

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

## **Background information and data accompanying SES1 and AP1 ES**

### **Ecology and biodiversity**

BID EC-017-00000 SES1 and AP1 ES

Ecological baseline data – other

MA01: Hough to Walley's Green

MA02: Wimboldsley to Lostock Gralam

MA03: Pickmere to Agden and Hulseheath

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MA01: Hough to Walley's Green

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MA03: Pickmere to Agden and Hulseheath



## 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 Structure of this report

- 1.1.1 This document sets out Background Information and Data (BID) that accompanies the High Speed Rail (Crewe – Manchester) Supplementary Environmental Statement 1 (SES1) and Additional Provision 1 Environmental Statement (AP1 ES)<sup>1</sup>.
- 1.1.2 This document sets out baseline data for habitats and species not reported in the BID report<sup>2</sup> (the main BID report) that accompanied the High Speed Rail (Crewe – Manchester) Environmental Statement published in 2022<sup>3</sup> (the main ES). It should be read in conjunction with the main BID report.
- 1.1.3 Baseline data in this document is reported for the following ecological aspects and species:
- habitats;
  - hedgerows;
  - birds;
  - ponds and canals;
  - river habitat;
  - otter; and
  - water vole.
- 1.1.4 Baseline data covering other habitats and species are contained in the following SES1 and AP1 ecological baseline data reports:
- Ecological baseline data – National Vegetation Classification and ancient woodland (BID EC-004-00000 SES1 and AP1 ES);
  - Ecological baseline data – amphibians (BID EC-007-00000 SES1 and AP1 ES); and
  - Ecological baseline data – bats (BID EC-011-00000 SES1 and AP1 ES).

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<sup>1</sup> High Speed Two Ltd (2022), High Speed Rail (Crewe – Manchester), *Supplementary Environmental Statement 1 and Additional Provision 1 Environmental Statement*. Available online at:

<https://www.gov.uk/government/collections/hs2-phase-2b-crewe-manchester-supplementary-environmental-statement-1-and-additional-provision-1-environmental-statement>.

<sup>2</sup> High Speed Two Ltd (2022), High Speed Rail (Crewe – Manchester), *Background Information and Data*. Available online at: <https://www.gov.uk/government/collections/hs2-phase2b-crewe-manchester-environmental-statement>.

<sup>3</sup> High Speed Two Ltd (2022), High Speed Rail (Crewe – Manchester), *Environmental Statement*. Available online at: <https://www.gov.uk/government/collections/hs2-phase2b-crewe-manchester-environmental-statement>.

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1.1.5 This document covers the following community areas (CA):

- Hough to Walley's Green (MA01);
- Wimboldsley to Lostock Gralam (MA02); and
- Pickmere to Agden and Hulseheath (MA03).

1.1.6 Maps relevant to this report are contained in the Background Information and Data, Ecology Map Book: Map Series EC-02 (Phase 1 habitat survey), EC-04 (Amphibians), EC-05 (Bat roosts), EC-06 (Bat activity), EC-08 (Breeding birds), EC-10 (Phase 2 habitat survey), EC-11 (Other protected and notable species) and EC-12 (Other protected and notable species) etc that accompanies the SES1 and AP1 ES.

1.1.7 In order to differentiate between the original scheme and the subsequent changes, the following terms are used:

- 'the original scheme' – the Bill scheme submitted to Parliament in January 2022, which was assessed in the main ES;
- 'the SES1 scheme' – the original scheme with the changes described in SES1 that are within the existing powers of the Bill; and
- 'the AP1 revised scheme' – the original scheme as amended by the SES1 changes and AP1 amendments.

## 1.2 Methodology, assumptions and limitations

1.2.1 The assessment scope, key assumptions and limitations are as set out in the main ES Environmental Impact Assessment Scope and Methodology Report (SMR) (see Volume 5, Appendix: CT-001-00001 in the main ES)<sup>4</sup>.

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



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# **2 Habitats**

## **2.1 Introduction**

2.1.1 This section sets out ecological baseline data relating to habitats not reported in the main BID report. It should be read in conjunction with main BID report, Ecological baseline data – Phase 1 habitat survey (see main BID EC-002-00001), which accompanied the main ES.

## **2.2 Methodology**

- 2.2.1 Details of the standard methodology used for extended Phase 1 Habitat Surveys are provided in the Technical note – Ecology and biodiversity – Ecological field survey methods and standards, which is included within the SMR which accompanied the main ES.
- 2.2.2 In 2020, HS2 Ltd agreed revised field survey areas for Phase 1 Habitat Survey with Natural England. These revisions were made in response to stabilisation of boundary of the land required for construction of the original scheme and a reduced need to survey land away from it to understand likely impacts. The survey area for Phase 1 Habitat Survey was reduced from the 250m buffer zone to the 100m buffer zone.
- 2.2.3 The scoping, desk study exercises and surveys reported in the main ES can be found in BID EC-002-00001, that accompanied the main ES. This section contains the outcomes of surveys undertaken that were not reported in the BID document that accompanied the main ES (BID EC-002-00001). This is either because the survey reporting process had not been completed to inform the assessment within the main ES, or because the surveys have been undertaken since production of the main ES.

## **2.3 Deviations, constraints and limitations**

2.3.1 Phase 1 Habitat Surveys were conducted between May and July 2021. Where access restrictions meant that survey was not possible, or incomplete, the survey findings were determined from aerial imagery.

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## 2.4 Baseline

### Hough to Walley’s Green (MA01)

#### Introduction

2.4.1 Approximately 62.9% of the area of land required for the AP1 revised scheme has been subject to Phase 1 Habitat Survey in the Hough to Walley’s Green area (MA01) by the end of July 2021. No new survey data were collected during 2021.

#### Updated summary of habitat types within the Hough to Walley’s Green area (MA01)

2.4.2 Table 1 provides a summary of the habitat types within the land required for the construction of the AP1 revised scheme in the Hough to Walley’s Green area (MA01).

**Table 1: Habitat types within the land required for the AP1 revised scheme within MA01**

Habitat type	Surveyed area (ha)/length (km) verified by field surveys	Un-surveyed area (ha)/length (km) interpreted from aerial imagery	Relevant to SES1 scheme (Y/N)	Relevant to AP1 revised scheme (Y/N)
Broadleaved woodland – semi-natural	0.7	2.9	Y	Y
Broadleaved woodland – plantation	0.2	-	Y	N
Mixed woodland – plantation	0.3	-	Y	N
Scrub – dense/continuous	0.4	3.1	Y	Y
Scrub – scattered	<0.1	0.1	Y	Y
Broadleaved parkland/scattered trees	<0.1	<0.1	Y	N
Acid grassland – semi-improved	0.2	-	Y	Y
Neutral grassland – unimproved	<0.1	-	Y	N
Neutral grassland – semi-improved	4.4	-	Y	Y
Improved grassland	69.6	1.9	Y	Y
Marsh/marshy grassland	0.8	2.0	Y	Y
Poor semi-improved grassland	9.9	16.6	Y	Y
Other tall herb and fern – ruderal	2.7	-	Y	Y
Swamp	0.2	-	Y	Y
Standing water	0.4	-	Y	Y

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Habitat type	Surveyed area (ha)/length (km) verified by field surveys	Un-surveyed area (ha)/length (km) interpreted from aerial imagery	Relevant to SES1 scheme (Y/N)	Relevant to AP1 revised scheme (Y/N)
Running water	-	<0.1	Y	N
Cultivated/disturbed land – arable	28.6	10.2	Y	Y
Cultivated/disturbed land – amenity grassland	0.1	4.7	Y	Y
Cultivated/disturbed land – ephemeral/short perennial	<0.1	-	Y	N
Introduced shrub	<0.1	-	Y	Y
Hedgerow – intact, species-rich	0.9	-	Y	Y
Hedgerow – intact, species-poor	5.6	-	Y	Y
Hedgerow – defunct, species-poor	1.8	-	Y	N
Hedgerow – with trees, species-rich	3.8	-	Y	Y
Hedgerow – with trees, species-poor	3.7	-	Y	Y
Hedgerow – not surveyed and assumed to be intact, species-rich	N/A	11.3	Y	Y
Buildings	0.3	0.2	Y	Y
Bare ground	0.1	0.7	Y	Y
Other habitat	2.4	30.7	Y	Y

## Wimboldsley to Lostock Gramam (MA02)

### Introduction

- 2.4.3 Approximately 70.4% of the area of land required for the construction of the AP1 revised scheme has been subject to Phase 1 Habitat Survey in the Wimboldsley to Lostock Gramam area by the end of July 2021.
- 2.4.4 Descriptions of the habitat types that have been subject to Phase 1 Habitat Survey, to verify the assumed baseline reported in BID EC-002-00001, which accompanied the main ES, are provided below.

### Woodland

- 2.4.5 Approximately 0.2ha of broadleaved plantation woodland in the land required for construction of the original scheme has been additionally ground truthed. It is present as

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roadside woodland planting, north-east of the junction between the A556 Chester Road and the A530 King Street, south of Rudheath. This woodland was dominated by young elm (*Ulmus sp.*) trees which appeared to have been planted.

### Scrub

- 2.4.6 Approximately 0.01ha of scattered scrub dominated by bramble (*Rubus fruticosus agg*) in the land required for construction of the original scheme has been additionally ground truthed. It is north-east of the junction between the A556 Chester Road and the A530 King Street, south of Rudheath.

### Hedgerows

- 2.4.7 Hedgerows that comprise 80% native woody species qualify as a habitat of principal importance. Details of additionally ground truthed hedgerows that are 'important', and which are located within the land required for the AP1 revised scheme are provided in Section 3.
- 2.4.8 Five hundred and seventy-three metres of hedgerow comprising species-poor hedgerow with trees was additionally ground truthed in the land required for the AP1 revised scheme in the Wimboldsley to Lostock Gralam area. These hedges were north-east of the junction between the A556 Chester Road and the A530 King Street, south of Rudheath. They contained frequent elm and abundant hawthorn (*Crataegus monogyna*) with occasional scattered horse-chestnut (*Aesculus hippocastanum*).

### Parkland and scattered trees

- 2.4.9 No parkland and scattered tree habitat was identified through additional surveys within the land required for construction of the original scheme or the AP1 revised scheme.

### Grassland and marsh

- 2.4.10 The following grassland habitats have been additionally ground truthed. Approximately 0.6ha of improved grassland and poor semi-improved grassland are present at the junction of the A54 Middlewich Road and Chester Road and north-east of the junction between the A556 Chester Road and the A530 King Street, south of Rudheath. This vegetation forms road verges and is present on a roundabout. The poor semi-improved grassland is irregularly managed and comprises frequent false oat-grass (*Arrhenatherum elatius*), occasional perennial rye-grass (*Lolium perenne*), locally frequent red fescue (*Festuca rubra*) with occasional to locally frequent common knapweed (*Centaurea nigra*), ox-eye daisy (*Leucanthemum vulgare*), docks (*Rumex sp.*), creeping thistle (*Cirsium arvense*) and occasional cow parsley (*Anthriscus sylvestris*). The improved grassland comprised abundant false-oat grass, frequent perennial rye-grass and occasional soft brome (*Bromus hordeaceus*) and

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common nettle (*Urtica dioica*). This grassland is in the land required for construction of the original scheme and a small area is in the additional land required for construction of the AP1 revised scheme.

**Watercourses**

2.4.11 No new watercourses were identified within the land required for the construction of the original scheme or the AP1 revised scheme.

**Water bodies**

2.4.12 No new standing water habitat was identified within the land required for the construction of the original scheme. In total, there are 79 water bodies within the land required for the construction of the AP1 revised scheme.

**Arable and cultivated land**

2.4.13 No new arable and cultivated land has been identified within the land required for the construction of the original scheme or the AP1 revised scheme.

**Buildings and structures**

2.4.14 No additional areas of buildings and structure are present beyond those reported in the main ES.

**Updated summary of habitat types within the Wimboldsley to Lostock Gralam area (MA02)**

2.4.15 Table 2 provides a summary of the habitat types within the land required for the construction of the AP1 revised scheme in the Wimboldsley to Lostock Gralam area (MA02).

**Table 2: Habitat types within the land required for the AP1 revised scheme within MA02**

Habitat type	Surveyed area (ha)/length (km) verified during additional surveys	Un-surveyed area (ha)/length (km) interpreted from aerial imagery	Relevant to SES1 scheme (Y/N)	Relevant to AP1 revised scheme (Y/N)
Broadleaved woodland – semi-natural	12.4	9.2	Y	Y
Broadleaved woodland – plantation	0.4	-	Y	Y
Mixed woodland – plantation	0.1	-	Y	Y
Scrub – dense/continuous	2.0	2.0	Y	Y
Scrub – scattered	0.5	-	Y	Y
Broadleaved parkland/scattered trees	0.5	0.1	Y	Y

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Habitat type	Surveyed area (ha)/length (km) verified during additional surveys	Un-surveyed area (ha)/length (km) interpreted from aerial imagery	Relevant to SES1 scheme (Y/N)	Relevant to AP1 revised scheme (Y/N)
Mixed parkland/scattered trees	0.2	-	Y	N
Neutral grassland – unimproved	0.2	-	Y	N
Neutral grassland – semi-improved	3.0	0.2	Y	Y
Improved grassland	278.8	5.3	Y	Y
Marsh/marshy grassland	1.8	-	Y	N
Poor semi-improved grassland	13.3	67.7	Y	Y
Bracken – continuous	<0.1	-	Y	N
Bracken – scattered	0.2	-	Y	Y
Other tall herb and fern – ruderal	15.2	-	Y	N
Swamp	<0.1	-	Y	N
Marginal and inundation – inundation vegetation	0.4	0.1	Y	N
Standing water	2.0	-	Y	Y
Standing water – eutrophic	0.1	-	Y	N
Running water	1.0	1.0	Y	Y
Surplus	0.2	-	Y	N
Cultivated/disturbed land – arable	145.4	75.8	Y	Y
Cultivated/disturbed land – amenity grassland	0.8	4.6	Y	Y
Cultivated/disturbed land – ephemeral/short perennial	1.6	<0.1	Y	Y
Introduced shrub	0.5	-	Y	Y
Hedgerow – intact, species-rich	1.0	-	Y	N
Hedgerow – intact, species-poor	28.1	-	Y	Y
Hedgerow – defunct, species-rich	<0.1	-	Y	N
Hedgerow – defunct, species-poor	4.9	-	Y	Y
Hedgerow – with trees, species-rich	2.1	-	Y	Y
Hedgerow – with trees, species-poor	15.2	-	Y	Y
Hedgerow – not surveyed and assumed to be intact, species-rich	N/A	35.5	Y	Y
Buildings	0.8	0.2	Y	Y
Bare ground	1.5	1.7	Y	Y
Other habitat	5.1	37.3	Y	Y

## Pickmere to Agden and Hulseheath (MA03)

### Introduction

- 2.4.16 Approximately 68.6% of the area of land required for the construction of the AP1 revised scheme has been subject to Phase 1 Habitat Survey in the Pickmere to Agden and Hulseheath (MA03) area by the end of July 2021.
- 2.4.17 Descriptions of the habitat types that have been subject to Phase 1 Habitat Survey, to verify the assumed baseline reported in BID EC-002-00001, which accompanied the main ES, are provided below.

### Woodland

- 2.4.18 Semi-natural broadleaved woodland qualifies as lowland mixed deciduous woodland, a habitat of principal importance in Section 41 of the Natural Environment and Rural Communities (NERC) Act (2006)<sup>5</sup>. A single area of semi-natural broadleaved woodland, less than 0.1ha in size, has been additionally ground truthed. It is a linear woodland around the southern edge of an arable field, adjacent to Waterless Brook and Tabley Brook (the two watercourses meet at this location), south of Budworth Road, opposite Heyrose Golf Course. This woodland forms part of the Arley and Waterless Brook Corridor Local Wildlife Site (LWS). The woodland contains frequent grey willow (*Salix cinerea*), pedunculate oak (*Quercus robur*) and ash (*Fraxinus excelsior*). The ground flora was quite diverse and included occasional: three-nerved sandwort (*Moehringia trinervia*), ramsons (*Allium ursinum*), wood anemone (*Anemone nemorosa*), dog's mercury (*Mercurialis perennis*), greater chickweed (*Stellaria neglecta*), remote sedge (*Carex remota*), false brome (*Brachypodium sylvaticum*), giant fescue (*Schedonorus giganteus*), large bitter-cress (*Cardamine amara*) and Himalayan balsam (*Impatiens glandulifera*). Some of these species are indicators for ancient woodland; however, the woodland is not on Natural England's Ancient Woodland Inventory (AWI). This woodland is in the land required for the original scheme.

### Scrub

- 2.4.19 No new scrub habitat was identified within the land required for the construction of the original scheme or the AP1 revised scheme.

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<sup>5</sup> *Natural Environment and Rural Communities Act 2006*, Chapter 16. Her Majesty's Stationery Office, London.

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### Hedgerows

- 2.4.20 Hedgerows that comprise 80% native woody species qualify as a habitat of principal importance. Details of additionally surveyed hedgerows that are 'important', and which are located within the land required for the construction of the original scheme or the AP1 revised scheme are provided in Section 3.
- 2.4.21 Ground truthing surveys additionally identified the following hedgerows in the land required for the original scheme, in the Pickmere to Agden and Hulseheath area:
- species-poor, defunct – 116m; and
  - species-rich, with trees – 425m.
- 2.4.22 Species-poor hedgerows are typically dominated by hawthorn (*Crataegus monogyna*) with an impoverished ground flora, comprising common nettle (*Urtica dioica*) and cleavers (*Galium aparine*). Species-rich hedgerows were of similar woody composition but included a wider range of broadleaved herbs, including greater stitchwort (*Stellaria holostea*), meadowsweet (*Filipendula ulmaria*), dog's mercury, three-nerved sandwort and wood sage (*Teucrium scorodonia*).

### Parkland and scattered trees

- 2.4.23 No additional parkland and scattered trees habitat are present in land required for construction of the original scheme or the AP1 revised scheme.

### Grassland and marsh

- 2.4.24 No additional grassland is present in land required for construction of the original scheme or the AP1 revised scheme.

### Watercourses

- 2.4.25 No additional watercourses are present in land required for construction of the original scheme or the AP1 revised scheme.

### Water bodies

- 2.4.26 Two additional water bodies were additionally ground truthed in the land required for construction of the original scheme:
- a highly eutrophic pond with abundant lesser duckweed (*Lemna minuta*) and water-starwort (*Callitriche sp.*). Marginal vegetation includes Himalayan balsam, grey willow, bramble and Cyperus sedge (*Carex pseudocyperus*); and
  - an enriched pond with a reasonably rich aquatic macrophyte flora including locally frequent floating sweet-grass (*Glyceria fluitans*), water-starwort, branched bur-reed



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(*Sparganium erectum*) and common duckweed (*Lemna minor*). Marginal vegetation primarily comprises woody nightshade (*Solanum dulcamara*), remote sedge, bramble and grey willow.

2.4.27 In total, there are 104 water bodies within the land required for the construction of the AP1 revised scheme.

**Arable and cultivated land**

2.4.28 An additional 8.7ha of arable habitat has been ground truthed, south of Budworth Road, opposite Heyrose Golf Club in the land required for construction of the AP1 revised scheme. It comprises wheat (*Triticum aestivum*) with occasional common field-speedwell (*Veronica persica*), annual meadow-grass (*Poa annua*) and field forget-me-not (*Myosotis arvensis*).

**Buildings and structures**

2.4.29 No additional areas of buildings and structure are present in the land required for construction of the AP1 revised scheme.

**Updated summary of habitat types within the Pickmere to Agden and Hulseheath area (MA03)**

2.4.30 Table 3 provides a summary of the habitat types within the land required for the construction of the AP1 revised scheme in the Pickmere to Agden and Hulseheath area.

**Table 3: Habitat types within the land required for the AP1 revised scheme within MA03**

Habitat type	Surveyed area (ha)/length (km) verified during additional surveys	Un-surveyed area (ha)/length (km) interpreted from aerial imagery	Relevant to SES1 scheme (Y/N)	Relevant to AP1 revised scheme (Y/N)
Broadleaved woodland – semi-natural	3.8	6.0	Y	Y
Broadleaved woodland – plantation	0.4	0.2	Y	Y
Coniferous woodland – plantation	-	<0.1	Y	N
Mixed woodland – plantation	0.2	<0.1	Y	Y
Scrub – dense/continuous	0.5	1.7	Y	Y
Scrub – scattered	0.8	-	Y	Y
Broadleaved parkland/scattered trees	0.1	0.1	Y	N
Mixed parkland/scattered trees	0.8	-	Y	Y
Neutral grassland – semi-improved	1.3	-	Y	Y
Improved grassland	132.5	26.8	Y	Y
Marsh/marshy grassland	0.1	-	Y	N

**Background Information and Data accompanying Supplementary Environmental Statement 1 and Additional Provision 1 Environmental Statement**

Ecology and biodiversity  
 BID EC-017-00000 SES1 and AP1 ES  
 MA01, MA02 and MA03  
 Ecological baseline data – other

Habitat type	Surveyed area (ha)/length (km) verified during additional surveys	Un-surveyed area (ha)/length (km) interpreted from aerial imagery	Relevant to SES1 scheme (Y/N)	Relevant to AP1 revised scheme (Y/N)
Poor semi-improved grassland	42.7	21.9	Y	Y
Bracken – continuous	<0.1	-	Y	N
Other tall herb and fern – ruderal	1.6	-	Y	Y
Standing water	1.0	<0.1	Y	Y
Standing water – eutrophic	0.6	-	Y	Y
Standing water – mesotrophic	0.2	-	Y	N
Running water	0.3	0.4	Y	Y
Cultivated/disturbed land – arable	106.2	55.7	Y	Y
Cultivated/disturbed land – amenity grassland	3.9	4.4	Y	Y
Introduced shrub	0.1	-	Y	Y
Hedgerow – intact, species-rich	1.3	-	Y	Y
Hedgerow – intact, species-poor	11.4	-	Y	Y
Hedgerow – defunct, species-rich	0.2	-	Y	Y
Hedgerow – defunct, species-poor	3.0	-	Y	Y
Hedgerow – with trees, species-rich	3.1	-	Y	Y
Hedgerow – with trees, species-poor	10.6	-	Y	Y
Hedgerow – not surveyed and assumed to be intact, species-rich	-	33.4	Y	Y
Buildings	0.4	0.3	Y	Y
Bare ground	1.3	1.4	Y	Y
Other habitat	2.0	20.1	Y	Y

## Background Information and Data accompanying Supplementary Environmental Statement 1 and Additional Provision 1 Environmental Statement

Ecology and biodiversity  
BID EC-017-00000 SES1 and AP1 ES  
MA01, MA02 and MA03  
Ecological baseline data – other

# 3 Hedgerows

## 3.1 Introduction

- 3.1.1 This section sets out ecological baseline data relating to hedgerows not reported in the main BID document that accompanied the main ES. It should be read in conjunction with main BID report, Ecology baseline data – hedgerows (see main BID EC-005-00001).

## 3.2 Methodology

- 3.2.1 Details of the standard methodology utilised for hedgerow surveys are provided in the Technical note – Ecology and biodiversity – Ecological field survey methods and standards, which is included within the SMR which accompanied the main ES.
- 3.2.2 In 2020, HS2 Ltd agreed revised field survey areas for hedgerow survey with Natural England. These revisions were made in response to stabilisation of boundary of the land required for construction of the original scheme and a reduced need to survey land away from it to understand likely impacts. The survey area for hedgerow survey was reduced from the 100m buffer zone to the land required for construction of the original scheme or the AP1 revised scheme.
- 3.2.3 The desk study exercises and surveys reported in the main ES can be found in BID EC-005-00001. This section contains the outcomes of surveys undertaken that were not reported in the main BID document that accompanied the main ES. This is either because the survey reporting process had not been completed to inform the assessment within the main ES, or because the surveys have been undertaken since production of the main ES.
- 3.2.4 Sites for hedgerow survey were identified as those that are within the land required for the original scheme or the AP1 revised scheme.

## 3.3 Deviations, constraints and limitations

- 3.3.1 All hedgerows within the land required for the AP1 revised scheme were identified from aerial photography and were then scoped and surveyed in the field.
- 3.3.2 Hedgerow surveys can be undertaken at any time of year, but the optimal period is April to October (Department for Environment, Food and Rural Affairs (Defra), 2007)<sup>6</sup>. The hedgerow surveys were conducted between May 2021 and July 2021.

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<sup>6</sup> Defra (2007), *Hedgerow Survey Handbook: A standard procedure for local surveys in the UK*. Prepared on behalf of the Steering Group for the UK Biodiversity Action Plan for Hedgerows, 2<sup>nd</sup> edition.

**Background Information and Data accompanying Supplementary Environmental Statement 1 and Additional Provision 1 Environmental Statement**

Ecology and biodiversity  
BID EC-017-00000 SES1 and AP1 ES  
MA01, MA02 and MA03  
Ecological baseline data – other

## **3.4 Baseline**

3.4.1 No new 'important' hedgerows were identified as a result of survey in 2021.

### **Hough to Walley's Green (MA01)**

3.4.2 Within the Hough to Walley's Green area (MA01) no additional hedgerows were surveyed to determine whether they meet the wildlife and landscape criteria to be considered an 'important' hedgerow under the Hedgerow Regulations.

### **Wimboldsley to Lostock Gralam (MA02)**

3.4.3 Within the Wimboldsley to Lostock Gralam area (MA02) one additional hedgerow with a length of approximately 0.3km was surveyed to determine if it met the wildlife and landscape criteria to be considered an 'important' hedgerow under the Hedgerow Regulations. It did not qualify as an 'important' hedgerow.

### **Pickmere to Agden and Hulseheath (MA03)**

3.4.4 Within the Pickmere to Agden and Hulseheath area (MA03) one additional hedgerow with a length of approximately 0.2km was surveyed to determine if it met the wildlife and landscape criteria to be considered an 'important' hedgerow under the Hedgerow Regulations. It did not qualify as an 'important' hedgerow.

## **4 Protected and notable Flora**

### **4.1 Introduction**

- 4.1.1 This section sets out ecological baseline data relating to protected and notable flora not reported in the main BID report. It should be read in conjunction with main BID report, Ecological baseline data – protected and notable flora (see main BID EC-003-00001), which accompanied the main ES.

### **4.2 Methodology**

- 4.2.1 The method used to review protected and notable flora species records arising from desk study and field survey sources can be found in BID EC-003-00001, which accompanied the main ES. This section contains protected and notable flora species records that were not reported in the BID document that accompanied the main ES. This is either because the field survey reporting process had not been completed to inform the assessment within the main ES, or because the surveys have been undertaken since production of the main ES, including on additional land required for the construction of the AP1 revised scheme.

### **4.3 Deviations, constraints and limitations**

- 4.3.1 Deviations, constraints and limitations are as reported in BID EC-003-00001, which accompanied the main ES.

### **4.4 Baseline**

- 4.4.1 The study has focussed on any protected and/or notable flora located within or adjacent to the land required for the AP1 revised scheme or located at greater distance but considered potentially subject to adverse effects.

#### **Desk study**

- 4.4.2 The desk study identified no additional notable plant species in or adjacent to the land required for construction of the original scheme or the AP1 revised scheme.

#### **Field survey**

- 4.4.3 A summary of relevant protected or notable flora recorded during field surveys is provided in Table 4.

## Background Information and Data accompanying Supplementary Environmental Statement 1 and Additional Provision 1 Environmental Statement

Ecology and biodiversity  
 BID EC-017-00000 SES1 and AP1 ES  
 MA01, MA02 and MA03  
 Ecological baseline data – other

**Table 4: Records of protected and notable flora relevant to the assessment obtained during field survey in MA01 to MA03**

Common name	Latin name	Status <sup>7</sup>	Location	Ordnance Survey (OS) grid reference	Distance (m)	CA	Within the land required for the AP1 revised scheme (yes/no)	Relevant to SES1 scheme (Y/N)	Relevant to AP1 revised scheme (Y/N)
Field scabious	<i>Knautia arvensis</i>	Near Threatened – England Red List	North-west of Stanthorne	SJ6901066975	22	MA02	No	Y	N
Tormentil	<i>Potentilla erecta</i>	Near Threatened – England Red List	North-west of Stanthorne	SJ6896666998	20	MA02	No	Y	N
Field scabious	<i>Knautia arvensis</i>	Near Threatened – England Red List	North-west of Stanthorne	SJ6895067005	19	MA02	No	Y	N
Tormentil	<i>Potentilla erecta</i>	Near Threatened – England Red List	North-west of Stanthorne	SJ6895067005	19	MA02	No	Y	N
Field scabious	<i>Knautia arvensis</i>	Near Threatened – England Red List	North-west of Stanthorne	SJ6892767017	18	MA02	No	Y	N
Tormentil	<i>Potentilla erecta</i>	Near Threatened – England Red List	North-west of Stanthorne	SJ688673	163	MA02	No	N	N
Field scabious	<i>Knautia arvensis</i>	Near Threatened – England Red List	Whatcroft	SJ6837570971	12	MA02	No	Y	N
Small-leaved lime	<i>Tilia cordata</i>	Locally Rare in South Lancashire (VC59), Locally Scarce in Cheshire (VC58)	Winnington and Peas Wood	SJ7015675753	22	MA02	No	N	N

<sup>7</sup> Where the status listed is the same in ‘A Vascular Plant Red List for England’ and ‘The Vascular Plant Red Data List for Great Britain’, only ‘The Vascular Plant Red Data List for Great Britain’ has been referenced.

## Background Information and Data accompanying Supplementary Environmental Statement 1 and Additional Provision 1 Environmental Statement

Ecology and biodiversity  
BID EC-017-00000 SES1 and AP1 ES  
MA01, MA02 and MA03  
Ecological baseline data – other

4.4.4 Bluebell was found to be present in the land required for the construction of the original scheme in a single location at Winnington and Peas Wood. Bluebell was adjacent to the land required for construction of the original scheme in three locations, all are also in Winnington and Peas Wood.

## 4.5 Discussion

### Hough to Walley's Green (MA01)

- 4.5.1 Field surveys and the desk study did not identify any additional notable plant species in or adjacent to the land required for construction of the original scheme or the AP1 revised scheme.
- 4.5.2 No new notable flora records were confirmed in the citations for LWS in or adjacent to the land required for construction of the original scheme or the AP1 revised scheme.
- 4.5.3 No new records of ancient or veteran trees are present in the land required for construction of the original scheme or the AP1 revised scheme.

### Wimboldsley to Lostock Gralam (MA02)

- 4.5.4 Field surveys did not identify any notable plant species in the land required for construction of the original scheme or the AP1 revised scheme.
- 4.5.5 Field surveys identified eight records of three notable plant species adjacent to the land required for construction of the original scheme:
- four records of field scabious (*Knautia arvensis*) near Whatcroft or north-west of Stanthorne. This species is listed as Near Threatened on the England Red List;
  - three records of tormentil (*Potentilla erecta*) north-west of Stanthorne. This species is listed as Near Threatened on the England Red List; and
  - a single record of small-leaved lime (*Tilia cordata*) in Winnington and Peas Wood. This species is Locally Rare in South Lancashire (VC59) and Locally Scarce in Cheshire (VC58).
- 4.5.6 The desk study did not identify any additional notable plant species in or adjacent to the land required for construction of the original scheme or the AP1 revised scheme.
- 4.5.7 No new notable flora records were confirmed in the citations for LWS in or adjacent to the land required for construction of the original scheme or the AP1 revised scheme.
- 4.5.8 No new records of ancient or veteran trees are present in the land required for construction of the original scheme or the AP1 revised scheme.

**Background Information and Data accompanying Supplementary Environmental Statement 1 and  
Additional Provision 1 Environmental Statement**

Ecology and biodiversity  
BID EC-017-00000 SES1 and AP1 ES  
MA01, MA02 and MA03  
Ecological baseline data – other

## **Pickmere to Agden and Hulseheath (MA03)**

- 4.5.9 Field surveys and the desk study did not identify any additional notable plant species in or adjacent to the land required for construction of the original scheme or the AP1 revised scheme.
- 4.5.10 No new notable flora records were confirmed in the citations for LWS in or adjacent to the land required for construction of the original scheme or the AP1 revised scheme.
- 4.5.11 No new records of ancient or veteran trees were present in the land required for construction of the original scheme or the AP1 revised scheme.



**Background Information and Data accompanying Supplementary Environmental Statement 1 and Additional Provision 1 Environmental Statement**

Ecology and biodiversity  
BID EC-017-00000 SES1 and AP1 ES  
MA01, MA02 and MA03  
Ecological baseline data – other

## **5 Breeding birds**

### **5.1 Introduction**

- 5.1.1 This section sets out ecological baseline data relating to breeding birds not reported in the main BID documents that accompanied the main ES. It should be read in conjunction with the main BID report, Ecological baseline data – breeding and wintering birds (see main BID EC-009-00001), which accompanied the main ES.

### **5.2 Methodology**

#### **General breeding bird survey**

- 5.2.1 Details of the standard methodology utilised for bird surveys are provided in the Technical note – Ecology and biodiversity – Ecological field survey methods and standards, which is included within the SMR which accompanied the main ES.
- 5.2.2 The scoping, desk study exercises and surveys reported in the main ES can be found in BID EC-009-00001, which accompanied the main ES. This section contains the outcomes of surveys undertaken that were not reported in the BID document that accompanied the main ES. This is either because the survey reporting process had not been completed to inform the assessment within the main ES, or because the surveys have been undertaken since production of the main ES. This information is referenced to the Background Information and Data, Ecology Map Book: Map Series EC-08 that accompanies the SES1 and AP1 ES.
- 5.2.3 Breeding bird surveys were undertaken between March and June 2021. Up to five visits were undertaken at each site, but there were fewer visits at some sites due to access constraints.
- 5.2.4 Table 5 summarises the two sites where surveys for breeding birds were undertaken.

**Background Information and Data accompanying Supplementary Environmental Statement 1 and Additional Provision 1 Environmental Statement**

Ecology and biodiversity  
 BID EC-017-00000 SES1 and AP1 ES  
 MA01, MA02 and MA03  
 Ecological baseline data – other

**Table 5: Summary of breeding bird field surveys undertaken within MA01 to MA03**

Ecology survey code	CA	Survey site name	OS grid reference	Location	Habitat types included in survey	Survey date(s)	Distance from the land required for the AP1 revised scheme (m) and orientation	Relevant to SES1 scheme (Y/N)	Relevant to AP1 revised scheme (Y/N)
BB1_BT12 A-D	MA03	Bentleyhurst Farm to Chapel Lane	SJ71728237	Glazebrook, Cheshire	Mixed farmland, woodland and parkland and hedgerows.	23 March 2021, 27 April 2021, 25 May 2021, 22 June 2021	Partly within	Y	N
BB1_BT13 A-B	MA03	Chapel Lane to Agden Bridge Farm	SJ72088516	Millington, Cheshire	Parkland, woodland, improved grassland and arable fields.	24 March 2021, 28 April 2021	Within	Y	N

## Background Information and Data accompanying Supplementary Environmental Statement 1 and Additional Provision 1 Environmental Statement

Ecology and biodiversity  
BID EC-017-00000 SES1 and AP1 ES  
MA01, MA02 and MA03  
Ecological baseline data – other

### 5.3 Identification of species most relevant to the assessment

5.3.1 Notable bird species are those that are listed on:

- Annex 1 of the Birds Directive<sup>8</sup>;
- Schedule 1 of the Wildlife and Countryside Act 1981 (as amended)<sup>9</sup>;
- Rare Breeding Birds Panel (RBBP) Species List<sup>10</sup>;
- Section 41 of the National Environment and Rural Communities Act 2006 (species of principal importance)<sup>5</sup>;
- Cheshire Local Biodiversity Action Plan (LBAP)<sup>11</sup>;
- Birds of Conservation Concern (Red and Amber species)<sup>12</sup>;
- the West Midland Bird Club<sup>13</sup>, Cheshire and Wirral Ornithological Society<sup>14</sup> and Greater Manchester<sup>15</sup> annual bird reports regional breeding status ('very rare', 'rare', 'scarce' or 'uncommon'); and/or
- county rare or scarce species listed in Table 7 of the Cheshire Wildlife Trust's selection criteria for sites of county biological importance<sup>16</sup> or in Greater Manchester sites of biological importance selection guidelines<sup>17</sup>.

5.3.2 Records of notable species are summarised for each site in Section 5.5.

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<sup>8</sup> Directive 2009/147/EC of the European parliament and of the council of 30 November 2009 on the Conservation of Wild Birds, European Parliament and Council, Brussels.

<sup>9</sup> *Wildlife and Countryside Act 1981*, Chapter 69. Her Majesty's Stationery Office, London. Available online at: [https://www.legislation.gov.uk/ukpga/1981/69/pdfs/ukpga\\_19810069\\_en.pdf](https://www.legislation.gov.uk/ukpga/1981/69/pdfs/ukpga_19810069_en.pdf).

<sup>10</sup> Rare Breeding Birds Panel (RBBP) (2018), *RBBP Species List*. Available online at: <https://rbbp.org.uk/wp-content/uploads/2020/11/2018-Report-summary-table.pdf>.

<sup>11</sup> Cheshire Local Biodiversity Action Plan (LBAP). Available online at: <https://www.cheshirewildlifetrust.org.uk/sites/default/files/2018-06/BAP%20list%20-%20updated%20April%202011.pdf>.

<sup>12</sup> Eaton, M., et al. (2015), *Birds of Conservation Concern 4: the population status of birds in the UK, Channel Islands and Isle of Man*. British Birds, 108 (12), pp.708-746.

<sup>13</sup> West Midlands Bird Club (2019), *The birds of Staffordshire, Warwickshire, Worcestershire and the West Midlands 2019*.

<sup>14</sup> Cheshire and Wirral Ornithological Society (2016), *Cheshire and Wirral Bird Report 2016*, Swallowtail Press, Norwich.

<sup>15</sup> Greater Manchester Bird Recording Group (2014), *Birds in Greater Manchester 2011*, GMBRG Manchester.

<sup>16</sup> Giles, R. (2014), *Local Wildlife Site Selection Criteria for the Cheshire Region*, Cheshire Wildlife Trust, Malpas.

<sup>17</sup> Greater Manchester Ecology Unit (2016), *Greater Manchester sites of biological importance selection guidelines*, GMEU, Manchester.

**Background Information and Data accompanying Supplementary Environmental Statement 1 and Additional Provision 1 Environmental Statement**

Ecology and biodiversity  
BID EC-017-00000 SES1 and AP1 ES  
MA01, MA02 and MA03  
Ecological baseline data – other

## **5.4 Deviations, constraints and limitations**

- 5.4.1 No deviations to the standard methodology were applied, and subject to the constraints and limitations identified in the following section, all surveys were conducted as per the standard methodology provided in the Technical note – Ecology and biodiversity – Ecological field survey methods and standards, which is included within the SMR that accompanied the main ES.
- 5.4.2 Surveys undertaken were limited to locations where landowner permission was obtained and from public rights of way (PRoW) (except where access for survey was refused).
- 5.4.3 Survey access to the transects was limited by restrictions. Consequently, only four visits were completed at BB1\_BT12 and two at BB1\_BT13 and the numbers of species and occurrences of behaviour indicating breeding are likely to be under-recorded. This is likely to have had a minor effect on data for transect BB1\_BT12, but is considered to be significant for BB1\_BT13.

## **5.5 Baseline**

### **Hough to Walley's Green (MA01)**

- 5.5.1 No additional breeding bird surveys were carried out on land required for the AP1 revised scheme within Hough to Walley's Green (MA01) between January 2021 and July 2021, inclusive.

### **Wimboldsley to Lostock Gralam (MA02)**

- 5.5.2 No additional breeding bird surveys were carried out on land required for the AP1 revised scheme within Wimboldsley to Lostock Gralam (MA02) between January 2021 and July 2021, inclusive.

### **Pickmere to Agden and Hulseheath (MA03)**

#### **Bentleyhurst Farm to Chapel Lane (BB1\_BT12) general breeding bird survey**

- 5.5.3 Four survey visits were carried out at Bentleyhurst Farm to Chapel Lane between 23 March and 22 June 2021. In total, 50 bird species were recorded including 19 notable species. Breeding territories of 18 species were recorded, of which four are notable; these are listed in Table 6.

**Background Information and Data accompanying Supplementary Environmental Statement 1 and Additional Provision 1 Environmental Statement**

Ecology and biodiversity  
 BID EC-017-00000 SES1 and AP1 ES  
 MA01, MA02 and MA03  
 Ecological baseline data – other

**Table 6: Notable birds recorded during the surveys at Bentleyhurst Farm to Chapel Lane (BB1\_BT12)**

Common name	Scientific name	Status	Estimated number of breeding territories	Number of survey visits during which the species were recorded (out of the total)	Relevant to SES1 scheme (Y/N)	Relevant to AP1 revised scheme (Y/N)
House sparrow	<i>Passer domesticus</i>	RSPB Red; NERC S41	2	3 (4)	Y	N
Song thrush	<i>Turdus philomelos</i>	RSPB Red; NERC S41	2	4 (4)	Y	N
Lapwing	<i>Vanellus vanellus</i>	RSPB Red; NERC S41	2	3 (4)	Y	N
Mistle thrush	<i>Turdus viscivorus</i>	RSPB Red	1	3 (4)	Y	N

5.5.4 In addition to the above records, the surveys identified a possible breeding territory of curlew. One curlew was recorded displaying in suitable habitat during the survey on 27 April 2021.

5.5.5 Desk study records for the Bentleyhurst Farm to Chapel Lane area are presented in the main BID report (BID EC-009-00001) under the Pownallgreen Farm to Park Farm (BB1\_BT04) area as both transects cover land parallel to the same section of the route.

### **Chapel Lane to Agden Bridge Farm (BB1\_BT13)**

5.5.6 Two survey visits were carried out at Chapel Lane to Agden Bridge Farm between 24 March and 28 April 2021. In total, 36 bird species were recorded including 12 notable species. Breeding territories of 14 species were recorded, of which one is notable, this is listed in Table 7.

**Table 7: Notable birds recorded during the surveys at Chapel Lane to Agden Bridge Farm (BB1\_BT13)**

Common name	Scientific name	Status	Estimated number of breeding territories	Number of survey visits during which the species were recorded (out of the total)	Relevant to SES1 scheme (Y/N)	Relevant to AP1 revised scheme (Y/N)
House sparrow	<i>Passer domesticus</i>	RSPB Red; NERC S41	2	2 (2)	Y	N

**Background Information and Data accompanying Supplementary Environmental Statement 1 and Additional Provision 1 Environmental Statement**

Ecology and biodiversity  
BID EC-017-00000 SES1 and AP1 ES  
MA01, MA02 and MA03  
Ecological baseline data – other

- 5.5.7 Desk study records for the Chapel Lane to Agden Bridge Farm area are presented in the main BID report (BID EC-009-00001) under the Park Farm to Agden Brow (BB1\_BT05) area as both transects cover land parallel to the same section of the route.

## Background Information and Data accompanying Supplementary Environmental Statement 1 and Additional Provision 1 Environmental Statement

Ecology and biodiversity  
BID EC-017-00000 SES1 and AP1 ES  
MA01, MA02 and MA03  
Ecological baseline data – other

# 6 Pond and canal survey

## 6.1 Introduction

6.1.1 This section sets out ecological baseline data relating to pond and canal surveys not reported in the main BID documents that accompanied the main ES. It should be read in conjunction with main BID report, Ecological baseline data – amphibian and pond and canal surveys (see main BID EC-007-00001), which accompanied the main ES.

## 6.2 Methodology

- 6.2.1 Details of the standard methodology used for pond and canal surveys are provided in the Technical note – Ecology and biodiversity – Ecological field survey methods and standards, which is included within the SMR which accompanied the main ES.
- 6.2.2 The scoping and desk study exercises and surveys reported in the main ES can be found in the main BID report, BID EC-007-00001. This section contains the outcomes of surveys undertaken that were not reported in the main BID document that accompanied the main ES. This is either because the survey reporting process had not been completed to inform the assessment within the main ES, or because the surveys have been undertaken since production of the main ES.
- 6.2.3 Survey methodology followed a tiered system from high to low detail, based upon the anticipated value of the resource, the proximity of the resource to land required for the AP1 revised scheme, and the potential for impacts. The most detailed survey is the National Pond Survey (NPS), followed by Predictive System for Multimetrics (PSYM) and then by Rapid Assessment (RA) protocols. PSYM and NPS methods collect detailed macro-invertebrate, macrophyte, chemical and physical data, whereas the RA method only includes survey of macro-invertebrates to family level. Of the three methods, the NPS protocol involved the greatest survey effort, comprising three separate visits, detailed site information and macro-invertebrates identified to species level for most groups, while PSYM requires only a single visit and family level macro-invertebrate identification.
- 6.2.4 Ponds were initially identified from review of Ordnance Survey and aerial mapping data through the pond selection process used for amphibian survey. The appropriate level of pond survey was based on information provided by the Habitat Suitability Index data gathered during the amphibian surveys, or detail from Phase 1 Habitat Survey or scoping surveys and site photographs (see Phase 1 Habitat Survey in Background Information and Data: BID EC-002-00001, which accompanied the main ES).
- 6.2.5 PSYM outputs were provided by the Freshwater Habitats Trust, formerly Pond Conservation Trust.

**Background Information and Data accompanying Supplementary Environmental Statement 1 and Additional Provision 1 Environmental Statement**

Ecology and biodiversity  
 BID EC-017-00000 SES1 and AP1 ES  
 MA01, MA02 and MA03  
 Ecological baseline data – other

- 6.2.6 A summary of locations at which pond and canal surveys were undertaken within MA01 to MA03 is provided in Table 8 (RA) and Table 9 (PYSM) and shown in accompanying SES1 and AP1 ES Ecology Map Book: Map Series EC-11.
- 6.2.7 Specific macrophyte (aquatic plant) species recorded have been reviewed against the relevant checklists/rare plant register: The Vascular Plant Red Data List for Great Britain, Species of Principal Importance in England, and the Cheshire VC58 Rare Plant Register to review status from a local perspective.
- 6.2.8 Background Information and Data, Ecology Map Book: Map Series EC-11 that accompanies the SES1 and AP1 ES shows the locations of the ponds and canals that were subject to field survey. These include a total of 14 ponds surveyed using RA methodology and 28 ponds surveyed using PSYM methodology. None of the surveyed ponds were considered of sufficient value or diversity to require survey using NPS methods and were adequately assessed using PSYM. As a result, no NPS results are presented.

**Table 8: Summary of completed RA surveys undertaken**

Ecology survey code	Survey site name	Feature type	Survey date(s)	CA	Approximate distance and orientation from land required for the AP1 revised scheme	Relevant to SES1 scheme (Y/N)	Relevant to AP1 revised scheme (Y/N)
U205788_L6301_PS1_Pond339_180521	Pond339	Pond	18 May 2021	MA03	37m south-east	Y	Y
U205788_L6301_PS1_Pond340_180521	Pond340	Pond	18 May 2021	MA03	29m east	Y	Y
U205788_L6301_PS1_Pond341_180521	Pond341	Pond	18 May 2021	MA03	5m east	Y	Y
U205788_L6301_PS1_Pond1393_180521	Pond1393	Pond	18 May 2021	MA03	12m south-east	Y	Y
U205788_L6301_PS1_Pond349_180521	Pond349	Pond	18 May 2021	MA03	41m east	Y	Y
U206654_L7111_PS1_Pond1199_200521	Pond1199	Pond	20 May 2021	MA03	10m north	Y	N
U206654_L7111_PS1_Pond1479_200521	Pond1479	Pond	20 May 2021	MA03	27m east	Y	Y
U206654_L7111_PS1_Pond1480_200521	Pond1480	Pond	20 May 2021	MA03	3m east	Y	Y
U206654_L7111_PS1_Pond355_200521	Pond355	Pond	20 May 2021	MA03	7m east	Y	Y
U206654_L7111_PS1_Pond358_200521	Pond358	Pond	20 May 2021	MA03	42m east	Y	Y
U206654_L7111_PS1_Pond362_200521	Pond362	Pond	20 May 2021	MA03	13m east	Y	Y



**Background Information and Data accompanying Supplementary Environmental Statement 1 and Additional Provision 1 Environmental Statement**

Ecology and biodiversity  
 BID EC-017-00000 SES1 and AP1 ES  
 MA01, MA02 and MA03  
 Ecological baseline data – other

Ecology survey code	Survey site name	Feature type	Survey date(s)	CA	Approximate distance and orientation from land required for the AP1 revised scheme	Relevant to SES1 scheme (Y/N)	Relevant to AP1 revised scheme (Y/N)
U206654_L7111_PS1_Pond363_200521	Pond363	Pond	20 May 2021	MA03	4m east	Y	Y
CH445468-CH461057_L5812_PS1_Pond414_190521	Pond414	Pond	19 May 2021	MA03	10m west	Y	Y
CH409597_L6036_PS1_Pond510_260521	Pond510	Pond	26 May 2021	MA03	8m west	Y	Y

**Table 9: Summary of completed PSYM surveys undertaken**

Ecology survey code	Survey site name	Feature type	Survey date(s)	CA	Approximate distance and orientation from land required for the AP1 revised scheme	Relevant to SES1 scheme (Y/N)	Relevant to AP1 revised scheme (Y/N)
Multiple_L16182_PS2_Pond24_220621	Pond24	Pond	22 June 2021	MA01	Within	Y	Y
CH675193_L4769_PS2_Pond907_220621	Pond907	Pond	22 June 2021	MA01	Within	Y	Y
CH616525-CH651619_L5228_PS2_Pond44_220621	Pond44	Pond	22 June 2021	MA01	Within	Y	Y
CH657840_L8259_PS2_Pond98_220621	Pond98	Pond	22 June 2021	MA02	Within	Y	Y
CH614475_L5372_PS2_Pond143_230621	Pond143	Pond	23 June 2021	MA02	Within	Y	Y
CH568445-U209880_L5498_PS2_Pond211_240621	Pond211	Pond	24 June 2021	MA03	Within	Y	Y
CH568445-U209880_L5498_PS2_Pond216_240621	Pond216	Pond	24 June 2021	MA03	Within	Y	Y
CH568445-U209880_L5498_PS2_Pond227_240621	Pond227	Pond	24 June 2021	MA03	Within	Y	Y
Multiple_L6271_PS2_Pond240_240621	Pond240	Pond	24 June 2021	MA03	Within	Y	Y
CH561651-CH640821_L5363_PS2_Pond262_240621	Pond262	Pond	24 June 2021	MA03	Within	Y	Y
CH561651-	Pond282	Pond	13 July 2021	MA03	Within	Y	Y

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Ecology and biodiversity  
 BID EC-017-00000 SES1 and AP1 ES  
 MA01, MA02 and MA03  
 Ecological baseline data – other

Ecology survey code	Survey site name	Feature type	Survey date(s)	CA	Approximate distance and orientation from land required for the AP1 revised scheme	Relevant to SES1 scheme (Y/N)	Relevant to AP1 revised scheme (Y/N)
U203291_L5486_PS2_Pond282_130721							
U206698_L6291_PS2_Pond327_160621	Pond327	Pond	16 June 2021	MA03	Within	Y	Y
U206698_L6291_PS2_Pond331_160621	Pond331	Pond	16 June 2021	MA03	Within	Y	Y
U206698_L6291_PS2_Pond332_160621	Pond332	Pond	16 June 2021	MA03	Within	Y	Y
U206698_L6291_PS2_Pond335_160621	Pond335	Pond	16 June 2021	MA03	Within	Y	Y
U206698_L6291_PS2_Pond336_160621	Pond336	Pond	16 June 2021	MA03	Within	Y	Y
U206654_L7111_PS2_Pond346_150621	Pond346	Pond	15 June 2021	MA03	Within	Y	Y
U206698_L6291_PS2_Pond875_150621	Pond875	Pond	15 June 2021	MA03	Within	Y	Y
U206698_L6291_PS2_Pond877_150621	Pond877	Pond	15 June 2021	MA03	Within	Y	Y
U206698_L6291_PS2_Pond352_150621	Pond352	Pond	15 June 2021	MA03	Within	Y	Y
U206698_L6291_PS2_Pond356_150621	Pond356	Pond	15 June 2021	MA03	Within	Y	Y
U206698_L6291_PS2_Pond357_170621	Pond357	Pond	17 June 2021	MA03	Within	Y	Y
U206698_L6291_PS2_Pond360_170621	Pond360	Pond	17 June 2021	MA03	Within	Y	Y
U206698_L6291_PS2_Pond369_170621	Pond369	Pond	17 June 2021	MA03	Within	Y	Y
U206698_L6291_PS2_Pond370_170621	Pond370	Pond	17 June 2021	MA03	Within	Y	Y
U206698_L6291_PS2_Pond373_170621	Pond373	Pond	17 June 2021	MA03	Within	Y	Y
Multiple_L5365_PS2_Pond395_140721	Pond395	Pond	14 July 2021	MA03	Within	Y	Y
Multiple_L5365_PS2_Pond403_140721	Pond403	Pond	14 July 2021	MA03	Within	Y	Y

## **Background Information and Data accompanying Supplementary Environmental Statement 1 and Additional Provision 1 Environmental Statement**

Ecology and biodiversity  
BID EC-017-00000 SES1 and AP1 ES  
MA01, MA02 and MA03  
Ecological baseline data – other

### **6.3 Deviations, constraints and limitations**

- 6.3.1 Screening for the pond habitat methodologies described above was dependent on access availability and detail provided within Phase 1 Habitat Survey and/or amphibian survey, from Habitat Suitability Index assessment.
- 6.3.2 Deviations from the methodology occurred as a result of seasonal and land access constraints. For example, the number or timing of seasonal visits for the ponds surveyed using the PYSM method was dependent on the time at which land access became available for survey, and the receipt of initial survey data from either Phase 1 Habitat Survey or amphibian survey that identified the need for this detailed method.
- 6.3.3 In some instances, land access was granted but ponds were found to be inaccessible due to the presence of barbed wire fencing, fast flowing or deep watercourse(s), and/or dense terrestrial vegetation. In such cases, surveys were not conducted as to do so would have compromised the safety of surveyors.
- 6.3.4 The Ecological Field Survey Methods and Standards (FSMS) specifies that ponds for survey will lie within the land required for the construction of the original scheme or within a 100m buffer. In a deviation from the FSMS, the buffer was reduced to 50m for the AP1 revised scheme. This deviation from the FSMS was agreed with Natural England.

### **6.4 Baseline**

#### **Hough to Walley's Green (MA01)**

- 6.4.1 A total of three ponds were surveyed within Hough to Walley's Green (MA01) between January 2021 and July 2021, inclusive. All three ponds were located either within or immediately adjacent to land required for the AP1 revised scheme and were surveyed using PSYM methodology. No ponds were surveyed using RA methodology.

#### **Predictive System for Multimetrics (PSYM)**

- 6.4.2 PSYM survey was conducted on three ponds in the Hough to Walley's Green area (MA01), see Table 10.

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Ecology and biodiversity  
 BID EC-017-00000 SES1 and AP1 ES  
 MA01, MA02 and MA03  
 Ecological baseline data – other

**Table 10: Summary of the results of the PSYM surveys for MA01**

Ecology survey code	Pond/canal description	Plants			Invertebrates			General Quality Assessment (GQA)	Approximate distance and orientation from land required for the AP1 revised scheme and NGR (centre point)
		Number of submerged and emergent plant species	Trophic ranking score for submerged and emergent plants	Number and species of uncommon plant species	Average Score Per Taxon (ASPT)	Number of dragonfly (Odonata) and alderfly (Megaloptera) families	Number of beetle (Coleoptera) families		
Multiple_L16182_PS2_Pond24_220621	Dry pond	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Within SJ7007857891
CH675193_L4769_PS2_Pond907_220621	1800m <sup>2</sup> Long pond on field boundary of improved grassland.	6	8.75	0	4.00	0	2	Poor	Within SJ6967859410
CH616525-CH651619_L5228_PS2_Pond44_220621	543m <sup>2</sup> Pond located in woodland, surrounded by grazed grassland.	0	9.00	0	2.50	0	0	Very poor	Within SJ6911260090

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Ecology and biodiversity  
BID EC-017-00000 SES1 and AP1 ES  
MA01, MA02 and MA03  
Ecological baseline data – other

### Discussion

- 6.4.3 Pond CH675193\_L4769\_PS2\_Pond907\_220621 did not support any plant species of conservation concern, as listed within the Cheshire VC58 Rare Plant Register, the Vascular Plant Red Data List, or listed as Species of Principal Importance. A total of six plant species were recorded: marsh horsetail (*Equisetum palustre*), meadowsweet (*Filipendula ulmaria*), soft rush (*Juncus effusus*), water forget-me-not (*Myosotis scorpioides*), greater reedmace (*Typha latifolia*) and an undetermined species of water starwort. The pond supported a macro-invertebrate community of low taxon richness, comprising commonly occurring waterbugs (*Naucoridae* and *Corixidae*), beetles (*Halipilidae* and *Hydrophilidae*), bivalve molluscs (*Sphaeriidae*), snails (*Planorbidae*) and non-biting midges (*Chironomidae*). The ASPT score suggested probable moderate pollution and the PSYM quality category for the pond was assessed as poor.
- 6.4.4 Pond CH616525-CH651619\_L5228\_PS2\_Pond44\_220621 did not support any plant species of conservation concern, as listed within the Cheshire VC58 Rare Plant Register, the Vascular Plant Red Data List, or listed as Species of Principal Importance. Remote sedge and common duckweed were the only two plant species recorded. The pond supported a macro-invertebrate assemblage of very low taxon richness, comprising commonly occurring water slaters (*Asellidae*) and non-biting midge (*Chironomidae*). The ASPT score suggested probable severe pollution and the PSYM quality category for the pond was assessed as very poor.

### Wimboldsley to Lostock Gralam (MA02)

- 6.4.5 A total of two ponds were surveyed within Wimboldsley to Lostock Gralam (MA02) between January 2021 and July 2021, inclusive. Both ponds were located either within or immediately adjacent to land required for the AP1 revised scheme and were surveyed using PSYM methodology. No ponds were surveyed using RA methodology.

### Predictive System for Multimetrics (PSYM)

- 6.4.6 PSYM survey was conducted on two ponds in the Wimboldsley to Lostock Gralam area (MA02), see Table 11.

**Background Information and Data accompanying Supplementary Environmental Statement 1 and Additional Provision 1 Environmental Statement**

Ecology and biodiversity  
 BID EC-017-00000 SES1 and AP1 ES  
 MA01, MA02 and MA03  
 Ecological baseline data – other

**Table 11: Summary of the results of the PSYM surveys for MA02**

Ecology survey code	Pond description	Plants			Invertebrates			General Quality Assessment (GQA)	Approximate distance and orientation from land required for the AP1 revised scheme and NGR (centre point)
		Number of submerged and emergent plant species	Trophic ranking score for submerged and emergent plants	Number and species of uncommon plant species	Average Score Per Taxon (ASPT)	Number of dragonfly (Odonata) and alderfly (Megaloptera) families	Number of beetle (Coleoptera) families		
CH657840_L8259_PS 2_Pond98_220621	117m <sup>2</sup> Pond in woodland next to road.	2	10.00	0	4.00	0	1	Very poor	Within SJ6877864900
CH614475_L5372_PS 2_Pond143_230621	247m <sup>2</sup> Pond fenced-off in ungrazed field.	5	8.75	0	3.87	0	1	Very poor	Within SJ6844970589

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Ecology and biodiversity  
BID EC-017-00000 SES1 and AP1 ES  
MA01, MA02 and MA03  
Ecological baseline data – other

### Discussion

- 6.4.7 Pond CH657840\_L8259\_PS2\_Pond98\_220621 did not support any plant species of conservation concern, as listed within the Cheshire VC58 Rare Plant Register, the Vascular Plant Red Data List, or listed as Species of Principal Importance. A total of three plant species were recorded: soft rush, remote sedge and bitter-sweet nightshade (*Solanum dulcamara*). The pond supported a macro-invertebrate assemblage of low taxon richness, with some higher scoring amphipods (*Gammaridae*). Other recorded taxa comprised commonly occurring waterbugs (*Corixidae*), beetles (*Dytiscidae*), water slaters (*Asellidae*) and worms (*Oligochaeta*). The ASPT score suggested probable moderate pollution and the PSYM quality category for the pond was assessed as very poor.
- 6.4.8 Pond CH614475\_L5372\_PS2\_Pond143\_230621 did not support any plant species of conservation concern, as listed within the Cheshire VC58 Rare Plant Register, the Vascular Plant Red Data List, or listed as Species of Principal Importance. A total of six plant species were recorded: yellow flag iris (*Iris pseudacorus*), soft rush, great willowherb (*Epilobium hirsutum*), water horsetail (*Equisetum fluviatile*), greater reed-mace and common duckweed. The pond supported a macro-invertebrate assemblage of moderate taxon richness, with commonly occurring waterbugs (*Notonectidae* and *Corixidae*), pond skaters (*Gerridae*), beetles (*Hydrophilidae*), snails (*Lymnaeidae*), bivalve molluscs (*Sphaeriidae*) and non-biting midges (*Chironomidae*). The ASPT score suggested probable severe pollution and the PSYM quality category for the pond was assessed as very poor.

### Pickmere to Agden and Hulseheath (MA03)

- 6.4.9 A total of 37 ponds were surveyed within Pickmere to Agden and Hulseheath (MA03) between January 2021 and July 2021, inclusive. Of these:
- 14 ponds located within a 50m buffer of the land required for the AP1 revised scheme were surveyed using RA methodology; and
  - 23 ponds located either within or immediately adjacent to land required for the AP1 revised scheme were surveyed using PSYM methodology.

### Rapid Assessment (RA)

- 6.4.10 RA surveys were conducted on 14 ponds within the Pickmere to Agden and Hulseheath area (MA03), see Table 12.

Background Information and Data accompanying Supplementary Environmental Statement 1 and Additional Provision 1 Environmental Statement

Ecology and biodiversity  
 BID EC-017-00000 SES1 and AP1 ES  
 MA01, MA02 and MA03  
 Ecological baseline data – other

Table 12: Summary of the results of the RA surveys for MA03<sup>18</sup>

Ecology survey code	Pond description	Invertebrates									Quality score	Quality band	Approximate distance and orientation from land required for the AP1 revised scheme and NGR (centre point)
		Caddis ( <i>Trichoptera</i> )	Alderflies ( <i>Megaloptera</i> ), dragonflies and damselflies ( <i>Odonata</i> )	Water beetles ( <i>Coleoptera</i> )	Water bugs ( <i>Hemiptera</i> )	Mayflies ( <i>Ephemeroptera</i> )	Shrimps ( <i>Amphipoda</i> )	Water slaters ( <i>Isopoda</i> )	Water snails ( <i>Gastropoda</i> )	Worms ( <i>Oligochaeta</i> ), fly larvae ( <i>Diptera</i> ) and leeches ( <i>Hirudinea</i> )			
U205788_L63 01_PS1_Pond 339_180521	642m <sup>2</sup> Pond in arable field. Partially shaded by trees to one side. Bank profile ranged from shallow to steep. Moderately turbid, with abundant woody debris. Low macrophyte abundance and diversity.	0	0, 0, 0	0	0	0	0	1	0	1	2	Low	37m south-east SJ7153881080
U205788_L63 01_PS1_Pond 340_180521	235m <sup>2</sup> Pond in copse of trees in arable field. Heavily shaded. Steep banks. Woody debris present. Low macrophyte abundance and diversity.	0	0, 0, 0	1	0	0	0	1	0	1	7	Low	29m east SJ7154481126
U205788_L63 01_PS1_Pond 341_180521	184m <sup>2</sup> Pond in copse of trees in arable field. Heavily shaded. Bank profile ranged	0	0, 0, 0	0	0	0	0	1	0	1	2	Low	5m east SJ7152181141

<sup>18</sup> 1 = present, 0 = absent



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Ecology and biodiversity  
 BID EC-017-00000 SES1 and AP1 ES  
 MA01, MA02 and MA03  
 Ecological baseline data - other

Ecology survey code	Pond description	Invertebrates									Quality score	Quality band	Approximate distance and orientation from land required for the AP1 revised scheme and NGR (centre point)
		Caddis ( <i>Tricoptera</i> )	Alderflies ( <i>Megaloptera</i> ), dragonflies and damselflies ( <i>Odonata</i> )	Water beetles ( <i>Coleoptera</i> )	Water bugs ( <i>Hemiptera</i> )	Mayflies ( <i>Ephemeroptera</i> )	Shrimps ( <i>Amphipoda</i> )	Water slaters ( <i>Isopoda</i> )	Water snails ( <i>Gastropoda</i> )	Worms ( <i>Oligochaeta</i> ), fly larvae ( <i>Diptera</i> ) and leeches ( <i>Hirudinea</i> )			
	from shallow to steep. Woody debris present. One marginal macrophyte species recorded.												
U205788_L63 01_PS1_Pond 1393_180521	232m <sup>2</sup> Shaded pond on edge of woodland. Moderately turbid. Bank profile ranged from shallow to steep. Low macrophyte abundance and diversity.	1	0, 1, 1	1	1	1	0	0	1	1	52	Excellent	12m south-east SJ7191681262
U205788_L63 01_PS1_Pond 349_180521	278m <sup>2</sup> Shaded pond in woodland on field boundary. Moderately turbid. High macrophyte cover. Moderate macrophyte diversity.	1	0, 0, 0	1	1	0	0	1	0	1	22	Moderate	41m east SJ7164881630
U206654_L71 11_PS1_Pond 1199_200521	465m <sup>2</sup> Heavily shaded pond in woodland. Shallow muddy banks. Woody debris. Slightly turbid.	0	0, 0, 0	0	0	0	0	1	0	1	2	Low	10m north SJ7190981749
U206654_L71 11_PS1_Pond 1479_200521	153m <sup>2</sup> Heavily shaded pond in woodland. Turbid. Woody debris and leaf litter	0	0, 0, 0	0	0	0	0	1	0	1	2	Low	27m east SJ7165381753

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Ecology and biodiversity  
 BID EC-017-00000 SES1 and AP1 ES  
 MA01, MA02 and MA03  
 Ecological baseline data – other

Ecology survey code	Pond description	Invertebrates									Quality score	Quality band	Approximate distance and orientation from land required for the AP1 revised scheme and NGR (centre point)
		Caddis ( <i>Trichoptera</i> )	Alderflies ( <i>Megaloptera</i> ), dragonflies and damselflies ( <i>Odonata</i> )	Water beetles ( <i>Coleoptera</i> )	Water bugs ( <i>Hemiptera</i> )	Mayflies ( <i>Ephemeroptera</i> )	Shrimps ( <i>Amphipoda</i> )	Water slaters ( <i>Isopoda</i> )	Water snails ( <i>Gastropoda</i> )	Worms ( <i>Oligochaeta</i> ), fly larvae ( <i>Diptera</i> ) and leeches ( <i>Hirudinea</i> )			
	present. Silty substrate. No macrophytes.												
U206654_L71 11_PS1_Pond 1480_200521	214m <sup>2</sup> Heavily shaded pond in woodland. Turbid. Woody debris and leaf litter present. Silty substrate. No macrophytes.	0	0, 0, 0	0	0	0	0	1	0	1	2	Low	3m east SJ7163781769
U206654_L71 11_PS1_Pond 355_200521	108m <sup>2</sup> Heavily shaded pond in woodland. Turbid. Woody debris and leaf litter present. Silty substrate. Duckweed ( <i>Lemna</i> sp.), no other macrophytes.	0	0, 0, 0	0	0	0	0	1	0	1	2	Low	7m east SJ7166081811
U206654_L71 11_PS1_Pond 358_200521	338m <sup>2</sup> Heavily shaded pond in woodland. Turbid. Relatively clear. Silty substrate with leaf litter. Duckweed, no other macrophytes.	0	0, 0, 0	0	0	1	0	1	0	1	7	Low	42m east SJ7176081921
U206654_L71 11_PS1_Pond 362_200521	209m <sup>2</sup> Heavily shaded pond in woodland. Slightly turbid. Earthy substrate with	0	0, 0, 0	0	0	0	1	1	0	1	7	Low	13m east SJ7177182007

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Ecology and biodiversity  
 BID EC-017-00000 SES1 and AP1 ES  
 MA01, MA02 and MA03  
 Ecological baseline data - other

Ecology survey code	Pond description	Invertebrates									Quality score	Quality band	Approximate distance and orientation from land required for the AP1 revised scheme and NGR (centre point)
		Caddis ( <i>Trichoptera</i> )	Alderflies ( <i>Megaloptera</i> ), dragonflies and damselflies ( <i>Odonata</i> )	Water beetles ( <i>Coleoptera</i> )	Water bugs ( <i>Hemiptera</i> )	Mayflies ( <i>Ephemeroptera</i> )	Shrimps ( <i>Amphipoda</i> )	Water slaters ( <i>Isopoda</i> )	Water snails ( <i>Gastropoda</i> )	Worms ( <i>Oligochaeta</i> ), fly larvae ( <i>Diptera</i> ) and leeches ( <i>Hirudinea</i> )			
	lots of leaf litter and woody debris. No macrophytes. Connected to Pond363 by a ditch. Ditch was dry at the time of survey.												
U206654_L71 11_PS1_Pond 363_200521	324m <sup>2</sup> Heavily shaded pond in woodland. Slightly turbid. Earthy substrate with lots of leaf litter and woody debris. No macrophytes. High, steep banks. Connected to Pond363 by a ditch. Ditch was dry at the time of survey.	0	0, 0, 0	1	0	0	0	1	0	1	7	Low	4m east SJ7177482026
CH445468- CH461057_L5 812_PS1_Pon d414_190521	313m <sup>2</sup> Partially shaded garden pond. Slight turbidity. Silt substrate. Low, steep banks. High diversity and abundance of macrophytes.	0	0, 0, 1	1	1	1	1	1	1	1	33	Moderate	10m west SJ7232883595
CH409597_L6 036_PS1_Pon d510_260521	180m <sup>2</sup> Pond within field of improved grassland. Areas shaded by small bankside trees. Moderately turbid. Silty	0	0, 0, 0	1	1	0	1	1	1	1	18	Moderate	8m west SJ7159685090

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Ecology and biodiversity  
 BID EC-017-00000 SES1 and AP1 ES  
 MA01, MA02 and MA03  
 Ecological baseline data - other

Ecology survey code	Pond description	Invertebrates									Quality score	Quality band	Approximate distance and orientation from land required for the AP1 revised scheme and NGR (centre point)
		Caddis ( <i>Trichoptera</i> )	Alderflies ( <i>Megaloptera</i> ), dragonflies and damselflies ( <i>Odonata</i> )	Water beetles ( <i>Coleoptera</i> )	Water bugs ( <i>Hemiptera</i> )	Mayflies ( <i>Ephemeroptera</i> )	Shrimps ( <i>Amphipoda</i> )	Water slaters ( <i>Isopoda</i> )	Water snails ( <i>Gastropoda</i> )	Worms ( <i>Oligochaeta</i> ), fly larvae ( <i>Diptera</i> ) and leeches ( <i>Hirudinea</i> )			
	substrate covered in macrophyte debris. High abundance of submerged and emergent macrophytes. Shallow, grassy banks.												

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Ecology and biodiversity  
BID EC-017-00000 SES1 and AP1 ES  
MA01, MA02 and MA03  
Ecological baseline data – other

## **Predictive System for Multimetrics (PSYM)**

- 6.4.11 PSYM survey was conducted on 23 ponds in the Pickmere to Agden and Hulseheath area (MA03), see Table 13.

Background Information and Data accompanying Supplementary Environmental Statement 1 and Additional Provision 1 Environmental Statement

Ecology and biodiversity  
 BID EC-017-00000 SES1 and AP1 ES  
 MA01, MA02 and MA03  
 Ecological baseline data – other

Table 13: Summary of the results of the PSYM surveys for MA03

Ecology survey code	Pond/canal description	Plants			Invertebrates			General Quality Assessment (GQA)	Approximate distance and orientation from land required for the AP1 revised scheme and NGR (centre point)
		Number of submerged and emergent plant species	Trophic ranking score for submerged and emergent plants	Number and species of uncommon plant species	Average Score Per Taxon (ASPT)	Number of dragonfly ( <i>Odonata</i> ) and alderfly ( <i>Megaloptera</i> ) families	Number of beetle ( <i>Coleoptera</i> ) families		
CH568445-U209880_L5498_PS2_Pond211_240621	469m <sup>2</sup> Pond on wheat field margin. Partially surrounded by trees. Bank vegetation of scrub and tall herb	1	10.00	0	4.44	1	1	Very poor	Within SJ7052176321
CH568445-U209880_L5498_PS2_Pond216_240621	1723m <sup>2</sup> Pond in middle of wheat field. A few tall trees, scrub and tall grasses/herbs surrounding pond	8	8.97	1 Lesser water parsnip ( <i>Berula erecta</i> )	4.50	0	1	Poor	Within SJ7057576509
CH568445-U209880_L5498_PS2_Pond227_240621	1234m <sup>2</sup> Pond in middle of wheat field. Surrounded by trees, scrub and tall grasses/herbs	7	9.30	1 Cyperus sedge	4.14	1	1	Poor	Within SJ7059376934
Multiple_L6271_PS2_Pond240_240621	Dry pond	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Within SJ705377235
CH561651-CH640821_L5363_PS2_Pond262_240621	Dry pond	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Within SJ7058978153
CH561651-	40m <sup>2</sup>	3	9.67	1	4.00	0	1	Poor	Within

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Ecology and biodiversity  
 BID EC-017-00000 SES1 and AP1 ES  
 MA01, MA02 and MA03  
 Ecological baseline data – other

Ecology survey code	Pond/canal description	Plants			Invertebrates			General Quality Assessment (GQA)	Approximate distance and orientation from land required for the AP1 revised scheme and NGR (centre point)
		Number of submerged and emergent plant species	Trophic ranking score for submerged and emergent plants	Number and species of uncommon plant species	Average Score Per Taxon (ASPT)	Number of dragonfly ( <i>Odonata</i> ) and alderfly ( <i>Megaloptera</i> ) families	Number of beetle ( <i>Coleoptera</i> ) families		
U203291_L5486_PS2_Pond282_130721	Pond in wheat field. Surrounded by trees. Himalayan balsam around entire pond margin. Extensive duckweed cover.			Cyperus sedge					SJ7072178812
U206698_L6291_PS2_Pond327_160621	198m <sup>2</sup> Pond surrounded by grazed land. No tree cover. Extensive macrophyte growth.	7	9.13	0	5.00	1	2	Poor	Within SJ7090280629
U206698_L6291_PS2_Pond331_160621	128m <sup>2</sup> Pond surrounded by grazed land. Pond surrounded by unmaintained fence.	4	9.40	0	5.17	2	2	Poor	Within SJ7116980675
U206698_L6291_PS2_Pond332_160621	653m <sup>2</sup> Large pond surrounded by grazed land. Partially surrounded by trees. Low macrophyte cover, especially in wooded areas.	3	9.50	0	4.00	0	2	Poor	Within SJ7092480704
U206698_L6291_PS2_Pond335_160621	34m <sup>2</sup> Pond surrounded by grazed land. Extensive duckweed cover.	4	8.64	1 White waterlily ( <i>Nymphaea</i> )	4.17	0	2	Very poor	Within SJ7105380856

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 MA01, MA02 and MA03  
 Ecological baseline data – other

Ecology survey code	Pond/canal description	Plants			Invertebrates			General Quality Assessment (GQA)	Approximate distance and orientation from land required for the AP1 revised scheme and NGR (centre point)
		Number of submerged and emergent plant species	Trophic ranking score for submerged and emergent plants	Number and species of uncommon plant species	Average Score Per Taxon (ASPT)	Number of dragonfly ( <i>Odonata</i> ) and alderfly ( <i>Megaloptera</i> ) families	Number of beetle ( <i>Coleoptera</i> ) families		
				alba)					
U206698_L6291_PS2_Pond336_160621	42m <sup>2</sup> Pond surrounded by grazed land. Extensive duckweed cover.	4	9.13	0	3.57	0	2	Very poor	Within SJ7104080859
U206654_L7111_PS2_Pond346_150621	Dry pond	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Within SJ7143781537
U206698_L6291_PS2_Pond875_150621	Dry pond	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Within SJ7113081640
U206698_L6291_PS2_Pond877_150621	414m <sup>2</sup> Large pond on field boundary. Field grazed by sheep. Heavily shaded, low macrophyte cover.	0	9.00	0	3.80	0	1	Very poor	Within SJ7135581731
U206698_L6291_PS2_Pond352_150621	37m <sup>2</sup> Pond surrounded by grazed land.	0	9.00	0	3.75	0	2	Poor	Within SJ7119081735
U206698_L6291_PS2_Pond356_150621	345m <sup>2</sup> Pond surrounded by grazed land. Pond split in two, one half with high duckweed cover. Heavily shaded. Lots of leaf litter/detritus.	0	9.00	0	4.50	0	1	Poor	Within SJ7150081896



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 Ecological baseline data – other

Ecology survey code	Pond/canal description	Plants			Invertebrates			General Quality Assessment (GQA)	Approximate distance and orientation from land required for the AP1 revised scheme and NGR (centre point)
		Number of submerged and emergent plant species	Trophic ranking score for submerged and emergent plants	Number and species of uncommon plant species	Average Score Per Taxon (ASPT)	Number of dragonfly ( <i>Odonata</i> ) and alderfly ( <i>Megaloptera</i> ) families	Number of beetle ( <i>Coleoptera</i> ) families		
U206698_L6291_PS2_Pond357_170621	119m <sup>2</sup> Small pond surrounded by grazed land. Some trees on the banks. Extensive duckweed cover.	0	9.00	0	4.00	0	2	Poor	Within SJ7166681925
U206698_L6291_PS2_Pond360_170621	95m <sup>2</sup> Pond surrounded by grazed land.	1	9.00	0	4.00	0	2	Poor	Within SJ7166081934
U206698_L6291_PS2_Pond369_170621	178m <sup>2</sup> Pond surround by grazed grass. Heavily shaded by trees. Low macrophyte cover.	0	9.00	0	4.00	0	2	Poor	Within SJ7159582184
U206698_L6291_PS2_Pond370_170621	235m <sup>2</sup> Pond surrounded by grazed land. Partially surrounded by trees. Low macrophyte cover.	1	9.50	0	4.00	0	1	Very poor	Within SJ7164682210
U206698_L6291_PS2_Pond373_170621	198m <sup>2</sup> Pond surrounded by grazed land. Some trees on bank. Extensive duckweed cover.	4	9.38	0	4.00	0	1	Very poor	Within SJ7157482355
Multiple_L5365_PS2_P	98m <sup>2</sup>	8	9.63	0	4.12	0	1	Poor	Within

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 Ecological baseline data – other

Ecology survey code	Pond/canal description	Plants			Invertebrates			General Quality Assessment (GQA)	Approximate distance and orientation from land required for the AP1 revised scheme and NGR (centre point)
		Number of submerged and emergent plant species	Trophic ranking score for submerged and emergent plants	Number and species of uncommon plant species	Average Score Per Taxon (ASPT)	Number of dragonfly ( <i>Odonata</i> ) and alderfly ( <i>Megaloptera</i> ) families	Number of beetle ( <i>Coleoptera</i> ) families		
ond395_140721	Pond on edge of golf course. Two invasive submerged macrophyte species present.								SJ7129183395
Multiple_L5365_PS2_Pond403_140721	440m <sup>2</sup> Pond on side of golf course. Two invasive macrophyte species present. Algal bloom.	8	9.13	0	4.87	1	1	Poor	Within SJ7132183479

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### Discussion

- 6.4.12 Pond U205788\_L6301\_PS1\_Pond1393\_180521 was within the excellent quality band for RA and was found to support high scoring taxa and a high taxon richness. The pond supported caddisfly, dragonfly and damselfly larvae, as well as more commonly occurring taxa such as water beetles, pond skaters, mayfly larvae, water snails, worms and leeches.
- 6.4.13 Ponds within the moderate quality band were U205788\_L6301\_PS1\_Pond349\_180521 and CH445468-CH461057\_L5812\_PS1\_Pond414\_190521. These ponds had relatively high taxon richness, with some high scoring taxa such as caddisflies and damselflies. More common water beetles, pond skaters, mayfly larvae, water slaters, water snails, worms and leeches were also recorded.
- 6.4.14 The remaining ponds where RA was undertaken within MA03 were assessed to be in the low quality band. Higher scoring taxa such as caddisflies, alderflies, dragonflies or damselflies were not recorded in any of these ponds. Only more common taxa were recorded, and taxon richness was low. Most of these ponds were situated in heavily shaded areas, such as woodland. Shading often precludes the growth of macrophytes, which would improve water quality and provide habitat for macro-invertebrates. Silty substrate and the presence of leaf litter also reduce water quality and increase turbidity, creating less favourable conditions for higher scoring taxa.
- 6.4.15 Pond CH568445-U209880\_L5498\_PS2\_Pond211\_240621 did not support any plant species of conservation concern, as listed within the Cheshire VC58 Rare Plant Register, the Vascular Plant Red Data List, or listed as Species of Principal Importance. Brooklime (*Veronica beccabunga*) and star duckweed (*Lemna trisulca*) were the only plant species recorded. The pond supported a macro-invertebrate community of moderate taxon richness, with higher-scoring caddisflies (*Limnephilidae*) and damselflies (*Coenagriidae*). Other recorded taxa were commonly occurring waterbugs (*Notonectidae* and *Corixidae*), beetles (*Hydrophilidae*), mayflies (*Baetidae*), leeches (*Glossiphoniidae*), water slaters (*Asellidae*) and non-biting midges (*Chironomidae*). The ASPT score suggested probable moderate pollution and the PSYM quality category for the pond was very poor.
- 6.4.16 Pond CH568445-U209880\_L5498\_PS2\_Pond216\_240621 was found to support one uncommon plant species, which was lesser water parsnip. An additional nine plant species were recorded: common water-plantain (*Alisma plantago-aquatica*), cuckoo flower (*Cardamine pratensis*), soft rush, great willowherb, water horsetail, water mint (*Mentha aquatica*), branched bur-reed, common duckweed and star duckweed. The pond supported a macro-invertebrate community of moderate taxon richness with higher-scoring caddisflies (*Limnephilidae*). Other recorded taxa were commonly occurring waterbugs (*Naucoridae*, *Notonectidae* and *Corixidae*), beetles (*Dytiscidae*), mayflies (*Baetidae*) and non-biting midges (*Chironomidae*). The ASPT score suggested probable moderate pollution and the PSYM quality category for the pond was poor.

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- 6.4.17 Pond CH568445-U209880\_L5498\_PS2\_Pond227\_240621 was found to support one uncommon plant species, which was *Cyperus* sedge. An additional eight plant species were recorded: common water-plantain, soft rush, cuckoo flower, great willowherb, bittersweet nightshade, greater reedmace, common duckweed and remote sedge. The pond supported a macro-invertebrate community of moderate taxon richness with high scoring dragonflies (*Gomphidae*). Other recorded taxa were commonly occurring waterbugs (*Notonectidae* and *Corixidae*), beetles (*Dytiscidae*), non-biting midges (*Chironomidae*), water slaters (*Asellidae*) and worms (*Oligochaeta*). The ASPT score suggested probable moderate pollution and the PSYM quality category for the pond was poor.
- 6.4.18 Pond CH561651-U203291\_L5486\_PS2\_Pond282\_130721 was found to support one uncommon plant species, which was *Cyperus* sedge. An additional five plant species were recorded: bittersweet nightshade, an undetermined species of water-starwort, common duckweed, least duckweed and the invasive Himalayan balsam. The pond supported a macro-invertebrate community of low taxon richness, comprising commonly occurring waterbugs (*Notonectidae* and *Corixidae*), beetles (*Dytiscidae*), non-biting midges (*Chironomidae*) and water slaters (*Asellidae*). The ASPT score suggested probable moderate pollution and the PSYM quality category for the pond was poor.
- 6.4.19 Pond U206698\_L6291\_PS2\_Pond327\_160621 did not support any plant species of conservation concern, as listed within the Cheshire VC58 Rare Plant Register, the Vascular Plant Red Data List, or listed as Species of Principal Importance. A total of ten plant species were recorded: common water-plantain, floating sweet-grass, soft rush, cuckoo flower, branched bur-reed, common duckweed, star duckweed, broad-leaved pondweed (*Potamogeton natans*), an undetermined water starwort species and an undetermined water crowfoot species (*Ranunculus* sp.). The pond supported a macro-invertebrate community of low taxon richness, with some high-scoring dragonflies (*Corduliidae*). Other recorded taxa were commonly occurring waterbugs (*Corixidae*), beetles (*Halipidae* and *Dytiscidae*), mayflies (*Baetidae*) and snails (*Lymnaeidae*). The ASPT score suggested probable clean water, but this is not considered reliable due to the low number of scoring taxa, and the PSYM quality category for the pond was assessed as poor.
- 6.4.20 Pond U206698\_L6291\_PS2\_Pond331\_160621 did not support any plant species of conservation concern, as listed within the Cheshire VC58 Rare Plant Register, the Vascular Plant Red Data List, or listed as Species of Principal Importance. A total of eight plant species were recorded: common water-plantain, floating sweet-grass, soft rush, common duckweed, star duckweed, amphibious bistort (*Persicaria amphibia*), broad-leaved pondweed and curled pondweed (*Potamogeton crispus*). The pond supported a macro-invertebrate community of moderate taxon richness, with some high-scoring caddisflies (*Leptoceridae*) and dragonflies (*Aeshnidae*), as well as damselflies (*Coenagrionidae*) and amphipods (*Gammaridae*). Commonly occurring waterbugs (*Pleidae* and *Corixidae*), beetles (*Halipidae* and *Dytiscidae*), snails (*Lymnaeidae* and *Planorbidae*) and bivalve molluscs (*Sphaeriidae*) were also recorded. The

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ASPT score suggested probable clean water, but the PSYM quality category for the pond was assessed as poor.

- 6.4.21 Pond U206698\_L6291\_PS2\_Pond332\_160621 did not support any plant species of conservation concern, as listed within the Cheshire VC58 Rare Plant Register, the Vascular Plant Red Data List, or listed as Species of Principal Importance. A total of five plant species were recorded: floating sweet-grass, soft rush, bittersweet nightshade, cuckoo flower and common duckweed. The pond supported a macro-invertebrate community of moderate taxon richness, comprising commonly occurring waterbugs (*Corixidae*), beetles (*Haliplidae* and *Dytiscidae*), pond skaters (*Gerridae*), snails (*Lymnaeidae*), water slaters (*Asellidae*) and non-biting midges (*Chironomidae*). The ASPT score suggested probable moderate pollution and the PSYM quality category for the pond was assessed as poor.
- 6.4.22 Pond U206698\_L6291\_PS2\_Pond335\_160621 was found to support one uncommon plant species, which was European white waterlily (*Nymphaea alba*). An additional seven plant species were recorded: common water-plantain, floating sweet-grass, soft rush, greater reedmace, common duckweed, star duckweed and broad-leaved pondweed. The pond supported a macro-invertebrate community of low taxon richness, comprising commonly occurring waterbugs (*Corixidae*), beetles (*Haliplidae* and *Dytiscidae*), leeches (*Piscicolidae*), water slaters (*Asellidae*) and snails (*Planorbidae*). The ASPT score suggested probable moderate pollution and the PSYM quality category for the pond was assessed as very poor.
- 6.4.23 Pond U206698\_L6291\_PS2\_Pond336\_160621 did not support any plant species of conservation concern, as listed within the Cheshire VC58 Rare Plant Register, the Vascular Plant Red Data List, or listed as Species of Principal Importance. A total of seven plant species were recorded: common water-plantain, floating sweet-grass, soft rush, branched bur-reed, common duckweed, star duckweed and broad-leaved pondweed. The pond supported a macro-invertebrate community of moderate taxon richness, comprising commonly occurring waterbugs (*Corixidae*), beetles (*Haliplidae* and *Dytiscidae*), leeches (*Piscicolidae*), snails (*Planorbidae*), non-biting midges (*Chironomidae*) and worms (*Oligochaeta*). The ASPT score suggested probable severe pollution and the PSYM quality category for the pond was assessed as very poor.
- 6.4.24 Pond U206698\_L6291\_PS2\_Pond877\_150621 did not support any plant species of conservation concern, as listed within the Cheshire VC58 Rare Plant Register, the Vascular Plant Red Data List, or listed as Species of Principal Importance. Two plant species were recorded, soft rush and common duckweed. The pond supported a macro-invertebrate community of very low taxon richness, comprising commonly occurring waterbugs (*Corixidae*), beetles (*Dytiscidae*), leeches (*Piscicolidae*), water slaters (*Asellidae*) and non-biting midges (*Chironomidae*). The ASPT score suggested probable severe pollution and the PSYM quality category for the pond was assessed as very poor.
- 6.4.25 Pond U206698\_L6291\_PS2\_Pond352\_150621 did not support any plant species of conservation concern, as listed within the Cheshire VC58 Rare Plant Register, the Vascular

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Plant Red Data List, or listed as Species of Principal Importance. Common duckweed was the only recorded species of plant. The pond supported a macro-invertebrate community of moderate taxon richness, comprising commonly occurring waterbugs (*Corixidae*), beetles (*Haliplidae* and *Dytiscidae*), pond skaters (*Gerridae*), leeches (*Piscicolidae*), water slaters (*Asellidae*), worms (*Oligochaeta*) and non-biting midges (*Chironomidae*). The ASPT score suggested probable severe pollution and the PSYM quality category for the pond was assessed as poor.

- 6.4.26 At the time of survey, U206698\_L6291\_PS2\_Pond356\_150621 was separated into two water bodies. However, due to their proximity, a single PSYM survey was considered sufficient to cover both. U206698\_L6291\_PS2\_Pond356\_150621 did not support any plant species of conservation concern, as listed within the Cheshire VC58 Rare Plant Register, the Vascular Plant Red Data List, or listed as Species of Principal Importance. Common duckweed was the only recorded species of plant. The pond supported a macro-invertebrate community of very low taxon richness, comprising commonly occurring water beetles (*Hydrophilidae*) and leeches (*Piscicolidae*). The ASPT score suggested probable moderate pollution and the PSYM quality category for the pond was assessed as poor.
- 6.4.27 Pond U206698\_L6291\_PS2\_Pond357\_170621 did not support any plant species of conservation concern, as listed within the Cheshire VC58 Rare Plant Register, the Vascular Plant Red Data List, or listed as Species of Principal Importance. Common duckweed was the only recorded species of plant. The pond supported a macro-invertebrate community of low taxon richness, comprising commonly occurring waterbugs (*Corixidae*), beetles (*Hydrophilidae* and *Dytiscidae*), water slaters (*Asellidae*) and non-biting midges (*Chironomidae*). The ASPT score suggested probable moderate pollution and the PSYM quality category for the pond was poor.
- 6.4.28 Pond U206698\_L6291\_PS2\_Pond360\_170621 did not support any plant species of conservation concern, as listed within the Cheshire VC58 Rare Plant Register, the Vascular Plant Red Data List, or listed as Species of Principal Importance. Common duckweed and floating sweet-grass were the only plant species recorded. The pond supported a macro-invertebrate community of low taxon richness, comprising commonly occurring pond skaters (*Gerridae*), beetles (*Hydrophilidae* and *Dytiscidae*) and non-biting midges (*Chironomidae*). The ASPT score suggested probable moderate pollution and the PSYM quality category for the pond was poor.
- 6.4.29 Pond U206698\_L6291\_PS2\_Pond369\_170621 did not support any plant species of conservation concern, as listed within the Cheshire VC58 Rare Plant Register, the Vascular Plant Red Data List, or listed as Species of Principal Importance. Common duckweed was the only plant species recorded. The pond supported a macro-invertebrate community of low taxon richness, comprising commonly occurring waterbugs (*Corixidae*), beetles (*Haliplidae* and *Dytiscidae*), water slaters (*Asellidae*) and non-biting midges (*Chironomidae*). The ASPT

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score suggested probable moderate pollution and the PSYM quality category for the pond was poor.

- 6.4.30 Pond U206698\_L6291\_PS2\_Pond370\_170621 did not support any plant species of conservation concern, as listed within the Cheshire VC58 Rare Plant Register, the Vascular Plant Red Data List, or listed as Species of Principal Importance. A total of three plant species were recorded: common duckweed, star duckweed and an undetermined species of water-starwort. The pond supported a macro-invertebrate community of low taxon richness, comprising commonly occurring waterbugs (*Notonectidae* and *Corixidae*), beetles (*Dytiscidae*), mayflies (*Baetidae*), leeches (*Piscicolidae*), water slaters (*Asellidae*) and non-biting midges (*Chironomidae*). The ASPT score suggested probable moderate pollution and the PSYM quality category for the pond was very poor.
- 6.4.31 Pond U206698\_L6291\_PS2\_Pond373\_170621 did not support any plant species of conservation concern, as listed within the Cheshire VC58 Rare Plant Register, the Vascular Plant Red Data List, or listed as Species of Principal Importance. A total of six plant species were recorded: floating sweet-grass, soft rush, branched bur-reed, brooklime, common duckweed and star duckweed. The pond supported a macro-invertebrate community of moderate taxon richness, with some higher-scoring amphipods (*Gammaridae*). Other recorded taxa were commonly occurring waterbugs (*Corixidae*), beetles (*Dytiscidae*), mayflies (*Baetidae*), leeches (*Piscicolidae*), snails (*Lymnaeidae*), water slaters (*Asellidae*) and non-biting midges (*Chironomidae*). The ASPT score suggested probable moderate pollution and the PSYM quality category for the pond was very poor.
- 6.4.32 Pond Multiple\_L5365\_PS2\_Pond395\_140721 did not support any plant species of conservation concern, as listed within the Cheshire VC58 Rare Plant Register, the Vascular Plant Red Data List, or listed as Species of Principal Importance. A total of nine plant species were recorded: New Zealand pigmyweed (*Crassula helmsii*), soft rush, great willowherb, gypsywort (*Lycopus europaeus*), bittersweet nightshade, greater reedmace, Nuttall's waterweed (*Elodea nuttallii*), star duckweed and an undetermined species of water-starwort. New Zealand pigmyweed and Nuttall's waterweed are invasive non-native plant species. The pond supported a macro-invertebrate community of moderate taxon richness, with some higher-scoring amphipods (*Gammaridae*). Other recorded taxa were commonly occurring waterbugs (*Notonectidae* and *Corixidae*), beetles (*Dytiscidae*), mayflies (*Baetidae*), snails (*Planorbidae*), water slaters (*Asellidae*) and non-biting midges (*Chironomidae*). The ASPT score suggested probable moderate pollution and the PSYM quality category for the pond was poor.
- 6.4.33 Pond Multiple\_L5365\_PS2\_Pond403\_140721 did not support any plant species of conservation concern, as listed within the Cheshire VC58 Rare Plant Register, the Vascular Plant Red Data List, or listed as Species of Principal Importance. A total of ten plant species were recorded: common water-plantain, New Zealand pigmyweed, joint-leaved rush (*Juncus articulatus*), soft rush, water mint, broad-leaved pondweed, bittersweet nightshade, greater

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reedmace, Nuttall's waterweed and star duckweed. New Zealand pigmyweed and Nuttall's waterweed are invasive non-native plant species. The pond supported a macro-invertebrate community of moderate taxon richness, with high-scoring dragonflies (Aeshnidae) and amphipods (*Gammaridae*). Other recorded taxa were common occurring waterbugs (*Notonectidae* and *Corixidae*), beetles (*Dytiscidae*), mayflies (*Baetidae*), snails (*Planorbidae*) and water slaters (*Asellidae*). The ASPT score suggested probable slight pollution and the PSYM quality category for this pond was poor.



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# 7 River Habitat Survey

## 7.1 Introduction

7.1.1 This section sets out ecological baseline data relating to river habitat surveys (RHS) not reported in the main BID documents that accompanied the main ES. It should be read in conjunction with main BID report, Ecological baseline data – river habitat, river macrophyte and ditch surveys (see main BID EC-006-00001), which accompanied the main ES.

## 7.2 Methodology

7.2.1 Details of the standard methodology used for RHS are provided in the Technical note – Ecology and biodiversity – Ecological field survey methods and standards, which is included within the SMR which accompanied the main ES.

7.2.2 The scoping and desk study exercises and surveys reported in the main ES can be found in the main BID report, BID EC-006-00001. This section contains the outcomes of surveys undertaken that were not reported in the main BID document that accompanied the main ES. This is either because the survey reporting process had not been completed to inform the assessment within the main ES, or because the surveys have been undertaken since production of the main ES.

7.2.3 A summary of locations at which RHS were undertaken within MA01 to MA03 is provided in Table 14, and shown in accompanying Background Information and Data, Ecology Map Book: Map Series EC-10 that accompanies the SES1 and AP1 ES.

**Table 14: Summary of accessible location where RHS was undertaken**

Ecology survey code	Watercourse name	Feature type	Survey date	CA	Approximate distance and orientation from land required for the AP1 revised scheme	Relevant to SES1 scheme (Y/N)	Relevant to AP1 revised scheme (Y/N)
AT05_RH1_190521	River Wheelock	Main river	19 May 2021	MA02	Within	Y	Y

## 7.3 Deviations, constraints and limitations

7.3.1 Surveys undertaken were limited to locations where landowner permission had been obtained.

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 Ecological baseline data – other

## 7.4 Baseline

### Hough to Walley’s Green (MA01)

7.4.1 No additional RHS were carried out on watercourses crossed by land required for the AP1 revised scheme within Hough to Walley’s Green (MA01) between January 2021 and July 2021, inclusive.

### Wimboldsley to Lostock Gralam (MA02)

- 7.4.2 One watercourse crossed by land required for the AP1 revised scheme was surveyed in MA02: River Wheelock. The RHS results for the River Wheelock (AT05\_RH1\_190521) are detailed in Table 15.
- 7.4.3 A habitat modification score (HMS) of 670 was calculated for the surveyed reach of the River Wheelock. The surveyed reach was categorised as habitat modification class (HMC) four, indicating that the watercourse is significantly modified.
- 7.4.4 The watercourse is characterised by an over-deepened channel through semi-improved grassland, tall herb and rank vegetation, and semi-natural broadleaf/mixed woodland. Sections of bank along the survey reach were resectioned, reinforced and/or embanked, although not extensively. There was some poaching of the bank where the surveyed reach crossed a livestock field.
- 7.4.5 At the time of survey, the watercourse was turbid and the bed of the river was barely visible. Consequently, no submerged macrophytes were visible in the channel. Only amphibious plant species were recorded in the channel. Himalayan balsam was present at this site, on both the bank face and bank top.

**Table 15: RHS data for the River Wheelock in MA02**

Watercourse name	Distance and orientation from land required for the SES1/AP1 revised scheme	Survey parameters	Results
River Wheelock (AT05_RH1_190521)	Within	Grid reference	SJ6941766696
		Date	19 May 2021
		Predominant valley form	Concave/bowl
		Number of riffles, pools and point bars	0 riffles, 0 pool, 1 point bar
		Realigned channel	No
		Over-deepened channel	Yes, <= 33%
		Impoundments	No

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Watercourse name	Distance and orientation from land required for the SES1/AP1 revised scheme	Survey parameters	Results
		Bank top land use and vegetation structure	Improved/semi-improved grassland with regularly spaced single trees on left bank. Tall herb/rank vegetation and semi-continuous trees on right bank.
		Channel dimensions	Left bank top height 1m Right bank top height 1.2m Channel bank full width 11.5m Channel water depth 0.5m Channel water width 4.5m
		Location of channel measurements	Glide
		Embankments	Left bank embanked height 0m Right bank embanked height 0m
		Trash line	None visible
		Bed material	Unconsolidated (loose)
		Invasive species	Himalayan balsam
		Habitat Modification Score	670
		Habitat Quality Assessment Score	50
		Habitat Modification Class	4: Significantly modified

## Pickmere to Agden and Hulseheath (MA03)

7.4.6 No additional RHS were carried out on watercourses crossed by land required for the AP1 revised scheme within Pickmere to Agden and Hulseheath (MA03) between January 2021 and July 2021, inclusive.

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# 8 Otter

## 8.1 Introduction

8.1.1 This section sets out ecological baseline data relating to otters not reported in the main BID document that accompanied the main ES. It should be read in conjunction with main BID report, Ecological baseline data – otter and water vole (see main BID EC-010-00001), which accompanied the main ES.

## 8.2 Methodology

- 8.2.1 Details of the standard methodology used for otter surveys are provided in the Technical note – Ecology and biodiversity – Ecological field survey methods and standards, which is included within the SMR which accompanied main ES.
- 8.2.2 The scoping and desk study exercises and surveys reported in the main ES can be found in BID EC-010-00001. This section contains the outcomes of surveys undertaken that were not reported in the BID document that accompanied the main ES. This is either because the survey reporting process had not been completed to inform the assessment within the main ES, or because the surveys have been undertaken since production of the main ES. Desk study records are presented in the main ES BID report as no new records have been provided for the sites subject to survey in 2021.
- 8.2.3 Table 16 summarises those sites that were subject to additional survey for otter.

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**Table 16: Summary of sites subject to additional otter survey**

Watercourse or water body and site name	Feature type	OS grid reference (start and finish)	Level of access within required extent	Ecology survey code	Survey dates	CA	Distance from the land required for construction of the AP1 revised scheme (m) and orientation	Relevant to SES1 (Y/N)	Relevant to AP1 (Y/N)
Smoker/ Wincham Brook	River	SJ70307599	SJ69937578	BT10_S006	1 July 2021	MA02	Within	Y	Y
Tributary of Smoker Brook 2	River	SJ71147638	SJ71147638	BT10_S001	1 July 2021	MA03	Within	Y	Y
Waterless/ Arley Brook	River	SJ70327914	SJ71037825	BT09_S001	2 June 2021	MA03	Within	Y	Y

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### 8.3 Deviations, constraints and limitations

8.3.1 Every effort was made to establish as complete a picture as possible of otter activity and to fully record the presence of otters and their resting places. However, the following constraints and limitations were encountered:

- field surveys were limited to locations where landowner permission had been obtained. As a result, surveys were not undertaken at potentially suitable locations due to landowner access restrictions;
- surveys were carried out from both banks of the watercourse where possible. However, at some locations access or health and safety constraints prevented this;
- at some locations, topography and vegetation structure restricted surveys by reducing access and visibility, therefore there is the potential for evidence to have been under-recorded;
- in order to complete the maximum number of surveys within the available survey timeframe, some surveys were completed during periods when water levels were high and/or after periods of heavy rainfall. While signs of otter activity can still be detected under such conditions, evidence may be under recorded as field signs may have been washed away or be less visible, thus reducing the confidence in negative results obtained during these surveys;
- due to limitations regarding land access within the available survey timeframe, it was not possible to carry out four survey visits to all sites or to carry out surveys at three-monthly intervals. This resulted in fewer opportunities for encountering otter field signs in a restricted survey season. Evidence of otter activity at the sites where fewer surveys were carried out, or where the interval between surveys was shorter, may be under recorded for these sites. This reduces the confidence in any negative results obtained during surveys at these sites; and
- due to significant land access constraints, a deviation was approved whereby otter surveys were undertaken only along those watercourses and on those water bodies within 100m (instead of 300m) of the land required for the construction of the SES1 revised scheme. Where watercourses were at least in part within the land required for the construction of the SES1 scheme, watercourses were subject to surveys to a 300m (instead of 2km) extent both upstream and downstream of where they cross the land required for the construction of the SES1 scheme, otters are highly mobile, range over large distances and activity was recorded on the River Bollin, Puddinglake Brook, Smoker Brook, Peover Eye, Gad Brook and Agden Brook during surveys carried out between 2018 and 2020. Therefore, in drawing conclusions on the presence of otters on watercourses/water bodies within each of the CAs a precautionary approach has been adopted, taking into consideration the above deviations, constraints and limitations. For

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example, where access was restricted, or where fewer than four surveys were possible, if suitable habitat exists then it has been assumed that otters are present.

### 8.4 Baseline

8.4.1 Stretches of watercourses or water bodies were scoped out from detailed otter survey where there was a lack of suitable habitat (river, streams and large water bodies) within and up to 100m of land required for the AP1 revised scheme. Scoping decisions took account of the presence of barriers to dispersal, availability of suitable terrestrial breeding habitats, adjoining land use, level of disturbance, depth, flow and width of watercourse, connectivity and pollution.

#### Hough to Walley's Green (MA01)

8.4.2 No additional otter surveys were carried out on watercourses crossed by land required for the SES1/AP1 revised scheme in the Hough to Walley's Green area (MA01) between January 2021 and July 2021 inclusive.

#### Wimboldsley to Lostock Gralam (MA02)

8.4.3 Surveys were undertaken on a single watercourse in 2021. Although suitable habitat for otter was present, no holts or potential holts were recorded. This is consistent with the main BID document that accompanied the main ES (see main BID EC-010-00001), where only limited signs of activity were reported.

#### Smoker/Wincham Brook

8.4.4 Surveys with full access to the watercourse were undertaken. No evidence of otter activity was recorded. Field surveys were obscured by vegetation, including dense stands of Himalayan balsam (*Impatiens glandulifera*) restricting access, which may have caused some signs to be missed.

8.4.5 Within and adjacent to the land required for the AP1 revised scheme, there was extensive suitable terrestrial breeding habitat in the proximity of the watercourse. This includes Winnington Wood, Peas Wood, Smoker Wood and Leonard's Wood. However, given the low number of otter signs reported, breeding is considered unlikely. It is assumed that otter will make use of the interconnected Trent and Mersey Canal, Wincham Brook, Smoker Brook and Peover Eye, for foraging and as corridors for movement. This is consistent with the main BID document that accompanied the main ES (see main BID EC-010-00001) and with the

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results of the Fifth National Otter Survey<sup>19</sup>, which states that otter is widely distributed to the south of Manchester but at a low population level.

### **Pickmere to Agden and Hulseheath (MA03)**

8.4.6 Surveys were undertaken on two watercourses in 2021. Although suitable habitat for otter was present, no holts or potential holts were recorded. This is consistent with the main BID document that accompanied the main ES (see main BID EC-010-00001), where only limited signs of activity were reported.

### **Smoker Brook Tributary 2**

8.4.7 Surveys with a moderate level of access to the watercourse were undertaken. No evidence of otter activity was recorded. Field surveys were obscured by dense vegetation, restricting access which may have caused some signs to be missed. Although adjacent woodland provides suitable breeding cover, the watercourse was dry, limiting foraging and breeding opportunities.

8.4.8 Within and adjacent to the land required for the AP1 revised scheme, there was extensive suitable terrestrial breeding habitat in the proximity of the watercourse, including Winnington Wood, Peas Wood, Smoker Wood and Leonard's Wood. It is assumed that otter will make use of the interconnected Trent and Mersey Canal, Wincham Brook, Smoker Brook and Peover Eye, for foraging and as a corridor for movement. This is consistent with the main BID document that accompanied the main ES (see main BID EC-010-00001) and with the results of the Fifth National Otter Survey<sup>19</sup>, which states that otter is widely distributed to the south of Manchester but at a low population level.

### **Waterless/Arley Brook**

8.4.9 A single survey with a moderate level of access to the watercourse was undertaken. Field surveys were obscured by dense vegetation and steep banks restricted access to the watercourse, which may have caused some signs to be missed. No holts/potential holts were recorded.

8.4.10 In contrast to previous surveys carried out between 2018 and 2020, otter footprints were found during the field survey. These were recorded within the land required for the construction of the original scheme (SJ708786) to the south of Pickmere Lane (B5391). Consistent with previous surveys, no evidence of holts was noted.

8.4.11 Outside the land required for the AP1 revised scheme, Waterless/Arley Brook is connected to suitable terrestrial breeding habitat in the proximity of the watercourses, including that of

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<sup>19</sup> Environment Agency (2010), *Fifth otter survey of England 2009 – 2010*.



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Rinks Wood, Round Wood, Bongs Rough, Bongs Wood and Gore Wood. Evidence of breeding otter in the wider Smoker Brook catchment was recorded during survey between 2018 and 2020. Whilst there was no evidence of breeding recorded for Waterless/Arley Brook in 2021, it is assumed that otter will make use of the watercourse for foraging and as a corridor for movement. This is consistent with the main BID document that accompanied the main ES (see main BID EC-010-00001) and with the results of the Fifth National Otter Survey<sup>19</sup>, which states that otter is widely distributed to the south of Manchester but at a low population level.

## 9 Water vole

### 9.1 Introduction

9.1.1 This section sets out ecological baseline data relating to water voles not reported in the main BID document that accompanied the main ES. It should be read in conjunction with main BID report, Ecological baseline data – otter and water vole (see main BID EC-010-00001), which accompanied the main ES.

### 9.2 Methodology

- 9.2.1 Details of the standard methodology used for water vole surveys are provided in the Technical note – Ecology and biodiversity – Ecological field survey methods and standards, which is included within the SMR which accompanied the main ES.
- 9.2.2 The scoping and desk study exercises and surveys reported in the main ES can be found in BID EC-010-00001. This section contains the outcomes of surveys undertaken that were not reported in the BID document that accompanied the main ES. This is either because the survey reporting process had not been completed to inform the assessment within the main ES, or because the surveys have been undertaken since production of the main ES.
- 9.2.3 Table 17 summarises those sites where additional surveys were undertaken for water vole. A number of watercourses were identified as potentially suitable for water vole but access was not available during 2021. It is, therefore, not possible to provide an assessment of the likely presence or absence of water vole at this time for these sites, as there is insufficient information provided through aerial photography alone. In each case these are shown on Background Information and Data, Ecology Map Book: Map Series EC-12 that accompanies the SES1 and AP1 ES as potentially suitable habitat for water vole. This included the following transects:
- MA01:
    - River Weaver (transect AT04);
  - MA02:
    - Tributary of the River Wheelock 5 (transect AT10);
    - Tributary of the River Wheelock 4 (transect AT13); and
    - Park Hall Marina (transect AT15).

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**Table 17: Summary of features subject to additional water vole survey**

Watercourse or water body and site name	Feature type	OS grid reference (start and finish)	Level of access within required extent	Ecology survey code	Survey dates	CA	Distance from the land required for the AP1 revised scheme (m) and orientation	Relevant to SES1 scheme (Y/N)	Relevant to AP1 revised scheme (Y/N)
Shropshire Union Canal (Middlewich Branch)	Canal	SJ68856573 to SJ69146574	Full	AT05_S009 AT05_S010 AT05_S011	11 May 2021	MA02	Within	Y	Y
Tributary of River Dane 3	River	SJ68516740 to SJ68806755	Full	AT11_S001 AT11_S002 AT11_S003 AT11_S004	8 June 2021	MA02	Within	Y	Y
The Willowbeds	Drain/ditch system	SJ596694 to SJ7446706 and SJ67396716	Low	BT26_S001 BT26_S002 BT26_S003 BT26_S008 BT26_S009 BT26_S013 BT26_S014	19 May 2021	MA02	Within	Y	Y
Waterless / Arley Brook	River	SJ71037825 to SJ70967848	Full	BT09_S018 BT09_S019 BT09_S020	2 June 2021	MA03	Adjacent	Y	Y
Tributary of Tabley Brook 7	River	SJ71028152 to SJ70938170	Full	BT08_S055 BT08_S056	2 June 2021	MA03	Adjacent	Y	Y

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Watercourse or water body and site name	Feature type	OS grid reference (start and finish)	Level of access within required extent	Ecology survey code	Survey dates	CA	Distance from the land required for the AP1 revised scheme (m) and orientation	Relevant to SES1 scheme (Y/N)	Relevant to AP1 revised scheme (Y/N)
				BT08_S057					
Tributary of Millington Clough 1	River	SJ1438347 to SJ71488355	Full	BT07_S031	8 June 2021	MA03	40m south-west	Y	Y

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## 9.3 Deviations, constraints and limitations

9.3.1 The following constraints and limitations were encountered:

- field surveys were limited to locations where landowner permission had been obtained or areas that were accessible to the public;
- surveys were carried out from within the watercourse or from both banks of the watercourse wherever possible, except where access or health and safety constraints prevented this;
- topography and vegetation structure at some locations may have restricted surveys alongside some watercourses/water bodies. While it would still be possible to observe signs of water vole activity in such habitats, evidence may have been under-recorded at these locations;
- in order to complete the maximum number of surveys within the timeframe allowed, some were completed during periods when water levels were high and/or after periods of heavy rainfall. While signs of water vole activity can still be detected under such conditions, evidence may have been under-recorded as field signs may have been washed away or be less visible;
- due to limitations on land access within the available survey timeframe, it was not possible to carry out two survey visits to each site between April and October or to allow a two-month interval between surveys at all sites. This resulted in a restricted survey season with consequently fewer opportunities for encountering water vole field signs. Evidence of water vole activity at the sites where fewer surveys were carried out, or the interval between surveys was shorter, may be under recorded. This reduces the confidence in any negative results obtained during surveys;
- due to significant land access constraints, a deviation was approved whereby water vole surveys were undertaken only along those watercourses and on those water bodies within 100m (instead of 300m) of the land required for the construction of the AP1 revised scheme. Where watercourses were at least in part within the land required for the construction of the AP1 revised scheme, watercourses were subject to surveys to a 300m (instead of 2km) extent both upstream and downstream of where they cross the land required for the AP1 revised scheme;
- where specific limitations are relevant to the interpretation of the baseline, these are discussed within the baseline section of the relevant CA; and

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- due to the low number of water vole signs encountered and the partial access to watercourses, the application of the population formula for estimating water vole population size (Morris et al. 1998)<sup>20</sup> was not possible.

## 9.4 Baseline

### Hough to Walley's Green (MA01)

- 9.4.1 No additional water vole surveys were carried out on watercourses crossed by land required for the AP1 revised scheme within Hough to Walley's Green (MA01) between January 2021 and July 2021, inclusive.

### Wimboldsley to Lostock Gralam (MA02)

- 9.4.2 Surveys were undertaken on two watercourses: Shropshire Union Canal (Middlewich Branch) and Tributary of River Dane 3; and The Willowbeds drainage ditch complex. There were no confirmed records of water vole within MA02 from field surveys. This is consistent with the main BID document that accompanied the main ES (see main BID EC-010-00001), where no confirmed records of water vole were reported from field surveys.

### River Weaver

- 9.4.3 Due to access constraints, no field surveys have been carried out on the River Weaver. Given the desk study returned evidence of water vole presence (a single adult sighting at Dairy House Farm, Nantwich (SJ664569), 1.2km to the south-west of land required for the AP1 revised scheme), in the absence of field surveys, it has been assumed that a low density water vole population is present along the length of the river as part of a metapopulation present in the wider area. This is consistent with the findings of the Northwest Lowlands Water Vole Project<sup>21</sup>. The report suggests that water vole is largely absent in the north-west due to the presence of mink, coupled with encroachment by invasive plants, including Himalayan balsam and Japanese knotweed, and a lack of suitable burrowing sites due to engineered watercourse banks.

### Shropshire Union Canal

- 9.4.4 Full access was granted to this section of the canal, with sub-optimal water vole habitats recorded within and adjacent to the land required for the construction of the AP1 revised

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<sup>20</sup> Morris et al. (1998), *Estimating numbers of the water vole Arvicola terrestris: A correction to the published method*. Journal of Zoology, London.

<sup>21</sup> Powell, A. and Milburn, K. (2011), *Northwest Lowlands Water Vole Project. Final Report, June 2011*.

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scheme. Habitat suitability was limited due to canalised banks, coupled with high levels of regular disturbance, pollution and agricultural runoff. Although minimal shading was present along the canal section, in-channel vegetation was limited. In addition, signs of mink were recorded during the surveys. Although confirmed evidence of water vole was returned by the desk study, the field survey results suggest that water vole is absent from the watercourse, within and adjacent to the land required for the AP1 revised scheme. This is consistent with the main BID document that accompanied the main ES (see main BID EC-010-00001) and with the findings of the Northwest Lowlands Water Vole Project<sup>21</sup>.

### River Dane Tributary 3

- 9.4.5 Full access was granted to Tributary 3 of the River Dane. Dense tree cover, including elm (*Ulmus glabra*), English oak (*Quercus robur*), sycamore (*Acer pseudoplatanus*) and alder (*Sambucus nigra*), restricted access and visibility and some signs of water vole may have been missed. Sub-optimal water vole habitats were recorded within and adjacent to the land required for the construction of the AP1 revised scheme. Habitat suitability was limited due to high turbidity, high levels of shading and poor water quality. In addition, food sources for water vole were limited to scattered herbs and occasional grasses. Extensive areas of the watercourse banks were also bare and subject to erosion.
- 9.4.6 Due to the historical water vole presence from the River Dane, 5.5km to the north of the surveyed section, it is possible that they remain present within the watercourse at a low density. However, the species is considered absent from the watercourse within and adjacent to the land required for the AP1 revised scheme. This is due to poor habitat suitability coupled with the presence of mink recorded during field surveys and noted as part of the citation for the River Dane, Bostock Site of Biological Importance (SBI). The lack of evidence is consistent with the main BID document that accompanied the main ES (see main BID EC-010-00001) and with the findings of the Northwest Lowlands Water Vole Project<sup>21</sup>.

### The Willowbeds

- 9.4.7 A low level of access was granted to this drainage ditch complex, with sub-optimal water vole habitats recorded within and adjacent to the land required for the construction of the AP1 revised scheme. Habitat suitability was limited due to low water levels and dense vegetation, including abundant bankside trees, bramble (*Rubus fruticosus* agg.) and common nettle (*Urtica dioica*). The vegetation structure provided no suitable food sources for water vole and connectivity with the wider landscape was poor. As a result, water vole is considered absent from The Willowbeds.

### Pickmere to Agden and Hulseheath (MA03)

- 9.4.8 Surveys were undertaken on three watercourses (Tributary of Millington Clough 1, Tributary of Tabley Brook 7 and Waterless/Arley Brook). There were no confirmed records of water

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vole within MA03 from field surveys. This is consistent with the main BID document that accompanied the main ES (see main BID EC-010-00001), where no confirmed records of water vole were reported from field surveys.

### Waterless / Arley Brook

9.4.9 A low level of access was granted to the watercourses. Dense vegetation, including stands of common nettle, bramble, willows (*Salix* spp.) and Himalayan balsam, restricted access and visibility and some signs of water vole may have been missed. Sub-optimal water vole habitat was recorded within and adjacent to the land required for the AP1 revised scheme. Although the watercourse was connected to the wider landscape, suitability was reduced due to high levels of shading, steep banks, poor vegetation structure and the presence of American mink. Water vole is, therefore, considered absent from the watercourse within and adjacent to land required for the construction of the AP1 revised scheme. The lack of evidence is consistent with the main BID document that accompanied the main ES (see main BID EC-010-00001) and with the findings of the Northwest Lowlands Water Vole Project<sup>21</sup>.

### Tributary of Tabley Brook 7

9.4.10 A high level of access was granted to the watercourse, although dense vegetation restricted access and visibility and some signs of water vole may have been missed. Sub-optimal water vole habitats were recorded within and adjacent to the land required for the AP1 revised scheme. Habitat suitability was limited due to high levels of shading, low water levels and limited vegetation structure. Water vole is, therefore, considered absent from the watercourse within and adjacent to the land required for the construction of the AP1 revised scheme. The lack of evidence is consistent with the main BID document that accompanied the main ES (see main BID EC-010-00001) and with the findings of the Northwest Lowlands Water Vole Project<sup>21</sup>.

### Tributary of Millington Clough 1

9.4.11 A low level of access was granted to the watercourses (approximately 100m of a 1.4km stretch), although dense vegetation restricted access and visibility and some signs of water vole may have been missed. Sub-optimal water vole habitats were recorded from within and adjacent to the land required for the AP1 revised scheme. Although patches of herbaceous species were present, habitat suitability was reduced due to high levels of shading by bankside trees, including hazel (*Corylus avellana*), English oak, sycamore and elder, as well as dense stands of common nettle. Although no evidence of water vole was reported during the survey, the habitat present was consistent with the main BID document that accompanied the main ES (see main BID EC-010-00001) for Millington Clough, where a low density water vole population was confirmed within the land required for the original scheme.



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