

High Speed Rail (Crewe – Manchester)

Background information and data

Ecology and biodiversity

BID EC-002-00001

Ecological baseline data -

Phase 1 habitat survey

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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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1 Introduction

- 1.1.1 This report presents a summary of the baseline data following an extended Phase 1 habitat survey.
- 1.1.2 Baseline data have been collected for the Proposed Scheme in relation to the following community areas (CA):
- Hough to Walley's Green (MA01);
 - Wimboldsley to Lostock Gralam (MA02);
 - Pickmere to Agden and Hulseheath (MA03);
 - Broomedge to Glazebrook (MA04);
 - Rislely to Bamfurlong (MA05);
 - Hulseheath to Manchester Airport (MA06);
 - Davenport Green to Ardwick (MA07); and
 - Manchester Piccadilly Station (MA08).
- 1.1.3 This report should be read in conjunction with Map Series EC-02 in the Background Information and Data, Ecology Map Book.
- 1.1.4 The Environmental Statement¹ should be referred to for details of the ecology impact assessment.

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

2 Phase 1 habitat survey

2.1 Methodology

- 2.1.1 Details of the standard methodology utilised for the extended Phase 1 habitat survey are provided in Technical Note – Ecology and biodiversity – Ecological Field Survey Methods and Standards (FSMS) included in the Scope and Methodology Report (SMR) (see Environmental Statement, Volume 5, Appendix CT-001-00001)².
- 2.1.2 Where access has not been available for field survey, interpretation of remote sensing data and aerial photography has been used to provide an indication of the likely habitats present.
- 2.1.3 Relevant desk study information was obtained from the following sources:
- rECOrd³, Local Biological Records Centre for the Cheshire region;
 - Cheshire Wildlife Trust;
 - Merseyside Biobank, Local Biological Records Centre for the North Merseyside Region⁴;
 - GMLRC⁵, Greater Manchester Local Record Centre;
 - Natural England's National Inventory of Ancient Woodlands; and
 - Natural England's Priority Habitat Inventory (PHI) which identifies possible locations of habitats of principal importance (HoPI) in England identified in Section 41 of the Natural Environment and Rural Communities (NERC) Act (2006)⁶.
- 2.1.4 The baseline descriptions⁷ of different habitat types are presented in a south to north direction. Cross references are given where National Vegetation Classification⁸ (NVC) surveys have also been carried out, see Background Information and Data, BID EC-004-00001.

² High Speed Two Ltd (2022), High Speed Rail (Crewe – Manchester), *Environmental Statement, Environmental Impact Assessment Scope and Methodology Report*, Volume 5, Appendix CT-001-00001. Available online at: <https://www.gov.uk/government/collections/hs2-phase-2b-crewe-manchester-environmental-statement>.

³ rECOrd, *Local Biological Records Centre serving Cheshire*. Available online at: <http://www.record-lrc.co.uk/>.

⁴ Merseyside Biobank, *Local Biological Records Centre for the North Merseyside Region*. Available online at: <https://www.activenaturalist.org.uk/mbb/node/116>.

⁵ MANEC, Great Manchester Local Records Centre. Available online at: <https://www.gmwildlife.org.uk/>.

⁶ Natural Environment and Rural Communities Act 2006 (Chapter 16), London. Her Majesty's Stationery Office.

⁷ Baseline descriptions name plant species as per Stace, C. (2010) *New Flora of the British Isles*. (3rd edn). Cambridge University Press. ISBN 978-0-520-70772-5.

⁸ NVC is a detailed survey and classification system that is used to compare plant communities with a range of defined community types.

2.2 Deviations, constraints and limitations

- 2.2.1 In many locations it has not been possible to determine the precise habitat type for Phase 1 habitat mapping, for the following reasons:
- in some locations, landowner permission was not granted, or was granted too late in the season for field assessments to be undertaken; and
 - in some areas where access was granted this was subject to significant restrictions associated with game management. Such restrictions particularly affected access to a number of woodland sites.
- 2.2.2 Where access was not granted or was granted too late in the season for field assessment, aerial photography and Ordnance Survey maps have been utilised to inform the assessment. Where access was not obtained for survey, an assumption has been made that hedgerows are intact and species-rich.
- 2.2.3 A small number of Phase 1 habitat surveys were conducted outside the optimal survey period when many plant species are not in evidence, and others are hard to identify, especially in the winter months. It is possible that some species may have been overlooked at these sites however sufficient information was gathered to allow for broad habitat descriptions and identification of notable habitats.
- 2.2.4 A digital base map was produced from aerial photography and other existing information. This was used by Phase 1 surveyors from June 2018 onwards as the starting point for recording surveys. It provides baseline habitat information for locations where it has not been possible to undertake survey due to lack of access.

2.3 Baseline

Hough to Walley's Green (MA01)

- 2.3.1 Approximately 64.2% of the land required for the construction of the Proposed Scheme was surveyed. Some surveys have also been undertaken within the 250m buffer zone.
- 2.3.2 The area in and adjacent to the land required for construction of the Proposed Scheme includes tributaries of the River Weaver 2 and Fowle Brook 1. Habitats consist of arable fields with surrounding woodland and semi-natural ancient woodland. Within MA01, a large proportion of the Proposed Scheme is in tunnel.

Woodland

- 2.3.3 There are at least 16 woodland blocks and clusters scattered throughout, or directly adjacent to, the land required for the construction of the Proposed Scheme in MA01⁹. The total area of woodland within the land required for the construction of the Proposed Scheme is as follows:
- 3.8ha of semi-natural broadleaved woodland;
 - 0.2ha of plantation broadleaved woodland; and
 - 0.3ha of plantation mixed woodland.
- 2.3.4 The woodland type with the largest area within land required for the construction of the Proposed Scheme is semi-natural broadleaved woodland, and includes:
- sections of Crewe Station Woodland and Crewe Station Sidings, both potential local wildlife sites, comprising blocks of semi-natural broadleaved woodland listed on the National Forest Inventory, located north of the Basford Hall Sorting Sidings. This woodland may qualify as lowland mixed deciduous woodland HoPI;
 - small section of the linear woodland in Mere Gutter With Basford Brook Local Wildlife Site (LWS), located adjacent to Crew Station Woodland. This woodland may qualify as lowland mixed deciduous woodland HoPI;
 - numerous sections of linear woodland running parallel to the West Coast Main Line (WCML). This woodland may qualify as lowland mixed deciduous woodland HoPI if it is mature woodland comprised of native species, but may not qualify as a HoPI if it is young woodland/mature scrub (the land was inaccessible for verification);
 - two small blocks in Coppenhall, along the edges of a field of unimproved, neutral grassland. Hybrid crack willow (*Salix x fragilis*) is dominant, with hawthorn (*Crataegus monogyna*), and blackthorn (*Prunus spinosa*) also present. This woodland qualifies as wet woodland HoPI;
 - a block north of the Leighton housing estate, which incorporates Thornfields Willows potential local wildlife site. This woodland may qualify as lowland mixed deciduous woodland HoPI;
 - linear woodland along the banks of the Tributary of Fowle Brook 1, north-west of Coppenhall Moss, within the Moss Bridge Marsh Local Wildlife Site. This woodland may qualify as lowland mixed deciduous woodland or wet woodland HoPI;
 - western and southern edge of the Larch Wood LWS, east of Minshull Vernon. Larch Wood comprises oak species (*Quercus* sp.), ash (*Fraxinus excelsior*), sycamore (*Acer pseudoplatanus*), willow (*Salix* sp.) and occasional hawthorn. It qualifies as lowland mixed deciduous woodland HoPI;

⁹ Please note that the 16 blocks/clusters do not necessarily translate to 16 descriptions in the bullet lists below as some woodlands comprise more than one block/patch.

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- small section of the woodland block with semi mature trees, north of Burnt Covert potential local wildlife site. Ash is frequently, with occasional oak and hazel (*Corylus avellana*). This woodland qualifies as lowland mixed deciduous woodland HoPI;
- a small triangular area on the opposite side of Parkfield Farm. This woodland may qualify as lowland mixed deciduous woodland HoPI; and
- linear woodland north of Wally's Green, along the banks of a Tributary of River Weaver 2 which lies along the boundary of MA01 and MA02. The woodland is between the existing WCML and the A530 and is identified as broadleaved woodland on the National Forest Inventory. Ash, sycamore, common lime (*Tilia × europaea*) and oak sp., dominate the canopy. Dog-rose (*Rosa canina* agg.), Himalayan balsam (*Impatiens glandulifera*) and dog's mercury (*Mercurialis perennis*) are present in the ground flora. This woodland qualifies as lowland mixed deciduous woodland HoPI.

2.3.5 There are also three semi-natural broadleaved woodlands located adjacent to the land required for the construction of the Proposed Scheme:

- linear woodland running parallel to the WCML, between Bradfield Road and Parkers Road in Leighton. This woodland may qualify as lowland mixed deciduous woodland HoPI if it is mature woodland comprised of native species, but may not qualify as a HoPI if it is young woodland/mature scrub (the land was inaccessible for verification);
- Spring Field Cottage Woodland potential local wildlife site, is a broadleaved woodland listed on the National Forest Inventory. This woodland is east of Moss Lane, east of Bradfield Green and is composed of mature oaks with a closed canopy and no understorey and appeared to be managed. This woodland qualifies as lowland mixed deciduous woodland HoPI; and
- Larch Wood LWS and Burnt Covert potential local wildlife site, two small, wooded areas east of Minshull Vernon, are listed as broadleaved woodland on the National Forest Inventory. Access was not available to Burnt Covert for a Phase 1 habitat survey. This woodland may qualify as lowland mixed deciduous woodland HoPI.

2.3.6 Mixed plantation woodland is present in one area within the land required for the construction of the Proposed Scheme. The woodland is located on the opposite side of the existing WCML to Larch Wood LWS, east of Minshull. Silver birch (*Betula pendula*) and ash are frequent within the woodland, with occasional Scot's pine (*Pinus sylvestris*), alder (*Alnus glutinosa*) and hazel. These plantations do not qualify as a HoPI.

2.3.7 There are also two small broadleaved woodland plantations north of Burnt Covert LWS, east of Minshull, that lie within the land required for the construction of the Proposed Scheme and contain immature ash and silver birch. These young plantations do not qualify as a HoPI.

Traditionally managed orchards

2.3.8 Two traditionally managed orchards listed on Natural England's PHI are in MA01. They are located on Groby Road at Foden Farm, north of Maw Green, and adjacent to the Shropshire Union Canal (Middlewich Branch) LWS and Site of Biological Importance (SBI), west of

Wimboldsley Hall. Both traditionally managed orchards are adjacent to the land required for construction of the Proposed Scheme and both are listed as LWS.

Scrub

- 2.3.9 A number of small areas of scrub are present. Woody species most frequently include hawthorn, blackthorn, ash, willow, alder, holly (*Ilex aquifolium*), sycamore, oak and elder (*Sambucus nigra*) with bramble (*Rubus fruticosus* agg.). Common nettle (*Urtica dioica*), dog-rose, and rosebay willowherb (*Chamerion angustifolium*) are dominant species within the ground layer. Scrub habitat comprises 3.7ha within the land required for the construction of the Proposed Scheme.

Hedgerows

- 2.3.10 In total, 28.0km of hedgerow habitat is present within the land required for the construction of the Proposed Scheme. This includes:
- 1.0km of intact species-rich hedgerow;
 - 5.3km of intact species-poor hedgerow;
 - 1.9km of defunct species-poor hedgerow;
 - 3.7km of native species-rich hedgerow with trees;
 - 3.7km of species-poor hedgerow with trees; and
 - 12.4km of unsurveyed assumed intact species-rich hedgerow.
- 2.3.11 Hedgerows that comprise at least one woody UK native species and have 80% or more cover, qualify as a HoPI. This excludes honeysuckle (*Lonicera* sp.) and bramble, which are integral to many hedgerows. Typical woody species include pedunculate oak (*Quercus robur*), hawthorn, holly, dog-rose, hazel and occasionally recorded, alder. Most of the arable and pasture fields are bordered by hedgerows.

Parkland and scattered trees

- 2.3.12 A large area of wood pasture and parkland habitat mapped on Natural England's PHI and called Crewe Hall is adjacent to the land required for construction of the Proposed Scheme. It is east of the A534 University Way, south-east of Crewe.
- 2.3.13 In the remainder of MA01, there are no large areas of parkland or scattered trees. However, mature treelines are found at some field boundaries. Both broadleaved and coniferous trees are present, with dominant species including hybrid crack willow, sessile oak (*Quercus petraea*), pedunculate oak, ash, sycamore, poplar (*Populus* sp.), Leyland cypress (*Cupressus × leylandii*) and lime (*Tilia* sp.).
- 2.3.14 Crewe Cemetery is within 100m of the land required for the construction of the Proposed Scheme but on the opposite side of the WCML. The cemetery has a variety of broadleaved trees scattered throughout the grounds.

Grassland and marsh

- 2.3.15 The main grassland types in MA01 are improved grassland used for cattle grazing (70.9ha), and poor semi-improved grassland (26.3ha). Improved grasslands typically comprise perennial rye-grass with a few additional species, such as white clover, dandelion, docks and plantains. Poor semi-improved grasses are slightly more diverse. They typically include the above species, but with additional species of grass such as red fescue, common bent, sweet vernal-grass and Timothy, and additional species of broad-leaved herb including buttercup (*Ranunculus* sp.), common mouse-ear and sometimes red clover, and at low frequency and abundance vetches (*Vicia* sp.) and bird's-foot trefoil. The species recorded throughout these grasslands often indicate the use of fertilisers, which may have reduced the grassland species richness, over time, or have been seeded with agricultural species. None of these grasslands qualify as HoPI.
- 2.3.16 Unimproved grassland is present along road verges throughout MA01 within the land required for the construction of the Proposed Scheme. It is also present in larger blocks at Spring Plantation Grassland LWS east of Moss Lane, east of Bradfield Green, which is designated for species-rich neutral grassland. The results of the Phase 1 habitat survey indicated that the land appeared to have been previously grazed but is currently unmanaged. The grassland is predominantly perennial ryegrass, with frequent cock's-foot, common knapweed and creeping buttercup, with occasional Yorkshire fog, white clover, lesser stitchwort, and compact rush. The vegetation composition does not indicate that unimproved grassland is present, but is assumed to be lowland meadow HoPI on a precautionary basis, as it is a designated grassland and is heavily grazed. Grazing may have obscured the presence of a greater diversity of meadow plants.
- 2.3.17 Semi-improved grassland is present along a number of road verges throughout MA01 within the land required for the construction of the Proposed Scheme. It is also present in larger blocks at the following locations:
- a large field of semi-improved acid grassland within Coppenhall, located to the east of the WCML and west of Broughton Road. Species recorded include sheep's sorrel (*Rumex acetosella*), common vetch (*Vicia sativa*), creeping bent (*Agrostis stolonifera*) and creeping buttercup. This grassland qualifies as lowland acid grassland HoPI;
 - an area of semi-improved neutral grassland partially within the land required for the construction of the Proposed Scheme, north-west of Coppenhall. The grassland located adjacent to the WCML and Bradfield Road had been recently cut at the time of the Phase 1 habitat survey and was grazed by sheep. Species include creeping bent, tufted hair-grass (*Deschampsia cespitosa*), Yorkshire fog (*Holcus lanatus*), meadow foxtail (*Alopecurus pratensis*), soft rush, common knapweed (*Centaurea nigra*), tufted vetch (*Vicia cracca*), creeping buttercup, bird's-foot-trefoil (*Lotus corniculatus*) and meadow vetchling (*Lathyrus pratensis*). Although moderately diverse, this grassland is insufficiently diverse to be a HoPI;
 - a field of unmanaged, semi-improved neutral grassland, north of the field listed above and similarly on the western side of the WCML. Due to the lack of management, grasses

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are dense and tussocky. Scrub and tall ruderal vegetation are present in the grassland. Bird's-foot-trefoil, yarrow (*Achillea millefolium*), common nettle, tufted vetch, common knapweed, meadow vetchling, lesser stitchwort (*Stellaria graminea*), meadowsweet (*Filipendula ulmaria*), cock's-foot (*Dactylis glomerata*), Yorkshire fog, meadow foxtail, perennial rye-grass and tufted hair-grass are all present. Although moderately diverse, this grassland is insufficiently diverse to be a HoPI;

- an area of semi-improved neutral grassland between Coppenhall and Coppenhall Moss, and south of Parkers Road, almost entirely within the land required for the construction of the Proposed Scheme. Species include common sorrel (*Rumex acetosa*), soft rush, creeping buttercup, common knapweed, meadow foxtail and red fescue (*Festuca rubra*). Perennial rye-grass, ribwort plantain (*Plantago lanceolata*) and red clover (*Trifolium pratense*) are also recorded. Although moderately diverse, this grassland is insufficiently diverse to be a HoPI;
- a semi-improved, neutral grassland field west of Coppenhall Moss, comprising occasional rutted, damp areas with soft rush, tansy (*Tanacetum vulgare*), broadleaved dock (*Rumex obtusifolius*), meadow foxtail, rose (*Rosa sp.*) and bramble. Semi-improved grassland is also present in the adjacent field which, at the time of the Phase 1 habitat survey, was grazed by livestock. Both areas lack diversity to be a HoPI;
- a field of semi-improved neutral grassland north of Coppenhall Moss and within the land required for the construction of the Proposed Scheme, fenced off from grazing and left unmanaged. Cock's-foot, common knapweed, meadow vetchling, meadowsweet, tufted hair-grass, red clover and bird's-foot-trefoil are present. Although moderately diverse, this grassland is insufficiently diverse to be a HoPI;
- an area of semi-improved neutral grassland directly adjacent to the land required for the construction of the Proposed Scheme, north of Leighton. This grassland is cattle grazed and has scattered soft rush tussocks with species including bird's-foot-trefoil, selfheal (*Prunella vulgaris*), common knapweed, marsh thistle (*Cirsium palustre*) and common sorrel. Tufted hair-grass, sweet vernal-grass (*Anthoxanthum odoratum*), creeping soft grass (*Holcus mollis*), Timothy (*Phleum pratense*), Yorkshire fog, and creeping bent are all present. Although moderately diverse, this grassland is insufficiently diverse to be a HoPI;
- a thin strip of a large field of semi-improved neutral grassland falls within the land required for the construction of the Proposed Scheme, adjacent to the southern boundary of Spring Plantation Grassland LWS. Grazed by cattle, the grassland is short and appeared to be grazed through the year. Species included Yorkshire fog, creeping bent, creeping buttercup, perennial rye-grass, Timothy, selfheal, spear thistle (*Cirsium vulgare*), common sorrel and cock's-foot. Patches of grazed soft rush throughout grassland are present. This grassland is insufficiently diverse to be a HoPI;
- a small field north-east of Spring Plantation Grassland LWS, adjacent to Springfield Cottage. Abundant couch grass (*Elytrigia repens*) and Yorkshire fog is present, with frequent creeping buttercup and broadleaved dock. Dandelion, Timothy and red clover is occasionally present, meadow buttercup (*Ranunculus acris*), ribwort plantain and red

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fescue is rarely present. Bare patches are present where vehicles have regularly driven through dense sward. This grassland is insufficiently diverse to be a HoPI; and

- a small field of neutral, semi-improved grassland adjacent to Moss Farm, north of Coppenhall Moss falls partially within the land required for the construction of the Proposed Scheme. Species include perennial rye-grass, ribwort plantain, white clover, red clover, common sorrel, red fescue, creeping buttercup, Timothy, and foxtail. This grassland is insufficiently diverse to be a HoPI.

2.3.18 Marshy grassland is localised and is present at the following locations within the land required for the construction of the Proposed Scheme:

- two small patches, north-east of Coppenhall, consisting of willow species (*Salix* spp.), soft rush (*Juncus effusus*) and false oat-grass (*Arrhenatherum elatius*). One of the patches of marshy grassland forms the Broughton Road Drains watercourse. This grassland does not qualify as a HoPI;
- Moss Bridge Marsh potential local wildlife site. Access to the majority of this land was not provided for a Phase 1 habitat survey, however, in the northern section of the potential local wildlife site a small area of wet, rush dominated marshy grassland is present within an area of poor semi-improved grassland. This area is dominated by soft rush with a few patches of sedge (*Carex* sp.). This marshy grassland may qualify as a purple moor-grass and rush pasture HoPI;
- Spring Plantation Grassland LWS, east of Moss Lane and Bradfield Green, is designated for species-rich neutral grassland. The Phase 1 habitat survey indicated the presence of marshy grassland containing small areas of standing water, and vegetation dominated by compact rush (*Juncus conglomeratus*), with perennial rye-grass, white clover and creeping buttercup (*Ranunculus repens*). The surveyed grassland does not qualify as a HoPI; and
- a small patch of marshy grassland, within a field of semi-improved grassland, south-east of Walley's Green. The area is moderately wet and dominated by sedge species. It does not qualify as a HoPI.

Watercourses

2.3.19 Three main watercourses are crossed by the Proposed Scheme:

- Gresty Brook is located north of the Basford Hall Sorting Sidings, and runs through the Crewe Station Woodland potential local wildlife site, Crewe Station Sidings potential local wildlife site and Mere Gutter with Basford Brook LWS (Basford Brook is downstream). Within the land required for construction of the Proposed Scheme, Gresty Brook is culverted beneath the existing WCML and at surface to the west of the railway;
- Valley Brook flows approximately east to west through Crewe. It passes under the A532 Macon Way and runs through wooded parkland before passing under the WCML north of Crewe Station. It is approximately 0.2km north of the land required for construction of the Proposed Scheme; and

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- Tributary of River Weaver 2, approximately 1.5m wide, lies along the boundary of MA01 and MA02. Broadleaved woodland listed on the National Forest Inventory covers the banks. Downstream it flows through Weaver Bank Wood an ancient woodland inventory (AWI) site which contains plantation on an ancient woodland site (PAWS) woodland, and into the River Weaver.

2.3.20 Five smaller watercourses¹⁰ were identified in the land required for the construction of the Proposed Scheme. Apart from Leighton Brook, which is located in Crewe, they are slow flowing watercourses associated with arable land and bank vegetation dominated by dense bramble and gorse (*Ulex europaeus*) scrub:

- Leighton Brook, within Crewe, is culverted for approximately two thirds of its length and runs beneath Underwood Lane and residential buildings. After Underwood Lane the culvert opens where the brook runs through a grassland area;
- Broughton Road Drains watercourse comprises two drains through agricultural fields along the Broughton Road, north of Coppenhall. One is located within an area of marshy grassland, the other is adjacent to a species-poor hedgerow with trees along a field of improved grassland. Both drains were dry at the time of survey;
- Parkers Road Drain is within an agricultural field, adjacent to the existing WCML, south of Moss Bridge Marsh LWS;
- Tributary of Fowle Brook 1 is an open channel that intersects with the WCML east of Moss Lane, east of Bradfield Green. It flows through agricultural fields and eventually becomes culverted to the west of the land required for construction of the Proposed Scheme; and
- Hoggins Brook, intersected by land required for construction of the Proposed Scheme west of Warmingham, flows through agricultural land with scattered trees along its bank.

2.3.21 Tributary of Swill Brook 1 runs adjacent to the land required for the construction of the Proposed Scheme, north-east of Shavington. The watercourse runs through a small block of broadleaved woodland adjacent to a roundabout.

Water bodies

2.3.22 The total number of ponds identified from aerial photography and OS maps within 500m of the area of land required for the construction of the Proposed Scheme is 313. This includes:

- twenty-one ponds within the area of land required for the construction of the Proposed Scheme;
- sixty-five between 100m and the area of land required for the construction of the Proposed Scheme;

¹⁰ This count is of the principal watercourses, where a watercourse branches into a network of smaller watercourses these are subsumed under a single bullet and not counted separately. This applies here to MA01 and for all other Community Areas.

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- eighty-one between 100m and 250m from the area of land required for the construction of the Proposed Scheme; and
- one hundred and forty-six between 250m and 500m from the land required for the construction of the Proposed Scheme.

2.3.23 There were no ditch surveys carried out in MA01.

2.3.24 Most water bodies within the Proposed Scheme are ponds set within agricultural land or residential gardens, often surrounded by woodland copses. Ditches are typically associated with the watercourses.

Arable and cultivated land

2.3.25 Aerial imagery and Phase 1 habitat survey data indicates MA01 is dominated by arable fields with occasional hedgerows and trees. Arable land represents approximately 36.3ha of the land required for construction of the Proposed Scheme.

Buildings and structures

2.3.26 There are four areas of isolated buildings and farmsteads within or directly adjacent to the land required for the construction of the Proposed Scheme:

- concentrations of industrial buildings adjacent to the land required for the construction of the Proposed Scheme, at Crewe Gates Farm Industrial Estate;
- Crewe sub-station buildings located within the land required for the construction of the Proposed Scheme;
- there is a concentration of residential buildings at Crewe, adjacent to the land required for the construction of the Proposed Scheme; and
- there are several farms, and outbuildings which make up Moss Bridge Farm and Bridge Farm, adjacent to Parkers Road, that are within the land required for the construction of the Proposed Scheme.

Wimboldsley to Lostock Gralam (MA02)

2.3.27 Approximately 65.3% of the land required for the construction of the Proposed Scheme was surveyed. Some surveys have also been undertaken within the 250m buffer zone.

2.3.28 Land in and adjacent to land required for construction of the Proposed Scheme consists of arable fields with woodland, some of which is an AWI site (both semi-natural and PAWS types) including Leonard's and Smoker Wood LWS, and Bull's Wood and Meadow LWS. A number of watercourses are present, including the Trent and Mersey Canal, Shropshire Union Canal (Middlewich Branch), River Dane, Puddinglake Brook, Gad Brook, Wade Brook, Smoker Brook and Peover Eye.

Woodland

- 2.3.29 There are at least 41 woodland blocks and clusters scattered throughout, or directly adjacent to, the land required for the construction of the Proposed Scheme in MA02¹¹. The total area of woodland within the land required for the construction of the Proposed Scheme is as follows:
- 21.8ha of semi-natural broadleaved woodland; and
 - 0.2ha of plantation broadleaved woodland.
- 2.3.30 The woodland type with the largest area within land required for the construction of the Proposed Scheme is semi-natural broadleaved woodland which includes at least 23 blocks including:
- a small block surrounding a pond near Wimboldsey Hall, adjacent to the railway line. The pond is within a field of poor semi-improved grassland. It may qualify as lowland mixed deciduous woodland HoPI;
 - a small strip west of Occlestone Green, surrounding dry ponds. It is surrounded by improved grassland and arable land. It may qualify as lowland mixed deciduous woodland HoPI;
 - a strip situated along the length of The Dingle watercourse, south of Wimboldsley Grange. Silver birch, horse chestnut (*Aesculus hippocastanum*), pedunculate oak, sycamore, common lime, sweet chestnut (*Castanea sativa*), alder, ash, cherry (*Prunus avium*), beech (*Fagus sylvatica*), rowan (*Sorbus aucuparia*) and hawthorn are present. Understorey species include a limited ground flora with lords-and-ladies (*Arum maculatum*) on the edge of the woodland. This woodland qualifies as lowland mixed deciduous woodland HoPI;
 - two areas, 200m further north from the Dingle watercourse woodland and of similar composition. These areas qualify as lowland mixed deciduous woodland HoPI;
 - a strip bordering Yewtree House/Yewtree Farm and A530 Nantwich Road, directly south of Wimboldsley. This woodland may qualify as lowland mixed deciduous woodland HoPI;
 - a small triangular woodland block, north-west of Wimboldsley. A closed canopy is present, consisting of mature white poplar (*Populus alba*), silver birch, alder, pedunculate oak, beech and ash. Young trees are attached to stakes, and coppiced hazel and grey willow (*Salix cinerea* subsp. *oleifolia*) are present. A varied understory is present with young ash, alder, beech and oak trees along with coppiced hazel, elder, damson (*Prunus domestica* agg.), rowan, grey willow and hawthorn and blackthorn. Although some trees are clearly planted, the wider wood has a semi-natural character and qualifies as lowland mixed deciduous woodland HoPI;

¹¹ Please note that the 41 blocks/clusters do not necessarily translate to 41 descriptions in the bullet lists below as some woodlands comprise more than one block/patch.

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- Stove Room Wood, deciduous woodland listed on the National Forest Inventory, north-west of Wimboldsley. Most of the trees are mature or semi-mature, with occasional gaps creating glades dominated by common nettle and bramble. There is a lack of natural regeneration. Canopy species comprise sycamore, horse chestnut, ash, beech, Scot's pine, large-leaved lime (*Tilia platyphyllos*) and hawthorn. A poorly structured understorey layer is present, with occasional elder, dog-rose and hawthorn. Holly is rarely present. The field layer is dense with a dominance of common nettle, bramble, ivy (*Hedera helix*), cleavers (*Galium aparine*) and wood millet (*Millium effusum*). The wood qualifies as lowland mixed deciduous woodland HoPI;
- aerial imagery indicates there are two small blocks within a field, with livestock present. The woodlands are located at the junction of Clive Green Lane and A530 Nantwich Road. These woodlands may qualify as lowland mixed deciduous woodland HoPI;
- a small block, identified from aerial imagery, along the A54 Middlewich Road east of the Stanthorne Hall Farm. This is an AWI site and may be lowland mixed deciduous woodland HoPI;
- a linear strip along Bostock Road, east of The Willowbeds LWS. This woodland may be lowland mixed deciduous woodland HoPI;
- a linear patch along the banks of a tributary of the River Dane. The woodland strip forms part of the River Dane, Bostock LWS, and is included on the Natural England PHI as wet woodland. The woodland is dominated by oak, with abundant hawthorn and willow species. This woodland qualifies as wet woodland HoPI;
- an area listed on the National Forest Inventory, along the banks of the River Dane. Ash, oak sp., sycamore and horse chestnut are the dominant species; however, access was restricted by dense vegetation and steep slopes. The woodland is connected to Bull's Wood and Meadow LWS. It qualifies as lowland mixed deciduous woodland HoPI;
- a small section of Bull's Wood and Meadow LWS, noted on Natural England's PHI as deciduous woodland. The majority of the LWS sits outside of the land required for the construction of the Proposed Scheme; however, a small section at the northern end of the woodland within the land required is an AWI site containing PAWS woodland. The woodland is not in obvious, active management, but contains glades where natural regeneration is evident. It qualifies as lowland mixed deciduous woodland HoPI;
- broadleaved woodland along the banks of the Trent and Mersey Canal, consisting of sycamore, hawthorn, alder, elm (*Ulmus* sp.), hazel, blackthorn, oak sp., poplar and ash. The ground flora contains common mugwort (*Artemisia vulgaris*), lords-and-ladies, common nettle and cleavers. It qualifies as lowland mixed deciduous woodland HoPI;
- a large block on the edge of an arable field and farm track, just north of the preceding woodland. The canopy species include common lime, ash, pedunculate oak and sycamore. The understorey comprises hawthorn, elder, dog-rose, hazel (coppiced in places) and holly. The field layer is under-developed due to shading. Dominant ground flora species include bramble and occasional red campion (*Silene dioica*), wood millet and ivy. This woodland qualifies as lowland mixed deciduous woodland HoPI;

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- Puddinglake Brook Wood LWS is situated along the banks of Puddinglake Brook and the Trent and Mersey Canal. Species include sycamore, hawthorn, alder, elm, hazel, blackthorn, oak sp., black poplar (*Populus nigra* ssp. *betulifolia*) and ash. Ground flora includes mugwort, lords-and-ladies, common nettle and cleavers. This woodland qualifies as lowland mixed deciduous woodland HoPI;
- Marshall's Gorse LWS, broadleaved woodland, listed on the National Forest Inventory, south of the distribution centre at Higher Shurlach. Species include hawthorn, oak sp., sycamore, hazel and blackthorn, ash and crack willow. Rose, bramble and cleavers are present in the understorey layer. This woodland qualifies as lowland mixed deciduous woodland HoPI;
- several blocks situated along the A556 Chester Road, often forming linear stretches of woodland. These woodlands may qualify as lowland mixed deciduous woodland HoPI;
- broadleaved woodland along the banks of Wade Brook, north of Lostock Green. This woodland may qualify as lowland mixed deciduous woodland HoPI;
- Square Wood, south-east of Lostock Gralam, with a canopy dominated by pedunculate oak, and abundant ash, horse chestnut, sycamore. Common lime, elder and goat willow (*Salix caprea*) are frequently present. The ground flora is dominated by common nettle with bittersweet (*Solanum dulcamara*), and bramble. Male fern (*Dryopteris filix-mas*) is rarely present. A stand of dead trees is present in the northern section of the woodland. This woodland qualifies as lowland mixed deciduous woodland HoPI;
- Long Wood LWS, a linear strip of mature broadleaved deciduous woodland east of Lostock Gralam, south of the A559 Manchester Road. The woodland has a pedunculate oak dominated canopy with elder, sycamore, silver birch, willow sp. and rowan also present. The understorey consists of hawthorn and hazel, with bramble. Ancient woodland indicator species are present in addition to veteran trees and standing dead wood. Long Wood qualifies as lowland mixed deciduous woodland HoPI. Long Wood LWS is connected to Plumley Lime Beds Site of Special Scientific Interest (SSSI), which is also Plumley Nature Reserve LWS, and Winnington Belt Wood, which is semi-natural ancient woodland. Both Plumley Lime Beds SSSI and Winnington Belt Wood are adjacent to the land required for the construction of the Proposed Scheme;
- Winnington and Peas Wood LWS, is a large AWI site. The woodland is dominated by beech. Other species include abundant sycamore, with occasionally rowan, pedunculate oak, hazel, holly, silver birch and crack willow. Bramble is abundant throughout the woodland. This woodland is lowland mixed deciduous woodland HoPI; and
- Leonard's and Smoker Wood LWS and AWI site runs along the banks of Smoker Brook. Leonard's Wood contains ancient PAWS woodland, with the canopy including abundant oak sp. and pine species (*Pinus* spp.), and frequent sycamore, silver birch, beech, ash, and alder. Understorey species include abundant silver birch and elder, with frequently hawthorn and ash. Rose spp., honeysuckle (*Lonicera periclymenum*), alder, holly and goat willow are all occasional. Smoker Wood contains ancient and semi-natural woodland. The woodland canopy species include abundant oak species, with frequent sycamore, silver birch, beech, ash, pine species and alder. Horse chestnut and Leyland cypress are

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occasionally present. The understorey is composed of abundant silver birch and elder, with frequent ash. Hawthorn, honeysuckle, alder, holly and goat willow are all occasionally present. Located on the boundary of MA02 and MA03, both woods are lowland mixed deciduous woodland HoPI.

2.3.31 Of the approximately 41 woodlands, 15 are semi-natural broadleaved woodlands located adjacent to the land required for the construction of the Proposed Scheme; these are:

- Woodlands near Lea Hall LWS and Rookery/Small Rookery Woods LWS and SBI are both AWI sites. They lie between the land required for construction of the Proposed Scheme and Shropshire Union Canal, west of Wimboldsley, and contain an understorey of hazel and hawthorn with a lack of natural regeneration and ground flora. They both qualify as lowland mixed deciduous woodland HoPI;
- Wimboldsley Wood, a SSSI and LWS, is located north-west of Wimboldsley, and is AWI woodland. The woodland, located on steep sided, sloping land and split into two areas by the Shropshire Union Canal, contains horse chestnut, hazel, alder, sycamore, pedunculate oak, elder, ash, common lime and wych elm (*Ulmus glabra*). Dense bramble scrub is present in the ground flora. It qualifies as lowland mixed deciduous woodland HoPI;
- large block listed on Natural England's PHI, east of Yew Tree Farm, north and south of the Shropshire Union Canal LWS. Species include English elm (*Ulmus procera*), hazel, horse chestnut pedunculate oak, beech sycamore, hawthorn and dog-rose. The understorey contained locally abundant periwinkle, ivy, and locally occasional dog's mercury and wood avens (*Geum urbanum*). It qualifies as lowland mixed deciduous woodland HoPI;
- a small block east of Stanthorne, south of the A54 respectively. This woodland may qualify as lowland mixed deciduous woodland HoPI;
- the Willowbeds LWS is a semi-natural broadleaved woodland with drains and ditches and a marshy area. It is adjacent to the land required for construction of the Proposed Scheme next to Winsford Industrial Estate. A narrow woodland also extends east adjacent to the land required for construction of the Proposed Scheme. The woodlands are dominated by oak, silver birch and sycamore. The understorey is mainly comprised of perennial rye-grass. Both woodlands qualify as lowland mixed deciduous woodland HoPI;
- Bull's Wood forms part of Bull's Wood and Meadow LWS. It is an AWI site, partly formed of PAWS woodland. This area is predominantly made up of broadleaved species with some scattered conifers. Glades exist where young trees are naturally regenerating. The canopy species include beech, sycamore, horse chestnut, pedunculate oak, silver birch, ash, European larch (*Larix decidua*) and Scots pine. The understorey includes rhododendron (*Rhododendron* sp.), elder, hawthorn, holly and bramble. Ground floor species include lesser celandine (*Ficaria verna*), hogweed (*Heracleum sphondylium*), common nettle, and germander speedwell (*Veronica chamaedrys*). Ancient woodland indicator species are also present, including bluebell (*Hyacinthoides non-scripta*), lords-and-ladies, opposite leaved golden saxifrage (*Chrysosplenium oppositifolium*), wild garlic

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(*Allium ursinum*) and dog's mercury. It is connected to woodland that runs along the length of the River Dane, and Oak Wood that links with Bostock Road. Both woods qualify as lowland mixed deciduous woodland HoPI;

- Oak Clump is a semi-natural broadleaved woodland and AWI site, with a small section of planted Scots pine and Douglas fir (*Pseudotsuga menziesii*) at its southern boundary. The woodland is managed for pheasant shooting. The canopy is closed with few glades and dominated by pedunculate oak and sycamore with occasional sweet chestnut. The understorey is species-poor with dominant rhododendron and occasional elder, hawthorn, holly and dog-rose. The majority of the field layer is made up of abundant bramble with rare daffodil (*Narcissus* sp.), bluebell, rosebay willowherb, soft rush, occasional common nettle and abundant leaf litter. There is little evidence of natural regeneration. Standing and fallen dead wood is present through the entire woodland, although in small quantities. The broadleaved part of the woodland qualifies as lowland mixed deciduous woodland HoPI;
- Hill Wood, a dense broadleaved semi-natural woodland east of Bostock Hall, consisting of oak sp., elder, holly, hawthorn, yew (*Taxus baccata*), sycamore, rhododendron and cherry laurel (*Prunus laurocerasus*). The ground flora includes bramble, common nettle, bluebell and lords-and-ladies. The woodland appeared to be used for rearing game with livestock-proof fencing present. Hill Wood qualifies as lowland mixed deciduous woodland HoPI;
- a linear woodland noted in Natural England PHI is located along sections of the A556 Chester Road and A530 Griffiths Road. Species include ash, silver birch, pedunculate oak, hawthorn, grey willow and naturally regenerating hazel. This wood qualifies as lowland mixed deciduous woodland HoPI;
- a long strip of woodland along A533 Bostock Road near Pennel's Wood. This woodland may qualify as lowland mixed deciduous woodland HoPI;
- Plumley Lime Beds SSSI, south of the A559 Manchester Road, consisting of wet broadleaved woodland listed on the National Forest Inventory, is dominated by silver birch, with abundant willow and pedunculate oak. This woodland qualifies as lowland mixed deciduous woodland HoPI;
- Winnington Belt Wood is a LWS, SSSI and AWI site, south of the A559 Manchester Road, with the canopy and understorey comprising frequent sycamore, beech, pedunculate oak and holly. Alder, hawthorn and elder are occasionally present with rare horse chestnut, garden privet (*Ligustrum ovalifolium*) and crab apple (*Malus sylvestris*). There is a sparse ground layer including frequent ivy, and occasional common nettle, broad buckler-fern (*Dryopteris dilatata*), male fern, honeysuckle, bluebell, bramble and rosebay willowherb. Mosses include elegant silk-moss (*Pseudotaxiphyllum elegans*), swan's-neck thyme-moss (*Mnium hornum*), common smoothcap (*Atrichum undulatum*) and common feather-moss (*Kindbergia praelonga*). Winnington Belt qualifies as lowland mixed deciduous woodland HoPI;
- a small block of mixed semi-natural woodland surrounds a pond at the junction of Clive Green Lane and Coalpit Lane and is adjacent to the land required for the construction of

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the Proposed Scheme. Species include Scot's pine, sycamore, horse chestnut, pedunculate oak, crack and other species of willows, with and understorey of holly, young willow shrubs and hawthorn. This woodland has a semi-natural character and qualifies as lowland mixed deciduous woodland HoPI; and

- another block of mixed, semi-natural woodland sits adjacent to the Proposed Scheme, between the Trent and Mersey Canal and the existing railway line. Species includes pedunculate oak, sweet chestnut, silver birch, Leyland cypress, and sessile oak. This woodland has a semi-natural character and qualifies as lowland mixed deciduous woodland HoPI.

2.3.32 Plantation woodland is found in three locations in MA02 adjacent to the land required for the construction of the Proposed Scheme:

- a large block of broadleaved plantation woodland is located adjacent to the land required for the construction of the Proposed Scheme, south of Puddinglake Brook. It is even-aged, with some areas of natural regeneration. Species include large-leaved lime, ash, sycamore, beech, wych elm, hazel, hawthorn, grey willow, sweet chestnut, cherry and elder. Scattered bramble is occasionally present with the ground flora dominated by ivy. This wood is a plantation and therefore does not qualify as a HoPI;
- within Bull's Wood (an area of PAWS in Bull's Wood and Meadow LWS) and Oak Wood, there are sections of coniferous plantations, composed entirely of larch with rare Scots pine. These plantation areas are used for pheasant rearing. They are adjacent to the land required for construction of the Proposed Scheme. This woodland is a plantation and does not qualify as a HoPI; and
- the section of Leonard's and Smoker Wood LWS, which is PAWS, running adjacent to the land required for the construction of the Proposed Scheme contains mixed woodland plantation, with abundant and frequent species including oak sp., pine sp., alder, ash, beech, silver birch and sycamore. The understorey layer contains elder, hawthorn, rose sp., honeysuckle, holly and goat willow. Garlic mustard (*Alliaria petiolata*) is dominant in the ground layer, with abundant ivy (*Hedera helix*), bramble and daffodil, wood anemone (*Anemone nemorosa*), dog's mercury, wood avens (*Geum urbanum*) and bluebell are frequent, with wild strawberry (*Fragaria vesca*) and lords-and-ladies present occasionally. This woodland is part of the wider LWS, which is lowland mixed deciduous woodland HoPI.

Traditionally managed orchards

2.3.33 Four orchards listed as traditionally managed orchards on Natural England's PHI are present in MA02.

- two orchards, Bostock Road Orchards, listed on Cheshire Wildlife Trust's Traditional Orchard Inventory are located along Bostock Road. Greenhays Farm is inside, and Bank Farm is adjacent to the land required for the construction of the Proposed Scheme. The Phase 1 habitat survey describes the habitats as improved grassland with scattered broadleaved parkland trees;

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- Birch View Orchard listed on Cheshire Wildlife Trust's Traditional Orchard Inventory lies adjacent the land required for the construction of the Proposed Scheme on Hangman's Lane, south-east of Lostock Green. The Phase 1 habitat survey of this land recorded amenity grassland with scattered trees located throughout the land parcel. These are dominated by coniferous species and occasionally occurring *Prunus* sp., hazel and pedunculate oak. Introduced shrubs are located within the south-west of the land parcel. Wall cotoneaster (*Cotoneaster horizontalis*) is also present; and
- at Lea House Farm, adjacent to the land required for the construction of the Proposed Scheme, south-east of Clive Green, on Nantwich Road. A Phase 1 habitat survey recorded this area as amenity grassland with a number of mature scattered trees.

Scrub

- 2.3.34 Several small areas of scrub are present. Of those areas surveyed, woody species include hawthorn, willow, blackthorn, elder and bramble with common nettle and willow herb sp. dominant in the ground layer. There is 5.6ha of scrub habitat within the land required for the construction of the Proposed Scheme.

Hedgerows

- 2.3.35 In total, 88.9km of hedgerow habitat is present within the land required for the construction of the Proposed Scheme. This includes:
- 1.1km of intact species-rich hedgerow;
 - 28.1km of intact species-poor hedgerow;
 - 52m of defunct native species-rich hedgerow;
 - 5.0km of defunct species-poor hedgerow;
 - 2.1km of native species-rich hedgerow with trees;
 - 14.6km of species-poor hedgerow with trees; and
 - 37.9km of unsurveyed assumed intact species-rich hedgerow.
- 2.3.36 Hedgerows that comprise at least one woody UK native species (excluding honeysuckle and bramble, which are integral to many hedgerows) and having 80% or more cover, qualify as a HoPI. Typical woody species include pedunculate oak, hawthorn, holly, rose species, and hazel. Most of the arable and pasture fields are bordered by hedgerows.

Parkland and scattered trees

- 2.3.37 There are no large areas of parkland or scattered trees within MA02, but mature treelines are found at some field boundaries, and there are a number of mature scattered trees within agricultural land. Both broadleaved and coniferous trees are present, dominant species include sessile oak, pedunculated oak, ash, sycamore and willow. Where veteran or ancient trees are identified by field surveys or desk study they are reported in the Protected and Notable Flora BID, see Background Information and Data, BID EC-003-00001.

Grassland and marsh

- 2.3.38 The main grassland type in MA02 is improved grassland used for cattle grazing (282.9ha) and poor semi-improved grassland (91.4ha). Marshy grassland and semi-improved grassland areas are common along the banks of the Trent and Mersey Canal and Shropshire Union Canal (Middlewich Branch). The majority of these areas are adjacent to the land required for the construction of the Proposed Scheme.
- 2.3.39 Unimproved grasslands within the land required for the construction of the Proposed Scheme are found at the following locations:
- a small area of diverse unimproved neutral grassland is within the land required for the construction of the Proposed Scheme, adjacent to the Shropshire Union Canal (Middlewich Branch) LWS and SBI, north-east of Clive Green. Grasses include crested dog's tail (*Cynosurus cristatus*), creeping bent, perennial rye-grass, Yorkshire fog, Timothy and herbs including selfheal, common bird's-foot-trefoil, devils bit scabious (*Succisa pratensis*), common knapweed, yarrow, selfheal, marsh hawk's-beard (*Crepis paludosa*), betony (*Stachys officinalis*), tufted vetch and meadow buttercup. This vegetation qualifies as lowland meadow HoPI; and
 - a strip of unimproved neutral grassland running along the tow path adjacent to the Trent and Mersey Canal, south-west of Whatcroft. Common knapweed, bird's-foot-trefoil, red clover, white clover, meadow buttercup, meadowsweet, ribwort plantain, tufted hair-grass, creeping bent, germander speedwell and meadow crane's-bill (*Geranium pratense*) are present. This vegetation qualifies as lowland meadow HoPI.
- 2.3.40 Semi-improved grassland within the land required for the construction of the Proposed Scheme is present at the following locations:
- a strip of neutral semi-improved grassland located along the edge of the Shropshire Union Canal, adjacent to Wimboldsley Grange. Species include greater birds-foot-trefoil (*Lotus pedunculatus*), white dead-nettle (*Lamium album*), rough meadow grass (*Poa trivialis*), creeping bent, Yorkshire fog, false oat-grass, smooth meadow grass (*Poa pratensis*), crested dog's tail, Timothy, meadowsweet, purple-loosestrife (*Lythrum salicaria*), meadow crane's-bill, yarrow, amphibious bistort (*Persicaria amphibia*), cow parsley (*Anthriscus sylvestris*) and creeping thistle. Although moderately diverse, this grassland is insufficiently diverse to be a HoPI;
 - an intermittent, thin strip of neutral semi-improved grassland immediately adjacent to the Shropshire Union Canal (Middlewich Branch) LWS and SBI, adjacent to Wimboldsley Woods and the land required for the construction of the Proposed Scheme. Species include common knapweed, greater plantain, yarrow, perennial rye-grass, Yorkshire fog, crested dog's tail, common bent, germander speedwell, feather-mosses spp., scattered rosebay willowherb, white clover, creeping cinquefoil (*Potentilla reptans*), creeping buttercup, bush vetch, tufted vetch and lesser celandine. Although moderately diverse, this grassland is insufficiently diverse to be a HoPI;

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- large field of semi-improved neutral grassland, adjacent to the land required for the construction of the Proposed Scheme at Wallange Paddocks Farm, east of Clive Green. The grassland is comprised of red clover, white clover, common sorrel, creeping buttercup, cock's-foot and yarrow. This grassland is not a HoPI;
- small strip of semi-improved neutral grassland between two patches of improved grassland, at Bostock House Farm, Stanthorne. Species include bittercress (*Cardamine* sp.), mouse ear (*Cerastium fontanum*), creeping buttercup, Yorkshire fog, perennial rye-grass, white clover, lesser celandine, hogweed, red dead-nettle (*Lamium purpureum*), selfheal, lords and ladies, daffodil, willowherb. This grassland is not a HoPI;
- a large land parcel, covering land surrounding Bostock Hall, with semi-improved grassland lying within the land required for the construction of the Proposed Scheme. Species including large-leaved Timothy, meadow foxtail, creeping bent, red fescue, common knapweed, sweet vernal-grass, common bird's-foot trefoil, tormentil (*Potentilla erecta*) and red clover are present. Although moderately diverse, this grassland is insufficiently diverse to be a HoPI;
- a small area of damp semi-improved grassland within a field off Old Lane, north-west of Whatcroft, adjacent to the land required for the construction of the Proposed Scheme. Couch grass and reed canary-grass (*Phalaris arundinacea*) are abundant. Frequent species include cow parsley, perennial rye-grass and rosebay willowherb; and red deadnettle, creeping buttercup, creeping thistle, ash and oak sp. saplings are occasional. Although moderately diverse, this grassland is insufficiently diverse to be a HoPI;
- a strip of semi-improved grassland along the banks of the Trent and Mersey Canal, south of Davenham Road, within land required for the construction of the Proposed Scheme. Species include common knapweed, bent grass (*Agrostis* sp.), Yorkshire fog, bush vetch (*Vicia sepium*), germander speedwell, wild garlic and ribwort plantain. Although moderately diverse, this grassland is insufficiently diverse to be a HoPI;
- small field containing rank and unmanaged semi-improved, neutral grassland, along with areas of scrub and broadleaved trees, adjacent to Marshall's Gorse LWS. Species include frequent false oat-grass, red fescue and cock's-foot, occasional creeping thistle, spear thistle, ribwort plantain and dandelion agg. and rare tall fescue (*Festuca arundinacea*), soft rush, hard rush, wild angelica (*Angelica sylvestris*), cow parsley, common ragwort (*Senecio jacobaea*) and broadleaved dock. Although moderately diverse with ruderal species, this grassland is insufficiently diverse to be a HoPI; and
- a thin strip of semi-improved neutral grassland along the boundary of Rudheath Lime Beds LWS. The grassland is dominated by red fescue, with abundant common bent and frequently occurring creeping thistle, white clover, Yorkshire fog, creeping bent and false oat-grass. common nettle, perennial rye-grass, common ragwort, creeping buttercup, cock's-foot are occasionally present. This grassland is insufficiently diverse to be a HoPI.

2.3.41 Marshy grassland is localised and is present at the following locations within the land required for the construction of the Proposed Scheme:

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- marshy grassland, dominated by soft rush and surrounded by fields of improved grassland, south of Middlewich Road, A54, east of Clive. This grassland is not a HoPI;
- marshy grassland consisting entirely of soft rush with areas of standing water in a poorly drained field of improved grassland at Bank Hall Farm Flush LWS, adjacent to Bull's Wood and Meadow LWS. This grassland is not a HoPI;
- damp grassland dominated by soft rush and Italian rye-grass (*Lolium multiflorum*) adjoining a section of the Trent and Mersey Canal next to Whatcroft Lane. This grassland is not a HoPI;
- two areas of marshy grassland present east of the Trent and Mersey Canal, south of the Orchard Marina and Marshall's Gorse LWS. Species include bulrush (*Typha latifolia*), soft rush, Timothy, hard rush (*Juncus inflexus*), branched bur-reed (*Sparganium erectum*), meadow foxtail, willowherb sp., and compact rush. This marshy grassland is not a HoPI but is moderately diverse; and
- an area of marshy grassland around standing water and dominated by soft rush adjacent to the land required for the construction of the Proposed Scheme, at the junction of the A559 Manchester Road and A556 Shurlach Road. This grassland is not a HoPI.

Watercourses

2.3.42 Nine main watercourses are crossed by the Proposed Scheme:

- Shropshire Union Canal (Middlewich Branch) LWS is approximately 11m wide and runs adjacent to the land required for the construction of the Proposed Scheme from a tributary of River Weaver (Tributary of River Weaver 2) at the boundary of MA01 and MA02 to Clive Green Lane;
- River Wheelock, 6.6m wide, flows through agricultural fields and woodland blocks west of Middlewich, before passing beneath the A54, Middlewich Road;
- River Dane, up to 20.0m wide at some points and between 1.0m and 3.0m deep, the river intersects with the land required for construction of the Proposed Scheme three times and flows through agricultural land. The river is bordered along some sections by a thin strip of broadleaved woodland and is designated as a LWS;
- Trent and Mersey Canal, approximately 12m wide, intersects with the land required for construction of the Proposed Scheme three times, once south of Whatcroft and twice just north of Whatcroft. The canal runs through areas of agricultural land and bordered by linear neutral grassland and semi-natural broadleaved woodland with ash, sycamore, alder, hawthorn and ivy present. Sandstone blocks which edge the canal support occasional populations of Freiberg's screw-moss (*Tortula freibergii*) which is listed as a Section 41 priority species on the NERC Act;
- Puddinglake Brook at Whatcroft and largely bordered by broadleaved trees. It is approximately 1.5m wide and 0.1m deep. It runs through agricultural fields until it flows into the River Dane. Macrophyte surveys (BID EC-006-00001) recorded great willowherb (*Epilobium hirsutum*), duckweed (*Lemna minor*), brooklime (*Veronica beccabunga*) and branched bur-reed which are characteristic of eutrophic watercourses;

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- Gad Brook, approximately 1.5m wide, at Marshall's Gorse, a block of broadleaved woodland;
- Wade Brook, approximately 4m wide, is north of Lostock Green. It is bordered by broadleaved trees along its banks and flows through agricultural land before flowing into Wade Brook LWS. Macrophyte surveys (BID EC-006-00001) recorded common reed (*Phragmites australis*), reed canary grass, common duckweed and fool's water-cress (*Apium nodiflorum*);
- Peover Eye, up to 15m wide and 0.2m deep, flows through Winnington Wood AWI site, and confluences downstream with Smoker Brook. Macrophyte surveys (BID EC-006-00001) recorded common water-moss (*Fontinalis antipyretica*), water forget-me-not (*Myosotis scorpioides*) and common duckweed; and
- Smoker Brook, approximately 6m wide and 0.1m deep, flows through Leonard's and Smoker Wood LWS and AWI site, at Linnards Lane. Smoker Brook runs along the boundary between MA02 and MA03. Macrophyte surveys (BID EC-006-00001) recorded common water-moss, brooklime, reed canary grass, branched bur-reed and green algae (*Cladophora glomerata*) most abundantly.

2.3.43 Thirteen smaller watercourses were identified within the land required for the construction of the Proposed Scheme. They are mostly slow flowing watercourses associated with arable land with bank vegetation dominated by dense scrub:

- The Dingle, 1.5m wide and south of Wimboldsley Grange, flows through agricultural fields with a strip of broadleaved woodland along its banks;
- Tributary of River Weaver 4 passes through agricultural fields near Clive Green;
- Tributary of River Wheelock 5 flows through agricultural land and has scattered trees along its banks. It intersects, three times, with the land required for the construction of the Proposed Scheme;
- Birch Lane Drain intersects the land required for the construction of the Proposed Scheme once in an agricultural grassland in Stanthorne;
- Tributary of River Dane 3 flows from Bank Farm through a thin strip of broadleaved woodland;
- Tributary of River Dane 4 flows between two agricultural fields;
- Hill Wood Drain, east of Bostock Hall, flows through Hill Wood, and into agricultural land;
- Tributary of Trent and Mersey Canal flows through agricultural fields with scattered trees along its bank, before joining the canal east of Bostock Green;
- Tributary of Gad Brook 3 flows across the A530 at Marshall's Gorse;
- Broken Cross Drains intersects the land required for the construction of the Proposed Scheme, around the edges of the waste lime beds, and as the drains pass into agricultural fields;
- Square Wood Drains flow mainly through Square Wood, but also out into the surrounding agricultural land. Some of these drains are within and adjacent to the land required for the construction of the Proposed Scheme;

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- Tributary of Peover Eye, flows through AWI site Winnington Wood and downstream to confluence with Peover Eye; and
- Tributary of Smoker Brook 1 flows into Smoker Brook River at the boundary between MA02 and MA03.

2.3.44 The Tributary of the River Weaver, A556 Drainage and Griffiths Road Drain watercourses also lie adjacent to the land required for the construction of the Proposed Scheme.

Water bodies

2.3.45 The total number of ponds and ditches identified from aerial photography and OS maps within 500m of the area of land required for the construction of the Proposed Scheme is 464. This includes:

- seventy within the area of land required for the construction of the Proposed Scheme;
- one hundred and sixteen between 100m and the area of land required for the construction of the Proposed Scheme;
- one hundred and sixteen between 100m and 250m from the area of land required for the construction of the Proposed Scheme; and
- one hundred and sixty-two between 250m and 500m from the land required for the construction of the Proposed Scheme.

2.3.46 There were no ditch surveys carried out in MA02.

2.3.47 Large water bodies are present adjacent to the Trent and Mersey Canal of which some are connected to the canal. Areas of marginal vegetation border these water bodies, including a dense and well-developed reedbed with common reed and reedmace dominant.

2.3.48 The Willowbeds is a wetland area, adjacent to the land required for the construction of the Proposed Scheme, at Winsford Industrial Estate. It includes a number of associated drainage channels.

2.3.49 There is a network of offline drains at Lostock Green, which also includes drainage channels within Broken Cross/Waste Lime Beds to the west of the land required for construction of the Proposed Scheme. They run through areas of agricultural land and neutral, semi-improved grassland.

2.3.50 A cluster of ponds are present in the north of MA02, between the land required for construction of the Proposed Scheme and the Plumley Lime Beds SSSI, to the east of the Scheme. They are set within agricultural fields and adjacent to the Tributary of Peover Eye.

2.3.51 There is a large pond set within Billinge Green Farm Pond LWS, east of the land required for construction of the Proposed Scheme, along Davenhall Road.

2.3.52 Most water bodies within the land required for construction of the Proposed Scheme are ponds set within agricultural land or residential gardens. Ditches are typically associated with the watercourses.

Arable and cultivated land

- 2.3.53 Aerial imagery and Phase 1 habitat survey data indicates MA02 is dominated by arable fields with occasional hedgerows and trees. Arable land represents approximately 282.9ha of the land required for construction of the Proposed Scheme.

Buildings and structures

- 2.3.54 There are 12 isolated buildings and farmsteads within the land required for the construction of the Proposed Scheme.
- 2.3.55 There are concentrations of residential buildings at Clive Green, Clive, Bostock Hall, Rudheath, Lostock Green and Lostock Gram, either within or adjacent to the land required for the construction of the Proposed Scheme.

Pickmere to Agden and Hulseheath (MA03)

- 2.3.56 Approximately 68.7% of the land required for the construction of the Proposed Scheme was surveyed. Some surveys have also been undertaken within the 250m buffer zone.
- 2.3.57 Land within and adjacent to land required for construction of the Proposed Scheme includes Waterless Brook/Arley Brook. Habitats mainly consist of arable fields with strips of woodland along the banks of the watercourses that intersect with the land required for the construction of the Proposed Scheme.

Woodland

- 2.3.58 There are at least 24 woodland blocks and clusters scattered throughout, or directly adjacent to land required for construction of the Proposed Scheme in MA03¹². The total area of woodland within the land required for the construction of the Proposed Scheme is as follows:
- 11.7ha of semi-natural broadleaved woodland;
 - 1.1ha of plantation broadleaved woodland;
 - 0.1ha of plantation mixed woodland; and
 - 0.1ha of plantation coniferous woodland.
- 2.3.59 The woodland type with the largest area within the land required for the construction of the Proposed Scheme is semi-natural broadleaved woodland, which includes:

¹² Please note that the 24 blocks/clusters do not necessarily translate to 24 descriptions in the bullet lists below as some woodlands comprise more than one block/patch.

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- an area of broadleaved woodland surrounding a body of water, between Clay House Farm and Roses Farm, east of Pickmere. This may be lowland mixed deciduous woodland HoPI;
- Arley and Waterless Brook Corridor LWS and SBI, a narrow band of broadleaved semi-natural woodland running along edge of Waterless Brook/Arley Brook, and Tabley Brook, south-west of the junction of Pickmere Lane and Budworth Road. Tree and shrub species include ash, holly, hawthorn, pedunculate oak and alder. This qualifies as lowland mixed deciduous woodland HoPI;
- a block of deciduous woodland on the National Forest Inventory west of Arley and Waterless Brook Corridor LWS and SBI, at the junction of Frog Lane and Budworth Road. This woodland qualifies as lowland mixed deciduous woodland HoPI;
- a woodland along Colliers Lane, south of Bate Heath. A small strip is in the land required for construction of the Proposed Scheme. It may qualify as lowland mixed deciduous woodland HoPI;
- Bongs Wood and Rough LWS and SBI, east of Feldy, is intersected by the land required for the construction of the Proposed Scheme. It is also an AWI site and contains PAWS. It may qualify as a HoPI (either wet woodland or lowland mixed deciduous woodland);
- a number of small woodlands lie west of Belt Wood. One of these woodlands, south-west of Daisybank Farm, is ancient woodland identified by HS2 Ltd on the basis of heritage data. It may qualify as lowland mixed deciduous woodland HoPI;
- Belt Wood, a large block of broadleaved woodland, lies to the east of the Proposed Scheme, west of Mere, partially within the land required for the construction of the Proposed Scheme. Part of Belt Wood is an AWI site, it is also listed on the National Forest Inventory and as deciduous woodland on the Natural England PHI. The northern part of this woodland is mapped by Natural England as wood pasture and parkland priority habitat. The majority of this wood qualifies as lowland mixed deciduous woodland HoPI;
- several small blocks of broadleaved woodland containing ponds and set within agricultural fields are south and west of Belt Wood. They may qualify as lowland mixed deciduous woodland HoPI;
- a small block of wood partially within the land required for the construction of the Proposed Scheme, is located south of Peacock Lane in a field of improved grassland. The woodland is dominated by oak with frequent ash. The ground flora includes sedges, bluebell, cleavers, speedwell, Yorkshire fog, moss species, and common nettle. It qualifies as lowland mixed deciduous woodland HoPI;
- area of woodland at Broom Manor and running along the Tributary of Millington Clough 1 and Millington Clough, which form the boundary of MA03 and MA06, is partially within and adjacent to the land required for the construction of the Proposed Scheme. The woodland may qualify as lowland mixed deciduous woodland HoPI;
- a woodland block to the west of Broom Manor within the land required for construction of the Proposed Scheme and listed as an area of deciduous woodland PHI. The woodland is along the banks of Tributary of Millington Clough 2 and is dominated by oak with ash

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frequent. The ground flora include sedge sp., bluebell, cleavers, speedwell (*Veronica* sp.), Yorkshire fog, creeping soft-grass, lesser celandine and dog's mercury. This woodland is an AWI site. It qualifies as lowland mixed deciduous woodland HoPI;

- a small cluster of woodlands at Five Acres, on Back Lane, which lie within and adjacent to the land required for the construction of the Proposed Scheme. They may qualify as lowland mixed deciduous woodland HoPI;
- a strip of woodland along either side of the M56 embankment at the Agden Lane bridge containing broadleaved woodland listed on the National Forest Inventory, as well as a small section of conifer plantation. Non-conifer sections may qualify as lowland mixed deciduous woodland HoPI; and
- linear semi-natural broadleaved woodland along the banks of Agden Brook and partially within the land required for the construction of the Proposed Scheme. The woodland is dominated by alder, with abundant mature willow trees, pedunculate oak and ash; occasional beech and sycamore, and rare occurrences of holly. Deadwood is present and ground vegetation includes frequent common nettle and perennial rye-grass, occasional bluebell, ribwort plantain, cleavers and herb-robert (*Geranium robertianum*) and rarely recorded opposite-leaved golden saxifrage (*Chrysosplenium oppositifolium*). This woodland is wet woodland HoPI.

2.3.60 Included in the 24 blocks/clusters of woodland, there are seven semi-natural broadleaved woodlands located adjacent to the land required for the construction of the Proposed Scheme. These are:

- Neild's Rough, an area of deciduous woodland PHI adjacent to the Tributary of Tabley Brook at the intersection of the land required for construction of the Proposed Scheme and the M6 north-east of Knutsford. The woodland is dominated by oak sp., with abundant sycamore and frequently recorded ash and hawthorn. Willow species are occasional. This woodland qualifies as lowland mixed deciduous woodland HoPI;
- Tableypipe Wood LWS an area of deciduous woodland listed PHI, lies north of Over Tabley. This woodland may qualify as ancient woodland on the basis of heritage data analysed by HS2 Ltd. It may qualify as lowland mixed deciduous woodland HoPI;
- Square Wood, south-west of Mere, listed on the National Forest Inventory. It may qualify as lowland mixed deciduous woodland HoPI;
- woodland at Wrenshot House, situated on Wrenshot Lane, including large mature trees surrounding a large pond. Species include horse chestnut, alder, pedunculate oak, Norway maple (*Acer platanoides*) and cherry. Mainly ornamental, this woodland does not qualify as lowland mixed deciduous woodland HoPI;
- Park Covert LWS is an AWI site (PAWS), adjacent to High Legh Park Golf Club. It may qualify as lowland mixed deciduous woodland HoPI;
- a small block of woodland listed on the National Forest Inventory at Moss Lane Farm on Moss Lane. It may qualify as lowland mixed deciduous woodland HoPI; and
- Round and Rinks Wood LWS is PAWS woodland, named Round and Rinks Woods AWI site, and is either side of the A556 Chester Road and adjacent to the land required for the

construction of the Proposed Scheme. As broadleaved species are dominant, it may qualify as lowland mixed deciduous woodland HoPI.

Traditionally managed orchards

- 2.3.61 A traditionally managed orchard listed on Natural England's PHI is located adjacent to the land required for the construction of the Proposed Scheme at Pownall Green Farm, north-west of junction 19 of the M6. This orchard is also an unnamed potential local wildlife site.

Scrub

- 2.3.62 Several areas of scrub are present. Of those areas surveyed, woody species include hawthorn, willow, alder and elder with bramble, common nettle, thistle and rosebay willowherb as dominant species within the ground layer. Scrub habitat comprises 3.5ha within the land required for the construction of the Proposed Scheme.

Hedgerows

- 2.3.63 In total, 68.0km of hedgerow habitat is present within the land required for the construction of the Proposed Scheme. This includes:
- 1.3km of intact species-rich hedgerow;
 - 15.6km of intact species-poor hedgerow;
 - 208m of defunct native species-rich hedgerow;
 - 2.9km of defunct species-poor hedgerow;
 - 2.6km of native species-rich hedgerow with trees;
 - 10.8km of species-poor hedgerow with trees; and
 - 34.6km of unsurveyed assumed intact species-rich hedgerow.
- 2.3.64 Hedgerows that comprise at least one woody UK native species (excluding honeysuckle and bramble which are integral to many hedgerows) and having 80% or more cover, qualify as a HoPI. Typical woody species include pedunculate oak, hawthorn, holly, rose, alder and hazel. Most of the arable and pasture fields are bordered by hedgerows.

Parkland and scattered trees

- 2.3.65 Heyrose Golf Club lies partially within the land required for the construction of the Proposed Scheme, west of the M6 at Knutsford. There are large areas of predominantly broadleaved scattered trees, with occasional coniferous species include sycamore, willow sp., oak, silver birch and poplar.
- 2.3.66 Scattered trees, both introduced and native species, have been planted in the grounds of Mere Court Hotel, south-east of High Legh. Planted over large areas of amenity grassland. The majority of the trees present are mature specimens. Species include copper beech

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(*Fagus sylvatica 'purpurea'*), willow species, pedunculate oak, silver birch and sycamore, holly, yew, and Scots pine.

- 2.3.67 A small area of the land required for construction of the Proposed Scheme is in land mapped by Natural England as wood pasture and parkland priority habitat at Mere Old Hall. This location is near the junction of the A50 Warrington Road and the B5569 Chester Road. Improved grassland dominated by perennial rye-grass with scattered mature broad-leaved pedunculate oak, sycamore and other trees is present; none are ancient trees, but a small number of trees contained veteran features.
- 2.3.68 A further area of Mere Old Hall (west of the A50) and part of Mere New Hall (east of the B5569) are adjacent to the land required for the construction of the Proposed Scheme. These areas contain woodland and scattered trees. Several large, mature beech trees are present east of the gatehouse to the Golf Resort and Spa. Other areas are not accessible for survey.
- 2.3.69 There are no further large areas of parkland or scattered trees within MA03 but mature treelines, and scattered trees within hedgerows, are found at a large proportion of field boundaries. Both broadleaved and coniferous trees are present, dominant species include willow sp., pedunculate oak, ash, hawthorn, alder, sycamore and cherry. Where veteran or ancient trees are identified by field surveys or desk study they are reported in the Protected and Notable Flora BID, see Background Information and Data, BID EC-003-00001.

Grassland and marsh

- 2.3.70 The main grassland types in MA03 are improved grassland used for agricultural grazing (191.6ha) and poor semi-improved grassland (79.0ha). Improved grasslands typically comprise perennial rye-grass with a few additional species, such as white clover, dandelion, docks and plantains. Poor semi-improved grasses are slightly more diverse. They typically include the above species, but with additional species of grass such as red fescue, common bent, sweet vernal-grass and Timothy, and additional species of broad-leaved herb including buttercups (*Ranunculus* sp.), common mouse-ear and sometimes red clover and, at low frequency and abundance, vetches (*Vicia* sp.) and bird's-foot trefoil. The species recorded throughout these grasslands often indicate the use of fertilisers, which may have reduced the grassland species richness over time.
- 2.3.71 Semi-improved grassland within and adjacent to the land required for the construction of the Proposed Scheme is found at the following locations:
- multiple large fields of semi-improved neutral grassland south of the M6, surrounding Hollowood Farm and leading down to Heyrose golf course and across to Old Hall Lane. The majority of the fields are partially within the land required for the construction of the Proposed Scheme and are generally dominated by perennial rye-grass or Yorkshire fog, creeping thistle, common thistle and dock. Creeping buttercup is frequently observed, with occasional dandelion, soft rush and teasel (*Dipsacus fullonum*) and common knapweed rarely recorded. This grassland is insufficiently diverse to be a HoPI;

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- an area identified by Natural England's PHI as good quality semi-improved grassland adjacent to the land required for the construction of the Proposed Scheme, within Tableypipe Wood LWS. Tabley Brook runs through the grassland. As a precaution, this grassland is assumed to be a HoPI;
- north-west of Bucklow Hill, there is a strip of semi-improved neutral grassland along the southern boundary of a land parcel that falls entirely within the land required for the construction of the Proposed Scheme. The dominant and abundant species are false oat-grass, cock's-foot, perennial rye-grass and thistle with frequent white clover, common nettle and broadleaved dock. Redshank, knotgrass (*Polygonum* sp.), dandelion, meadow grass, Yorkshire fog, common ragwort and meadow foxtail are all occasional. Soft rush, rosebay willowherb and red campion occur rarely. This grassland is insufficiently diverse to be a HoPI; and
- a strip of semi-improved neutral grassland entirely within the land required for the construction of the Proposed Scheme on the southern boundary arable field between Hulseheath and Wrenshot House. It is dominated by false oat-grass and abundant cock's-foot, thistle sp., perennial rye-grass and frequent common nettle, white clover and broadleaved dock. A broad range of additional species are present including knotgrass, dandelion, meadow grass sp., Yorkshire fog, common ragwort, meadow foxtail. Soft rush, rosebay willowherb and red campion are all rare within the sward. This grassland is insufficiently diverse to be a HoPI.

2.3.72 Marshy grassland is present at the following locations:

- at land between Pickmere Lane and Budworth Road, with a marshy grassland habitat containing crested dog's tail, soft rush and hard rush. This grassland is insufficiently diverse to be a HoPI;
- surrounding a pond north of Five Acres on Back Lane. Species include couch grass, bulrush, soft rush and compact rush, the pond had a broad draw-down zone indicating a previously higher water level. This grassland is insufficiently diverse to be a HoPI;
- several locations at High Legh Park Golf Club, including within land that will be required for the construction of the Proposed Scheme. Bulrush is abundant with frequent soft rush also recorded. Northern marsh orchid (*Dactylorhiza purpurella*) is present within an area of marshy grassland adjacent to the land required for the construction of the Proposed Scheme. This grassland does not qualify as a HoPI but it contains notable, unimproved indicator species;
- surrounding a pond within fields of improved grassland, south of Middlemoss Farm on Agden Lane. Species included couch grass, bulrush, soft rush and compact rush. This grassland is insufficiently diverse to be a HoPI; and
- within fields of improved grassland, south of the M56 at Booth Bank Farm. The marshy grassland is dominated by soft rush and redshank (*Persicaria maculosa*). This grassland is insufficiently diverse to be a HoPI.

Watercourses

- 2.3.73 One main watercourse is crossed by the Proposed Scheme:
- Waterless Brook/Arley Brook, up to 6.0m wide/0.1m deep, intersects with the land required for construction of the Proposed Scheme south-east of the junction of Pickmere Lane and Budworth Road. A strip of broadleaved woodland running along the banks of the brook is designated as Arley and Waterless Brook Corridor LWS.
- 2.3.74 Twenty smaller watercourses¹³ were identified within the land required for the construction of the Proposed Scheme. They contain low water levels and are associated with arable land with bank vegetation dominated by scrub and scattered trees:
- Pickmere Lane Drain is adjacent to Pickmere Lane, north-east of Pickmere;
 - Tributary of Smoker Brook 2 intersects the land required for the construction of the Proposed Scheme twice;
 - Tributaries of Tabley Brook 2, 3, 4, 5, 6, 7, 8 and 9 are a network of small watercourses;
 - Tributary of Waterless Brook/Arley Brook 2 and 5 intersect before joining Waterless Brook/Arley Brook. Both tributaries;
 - Tributary of Tabley Brook 1 flows through the Heyrose Golf Course and then joins the Tabley Brook;
 - Tabley Brook intersect south of Budworth Road, west of Tabley Brook Farm;
 - Winterbottom Lane Drains intersects the land required for the construction of the Proposed Scheme adjacent to Daisybank Farm, north of Winterbottom and lie within agricultural fields;
 - Hulsheath Lane Drains and Chapel Lane Drain are adjacent west of Bucklow Hill; and
 - Tributary of Millington Clough 1 is near Broom Manor before joining with Millington Clough. Tributary of Millington Clough 2, 3 and 4 intersect and then join with Millington Clough.

Water bodies

- 2.3.75 The total number of ponds and ditches identified from aerial photography and OS maps within 500m of the land required for the construction of the Proposed Scheme is 592. This includes:
- one hundred and nine in the area of land required for the construction of the Proposed Scheme;
 - one hundred and sixty-nine between 100m and the area of land required for the construction of the Proposed Scheme;

¹³ Count of watercourses includes the listed watercourses but not the sub-watercourses making up the network (e.g. Tributaries of Tabley Brook = eight watercourses listed in a single bullet point).

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- one hundred and twenty-six between 100m and 250m from the area of land required for the construction of the Proposed Scheme; and
- one hundred and eighty-eight between 250m and 500m from the land required for the construction of the Proposed Scheme.

2.3.76 Ditch surveys were carried out in two locations:

- Tributary of Tabley Brook 2; and
- Tributary of Millington Clough 3.

2.3.77 Both ditches pass through arable fields and intersect with the land required for the construction of the Proposed Scheme. Both ditches are dry, therefore no further information was collected during the surveys.

2.3.78 Most water bodies within the land required for construction of the Proposed Scheme are ponds set within agricultural land or residential gardens, often surrounded by woodland copses. There are a small number of ponds associated with Heyrose Golf Club. Ditches are typically associated with the watercourses. There are no large ponds within or adjacent to the land required for construction of the Proposed Scheme in MA03.

Arable and cultivated land

2.3.79 Aerial imagery and Phase 1 habitat survey data indicates MA03 is dominated by arable fields with occasional hedgerows and trees. Arable land represents approximately 177.7ha of the land required for construction of the Proposed Scheme in this area.

Buildings and structures

2.3.80 There are seven isolated buildings and farmsteads within the land required for the construction of the Proposed Scheme. There are concentrations of residential buildings at Hoo Green that are either within or adjacent to the land required for the construction of the Proposed Scheme.

Broomedge and Glazebrook (MA04)

2.3.81 Approximately 64.3% of the land required for the construction of the Proposed Scheme was surveyed. Some surveys have also been undertaken within the 250m buffer zone.

2.3.82 Land within and adjacent to the boundary of land required for construction of the Proposed Scheme includes the Manchester Ship Canal, Red Brook, the River Bollin and the Bridgewater Canal. Habitats are mainly comprised of arable and pasture fields with small, isolated areas of marshy grassland. Broadleaved woodland is scarce in the survey area and one AWI site is present at Coroners Wood, which is west of Partington and directly south of the Manchester Ship Canal.

Woodland

- 2.3.83 There are at least 16 woodland blocks and clusters scattered throughout, or directly adjacent to land required for construction of the Proposed Scheme in MA04¹⁴. The total area of woodland within the land required for the construction of the Proposed Scheme is as follows:
- 18.0ha of semi-natural broadleaved woodland;
 - 0.4ha of plantation mixed woodland; and
 - 0.3ha of plantation coniferous woodland.
- 2.3.84 The woodland type with the largest area within land required for the construction of the Proposed Scheme is semi-natural broadleaved woodland which includes:
- Fox Covert and Meadows SBI, north-east of the village of Heatley. It is adjacent to and partially within the land required for construction of the Proposed Scheme. A diverse canopy of eight species of broadleaved trees is present, including abundant sycamore and oak with goat willow, rowan, beech, horse chestnut and wild cherry also present. This qualifies as lowland mixed deciduous woodland HoPI;
 - an unnamed woodland adjacent to the A6144 Paddock Lane at Mossbrow. Species recorded include abundant willow species, ash and occasional sweet chestnut surrounding a shallow, seasonal pond. This habitat may qualify as wet woodland HoPI;
 - Coroners Wood SBI is an AWI site located west of Partington. The open, 15m high canopy is dominated variously by sycamore coppice and standard trees including ash, pedunculate oak and sycamore, and occasional semi-mature pedunculate oak. The understorey includes frequent crack willow, ash, hawthorn, wild cherry and hazel, and the rarely recorded wild service tree (*Sorbus torminalis*). The ground flora is dominated by common nettle and bramble, with frequent ivy and red campion, Himalayan balsam and occasional hogweed. Rarely recorded species include male fern, upright hedge-parsley (*Torilis japonica*), lords-and-ladies, hedge woundwort (*Stachys sylvatica*) and herb-robert. This woodland qualifies as lowland mixed deciduous woodland HoPI;
 - broadleaved woodland, listed on the National Forest Inventory, and part mapped as a deciduous woodland in Natural England's PHI, is present on both sides of the Manchester Ship Canal. It consists of abundant sycamore, frequent ash and willow and occasional oak and birch species. It qualifies as lowland mixed deciduous woodland HoPI;
 - two areas of broadleaved semi-natural woodland within a disused campsite at Glazebrook, south-west of Bank Street. Both are listed on the National Forest Inventory, and part of the habitat, as deciduous woodland in Natural England's PHI. The southern block consists of abundant mature scattered hawthorn with occasional semi-mature pedunculate oak present at the woodland margins. Within the northern block, mature

¹⁴ Please note that the 16 blocks/clusters do not necessarily translate to 16 descriptions in the bullet lists below as some woodlands comprise more than one block/patch.

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trees are predominantly restricted to the boundaries and the northwest of the wood, which lies within the land required for the construction of the Proposed Scheme. Species include frequent sycamore, silver birch, willow species, ash, pedunculate oak, hawthorn, hazel. Bramble and young trees are dominant in the understorey. In drier areas, the ground flora includes common nettle and red campion, with occasional tufted hair-grass, foxglove (*Digitalis purpurea*) and hedge woundwort. In wetter areas it is dominated by Himalayan balsam, great willowherb, with locally dominant water mint (*Mentha aquatic*), yellow flag iris (*Iris pseudacorus*), and fern and rush species. The occasional garden escape is also present within the woodland, including cotoneaster (*Cotoneaster* sp.), *rhododendron* sp., redcurrant (*Ribes rubrum*) and lily of the valley (*Convallaria majalis*). The bulk of the vegetation present in this location is dense scrub/verging on young woodland with open glades. Aerial photography indicates that this mosaic vegetation has become markedly less open and more scrub-dominated in the past five years. Open habitat species present within the land required for construction of the Proposed Scheme include several mosses, frequent chickweed, opposite-leaved golden saxifrage, and perforate St John's-wort (*Hypericum perforatum*), abundant biting stonecrop (*Sedum acre*), mouse-ear hawkweed (*Pilosella officinarum*) and occasional wild basil (*Clinopodium vulgare*), stands of bracken and green field speedwell (*Veronica agrestis*). Semi-improved neutral grassland is also present here, in open areas and along woodland rides, with frequent spurge (*Euphorbia peplus*) and occasional shepherd's purse and common ragwort recorded. Tansy and goldenrod (*Solidago* sp.) are rarely present. This mosaic of woodland, dense scrub and grassland may qualify as open mosaic on previously developed land HoPI (see paragraph 2.3.90); and

- Glazebrook Moss potential local wildlife site, listed as deciduous woodland in the Natural England PHI, is located north-east of Glazebrook. The linear woodland contains silver birch, elder and rowan and Himalayan balsam and willowherb species. It qualifies as lowland mixed deciduous woodland HoPI.

2.3.85 Included in the approximately 16 blocks/clusters of woodland, there are also six semi-natural broadleaved woodlands located adjacent to the land required for the construction of the Proposed Scheme:

- a small area of woodland east of Heatley and due north of Wet Gate Farm. The wood is dominated by pedunculate oak with occasional ash, grey willow and sycamore. It has a ground flora with frequent Himalayan balsam. It may qualify as lowland mixed deciduous woodland HoPI. This woodland is ancient woodland on the basis of the heritage review undertaken by HS2 Ltd;
- willow-dominated broadleaved woodland adjacent to the River Bollin. Oak and silver birch are frequently present and with limited understorey and ground layer. Open areas are dominated by either Himalayan balsam, willowherb species or common nettle, the former concentrated on the banks of the River Bollin. Giant hogweed is also present. This woodland may qualify as wet woodland HoPI;

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- a block of broadleaved woodland east of Warburton Park, south of the Manchester Ship Canal and listed on the National Forest Inventory. This woodland may qualify as lowland mixed deciduous woodland HoPI;
- broadleaved semi-natural woodland on the south bank of the Manchester Ship Canal at Partington. The canopy is dominated by sycamore, with silver birch, pedunculate oak, goat willow and ash also present. The understorey includes hawthorn, ash seedlings, hazel, dogwood (*Cornus sanguinea*), and, rarely, elder, cherry seedlings, dog-rose, lilac (*Syringa vulgaris*), grey willow, damson, wild cherry and holly. The ground flora includes abundant ivy, locally frequent bramble and occasional common nettle, cleaver and cow parsley. Bracken (*Pteridium aquilinum*), hop (*Humulus lupulus*), and wood avens are rare. This woodland qualifies as lowland mixed deciduous woodland HoPI; and
- an unnamed woodland on the north bank of the Manchester Ship Canal at Cadishead. Species recorded include abundant sycamore with frequent ash, willow, and occasional oak and silver birch. This woodland qualifies as lowland mixed deciduous woodland HoPI.

2.3.86 A small area of broadleaved plantation woodland, due west of the A6144 Paddock Lane and east of Mossbrow, lies partially within the land required for the construction of the Proposed Scheme. Sycamore and willow species are abundant, with frequent ash and pedunculate oak. Elder, sweet chestnut and silver birch are all occasional. It may qualify as lowland mixed deciduous woodland HoPI.

2.3.87 A block of plantation mixed woodland, listed on Natural England's PHI as deciduous woodland, is located directly north of the A57 Cadishead Way, north of the Manchester Ship Canal. It is partly within the land required for the construction of the Proposed Scheme. It is predominantly broadleaved with frequent lime species and occasional conifers, ash, sycamore, horse chestnut and silver birch. Rowan, field maple (*Acer campestre*), hazel, hawthorn, blackthorn, conifer species, pedunculate oak saplings, beech and cherry species are all infrequent. A sparse understorey layer is present with few tree saplings and bramble. The ground layer is predominantly bare ground with occasional common nettle, herb-robert and field horsetail (*Equisetum arvense*). This woodland has the even-aged structure of a plantation and does not qualify as lowland mixed deciduous woodland HoPI.

Traditionally managed orchards

2.3.88 Two traditionally managed orchards listed on Natural England's PHI are located within the village of Mossbrow at Onion Farm and Villa Farm and are surrounded by (but not within) land required for construction of the Proposed Scheme. A Phase 1 habitat survey of these orchards recorded scattered fruit trees including, apple (*Malus domestica*), plum (*Prunus domestica*) and walnut (*Juglans regia*). The associated grassland had been mown and is poor semi-improved grassland with dominant Yorkshire fog, occasional yellow oat-grass (*Trisetum flavescens*), dandelion and broadleaved dock. These orchards are likely to qualify as traditional orchard HoPI.

Scrub

- 2.3.89 Small areas of scrub are distributed throughout MA04, accounting for 2.6ha within the land required for construction of the Proposed Scheme. Analysis of aerial photography indicated that this habitat is scarce in agricultural land between Warburton and Partington. Where present, bramble and willow sp. are the most frequently recorded species.
- 2.3.90 Habitats that may be representative of open mosaic habitat on previously developed land HoPI are present at a disused campsite, partly within the land required for the construction of the Proposed Scheme, adjacent to Bank Street south of Glazebrook. The vegetation is dense scrub/young woodland with open grassy glades. It is described in paragraph 2.3.84.

Hedgerows

- 2.3.91 In total, 31.7km of hedgerow habitat is present within the land required for the construction of the Proposed Scheme. This includes:
- 44m of intact species-rich hedgerow;
 - 10.0km of intact species-poor hedgerow;
 - 1.2km of defunct species-poor hedgerow;
 - 363m of native species-rich hedgerow with trees;
 - 3.5km of species-poor hedgerow with trees; and
 - 16.6km of unsurveyed assumed intact species-rich hedgerow.
- 2.3.92 Hedgerows that comprise at least one woody UK native species (excluding honeysuckle and bramble which are integral to many hedgerows) and having 80% or more cover, qualify as a HoPI. Typical woody species include pedunculate oak, hawthorn, holly, rose species, alder and hazel. Most of the arable and pasture fields are bordered by hedgerows.

Grassland and marsh

- 2.3.93 The main grassland types in MA04 are improved grassland (70.6ha) or poor semi-improved grassland (41.7ha). Improved grasslands typically comprise perennial rye-grass with a few additional species, such as white clover, dandelion, docks and plantains. Poor semi-improved grasses are slightly more diverse. They typically include the above species, but with additional species of grass such as red fescue, common bent, sweet vernal-grass and Timothy; additional species of broad-leaved herb including buttercups (*Ranunculus* sp.), common mouse-ear and sometimes red clover and at low frequency and abundance vetches (*Vicia* sp.) and bird's-foot trefoil. The species recorded throughout these grasslands often indicate the use of fertilisers or seeding with agricultural species.
- 2.3.94 Semi-improved neutral grassland is present partly within the land required for the construction of the Proposed Scheme, directly south of Spring Lane, approximately 0.3km north of the Bridgewater Canal. It is dominated by perennial rye-grass with occasional to frequent white clover, cock's-foot, yarrow, creeping buttercup, horsetail, creeping thistle,

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black medick, ribwort plantain, red fescue, common bent and ragwort species *Senecio* sp. Although moderately diverse, this grassland is insufficiently diverse to be a HoPI.

2.3.95 Grassy, open habitat is present at a former campsite near Glazebrook, where there is also woodland and scrub in an area that may qualify as open mosaic on previously developed land HoPI (see paragraph 2.3.84). Open habitat species present within the land required for construction of the Proposed Scheme include several mosses, frequent chickweed, opposite-leaved golden saxifrage, and perforate St John's-wort, abundant biting stonecrop, mouse-ear hawkweed and occasional wild basil, stands of bracken and green field-speedwell.

2.3.96 Marshy grassland occurs in the following locations:

- adjacent to the River Bollin and the land required for the construction of the Proposed Scheme at Heatley. The area is dominated by common reed with occasional Himalayan balsam, purple loosestrife (*Lythrum salicaria*), marsh willowherb (*Epilobium palustre*) and common nettle. An adjoining field, adjacent to the land required for the construction of the Proposed Scheme is dominated by common reed with frequent perennial rye-grass, compact rush and couch grass present in drier areas. This vegetation does not qualify as a HoPI but is moderately diverse swamp/grassland habitat;
- west of Fox Covert, Heatley, due west of the Old River Bollin and is within the land required for construction of the Proposed Scheme. It is listed by Natural England's PHI as good quality semi-improved grassland and is dominated by common reed with abundant soft rush, frequent tufted hair-grass, meadowsweet, horsetail species (*Equisetum* sp.) and occasional amphibious bistort. Marginal vegetation is dominated by Himalayan balsam and common nettle, with frequent broad-leaved dock, hogweed and cow parsley and occasional soft-shield fern (*Polystichum setiferum*). This vegetation does not qualify as a HoPI but is moderately diverse swamp/grassland habitat;
- at Glazebrook, south of the Liverpool to Manchester Line (via Warrington Central) and is within the land required for the construction of the Proposed Scheme. Soft rush, common bent and broad-leaved willowherb (*Epilobium montanum*) are present. This vegetation does not qualify as a HoPI; and
- within pasture adjacent to Holcroft Moss and dominated by soft rush. This vegetation does not qualify as a HoPI.

Watercourses

2.3.97 The five main watercourses that are crossed by the Proposed Scheme are:

- Bridgewater Canal, approximately 15m wide, crosses between arable fields and connects Runcorn to Manchester and Leigh. Sandstone blocks which edge the canal support occasional populations of Freiberg's screw-moss;
- River Bollin, approximately 8.0m wide/1.0m deep, flowing through arable fields, improved grassland and broadleaved semi-natural woodland. The bankside vegetation on the northern bank is mostly tall ruderal habitat. Himalayan balsam and common nettle are abundant, with frequent common hogweed. Japanese knotweed (*Fallopia*

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japonica) and giant hogweed (*Heracleum mantegazzianum*) are present. Aquatic macrophyte surveys (BID EC-006-0001) recorded long-beaked water feather-moss (*Platyhyphnidium riparioides*), spiked water-milfoil (*Myriophyllum spicatum*), fennel pondweed (*Potamogeton pectinatus*) and water pepper (*Persicaria hydropiper*) most abundantly. This river may qualify as river HoPI;

- Old Bollin, approximately 1.5m wide, flowing through improved grassland and an area of marshy grassland. Tall ruderal species present along the stream margins include Himalayan balsam, great willowherb, common nettle and common hogweed;
- Red Brook, approximately 5m wide, flows along a strip of semi-natural ancient woodland within Millbank Hall Woodland LWS. This river may qualify as river HoPI; and
- Manchester Ship Canal, also known as the River Mersey, approximately 70m wide, between Hollins Green and Cadishead. It flows between areas of species-poor semi-improved grassland. The banks on the southern side of the canal are heavily vegetated with broadleaved trees.

2.3.98 Ten smaller watercourses were identified in the land required for the construction of the Proposed Scheme. They are mostly shallow flowing watercourses associated with arable land with bank vegetation dominated by dense bramble and gorse scrub:

- Agden Lane Road Drain 1, south of Bridgewater Canal, ditch running parallel to a hawthorn hedgerow, adjacent to improved grassland;
- Tributary of Agden Brook 1, running parallel to an arable field hawthorn hedgerow;
- Helsdale Brook intersects beneath Bradshaw Lane, south-east of Oughtrington;
- Tributary of Old Bollin, flows through broadleaved woodland, marshy grassland and arable fields. A strip of tall dense ruderal species is along the banks of the tributary including Himalayan balsam, hogweed, dock species and common nettle;
- Carrgreen Lane Drains is north-east of Heatly;
- Tributary of Manchester Ship Canal 2, known as Warburton Park Brook intersects the land required for the construction of the Proposed Scheme twice;
- Field Drains A6144 Paddock Lane run through arable fields north of Mossbrow. Several patches of tall ruderal vegetation including frequently occurring thistle species, common nettle, Himalayan balsam and dock species;
- Tributary of Glazebrook 1, known as Hollins Green Brook has banks which are heavily vegetated with trees such as mature sycamore and willow with a ground flora dominated by Himalayan balsam;
- Dam Head Drains, a wet ditch 0.5m wide and approximately 0.1m deep. Bank vegetation is comprised of rosebay willowherb, honeysuckle, common nettle, cleavers and Yorkshire-fog. Towards the north-east end, the drain is dry and densely vegetated. Towards the south-east section, the drain opens up into an area of dominated by rushes and pondweed (*Potamogeton* sp.); and
- Tributary of Glaze Brook 2, mainly small drains or ditches associated with agricultural fields.

Water bodies

- 2.3.99 The total number of ponds and ditches identified from aerial photography and OS maps within 500m of the area of land required for the construction of the Proposed Scheme is 121. This includes:
- eighteen within the area of land required for the construction of the Proposed Scheme;
 - thirty-eight between 100m and the area of land required for the construction of the Proposed Scheme;
 - nineteen between 100m and 250m from the area of land required for the construction of the Proposed Scheme; and
 - forty-one between 250m and 500m from the land required for the construction of the Proposed Scheme.
- 2.3.100 Ditch surveys were carried out at a single location:
- Tributary of Glaze Brook 1. This ditch passes through arable fields and under Dam Head Lane, which is within the land required for construction of the Proposed Scheme. However, the ditch is dry and does not support aquatic vegetation.
- 2.3.101 Small water bodies are present throughout the survey area, many are within the land required for construction of the Proposed Scheme between Mossbrow and Warburton Park. Most are agricultural land or residential gardens, and the majority are at field margins with surrounding trees and connecting to species-poor hedgerows. The majority of ditches cross arable farmland and ultimately drain into the Manchester Ship Canal. In addition, a network of ditches that flow into the River Bollin are present in the land required for construction of the Proposed Scheme around Fox Covert, and between Hollins Green and to the west of Glazebrook.

Arable and cultivated land

- 2.3.102 MA04 is dominated by arable fields with occasional hedgerows and trees. Arable land represents approximately 134ha of the land required for construction of the Proposed Scheme.

Buildings and structures

- 2.3.103 There are 15 isolated buildings and farmsteads within the land required for the construction of the Proposed Scheme.
- 2.3.104 There is a concentration of residential buildings at Hollins Green directly adjacent to the land required for the construction of the Proposed Scheme with further areas of residential buildings at Cadishead and Partington within 100m of the land required for construction of the Proposed Scheme.

Risley to Bamfurlong (MA05)

- 2.3.105 Approximately 77.4% of the area of land required for the construction of the Proposed Scheme was surveyed. Some surveys have also been undertaken within the 250m buffer zone.
- 2.3.106 Land within and adjacent to land required for construction of the Proposed Scheme includes Holcroft Lane Brook, Carr Brook, Small Brook, Windy Bank Brook, Nan Holes Brook, Hey Brook, Coffin Lane Brook and the Leeds and Liverpool Canal. The area includes urban and suburban parts of Warrington, Culcheth, Golborne, Ashton-in-Makerfield and Wigan. The other dominant land use in the Risley to Bamfurlong community area is intensive agriculture. Broadleaved woodland is scattered within the survey area; however, no AWI sites are present within the land required for the construction of the Proposed Scheme in MA05.

Woodland

- 2.3.107 There are at least 29 woodland blocks and clusters scattered throughout, or directly adjacent to, the land required for the construction of the Proposed Scheme in MA05¹⁵. The total area of woodland within the land required for the construction of the Proposed Scheme is as follows:
- 12.9ha of semi-natural broadleaved woodland;
 - 0.4ha of semi-natural mixed woodland;
 - 2.7ha of plantation broadleaved woodland;
 - 6.3ha of plantation mixed woodland; and
 - 0.6ha of plantation coniferous woodland.
- 2.3.108 The woodland type with the largest area within land required for the construction of the Proposed Scheme is semi-natural broadleaved woodland, which includes:
- several small blocks which are listed as deciduous woodland on Natural England's PHI in Holcroft Moss SSSI, and Woods by Holcroft Moss LWS. They are partly in and adjacent to the land required for the construction of the Proposed Scheme. South of the M62, open broadleaved semi-natural woodland is dominated by birch and willow species with infrequent hawthorn, elder and ivy-covered trees. The ground flora is sparse and dominated by bramble and common nettle, as well as occasional ivy and soft shield-fern. Male fern, common polypody (*Polypodium vulgare*) and dog-rose occur rarely. Rough-stalked feather-moss (*Brachythecium rutabulum*), common tamarisk-moss (*Thuidium tamariscinum*) and elegant silk-moss (*Pseudotaxiphyllum elegans*) are occasionally present. This qualifies as wet woodland HoPI;

¹⁵ Please note that the 29 blocks/clusters do not necessarily translate to 29 descriptions in the bullet lists below as some woodlands comprise more than one block/patch.

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- North of the M62 in the Woods by Holcroft Moss LWS, the woodland comprises abundant English elm, frequent young silver birch, grey willow, and occasional elder and hawthorn. The ground flora comprises frequent male fern and occasional broad buckler-fern. Bramble, hart's-tongue fern (*Asplenium scolopendrium*), soft rush, Himalayan balsam and wood-spurge (*Euphorbia amygdaloides*) occur rarely. The bryophyte layer comprises elegant silk-moss and rough-stalked feather-moss. These woodlands are lowland mixed deciduous woodland HoPI;
- woodland in Gorse Covert Mounds LWS, mapped by Natural England as deciduous woodland HoPI or 'no main habitat but additional habitats present', is partly within the land required for the construction of the Proposed Scheme. Areas within the land required for construction of the Proposed Scheme include silver birch, goat willow, rowan with a species-poor ground flora consisting of common nettle, bramble and Himalayan balsam. Some of this woodland is likely planted but it has a semi-natural character and qualifies as lowland mixed deciduous woodland HoPI, some may qualify as wet woodland HoPI;
- a small area inside the land required for the construction of the Proposed Scheme at the east end of Silver Lane Ponds LWS. It contains frequent willow with occasional silver birch and alder. It qualifies as wet woodland HoPI;
- a block listed on the National Forest Inventory, and Natural England's PHI, is between the A574 Warrington Road and Taylor Business Park at Culcheth and partly inside the land required for construction of the Proposed Scheme. The canopy is comprised of oak sp., hawthorn, willow sp., and birch sp. and holly. Bramble, rosebay willowherb and common nettle make up the ground layer. This wood is relatively species-poor but is lowland mixed deciduous woodland HoPI;
- an area mapped by Natural England as deciduous woodland in the PHI is present in Culcheth Linear Park, that runs for approximately 3km along a dismantled railway line from south-east Culcheth up to the Liverpool to Manchester Line (Chat Moss). A second area of woodland is present between the railway and the A580 East Lancashire Road. These woodlands comprise abundant semi-mature hawthorn and pedunculate oak with less abundant ash and sycamore. The majority of the woodland is adjacent to the land required for the construction of the Proposed Scheme but within it in the vicinity of Wigshaw. These woodlands are relatively young, secondary woodlands but qualify as lowland mixed deciduous woodland HoPI;
- mature woodland at Eleven Acre Common LWS, of which the north-western part is within the land required for the construction of the Proposed Scheme, is dominated by mature pedunculate oak and sycamore. The southern part includes mature and immature oak sp. and a large clonal patch of aspen (*Populus tremula*). The ground flora is dominated by ivy and common nettle, with rare occurrences of fern and sedge species. Himalayan balsam is present on northern part. This wood is lowland mixed deciduous woodland HoPI;
- a block of woodland listed on the National Forest Inventory, north-west of Lowton Common contains oak sp. alder, horse chestnut and blackthorn. There is no understorey,

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and the ground layer is either bare or dominated by common nettle. This wood is relatively species-poor but is a lowland mixed deciduous woodland HoPI;

- a large area adjacent to the land required for the construction of the Proposed Scheme, west of the existing WCML, south of Bryn Gates. This wood may qualify as lowland mixed deciduous woodland HoPI;
- a large area east of the WCML and west of the Leeds and Liverpool Canal, south of Bamfurlong, which is partly in the land required for the construction of the Proposed Scheme. This wood may qualify as lowland mixed deciduous woodland HoPI; and
- a small area at Bamfurlong Hall Farm (between Lily Lane, Abram Flashes LWS and the WCML), comprising frequent willow sp. and occasional ash and birch sp. The ground layer is a mosaic of bare ground and scrub dominated by bramble and tall ruderal vegetation. This woodland is wet woodland HoPI.

2.3.109 Included in the approximate 29 blocks/clusters of woodland, there are also six semi-natural broadleaved woodlands located adjacent to the land required for the construction of the Proposed Scheme:

- Ferndale Mews Orchard, east of Holcroft Moss, adjacent to the land required for the Proposed Scheme, is identified as traditionally managed orchard on Natural England's PHI. However, a Phase 1 habitat survey identified semi-natural broadleaved woodland comprised of mature and semi-mature trees, across the majority of the land. It may qualify as lowland mixed deciduous woodland HoPI;
- a large block adjacent to the south-west of Silver Lane Ponds LWS with a canopy of approximately 5m dominated by ash, elder, alder, hawthorn and locally dominant pedunculate oak. The understorey is dominated by Himalayan balsam, with abundant common nettle, locally dominant bramble, and rarely present wood millet. The wood contains frequent non-native ground flora species but qualifies as lowland mixed deciduous woodland HoPI;
- Little Covert, surrounding a residential dwelling at Kenyon, adjacent to the Liverpool to Manchester Line (Chat Moss). The woodland is dominated by sycamore and ash, with occasional beech, horse chestnut, pedunculate oak and hazel. A partially developed under canopy and a ground layer of ivy is present. This wood is relatively species-poor but qualifies as lowland mixed deciduous woodland HoPI;
- an area mapped by Natural England's PHI as deciduous woodland, west of where Nan Holes Brook crosses the WCML where there is industrial land/mineral extraction. Semi-mature trees are present in areas of lower ground with younger trees apparently planted on an old, excavated material heap. Silver birch dominates, with pedunculate oak, rowan, goat willow, ash, common alder and grey willow all present but rarely. Himalayan balsam is present throughout the woodland. Invasive species wall cotoneaster and Japanese knotweed are also present. This wood is relatively species-poor and young but qualifies as lowlands mixed deciduous woodland HoPI;
- linear semi-mature woodland between Bamfurlong and the Leeds and Liverpool Canal (Leigh Branch). The canopy comprises sycamore, alder, willow sp., oak sp., horse

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chestnut and birch sp. Hawthorn, hazel, cherry and elder forms a well-developed understorey. This wood qualifies as lowland mixed deciduous woodland HoPI;

- broadleaved semi-natural woodland adjacent to the land required for construction of the Proposed Scheme, on both the east and west sides of the WCML north of Bamfurlong. This woodland has frequent sycamore, alder, willow and oak sp. and qualifies as lowland mixed deciduous woodland HoPI; and
- broadleaved semi-natural woodland on the southern and eastern boundaries of Bryn and Ince Moss SSSI. It may qualify as lowland mixed deciduous woodland HoPI.

- 2.3.110 An area of newly planted broadleaved woodland is present at Silver Lane Ponds LWS. The northern part of the plantation is in the land required for construction of the Proposed Scheme. Oak sp., ash, birch sp., Scot's pine and hawthorn are all recorded, with a ground layer of occasional rosebay willowherb and horsetail species and frequent common reed. Semi-mature plantation broadleaved woodland extends from the north-east of the Silver Lane Ponds LWS, along arable field edges and a disused railway line. Scot's pine, alder, cherry, rowan, elder, oak, willow and sycamore are frequent, and the ground layer is dominated by bramble. This woodland is of planted origin and is not semi-natural in composition. It does not qualify as lowland mixed deciduous woodland HoPI.
- 2.3.111 A broadleaved plantation, north of a dismantled railway, Windy Bank Brook and between the A573 Wigan Road and Crankwood is listed is mapped by Natural England as deciduous woodland PHI. It is partly in the land required for the construction of the Proposed Scheme. The woodland is of uniform age and height with abundant oak sp. and frequent ash and willow sp. No understorey is present. A sparse ground flora is present comprising grass and ruderal species. This woodland is of planted origin and is not semi-natural in composition. It does not qualify as lowland mixed deciduous woodland HoPI.
- 2.3.112 A large Forestry Commission community woodland, Byrom Wood, is present west of Pennington Flash SBI is within the land required for the construction of the Proposed Scheme. It is mixed plantation woodland with a diverse mixture of young to semi-mature, trees comprising willow, pedunculate oak, Scot's pine, hawthorn, beech, hazel, silver birch and ash. Densely planted, it has little ground flora but contains several scattered water bodies. This woodland does not qualify lowland mixed deciduous woodland HoPI yet, owing to its recent plantation origin. It may qualify in the future should it mature and attain semi-natural characteristics.
- 2.3.113 A section of Viridor Wood, south-east of Bryn Gates Forestry Commission managed wood, runs adjacent to the WCML. The area adjacent to the land required for the construction of the Proposed Scheme is predominantly a mixed plantation woodland. It does not qualify as lowland mixed deciduous woodland HoPI as it is a plantation.

Scrub

- 2.3.114 Scrub is widely distributed at low abundance throughout the survey area along field margins. A large area of dense bramble scrub is present on a former landfill site at Risley,

and frequent dense and scattered scrub along field margins dominated by willows, bramble and common hawthorn are also recorded. A further large area of dense scrub is present east of the WCML, south of Bamfurlong (no access was available for survey). Scrub habitat comprises 7.4ha within the land required for the construction of the Proposed Scheme.

Hedgerows

- 2.3.115 In total, 41.9km of hedgerow habitat is present within the land required for the construction of the Proposed Scheme. This includes:
- 760m of intact species-rich hedgerow;
 - 5.2km of intact species-poor hedgerow;
 - 251m of defunct native species-rich hedgerow;
 - 2.2km of defunct species-poor hedgerow;
 - 109m of native species-rich hedgerow with trees;
 - 2.1km of species-poor hedgerow with trees; and
 - 31.3km of unsurveyed assumed intact species-rich hedgerow.
- 2.3.116 Most hedgerows recorded by field surveys are species-poor intact hedges. Phase 1 habitat surveys revealed that common hawthorn, willow and sycamore are dominant, with elder found occasionally. Approximately one third of hedgerows encountered during field surveys contained mature trees with pedunculate oak, sessile oak and ash all frequent.
- 2.3.117 Hedgerows that comprise at least one woody UK native species (excluding honeysuckle and bramble which are integral to many hedgerows) and having 80% or more cover, qualify as a HoPI. Typical woody species include pedunculate oak, hawthorn and hazel. Most of the arable and pasture fields are bordered by hedgerows.

Parkland and scattered trees

- 2.3.118 There are no large areas of parkland or scattered trees within MA05, but mature treelines are found at some field boundaries which include defunct/former hedgerows and veteran trees. Both broadleaved and coniferous trees are present, dominant species include willow, pedunculated oak, ash, alder, Leyland cypress, sycamore, beech and elm. Where veteran or ancient trees are identified by field surveys or desk study they are reported in the Protected and Notable Flora BID, see Background Information and Data, BID EC-003-00001.

Grassland and marsh

- 2.3.119 The main grassland type in MA05 is improved grassland used for agricultural grazing (89.7ha), or poor semi-improved grassland (71.0ha). Improved grasslands typically comprised perennial rye-grass with a few additional species, frequently including white clover, dandelion, docks and plantains. Poor semi-improved grasslands are slightly more diverse, typically including the above species, with the addition of species of grass such as red fescue, common bent, sweet vernal-grass and Timothy; species of broad-leaved herb

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including buttercups, common mouse-ear and sometimes red clover; and, at low frequency and abundance vetches and bird's-foot trefoil. The species recorded throughout these grasslands often indicate the use of fertilisers or seeding with agricultural species.

2.3.120 Semi-improved grassland within the land required for the construction of the Proposed Scheme is present at the following locations:

- Eleven Acre Common LWS, due west of Culcheth, is partially within the land required for construction of the Proposed Scheme. The central part of the LWS is semi-improved neutral grassland with scattered trees and shrubs. The grassland is dominated by false oat-grass, common bent, cock's-foot, and Yorkshire fog. Among the herbs, common knapweed and tufted vetch are both abundant and sneezewort (*Achillea ptarmica*), meadow vetchling, hogweed, field horsetail and bush vetch are frequent. The sward is rank and unmanaged. The grassland does not qualify as a HoPI but it contains distinctive species of unimproved grassland;
- a large field of semi-improved neutral grassland grazed by horses falls partially within the land required for the construction of the Proposed Scheme, north-east of Golborne. The sward comprises frequent Yorkshire fog and occasional common bent, crested dog's tail and soft rush, with cock's-foot more rarely present. Occasional ribwort plantain, red clover, meadow buttercup, creeping buttercup are present, along with rarely recorded red bartsia (*Odontites vernus*), common ragwort (*Senecio jacobaea*), petty spurge, wood dock (*Rumex sanguineus*), meadow vetchling, common bird's-foot-trefoil and common knapweed. The grassland does not qualify as a HoPI but it contains distinctive species of unimproved grassland; and
- a large, unmanaged semi-improved neutral grassland, adjacent to Slag Lane north-east of Golborne within the land required for the construction of the Proposed Scheme. It comprises frequent smooth meadow grass, cock's-foot, perennial rye-grass, common knapweed, Yorkshire fog and greater plantain; and occasional sweet vernal-grass, soft rush, crested dog's tail, bush vetch, common mouse-ear, tufted vetch, marsh thistle. The grassland does not qualify as a HoPI but it contains distinctive species of unimproved grassland.

2.3.121 Mosaics of marshy grassland, bog and mire habitat types were recorded by field surveys or indicated by information contained in the citations for designated sites. These can be found at the following locations:

- Holcroft Moss SSSI includes an area of lowland raised bog PHI mapped by Natural England which is partly within the land required for construction of the Proposed Scheme. The Phase 1 habitat field survey of Holcroft Moss SSSI shows that it contains ungrazed, raised bog dominated by tussocks of purple moor-grass (*Molinia caerulea*) with occasional common cotton-grass (*Eriophorum angustifolium*), papillose bog-moss (*Sphagnum papillosum*) and rare cross-leaved heath (*Erica tetralix*) and heather (*Calluna vulgaris*). Downy birch (*Betula pubescens*) seedlings are rarely present as is cranberry (*Vaccinium oxycoccos*). This vegetation qualifies as lowland raised bog HoPI;

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- Silver Lane Ponds LWS is partly within the land required for the construction of the Proposed Scheme. It is adjacent to the north boundary of Risley landfill site, immediately to the north of Junction 11 of the M62 at Risley. It contains a number of ponds and areas of dense, varied marshy grassland. Swamp habitat contains a mixture of reeds and rushes including abundant common reed, frequent great willowherb and occasional willow scrub. Marshy grassland in the east of the LWS contains abundant soft rush and frequent reed canary-grass. Also present are common bird's-foot-trefoil, common fleabane (*Pulicaria dysenterica*), jointed rush (*Juncus articulatus*), meadowsweet, red fescue and horsetail species. This marshy grassland is not a close match to any HoPI type, but it is moderately species-rich and a distinctive vegetation type;
- field of marshy grassland, north-east of Lowton, partially intersected by the land required for the construction of the Proposed Scheme. Yorkshire fog and rush sp. are abundant, with frequent perennial rye-grass, creeping buttercup, meadow buttercup, and dock sp. Locally frequent grey willow is also present in the south-east corner of the field, along with occasional greater tussock-sedge (*Carex paniculata*). This vegetation does not qualify as a HoPI;
- a small area of marshy grassland north-east of Lowton, partly within the land required for construction of the Proposed Scheme. It is dominated by perennial rye-grass and soft rush, surrounded by amenity grassland. This vegetation does not qualify as a HoPI;
- a patch of marshy grassland dominated by perennial rye-grass and abundant soft rush, within a field of species-poor, semi-improved grassland, adjacent to Byrom Hall Wood, north-east of Golborne. This vegetation is adjacent to the land required for construction of the Proposed Scheme. It does not qualify as a HoPI;
- Lightshaw Lime Beds SBI, which is bordered by the town of Lowton, contains land mapped by Natural England as lowland fen PHI. This habitat is adjacent to the land required for construction of the Proposed Scheme. It was not surveyed but may qualify as a HoPI;
- ponds near Lightshaw Lane SBI, which is located due north of Lightshaw Lime Beds SBI, contains land listed as lowland fen on Natural England's PHI (Natural England's GIS data states that there is low confidence in this classification). This habitat is within and adjacent to the land required for construction of the Proposed Scheme. The central and east part of this SBI, within the land required for construction of the Proposed Scheme, is largely unmanaged, damp, species-poor, semi-improved grassland with areas of willow and hawthorn scrub. The grassland is dominated by perennial ryegrass, cock's foot, false oat-grass and with frequent common nettle, rosebay willowherb and soft rush. Some of the ponds that were accessed are dominated by bulrush. This grassland does not qualify as a HoPI;
- Abram Flashes SSSI and SBI contains extensive areas of land mapped on Natural England's PHI as lowland fen and smaller areas mapped on the PHI as reedbed or good quality semi-improved grassland. These areas are adjacent to land required for construction of the Proposed Scheme. The SSSI citation reports a mosaic of wetland habitats including swamp, tall herb fen and wet marshy grassland. Field surveys within

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and adjacent to the land required for construction of the Proposed Scheme found a range of habitats, often in mosaic with each other. They include poor semi-improved grassland dominated by false oat-grass, rush mire/water horsetail (*Equisetum fluviatile*) swamp vegetation, grey willow scrub/woodland, reed canary-grass swamp, bulrush swamp and soft rush marshy grassland. This mosaic of habitats may qualify as lowland fen HoPI, but the component vegetation types are, each in their own right, relatively common and widespread in lowland England. Unimproved neutral grassland with crested dog-tail, common bent and bird's-foot-trefoil is also present which may qualify as lowland meadow HoPI;

- an area of habitat adjoining Abram Flashes SSSI, within the land locally named Lightshaw Meadows, is adjacent to the land required for construction of the Proposed Scheme. The area is managed as part of Red Rose Forest community forest scheme and the Phase 1 habitat survey recorded recently planted woodland; an area of orchard; an area of marshy grassland with abundant Yorkshire fog and frequent soft rush, and poor semi-improved grassland with patches of common reed and soft rush. This marshy grassland does not qualify as a HoPI;
- Edge Green SBI is located north-east of Edge Green, a suburb of Golborne and is within 250m of the land required for construction of the Proposed Scheme. The SBI citation records reedbeds, swamp and fen as the key habitats present. However, dense scrub and tall ruderal vegetation, a dry ditch on the west boundary with woodland species and a wet ditch with abundant reed canary-grass and frequent Himalayan balsam were recorded during the Phase 1 habitat survey. This vegetation does not qualify as a HoPI;
- large, fields of grazed, marshy grassland are present within the land required for the construction of the Proposed Scheme between the WCML and the A573 Wigan Road, north of Aye Bridge Farm. Rushes are abundant, with frequently recorded perennial rye-grass, crested dog's tail, occasional rough meadow-grass, and docks, buttercups. and clover. recorded more rarely. This marshy grassland does not qualify as a HoPI; and
- Bryn Marsh and Ince Moss SSSI, Wigan Flashes LNR and Horrocks Flash SBI is directly adjacent to the land required for construction of the Proposed Scheme. In this SSSI are habitats mapped by Natural England's PHI as lowland raised bog, the closest being 95m from the land required for the construction of the Proposed Scheme. Vegetation in this SSSI may qualify as lowland raised bog HoPI.

Watercourses

2.3.122 The eight main watercourses that are crossed by the Proposed Scheme are:

- Holcroft Lane Brook, which flows through arable fields with scattered deciduous trees and scrub vegetation along the banks;
- Carr Brook, approximately 1.5m wide, a wet drainage ditch, with no flow and algae in places. The banks are steep and bare, with tall ruderal vegetation at the top of the slope. Where the brook intersects the land required for the construction of the Proposed

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Scheme it passes between improved grassland and Lowton Junior and Infant School. Erosion of banks has occurred from dogs and people;

- Small Brook, which intersects the land required for the construction of the Proposed Scheme north of Lowton Common. It is a wet shallow ditch with gently sloping banks and a substrate of decaying organic material, approximately 50cm wide and 10cm deep. Scrub on the banks is dominated by bramble;
- Windy Bank Brook, approximately 1.5m wide, intersects with the land required for the construction of the Proposed Scheme three times flowing through an agricultural field and beneath the existing railway line initially. It then follows a planted woodland and has heavily vegetated banks. A line of mature trees where willow is dominant, follows its banks;
- Nan Holes Brook, approximately 2.5m wide/less than 0.1m deep, is a small watercourse with steep vegetated banks with gravel and small stone substrate. It is very shallow and slow flowing, with areas of still water. Trees, Himalayan balsam, common nettle and bramble are present along its banks;
- Hey Brook approximately 4m wide, runs within and adjacent to Abram Flashes SSSI and SBI. It flows through areas of semi-improved grassland and lowland fen PHI. The brook is present as dry at some sections. Scattered scrub, scattered trees and Himalayan balsam is present at several locations along its length;
- Coffin Lane Brook flows through areas of grassland, deciduous woodland and agricultural field margins before crossing the land required for the construction of the Proposed Scheme and into Abram Flashes SSSI and SBI. The brook is culverted in a number of locations and often surrounded by thick tall ruderal vegetation, including Himalayan balsam; and
- Leeds and Liverpool Canal passed beneath a bridge that is currently part of the WCML at Bamfurlong Junction.

2.3.123 Nineteen smaller watercourses¹⁶ were identified in the land required for the construction of the Proposed Scheme. They are mostly shallow flowing watercourses associated with arable land with bank vegetation dominated by dense bramble and gorse scrub:

- M62 Drainage, a small ditch within a block of deciduous woodland adjacent to the M62, composed predominantly of elm, grey willow and silver birch. It is connected to a small pond with no emergent or aquatic vegetation present;
- Tributary of Holcroft Lane Brook 1, 2, 3 and 5 all generally flow through arable fields with scattered deciduous trees and scrub vegetation along the banks;
- Tributary of Holcroft Lane Brook 4 passes through blocks of woodland and before entering the land required for construction of the Proposed Scheme, where it flows along field boundaries with broadleaved trees along its banks;

¹⁶ Count of watercourses includes the listed watercourses but not the sub-watercourses making up the network (e.g. Tributaries of Holcroft Lane Brook = four watercourses listed in a single bullet point).

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- Silver Lane Lakes Drains, small channels linking the ponds within Silver Lane Ponds LWS;
- Tributary of Cross Brook 1, situated between two agricultural fields north-east of Little Town. During the Phase 1 habitat survey it was found to be a dry ditch, with common nettle, broad-leaved willowherb, red campion, bramble, foxglove and false oat-grass recorded within the brook;
- Wigshaw Lane Drains, a series of drains within agricultural fields, with occasional scattered trees along the banks;
- Culcheth Linear Park Drain 1 runs through the broadleaved woodland at Culcheth Linear Park, south of Culcheth;
- Tributary of Carr Brook 1, flows through agricultural fields with the occasional scattered tree along the banks;
- Slag Lane Drain, a small drain that intersects alignment north of Lowton Common;
- Sandy Lane Drain 1, set within agricultural field margins north of Lowton Common with scattered trees along its banks;
- Tributary of Hey Brook 1 and 2. Both run adjacent and intersect with the land required for the construction of the Proposed Scheme twice in the location of Byrom Hall. The majority of the watercourses pass through agricultural fields along hedgerows;
- Tributary of Hey Brook 3 and 4, both approximately 1.5m wide and pass through Byrom Wood, a community woodland managed by the Forestry Commission. Both flow adjacent to Ponds near Lightshaw Lane SBI. Tributary 4 also flows adjacent to the land required for the construction of the Proposed Scheme, and next to Lightshaw Lime Beds SBI;
- Heydock Branch Junction Drains, a drain feeding several small ponds and set within a large area of grassland north of Heydock Branch Junction. Approximately 1.5m wide and 0.3m deep, it has limited macrophytes, apart from one open area dominated by common reed;
- Tributary of Nan Holes Brook 1 and 2, and Wigan Road Drain all lie within fields of improved grassland (dominated by perennial rye-grass) with lines of broadleaved trees along the banks. They eventually join with Nan Holes Brook;
- Tributary of Hey Brook 5, passes through areas of grassland before flowing into Abram Flashes SSSI;
- Locker Lane Drains, set within marshy grassland to the west of Abram Flashes SSSI and SBI;
- Tributary of Coffin Lane Brook 1, flows adjacent to Abram Flashes SSSI and SBI before entering the land that is required for construction of the Proposed Scheme, east of Bamfurlong;
- Bamfurlong Drains, a small drain within grassland to the west of Abram Flashes SSSI and SBI; and
- Tributary of Hey Brook 6 flows through grassland and tall ruderal vegetation south of Bamfurlong Junction before flowing into Abram Flashes SSSI and SBI.

Water bodies

- 2.3.124 Four water bodies are present within Silver Lane Ponds LWS, which is adjacent to the north boundary of Risley landfill site, immediately to the north of the M62 at Risley. The LWS was created as part of the restoration of Risley landfill site and is partly within the land required for construction of the Proposed Scheme.
- 2.3.125 Additional ponds are present at the village of Wigshaw where these have been created for angling.
- 2.3.126 A substantial area of open water is present at Bryn Marsh and Ince Moss SSSI which lies adjacent to the northern-most part of the land required for construction of the Proposed Scheme.
- 2.3.127 The total number of ponds and ditches identified from aerial photography and OS maps within 500m of the area of land required for the construction of the Proposed Scheme is 371. This includes:
- sixty within the area of land required for the construction of the Proposed Scheme;
 - one hundred and twenty-five between 100m and the area of land required for the construction of the Proposed Scheme;
 - ninety-two between 100m and 250m from the area of land required for the construction of the Proposed Scheme; and
 - ninety-four between 250m and 500m from the land required for the construction of the Proposed Scheme.
- 2.3.128 Ditches are distributed throughout the survey area and a ditch survey was carried out in one location:
- Small Brook, which passes through the urban area of Lowton and is within the land required for construction of the Proposed Scheme. However, the ditch is dry and does not support aquatic vegetation.
- 2.3.129 Most water bodies within the Proposed Scheme are ponds set within agricultural land or residential gardens, often surrounded by woodland copses. Ditches are typically associated with the watercourses.

Arable and cultivated land

- 2.3.130 Aerial imagery and Phase 1 habitat survey data indicates MA05 is dominated by arable fields with occasional hedgerows and trees. Arable land represents approximately 109.1ha of the land required for construction of the Proposed Scheme.

Buildings and structures

- 2.3.131 There are 85 isolated buildings and farmsteads within the land required for the construction of the Proposed Scheme.

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- 2.3.132 There are several concentrations of buildings and farmsteads within the land required for construction of the Proposed Scheme. These are:
- Philips Farm and Glaziers Lane Farm at Wigshaw;
 - White's Farm and Birchall's Farm off B5207 Wilton Lane; and
 - an area of commercial units and residential dwellings at Lowton Business Park, Laburnum Farm near Lowton.
- 2.3.133 There are urban areas at Partington and Cadishead, Culcheth, Lowton St Mary's and Lowton and Platt Bridge a suburb of Wigan that are adjacent to the land required for construction of the Proposed Scheme.

Hulseheath to Manchester Airport (MA06)

- 2.3.134 Approximately 44.9% of the land required for the construction of the Proposed Scheme was surveyed. Some surveys have also been undertaken within the 250m buffer zone.
- 2.3.135 Land in and adjacent to land required for construction of the Proposed Scheme includes Agden Brook, Blackburn's Brook, Birkin Brook, the River Bollin, Timperley Brook and Rostherne Mere SSSI, National Nature Reserve (NNR) and Ramsar site. Habitats across the MA consist of arable fields with surrounding woodland including several AWI sites. Reed swamp, peat bog and willow beds are also present at Rostherne Mere.

Woodland

- 2.3.136 There are at least 37 woodland blocks and clusters scattered throughout, or directly adjacent to, the length of the route in MA06¹⁷. The total area of woodland within the land required for the construction of the Proposed Scheme is as follows:
- 21.6ha of semi-natural broadleaved woodland;
 - 1.9ha of plantation broadleaved woodland;
 - 4.3ha of plantation mixed woodland; and
 - 0.5ha of plantation coniferous woodland.
- 2.3.137 The woodland type with the largest area within land required for the construction of the Proposed Scheme is semi-natural broadleaved, which includes:
- a block of broadleaved semi natural woodland listed as deciduous woodland on Natural England's PHI, through which Millington Clough runs. The woodland contains frequently occurring pedunculate oak and holly canopy species, and a ground layer of frequent broad buckler-fern, bramble, opposite-leaved golden saxifrage and common hogweed. The north spur of this woodland is broadleaved plantation and is dominated by silver

¹⁷ Please note that the 37 blocks/clusters do not necessarily translate to 37 descriptions in the bullet lists below as some woodlands comprise more than one block/patch.

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birch with occasional pedunculate oak, ash and hazel. This woodland is an AWI site and qualifies as lowland mixed deciduous woodland HoPI;

- Agden Brook LWS, south of Booth Bank, is a linear woodland on a north-easterly facing slope. The canopy is dominated by pedunculate oak with occasional ash, and sycamore. Alder, birch sp. and holly are rare in the canopy. The shrub layer includes frequent hawthorn, and occasional hazel, elder and holly. The ground flora has the ancient woodland indicator species bluebell, which are frequent, and pignut and wood sorrel which are occasional. This woodland qualifies as lowland mixed deciduous woodland HoPI;
- Millington Lane Wood LWS, south of Booth Bank, comprises frequently occurring pedunculate oak, hawthorn and beech. This woodland qualifies as lowland mixed deciduous woodland HoPI;
- Yarwood Heath Covert LWS and SBI, north of Rostherne Mere, contains a block of broadleaved woodland listed on the National Forest Inventory. It was not accessed for survey but may qualify as lowland mixed deciduous woodland HoPI;
- small areas of broadleaved woodland listed on the National Forest Inventory, and Natural England's PHI, are located on Bowdon Roundabout, which is 600m north of junction 8 of the M56. This is likely to be highways landscaping woodland, but may qualify as lowland mixed deciduous woodland HoPI;
- several small broadleaved woodlands listed on the National Forest Inventory, and Natural England's PHI, between Birkin Brook and junction 8 of the M56. These woodlands include areas of landscaping woodland which do not qualify as lowland mixed deciduous woodland HoPI but also areas with a more semi-natural appearance which may qualify as a HoPI;
- Hancock's Bank South LWS and Hancock's Bank North LWS, adjacent to Blackburns Brook, north-east of Rostherne Mere NNR, are AWI sites containing both ancient semi-natural woodland and small areas of PAWS woodland. These woodlands qualify as lowland mixed deciduous woodland HoPI;
- Rycroft Covert LWS, SBI and AWI site containing deciduous woodland PHI and listed on the National Forest Inventory, adjacent to Birkin Brook LWS. Canopy species include pedunculate oak and elm, and common ash and crack willow are present adjacent to the brook. The majority of the woodland is semi-mature, or immature, and the understorey is heavily shaded. The shrub layer contains holly, rhododendron and bramble sp. Abundant species in the ground flora include broad buckler-fern, wood avens and common ivy, and frequent pendulous sedge (*Carex pendula*) and greater stitchwort (*Stellaria holostea*). This woodland qualifies as lowland mixed deciduous woodland HoPI;
- a small block of woodland along the Tributary of Birkin Brook 4, listed on the National Forest Inventory, adjacent to Ashley Road. This woodland may qualify as lowland mixed deciduous woodland HoPI;
- a block of woodland that lies partially within the land required for the construction of the Proposed Scheme, at Birtles Farm, adjacent to Mobberley Brook. This woodland may qualify as lowland mixed deciduous woodland HoPI;

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- Wood Near Arden House LWS and SBI and named Arden House Wood AWI site (PAWS), which lies partly within the land required for the construction of the Proposed Scheme. This woodland may qualify as lowland mixed deciduous woodland HoPI;
- a block of woodland adjacent to Tributary of Birkin Brook 2 and 3, north of Erlam's Meadows LWS. This woodland may qualify as lowland mixed deciduous woodland HoPI;
- Sugar Brook LWS, a small portion of the deciduous woodland on Natural England's PHI, south of Erlam's Meadows, and Ashley Brickworks, is within the land required for the construction of the Proposed Scheme. This woodland may qualify as ancient woodland on the basis of heritage data analysed by HS2 Ltd. This woodland qualifies as lowland mixed deciduous woodland HoPI;
- a section of Ashley Mille Wood LWS, adjacent to the River Bollin, south-west of Ashley Heath. This deciduous woodland is listed on Natural England's PHI. This woodland may qualify as lowland mixed deciduous woodland HoPI;
- Small sections of broadleaved woodland adjacent to the M56, north-west of Ashley. This deciduous woodland is listed on the National Forest Inventory, and may qualify as lowland mixed deciduous woodland HoPI;
- broadleaved semi-natural woodland in Erlams's Meadow LWS and Ashley Brickworks Extension LWS. This woodland may qualify as lowland mixed deciduous woodland HoPI;
- Ecclesfield Wood LWS and SBI, south-east of Ashley, an area of deciduous woodland on the National Forest Inventory of which the northern portion is within the land required for the construction of the Proposed Scheme. It may qualify as lowland mixed deciduous woodland HoPI;
- a small section of Brickhill Wood LWS and SBI, south of Thorns Green. The site is an AWI site (PAWS woodland) and may qualify as lowland mixed deciduous woodland HoPI;
- Mill Wood/Castle Mill LWS linear woodland along either bank of the River Bollin, listed on the National Forest Inventory and Natural England's PHI. The woodland contains abundant sycamore and grey willow with frequent alder and self-seeding ash. The ground flora includes frequent wood avens, common nettle, and cleavers, with occasional cow parsley, hogweed and rare occurrences of fern *Dryopteris* sp. Abundant ivy and Himalayan balsam are also present. This woodland qualifies as wet woodland HoPI;
- Sunbank Wood and Ponds SBI, is adjacent to the land required for the construction of the Proposed Scheme with a small area at the northern end of the woodland (Bollin Bank) situated within. The majority of this SBI is an AWI site (ancient semi-natural woodland), however the AWI site is not in the land required for the construction of the Proposed Scheme. Canopy species include pedunculate oak, silver birch, alder, ash and sycamore. Understorey species include rowan, hazel, holly, hawthorn, and saplings of pedunculate oak, ash and sycamore. This woodland qualifies as lowland mixed deciduous woodland HoPI;

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- The northern tip of Sunbank Wood and Ponds SBI is called Bollin Bank and is within the land required for construction of the Proposed Scheme. This woodland is an AWI site and may qualify as lowland mixed deciduous woodland HoPI;
- Wood near Chapel Lane SBI (also known as Hennersley Bank), adjacent to Tributary of River Bollin 3, falls partially within the land required for the construction of the Proposed Scheme. This woodland is an AWI site and may qualify as lowland mixed deciduous woodland HoPI;
- an area of broadleaved woodland, listed on the National Forest Inventory/deciduous woodland PHI, within the cloverleaf at junction 6 of the M56, and adjacent to the A538 at the junction. This woodland may be landscaping planting and not qualify as a HoPI;
- Davenport Green Wood SBI and AWI site (ancient semi-natural woodland), surrounding Timperley Brook, is an area of deciduous woodland listed as deciduous woodland on the PHI surrounding Timperley Brook, south of Davenport. The woodland has abundant pedunculate oak in the canopy and qualifies as lowland mixed deciduous woodland HoPI; and
- several small blocks of woodland adjacent and within the land required for the construction of the Proposed Scheme, north-east of Davenport. One block with a canopy of alder, ash, pedunculate oak, elder, hawthorn and hazel is considered to be semi-natural broadleaved woodland. The ground flora is dominated by common nettle; however, a wide range of additional species are also present including hairy bittercress (*Cardamine hirsuta*), bittersweet (*Solanum dulcamara*) and enchanter's nightshade (*Circaea lutetiana*), along with male fern and soft rush. There are also several species of common woodland moss including common feather-moss (*Kindbergia praelonga*). This woodland qualifies as lowland mixed deciduous woodland HoPI.

2.3.138 Included in the approximate 37 blocks/clusters of woodland, four larger areas of semi-natural broadleaved woodland, and several smaller blocks, located adjacent to the land required for the construction of the Proposed Scheme are:

- Rushy Pits Covert SBI, west of the M56/A556 junction 8 is a block of broadleaved woodland listed on the National Forest Inventory. This woodland may qualify as lowland mixed deciduous woodland HoPI;
- Cloverleaf SBI is completely surrounded by the M56/A556 junction 8 and is inaccessible. It contains woodland on the deciduous woodland PHI. This woodland may qualify as lowland mixed deciduous woodland HoPI;
- several small blocks of broadleaved woodland listed on the National Forest Inventory are present adjacent to the M56 and its junctions. This woodland may qualify as lowland mixed deciduous woodland HoPI;
- Flaxhigh Covert is a woodland mostly adjacent to the land required for the construction for the Proposed Scheme, east of Hale Barns. A small section of the woodland falls within the land required for the construction of the Proposed Scheme. The woodland is listed as deciduous woodland in the PHI. The Phase 1 habitat survey identifies it as broadleaved semi-natural woodland. Hazel and sycamore are the most frequent species within the

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canopy layer, with occasional beech, conifers, holly, rowan and elder. Bramble, bracken and rhododendron are frequent within the ground layer, with occasional ivy and snowberry (*Symphoricarpos albus*). This woodland qualifies as lowland mixed deciduous woodland HoPI; and

- Humphreys Wood, a broadleaved woodland, lies adjacent to the land required for the construction of the Proposed Scheme, north-east of Hale Barns. It is listed on the National Forest Inventory and may qualify as lowland mixed deciduous woodland HoPI.

2.3.139 A small block of coniferous plantation woodland adjacent to Birkinheath Brook LWS is within the land required for the construction of the Proposed Scheme. Within this small wood, canopy species are semi-mature and approximately 6m in height. They include Scot's pine and yew. The shrub layer contains stands of bramble and holly. The understorey is heavily shaded by the trees and has several areas of bare ground. Ground flora species include ivy, red campion, common nettle and creeping thistle. This woodland is not a HoPI.

2.3.140 A large area of broadleaved plantation woodland is within the land required for the construction of the Proposed Scheme between Millington Lane and Peacock Lane (adjoining Millington Clough woodland). The woodland canopy contains mixed broadleaved species including oak, ash, silver birch, frequent rowan, hawthorn, and wild cherry. Holly and hazel are present in the understorey. The ground layer is relatively sparse and dominated by common nettle, with occasional clover species (*Trifolium* sp.) and red campion. The woodland is well used by pedestrians and horses. The northern and southern section of the wood are on Natural England's PHI as deciduous woodland. This plantation is not of sufficient quality and condition to qualify as a HoPI.

2.3.141 Birkinheath Covert LWS and SBI, a small block of mixed plantation woodland, at the junction of Birkinheath Lane and Ashley Road, falls partially within the land required for the construction of the Proposed Scheme. Canopy species are semi-mature with a general height of approximately 6m. They included Scot's pine, pedunculate oak, horse chestnut, ash and yew. The shrub layer contains large stands of rhododendron and holly. The understorey mainly comprises bracken, with species such as bluebell, red campion and foxglove. In the damper areas Himalayan balsam is also present. This block of woodland also continues on the southern side of Ashley Road where it is listed as deciduous woodland on Natural England's PHI. Parts of this woodland which have a semi-natural character qualify as lowland mixed deciduous woodland HoPI. Those which are dominated by rhododendron do not qualify.

Scrub

2.3.142 There is 9.9ha of scrub habitat within the land required for the construction of the Proposed Scheme. Dense and scattered scrub is found throughout the community area, with a particular concentration at the junction of the A538 and M56, both within and adjacent to the land required for construction of the Proposed Scheme. There is a second concentration within the land required for the construction of the Proposed Scheme, where the

Mid-Cheshire Line is crossed. Scrub generally comprises willow, elder, hawthorn and bramble with common nettle, ivy and rosebay willow herb in the ground flora.

Hedgerows

- 2.3.143 In total, 58.1km of hedgerow habitat is present within the land required for the construction of the Proposed Scheme. This includes:
- 435m of intact species-rich hedgerow;
 - 11.2km of intact species-poor hedgerow;
 - 347m of defunct native species-rich hedgerow;
 - 313m of defunct species-poor hedgerow;
 - 1.9km of native species-rich hedgerow with trees;
 - 3.2km of species-poor hedgerow with trees;
 - 40.7km of unsurveyed assumed intact species-rich hedgerow.
- 2.3.144 Hedgerows that comprise at least one woody UK native species (excluding honeysuckle and bramble which are integral to many hedgerows) and having 80% or more cover, qualify as a HoPI. Typical woody species include pedunculate oak, hawthorn, holly, rose, alder and hazel. Most of the arable and pasture fields are bordered by hedgerows.

Parkland and scattered trees

- 2.3.145 Scattered trees and mature treelines are found at a number of field boundaries across MA06. Both broadleaved and coniferous trees are present, dominant species include oak sp., ash, sycamore, beech and willow.
- 2.3.146 There is a large area of mixed parkland/scattered trees east of Davenport, adjacent to the land required for the construction of the Proposed Scheme. They consist of Scots pine, larch, western hemlock (*Tsuga heterophylla*), and abundant pedunculate oak. There are also a number of assorted ornamental trees.
- 2.3.147 A large area of land mapped by Natural England as wood pasture and parkland is present in Tatton Park, a small proportion of which is inside the land required for construction of the Proposed Scheme. This area is near the junction of Ashley Road and Birkinheath Lane, south of Birkinheath Covert LWS. It is wooded and is included in the deciduous woodland PHI by Natural England.

Grassland and marsh

- 2.3.148 The main grassland types in MA06 are improved grassland used for cattle grazing (59.7ha), and poor semi-improved grassland (111.7ha). Improved grasslands typically comprise perennial rye-grass with a few additional species, such as white clover, dandelion, docks and plantains. Poor semi-improved grasses are slightly more diverse. They typically include the above species, along with species of grass such as red fescue, common bent, sweet vernal-

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grass and Timothy; and species of broad-leaved herb including buttercups, common mouse-ear and sometimes red clover; and at low frequency and abundance, vetches and bird's-foot trefoil. The species recorded throughout these grasslands often indicate the use of fertilisers or seeding with agricultural species.

- 2.3.149 Unimproved neutral grassland is assumed to be present in Ashley Brickworks LWS (formerly known as Erlam's Meadow LWS) and in an area directly to the south of this LWS called Ashley Brickworks Extension potential local wildlife site, both are south of Ashley (in total 8.41 ha). Natural England's PHI identifies one large area of 'good quality semi-improved grassland' and two areas of lowland meadow in this location. A Phase 1 habitat survey has not yet been undertaken within this area and so unimproved neutral grassland is assumed to be present on a precautionary basis. This grassland is assumed to qualify as lowland meadow HoPI.
- 2.3.150 A very small area of unimproved acid grassland (0.04ha) is within the land required for the construction of the Proposed Scheme between Millington Hall and Agden Brook LWS. It contains a relatively species-diverse sward including the grasses common bent, red fescue, sweet vernal grass and Yorkshire fog, as well as frequent sheep's sorrel and bluebell, and occasional common sorrel, pignut (*Conopodium majus*), field wood-rush (*Luzula campestris*). Heath bedstraw (*Galium saxatile*) and mouse-ear hawkweed (*Pilosella officinarum*) are both locally frequent, while autumn hawkbit (*Scorzoneroides autumnalis*), cat's-ear (*Hypochaeris radicata*) and yarrow are all rare. This grassland qualifies as lowland acid grassland HoPI.
- 2.3.151 Semi-improved grassland within and adjacent to the land required for the construction of the Proposed Scheme is found at the following locations. None of these grasslands qualify as a HoPI but they are all moderately diverse examples of this habitat:
- semi-improved neutral grassland around a drainage pond, west of the junction 8 between the M56 and A556. This grassland is assumed to be semi-improved grassland on a precautionary basis as it was not accessible for survey;
 - a large area distributed across several fields, east of junction 7 of the M56, including Birkinheath Brook. These grasslands are part of the farming set-aside to provide a buffer against the river. With an average sward height of 30cm, abundant species comprise Yorkshire fog, cock's-foot, creeping bent. Frequent species include Timothy, crested dog's-tail and rough meadow grass, along with broad-leaved herbs such as creeping buttercup and meadow buttercup, occasional species include meadow vetchling, bush vetch and grass vetchling (*Lathyrus nissolia*), with locally occasional clusters of bird's-foot-trefoil and sticky mouse ear (*Cerastium glomeratum*);
 - an arable field with semi-improved neutral grassland around its southern boundaries is within the land required for the construction of the Proposed Scheme south of Ashley and is adjacent to Wood Near Arden House LWS. Abundant grass species include false oat-grass, perennial rye-grass, red fescue, Yorkshire fog and rough meadow grass. Frequent grass species comprise meadow foxtail and cock's foot. Occasional grass species include crested dog's tail and annual meadow grass. Broadleaved herbs are locally frequent including tufted vetch, meadow vetchling, hairy tare (*Vicia hirsuta*) and birds-foot trefoil. Meadowsweet is occasional in the sward;

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- a mosaic of semi-improved neutral grassland and marshy grassland, all within the land required for the construction of the Proposed Scheme, is located close to the River Bollin where it passes under the M56. Marshy areas contain frequent meadow foxtail, floating sweet-grass, Yorkshire fog, rough meadow-grass and meadow buttercup. Fools-watercress is occasional and great willowherb and common nettle are rare. Areas of semi-improved neutral grassland feature abundant common bent, frequently occurring Yorkshire fog and occasional common sorrel and field wood-rush. Meadow buttercup and pignut are rare, and bramble encroachment is localised;
- an area of predominantly species poor, semi-improved grassland is present near Thorns Green, adjacent to the River Bollin and within the land required for the construction of the Proposed Scheme. It mainly comprises abandoned grazing land with abundant common nettle and hogweed, locally abundant creeping thistle and curled dock (*Rumex crispus*). Areas of locally frequent cock's-foot, false oat-grass, Yorkshire fog, perennial rye-grass and meadow foxtail, and occasional common ragwort and rosebay willowherb are also present. A small area of more species rich semi-improved neutral grassland is present at the bottom of a slope in this location. It contains frequent common knapweed, meadow vetchling, white clover, meadow buttercup, cat's-ear, rosebay willowherb, creeping thistle, tufted hair-grass, red fescue, great willowherb and curled dock;
- a field of semi-improved neutral grassland is located between the River Bollin and Sunbank Wood AWI site, south-west of Sunbank Lane. Species include common knapweed, Himalayan balsam, hogweed, bramble, ragwort sp., broad-leaved dock, cock's-foot, creeping buttercup, reed canary-grass, Yorkshire fog and common bent;
- between the M56 and Warburton Green is a large area of varied, semi-improved neutral grassland stretching from the River Bollin, almost as far as the slip road to the A538 Hale Road. These grasslands are partly within the land required for construction of the Proposed Scheme. West of Chapel Lane, the grassland contains abundant Yorkshire fog, frequent rough meadow-grass, cock's-foot, bramble, ribwort plantain, with occasional Timothy grass, common hogweed, bird's-foot trefoil, meadow vetchling, common knapweed, common cat's-ear and locally abundant Himalayan balsam. Some of this grassland is horse pasture. There are localised marshy areas with occasional floating sweet-grass, meadow foxtail, ragwort and soft rush. East of Chapel Lane, the semi-improved neutral grassland is varied and contains abundant Yorkshire fog, creeping buttercup, red fescue and perennial rye-grass, and occasional dandelion, cranes-bill (*Geranium* sp.), and ribwort plantain. Patches of marshy grassland are present and include compact rush and soft rush or floating sweet-grass. Other areas of semi-improved neutral grassland in this locality, particularly those flanking paths and tracks, have a different character and include locally frequent crested dog's-tail, Timothy grass, false oat-grass, sticky mouse-ear and lesser celandine. Elsewhere they contain locally abundant couch grass, field scabious (*Knautia arvensis*), greater plantain and smooth meadow grass. Throughout these grasslands are stands of tall ruderal species including cow parsley, rosebay willowherb, hogweed, docks and creeping thistle;
- a large area of semi-improved neutral grassland is present in a damp area north of Sunbank Lane and south of the M56, entirely within the land required for the

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construction of the Proposed Scheme. Species include annual meadow-grass, Yorkshire fog, perennial rye-grass, false oat-grass, sweet vernal-grass, meadow foxtail, creeping buttercup, broad-leaved dock, dandelion, common sorrel, common ragwort, creeping bent, creeping thistle, ribwort plantain, red fescue, common ragwort, rosebay willowherb, meadow buttercup, Timothy, herb-robert, hogweed, cock's-foot, cleavers, greater plantain, common nettle, couch grass, colt's-foot (*Tussilago farfara*), redshank and hedge bindweed (*Calystegia sepium*);

- a large area of semi-improved neutral grassland is present south of Sunbank Lane, in an area known as Keepers Cottages. The majority of the grassland is adjacent to the land required for the construction of the Proposed Scheme, with only a small area within it. Cat's-ear is the dominant species recorded, accompanied by abundant Yorkshire fog, soft rush, ribwort plantain, hogweed and perennial rye-grass. Occasional species include false oat-grass, common knapweed, cock's-foot, broadleaved dock, creeping buttercup, meadow buttercup, meadow foxtail, creeping thistle, redshank, common ragwort, willowherb sp. and marsh woundwort (*Stachys palustris*). Rarely occurring species include field horsetail, red campion, pendulous sedge and a hawk's-beard (*Crepis* sp.);
- semi-improved neutral grassland is present north of the Amazon UK terminal and south of the slip road connecting the M56 and the A538 Hale Road. It contains large, dense patches of tall ruderal herbs. Grassland species include perennial rye-grass, Yorkshire fog, dandelion, false oat-grass, creeping buttercup, broad-leaved dock, common sorrel, colt's-foot, red clover and Timothy grass; and
- a small, damp, semi-improved neutral grassland is present between Shay Lane and Brooks Drive, near to Davenport Green, adjacent to the land required for the construction of the Proposed Scheme. Perennial rye-grass dominated the grassland, with species including Yorkshire fog, selfheal, speedwell, Timothy, white clover, cat's-ear, bent species sp., creeping thistle and redshank abundant within the grassland. Occasional species recorded included soft rush, willowherb sp., knotgrass, fescue sp., daisy (*Bellis perennis*), buttercup sp., ragwort and black medick (*Medicago lupulina*).

2.3.152 Small areas of marshy grassland are present in MA06 (0.9ha) at the following locations:

- south of Millington Clough and east of Chapel Lane, and adjacent to Millington Clough, are two patches of marshy grassland within a field of species poor, semi-improved grassland and dominated by soft rush. This grassland is not a HoPI;
- within a clearing in the block of woodland surrounding Millington Clough is an area of marshy grassland dominated by reed canary-grass. Frequently present are meadowsweet, great willowherb, opposite-leaved golden-saxifrage with occasional wild angelica, bittersweet, soft rush and marsh thistle. Common valerian (*Valeriana officinalis*) is rare. This vegetation is not a HoPI but is relatively diverse marshy grassland;
- a patch of marshy grassland within a field of improved grassland adjacent to Agden Brook. The marshy grassland is dominated by grasses, but brooklime is also present. This grassland is not a HoPI;

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- east of Warburton Green and Hale Burns, small patches of marshy grassland are present in semi-improved grassland. They are dominated by Yorkshire fog with frequent creeping buttercup, floating sweet-grass (*Glyceria fluitans*), soft rush and willowherb sp. brooklime, grey willow and occasional ribwort plantain. This grassland is not a HoPI; and
- a small patch of marshy grassland dominated by soft rush lies along the edge of a field of species poor, semi-improved grassland adjacent to junction 6 of the M56. This grassland is not a HoPI.

Watercourses

2.3.153 The eight main watercourses that are crossed by the Proposed Scheme are:

- Millington Clough, approximately 2.0m wide/less than 0.1m deep, flows through deciduous woodland listed on the National Forest Inventory, and Agden Brook LWS. Outside of the woodland, trees are present at the top of the steep bank of the water course, with scattered scrub also present. Aquatic macrophytes include water starwort (*Calitriche* sp.), flag iris and fool's water-cress. There are several sections with steep, near-vertical mud banks;
- Agden Brook, flows through agricultural fields and a small area of deciduous woodland in MA06 and continues north towards MA03;
- Blackburn's Brook, approximately 3m wide, flows through Hancock's Bank South LWS, north-east of Rostherne Mere NNR, an AWI site which contains PAWS woodland;
- Birkin Brook, approximately 10m wide/0.3m deep, flows adjacent to Ryecroft Covert LWS containing lowland deciduous woodland adjacent to Birkin Brook and Birkin Brook floodplains. River macrophyte surveys (BID EC-006-0001) recorded spiked water-milfoil, slender sedge (*Carex acuta*), lesser pond sedge (*Carex acutiformis*), Canadian pondweed (*Elodea canadensis*) and duckweed most abundantly;
- River Bollin, approximately 10m wide, surrounded by riparian woodland extending up slope and into the adjacent field, along the drainage ditch that feeds the river. River macrophyte surveys (BID EC-006-0001) found ivy-leaved duckweed (*Lemna triscula*) to be the most abundant species;
- Mobberley Brook, approximately 4m wide, flows through agricultural field margins with scattered trees and scrub along its banks. Located south of Ashley;
- Sugar Brook, approximately 3m wide, flows through agricultural field margins with scattered trees and scrub and blocks of deciduous woodland along its banks. Set between Ashley and Mobberley it is intersected by land required for the construction of the Proposed Scheme several times; and
- Timperley Brook, approximately 2m wide, flowing through Davenport Green Wood SBI, an area of deciduous woodland.

2.3.154 Thirteen smaller watercourses were identified in the land required for the construction of the Proposed Scheme. They are mostly low-flow watercourses associated with arable land, with bank vegetation dominated by dense bramble, gorse scrub and scattered trees:

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- Tributary of River Bollin 6 flows through agricultural fields with scrub along the banks;
- Tributary of Birkin Brook 5 and Tributary of the Birkin Brook 6 flow through a block of deciduous woodland listed on Natural England's PHI, adjacent to Birkinheath Covert on the southern side of Ashley Road;
- Tributary of Birkin Brook 7 flows through Birkinheath Covert LWS and SBI, a small block of mixed plantation woodland north of Birkinheath Lane;
- Tributary of Birkin Brook 9, adjacent to the M56, east of Junction 8, flows through Lambs Covert and Ryecroft Covert LWS and SBI which contains deciduous woodland listed on the National Forest Inventory;
- Tributary of Birkin Brook 4 flows through an area of grassland and deciduous woodland before joining Birkin Brook;
- Tributary of Birkin Brook 3 flows through areas of good quality semi-improved grassland and lowland meadows (Erlam's Meadows LWS and SBI, and Ashley Brickworks LWS) before joining Birkin Brook;
- Tributary of River Bollin 3, flows through Wood near Chapel Lane SBI, containing deciduous woodland on the Natural England PHI, with dense scrub and scattered trees along sections of the banks. The watercourse is dry;
- Tributary of River Bollin 2 flows through semi-natural ancient woodland within Sunbank Wood and Ponds SBI, located south of Warburton Green;
- Tributary of Timperley Brook 1, which flows through improved grassland and semi natural mixed woodland before joining with Timperley Brook;
- Drain to M56 1, 2 and 3, a series of drains adjacent to the M56, set within the adjacent grassland areas. Most had scattered trees and scrub along their banks with marginal vegetation including brooklime, creeping buttercup, common nettle and floating sweet-grass;
- Tributary of Sugar Brook, flows through agricultural field margins with scattered trees and scrub along its banks before flowing into a block of deciduous woodland and Sugar Brook LWS, south of Erlam's Meadows, and Ashley Brickworks;
- Brickhill Wood Drains, a series of drains in the locality of Brickhill Woods LWS, south of Thorns Green; and
- Tributary of Birkin Brook 2 flows from Erlam's Meadows LWS and SBI, and Ashley Brickworks LWS, along agricultural field margins with scattered trees along its banks, to Ecclesfield Wood LWS and SBI.

Water bodies

- 2.3.155 Rostherne Mere is a designated SSSI, NNR and Ramsar site, situated north of Rostherne. The mere has little submerged vegetation but is fringed by a narrow band of reed swamp for over half of its circumference. This consists mainly of common reed, with lesser reedmace and sweet flag (*Acorus calamus*). Around the mere the catchment slopes are primarily large blocks of woodland and moderately intensively farmed grassland. At the north-west end

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there is a small area of mire habitat now overgrown with birch. However, a number of plant species associated with the peat bog remain including broad buckler-fern, purple moor-grass and bog mosses as well as purple small-reed (*Calamagrostis canescens*), regarded as locally scarce in Cheshire¹⁸. The Natural England citations states that willow beds are present at the southern end. The water body itself lies more than 100m from the land required for the construction of the Proposed Scheme. However, the Ramsar site extends into 100m from the land required and the NNR and SSSI boundary lies adjacent to the land required for the construction of the Proposed Scheme.

- 2.3.156 The total number of ponds and ditches identified from aerial photography and OS maps within 500m of the area of land required for the construction of the Proposed Scheme is 306. This includes:
- fifty within the area of land required for the construction of the Proposed Scheme;
 - ninety-one between 100m and the area of land required for the construction of the Proposed Scheme;
 - seventy-two between 100m and 250m from the area of land required for the construction of the Proposed Scheme; and
 - ninety-one between 250m and 500m from the land required for the construction of the Proposed Scheme.
- 2.3.157 Ditch surveys were carried out in one location, at Tributary of Birkin Book 2, a ditch that intersects with the land required for the Proposed Route and flows through arable fields and a small area of woodland. The ditch is dry, no further information was collected.
- 2.3.158 Most water bodies within land required for the construction of the Proposed Scheme are ponds set within agricultural land or residential gardens, often surrounded by woodland copses. Ditches are typically associated with the watercourses. A cluster of ponds within the Erlam's Meadow and Ashley Brickworks LWS, south of Ashley, lie within the land required for the construction of the Proposed Scheme.

Arable and cultivated land

- 2.3.159 Aerial imagery and Phase 1 habitat survey data indicates MA06 is dominated by arable fields with occasional hedgerows and trees. Arable land represents approximately 163.8ha of the land required for construction of the Proposed Scheme.

¹⁸ Botanical Society for Britain and Ireland, *Rare Plant Register for Vice County 58 (Cheshire)*, Available online at: https://bsbi.org/Cheshire_RDB_2015.pdf.

Buildings and structures

- 2.3.160 There are 11 isolated buildings and farmsteads within the land required for the construction of the Proposed Scheme.
- 2.3.161 There are large concentrations of residential buildings in the urban areas of Ashley, Thorns Green, Warburton Green, Hales Barns and that are either within or adjacent to the land required for the construction of the Proposed Scheme.

Davenport Green to Ardwick (MA07)

- 2.3.162 Approximately 30.4% of the land required for the construction of the Proposed Scheme was surveyed. Some surveys have also been undertaken within the 250m buffer zone.
- 2.3.163 The majority of the Proposed Scheme within MA07 is tunnelled. There are only six locations where the land required for the construction of the Proposed Scheme is above ground. The majority falls within urban areas, at Withington Golf Course or in the Ardwick area of central Manchester. The River Mersey and Fairywell Brook also flow within or adjacent to this land.

Woodland

- 2.3.164 There are at least 15 woodland blocks and clusters scattered throughout, or directly adjacent to, the land required for the construction of the Proposed Scheme in MA0719. The total area of woodland within the land required for the construction of the Proposed Scheme is as follows:
- 3.2ha of semi-natural broadleaved woodland; and
 - 1.1ha of plantation broadleaved woodland.
- 2.3.165 The woodland type with the largest area within land required for the construction of the Proposed Scheme is semi-natural broadleaved woodland and includes the following:
- a large block of woodland on the boundary of MA06 and MA07, along Fairywell Brook. It is dominated by hazel with abundant mature hawthorn and some elm. Aspen is also locally dominant. A large veteran oak is present in the land required for the construction of the Proposed Scheme in MA07. This has been reported in the Protected and Notable Flora BID, BID EC-003-00001. The ground flora is dominated by ivy with patches of garden escape species and giant hogweed. This vegetation may qualify as lowland mixed deciduous woodland HoPI;
 - several clusters of deciduous woodland around Withington Golf Course, including Wrengate Wood SBI to the north of the golf course. The majority of these woodland blocks are listed on the National Forest Inventory, and some, are mapped in the PHI as

¹⁹ Please note that the 15 blocks/clusters do not necessarily translate to 15 descriptions in the bullet lists below as some woodlands comprise more than one block/patch.

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deciduous woodland. A small part of this woodland located centrally within the SBI is known as Heyscroft. This woodland is considered ancient woodland by HS2 Ltd on the basis of heritage data. Across the golf courses the woodlands contain frequent black poplar, pedunculate oak, willow sp. and occasional lime sp., sycamore, beech, rowan, horse chestnut and alder. The ground flora lacks diversity and comprises species such as common nettle, ivy and wood avens. Many of the golf course woodlands are old ornamental plantings. They technically fall within the definition of lowland mixed deciduous woodland HoPI, but are atypical examples; and

- a number of small fragments of broadleaved semi-natural woodland along railway lines and in wasteland in the Ardwick area, in parkland where the River Medlock crosses Palmerston Street and near the A662 Ashton New Road. These woodlands are likely to be disturbed by being in a dense urban area. They are unlikely to qualify as a HoPI.

2.3.166 Included in the 15 blocks/clusters of woodland, there are three semi-natural broadleaved woodlands located immediately adjacent to the land required for the construction of the Proposed Scheme are:

- area of deciduous woodland adjacent to junction 3A of the M56. This is likely to be highways landscaping woodland and may not qualify as lowland mixed deciduous woodland HoPI;
- cluster of deciduous woodland around Withington Golf Course, some of which are listed on the National Forest Inventory, and/or, mapped as deciduous woodland by Natural England's PHI. These clusters may qualify as lowland mixed deciduous woodland HoPI; and
- linear deciduous woodland along the banks of the existing railway line at Birchfields Primary School. This vegetation may qualify as lowland mixed deciduous woodland HoPI;

2.3.167 Broadleaved plantation woodland, comprising narrow, fairway and shelter belts, is within the land required for construction of the Proposed Scheme in Withington Golf Course. Species include horse chestnut, alder, rowan and willow with occasional Scot's pine. These introduced trees do not qualify as a HoPI. Broadleaved plantation woodland is also in the land required for construction of the Proposed Scheme at junction 3A of the M56. No survey data is available, but it is likely to be an ornamental landscape planting and not qualify as a HoPI.

Scrub

2.3.168 Few areas of scrub are present. The main cluster of this habitat is on railways and waste ground north-east of Ardwick Station. This scrub could not be accessed but forms the boundaries between buildings or covers embankments. Of those areas surveyed, woody species include *Prunus* sp., blackthorn, willow, hawthorn and dogwood, with bramble as the dominant species within the ground layer. Scrub habitat comprises 3.4ha within the land required for the construction of the Proposed Scheme.

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2.3.169 Aerial photography was used to provide an indication of the habitats present either side of Rondin Road between Ardwick Station and the A635 Mancunian Way given that there was no access. A mix of scrub and open land is present, indicating the area may be representative of open mosaic habitat on previously developed land, a HoPI.

Hedgerows

2.3.170 In total, 606m of hedgerow habitat is present within the land required for the construction of the Proposed Scheme. This includes:

- 293m of intact species-poor hedgerow; and
- 313m of unsurveyed assumed intact species-rich hedgerow.

2.3.171 Hedgerows that comprise at least one woody UK native species (excluding honeysuckle and bramble which are integral to many hedgerows) and having 80% or more cover, qualify as a HoPI. Typical woody species include pedunculate oak, hawthorn, holly, rose, alder and hazel. Most of the arable and pasture fields are bordered by hedgerows.

Parkland and scattered trees

2.3.172 Withington Golf Club is within the land required for the construction of the Proposed Scheme. Scattered trees, and lines of trees are found across the courses with frequent black poplar, pedunculate oak, willow sp., cypress (*Cupressus* sp.) and Leyland cypress. An area of habitat mapped on Natural England's PHI as wood pasture and parkland is adjacent to the land required for construction of the Proposed Scheme in Philips Park.

Grassland and marsh

2.3.173 The main grassland types in MA07 are amenity grassland (9.7ha) and poor semi-improved grassland (5.8ha). The majority of the amenity grassland is found in Withington Golf Club, as amenity verges and around buildings north-east of Ardwick Station. Poor semi-improved grassland is principally distributed north of Ardwick Station, in and around brownfield and industrial land uses; or in the south of MA07 as highways landscaping at the interchange of the A560 Altrincham Road and M56 roads.

2.3.174 Semi-improved neutral grassland (0.7ha) is present at the following locations:

- along the boundary of MA06 and MA07, adjacent to Fairywell Brook. The majority of this grassland falls outside of the land required for the construction of the Proposed Scheme; however, the southern tip of this grassland is within. The grassland is ungrazed and uncut and is on a raised area of land surrounded by woodland and scrub. Timothy, cock's-foot, common vetch, tufted vetch and curled dock are all frequent within the sward, with abundant red fescue and hairy sedge (*Carex hirta*). Great horsetail (*Equisetum telamiteia*) and black knapweed are occasional in the sward, while horse radish (*Armoracia rusticana*), meadow vetchling, common fleabane, silverweed (*Potentilla anserina*) and common toadflax (*Linaria vulgaris*) are rare. This grassland does not qualify

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as a HoPI but it is a relatively diverse area of semi-natural grassland which is distinctive; and

- towards the northern end of MA07 between the existing railway line and Rondin Road. This grassland is mainly ephemeral grassland on a brownfield site. The sward comprises abundant red fescue with frequent false oat-grass and Yorkshire fog. Herbs such as hop trefoil (*Trifolium campestre*) and white clover are abundant in the sward, with frequent meadow vetchling, creeping thistle and bird's-foot-trefoil. Yellow wort is locally frequent and common centaury (*Centaureum erythrea*) is occasional. This grassland may form a component of open mosaic of previous developed land HoPI which may be present in this location (see further discussion in paragraph 2.3.169).

Watercourses

- 2.3.175 A single main watercourse is crossed by the route of the Proposed Scheme. Fairywell Brook is approximately 1.5m wide and flows along the boundary of MA06 and MA07, between Davenport Green and Newall Green. It flows through areas of semi-improved grassland, with strips of scrub present along the banks.
- 2.3.176 The route of the Proposed Scheme will pass beneath the River Mersey in Manchester tunnel. The River Mersey is also adjacent to land required for the construction of the Proposed Scheme at Withington Golf Club.
- 2.3.177 Three smaller watercourses were identified in the land required for the construction of the Proposed Scheme. They are mostly slow flowing watercourses associated with arable land with bank vegetation dominated by dense bramble and gorse scrub:
- Baguley Brook intersects at junction 3A of the M56;
 - Tributary of Baguley Brook, a culverted section that passes beneath at junction 3A of the M56; and
 - Tributary of River Mersey 2, over 2m wide, flows through Withington Golf Course and deciduous woodland, before joining with the River Mersey.

Water bodies

- 2.3.178 The total number of ponds and ditches identified from aerial photography and OS maps within 500m of the area of land required for the construction of the Proposed Scheme is 34. This includes:
- none are in the area of land required for the construction of the Proposed Scheme, however, one is adjacent in the Withington Golf Club;
 - six between 100m and the area of land required for the construction of the Proposed Scheme;
 - nine between 100m and 250m from the area of land required for the construction of the Proposed Scheme; and

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- nineteen between 250m and 500m from the land required for the construction of the Proposed Scheme.

2.3.179 There were no ditch surveys carried out in MA07.

Arable and cultivated land

2.3.180 Phase 1 habitat survey data and aerial photos show that there is relatively little arable (0.1ha) land within MA07. The majority of the land required for the construction of the Proposed Scheme is in urban and semi-urban areas, or grassland and woodland habitat at Withington and Didsbury golf courses.

Buildings and structures

2.3.181 The majority of land required for the construction of the Proposed Scheme within MA07 falls within urban areas of Manchester. There are concentrations of residential buildings at almost all sections of land required for the construction of the Proposed Scheme, including Newall Green, junction 3A of the M56, Didsbury and Withington, the area surrounding Birchfields Primary School and Ardwick that are either within or adjacent to the land required for the construction of the Proposed Scheme.

Manchester Piccadilly Station (MA08)

2.3.182 Approximately 12.1% of the land required for the construction of the Proposed Scheme was surveyed. Some surveys have also been undertaken within the 250m buffer zone.

2.3.183 Land in and adjacent to land required for construction of the Proposed Scheme includes habitats comprising mainly urban, industrial and commercial areas with small patches of amenity grassland and scattered urban trees. Three main watercourses, the River Medlock, Ashton Canal (West) and Rochdale Canal intersect the land required for the construction of the Proposed Scheme. They flow in and adjacent to this land.

Woodland

2.3.184 There are two woodland blocks and clusters scattered throughout, or directly adjacent to, the land required for the construction of the Proposed Scheme in MA08. The total area of woodland within the land required for the construction of the Proposed Scheme is 0.7ha, all of which is plantation broadleaved woodland.

2.3.185 Plantation broadleaved woodland which is unlikely to qualify as a HoPI includes:

- a strip of woodland along the banks of the River Medlock; and
- a number of small patches of woodland that form landscape planting around areas of commercial or residential development near Helmet Street, Travis Street and Portugal Street East, adjacent to the A6 Ardwick Green South road and in several other locations.

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2.3.186 Semi-natural broadleaved woodland is located adjacent to the land required for the construction of the Proposed Scheme where there is a large area mapped by Natural England as deciduous woodland HoPI north and west of the A665 Pin Mill Brow and adjacent to the River Medlock. This woodland contains abundant poplar hybrids, with occasional goat willow, ash, silver birch and sycamore. Himalayan balsam is also present within the woodland. Woodland in this location is also present where oak is dominant over a hawthorn understorey, with a sparse ground flora layer of ivy and bare soil.

Scrub

2.3.187 Aerial imagery indicates that small patches of scrub are present, covering an area of 0.3ha within the land required for the construction of the Proposed Scheme in MA08. This vegetation is between industrial and commercial buildings. There may also be strips of scrub along existing railway corridors in MA08.

Hedgerows

2.3.188 No hedgerows are present within the land required for the construction of the Proposed Scheme.

Parkland and scattered trees

2.3.189 There are no large areas of parkland or scattered trees within the land required for the construction of the Proposed Scheme in MA08 although aerial imagery indicates that occasional street trees are present.

Grassland and marsh

2.3.190 Aerial imagery indicates that there are numerous, small patches of amenity grassland. They amount to 2.9ha in area and are within industrial or commercial areas.

2.3.191 A park south of Palmerston Street and east of Pin Mill Brow contains semi-improved neutral grassland and is adjacent to the land required for the construction of the Proposed Scheme. This grassland comprises abundant bent species and red fescue with frequent cock's foot and Yorkshire fog. A relatively diverse range of broadleaved herbs is present, including lesser trefoil (*Trifolium dubium*), white clover, red clover, ragwort, common mouse-ear, ribwort plantain, ox-eye daisy (*Leucanthemum vulgare*) and meadow vetchling.

Watercourses

2.3.192 Three main watercourses are crossed by the Proposed Scheme:

- the River Medlock, approximately 10m wide, flows through the industrial area south of the Piccadilly Trading Estate, and beneath the existing railway line. A strip of broadleaved semi-natural woodland is present along the banks. Several sections along its course are culverted;

Background Information and Data

Ecology and biodiversity

BID EC-002-0001

Ecological baseline data – Phase 1 habitat survey

- Ashton Canal (West) SBI and Rochdale Canal, Stott's Lane–Ducie Street Basin SBI are both approximately 11m wide. They run through urban areas in Manchester towards Piccadilly basin. The land required for the construction of the Proposed Scheme intersects these SBIs three times, at points where the canal flows beneath existing bridges, and once at an existing aqueduct; and
- One smaller watercourse was identified in the land required for the construction of the Proposed Scheme. Shooters Brook Downstream is an underground tributary of the River Medlock.

Water bodies

- 2.3.193 The total number of ponds and ditches identified from aerial photography and OS maps within 500m of the area of land required for the construction of the Proposed Scheme is 11. This includes:
- six between 100m and 250m from the land required for the construction of the Proposed Scheme; and
 - five between 250m and 500m from the land required for the construction of the Proposed Scheme.
- 2.3.194 There were no ditch surveys carried out in MA08.
- 2.3.195 All water bodies within, or adjacent to the Proposed Scheme are ponds set within residential gardens, or urbanised areas.

3 References

Botanical Society for Britain and Ireland, *Rare Plant Register for Vice County 58 (Cheshire)*, Available online at: https://bsbi.org/Cheshire_RDB_2015.pdf.

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

GMLRC, Great Manchester Local Records Centre. Available online at: <https://www.gmwildlife.org.uk/>.

Natural England Ancient Woodland Inventory. Available online at: <https://magic.defra.gov.uk/magicmap.aspx>.

Natural England Priority Habitat Inventory. Available online at: <https://magic.defra.gov.uk/magicmap.aspx>.

Natural Environment and Rural Communities Act 2006 (Chapter 16), London. Her Majesty's Stationery Office.

rECOrd, *Local Biological Records Centre serving Cheshire*. Available online at: <http://www.record-lrc.co.uk/>.

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