



High Speed Two Phase 2a (West Midlands - Crewe)

Background Information and Data

Ecology and biodiversity

Ecological baseline data - otter and water vole (BID-EC-010-000)



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Department for Transport

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

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1 Introduction

- 1.1.1 This report presents a summary of the ecological baseline data relating to:
- otter (*Lutra lutra*); and
 - water vole (*Arvicola amphibius*).
- 1.1.2 Ecological baseline data has been collected for the assessment of High Speed Rail (West Midlands - Crewe). The Proposed Scheme will pass through the following community areas (CA):
- CA1: Fradley to Colton;
 - CA2: Colwich to Yarlet;
 - CA3: Stone and Swynnerton;
 - CA4: Whitmore Heath to Madeley; and
 - CA5: South Cheshire.
- 1.1.3 This report should be read in conjunction with Map Series EC-11 to EC-12 in the Background Information and Data, Ecology Map Books.
- 1.1.4 The following baseline ecology reports can also be referred to:
- Ecological baseline data - Phase 1 habitat survey (Background Information and Data: BID-EC-002-000);
 - Ecological baseline data - protected and or notable flora (Background Information and Data: BID-EC-003-000);
 - Ecological baseline data - national vegetation classification and ancient woodland (Background Information and Data: BID-EC-004-000);
 - Ecological baseline data - hedgerows (Background Information and Data: BID-EC-005-000);
 - Ecological baseline data - river habitat, river corridor, and ditch surveys, (Background Information and Data: BID-EC-006-000);
 - Ecological baseline data - amphibian and pond surveys (Background Information and Data: BID-EC-007-000);
 - Ecological baseline data - reptiles (Background Information and Data: BID-EC-008-000);
 - Ecological baseline data - breeding and wintering birds (Background Information and Data: BID-EC-009-000);
 - Ecological baseline data - hazel dormouse (Background Information and Data: BID-EC-011-000);

- Ecological baseline data - bats (Background Information and Data: BID-EC-012-000);
- Ecological baseline data - white clawed crayfish and other invertebrate (Background Information and Data: BID-EC-013-000); and
- Ecological baseline data - fish (Background Information and Data: BID-EC-014-000).

1.1.5 Note that baseline data for badger is not made publically available due to the historic persecution of this species.

1.1.6 The ecological assessment is detailed in the High Speed Rail (West Midlands - Crewe) Environmental Statement (ES)¹.

- Volume 2, Community area reports;
- Volume 3, Route-wide effects;
- Volume 4, Off-route effects; and
- Volume 5, Appendices.

¹ HS2 Ltd (2017), *High Speed Rail (West Midlands – Crewe) Environmental Statement (ES)*, www.gov.uk/hs2

2 Otter

2.1 Methodology

- 2.1.1 Details of the standard methodology utilised for otter surveys are provided in the Technical Note HS2 Ecological Surveys: Field Survey Methods and Standards (FSMS) included in the Scope and Methodology Report (SMR) Addendum (see ES Volume 5: Appendix CT-001-002).
- 2.1.2 Desk study records relating to otters within 5km of the land required for the construction of the Proposed Scheme were obtained from the following sources:
- Staffordshire Ecological Record²; and
 - rECOrd³, Local Biological Records Centre for the Cheshire region.
- 2.1.3 In addition to the standard field signs stated in the FSMS, 'lying up' sites were also recorded during surveys. These were defined as cavities in river banks which are less than 1m deep and thus cannot be recorded as holts but may be used by otter for resting or sheltering. Lying up sites have only been recorded where sprinting was also recorded in close proximity to the site.
- 2.1.4 Otters can use a wide variety of habitats to move through the landscape including large and small rivers and their tributaries and other water bodies, including wet ditches and ponds. Terrestrial habitat features in close proximity to water, such as woodlands, hedgerows and dry ditches may also be used. For each water body/watercourse scoped in following initial Phase 1 habitat survey, a habitat suitability appraisal was carried out. For the purpose of these surveys, a precautionary approach was taken and the majority of habitats were scoped in for detailed survey following the initial habitat suitability appraisal and detailed surveys were carried out at the same time. Table 1 summarises those sites that were scoped in for a detailed survey. This information is cross referenced to the accompanying map series EC-11.
- 2.1.5 Assessment of terrestrial otter breeding habitat was undertaken using the method adapted by Chanin from Liles (2003)⁴. Potential terrestrial breeding habitat must meet the following criteria:
- any single area of extensive concealing habitat such as woodland, scrub, and reedbed, which is greater than 1ha in area and within 100m of a watercourse;
 - any combination of extensive concealing habitat which are within 100m of one another, total at least 1ha are within 100m of a watercourse; and
 - a range of other criteria including quality of food supply and cover were also assessed.

² Staffordshire Ecological Record, *The Ecological Database for Staffordshire*, http://www.staffs-ecology.org.uk/html2015/index.php?title=Main_Page

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

⁴ Liles G, (2003), *Otter Breeding Sites. Conservation and Management. Conserving Natura 2000 Rivers Conservation Techniques Series No. 5*, English Nature, Peterborough

- 2.1.6 Only poor quality habitats where there was little vegetative cover, poor food resources and/or poor connectivity have been scoped out. Where watercourses or water bodies have been scoped out for detailed survey, the relevant information is provided to explain the rationale for this in the text for each CA in the Baseline section.

Table 1: Summary of features subject to otter survey

Watercourse or water body and site name	Feature type	OS grid reference (start and finish)	Level of access within required extent ⁵	Ecology survey code	Survey dates	CA	Distance from the land required for construction of the Proposed Scheme (m) and orientation
Pyford Brook	Stream	SK130133 and SK132144	Moderate	000-OT3-188002 000-OT3-188003 000-OT3-188004 000-OT3-188005 000-OT3-188009 000-OT3-188012 000-OT3-188013 000-OT3-188014 000-OT3-188015 000-OT3-188018 000-OT3-188019 000-OT3-188037	16 August 2016 19 December 2016	CA1	6m south-east Within Within Within Within Within Within 15m north-east 96m north-east 102m north-east 150m north-east 56m south-east
North-west of Cranberry	Pond	SK131140	Full	000-OT3-188007	02 August 2016	CA1	17m north-east
North-west of Cranberry	Pond	SK131140	Full	000-OT3-188010	02 August 2016 07 November 2016	CA1	3m north-east
North-west of Cranberry	Pond	SK131140	Full	000-OT3-188011	02 August 2016	CA1	27m north-east
Ashby Sitch	Stream	SK119142 and SK138157	Little	000-WV1-189015 000-WV1-189019 000-WV1-189020 000-WV1-189021 000-WV1-189022	16 August 2016 18 August 2016 28 September 2016 19 December 2016	CA1	Within Within 176m north-east 70m north-east 106m north-west
South-east of A515	Pond	SK123152	Full	000-OT3-190001	18 August 2016	CA1	73m north-east
South-west of Ashby Sitch	Pond	SK123152	Full	000-OT3-190002	18 August 2016	CA1	85m south-east
South-east of A515	Pond	SK119150	Moderate	000-OT3-190003	18 August 2016	CA1	Within

⁵ Full (100%)/majority (75% - 99%) /moderate (25-75%) /little (>25%) /none (0%)

Watercourse or water body and site name	Feature type	OS grid reference (start and finish)	Level of access within required extent ⁵	Ecology survey code	Survey dates	CA	Distance from the land required for construction of the Proposed Scheme (m) and orientation
Bourne Brook	Stream	SK108141 and SK124156	Little	000-OT3-190030	30 August 2016	CA1	Within
South-east of Shaw Lane	Lake	SK113153	Majority	000-OT3-190044	21 September 2016	CA1	11m north-west
South-west of Shaw Lane	Drain	SK108155 and SK112157	Little	000-OT3-191003 000-OT3-191004 000-OT3-191006	15 November 2016	CA1	Within
South-east of Echills	Pond	SK109163	Full	000-OT3-191017	15 November 2016	CA1	Within
South-west of A513	Drain	SK104163 and SK109167	Moderate	000-OT3-192001 000-OT3-192002 000-OT3-192003 000-OT3-192004 000-OT3-192006 000-OT3-192007 000-OT3-192008	15 November 2016	CA1	Within Within 85m south-west Within Within 39m south-west Within
South-west of A513	Ditch	SK102167 and SK108166	Moderate	000-OT3-192010 000-OT3-192011 000-OT3-192020	15 November 2016 22 September 2016	CA1	Within 1m south-west
North-west of Rookery Lodge	Drain	SK108168 and SK108168	Full	000-OT3-192012	18 November 2016	CA1	30m north-east
North-east of King's Bromley Lane	Stream	SK106169 and SK107170	Full	000-OT3-192016	08 November 2016	CA1	61m north-east
South-east of River Trent	Stream	SK099170 and SK106171	Full	000-OT3-192019 000-OT3-192023 000-OT3-192024 000-OT3-192025 000-OT3-192026 000-OT3-192029 000-OT3-192030 000-OT3-192032 000-OT3-193005	5 November 2016 17 August 2016	CA1	136m north-east 139m south-east 70m south-east Within 6m north-east Within Within Within Within

Watercourse or water body and site name	Feature type	OS grid reference (start and finish)	Level of access within required extent ⁵	Ecology survey code	Survey dates	CA	Distance from the land required for construction of the Proposed Scheme (m) and orientation
South-east of River Trent	Stream	SK105171	Full	000-OT3-192021	15 November 2016	CA1	58m north-east
North-east of River Trent	Ditch	SK098173 and SK099174	Moderate	000-OT3-193012	17 August 2016	CA1	26m south-west
North-west of King's Bromley Lane	Stream	SK099171 and SK101171	Full	000-OT3-192028 000-OT3-193001	17 August 2016 19 December 2016	CA1	41m south-west 25m north-east
North-east of Pipe Ridware	Pond	SK099179	Full	000-OT3-193018	02 November 2016	CA1	Within
Luth Burn	Stream	SK091180 and SK106178	Little	000-OT3-193020 000-OT3-193023 000-OT3-193024 000-OT3-194005 000-OT3-194006	12 July 2016 13 July 2016 28 July 2016 22 September 2016	CA1	Within Within Within 45m south-west 46m south-west
North-east of Pipe Wood Lane	Pond	SK093185	Full	000-OT3-194009	10 August 2016	CA1	80m north-east
South-west of Pipe Wood Lane	Ditch	SK089186 and SK088181	Moderate	000-OT3-194013 000-OT3-194015	10 August 2016	CA1	Within
North-east of Bentley Hall Cottage	Stream	SK074205 and SK081191	Moderate	000-OT3-195003 000-OT3-195004 000-OT3-195005 000-OT3-196001 000-OT3-196027 000-OT3-197002 000-OT3-197003 000-OT3-197007 000-OT3-197008 000-OT3-197012 000-OT3-197014	28 June 2016 13 July 2016 07 September 2016 27 September 2016 08 November 2016 16 November 2016	CA1	127m north-west 125m north-west 99m south-east 17m north-east Within Within Within 10m south-west Within Within Within
South-east of B5014	Drain	SK081195 and SK080193	Moderate	000-OT3-196002 000-OT3-196003 000-OT3-196004 000-OT3-196008	28 June 2016 06 December 2016	CA1	Within 40m south-west Within Within

Watercourse or water body and site name	Feature type	OS grid reference (start and finish)	Level of access within required extent ⁵	Ecology survey code	Survey dates	CA	Distance from the land required for construction of the Proposed Scheme (m) and orientation
South-east of B5014	Pond	SK081195	Moderate	000-OT3-196006	28 June 2016	CA1	Within
North-east of Stonyford Lane	Pond	SK075199	Full	000-OT3-196022	06 December 2016	CA1	2m south-west
North-west of Blithbury Road	Pond	SK073204	Full	000-OT3-197009	07 September 2016	CA1	84m south-west
North-west of Rosewood Farmhouse	Pond	SK068205	Moderate	000-OT3-197019	12 July 2016	CA1	Within
North-west of Rosewood Farmhouse	Pond	SK067206	Full	000-OT3-197020	12 July 2016	CA1	Within
South-east of Newlands Lane	Ditch	SK068207 to SK068208	Moderate	000-OT3-197021	30 September 2016	CA1	Within
South-east of Moor Lane	Stream	SK050212 and SK058216	Moderate	000-OT3-199001 000-OT3-199003 000-OT3-199004 000-OT3-199010 000-OT3-199015 000-OT3-199016 000-OT3-199017 000-OT3-199018 000-OT3-199019	29 June 2016 04 August 2016 22 September 2016 05 October 2016 14 October 2016	CA1	59m north-east Within 201m north-east Within 76m south-west Within Within 230m south-west 170m south-west
North-east of Newlands Lane	Pond	SK056215	Full	000-OT3-199008	05 October 2016	CA1	67m north-east
North-east of Hamley House Farm	Pond	SK051217	Full	000-OT3-199020	20 July 2016	CA1	5m north-east
North-west of Hamley Heath House	Pond	SK044216	Full	000-OT3-200013	29 July 2016	CA1	13m north-east
South-west of Sherracop Lane	Pond	SK048224	Full	000-OT3-200014	19 September 2016	CA1	115m south-east
South-west of Sherracop Lane	Pond	SK048224	Full	000-OT3-200016	19 September 2016	CA1	109m south-east
North-west of B5013	Ditch	SK050223 and SK041216	Moderate	000-OT3-200017 000-OT3-200020 000-OT3-200022 000-OT3-200023 000-OT3-200025 000-OT3-200029	20 June 2016	CA1	Within

Watercourse or water body and site name	Feature type	OS grid reference (start and finish)	Level of access within required extent ⁵	Ecology survey code	Survey dates	CA	Distance from the land required for construction of the Proposed Scheme (m) and orientation
				000-OT3-200030 000-OT3-200031			
North-east of Lount Farm	Drain	SK037217 and SK039215	Moderate	000-OT3-200038 000-OT3-201005	20 December 2016	CA1	Within
Moreton Brook	Stream	SK040214 and SK033232	Moderate	000-OT3-200039 000-OT3-201007 000-OT3-201010 000-OT3-201012 000-OT3-201013 000-OT3-201025 000-OT3-201033 000-OT3-201034 000-OT3-201035 000-OT3-201036 000-OT3-201039 000-OT3-201040 000-OT3-201041 000-OT3-201042 000-OT3-201043 000-OT3-201048 000-OT3-201049 000-OT3-201050	20 June 2016 30 June 2016 03 November 2016 13 December 2016 20 December 2016	CA1 and CA2	1m north-east 1m north-east 1m north-east 1m north-east Within Within Within Within Within Within Within Within Within Within Within Within 35m north-east 66m north-east 94m north-east
South-west of Jongham's Cottage	Ditch	SK043227 and SK036220	Moderate	000-OT3-200042 000-OT3-200043 000-OT3-201001 000-OT3-201002 000-OT3-201008 000-OT3-201015 000-OT3-201016 000-OT3-201017 000-OT3-201018	20 June 2016 14 December 2016	CA1	Within Within Within Within Within Within 14m south-east 36m south-east
South-west of Jongham's Cottage	Ditch	SK037219 and SK038217	Moderate	000-OT3-201004 000-OT3-201009	20 December 2016	CA1	29m north-east 38m north-east
South-east of Jongham's Cottage	Lake	SK039221	Full	000-OT3-201006	26 June 2016	CA1	2m south-west

Watercourse or water body and site name	Feature type	OS grid reference (start and finish)	Level of access within required extent ⁵	Ecology survey code	Survey dates	CA	Distance from the land required for construction of the Proposed Scheme (m) and orientation
South-west of Jongham's Cottage	Drain	SK035219 and SK036220	Moderate	000-OT3-201014	20 December 2016	CA1	Within
South-west of Jongham's Cottage	Drain	SK035221 and SK036219	Moderate	000-OT3-201020 000-OT3-201026 000-OT3-201029	20 December 2016	CA1	Within
South-east of Moreton Brook	Stream	SK035224 and SK037221	Moderate	000-OT3-201022 000-OT3-201024 000-OT3-201028 000-OT3-201031	20 June 2016	CA1	Within
South-west of Moreton Brook	Ditch	SK033225 and SK034223	Moderate	000-OT3-201032 000-OT3-201037	30 June 2016	CA1	Within
North-west of Moreton Brook	Ditch	SK032228 and SK032226	Moderate	000-OT3-201044 000-OT3-201046	30 June 2016	CA2	Within
North-west of Moreton Brook	Ditch	SK026227 and SK033226	Moderate	000-OT3-201045 000-OT3-201051 000-OT3-202023 000-OT3-202026	30 June 2016	CA1 and CA2	Within
North-west of Moreton Brook	Stream	SK032227 and SK027230	Moderate	000-OT3-201052 000-OT3-202012	30 September 2016	CA2	Within
North-west of Moreton Brook	Ditch	SK030228 and SK031227	Moderate	000-OT3-202003 000-OT3-202010 000-OT3-202014	30 June 2016 30 September 2016 30 June 2016	CA2	12m south-west 12m south-east 22m north-east
North-east of Tithebarn Covert	Pond	SK013230	Full	000-OT3-203004	04 July 2016	CA2	Within
South-west of Tithebarn Farm	Pond	SK012232	Full	000-OT3-203005	04 July 2016	CA2	Within
North-west of Tithebarn Farm	Pond	SK013232	Full	000-OT3-203006	04 July 2016	CA2	Within
North-east of Tithebarn Covert	Ditch	SK010230 and SK010231	Majority	000-OT3-204003 000-OT3-204012	04 July 2016	CA2	141m south-west 88m south-west

Watercourse or water body and site name	Feature type	OS grid reference (start and finish)	Level of access within required extent ⁵	Ecology survey code	Survey dates	CA	Distance from the land required for construction of the Proposed Scheme (m) and orientation
North-east of Tithebarn Covert	Ditch	SK011230 and SK008235	Majority	000-OT3-204005 000-OT3-204007 000-OT3-204008 000-OT3-204009 000-OT3-204014	04 July 2016	CA2	86m south-west 83m south-west Within 60m south-west Within
South-west of Moreton Lane	Ditch	SK011235 and SJ997229	Moderate	000-OT3-204013 000-OT3-204016 000-OT3-204019 000-OT3-204020 000-OT3-204021 000-OT3-204024 000-OT3-204025 000-OT3-204027 000-OT3-205001 000-OT3-205002 000-OT3-205014	04 July 2016 29 June 2016	CA2	85m north-east 45m north-east Within Within Within Within Within 3m north-west Within 5m north-east 86m south-west
North-west of A51	Stream	SK000238 and SJ997237	Moderate	000-OT3-205007 000-OT3-205013	13 December 2016	CA2	Within
South-east of Trent and Mersey Canal	Pond	SJ997240	Full	000-OT3-205018	13 December 2016	CA2	21m south-west
River Trent	River	SJ995241 and SJ993229	Little	000-OT3-205022	29 June 2016	CA2	Within
North-east of Trent and Mersey Canal	Ditch	SJ997241 and SJ996241	Little	000-OT3-205031	29 June 2016	CA2	46m south-west
North-west of Nursery Way	Pond	SJ998231	Moderate	000-OT3-205060	29 June 2016	CA2	96m south-west
North-east of Flushing Covert	Ditch	SJ982240	Full	000-OT3-207004	13 December 2016	CA2	Within
North-west of Flushing Covert	Ditch	SJ979239 and SJ980239	Full	000-OT3-207006 000-OT3-207008 000-OT3-207010 000-OT3-207011	13 December 2016	CA2	Within 29m south-west 74m south-west 69m south-west
North-west of Flushing Covert	Pond	SJ980239	Full	000-OT3-207007	13 December 2016	CA2	Within

Watercourse or water body and site name	Feature type	OS grid reference (start and finish)	Level of access within required extent ⁵	Ecology survey code	Survey dates	CA	Distance from the land required for construction of the Proposed Scheme (m) and orientation
North-west of Flushing Covert	Pond	SJ980241	Full	000-OT3-207009	13 December 2016	CA2	19m north-east
South-east of Town Field Plantation	Ditch	SJ978239	Little	000-OT3-207013	13 December 2016	CA2	112m south-west
North-east of Town Field Plantation	Ditch	SJ980242 and SJ980243	Full	000-OT3-207014	13 December 2016	CA2	70m north-east
South-east of Town Field Plantation	Ditch	SJ978239	Full	000-OT3-207016	13 December 2016	CA2	72m south-west
South-east of Town Field Plantation	Ditch	SJ977239	Full	000-OT3-207017	13 December 2016	CA2	78m south-east
South-west of Battle Ridge	Ditch	SJ942253 and SJ950257	Moderate	000-OT3-2110013 000-OT3-211001 000-OT3-211002 000-OT3-211003	14 December 2016	CA2	Within
South-east of Marston Lane	Stream	SJ927275 and SJ931277	Little	000-OT3-213004	13 December 2016	CA2	67m north-east
South-east of A34	Drain	SJ911288 and SJ921286	Little	000-OT3-215012	27 June 2016	CA2	Within
North-east of M6	Pond	SJ890317	Full	000-OT3-219015	27 June 2016	CA3	Within
North-west of Walton Farm House	Pond	SJ891319	Full	000-OT3-219016	27 June 2016	CA3	Within
North-west of Walton Farm House	Pond	SJ891320	Full	000-OT3-219017	27 June 2016	CA3	1m north-east
North-west of Walton Farm House	Pond	SJ891320	Full	000-OT3-219018	27 June 2016	CA3	Within
North-east of M6	Pond	SJ889320	Full	000-OT3-219019	27 June 2016	CA3	Within
Filly Brook	Stream	SJ878331 and SJ894334	Little	000-OT3-220007 000-OT3-220043 000-OT3-220046 000-OT3-220047	26 June 2016 27 June 2016	CA3	Within 1m south-west Within Within
South-west of M6	Stream	SJ870347 and	Little	000-OT3-221024 000-OT3-221037	27 June 2016 28 June 2016	CA3	Within

Watercourse or water body and site name	Feature type	OS grid reference (start and finish)	Level of access within required extent ⁵	Ecology survey code	Survey dates	CA	Distance from the land required for construction of the Proposed Scheme (m) and orientation
		SJ878331		000-OT3-221039 000-OT3-221041 000-OT3-221042 000-OT3-221049 000-OT3-222001 000-OT3-222002 000-OT3-222007 000-OT3-222009 000-OT3-222011 000-OT3-222014	29 June 2016 02 August 2016		
South-west of M6	Pond	SJ872340	Full	000-OT3-222008	29 June 2016	CA3	Within
South-west of M6	Pond	SJ871341	Full	000-OT3-222013	01 July 2016	CA3	1m north-west
South-west of M6	Pond	SJ871340	Full	000-OT3-222015	01 July 2016	CA3	2m north-west
South-west of A51	Pond	SJ858361	Full	000-OT3-224009	18 July 2016	CA3	13m north-west
South-west of A51	Stream	SJ857361 and SJ860362	Moderate	000-OT3-224010 000-OT3-224013	18 July 2016	CA3	Within
South-west of A51	Stream	SJ857361 and SJ857360	Moderate	000-OT3-224012	18 July 2016	CA3	Within
South-west of A51	Pond	SJ856361	Full	000-OT3-224014	18 July 2016	CA3	Within
South-west of A51	Pond	SJ856361	Full	000-OT3-224015	18 July 2016	CA3	Within
South-west of A51	Pond	SJ856361	Full	000-OT3-224016	18 July 2016	CA3	Within
South-east of Beswick Green	Pond	SJ852357	Moderate	000-OT3-225001	01 July 2016	CA3	Within
South-west of Bent Lane	Pond	SJ813395	Full	000-OT3-230015	04 July 2016	CA4	Within
South-west of Bent Lane	Pond	SJ814394	Full	000-OT3-230016	04 July 2016	CA4	Within
South-west of Bent Lane	Pond	SJ813394	Full	000-OT3-230017	04 July 2016	CA4	Within

Watercourse or water body and site name	Feature type	OS grid reference (start and finish)	Level of access within required extent ⁵	Ecology survey code	Survey dates	CA	Distance from the land required for construction of the Proposed Scheme (m) and orientation
South-west of Bent Lane	Pond	SJ813395	Full	000-OT3-230025	04 July 2016	CA4	Within
South-west of Bent Lane	Pond	SJ812396	Full	000-OT3-230028	04 July 2016	CA4	Within
South-west of Bent Lane	Pond	SJ812397	Full	000-OT3-230029	04 July 2016	CA4	Within
South-west of Bent Lane	Pond	SJ811398	Full	000-OT3-230031	04 July 2016	CA4	Within
South-east of A53	Pond	SJ803406	Full	000-OT3-231019	04 July 2016	CA4	Within
South-east of A53	Pond	SJ801406	Full	000-OT3-231020	04 July 2016	CA4	Within
South-west of Snape Hall Road	Ditch	SJ790411 and SJ791412	Little	000-OT3-233009	27 July 2016	CA4	130m south-east
South-west of Whitmore Wood	Ditch	SJ794408 and SJ780425	Little	000-OT3-233014	27 July 2016	CA4	Within
River Lea	River	SJ774423 and SJ773441	Little	000-OT3-235001 000-OT3-235002 000-OT3-235008 000-OT3-235009 000-OT3-235010 000-OT3-235019 000-OT3-235020 000-OT3-235044 000-OT3-235046 000-OT3-235047 000-OT3-236001 000-OT3-236004	27 June 2016 27 September 2016 28 September 2016	CA4	3m south-east 7m south-east Within 16m north-west 40m south-west Within Within Within Within Within Within
South-east of Manor Road	Pond	SJ775428	Full	000-OT3-235014	27 June 2016	CA4	Within
South-east of Manor Road	Pond	SJ775428	Full	000-OT3-235015	27 June 2016	CA4	Within
South-east of Manor Road	Pond	SJ773428	Full	000-OT3-235016	27 June 2016	CA4	Within
South-east of Bar Hill	Lake	SJ767439	Full	000-OT3-236002	27 October 2016	CA4	Within

Watercourse or water body and site name	Feature type	OS grid reference (start and finish)	Level of access within required extent ⁵	Ecology survey code	Survey dates	CA	Distance from the land required for construction of the Proposed Scheme (m) and orientation
South-west of East Of Wrinehill Wood	Stream	SJ756445 and SJ752457	Little	000-OT3-238002 000-OT3-238003 000-OT3-238004 000-OT3-238008 000-OT3-238013	29 September 2016	CA4	194m south-west 195m south-west 49m south-west 7m south-west 10m south-west
South of Wrinehill Wood	Stream	SJ751452 and SJ752456	Little	000-OT3-238030	29 September 2016	CA4	50m south-west
North-west of Wrinehill Hall	Stream	SJ751461	Little	000-OT3-239021 000-OT3-239026	29 September 2016	CA4	78m north-east 98m south-west
South-east of Den Lane	Ditch	SJ739474 and SJ737477	Full	000-OT3-241009 000-OT3-241011 000-OT3-241012	16 August 2016	CA5	Within
South-east of Den Lane	Drain	SJ737476 and SJ738476	Full	000-OT3-241013	16 August 2016	CA5	Within
North-east of Den Lane	Ditch	SJ732482 and SJ739487	Little	000-OT3-242011 000-OT3-242015 000-OT3-242027	28 July 2016	CA5	Within
North-east of Den Lane	Pond	SJ732484	Full	000-OT3-242028	28 July 2016	CA5	Within
South-east of Gonsley Green Farm	Pond	SJ733486	Full	000-OT3-242030	28 July 2016	CA5	Within
South-east of Gonsley Green Farm	Pond	SJ733486	Full	000-OT3-242031	28 July 2016	CA5	Within
North-east of Gonsley Green Farm	Pond	SJ732487	Full	000-OT3-242032	28 July 2016	CA5	Within
South-west of Gonsley Green Farm	Pond	SJ729485	Full	000-OT3-242033	28 July 2016	CA5	Within
North-east of Gonsley Green Farm	Pond	SJ731487	Full	000-OT3-242036	28 July 2016	CA5	Within
North-east of Gonsley Green Farm	Pond	SJ731489	Full	000-OT3-242041	28 July 2016	CA5	Within

Watercourse or water body and site name	Feature type	OS grid reference (start and finish)	Level of access within required extent ⁵	Ecology survey code	Survey dates	CA	Distance from the land required for construction of the Proposed Scheme (m) and orientation
North-west of Gonsley Green Farm	Pond	SJ729489	Full	000-OT3-243002	28 July 2016	CA5	Within
South-west of Waybutt Lane	Drain	SJ731492 and SJ728492	Moderate	000-OT3-243008 000-OT3-243012 000-OT3-243013	28 July 2016 07 September 2016	CA5	Within
North-east of Half Moon Farm	Ditch	SJ723489 and SJ727492	Moderate	000-OT3-243017 000-OT3-243018 000-OT3-243020	28 July 2016	CA5	Within
South-west of Waybutt Lane	Pond	SJ730493	Full	000-OT3-243021	07 September 2016	CA5	Within
South-west of Waybutt Lane	Pond	SJ730494	Full	000-OT3-243022	07 September 2016	CA5	Within
Swill Brook	Stream	SJ727494 and SJ712514	Moderate	000-OT3-243023 000-OT3-243028 000-OT3-243029 000-OT3-243032 000-OT3-243033 000-OT3-243034 000-OT3-244001 000-OT3-245013 000-OT3-245017 000-OT3-245018 000-OT3-245021 000-OT3-245023	07 September 2016 06 October 2016 26 October 2016 01 November 2016	CA5	Within Within Within Within Within Within 80m north-west 150m north-west 128m south-east 72m south-west 80m south-west
South-west of Waybutt Lane	Pond	SJ729494	Full	000-OT3-243024	07 September 2016	CA5	Within
South-west of Waybutt Lane	Pond	SJ729495	Full	000-OT3-243027	07 September 2016	CA5	Within
South-west of Waybutt Lane	Pond	SJ726495	Full	000-OT3-243030	07 September 2016	CA5	Within
South-west of Waybutt Lane	Pond	SJ727497	Full	000-OT3-243031	07 September 2016	CA5	Within
South-west of Waybutt Lane	Pond	SJ727497	Full	000-OT3-243035	07 September 2016	CA5	Within
South-east of Chorlton Lane	Drain	SJ726502	Little	000-OT3-244005	07 September 2016	CA5	Within

Watercourse or water body and site name	Feature type	OS grid reference (start and finish)	Level of access within required extent ⁵	Ecology survey code	Survey dates	CA	Distance from the land required for construction of the Proposed Scheme (m) and orientation
North-east of Chorlton Lane	Ditch	SJ726506	Full	000-OT3-244016	03 October 2016	CA5	60m north-east
North-west of Chorlton Lane	Pond	SJ721502	Full	000-OT3-244019	10 August 2016	CA5	282m south-west
South-west of Chorlton Lane	Pond	SJ723509	Full	000-OT3-245008	08 September 2016	CA5	Within
North-west of Chorlton Lane	Pond	SJ722509	Full	000-OT3-245010	08 September 2016	CA5	Within
North-west of Chorlton Lane	Pond	SJ721509	Full	000-OT3-245011	08 September 2016	CA5	Within
North-west of Chorlton Lane	Pond	SJ721509	Full	000-OT3-245012	08 September 2016	CA5	Within
North-west of Chorlton Lane	Pond	SJ721508	Full	000-OT3-245014	08 September 2016	CA5	Within
South-west of Meadow Avenue	Ditch	SJ727517	Little	000-OT3-245028	08 September 2016	CA5	252m north-east
South-west of A500	Pond	SJ712524	Full	000-OT3-246030	28 June 2016	CA5	6m north-west
South-west of A500	Pond	SJ713524	Full	000-OT3-246038	28 June 2016	CA5	8m south-east
Basford Brook	Stream	SJ722528 and SJ722534	Little	000-OT3-247005 000-OT3-247014 000-OT3-247019	08 September 2016	CA5	245m south-east 176m south-west 129m south-east

2.2 Deviations, constraints and limitations

2.2.1 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 within 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 Proposed Scheme. Where watercourses were at least in part within the land required for the construction of the Proposed 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 Proposed Scheme.

2.2.2 Otters are highly mobile, range over large distances and activity has been recorded on the Pyford Brook, the Bourne Brook, the River Trent, the Moreton Brook and the River Lea and a limited number of minor watercourses/water bodies surveyed. 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 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.

2.3 Baseline

- 2.3.1 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 construction of the Proposed Scheme. Scoping out decisions considered 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.
- 2.3.2 Table 2 provides a summary of the holts, potential holts, couches and potential couches recorded during surveys of CA1 to CA5. The potential holt is highlighted on the accompanying Volume 5: Map Series EC-11.

Table 2: Summary of holts, potential holts and couches recorded during survey

Name of watercourse (and ecology survey code)	Location	OS grid reference	Nature of record ⁶	CA	Distance from Proposed Scheme (m) and orientation
Moreton Brook 000-OT3-201049	South-west of Oakfields Farm	SK033231	Potential couch	CA1 and CA2	81m north-west
Moreton Brook 000-OT3-202009	South-west of Rectory Farm	SK033232	Potential couch	CA2	197m north-east
River Trent 000-OT3-205050	South-west of Rectory Farm	SJ995239	Couch	CA2	14m south-west
A tributary of River Lea 000-OT3-238003	North-east of Wrinehill Wood	SJ756446	Potential holt	CA4	199m south-west
Checkley Brook 000-OT3-239029	North-east of Wrinehill Wood	SJ750461	Potential couch	CA4	70m north-east
Checkley Brook 000-OT3-239028	South-east of Checkley Lane	SJ750461	Potential couch	CA5	Within

Fradley to Colton (CA1)

- 2.3.3 No holts or potential holts were recorded within CA1. Two potential couches were recorded along Moreton Brook. There are desk study records from the Staffordshire Ecological Record of otter within 2km from the land required for the construction of the Proposed Scheme.

Pyford Brook

- 2.3.4 The desk study did not return any records for otter along the Pyford Brook.

⁶ Potential holt identified by either a tunnel with internal diameter of at least 250mm and extending 1m into the bank or where the end is out of sight or any cavity of similar dimensions: drain pipe; log pile; rock/boulder pile; under structures such as bridges or buildings. Active holts were identified where features met the potential holt criteria and the following: presence of otter spraints or footprints beside or inside tunnel; evidence of an animal's body rubbing against wall or roots; presence of hairs ca 25mm long and mid brown in colour; or presence of scratch marks

- 2.3.5 An incidental sighting of otter tracks/footprints (SK131140) was recorded along the Pyford Brook 1m south-east of the land required for the construction of the Proposed Scheme, linking to the water bodies adjacent to this watercourse and surrounding scrub habitats of Cranberry Wood partially within the land required for the construction of the Proposed Scheme.
- 2.3.6 Surveys with a moderate access to the Pyford Brook was undertaken and although no further otter activity was recorded, there is suitable terrestrial breeding habitat in proximity to the watercourse. Field surveys were obscured by vegetation, restricting access to the bank. It is assumed that otter will make use of the Pyford Brook and water bodies adjacent to the brook for foraging and as a corridor for movement. The presence of broadleaved plantation woodland within the land required for the construction of the Proposed Scheme offers potential terrestrial breeding habitat, however given the very low levels of otter signs breeding is unlikely.

Ashby Sitch

- 2.3.7 The desk study did not return any records for otter along the Ashby Sitch.
- 2.3.8 Little access was possible for the Ashby Sitch. A stretch of the Ashby Sitch south of Common Lane partially within the land required for the construction of the Proposed Scheme was surveyed. No signs of otter were recorded. There is evidence of moderate pollution and a lack of suitable terrestrial breeding habitat. Access to the bank of the watercourses where surveys took place was restricted by dense vegetation cover. Adopting a precautionary approach, it is assumed that otters are using this watercourse and associated water bodies for foraging and as a commuting corridor. There is potential terrestrial breeding habitat within the land required for the construction of the Proposed Scheme within Rice's Spinney and Rice's Gorse, adjacent to the land required for the construction of the Proposed Scheme.
- 2.3.9 A pond south of Holly Cottage and Common Lane within the land required for the construction of the Proposed Scheme and two ponds at Barn Farm south of Common Lane outside the land required for the construction of the Proposed Scheme were scoped out for further surveys due to lack of suitable terrestrial breeding habitats and moderate to very high levels of pollution such as slurry present in the water bodies itself.

Trent and Mersey Canal

- 2.3.10 Access was not obtained for the Trent and Mersey Canal. Desk study showed that otter spraints have been recorded in 2008 and 2011 at the Trent and Mersey Canal at Handsacre at grid reference SK091162, approximately 591m from the land required for the construction of the Proposed Scheme. There is an unspecified record in 2015 on the Coventry Canal at grid reference SK156131 flowing into the Trent and Mersey Canal within 1.8km from the land required for the construction of the Proposed Scheme. Brokendown Wood is present to the north and Fradley Gorse to the south of the Trent and Mersey Canal, which offers potential terrestrial habitats within the land required for the construction of the Proposed Scheme. Adopting a precautionary approach, it is assumed that otters are also using this watercourse, associated watercourses and water bodies for foraging and as a commuting corridor.

2.3.11 Within the land required for the construction of the Proposed Scheme, associated watercourses east of the Trent and Mersey Canal and north east of Great Haywood and were scoped out for further surveys due to lack of suitable breeding habitat and low availability of food supply. As these watercourses connect to the Trent and Mersey Canal, they offer potential as commuting corridors.

2.3.12 A mesotrophic lake north-east of the Trent and Mersey Canal outside the land required for the construction of the Proposed Scheme was surveyed and although no otter signs were recorded, there is suitable terrestrial breeding woodland habitat surrounding the lake. However, due to the presence of barriers such as roads and disturbance from farming and recreation, breeding is unlikely.

Bourne Brook

2.3.13 The desk study did not return any records for otter along the Bourne Brook.

2.3.14 An otter spraint (SK119155) was recorded during a survey along the Bourne Brook within the land required for the construction of the Proposed Scheme.

2.3.15 Little access was possible for the Bourne Brook. It is assumed that otter will make use of the Bourne Brook and associated water bodies for foraging and as a corridor for movement. Given the availability of suitable terrestrial breeding habitat along this watercourse, there is scope for otter to breed within of the land required for the construction of the Proposed Scheme.

Crawley Brook

2.3.16 The desk study did not return any records for otter along the Crawley Brook.

2.3.17 Access was not obtained for the Crawley Brook. In the absence of survey data, it is assumed that otter will make use of the Crawley Brook for foraging and as a corridor for movement within land required for the Proposed Scheme. Given the availability of potential terrestrial breeding habitat such as Tomlinson's Spinney and a small woodland north of Crawley Lane, there is scope for otter to breed within the land required for the construction of the Proposed Scheme.

2.3.18 Unnamed watercourses crossing the land required for the construction of the Proposed Scheme adjacent to Little Spinney were scoped out due to the presence of barriers such as roads and culverts, with slight disturbance and low availability of suitable terrestrial breeding habitat. As the watercourses connect to a larger water body (former gravel pits) north of the Crawley Brook and south of the River Trent, it is possible that otter if present would use the watercourses as commuting corridors.

2.3.19 A tributary of the Crawley Brook west of Shaw Lane outside the land required for the construction of the Proposed Scheme was scoped out for further surveys due to being a minor watercourse with dense aquatic vegetation, minimal flow and offering few habitat opportunities for breeding.

2.3.20 A pond stocked with carp outside the land required for the construction of the Proposed Scheme north west of the Crawley Brook and south-east of Echills was scoped out following habitat surveys due to no suitable terrestrial breeding habitats for otter. It is possible that otter may use this water body as a foraging and commuting corridor.

- 2.3.21 A drain north of Rugeley Road and south of Rookery Plantation was scoped out for further survey due to no water present, despite availability of suitable woodland habitat.

River Trent

- 2.3.22 Desk study records for otter include the following (distances are relative to the land required for the construction of the Proposed Scheme):
- an unspecified records along the River Trent in 2009 at grid reference SK092167, at approximately 216m;
 - a spraint along the River Trent in 2009 at grid reference SK092167, at approximately 258m;
 - a record for an adult along the River Trent in 2016 at grid reference SK091167, at approximately 315m;
 - a spraint along the River Trent in 2011, at grid reference SK131177, at approximately 702m;
 - an unspecified record along the River Trent in 2015 at grid reference SK160155, at approximately 1.6km; and
 - two records for an adult along the River Trent in 2008 at grid reference SK039197, at 1.7km.
- 2.3.23 Little access for field surveys was granted along the River Trent. Desk study shows the presence of woodland, with the potential for terrestrial breeding habitat within the land required for the construction of the Proposed Scheme. It is assumed that otter will make use of the River Trent for foraging and as a corridor for movement with associated woodland cover providing potential breeding habitat.
- 2.3.24 An unnamed watercourse crossing the land required for the construction of the Proposed Scheme south of the River Trent and north-east of Oak Farm was scoped out due to evidence of moderate pollution, low to no flow and poor opportunities for terrestrial breeding habitat due to predominantly agricultural land.
- 2.3.25 Adjacent watercourses with flow provide commuting and foraging opportunities for otter due to the presence of woodland cover, and evidence of common frogs and toads. However, in the absence of any signs of otter breeding is unlikely.
- 2.3.26 A dry watercourse south of the River Trent and north of Oak Farm outside the land required for the construction of the Proposed Scheme was scoped out.

Luth Burn

- 2.3.27 The desk study did not return any records for otter along the Luth Burn.
- 2.3.28 Little access was obtained to the Luth Burn. No otter signs were recorded during surveys and it is assumed that otter will make use of the Luth Burn for foraging and as a corridor for movement within land required for the Proposed Scheme. This watercourse is adjacent to a road and does not offer extensive areas of concealing habitats for breeding therefore it was scoped out for further surveys.

- 2.3.29 Watercourses scoped out within or partially within the land required for the construction of the Proposed Scheme include: a dry ditch within arable land east of Quentin's Orchard with no suitable terrestrial habitats; a drain east of Uttoxeter Road with moderate levels of pollution, low water levels and no food supply; and a shallow stream south-east of Uttoxeter Road with no concealing habitats or food supply and two drying ditches on either side of Blithbury Road with no suitable cover.
- 2.3.30 Small, shallow and isolated ponds within arable fields with little to no connectivity, evidence of pollution or barriers such as roads were scoped out for further surveys within the land required for the construction of the Proposed Scheme. These include a pond south-east of Uttoxeter Road, a pond east of Hurst Wood and a pond south of Hurstwood Pit.
- 2.3.31 Scoped out watercourses and water bodies outside the land required for the construction of the Proposed Scheme include: a shallow stream with no suitable terrestrial habitats south-east of Uttoxeter Road; a pond north-west of Blithbury Road; a pond south-east of Woodhouse Farm; and a pond north-east of Stonyford Lane.

Moreton Brook

- 2.3.32 The desk study returned a record of an adult at Colton in 2009 at grid reference SK047205, approximately 874m from the land required for the construction of the Proposed Scheme.
- 2.3.33 There was moderate access to Moreton Brook where surveys were undertaken. A potential otter spraint (SK038217) was recorded within the land required for the Proposed Scheme north-east of Lount Farm. The spraint was old and surveyors were not able to determine whether the spraint was from otter or mink (*Neovison vison*). The following field signs were recorded along the Moreton Brook outside the land required for the construction of the Proposed Scheme: a potential couch and a slide (SK033231) 81m north-east, a fresh spraint (SK033232) 130m north-east, and a potential couch (SK033232) 197m north-east. Based on the results of the field surveys, it is assumed that otter will make use of the Moreton Brook for foraging and as a corridor for movement within land required for the Proposed Scheme. They may be present in other suitable aquatic and terrestrial breeding habitat in the land required for the construction of the Proposed Scheme.
- 2.3.34 Tributaries of the Moreton Brook within and partially within the land required for the construction of the Proposed Scheme were scoped out for further surveys as they were completely dry or drying, there is a lack of suitable breeding habitat and a lack of available food supply. The tributaries include north of Lount Farm and a network south-west of Spencer's Plantation.
- 2.3.35 Watercourses scoped out for further surveys within and partially within the land required for the construction of the Proposed Scheme include a shallow stream south-west of Moor Lane with no suitable cover, shallow ditches north-east of Hamley Heath House and shallow ditches with no suitable cover south-east of Wilderley Barn.
- 2.3.36 Minor watercourses scoped out for further surveys outside the land required for the construction of the Proposed Scheme include those south-west of Stockwell Heath due to no suitable cover.

- 2.3.37 Scoped out water bodies outside the land required for the construction of the proposed scheme include: a pond north-east of Newlands Lane in Stockwell Heath; a pond north of Hamley House Farm; a pond south of Spencer’s Plantation adjacent to Jongham’s Cottage; a pond within Hamley Heath House; and two shallow ponds lacking suitable cover and food supply south of Sherracop Lane.

Colwich to Yarlet (CA2)

- 2.3.38 No holts or potential holts were recorded within CA2. A couch was recorded along the River Trent. There are desk study records from the Staffordshire Ecological Record of otter within 2km from the land required for the construction of the Proposed Scheme.

Moreton Brook tributaries

- 2.3.39 Scoped out watercourses within and partially within the land required for the construction of the Proposed Scheme include: tributaries of the Moreton Brook east of Moreton Grange and south of Moreton Farm due to a lack of food supply and lack of suitable terrestrial breeding habitats; shallow ditches within Tithebarn Covert with low food supply; and shallow ditches south of Tolldish Lane with poor food supply and no concealing habitats.

- 2.3.40 Scoped out water bodies within and partially within the land required for the construction of the Proposed Scheme include three ponds with low food supply and poor availability of suitable terrestrial habitats within Tithebarn Farm.

Trent and Mersey Canal

- 2.3.41 Desk study records for otter include the following (distances are relative to the land required for the construction of the Proposed Scheme):

- a dead otter in Pasturefields adjacent to the Trent and Mersey canal in 2014 at grid reference SJ994248, at approximately 235m;
- a record of an adult at Shirley which adjacent to the Trent and Mersey canal in 2006 at grid reference SJ983255, at approximately 1.1km;
- multiple records (the type of evidence was not provided for each case) to the north and east of Baswich on the network of watercourses associated with the Staffordshire and Worcestershire Canal between 2006 and 2015 within 3km;
- three records (the type of evidence was not provided for each case) within the River Sow at Little Bridgeford and Great Bridgeford in 2006 within 4km; and
- multiple records at Stafford on the network of watercourses and water bodies associated with the River Sow between 2006 and 2016 within 5km.

- 2.3.42 Desk study showed presence of signal crayfish (*Pacifastacus leniusculus*) along the Trent and Mersey Canal affording high quality food supply for otter. Adopting a precautionary approach, it is assumed that otters are also using this watercourse, associated watercourses and water bodies for foraging and as a commuting corridor.

- 2.3.43 A drain south-east of the Trent and Mersey Canal within the land required for the construction of the Proposed Scheme was scoped out for further surveys due to lack of cover and food supply.

- 2.3.44 A pond south of Hoomill Lane outside the land required for the construction of the Proposed Scheme was scoped out for further surveys due to regular disturbance from the Marina, moderate levels of pollution and lack of food, cover and concealing habitats.

River Trent

- 2.3.45 There are multiple desk study records (the type of evidence was not provided for each case) for otter adjacent to the River Trent south Colwich between 2006 and 2013 within 2km from the land required for the construction of the Proposed Scheme.
- 2.3.46 Access was obtained for an upstream section south of Hoomill Lane where otter activity was confirmed. The following field signs were recorded outside the land required for the construction of the Proposed Scheme: a couch (SJ995239) 14m south-west and an otter spraint (SJ995239) 16m south-west.
- 2.3.47 A tributary of the River Trent intersecting Hoomill Lane, Great Haywood was surveyed. Although no activity was recorded, it is assumed that otter will make use of the River Trent for foraging and as a corridor for movement.
- 2.3.48 Little access was obtained for the River Trent. Based on the results of field surveys, it is assumed that otter will make use of the River Trent for foraging and as a corridor for movement. They may also be present in other suitable aquatic and terrestrial breeding habitat within the land required for the construction of the Proposed Scheme.
- 2.3.49 Additional watercourses scoped out within land required for the construction of the Proposed Scheme include a dry ditch north-east of Flushing Covert, a dry ditch north-west of Flushing Covert and a small brook south of Hopton due to lack of suitable terrestrial breeding habitat. No otter signs were found, however due to the connectivity with Hopton Pools Farm to the east, it is possible that otter would use this brook for foraging and as a corridor for movement.
- 2.3.50 A pond north-west of Flushing Covert within the land required for the construction of the Proposed Scheme was scoped out for further surveys due to a lack of terrestrial habitat, food supply and due to regular disturbance from Ingestre Park Golf Course.
- 2.3.51 Watercourses scoped out for further surveys outside the land required for the construction of the Proposed Scheme include: a drying ditch lacking suitable terrestrial habitats south of The Old Rectory; dry ditches south-east of Town Field Plantation; a minor watercourses south of Marston Lane due to lack of suitable breeding habitat, regular disturbance and lack of availability of food supply; and a minor watercourse north-east of Yarlet Lane due to lack of suitable breeding habitat and regular disturbance from the A34.
- 2.3.52 A pond south-east of Town Field Plantation Water outside the land required for the construction of the Proposed Scheme was scoped out for further surveys due to regular disturbance from Ingestre Park Golf Course, low availability of food supply.

Stone and Swynnerton (CA3)

- 2.3.53 No otter field signs were recorded within CA3 from field surveys. Desk study records from the Staffordshire Ecological Record of otter within 2km from the land required

for the construction of the Proposed Scheme showed that otter was recorded within the land required for the construction of the Proposed Scheme within CA3.

Filly Brook

- 2.3.54 Desk study records for otter include the following (distances are relative to the land required for the construction of the Proposed Scheme):
- an unspecified record adjacent to ponds and tributaries of the Filly Brook in 2014 at grid reference SJ876339, within land required for the construction of the proposed scheme;
 - an unspecified record at Stone in 2014 at grid reference SJ892324, at approximately 209m;
 - a record of an adult at Burybank Wood in 2004 at grid reference SJ884359, at approximately 988m;
 - a record of an otter swimming on the Trent and Mersey Canal in Stone in 2010 at grid reference SJ912325, at approximately 1.4km;
 - a record of an adult at Trentham in 2006 at grid reference SJ869398, at approximately 2.8km; and
 - a record of an adult on the River Trent at Trentham in 2009 at grid reference SJ864413, at approximately 3.8km.
- 2.3.55 Little access for field surveys was granted along the Filly Brook. Desk study shows the presence of woodland, with the potential for terrestrial breeding habitat within the land required for the construction of the Proposed Scheme. It is assumed that otter will make use of the Filly Brook for foraging and as a corridor for movement with associated woodland cover providing potential breeding habitat.
- 2.3.56 Tributaries of the Filly Brook that are within the land required for the construction of the Proposed Scheme were scoped out due to disturbance from the motorway and poor connectivity. There is a lack of terrestrial breeding habitat and poor availability of food supply.
- 2.3.57 A stream south of Sandyford Farm within the land required for the construction of the Proposed Scheme was scoped out for further surveys due to lack of suitable breeding habitats and availability of food supply.
- 2.3.58 Small, shallow and isolated ponds within arable fields with little to no connectivity, evidence of pollution or barriers such as roads scoped out for further surveys within the land required for the construction of the Proposed Scheme include: a pond south of Fox Covert; a pond south-west of Walton House Farm; three ponds south of Walton Heath Farm; and an angling lake within Swynnerton and two ponds south of Sandyford Farm.
- 2.3.59 Scoped out water bodies outside the land required for the construction of the Proposed Scheme include two ponds within Fox Covert and a pond south-east of Sandyford Farm.

Meece Brook

2.3.60 Desk study records for otter include the following (distances are relative to the land required for the construction of the Proposed Scheme):

- an unspecified record at Chebsey in 2014 at grid reference SJ880297, approximately 1.7km
- a record of an adult at Swynnerton in 2006 at grid reference SJ845335, approximately 2.1km;
- an unspecified record at the Meece Brook in 2016 at grid reference SJ848322, approximately 2.4km;
- a possible breeding site downstream at the Meece Brook in 2014 at grid reference SJ859306, approximately 2.5km;
- a record of an adult at Chebsey in 2006 at grid reference SJ873289, approximately 2.6km;
- an unspecified record downstream at the Meece Brook in 2014 at grid reference SJ858305, approximately 2.6km; and
- an unspecified record of an adult at Chebsey in 2008 at grid reference SJ860285, approximately 4km.

2.3.61 Within CA₃, access was not obtained for the Meece Brook. Desk study showed records for signal crayfish along the Meece Brook outside the land required for the construction of the Proposed Scheme, affording high quality food supply for otter. In absence of survey data, it is assumed that otter will make use of the Meece Brook for foraging and as a corridor for movement.

Whitmore Heath to Madeley (CA₄)

2.3.62 A potential holt was recorded within CA₄ on a tributary of the River Lea. A potential couch was recorded along Checkley Brook. There are desk study records from the Staffordshire Ecological Record of otter within 2km from the land required for the construction of the Proposed Scheme.

Meece Brook

2.3.63 The desk study did not return any records for otter along the Meece Brook within CA₄, however they have been recorded downstream.

2.3.64 A partial stretch of the Meece Book outside the land required for the construction of the Proposed Scheme was surveyed and no otter activity was recoded. On a precautionary approach, it is assumed that otter will make use of the Meece Brook and associated water bodies for foraging and as a corridor for movement.

2.3.65 Water bodies scoped out for surveys within the land required for the construction of the Proposed Scheme include: seven ponds associated with the Meece Brook west of Bent Lane as they were dry or held low water levels and two ponds south of the A53 south of Whitmore Heath due to low availability of suitable terrestrial habitats, lack of available food supply and slight disturbance from the road.

River Lea

- 2.3.66 The desk study returned an unspecified record on an unnamed watercourse east of the River Lea in Madeley in 2013 at grid reference SJ791443, at approximately 998m from the land required for the construction of the Proposed Scheme.
- 2.3.67 Surveys took place on a tributary adjacent to the River Lea and a potential holt (SJ756446) was recorded 199m south-west from the land required for the construction of the Proposed Scheme. Surveys took place on upstream sections of the river south of Madeley and found no sign of otters but did identify suitable terrestrial breeding habitat. Downstream sections were not accessible but contain areas of woodland adjacent to the river. On a precautionary basis it is likely that the River Lea and associated watercourses and water bodies will be used for foraging and as a movement corridor, and suitable breeding habitat is available in a number of locations.
- 2.3.68 A tributary of the River Lea east of Wrinehill Wood outside the land required for the construction of the Proposed Scheme was surveyed. Although no otter signs were found, there is availability of suitable breeding habitat. It is assumed that if present, otter will make use of this tributary for foraging and as a corridor for movement.
- 2.3.69 A downstream section of the River Lea to the north-east of Hey House and outside the land required for the construction of the Proposed Scheme was scoped out for further surveys due to moderate evidence of pollution, lack of suitable breeding habitats and low availability of food supply.
- 2.3.70 A tributary of the River Lea to the west of Whitmore Wood and Snapehall Farm was scoped out for further surveys due to lack of permanent water and no suitable terrestrial breeding habitats.
- 2.3.71 North of the River Lea, surveys were undertaken at three Manor Farm ponds stocked with fish, which offer potential food supply. These ponds are within the land required for the construction of the Proposed Scheme. No otter activity was recorded and given the limited terrestrial breeding habitat surrounding the ponds, breeding is unlikely.
- 2.3.72 A stocked pond south of Bar Hill (Drummer Stile) within the land required for the construction of the Proposed Scheme offer potential sources of food supply, however breeding is unlikely as there is no suitable terrestrial habitats and no otter activity was recorded.

Checkley Brook

- 2.3.73 The desk study did not return any records for otter along the Checkley Brook within CA4.
- 2.3.74 A potential couch (SJ750461) was recorded along the Checkley Brook 70m north-east from the land required for the construction of the Proposed Scheme. Access was restricted by landowners during 2016. On a precautionary approach it is assumed that if present, otter will make use of the Checkley Brook and surrounding water bodies for foraging and as a corridor for movement.

- 2.3.75 A tributary of the Checkley Brook to the north-west of Wrinehill Mill and outside the land required for the construction of the Proposed Scheme was scoped out for further surveys due to lack of suitable breeding habitats and lack of food supply.

South Cheshire (CA5)

- 2.3.76 No holts or potential holts were recorded within CA5. A couch was recorded along the River Lea and a potential couch on the Checkley Brook. There are desk study records from the Staffordshire Ecological Record and rECOrd, Local Biological Records Centre for the Cheshire region of otter within 2km from the land required for the construction of the Proposed Scheme.

River Lea

- 2.3.77 Access was not obtained for the stretch of watercourse in CA5 within the land required for the construction of the Proposed Scheme for otter surveys. An otter spraint and couch (SJ749459) were recorded within the land required during a River Corridor Survey. It is assumed that otters will use the River Lea as a foraging and as a corridor for movement due to availability of suitable habitats upstream of this watercourse and its connectivity to Checkley Brook.

Checkley Brook

- 2.3.78 The desk study returned a record for a dead otter along London Road in proximity to the Checkley Brook in 2014 at grid reference SJ717466 at approximately 1.6km from the land required for the construction of the Proposed Scheme.
- 2.3.79 Access to the Checkley Brook within south Cheshire was restricted by landowners during 2016. Partial access was granted earlier in the season. A potential couch (SJ748461) was recorded adjacent to a pond north of the brook near Wrinehill Mill within the land required for the Construction of the Proposed Scheme. No confirmed holts or further activity for otter were recorded during the survey within the land required for the Proposed Scheme. It is assumed that otter will make use of the Checkley Brook for foraging and as a corridor for movement.
- 2.3.80 Minor watercourses to either side of Den Lane within the land required for the construction of the Proposed Scheme were scoped out due to low water levels and dry ditches, poor connectivity, lack of suitable breeding habitats and low availability of food supply.
- 2.3.81 Ponds within the land required for the construction of the Proposed Scheme were scoped out after initial habitats surveys due to no water present, low to poor availability of food supply or presence of low quality habitats (pasture and arable) with limited availability of terrestrial breeding habitat. These include a cluster of seven ponds surrounding Gonsley Green Farm and a pond south of Gonsley Green Farm south-west.

Mere Gutter

- 2.3.82 The desk study did not return any records for otter along the Mere Gutter.
- 2.3.83 Access to Mere Gutter within South Cheshire was restricted by land owners during 2016. In absence of survey data, the possibility of a holt or couch cannot be excluded.

It is assumed that otter will make use of the Mere Gutter for foraging and as a corridor for movement.

Swill Brook

- 2.3.84 The desk study did not return any records for otter along the Swill Brook.
- 2.3.85 Moderate access was available on the Swill Brook and a stretch south of Lane End Farm, Chorlton partially within the land required for the construction of the Proposed Scheme was surveyed. No otter signs were found, however it is assumed that otter will make use of the Swill brook and as a corridor for movement.
- 2.3.86 Seven dry ponds and east of the Swill Brook south-west of Waybutt Lane within the land required for the construction of the Proposed Scheme were scoped out for further surveys.
- 2.3.87 A stretch of the Swill Brook north east of Hough, outside the land required for the construction of the Proposed Scheme was surveyed. No otter activity was recorded. Part of this stretch was scoped out for further surveys due to poor quality habitat (arable and pasture fields) and lack of potential terrestrial breeding habitats. It is assumed that otter will make use of the Swill brook and as a corridor for movement.
- 2.3.88 Minor watercourses upstream of the Swill Brook south-west of Waybutt Lane within and partially within the land required for the construction of the Proposed Scheme were scoped out for further surveys due to drying or low water levels, low availability of suitable terrestrial breeding habitats and low availability of food supply.
- 2.3.89 Five dry ponds east of the Swill Brook south of Heath Farm within the land required for the construction of the Proposed Scheme were scoped out for further surveys.
- 2.3.90 Desk study shows the presence of potential terrestrial breeding habitat. In absence of survey data, it is assumed that otter will make use of Swill Brook for foraging and as a corridor for movement.

Basford Brook

- 2.3.91 Desk study records for otter include the following (distances are all relative to the land required for the construction of the Proposed Scheme):
- otter tracks at the Basford Brook in 2015 at grid reference SJ730513 at approximately 32m;
 - an unspecified records at the Basford Brook in 2012 at grid reference SJ723526 at 289m and three unspecified records at approximately 336m;
 - an unspecified record at the Basford Brook in 2012 at grid reference SJ720536 at approximately 441m; and
 - an unspecified record at the Electra Way Ponds, Crewe in 2011 at grid reference SJ719550 at approximately 760m.
- 2.3.92 Access to the majority of the Basford Brook within CA5 was restricted by landowners during 2016. Desk study records and field surveys confirmed the presence of crayfish at the Basford Brook, affording high quality food supply for otter. It is assumed that otter will make use of the Basford Brook for foraging and as a corridor for movement.

- 2.3.93 Desk study showed that a downstream stretch of the Basford Brook north of Newcastle Road, within the land required for the Proposed Scheme has potential terrestrial breeding habitat for otter. In the absence of survey data, the possibility of a holt or couch cannot be excluded.
- 2.3.94 A downstream stretch of the Basford Brook north of the A500 and west of Crotia Mill Farm outside the land required for the construction of the Proposed Scheme was surveyed. No fields signs were found, however suitable habitats such as exposed tree roots along the bank may offer suitable features for holts.
- 2.3.95 Two ponds south-west of the A500 and north of Basford outside the land required for the construction of the Proposed Scheme were scoped out for further surveys due to lack of connectivity, road barriers and predominantly grazing land.

Gresty Brook

- 2.3.96 The desk study returned an unspecified record at the Wistason Brook downstream of the Gresty Brook in 2013 at grid reference SJ676549, approximately 3.2km from the land required for the construction of the Proposed Scheme.
- 2.3.97 Full access to the Gresty Brook was not granted for surveys. In absence of survey data, it is assumed that otter will make use of the Gresty Brook for foraging and as a corridor for movement due to the connectivity with the Basford Brook. There is potential terrestrial breeding habitat for otter along this watercourse within the land required for the Proposed Scheme.

3 Water vole

3.1 Methodology

- 3.1.1 Desk study records relating to water vole within 5km of the land required for construction of the Proposed Scheme were obtained from the following sources:
- Staffordshire Ecological Record²; and
 - rECOrd, Local Biological Records Centre for the Cheshire region³.
- 3.1.2 Details of the standard methodology utilised for water vole are provided in the Technical Note HS2 Ecological Surveys: Field Survey Methods and Standards (FSMS) included in the Scope and Methodology Report (SMR) Addendum (see Volume 5: Appendix CT-001-002).
- 3.1.3 Table 3 provides a summary of watercourses and water bodies subject to survey for water voles. This information is cross referenced to the accompanying Map series EC-12. For each water body/watercourse scoped in following initial Phase 1 habitat survey, a habitat suitability appraisal was carried out and, where suitable habitat was identified, more detailed field surveys were undertaken to establish presence/ likely absence. For all survey sites where the habitat suitability appraisal was undertaken between June and October 2016, detailed surveys were carried out at the same time.
- 3.1.4 During the initial habitat suitability appraisal, poor quality habitats considered unsuitable to support water vole were scoped out. Factors that would result in a watercourse being scoped out included high levels of shading, poor food availability, poor connectivity and/or lack of suitable banks for burrowing. Examples of these include: watercourses/water bodies being tree-lined, resulting in a lack of water margin vegetation; heavily managed watercourses/water bodies with limited vegetation cover; high levels of disturbance; watercourses drying out, resulting in poor food availability; and canalised watercourses resulting in lack of burrowing substrate.
- 3.1.5 Best practice survey guidance⁷ states that water vole presence can only be confirmed if several field signs of this species are recorded in association with one another. During field surveys, mammal burrows, mammal feeding remains and other field signs were only regarded as evidence of water vole if found in association with water vole droppings.

⁷ Dean, M., Strachan, R., Gow, D. and Andrews, R. (2016), *The Water Vole Mitigation Handbook* (Mammal Society Mitigation Guidance Series), Eds. Fiona Mathews and Paul Chanin. The Mammal Society, London

Table 3: Summary of features subject to water vole survey

Watercourse or water body and site name	Feature type	OS grid reference (start and finish)	Level of access within required extent ⁸	Ecology survey code	Survey dates	CA	Distance from the land required for construction of the Proposed Scheme (m) and orientation
Pyford Brook	Stream	SK130133 and SK132144	Moderate	000-WV1-188002 000-WV1-188003 000-WV1-188004 000-WV1-188005 000-WV1-188009 000-WV1-188012 000-WV1-188013 000-WV1-188014 000-WV1-188015 000-WV1-188018 000-WV1-188019	16 August 2016	CA1	6m south-east Within Within Within Within Within 15m north-east 96m north-east 102m north-east 150m north-east
North-west of Cranberry	Pond	SK131140	Full	000-WV1-188007	02 August 2016	CA1	17m north-east
North-west of Cranberry	Pond	SK131140	Full	000-WV1-188010	02 August 2016 04 August 2016	CA1	3m north-east
North-west of Cranberry	Pond	SK131140	Full	000-WV1-188011	02 August 2016	CA1	27m north-east
Ashby Sitch	Stream	SK119142 and SK138157	Little	000-WV1-189015 000-WV1-189019 000-WV1-189020 000-WV1-189021 000-WV1-189022	18 August 2016	CA1	Within Within 176m north-east 70m north-east 106m north-west
South-east of A515	Pond	SK123152	Full	000-WV1-190001	18 August 2016	CA1	73m north-east
South-west of Ashby Sitch	Pond	SK123152	Full	000-WV1-190002	18 August 2016	CA1	85m south-east
South-east of A515	Pond	SK119150	Moderate	000-WV1-190003	18 August 2016	CA1	Within
Bourne Brook	Stream	SK108141 and SK124156	Little	000-WV1-190012 000-WV1-190013	11 October 2016 30 August 2016	CA1	35m south-east 15m south-east

⁸ Full (100%)/majority (75% - 99%) /moderate (25-75%) /little (>25%) /none (0%)

Watercourse or water body and site name	Feature type	OS grid reference (start and finish)	Level of access within required extent ⁸	Ecology survey code	Survey dates	CA	Distance from the land required for construction of the Proposed Scheme (m) and orientation
				000-WV1-190018 000-WV1-190020 000-WV1-190030			11m south-east 2m south-east Within
Pond North-west of A515	Pond	SK112146	Majority	000-WV1-190015	11 October 2016	CA1	41m south-east
Pond North-east of Trent and Mersey Canal	Pond	SK114151	Full	000-WV1-190044	21 September 2016	CA1	11m north-west
North-west of Rookery Lodge	Drain	SK108168	Full	000-WV1-192012	18 November 2016	CA1	30m north-east
North-east of King's Bromley Lane	Drain	SK106169 and SK107170	Full	000-WV1-192016	15 November 2016	CA1	61m north-east
South-west of River Trent	Stream	SK099170 and SK106171	Full	000-WV1-192019 000-WV1-192023 000-WV1-192024 000-WV1-192025 000-WV1-192026 000-WV1-192029 000-WV1-192030 000-WV1-192032 000-WV1-193005	15 November 2016 17 August 2016	CA1	136m north-east 139m south-east 70m south-east Within land required 6m north-east Within Within Within
South-west of King's Bromley Lane	Ditch	SK102167 and SK108166	Little	000-WV1-192020	22 September 2016	CA1	1m south-west
South-east of River Trent	Drain	SK105171	Full	000-WV1-192021	15 November 2016	CA1	58m north-east
North-west of King's Bromley Lane	Stream	SK099171	Full	000-WV1-192028 000-WV1-193001	17 August 2016	CA1	41m south-west 25m north-east
North-east of River Trent	Ditch	SK098173	Moderate	000-WV1-193012	17 August 2016	CA1	26m south-west
pond North-east of Pipe Ridware	Pond	SK099179	Full	000-WV1-193018	02 November 2016	CA1	Within

Watercourse or water body and site name	Feature type	OS grid reference (start and finish)	Level of access within required extent ⁸	Ecology survey code	Survey dates	CA	Distance from the land required for construction of the Proposed Scheme (m) and orientation
Luth Burn	Stream	SK091180 and SK106178	Little	000-WV1-193020 000-WV1-193022 000-WV1-193023 000-WV1-193024 000-WV1-194006	12 July 2016 22 September 2016	CA1	Within Within Within Within 46m south-west
pond North-east of Pipe Wood Lane	Pond	SK093185	Full	000-WV1-194009	10 August 2016	CA1	80m north-east
South-west of Pipe Wood Lane	Ditch	SK089186 and SK088181	Moderate	000-WV1-194013	10 August 2016	CA1	Within
South-west of Blithbury Road	Ditch	SK074205 and SK081191	Moderate	000-WV1-195003 000-WV1-195004 000-WV1-195005 000-WV1-196001 000-WV1-196005 000-WV1-196027 000-WV1-197003 000-WV1-197008 000-WV1-197012	28 June 2016 13 July 2016 07 September 2016 08 November 2016	CA1	127m north-west 125m north-west 99m south-east 17m north-east Within Within Within Within
South-east of B5014	Stream	SK081195 and SK080193	Little	000-WV1-196003	28 June 2016	CA1	40m south-west
pond South-east of B5014	Pond	SK081195	Full	000-WV1-196006	28 June 2016	CA1	Within
North-west of Blithbury Road	Pond	SK073204	Full	000-WV1-197009	07 September 2016	CA1	84m south-west
North-west of Rosewood Farmhouse	Pond	SK068205	Moderate	000-WV1-197019	12 July 2016	CA1	Within
North-west of Rosewood Farmhouse	Pond	SK067206	Full	000-WV1-197020	12 July 2016	CA1	Within
South-east of Newlands Lane	Ditch	SK068207	Moderate	000-WV1-197021	30 September 2016	CA1	Within
South-east of Moor Lane	Stream	SK050212 and SK058216	Moderate	000-WV1-199001 000-WV1-199003 000-WV1-199004 000-WV1-199006 000-WV1-199010	29 June 2016 04 August 2016 21 September 2016 14 October 2016	CA1	59m north-east Within 201m north-east 138m north-east Within

Watercourse or water body and site name	Feature type	OS grid reference (start and finish)	Level of access within required extent ⁸	Ecology survey code	Survey dates	CA	Distance from the land required for construction of the Proposed Scheme (m) and orientation
				000-WV1-199015 000-WV1-199016 000-WV1-199017 000-WV1-199018 000-WV1-199019			76m south-west Within Within 230m south-west 170m south-west
North-east of Newlands Lane	Pond	SK056215	Full	000-WV1-199008	05 October 2016	CA1	67m north-east
North-east of Hamley House Farm	Pond	SK051217	Full	000-WV1-199020	28 July 2016	CA1	5m north-east
North-west of Hamley Heath House	Pond	SK044216	Full	000-WV1-200013	29 July 2016	CA1	13m north-east
South-west of Sherracop Lane	Pond	SK048224	Full	000-WV1-200014	19 September 2016	CA1	115m south-east
South-west of Sherracop Lane	Pond	SK048224	Full	000-WV1-200016	19 September 2016	CA1	109m south-east
North-west of B5013	Ditch	SK050223 and SK041216	Moderate	000-WV1-200017 000-WV1-200020 000-WV1-200022 000-WV1-200023 000-WV1-200025 000-WV1-200029 000-WV1-200030 000-WV1-200031	20 June 2016	CA1	Within
South-west of Lea Hall Farm	Pond	SK047226	Full	000-WV1-200026	20 June 2016	CA1	73m north-west
North-west of B5013	Pond	SK047226	Full	000-WV1-200026	20 June 2016	CA1	60m north-west
North-west of B5013	Pond	SK043219	Full	000-WV1-200032	20 June 2016	CA1	Within
North-east of Jongham's Cottage	Pond	SK041222	Full	000-WV1-200041	20 June 2016	CA1	Within
North-east of Jongham's Cottage	Ditch	SK043227 and SK036220	Moderate	000-WV1-200042	20 June 2016	CA1	Within
South-east of Jongham's Cottage	Pond	SK039220	Full	000-WV1-201006	29 June 2016 06 October 2016	CA1	2m south-west

Watercourse or water body and site name	Feature type	OS grid reference (start and finish)	Level of access within required extent ⁸	Ecology survey code	Survey dates	CA	Distance from the land required for construction of the Proposed Scheme (m) and orientation
North-west of Jongham's Cottage	Ditch	SK035224 and SK037221	Moderate	000-WV1-201022 000-WV1-201024 000-WV1-201028 000-WV1-201031	20 June 2016	CA1	Within
South-west of Moreton Brook	Drain	SK033225 and SK034223	Moderate	000-WV1-201032 000-WV1-201037	30 June 2016	CA1	Within
Moreton Brook	Stream	SK040214 and SK033232	Little	000-WV1-201030 000-WV1-201033 000-WV1-201034 000-WV1-201035 000-WV1-201036 000-WV1-201043	20 June 2016 30 June 2016 19 September 2016	CA1	Within
North-west of Moreton Brook	Ditch	SK032228 and SK032226	Moderate	000-WV1-201044 000-WV1-201046	30 June 2016	CA2	Within
North-west of Moreton Brook	Ditch	SK026227 and SK033226	Moderate	000-WV1-201045	30 June 2016	CA1	Within
North-west of Moreton Brook	Ditch	SK026227 and SK033226	Moderate	000-WV1-201051 000-WV1-202023 000-WV1-202026	30 June 2016	CA2	Within
North-west of Moreton Brook	Ditch	SK032227 and SK027230	Moderate	000-WV1-201052 000-WV1-202012	30 September 2016	CA2	Within
North-west of Moreton Brook	Ditch	SK030228 and SK031227	Moderate	000-WV1-202003 000-WV1-202010 000-WV1-202014	30 June 2016 30 September 2016	CA2	12m south-west 12m south-east 22m north-east
South-east of Tithebarn Farm	Pond	SK016230	Full	000-WV1-203003	04 July 2016	CA2	Within
North-east of Tithebarn Covert	Pond	SK013230	Full	000-WV1-203004	04 July 2016	CA2	Within
South-west of Tithebarn Farm	Pond	SK012232	Full	000-WV1-203005	04 July 2016	CA2	Within

Watercourse or water body and site name	Feature type	OS grid reference (start and finish)	Level of access within required extent ⁸	Ecology survey code	Survey dates	CA	Distance from the land required for construction of the Proposed Scheme (m) and orientation
North-west of Tithebarn Farm	Pond	SK013232	Full	000-WV1-203006	04 July 2016	CA2	Within
North-east of Tithebarn Covert	Ditch	SK010230 and SK010231	Majority	000-WV1-204003 000-WV1-204012	04 July 2016	CA2	141m south-west 88m south-west
South-west of Tithebarn Farm	Ditch	SK011230 and SK008235	Majority	000-WV1-204005 000-WV1-204007 000-WV1-204008 000-WV1-204009 000-WV1-204014	04 July 2016	CA2	86m south-west 83m south-west Within 60m south-west Within
North-east of Tithebarn Covert	Pond	SK009232	Full	000-WV1-204010	04 July 2016	CA2	2m south-west
South-east of Tolldish Lane	Ditch	SK011235 and SJ997229	Moderate	000-WV1-204013 000-WV1-204016 000-WV1-204017 000-WV1-204018 000-WV1-204019 000-WV1-204020 000-WV1-204021 000-WV1-204024 000-WV1-204025 000-WV1-204027 000-WV1-205001 000-WV1-205002 000-WV1-205014	29 June 2016 04 July 2016 05 July 2016	CA2	85m north-east 45m north-east 1m south-east 3m south-east Within Within Within Within Within 3m north-west Within 5m north-east 86m south-west
North-west of Tithebarn Covert	Pond	SK007232	Full	000-WV1-204015	04 July 2016	CA2	Within
River Trent	River	SJ995241 and SJ993229	Little	000-WV1-205022	29 June 2016	CA2	Within
North-east of Trent and Mersey Canal	Ditch	SJ997241	Little	000-WV1-205031	29 June 2016	CA2	46m south-west
North-east of Flushing Covert	Drain	SJ982240	Full	000-WV1-207004	29 June 2016	CA2	Within

Watercourse or water body and site name	Feature type	OS grid reference (start and finish)	Level of access within required extent ⁸	Ecology survey code	Survey dates	CA	Distance from the land required for construction of the Proposed Scheme (m) and orientation
North-west of Flushing Covert	Ditch	SJ979239	Full	000-WV1-207006 000-WV1-207008 000-WV1-207010 000-WV1-207011	29 June 2016	CA2	Within 29m south-west 74m south-west 69m south-west
North-west of Flushing Covert	Pond	SJ980239	Full	000-WV1-207007	29 June 2016	CA2	Within
North-west of Flushing Covert	Pond	SJ980241	Full	000-WV1-207009	29 June 2016	CA2	19m north-east
South-east of Town Field Plantation	Ditch	SJ978239	Moderate	000-WV1-207012	29 June 2016	CA2	85m south-west
North-east of Town Field Plantation	Ditch	SJ980242 and SJ980243	Full	000-WV1-207014	29 June 2016	CA2	70m north-east
South-east of Town Field Plantation	Ditch	SJ978239	Moderate	000-WV1-207015	29 June 2016	CA2	71m south-west
South-east of Town Field Plantation	Drain	SJ978239	Full	000-WV1-207016	29 June 2016	CA2	72m south-west
South-east of Town Field Plantation	Ditch	SJ978239 and SJ977240	Moderate	000-WV1-207018	29 June 2016	CA2	55m south-west
South-east of Marston Lane	Drain	SJ927275 and SJ931277	Little	000-WV1-213004	27 June 2016	CA2	67m north-east
South-east of A34	Drain	SJ911288 and SJ921286	Little	000-WV1-215012	27 June 2016	CA2	Within
North-east of M6	Pond	SJ890317	Full	000-WV1-219015	27 June 2016	CA3	Within
North-west of Walton Farm House	Pond	SJ891319	Full	000-WV1-219016	27 June 2016	CA3	Within
North-west of Walton Farm House	Pond	SJ891320	Full	000-WV1-219017	27 June 2016	CA3	1m north-east
North-west of Walton Farm House	Pond	SJ891320	Full	000-WV1-219018	27 June 2016	CA3	Within
North-east of M6	Pond	SJ889320	Full	000-WV1-219019	27 June 2016	CA3	Within

Watercourse or water body and site name	Feature type	OS grid reference (start and finish)	Level of access within required extent ⁸	Ecology survey code	Survey dates	CA	Distance from the land required for construction of the Proposed Scheme (m) and orientation
South-west of M6	Stream	SJ870347 and SJ878331	Little	000-WV1-221024 000-WV1-221037 000-WV1-221039 000-WV1-221041 000-WV1-221042 000-WV1-221049 000-WV1-222001 000-WV1-222002 000-WV1-222007 000-WV1-222009 000-WV1-222011 000-WV1-222014	27 June 2016 28 June 2016 29 June 2016 02 August 2016	CA3	Within
South-west of M6	Pond	SJ872340	Full	000-WV1-222008	29 June 2016	CA3	Within
South-west of M6	Pond	SJ871341	Full	000-WV1-222013	01 July 2016	CA3	1m north-west
South-west of M6	Pond	SJ871340	Full	000-WV1-222015	01 July 2016	CA3	2m north-west
South-west of A51	Pond	SJ858361	Full	000-WV1-224009	18 July 2016	CA3	13m north-west
South-west of A51	Stream	SJ859361 and SJ860362	Moderate	000-WV1-224010 000-WV1-224013	18 July 2016	CA3	Within
South-west of M6	Stream	SJ857361	Moderate	000-WV1-224012	18 July 2016	CA3	Within
South-west of A51	Pond	SJ856361	Full	000-WV1-224014	18 July 2016	CA3	Within
South-west of A51	Pond	SJ856361	Full	000-WV1-224015	18 July 2016	CA3	Within
South-west of A51	Pond	SJ856361	Full	000-WV1-224016	18 July 2016	CA3	Within
South-east of Beswick Green	Pond	SJ852357	Moderate	000-WV1-225001	01 July 2016	CA3	Within
South-west of Bent Lane	Pond	SJ813395	Full	000-WV1-230015	04 July 2016	CA4	Within
South-west of Bent Lane	Pond	SJ814394	Full	000-WV1-230016	04 July 2016	CA4	Within

Watercourse or water body and site name	Feature type	OS grid reference (start and finish)	Level of access within required extent ⁸	Ecology survey code	Survey dates	CA	Distance from the land required for construction of the Proposed Scheme (m) and orientation
South-west of Bent Lane	Pond	SJ813394	Full	000-WV1-230017	04 July 2016	CA4	Within
Meece Brook	Stream	SJ809411 and SJ815388	Moderate	000-WV1-230020 000-WV1-230024 000-WV1-230027 000-WV1-230030 000-WV1-230032 000-WV1-230033 000-WV1-230034 000-WV1-231001 000-WV1-231002 000-WV1-231003 000-WV1-231005 000-WV1-231009 000-WV1-231011 000-WV1-231013 000-WV1-231015 000-WV1-231017	23 June 2016	CA4	Within
South-west of Bent Lane	Pond	SJ813395	Full	000-WV1-230025	04 July 2016	CA4	Within
South-west of Bent Lane	Pond	SJ812396	Full	000-WV1-230028	04 July 2016	CA4	Within
South-west of Bent Lane	Pond	SJ812397	Full	000-WV1-230029	04 July 2016	CA4	Within
South-west of Bent Lane	Pond	SJ811398	Full	000-WV1-230031	04 July 2016	CA4	Within
South-west of Bent Lane	Stream	SJ803399 and SJ809400	Little	000-WV1-231004 000-WV1-231006 000-WV1-231007	22 June 2016	CA4	Within
South-east of A53	Pond	SJ803406	Full	000-WV1-231019	04 July 2016	CA4	Within
South-east of A53	Pond	SJ801406	Full	000-WV1-231020	04 July 2016	CA4	Within
South-west of Snape Hall Road	Ditch	SJ790411 to SJ791412	Little	000-WV1-233009	27 July 2016	CA4	130m south-east

Watercourse or water body and site name	Feature type	OS grid reference (start and finish)	Level of access within required extent ⁸	Ecology survey code	Survey dates	CA	Distance from the land required for construction of the Proposed Scheme (m) and orientation
South-west of Whitmore Wood	Ditch	SJ794408 and SJ780425	Little	000-WV1-233014 000-WV1-234020	27 July 2016 26 October 2016	CA4	Within
South-west of South Of Hey Sprink	Ditch	SJ783419 to SJ779425	Little	000-WV1-234001 000-WV1-234005 000-WV1-234009 000-WV1-234014 000-WV1-234015 000-WV1-234019 000-WV1-234026	26 October 2016	CA4	86m south-west 68m south-east 5m south-west 50m south-west 67m south-west 27m south-west Within
North-east of Manor Road	Ditch	SJ780422 to SJ779426	Little	000-WV1-234016 000-WV1-234017 000-WV1-234023 000-WV1-234025 000-WV1-234027 000-WV1-234029	26 October 2016	CA4	159m south-west 114m south-east 29m south-east Within Within Within
River Lea	River	SJ774423 and SJ773441	Little	000-WV1-235001 000-WV1-235002 000-WV1-235006 000-WV1-235008 000-WV1-235009 000-WV1-235010 000-WV1-235011 000-WV1-235012 000-WV1-235013 000-WV1-235019 000-WV1-235020 000-WV1-236001	27 June 2016 29 September 2016 28 September 201	CA4	3m south-east 7m south-east Within Within 16m north-west 40m south-west Within Within Within Within Within
North-east of Manor Road	Ditch	SJ779426 and SJ778426	Little	000-WV1-235003 000-WV1-235004	15 September 2016	CA4	Within
South-east of Manor Road	Pond	SJ775428	Full	000-WV1-235014	27 June 2016	CA4	Within
South-east of Manor Road	Pond	SJ775428	Full	000-WV1-235015	27 June 2016	CA4	Within

Watercourse or water body and site name	Feature type	OS grid reference (start and finish)	Level of access within required extent ⁸	Ecology survey code	Survey dates	CA	Distance from the land required for construction of the Proposed Scheme (m) and orientation
South-east of Manor Road	Pond	SJ773428	Full	000-WV1-235016	27 June 2016	CA4	Within
North-west of Hey House	Ditch	SJ775435 and SJ775433	Full	000-WV1-235017 000-WV1-235018 000-WV1-235021	26 September 2016	CA4	Within
South-east of Bar Hill	Pond	SJ767439	Full	000-WV1-236002	27 October 2016	CA4	Within
South-east of Bower End Lane	Pond	SJ764444	Full	000-WV1-237001	27 September 2016	CA4	16m north-west
South-west of East Of Wrinehill Wood	Stream	SJ756445 and SJ752457	Little	000-WV1-238002 000-WV1-238003 000-WV1-238004 000-WV1-238005 000-WV1-238008 000-WV1-238013	29 September 2016	CA4	194m south-west 195m south-west 49m south-west 143m south-west 7m south-west 10m south-west
South of Wrinehill Wood	Stream	SJ751452 and SJ752456	Little	000-WV1-238030	29 September 2016	CA4	50m south-west
North-west of Wrinehill Hall	Culvert	SJ752460	Little	000-WV1-239021 000-WV1-239026	29 September 2016	CA4	78m north-east 98m south-west
Checkley Brook	Stream	SJ754465 and SJ746458	Moderate	000-WV1-239028 000-WV1-239029 000-WV1-239031 000-WV1-239032 000-WV1-239033 000-WV1-239034 000-WV1-239043 000-WV1-239048 000-WV1-239050	23 June 2016 27 June 2016	CA4 and CA5	7m south-east 56m north-east 9m south-west Within Within 118m south-east 107m north-east 61m south-west
North-east of Checkley Brook	Pond	SJ748461	Full	000-WV1-239041	23 June 2016	CA5	Within
North-east of Checkley Brook	Pond	SJ747459	Full	000-WV1-239049	23 June 2016	CA5	37m south-west
North-east of Checkley Brook	Pond	SJ748461	Full	000-WV1-239051	23 June 2016	CA5	Within

Watercourse or water body and site name	Feature type	OS grid reference (start and finish)	Level of access within required extent ⁸	Ecology survey code	Survey dates	CA	Distance from the land required for construction of the Proposed Scheme (m) and orientation
South-east of Checkley Lane	Pond	SJ745462	Full	000-WV1-239054	23 June 2016	CA5	Within
South-west of Den Lane	Ditch	SJ739474 and SJ737477	Full	000-WV1-241009 000-WV1-241011 000-WV1-241012	16 August 2016	CA5	Within
South-east of Den Lane	Drain	SJ737476	Full	000-WV1-241013	16 August 2016	CA5	Within
North-east of Den Lane	Ditch	SJ732482 and SJ739487	Little	000-WV1-242027	28 July 2016	CA5	Within
South-east of Gonsley Green Farm	Pond	SJ733486	Full	000-WV1-242030	28 July 2016	CA5	Within
South-east of Gonsley Green Farm	Pond	SJ733486	Full	000-WV1-242031	28 July 2016	CA5	Within
South-west of Waybutt Lane	Drain	SJ730492	Little	000-WV1-243008 000-WV1-243013	07 September 2016	CA5	Within
South-west of Waybutt Lane	Pond	SJ730493	Full	000-WV1-243021	07 September 2016	CA5	Within
South-west of Waybutt Lane	Pond	SJ730494	Full	000-WV1-243022	07 September 2016	CA5	Within
South-west of Waybutt Lane	Pond	SJ729494	Full	000-WV1-243024	07 September 2016	CA5	Within
South-west of Waybutt Lane	Pond	SJ729495	Full	000-WV1-243027	07 September 2016	CA5	Within
Swill Brook	Stream	SJ727494 and SJ712514	Moderate	000-WV1-243028 000-WV1-243029 000-WV1-243032 000-WV1-243033 000-WV1-243034 000-WV1-244001 000-WV1-245013 000-WV1-245017 000-WV1-245018 000-WV1-245021 000-WV1-245023	07 September 2016 31 October 2016 26 October 2016	CA5	Within Within Within Within Within Within 80m north-west 150m north-west 128m south-east 72m south-west 80m south-west

Watercourse or water body and site name	Feature type	OS grid reference (start and finish)	Level of access within required extent ⁸	Ecology survey code	Survey dates	CA	Distance from the land required for construction of the Proposed Scheme (m) and orientation
South-west of Waybutt Lane	Pond	SJ726495	Full	000-WV1-243030	07 September 2016	CA5	Within
South-west of Waybutt Lane	Pond	SJ727497	Full	000-WV1-243031	07 September 2016	CA5	Within
South-west of Waybutt Lane	Pond	SJ727497	Full	000-WV1-243035	07 September 2016	CA5	Within
South-east of Chorlton Lane	Drain	SJ726502	Little	000-WV1-244005	07 September 2016	CA5	Within
North-east of Chorlton Lane	Ditch	SJ726506	Full	000-WV1-244016	03 October 2016	CA5	60m north-east
North-west of Chorlton Lane	Pond	SJ724509	Moderate	000-WV1-245002	08 September 2016	CA5	Within
North-west of Chorlton Lane	Pond	SJ722508	Full	000-WV1-245005	08 September 2016	CA5	Within
North-west of Chorlton Lane	Pond	SJ723509	Moderate	000-WV1-245006	08 September 2016	CA5	Within
South-west of Chorlton Lane	Pond	SJ723509	Full	000-WV1-245008	08 September 2016	CA5	Within
North-west of Chorlton Lane	Pond	SJ722509	Full	000-WV1-245010	08 September 2016	CA5	Within
North-west of Chorlton Lane	Pond	SJ721509	Full	000-WV1-245011	08 September 2016	CA5	Within
North-west of Chorlton Lane	Pond	SJ721509	Full	000-WV1-245012	08 September 2016	CA5	Within
North-west of Chorlton Lane	Pond	SJ721508	Full	000-WV1-245014	08 September 2016	CA5	Within
South-west of Chorlton Bank Farm	Pond	SJ720510	Full	000-WV1-245016	08 September 2016	CA5	73m south-west
South-west of Meadow Avenue	Ditch	SJ727517	Little	000-WV1-245028	08 September 2016	CA5	252m north-east
South-west of A500	Pond	SJ712524	Full	000-WV1-246030	28 June 2016	CA5	18m south-east
South-west of A500	Pond	SJ713524	Full	000-WV1-246038	28 June 2016	CA5	8m south-east

Watercourse or water body and site name	Feature type	OS grid reference (start and finish)	Level of access within required extent ⁸	Ecology survey code	Survey dates	CA	Distance from the land required for construction of the Proposed Scheme (m) and orientation
Basford Brook	Stream	SJ722528 and SJ722534	Little	000-WV1-247005 000-WV1-247014 000-WV1-247019	08 September 2016	CA5	245m south-east 176m south-west 129m south-east

3.2 Deviations, constraints and limitations

3.2.1 Every effort was made to establish as complete a picture as possible of water vole activity and to fully record the presence of water voles and their burrows. However, 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. This resulted in some watercourses/water bodies (either partially or entirely) not being scoped in or out of the survey process;
- 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 Proposed Scheme. Where watercourses were at least in part within the land required for the construction of the Proposed 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 Proposed Scheme;
- where particular limitations are relevant to the interpretation of the baseline these are discussed within the baseline section of the relevant CA; and

- 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)⁹ was not possible.

3.3 Baseline

3.3.1 A summary of all positive evidence of water vole is provided in Table 4.

Table 4: Summary of all positive evidence of water vole

Name of watercourse (and ecology survey code)	Location	OS grid reference	Nature of activity recorded	CA	Distance from Proposed Scheme (m) and orientation
Unnamed watercourse 000-WV1-193001	Trentside Meadows Local Wildlife Site (LWS) north-west of King's Bromley Lane	SK100171	Potential water vole sighting. Surveyor waited for a resurface but dense vegetation obscured access	CA1	15m north-west
Unnamed watercourse 000-WV1-201052	Lount Farm LWS north-west of Moreton Brook	SK032227	Latrine	CA1 and CA2	11m south-west
Unnamed watercourse 000-WV1-201052	Lount Farm LWS north-west of Moreton Brook	SK032227	Latrine	CA1 and CA2	Within
Unnamed watercourse 000-WV1-202012	Lount Farm LWS north-west of Moreton Brook	SK031227	Latrine	CA1 and CA2	10m south-east
Unnamed watercourse 000-WV1-202010	Lount Farm LWS north-west of Moreton Brook	SK031227	Latrine	CA1 and CA2	14m south-east
Unnamed watercourse 000-WV1-202010	Lount Farm LWS north-west of Moreton Brook	SK031227	Burrow – confirmed	CA1 and CA2	14m south-east
River Lea 000-WV1-235002	North-east of Manor Road	SJ776423	Potential footprint, star shaped and short heel on hind foot	CA4	44m south-east
River Lea 000-WV1-235008	North-east of Manor Road	SJ779425	Potential burrow	CA4	Within

⁹ Morris, P., Morris, M., MacPhearson, D., Strachan, R., and Woodroff, G. (1998), *Estimating numbers of water voles Arvicola terrestris: a correction to the published method*, Journal of Zoology, 246, 61-62

Name of watercourse (and ecology survey code)	Location	OS grid reference	Nature of activity recorded	CA	Distance from Proposed Scheme (m) and orientation
River Lea pond 000-WV1-235015	South-east of Manor Road	SJ775428	Unconfirmed run through dense rush around pond margin, but no other evidence e.g. droppings/latrines to confirm assessment	CA4	Within
River Lea pond 000-WV1-235016	South-east of Manor Road	SJ773428	Potential burrow	CA4	Within
Unnamed watercourse 000-WV1-243013	South-west of Waybutt Lane	SJ729492	Latrine with approximately 12 dropping sin a neat pile	CA5	Within
Unnamed watercourse 000-WV1-243013	South-west of Waybutt Lane	SJ729492	Burrow – confirmed along north bank within dense vegetation	CA5	Within
Unnamed watercourse 000-WV1-243013	South-west of Waybutt Lane	SJ729492	Run	CA5	Within
Swill Brook 000-WV1-243033	South-west of Waybutt Lane	SJ725496	Unconfirmed burrow in west bank. Old hole not in use	CA5	Within
Swill Brook 000-WV1-243033	South-east of Chorlton Lane	SJ725496	Unconfirmed run through dense rush around pond margin, but no other evidence e.g. droppings/latrines to confirm assessment	CA5	Within

Fradley to Colton (CA1)

- 3.3.2 There were no confirmed water vole records within CA1 from surveys. A potential sighting was recorded within the Trentside Meadows Local Wildlife Site (LWS) outside the land required for the construction of the Proposed Scheme. The desk study did not return any records from the Staffordshire Ecological Record for water vole within the land required for the construction of the Proposed Scheme.

Pyford Brook

- 3.3.3 The nearest record to the Pyford Brook for water vole includes an unspecified record within a pond at East Hill in 2007 at grid reference SK143118, approximately 987m from the land required from the construction of the Proposed Scheme.
- 3.3.4 Moderate access was obtained for the Pyford Brook, including three ponds to the east within Cranberry Wood outside the land required for the Proposed Scheme. Suitable water vole habitats were recorded from a survey along the Pyford Brook within and

partially within the land required for the construction of the Proposed Scheme. Dense vegetation limited access during field searches. No evidence of water voles was found.

- 3.3.5 Three ponds south east of the Pyford Brook in Cranberry Wood outside the land required for the construction of the Proposed Scheme were scoped out for further surveys due to limited vegetation structure and food sources. Vegetation within the broad-leaved woodland plantation is overgrown leading to shading and reduces the habitat suitability of these water bodies. Pond surfaces were found to be covered in duckweed (*Lemna* sp.).

Ashby Sitch

- 3.3.6 The desk study did not return any records along the Ashby Sitch and full access was not granted.
- 3.3.7 A survey was undertaken along a stretch downstream that is partially within the land required for the construction of the Proposed Scheme. At the time of survey, the watercourse was drying reducing suitability for water voles despite suitable burrowing substrate being present. There is potential exposure from agriculture run off from fields. This stretch showed high levels of shading from overgrown bramble (*Rubus fruticosus* agg.) and nettle (*Urtica* sp.). Steep banks limited access to the watercourse edge and overgrown vegetation reduced visibility. No evidence of water voles was found.
- 3.3.8 In the absence of survey data, it is assumed that potential water vole habitats may be present along the Ashby Sitch.
- 3.3.9 Water bodies and watercourses scoped out for further surveys within the land required for the construction of the Proposed Scheme in proximity to the Ashby Sitch include a pond south of Holly Cottage and south of Common Lane due to limited availability of food sources and poor connectivity.
- 3.3.10 Water bodies and watercourses scoped out for further surveys outside the land required for the construction of the Proposed Scheme in proximity to the Ashby Sitch include two ponds and a ditch associated with Barn Farm south of Common Lane due to poor habitat suitability associated with agricultural run-off.

Trent and Mersey Canal

- 3.3.11 Access was not obtained to the Trent and Mersey Canal. The nearest record to Trent and Mersey Canal for water vole includes an unspecified record along Shropshire Brook at Armitage with Handsacre Parish in 2009 at grid reference SK087156, approximately 1.3km from the land required for the construction of the Proposed Scheme.
- 3.3.12 Desk study showed a record for mink at Handsacre adjacent to the Trent and Mersey Canal in 2016 at grid reference SK092161, approximately 635m from the land required for the construction of the Proposed Scheme. The presence of mink on this watercourse further reduces the likelihood of water voles being present within the land required for the construction of the Proposed Scheme.
- 3.3.13 In absence of survey data, it is assumed that potential water vole habitats may be present along Trent and Mersey Canal.

- 3.3.14 Water bodies and watercourses scoped out for further surveys within or partially within the land required for the construction of the Proposed Scheme include the marina adjacent to the Trent and Mersey Canal. Hardstanding habitat and poor opportunities for burrowing reduced the habitat suitability. There is regular disturbance from recreation and there was low to no availability of food sources for water voles.
- 3.3.15 Water bodies and watercourses scoped out for further surveys outside the land required for the construction of the Proposed Scheme include: a large pond south-east of Shaw Lane and north-east of the Trent and Mersey Canal. The presence of woodland produces high levels of shading. Vegetation structure was limited and there was a lack of food source for water vole.

Bourne Brook

- 3.3.16 The desk study did not return any records along the Bourne Brook and little access was granted for surveys.
- 3.3.17 Water bodies and watercourses scoped out for further surveys within or partially within the land required for the construction of the Proposed Scheme include: an upstream stretch of the Bourne Brook due to lack of availability of food sources, high levels of shading from bankside trees and slight disturbance from the marina to the south; and a short stretch of the Bourne Brook downstream north-east of the A515 due to no suitable food sources for water vole. Vegetation was dominated by Himalayan balsam (*Impatiens glandulifera*) and mature bankside trees increasing shading of the banks. A mink spraint was recorded along this stretch during a water vole survey (SK118155) within the land required for the construction of the Proposed Scheme. The presence of mink on this watercourse further reduces the likelihood of water voles being present within the land required for the construction of the Proposed Scheme.
- 3.3.18 In the absence of survey data, it is assumed that potential water vole habitats may be present along Bourne Brook.

Crawley Brook

- 3.3.19 The desk study did not return any records along the Crawley Brook and access was not granted for the Crawley Brook.
- 3.3.20 In the absence of survey data, it is assumed that potential water vole habitats may be present along the Crawley Brook.
- 3.3.21 Watercourses scoped out for further survey outside the land required for the construction of the Proposed Scheme include: a drain south of Rookery Plantation due to no water present; and a drain south-west of King's Bromley Lane due to low water levels and lack of available food sources.
- 3.3.22 Desk study showed a record for mink in 2006 on the A513 north-west of the Crawley Brook and west of the gravel pits at Kings Bromley at grid reference SK108167 within the land required for the construction of the Proposed Scheme, further reducing the likelihood of water voles being present within the land required for the construction of the Proposed Scheme.

River Trent

- 3.3.23 Little access was granted for the River Trent. The nearest record to the River Trent includes a record of a single water vole swimming along the River Swarbour in 2011 at grid reference SK142184, approximately 1.4km from the land required for the construction of the Proposed Scheme.
- 3.3.24 In absence of survey data, it is assumed that potential water vole habitats may be present along the River Trent.
- 3.3.25 A short section of a drain north of Oak Farm and King's Bromley Lane provided burrowing opportunities and food source for water voles, however the adjacent stretches of the minor watercourse were found to be unsuitable for water vole.
- 3.3.26 A watercourse south of the River Trent and north of Oak Farm that crosses the land required for the construction of the Proposed Scheme was scoped out for further surveys due to high levels of shading from overgrown vegetation. Although there is some availability of food sources in a few areas, these patches were sparse. These factors in addition to low water levels reduce the habitat suitability for water vole; an adjoining drain to the south of this watercourse was scoped out due to shallow water level and high levels of shading.
- 3.3.27 A potential water vole sighting (SK100171) was recorded during a field survey on an unnamed watercourse 15m north-west of the land required for the construction of the Proposed Scheme within the Trentside Meadows LWS. Surveyors were unable to confirm presence. Visibility and access during survey was limited by steep banks and overgrown vegetation. Suitable habitat was limited in extent. The possibility of water voles on this stretch cannot be excluded however it is unlikely that water voles is present within the land required for the construction of the Proposed Scheme due to the poor habitat connectivity to the area with the potential sighting and the absence of suitable habitat within the Proposed scheme.
- 3.3.28 A shallow ditch south of the River Trent outside the land required for the construction of the Proposed Scheme with shallow banks and limited availability of food sources was scoped out for further surveys.
- 3.3.29 Desk study showed a record for mink on the B5014 north-west of the River Trent in 2006 at grid reference SK090172, approximately 510m from the land required for the construction of the Proposed Scheme. The presence of mink on this watercourse further reduces the likelihood of water voles being present within the land required for the construction of the Proposed Scheme.

Luth Burn

- 3.3.30 The desk study did not return any records along the Luth Burn. Little access was obtained for a stretch south of Pipe Wood Lane north of agricultural fields within land required for the construction of the Proposed Scheme. This stretch was shallow and is between a hedge and the road with slight disturbance. A limited supply of food sources dominated by nettles and thistle with only few fruit bearing species was noted. It is unlikely that water voles are present along this stretch due to poor habitat suitability.

- 3.3.31 A pond south of the Luth Burn and Pipe Wood Lane outside the land required for the construction of the Proposed Scheme was scoped out from further surveys due to low water levels, regular disturbance from the road, poor availability of food sources and moderate level of shading.
- 3.3.32 A stretch of the Luth Burn south-west of Pipe Wood Lane outside the land required for the construction of the Proposed Scheme was scoped out for further surveys due to low water levels, light grazing disturbance from the adjacent field, moderate levels of shading from tall ruderal and trees and limited food sources.
- 3.3.33 North of the Luth Burn, water bodies and watercourses scoped out for further surveys within or partially within the land required for the construction of the Proposed Scheme include: a dry ditch east of Quintin's Orchard and south-west of Woodhouse Farm; a shallow pond with silt south-east of the B5014; a heavily shaded shallow stream south-east of the B5014 and a dry adjoining ditch; a dry ditch north of Blithbury Road and east of Hadley Gate; a heavily shaded and shallow ditch south of Blithbury Road; a heavily shaded shallow pond east of Hurst Wood; a heavily shaded shallow pond south of Hurstwood Pit; and a dry ditch north of Hurstwood Pit.
- 3.3.34 North of Luth Burn, water bodies and watercourses scoped out for further surveys outside the land required for the construction of the Proposed Scheme include: an isolated pond south-east of Woodhouse Farm; a heavily shaded watercourse east of Uttoxeter Road; and a pond north-west of Blithbury Road south east of Hadley Gate adjacent to a grazing field.

Moreton Brook

- 3.3.35 The desk study did not return any records along the Moreton Brook and little access was available to the Moreton Brook. The northern stretches of the Moreton Brook within the land required for the construction of the Proposed Scheme provides minimal potential for water voles. Vertical earth banks, deep water and moderate connectivity to other suitable habitats were noted. Food availability is limited with nettles and herbs and there are high levels of shading from the bankside trees. However, due to the connectivity to the Lount Farm LWS, it is possible that water voles may use this stretch of watercourse for dispersal.
- 3.3.36 Southern stretches of the Moreton Brook within the land required for the construction of the Proposed Scheme were scoped out for further surveys as they were heavily shaded by bankside trees and scrub. Food source for water voles was minimal with few grasses and herbs present bankside. Grazing pasture is present on either side of the banks.
- 3.3.37 Mink tracks were recorded along the Moreton Brook during a water vole survey (SK034222) within the land required for the construction of the Proposed Scheme. Despite the presence of mink there were confirmed field signs indicative of low numbers of water vole recorded on a tributary of the Moreton Brook within CA2.
- 3.3.38 A partial stretch of a watercourse south-east of Moor Lane in Stockwell Heath that crosses the land required for the construction of the Proposed Scheme was surveyed and found to have suitable habitats. No evidence of water voles was found.

- 3.3.39 A stretch of watercourse south of Pool Farm and Park Lane outside the land required for the construction of the Proposed Scheme was surveyed and found to have suitable habitats. No evidence of water voles was found.
- 3.3.40 A tributary of the Moreton Brook located to the west was partially suitable for water voles due to the availability of rushes, grasses with occasional patches of rosebay willowherb (*Chamaenerion angustifolium*) and sedges, however water depth was low.
- 3.3.41 A pond south-east of Jongham's Cottage partially within the land required for the construction of the Proposed Scheme was subjected to field surveys. No evidence of water voles was found, however short feeding remains below 5cm and small mammal burrows resembling field vole (*Microtus agrestis*) were recorded. There is a good availability of food sources including grasses, reeds, yellow flag (*Iris pseudacorus*) and meadowsweet that are favoured by water voles. Steep earth banks are present offering potential burrowing habitat.
- 3.3.42 East of Moreton Brook, water bodies and watercourses scoped out for further surveys within or partially within the land required for the construction of the Proposed Scheme include: shallow stream south-east of Newlands Lane; a shallow and heavily shaded ditch intersecting the B5013 north of Hamley Heath House; a heavily shaded pond north-west of B5013 and Hamley Heath House; a shallow ditch crossing the land required north-east of Jongham's Cottage; and a dry ditch that is running parallel to and east of the Moreton Brook and north-west of Jongham's Cottage.
- 3.3.43 East of the Moreton Brook, water bodies and watercourses scoped out for further surveys outside the land required for the construction of the Proposed Scheme include: a shallow ditch south-east of Park Lane with limited food resource; a man-made pond south-east of Newlands Lane in Stockwell Heath with no structure or availability of food source; a heavily shaded pond North-east of Hamley House Farm; regularly disturbed ornamental pond north-west of Hamley Heath House; two heavily shaded ponds south of Sherracop Lane, one dry and the other with low water levels; and a drying regularly disturbed pond south of Lea Hall Farm adjacent to cattle grazing.

Colwich to Yarlet (CA2)

- 3.3.44 Four latrines and a water vole burrow were recorded within CA2 from surveys in close proximity to the Moreton Brook, suggesting a low population size. One of the latrines was within the land required for the construction of the Proposed Scheme. The desk study returned a single record from the Staffordshire Ecological Record of a burrow within the land required for the construction of the Proposed Scheme.

Moreton Brook tributary

- 3.3.45 A water vole latrine was recorded during a field survey along a tributary of the Moreton Brook (SK031227) at the Lount Farm LWS within the land required for the construction of the Proposed Scheme. Two latrine was recorded within the Lount Farm LWS (SK031227) 10m south-east; 11m south-east; and 14m south-east of the land required for the construction of the Proposed Scheme. A burrow was recorded at the Lount Farm LWS (SK031227) 14m south-east of the land required for the construction of the Proposed Scheme. The ditch held low water levels and flows through a wet meadow with a supply of food sources such as common reed

(*Phragmites australis*) with high connectivity to other habitats. This ditch is located partially within the land required for the construction of the Proposed Scheme. The surrounding minor watercourses offered potential food sources such as rushes, willowherb and grasses, however the banks were flat and water levels were low. It is assumed that water vole would use these minor watercourses for foraging and as a dispersal route and it is possible that water vole could become established in the land required for the construction of the Proposed Scheme in future on the basis of current habitat suitability.

- 3.3.46 A tributary of the Moreton Brook within CA2 north-east of Moreton Grange within land required for the construction of the Proposed Scheme was found to be shallow. Due to the connectivity to the positive latrines recorded (SK031227), this stretch may offer foraging and dispersal potential due to presence of available food sources including rosebay willowherb, meadowsweet (*Filipendula ulmaria*) and grass species.

Trent and Mersey Canal

- 3.3.47 The desk study returned a record for a water vole east of the Trent and Mersey Canal at Great Haywood in 2007 at grid reference SJ997236 within the land required for the construction of the Proposed Scheme.
- 3.3.48 Access was not granted on the Trent and Mersey Canal. In the absence of survey data and taking into consideration historic records, it is assumed that potential water vole habitats may be present along the Trent and Mersey Canal.
- 3.3.49 Water bodies and watercourses east of the Trent and Mersey Canal scoped out for further surveys within or partially within the land required for the construction of the Proposed Scheme include: two heavily shaded ponds south-east and south-west of Tithebarn Farm with evidence of pollution and cattle grazing; a dry pond south-west of Tithebarn Farm; a heavily shaded pond north-west of Tithebarn Farm within a woodland with no marginal vegetation; a dry pond north-east of Tithebarn Covert; a shallow ditch crossing Tithebarn Covert and the land required for the construction of the Proposed Scheme with no aquatic or marginal vegetation; a dry ditch within an wheat field north of Tithebarn Covert; a small heavily shaded pond within Little Covert without marginal vegetation north-west of Tithebarn Covert; and a heavily shaded ditch crossing the land required south-east of Toldish Lane with dry sections and shallow water.
- 3.3.50 Water bodies and watercourses east of the Trent and Mersey Canal scoped out for further surveys outside the land required for the construction of the Proposed Scheme include: a shallow ditch and pond within Great Haywood north-west of Nursery Way lacking marginal vegetation.

River Trent

- 3.3.51 The desk study did not return any records along the River Trent in CA2 and access was not granted for the majority of the River Trent, however a water vole burrow at grid reference SJ997236 was located at Great Haywood in 2007 adjacent to the Trent and Mersey Canal within the land required for the construction of the Proposed Scheme.
- 3.3.52 A stretch of the River Trent was scoped out south of Hoomill Lane due to fast flow and disturbance from cattle reducing the availability of water vole food source.

- 3.3.53 Desk study showed the presence of mink along the River Trent at Tixall in 2015 at grid reference SJ979220, approximately 1.7km; and in 2009 at grid reference SJ976224, approximately 1.4km from the land required for the construction of the Proposed Scheme. The presence of mink on this watercourse further reduces the likelihood of water voles being present, although mink were not recorded during water vole surveys.
- 3.3.54 Given the absence of survey data and a historic record from the River Trent, it is assumed that habitat that may potentially be suitable for water vole is present along the River Trent and associated water bodies and watercourses.
- 3.3.55 A minor watercourse south-west of Marston Hall Farm was found to have suitable food sources and burrowing habitat for water voles. No access was granted to the remaining stretch of this drain that flows within the land required for the construction of the Proposed Scheme.
- 3.3.56 Water bodies and watercourses west of the River Trent scoped out for further surveys within or partially within the land required for the construction of the Proposed Scheme include: a pond within Ingestre Park Golf Club with regular disturbance and limited availability of food source; and minor watercourses within the golf course that are dry or drying with evidence of intense bankside management and disturbance.
- 3.3.57 Water bodies and watercourses north-west of the River Trent scoped out for further surveys outside the land required for the construction of the Proposed Scheme include: a ditch north of Hoomill Bridge adjacent to a garden and grazing land; a pond within Ingestre Park Golf Club north-east of Town Field Plantation with regular disturbance and limited availability of food source; a dry ditch south of Ingestre and north-east of Town Field Plantation; and a heavily shaded drain north-east of Yarlet Lane .

Stone and Swynnerton (CA3)

- 3.3.58 There were no confirmed water vole records within CA3 from surveys. The desk study did not return any records from Staffordshire Ecological Record for water vole within the land required for the construction of the Proposed Scheme.

Filly Brook

- 3.3.59 The desk study did not return any records along Filly Brook. The nearest record to the Filly Brook for water vole includes an unspecified record along the River Trent north of Aston-by-Stone in 2010 at grid reference SJ913321, approximately 1.1km from the land required for the construction of the Proposed Scheme.
- 3.3.60 Access to the Filly Brook was not granted. In the absence of survey data, it is assumed this watercourse may offer suitable foraging and burrowing habitats for water vole.
- 3.3.61 Water bodies and watercourses associated with the Filly Brook scoped out for further surveys within or partially within the land required for the construction of the Proposed Scheme include: a pond south-west of Walton House Farm with poor availability of food sources and disturbance from fishing and cattle grazing; a shallow pond south-east of Walton Heath Farm with access for cattle; two poor quality ponds south of Walton Heath Farm with evidence of nutrient run off; a heavily shaded tributary of the Filly Brook south of Fox Covert to Whitmoor Farm flowing through

horse grazed fields with poor availability of food sources; a poor quality pond south of Walton Heath Farm with evidence of nutrient run off; and a pond south of Fox Covert with poor availability of food sources.

- 3.3.62 Water bodies and minor watercourses south of Sandyford Farm within and partially within the land required for the construction of the Proposed Scheme were scoped out for further surveys due to poor water quality from heavy silt, evidence of slurry, regular disturbance from grazing and shading from bankside vegetation.
- 3.3.63 Water bodies scoped out for further surveys outside the land required for the construction of the Proposed Scheme include two heavily shaded ponds within Fox Covert with poor availability of food sources, and a pond north of Home Farm, Swynnerton due to disturbance from anglers and heavily shaded banking.

Meece Brook

- 3.3.64 The desk study did not return any records along the Meece Brook and access was not granted for the stretch of the Meece Brook within CA₃. It is assumed that in absence of survey data, this watercourse may offer suitable foraging and burrowing habitats for water vole.

Whitmore Heath to Madeley (CA₄)

- 3.3.65 There were no confirmed water vole records within CA₄ from surveys. Four unconfirmed records were noted to include two potential burrows and an unconfirmed run within the land required for the construction of the Proposed Scheme. The desk study did not return any records from the Staffordshire Ecological Record for water vole within the land required for the construction of the Proposed Scheme.

Meece Brook

- 3.3.66 The desk study did not return any records along the Meece Brook. Moderate access was obtained for the Meece Brook. The Meece Brook was found to have potential suitability for water voles, however access to the banks were limited due to dense cover of bankside vegetation. Certain stretches were inaccessible. No evidence of water voles were found during the survey within the land required for the construction of the Proposed Scheme.

A tributary of the Meece Brook partially within the land required for the construction of the Proposed Scheme may provide suitable habitats for water vole, however access to the banks were limited due to dense cover of bankside vegetation. Certain stretches were inaccessible. No evidence of water voles was found during the survey.

- 3.3.67 Mink tracks were recorded along the Meece Brook during a water vole survey (SJ809402) within the land required for the construction of the Proposed Scheme. The presence of mink on this watercourse further reduces the likelihood of water voles being present within the land required for the construction of the Proposed Scheme.

Two isolated ponds north-west of the Meece Brook to the south of the A53 were scoped out for further surveys due to disturbance from the road, with the most western pond being completely dry.

Seven ponds associated with the Meece Brook within the land required for the construction of the Proposed Scheme were scoped out for further surveys as they were drying or had completely dried, despite some grasses, sedges and herbs being present.

River Lea

- 3.3.68 The desk study did not return any records along the River Lea. Little access was obtained along the River Lea for surveys. The nearest record to the River Lea for water vole includes footprints and a burrow along a minor watercourse south of Madeley Heath in 2012 at grid reference SJ785449, approximately 1.3km from the land required for the construction of the Proposed Scheme.
- 3.3.69 A potential burrow (SJ779425) was recorded along the River Lea during a survey within the land required for the construction of the Proposed Scheme. There are suitable habitats for water vole along this stretch and within the associated tributaries to the south. A short ditch to the north provides suitable food sources, however disturbance from cattle grazing was noted reducing suitability for water voles.
- 3.3.70 A potential burrow (SJ773428) was recorded south-east of Manor Road during a survey within the land required for the construction of the Proposed Scheme.
- 3.3.71 An unconfirmed run (SJ775428) was noted on a pond south-east of Manor Road within the land required for the construction of the Proposed Scheme.
- 3.3.72 Potential footprints (SJ776423) were recorded along the River Lea 44m south-east of the land required for the construction of the Proposed Scheme where there are suitable habitats for water vole.
- 3.3.73 Downstream stretches of the River Lea outside the land required for the construction of the Proposed Scheme were scoped out for further surveys due to shading from bankside vegetation, silt substrate and disturbance from cattle grazing. Certain stretches did not provide suitable burrowing habitat due to stone substrate and lack of suitable food sources.
- 3.3.74 Water bodies and watercourses scoped out for further surveys within or partially within the land required for the construction of the Proposed Scheme include stretches of a tributary of the River Lea south-east of Wrinehill due to silt substrate, disturbance from cattle and shading from bankside trees and scrub; a heavily shaded ditch north of Hey House as it was drying or completely dry in sections at the time of surveys with disturbance from cattle; and a fishing pond (Drummer Stile) south of Bar Hill due to disturbance from anglers and limited feeding areas.
- 3.3.75 Water bodies and watercourses scoped out for further surveys outside the land required for the construction of the Proposed Scheme include: a stretch within Whitmore Wood due to shading from bankside trees and scrub with disturbance from cattle; two minor watercourses that are a tributary of the River Lea south of Whitmore as they were drying or had completely dried. There is evidence of poaching from cattle and encroachment of bramble increasing shading of the banks.
- 3.3.76 Also scoped out where a managed garden pond south of Moor Hall Farm and south-west of Bower End Lane with limited food sources; and a tributary of the river Lea

north of Wrinehill Mill due to increased shading from bankside vegetation including Himalayan balsam and subject to partial drying.

Checkley Brook

- 3.3.77 The desk study did not return any records along the Checkley Brook and moderate access was obtained. Surveys were undertaken within and partially within the land required for the construction of the Proposed Scheme. A survey recorded potential habitats suitable for water vole along the Checkley Brook.

South Cheshire (CA5)

- 3.3.78 A latrine, burrow and run were confirmed from surveys within the land required for the construction of the Proposed Scheme within CA5 suggesting a low water vole population. An unconfirmed run and burrow were also noted within the land required for the construction of the Proposed Scheme. The desk study did not return any records from the Staffordshire Ecological Record or rECOrd, Local Biological Records Centre for the Cheshire region for water vole within the land required for the construction of the Proposed Scheme. Cheshire Wildlife Trust¹⁰ have identified key local areas for water vole. This includes the Mere Gutter, the Basford Brook and the Swill Brook.

River Lea

- 3.3.79 Access was not granted for the River Lea within CA5. Due to the connectivity with the Checkley Brook with suitable water vole habitats and absence of survey data, it is not possible to exclude the presence of water voles within the land required for the construction of the Proposed Scheme. No evidence of water voles was found during the survey.

Checkley Brook

- 3.3.80 The desk study did not return any records along the Checkley Brook and moderate access was obtained. Surveys were undertaken within and partially within the land required for the construction of the Proposed Scheme. A survey recorded potential habitats suitable for water vole along the Checkley Brook and on two ponds to the north. No evidence of water voles was recorded during the survey.
- 3.3.81 A ditch south of Den Lane was found to have partial suitability for water voles due to the presence of suitable herbaceous food sources. Grazing is present within neighbouring land, however fencing limits access to the ditch.
- 3.3.82 Water bodies and watercourses scoped out for further surveys within or partially within the land required for the construction of the Proposed Scheme include a heavily shaded ditch south-east of Gonsley Green Farm and two ponds south-east of Gonsley Green Farm. These ponds provide suitable food sources such as branched bur-reed (*Sparganium erectum*), grasses and rushes but are isolated.

¹⁰ Cheshire Wildlife Trust, <https://www.cheshirewildlifetrust.org.uk/sites/default/files/files/eia.pdf>

Mere Gutter

- 3.3.83 The desk study did not return any records along the Mere Gutter. The Mere Gutter connects to the Basford Brook where water voles have previously been recorded. Access was not granted for the Mere Gutter. Water voles have been reported by the Cheshire Wildlife Trust as present along the Mere Gutter and Lower Den Farm, east of Betley Common. No records were returned from rECOrd, the Local Biological Records Centre for the Cheshire region.
- 3.3.84 The Mere Gutter has been identified as a key local area for water voles by Cheshire Wildlife Trust¹⁰. In the absence of survey data, it is assumed that potential water vole habitats may be present within the land required for the construction of the Proposed Scheme.

Swill Brook

- 3.3.85 Moderate access was obtained for the Swill Brook. The desk study returned an unspecified record along the Swill Brook at Shavington in 2012 at grid reference SJ705519, approximately 612m from the land required for the construction of the Proposed Scheme.
- 3.3.86 There is suitable foraging habitat for a stretch of the Swill Brook that is partially within the land required for the construction of the Proposed Scheme. An unconfirmed burrow and an unconfirmed run (SJ725496) were recorded within the land required for the construction of the Proposed Scheme. A stretch east of Hough was found to be unsuitable for water voles due to shallow water levels, poached banks from cattle disturbance and heavy shading along certain sections.
- 3.3.87 A water vole burrow, latrine, and a run (SJ729492) were recorded along a field drain south of the Swill Brook within the land required for the construction of the Proposed Scheme. It is assumed that water voles are using the watercourse and surrounding water bodies within the land required for the construction of the Proposed Scheme for foraging, burrowing and breeding. This stretch provides suitable habitats. There is a pond to the north of this field drain with limited potential for borrowing that may provide food sources for water voles.
- 3.3.88 Water bodies and watercourses scoped out for further surveys within or partially within the land required for the construction of the Proposed Scheme include: seven dry ponds east of Swill Brook south-west of Waybutt Lane; five dry ponds east of Swill Brook and north-west of Chorlton Lane; and three shallow and open ponds with minimal cover for water voles and flat banks unsuitable for burrowing.
- 3.3.89 A pond east of the Swill Brook south of Newcastle Road within the land required for the Proposed Scheme and a pond outside the land required for the construction of the Proposed Scheme were surveyed as they were found to be potentially suitable for water voles. No evidence of water voles was found. It is unlikely that water voles would be present within these ponds due to the lack of suitable connecting water bodies.
- 3.3.90 The Swill Brook has been identified as a key local area for water voles by the Cheshire Wildlife Trust. In the absence of survey data, it is assumed that other potentially

suitable water vole habitats may be present within the land required for the construction of the Proposed Scheme.

Basford Brook

- 3.3.91 The desk study returned an unspecified water vole record east of the Basford Brook in 2008 at grid reference SJ724532, approximately 78m from the land required for the construction of the Proposed Scheme.
- 3.3.92 Mink tracks were recorded along the Basford Brook during a water vole survey at grid reference SJ727517, east of the land required for the construction of the Proposed Scheme. The presence of mink on this watercourse further reduces the likelihood of water voles being present within the land required for the construction of the Proposed Scheme.
- 3.3.93 Little access was granted for the Basford Brook. A stretch of the Basford Brook west of Croatia Mill was scoped out for further surveys due to sections of the channels being heavily vegetated causing increased shading.
- 3.3.94 Two ponds north of Basford outside the land required for the construction of the Proposed Scheme were scoped out for further surveys due to regular disturbance from cattle and heavily poached banks that are unlikely to support burrows.
- 3.3.95 The Basford Brook has been identified as a key local area for water vole by Cheshire Wildlife Trust. In the absence of survey data, it is assumed that potential water vole habitats may be present within the land required for the construction of the Proposed Scheme.

Gresty Brook

- 3.3.96 The desk study did not return any records along the Gresty Brook and access was not granted. The nearest record to the Gresty Brook for water vole is a latrine along the Wistaston Brook in 2009 at grid reference SJ685542, approximately 2.3km from the land required for the construction of the Proposed Scheme.
- 3.3.97 In absence of survey data, it is assumed that potential water vole habitats may be present within the land required for the construction of the Proposed Scheme.

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