of land required for the Proposed Scheme within Davenport Green Wood. The inverted siphon has the potential to result in a significant effect on the hydromorphology of the watercourse, however it has a smaller footprint on Timperley Brook and associated woodland than a culvert would, due to the topography of the local area. Proposed mitigation, agreed in principle during consultation with the Environment Agency, landowners and other design critical operations, is a new approximately 300 to 350m length of open channel (linked with the floodplain to create flood storage) approximately 500m downstream.
- 15.4.14 The wider issues associated with these culverts, and how as far as reasonably practicable their detailed design will ensure no deterioration in the status of any of the relevant water body's WFD quality elements, is considered within the Volume 5: Appendix WR-001-00000, WFD compliance assessment. Any mitigation required in response to significant ecological effects of these culverts is set out in Section 7, Ecology and biodiversity.
- 15.4.15 Existing groundwater abstraction boreholes or monitoring points will be protected from physical damage, insofar as reasonably practicable, including appropriate decommissioning of abandoned boreholes in order to remove potential pollution pathways. If boreholes are to be decommissioned and replaced with alternatives, the contractors will follow the latest industry standard. This principle will also be applicable to springs potentially affected by the

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Proposed Scheme, although additional measures may be required to mitigate temporary construction impacts. Wherever a spring is to be covered or displaced by design elements then where reasonably practicable, additional mitigation measures may be required to relocate the spring.

- 15.4.16 Measures will be introduced, as required, to mitigate the temporary and permanent effects on groundwater flows and water quality during excavation and construction of foundations and cuttings, as far as is reasonably practicable. The types of measure that could be adopted include:
- installation of cut-off structures (impermeable barriers preventing water flow) around excavations;
  - ensuring cut-off structures are driven to sufficient depths to meet an underlying strata or zone of lower permeability;
  - promoting groundwater recharge, such as discharging pumped water to recharge trenches around excavations to maintain baseline groundwater and surface water conditions. The proposed recharge trenches to the north and west of Rostherne Mere are an example of this type of measure; and
  - incorporating passive bypasses within the design, which could comprise a 'blanket' of permeable material, such as gravel, placed around temporary structures allowing groundwater to bypass the below-ground works, without a rise in groundwater levels on the upstream side.
- 15.4.17 The exact requirements will be refined and method of mitigation will be designed following ground investigation at foundations and cutting locations, where appropriate.
- 15.4.18 For major utilities, the following specific measures are considered in addition to the above points:
- trenchless crossing techniques will be used wherever reasonably practicable for main rivers/sensitive watercourses and key designations to minimise the impact on these features;
  - where temporary watercourse realignments or diversions are required, during the reinstatement the watercourse will be returned to its natural course and condition where reasonably practicable after work is complete, with due consideration to its WFD status objectives; and
  - at watercourse crossings hard bank reinforcement will be avoided where reasonably practicable.
- 15.4.19 No borrow pits are proposed in the Hulseheath to Manchester Airport area.

## **Flood risk and land drainage**

- 15.4.20 The design of the Proposed Scheme will, insofar as reasonably practicable, mitigate permanent impacts on flood risk and land drainage as follows:



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- the floodplain avoidance strategy will ensure that the impacts on flood flows within rivers and streams, and their floodplains, will be limited to those associated with the intermediate pier structures on Agden Brook viaduct, Blackburn's Brook North viaduct and River Bollin East viaduct, which are located in the Agden Brook, and Blackburn's Brook, Birkin Brook and River Bollin floodplains. The Proposed Scheme includes replacement floodplain storage areas to compensate for the loss of flood storage volume associated with the piers;
- the temporary works shown on Map Series CT-05 in the Volume 2: MA06 Map Book have been informed by a detailed consideration of the flood risk constraints and have sought to avoid flood zones wherever reasonably practicable;
- provision has been made to pass surface water runoff and land drainage flows beneath sections of raised embankment that will cross surface water flow paths where reasonably practicable. This will be achieved using perimeter drainage and culverts, with their inverts set below the likely level of any upstream field subsurface drainage systems;
- in locations where the route of the Proposed Scheme will cross watercourses, structures will be designed to accommodate flood flows up to and including the 1 in 100 (1%) annual probability flood with an allowance for climate change;
- runoff from the footprint of the infrastructure could occur more rapidly post-construction due to steeper slope angles and the permeability (or compacted nature) of the newly-created surfaces. The drainage systems will be designed to ensure that there will be no significant increases in flood risk, during storms up to and including the 1 in 100 (1%) annual probability design event, with an allowance for climate change;
- balancing ponds for new sections of highway and railway drainage have been sized on a precautionary basis, pending more detailed information about the permeability and runoff characteristics of existing and proposed ground surfaces;
- where the Proposed Scheme will pass in cutting, drainage measures will be provided to limit overland flow into the cutting. This overland flow along with seepage and runoff from the cutting will, where reasonably practicable, be drained to the catchment to which this water would naturally drain, avoiding transfer of water from one water body to another, which could increase flood risk or impact on land drainage systems;
- where the Proposed Scheme will pass in cutting, drainage measures will be provided, as far as reasonably practicable, to return groundwater drainage back into the ground via recharge trenches, such as those proposed to the north and west of Rostherne Mere; and
- measures will be introduced to reduce any potentially significant effects on groundwater flood risk as far as is reasonably practicable, including the incorporation of passive hydraulic bypasses at cuttings and other below ground structures. These could for example comprise a 'blanket' of permeable material such as gravel.

15.4.21 The nominated undertaker will, as far as reasonably practicable, ensure that flood risk is managed throughout the construction period and will consider flooding issues when planning sites and storing materials. If necessary, temporary provision will be made to

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reduce the potential for impacts on existing land drainage systems during construction. Some of the specific measures referred to in the draft CoCP, include:

- having regard to the requirement for construction activities to avoid any increases in flood risk to vulnerable receptors;
- preparation of flood risk assessments and method statements for temporary works, including main construction and satellite compound drainage, watercourse crossings and realignments and temporary realignments in consultation with the Environment Agency, and where applicable, the LLFA and other relevant regulators;
- location of storage, machinery, equipment and temporary buildings outside flood risk areas where reasonably practicable;
- construction of outfalls during periods of low flow to reduce the risk of scour and erosion; and
- design of temporary watercourse realignments with equivalent hydraulic capacity to the existing channels, ensuring that field subsurface drainage systems can be adapted to discharge into the new channel.

15.4.22 In accordance with Section 16 of the draft CoCP, monitoring will also be undertaken in consultation with the Environment Agency, and where applicable, the LLFA, to ensure that temporary structures are installed, maintained and removed in accordance with the relevant environmental approvals and that any impacts on existing land drainage systems are managed appropriately.

15.4.23 For major utilities, the following specific measures are considered in addition to the above points:

- trenchless crossing techniques will be used wherever practicable for main rivers/sensitive watercourses to minimise the impact of temporary watercourse diversions on flood risk; and
- at watercourse crossings hard bank reinforcement and piers in floodplains will be avoided where reasonably practicable.

## **Assessment of impacts and effects**

15.4.24 This section describes the significant effects following the implementation of the avoidance and mitigation measures. The majority of the potential temporary impacts on the water environment during construction will be avoided or mitigated by the working methods outlined in the draft CoCP. The mitigation included in the design has focused on reducing permanent impacts resulting from the presence of the Proposed Scheme to as low a level as is reasonably practicable.

## Temporary effects – Water resources

### Surface water

- 15.4.25 Potential temporary impacts on surface water quality, due to site runoff and increased pollution risk, are a key concern during construction and have the potential to affect abstractions and the water environment more generally. However, the practices outlined in the draft CoCP are considered adequate to mitigate any impacts, such that there are unlikely to be any significant effects.
- 15.4.26 Construction compounds may have substantial water demands that may require approval through the protective provisions in the Bill for abstractions to augment other supply options. The assessment will include location-specific engagement with the Environment Agency and other water undertakers on the availability of water at that location. The Environment Agency will be able to impose conditions on any abstractions approved so that no significant effects are likely to arise. In this case, in the Hulseheath to Manchester Airport area, the current Environment Agency Abstraction Licensing Strategy (ALS)<sup>193</sup> information suggests that there will not be restrictions on obtaining water supplies from surface water sources.
- 15.4.27 Where construction highway drainage is discharged to local watercourses, assessments for determining whether routine runoff and spillage risk are likely to have detrimental impacts on water quality are carried out using the Highways England Water Risk Assessment Tool (HEWRAT)<sup>194</sup>. No construction HEWRAT assessments were required in this area, as there are no construction highway discharges to watercourses in this area.

### Groundwater

#### Aquifers

- 15.4.28 The proposed cuttings, retaining walls, box structure, Manchester Airport High Speed station retained cutting and piled foundations for viaducts in the study area will intersect the alluvium, glaciofluvial deposits and glaciofluvial sheet deposits Secondary A aquifers, the glacial till Secondary (Undifferentiated) aquifer, the Sherwood Sandstone Group Principal aquifer and the Mercia Mudstone Group Secondary B aquifers. Whilst there are likely to be minor or moderate localised impacts, the implementation of the measures outlined in the

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<sup>193</sup> Environment Agency (2020), *Weaver and Dane abstraction licensing strategy*. Available online at: [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/938206/Weaver-and-Dane-abstraction-licensing-strategy.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/938206/Weaver-and-Dane-abstraction-licensing-strategy.pdf).

<sup>194</sup> Highways England (2019), *Design Manual for Roads and Bridges (DMRB), Sustainability and Environment Appraisal, LA 113 Road drainage and the water environment (formerly HD 45/09)*. Available online at: <http://www.standardsforhighways.co.uk/ha/standards/dmr/b/vol11/section3/LA%20113%20Road%20drainage%20and%20the%20water%20environment-web.pdf>.

draft CoCP is likely to mean that any impacts on the overall status of most of these aquifers will not be significant.

- 15.4.29 Where foundations, cuttings, retaining walls or box structures could affect local receptors, such as groundwater abstractions or springs, this is reported in the sections below.
- 15.4.30 The construction of the Proposed Scheme will require dewatering activities to take place, which will require approval under Protective Provisions in the Bill. The current assessment covers the dewatering activities associated with cuttings. As well as assessing the specific impacts of these activities on potential water receptors, an evaluation of water resource policy in this area, using the Environment Agency's ALS<sup>193</sup>, has been carried out. Owing to the nature of the aquifers in the Weaver and Dane catchment, there are no Groundwater Management Units (GWMU) managed as part of the ALS. Restrictions may apply to consents where groundwater availability is limited or to protect the environment (such as surface water flows and water dependent habitats) and are assessed on a case by case basis. This could lead to restrictions on obtaining approvals for these dewatering activities. Engagement with the Environment Agency will be undertaken in relation to each of the dewatering locations and the Environment Agency will be able to impose conditions on any abstractions approved so that no significant adverse effects are likely to arise.

### **Abstractions**

- 15.4.31 The 'Well at Arden House' is located within the land required for the construction of the Proposed Scheme and may be unusable during construction. At this time, it is not clear if this well is in use as an abstraction and it has been included on a precautionary basis, as a high value receptor. This is assessed to be a permanent major impact on this high value receptor leading to a major adverse effect which is significant.

### **Groundwater – surface water interactions**

- 15.4.32 The assessment has not identified any temporary significant effects on groundwater – surface water interactions.

### **Water dependent habitats**

- 15.4.33 Ryecroft Covert SBI, LWS and ancient woodland is partially located within land required for construction of the Proposed Scheme for a 1.9km diversion of a National Grid transmission 400kV overhead power line. The diversion includes installation of a new electricity tower adjacent to Ryecroft Covert which may impact water quality during installation. This is assessed as a minor temporary impact on a precautionary basis pending confirmation of groundwater dependency.

## Temporary effects – Flood risk and land drainage

- 15.4.34 Construction of the Proposed Scheme will require temporary working within areas at risk of flooding as set out below:
- Agden Brook viaduct within Agden Brook floodplain;
  - Blackburn’s Brook North viaduct within Blackburn’s Brook and Birkin Brook floodplains;
  - River Bollin East viaduct within River Bollin floodplain; and
  - Mobberley Road realignment within floodplains of Tributary of Birkin Brook 4, Tributary of Birkin Brook 3 and Tributary of Birkin Brook 1.
- 15.4.35 Construction will include the site haul route that will span the main channels of Agden Brook, Blackburn’s Brook, Birkin Brook, River Bollin, Tributary of Birkin Brook 4 and Tributary of Birkin Brook 2. Construction sequencing and temporary works will be designed to reduce potential flood risk to a level that is not significant. Method statements will be produced by the nominated undertaker and subject to approvals required under the protective provisions in the Bill for the EA and LLFA<sup>195</sup>.

## Permanent effects – Water resources

- 15.4.36 Permanent effects are those initially caused by activity to construct the Proposed Scheme, but which will also remain after the Proposed Scheme has been constructed and is present in the area.

### Surface water

- 15.4.37 The Timperley Brook inverted siphon will have potential to impact the hydromorphology of Timperley Brook, a moderate value receptor. The inverted siphon will be approximately 170m in length and will be constructed under Manchester Airport High Speed station. The inverted siphon will re-join the existing watercourse west of the station, leading to the loss of approximately 275m of open channel. In order to mitigate for the loss of the Timperley Brook open channel, downstream channel improvements have been included in the design. As part of the Proposed Scheme, a new approximately 350m long open channel, and associated replacement floodplain storage, will be created to replace an existing culverted section of Timperley Brook, running along Brooks Drive. Consultation has been carried out with the Environment Agency to confirm the acceptability of the siphon for flood risk and WFD compliance, and to agree the principle of suitable mitigation. Due to embedded mitigation, this assessment concludes no significant effect on the hydromorphology of Timperley Brook.

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<sup>195</sup> High Speed Two Ltd (2022), Phase 2b Western Leg Information Paper E15: *Water resources flood risk and authorisation of related works*. Available online at: <https://www.gov.uk/government/collections/hs2-phase-2b-crewe-manchester-environmental-statement>.

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- 15.4.38 Where highway drainage is discharged to local watercourses, assessments for determining whether routine runoff and spillage risk are likely to have detrimental impacts on water quality are carried out using the HEWRAT<sup>194</sup>. Assessments were undertaken for discharges to Timperley Brook and Tributary of Timperley Brook 1, relating to the:
- change of the A538 Hale Road and Hasty Lane to the A538 Hale Road/Station Access gyratory (eastbound traffic);
  - modifications to M56 junction 6 east and west slip roads;
  - Manchester Airport High Speed station access road (east);
  - Manchester Airport High Speed station access road (west); and
  - Runger Lane.
- 15.4.39 These assessments identify moderate impacts on water quality in Tributary of Timperley Brook 1 and on Timperley Brook prior to mitigation. For the low value Tributary of Timperley Brook 1 this results in a minor adverse effect, which is not significant. For the moderate value Timperley Brook this results in a moderate adverse effect, which is significant.

## **Groundwater**

### **Aquifers**

- 15.4.40 Implementation of the avoidance and mitigation measures, set out in the draft CoCP, will ensure that there are no permanent significant effects related to the impact of the proposed foundations, cuttings, retaining walls or box structures on water levels and quality in the aquifers intercepted by the Proposed Scheme. Where the impacts of the cuttings on the aquifers could affect additional local receptors that rely on the groundwater resource, for example springs and abstractions, the impacts on these have been assessed and are described below.
- 15.4.41 Tributary of Timperley Brook 1 has a low Q95 flow and may be dry under some conditions. During these dry conditions, highways drainage discharges to this watercourse have the potential to be discharging into the underlying glacial till aquifer. Therefore, the HEWRAT groundwater assessment has been undertaken for discharges relating to the modifications to the changes of the A538 Hale Road and Hasty Lane to A538 Hale Road/Station Access gyratory (eastbound traffic). The assessment reports a moderate impact on groundwater quality. For the moderate value aquifer this results in a moderate adverse effect, which is significant.

### **Abstractions**

- 15.4.42 The Well at Mobberley Road is located within the land required for the construction of the Proposed Scheme and may be removed as a result of the construction. At this time, it is not clear if this well is in use as an abstraction and it has been included on a precautionary basis, as a high value receptor. This is assessed to be a permanent major impact on this high value receptor leading to a major adverse effect which is significant.

## **Groundwater – surface water interactions**

- 15.4.43 The potential spring in Bucklow Hill is located more than 1km outside of the lateral extent of drawdown of Hoo Green North cutting (in the adjacent Pickmere to Agden and Hulseheath area (MA03)). However, as the Bucklow Hill area is downgradient of the cutting, it may intercept some of the groundwater flow to the potential spring. Although water features surveys were unable to locate a groundwater feature at this site, the potential spring may support flow in an unnamed tributary discharging to Rostherne Brook which, in turn, flows into Rostherne Mere Ramsar site, SSSI and NNR (see Water dependent habitats section below). Recharge trenches are provided in the design to return groundwater to the catchment. Until ground investigation can be undertaken in the catchment it cannot be confirmed that the artificial recharge will return groundwater to the flow path for this spring. Therefore, on a precautionary basis this is assessed as a potential minor impact on a high value receptor, leading to a moderate effect which is significant.
- 15.4.44 The Proposed Scheme is likely to impact the potential spring at Ecclesfield Wood, which is located 40m south of the route of the Proposed Scheme and 40m west of Back Lane Farm access diversion. Until the nature of this feature has been confirmed by a site survey, it has been assumed to be a high value receptor on a precautionary basis. The assessment, therefore, identifies the loss of this feature as resulting in a permanent moderate impact, leading to a moderate adverse effect, which is significant.
- 15.4.45 The seasonal spring at Pigleystair Bridge, River Bollin is located within the land required for the construction of the Proposed Scheme. The baseflow to this spring is likely to be altered, which is assessed as a major impact on this moderate value receptor. However, surface water drainage from the Proposed Scheme will be discharged at the spring location and will support flow to the River Bollin. Therefore, the assessment identifies this change in spring flow as a permanent minor impact leading to a minor adverse effect, which is not significant.
- 15.4.46 Some of the baseflow to the potential spring 222m west of Pigleystair Bridge, River Bollin may be intercepted by Thorns Green cutting. Until the nature of this feature has been confirmed by a site survey, it has been assumed to be a high value receptor. The assessment identifies this potential reduction in flow as a permanent moderate impact, leading to a moderate adverse effect, which is significant.
- 15.4.47 The spring at Keepers Cottage, Sunbank Lane (south) and potential spring at Keepers Cottage, Sunbank Lane (north) are located within the zone of influence of Manchester Airport High Speed station cutting and associated retaining walls. The assessment identifies that groundwater flow to the spring and potential spring may be impacted. However, the use of cutting retaining walls will reduce the zone of influence of the cutting in groundwater. Therefore, this is assessed as a permanent minor impact on these high value receptors, leading to a moderate adverse effect, which is significant.
- 15.4.48 The potential spring at the hotel on Hasty Lane is located beneath Manchester Airport High Speed Station cutting and will be lost during construction. The assessment identifies the impact of the Proposed Scheme on the possible spring, and on the reduction in baseflow to

the Tributary of Timperley Brook 1, as a major impact, leading to a major adverse effect, which is significant.

- 15.4.49 Timperley Brook will be crossed by Manchester Airport High Speed cutting and associated retaining wall north. Works that will provide for a viaduct to convey a future extension of Metrolink will also be located adjacent to, but not within, the watercourse. The assessment identifies the potential reduction in groundwater baseflow to the watercourse, intercepted by below-ground structures of the cutting and viaduct. Drainage from both highways and from Manchester Airport High Speed station will be discharged into Timperley Brook. This will help to support the flow in the watercourse, although the timing of flow may change. This could in turn lead to minor changes in the watercourse flow hydrograph. Following this embedded mitigation, the impact is assessed to be as a minor impact, leading to a minor adverse effect, which is not significant.

## **Water dependent habitats**

- 15.4.50 Details of the hydrological impacts to water dependent habitats are as follows:
- Rostherne Mere Ramsar site, SSSI and NNR:
    - a small part of the catchment for the Rostherne Mere Ramsar site, SSSI and NNR is located within the zone of influence of the Millington and Rostherne cuttings. A field visit in May 2018 indicated that about 0.3% of the total inflow to Rostherne Mere occurred as groundwater discharges in the catchment area within, or downgradient of, the zone of influence. Rostherne Mere may, therefore, receive a slightly reduced inflow as a result of the interception of these discharges by the cuttings. However, the groundwater discharges were seen to have ceased in dry summer conditions during further field surveys in July to September 2018. A minor impact is possible on groundwater discharges that contribute to Rostherne Mere with longer periods of no flow possible due to the cuttings;
    - the zone of influence from drainage in Hoo Green North cutting and Hoo Green North cutting retained wall (located in the Pickmere to Agden and Hulseheath area (MA03)) is, in part, located in an area of the Rostherne Mere catchment, as reported in Volume 2, Community Area report: Pickmere to Adgen and Hulseheath (MA03). The Rostherne Mere surface water catchment extends out to the west in the vicinity of the cutting, with the area of the catchment in the zone of influence comprising about 2% of the catchment upstream of Rostherne Mere. A minor impact is possible, due to the cutting, on groundwater discharging in springs that contribute to the inflows to Rostherne Mere; and
    - a water balance assessment has been carried out for Rostherne Mere. The assessment indicates that the reduction in groundwater inflows due to the Proposed Scheme results in a reduction in the mere water level of up to 5mm during low or extremely low water level conditions in late spring and summer. The potential reduction in water level at the Rostherne Mere Ramsar site, SSSI and NNR from the Millington and Rostherne cuttings and Hoo Green North cutting, is assessed as a minor hydrological impact. Recharge trenches along Cherry Tree Lane and east of the



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Hoo Green North cuttings have been included in the design to mitigate for any potential reduction in water level from Millington and Rostherne cuttings and Hoo Green North cutting and retaining wall. This mitigation will ensure there is no impact on the groundwater flow to Rostherne Mere from the cuttings. During design development, following further investigations, this mitigation will be refined and agreed with the Environment Agency and Natural England, to ensure no potential impact on groundwater flow to Rostherne Mere.

- Hancock's Bank South LWS, SBI and ancient woodland (including Birkin House ancient woodland) will be within the zone of influence of Rostherne cutting. The site may receive reduced groundwater flow as a result of interception by the cutting. There is also the potential for the piling in the superficial deposits and shallow bedrock associated with Rostherne East box structure and Blackburn's Brook North viaduct to affect the flow of groundwater to the site. The impact on groundwater flow is assessed as a minor impact on a precautionary basis pending confirmation of groundwater dependency of the site;
- Mill Wood – Castle Mill LWS is a surface water and groundwater dependent habitat which will be partially within the zone of influence of Thorns Green cutting. As a result, a part of the site may receive reduced baseflow due to the presence of the cutting. This is assessed as a minor impact on a precautionary basis;
- Yarwood Heath Covert LWS and SBI will be within the zone of influence of Millington and Rostherne cuttings. The site is separated from the Proposed Scheme by the M56 (which is in cutting in this location). The impact on groundwater flow is assessed as a minor impact on a precautionary basis pending confirmation of groundwater dependency of the site;
- Ecclesfield Wood LWS and SBI will be outside the zone of influence of Thorns Green cutting, although the catchment area upstream of the site may be located within the zone of influence. As a result, the site may receive reduced baseflow due to the presence of Thorns Green cutting. This is assessed as a minor impact on a precautionary basis pending confirmation of groundwater dependency of the site;
- Wood Near Chapel Lane SBI will be downgradient of the Proposed Scheme. Although outside of the zone of influence of Ringway cutting, the site may receive reduced groundwater flow as a result of changes in the catchment for the spring upgradient of the site. This is assessed as a minor impact on a precautionary basis pending confirmation of groundwater dependency of the site;
- Sunbank Wood and Ponds SBI and ancient woodland (including Bollin Bank ancient woodland) will be partly within the land required for the construction of the Proposed Scheme and will be within the zone of influence of Ringway cutting, M56 East tunnel and Manchester Airport High Speed Station cutting and associated retaining walls. Therefore, there may be a reduction in groundwater flow to the site as a result of interception by the cutting in the catchment upstream of the site. Piling from River Bollin East viaduct may also affect groundwater flow to the habitat. Therefore, the assessment identifies the potential reduction in flow as a minor impact; and

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- Davenport Green Wood SBI and ancient woodland will be crossed by the Proposed Scheme and within the zone of influence of Manchester Airport High Speed station cutting and associated retaining wall north, with the majority of the site downgradient of the Proposed Scheme. There is potential for the cutting to intercept groundwater flow to the site. This is assessed as a moderate impact on a precautionary basis pending confirmation of groundwater dependency of the site.

15.4.51 The potential for these hydrological impacts to result in local ecological effects is assessed in Volume 5: Appendix EC-015-0MA06 and, for any significant effects, mitigation is identified in Section 7, Ecology and biodiversity of this report.

## **Permanent effects – Flood risk and land drainage**

15.4.52 The Tributary of Birkin Brook 1 currently crosses the existing Mid-Cheshire railway line via a culvert south of Mobberley Road. As part of the Proposed Scheme this tributary will be diverted north into an existing culvert beneath the railway embankment. Hydraulic modelling indicates that, without additional mitigation, there is a potential for major adverse impacts on peak flood levels affecting moderate value agricultural land and the very high value Mid-Cheshire Line. This results in a major adverse effect, which is significant.

## **Summary of significant effects**

- 15.4.53 On a precautionary basis the Proposed Scheme is anticipated to result in the following significant effects which require other mitigation:
- permanent major adverse effect on the 'Well at Mobberley Road' as it is located within the land required for the construction of the Proposed Scheme and is likely to be removed during construction;
  - a temporary major adverse effect on the 'Well at Arden House' as it is located within the land required for the construction of the Proposed Scheme and will not be accessible during this period and could potentially need to be removed during construction;
  - a permanent moderate adverse effect due to a reduction in flow in the potential spring at Bucklow Hill;
  - a permanent moderate adverse effect due to loss of the potential spring at Ecclesfield Wood;
  - a permanent moderate adverse effect related to the reduction of groundwater baseflow to the potential spring 222m west of Pigleystair Bridge, River Bollin;
  - permanent moderate adverse effects related to the reduction of groundwater baseflow to the spring at Keepers Cottage, Sunbank Lane (south) and the potential spring at Keepers Cottage, Sunbank Lane (north);
  - a major adverse effect due to the loss of the potential spring at the hotel on Hasty Lane;
  - a permanent moderate adverse effect on water quality in Timperley Brook due to water quality changes from highways drainage;

- a permanent moderate adverse effect on groundwater quality in glacial till aquifer due to water quality changes from highways drainage (Tributary of Timperley Brook 1); and
- a permanent major adverse effect on flood risk to agricultural land and the Mid-Cheshire Line close to Mobberley Road due to the diversion of Tributary of Birkin Brook 1.

## Other mitigation measures

- 15.4.54 Additional mitigation measures have been developed to further reduce the temporary and permanent impacts of construction stage activities, where there is potential for the Proposed Scheme to result in significant effects.

### Surface water

- 15.4.55 The mitigation proposed in the design of the inverted siphon on Timperley Brook will be developed further in consultation with the Environment Agency. Monitoring will be undertaken to check whether mitigation has been successfully established.
- 15.4.56 Mitigation measures are required to address the impacts of changes to highways drainage on water quality in the Timperley Brook and Tributary of Timperley Brook 1, taking into account the background water quality in these watercourses. These mitigation measures include provision of additional rain gardens (small swales). Design of these mitigation measures will need to consider the confined nature of this area and the requirement to reduce surface water features to avoid attracting birds in the vicinity of Manchester Airport. During the passage of the Bill further investigations, such as monitoring and analysis of the bioavailability of metals and dilution, will be carried out, where reasonably practicable, to identify whether additional mitigation measures are required. If further mitigation is required these will be designed in consultation with the Environment Agency and other stakeholders. On a precautionary basis, until such time as these investigations are carried out, a residual significant effect will remain.

### Groundwater

- 15.4.57 Surveys are required of the two potential groundwater abstractions; Well at Arden House and Well at Mobberley Road, to determine their use, value and to identify whether further mitigation is required. If the site visits confirm that the abstractions are used then mitigation measures will be implemented, where reasonably practicable, to provide alternative sources of water in a manner that ensures any adverse impacts are mitigated. Any such additional measures will be designed in consultation with the landowner and the Environment Agency to ensure no significant adverse effect on water users.
- 15.4.58 Mitigation measures are required to address the impacts of changes to highways drainage on water quality in the glacial till aquifer (relating to Tributary of Timperley Brook 1). These mitigation measures may include provision of rain gardens (small swales) and are as set out in the surface water mitigation section above. There is considered to be sufficient flexibility in the highways and drainage design to provide this mitigation. During design development,

following further investigations, the mitigation measures will be designed in consultation with the Environment Agency and other stakeholders to ensure no significant adverse effects on water quality.

## **Groundwater – surface water interactions**

- 15.4.59 Mitigation, comprising recharge trenches to the east of Hoo Green north cuttings, is included in the design in order to compensate for potential losses in baseflow in the Rostherne Mere catchment. While the recharge trenches may also compensate for any impact on flows at the potential spring in Bucklow Hill, it is assumed on a precautionary basis that a permanent moderate adverse significant effect remains at the potential spring.
- 15.4.60 Additional mitigation measures may be required for the management of groundwater flows to the potential spring features at Ecclesfield Wood, 222m west of Pigleystair Bridge, River Bollin and at the hotel on Hasty Lane. If the site visits confirm the springs are present, are of moderate or high value and the value of any supported habitat established, mitigation measures will be implemented, where practicable, to re-establish the springs or spring flows in a manner that ensures any adverse impacts are mitigated. During design development, any such additional measures will be designed in consultation with the Environment Agency to ensure no significant adverse effect on spring flow.

## **Flood risk and land drainage**

- 15.4.61 Mitigation measures are required to reduce the flood risk at the Mobberley Road railway crossing from the diverted Tributary of Birkin Brook 1, as far as reasonably practicable. Measures may include:
- provision of replacement flood storage upstream of the Mid-Cheshire Line embankment;
  - design of the channel diversion cross section, slope and meanders to manage the increase in peak flow rates;
  - high flow channel and culvert beneath the Mid-Cheshire line and proposed Ashley Railhead along the channel alignment of the existing Tributary of Birkin Brook 1; and
  - increasing the size of the existing culvert under the railway.
- 15.4.62 These mitigation measures will be developed further in consultation with the Environment Agency and Network Rail during the passage of the Bill. Until such a time as these mitigation measures have been defined, a residual significant effect will remain.

## **Summary of likely residual significant effects**

- 15.4.63 Implementation of the other mitigation measures described above will reduce a number of the identified effects to a level that is not significant. However, on a precautionary basis, it is anticipated that significant residual effects will remain on:
- the water quality in Timperley Brook relating to highways discharges from the Manchester Airport area (permanent moderate adverse effect);

- the potential spring at Bucklow Hill (permanent moderate adverse effect);
- the spring at Keepers Cottage, Sunbank Lane (south) and potential spring at Keepers Cottage, Sunbank Lane (north) (permanent moderate adverse effects); and
- agricultural land and the Mid-Cheshire Line railway due to the diversion of Tributary of Birkin Brook 1 (permanent major adverse effect).

## Cumulative effects

- 15.4.64 No significant cumulative temporary or permanent effects during construction related to water resources or flood risk are anticipated.

## 15.5 Effects arising from operation

### Avoidance and mitigation measures

- 15.5.1 The principal issue of concern during operation of the Proposed Scheme is the potential for accidental spillages to occur that could result in the release of contaminants into the water environment. This issue has been assessed on a route-wide basis in Volume 3: Route-wide effects (Section 16), where the mitigation measures associated with this risk are described. A draft operation and maintenance plan for water resources and flood risk is provided in Volume 5: Appendix WR-007-00000.
- 15.5.2 The design takes into account the policies in the NPPF and will ensure that the Proposed Scheme is safe from flooding without increasing flood risk elsewhere, as outlined in the Flood risk assessment, Appendix WR-005-0MA06. Evidence of application of the Sequential Test and Exception Tests in the NPPF is provided on a route-wide basis in Volume 3: Route-wide effects.
- 15.5.3 Sustainable drainage systems will be used where reasonably practicable. These will help to remove any suspended material within runoff from the Proposed Scheme through filtration, vegetative adsorption or settlement. The drainage systems proposed will ensure that the quantity and quality of water draining from the Proposed Scheme during its operational phase will have a negligible impact on the water environment.
- 15.5.4 A route-wide WFD compliance assessment is provided in Volume 5: WR-001-00000. This describes how the Proposed Scheme complies with the requirements of the WFD.

### Assessment of impacts and effects

- 15.5.5 There are considered to be no significant adverse effects related to water resources and flood risk arising from operation of the Proposed Scheme.

## **Other mitigation measures**

- 15.5.6 There are considered to be no further measures required to mitigate adverse effects on surface water resources, groundwater resources or flood risk.

## **Summary of likely residual significant effects**

- 15.5.7 The assessment indicates that there will be no residual significant effects on surface water, groundwater or flood risk during operation of the Proposed Scheme.

## **Cumulative effects**

- 15.5.8 No significant cumulative effects during operation related to water resources or flood risk are anticipated.

## **Monitoring**

- 15.5.9 Volume 1, Section 9 sets out the general approach to monitoring of water resources and flood risk during operation of the Proposed Scheme.
- 15.5.10 There are no area-specific requirements for monitoring water resources and flood risk during operation of the Proposed Scheme.



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