Extra MSA Group

Warrington Motorway Service Area, J11 M62

Addendum to Environmental Statement

Part 2 –Ecology and Nature Conservation

Technical Paper 5

Revision 0046 ~~22nd August 2019~~ ~~14th December 2021~~ 7th January 2022

Revision Record

Revision Reference	Date of Revision	Nature of Revision	Author	Checked By
001	15.04.19	Draft	T Palmer	J Ray
002	24.07.19	Draft	T Palmer	J Ray
003	05.08.19	FINAL	T Palmer	J Ray
004	22.08.19	FINAL	T Palmer	J Ray
005	16.12.21	Draft	T Palmer	J Ray and A Baxter
006	07.01.22	FINAL	T Palmer	

Report Author	Tim Palmer
Report Date	~~22nd August 2019 16th December 2021~~ 7th January 2022
Project No.	SH11739
Document Ref.	ES Chapter
Revision	004~~5~~

Contents

Tables and Figures:

Appendices:

Appendix 5.5 – Bat Survey Report

Appendix 5.6 – Badger Survey Report

Appendix 5.7 – Breeding Birds Survey Report

Appendix 5.8 – Wintering Birds Survey Report

Appendix 5.9 – Invertebrate Survey Report

Appendix 5.10 – Framework Habitat Management Plan

Appendix 5.11 – Biodiversity Offsetting Report

Appendix 5.12 – Water Vole Survey Report

Appendix 5.13 – Reptile Survey Report

Appendix 5.14 – Wintering Birds Survey Update Interim Technical Note

Appendix 5.15 – Preliminary Ecological Appraisal 2021 Update

Appendix 5.16 – 2021 Update Habitat Survey and Biodiversity Net Gain Assessment

Appendix 5.17 – Log of Deletions from 2018 Technical Paper

1. Introduction

1.1. This document now constitutes part of an Addendum to the Environmental Statement originally submitted to Warrington Council in August 2018 to accompany the outline planning application for a 'New Concept' Motorway Service Area (MSA) at Junction 11 of the M62 Motorway.

1.2. Following the submission of the outline planning application, Warrington Council have refused the Planning Application (Decision Notice dated 17 June 2021) and subsequently, the Applicant has submitted an appeal under Section 78 of the Town and Country Planning Act 1990 against the refusal by Warrington Borough Council for which an Inquiry will be held.

1.3. As part of the Cumulative Assessment, HS2 is included as one of the projects assessed, as there 'might' be cumulative environmental effects when considered with the Application Proposals. Since the submission of the planning application, additional information has been made available by the Secretary of State for Transport and HS2. The Applicant has also had ongoing discussions with HS2 due to the proximity of the Site to the HS2 proposals and HS2's requirement for land associated with the Application Proposals as shown through the Safeguarding Plans, most recently those plans relating to the Safeguarding Directions, dated 2020 (ES Part 1 Report, Appendix 14c), which are an update to the previous plans relating to the Safeguarding Directions, dated 2018 (ES Part 1 Report, Appendix 14b).

1.4. This Addendum to the ES is primarily to provide an update to the cumulative assessment in light of this additional information. However it also updates other matters such as policy and guidance references where relevant, most notably in relation to a newly published National Planning Policy Framework (2021). There are no resulting amendments to the assessment of the likely environmental effects as a result of the Application Proposals when considered individually, which remain as set out within the original ES (August 2018).

1.5. In addition, the addendum presents information from update surveys for habitats and certain protected species during winter 2021/22. These include updates to the Phase I Habitat Survey and mapping to account for any changes/succession of habitats since the original work as well as updated information on badgers and wintering birds. The earlier Biodiversity Net Gain (BNG) assessment has also been updated following the launch of the new 3.0 Biodiversity Metric in July 2021, which is to be read alongside, and in addition, to the previous 2.0

Biodiversity metric calculation. This update uses information gathered from detailed habitat mapping and condition assessments by Aspect Ecology during December 2021 and additional design information including HS2 requirements within the site which are associated with the cumulative assessment. The update also utilises MORPH (BEACH 2017) river assessments, given these are now in wide currency for assessing development impacts as part of the v3.0 metric.

1.6. The cumulative assessment is a requirement of the Environmental Impact Assessment Regulations (2017) and is undertaken to identify whether there are likely to be any incremental effects from the combined influences of various projects coming forward, based on the information that is available at the time. Schedule 4 of the EIA Regulations states that an Environmental Statement must include a description of the likely significant effects of the development on the environment resulting from 'the cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources' (Schedule 4 (5)(e)).

1.7. It is to be noted that it is not the role of an Environmental Statement to assess every theoretical possibility that may come forward, but to look at the reasonable likelihood of a development occurring. Assessment should be of the likely significant effects and be proportionate. It is the assessment of the accumulation of, and interrelationship between, effects which might affect the environment, economy or community as a whole, even though they may be acceptable when considered on an individual basis with mitigation measures in place. Thereby, assessing the likely residual effects as a result of the interrelationship between the proposed and cumulative sites at that point in time.

1.8. The amendments to Section 9 of the ES Part 1 Addendum (Interaction of Effects and Cumulative Impact) provides a project description in respect of the HS2 proposals, supported by a series of plans, included at ES Part 1 Report, Appendix 14a-14f, as well as an update as a result of the cumulative assessment undertaken within this ES Part 2 Technical Paper Addendum.

1.9. In order to ensure the Addendum is understandable and to avoid extensive cross referencing, changes have been integrated within the original text of the ES and its technical papers to form a single Addendum to the ES. Wherever changes or additions have been made to the text of the original technical paper, the text has been underlined and anything that is no longer

relevant or valid has been struck through (~~struck through~~) but retained within the text. A log is also included within the appendix of this Technical Paper (Appendix 5.17) so that the text removed (i.e. the text struck through within the paper) is identified and a reason for its removal provided. This Addendum should however be read in conjunction with the original ES (August 2018) as not all the technical papers have been subject to change.

1.10. The Application is now the subject of an Appeal, and as such all references to Application Proposals, Application Site, Applicant should be read as Appeal Proposals, Appeal Site and Appellant respectively. These references have not however been amended within the ES Part 1 or Part 2 Addendum documents.

1.11. This technical paper has been prepared by Tim Palmer BSc (Hons), (Technical Director – Ecology) of Wardell Armstrong, who has over 15-years' experience in ecology consultancy and has worked on numerous EIA projects throughout the UK. The paper has been technically reviewed by ~~Richard Laws (Principal Consultant)~~ Simon Holden (Technical Director) BSc Hons MSc at Wardell Armstrong. The assessment considers all land within the Application Boundary, with appropriate survey/data radii being applied for relevant species groups/taxa.

1.12. This Technical Paper will assess the likely environmental effects to ecological receptors by the following staged process:

- Summarise the ecological baseline conditions;
- Identify and evaluate the nature conservation and/or biodiversity present;
- Identify any potential impacts (during construction and operational phase of development);
- Establish the magnitude and significance of those identified impacts;
- Identify the mitigation measures to address significant impacts; and
- Assess any residual impacts and the need for any compensation and enhancement.

1.13. The assessment is informed via a combination of field survey work and desk top research, which included the assessment of statutory and non statutory conservation Sites, protected and notable species, habitats and invasive species. Wardell Armstrong LLP have completed a proportionate scope of detailed field survey to support this application, which comprises:

- Preliminary Ecological Appraisal Report 2021 Update (including data collection from RECORD (September 2021)[1];

[1] http://www.record-lrc.co.uk/

- River Corridor Survey (April 2019) and ~~River MORPH Survey (November 2022)~~;
- Habitat Suitability Index (HSI) assessment for Great Crested Newt (November 2018);
- eDNA sampling for Great Crested Newt (April 2019);
- Breeding Bird Surveys (April, May and June 2019);
- Wintering Bird Surveys (January – March and October – December 2018);
- Water Vole Surveys (April, May and June 2019);
- Badger Surveys (November 2019 and September 2021);
- Climbed inspection of trees for roosting bats (April 2019);
- Bat Activity Survey (October 2018, April and June 2019);
- Aquatic and Terrestrial Invertebrate Surveys (April 2019); and
- Reptile Surveys (May and June 2019).
- Tree Surveys (BS5837 during April 2019)

1.14. The assessment should be considered in conjunction with the hydrology of the Site (as set out in Paper 3: Water Resources); and, in relation to the potential excavation and reuse of peat resources, Agricultural Land and Soils (Paper 10). In addition to the baseline ecology reports given as ES Part II Appendices 5.1 to 5.14, the following ES Part I Appendices are also of relevance to this assessment:

- Appendix 8 Illustrative Masterplan;
- Appendix 12 Construction Management Plan Framework;
- Appendix 15 Arboriculture Report.; and
- Appendix16 Lighting Assessment.

1.15. In order to assess the significance of impacts, the following legislation has been considered:

- Conservation of Habitats and Species Regulations 2018 (and as amended), which protects a range of species including bats, otter, and great crested newt.
- Wildlife and Countryside Act (WCA) 1981 (as amended), which protects Sites of Special Scientific Interest, National Nature Reserves, and a range of species including bats, great crested newt, otter, water vole and all wild birds. This includes partial protection for adder, common lizard and grass snake. Additional protection is provided to birds listed on Schedule 1 of WCA against disturbance of any Schedule listed bird or young while nesting. Finally, Section 14 of the WCA prohibits the release of any Schedule 9 (part 2) species.
- The Protection of Badgers Act 1992, which protects badger setts and protects the animals from disturbance.
- Natural Environment and Rural Communities (NERC) Act 2006 which requires the Secretary of State to publish a list of habitats and species of principal importance for the conservation of biodiversity in England.

2. Documents Consulted

National Policy

2.1. Section 40 of the Natural Environment and Rural Communities (NERC) Act imposes a legal duty on Planning Authorities to 'have regard' to the conservation of biodiversity when considering planning applications.

2.2. Section 41 of the NERC Act requires the Secretary of State to publish a list of species and habitats of principal importance for conserving biodiversity in the UK. Such Biodiversity Action Plan (BAP) Habitats and Species (2007) do not offer the species any specific protection but help to highlight the species importance at a national level. This list is used by Local Planning Authorities to identify the species and habitats that should be afforded priority when applying the requirements of the National Planning Policy Framework (NPPF~~19~~ 2021).

2.3. The NPPF~~19~~ 2021 underpins the Government's planning policies for England and how these are to be applied. The central theme of the NPPF~~19~~ 2021 is a presumption in favor of sustainable development.

2.4. The NPPF~~19~~ 2021 states:

> When determining planning applications, local planning authorities should apply the following principles:
>
> - if significant harm resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;
> - development on land within or outside a Site of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact on the features of the site that make it of special scientific interest, and any broader impacts on the national network of Sites of Special Scientific Interest;
> - development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons and a suitable compensation strategy exists; and;
> - development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to ~~incorporate~~ improve biodiversity ~~improvements~~ in and around developments should be ~~encouraged~~ integrated as

part of their design, especially where this can secure measurable net gains for biodiversity; or enhance public access to nature where this is appropriate.

- development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to improve biodiversity in and around developments should be integrated as part of their design, especially where this can secure measurable net gains for biodiversity
- The following should be given the same protection as habitats sites:
  a) potential Special Protection Areas and possible Special Areas of Conservation;
  b) listed or proposed Ramsar sites; and
  c) sites identified, or required, as compensatory measures for adverse effects on habitats sites, potential Special Protection Areas, possible Special Areas of Conservation, and listed or proposed Ramsar sites.

  The presumption in favour of sustainable development does not apply where the plan or project is likely to have a significant effect on a habitats site (either alone or in combination with other plans or projects), unless an appropriate assessment has concluded that the plan or project will not adversely affect the integrity of the habitats site.

Local Policy

2.5. Local Policy is set out within the *Local Plan Core Strategy* (Warrington Borough Council, Adopted July 2014). The following policies are appropriate to Ecology:

Policy QE 3

Green Infrastructure

The Council will work with partners to develop and adopt an integrated approach to the provision, care and management of the borough's Green Infrastructure. Joint working and the assessment of applications will be focused on:

- protecting existing provision and the functions this performs;
- increasing the functionality of existing and planned provision especially where this helps to
- mitigate the causes of and addresses the impacts of climate change;
- improving the quality of existing provision, including local networks and corridors, specifically
- to increase its attractiveness as a sport, leisure and recreation opportunity and its value as a habitat for biodiversity;
- protecting and improving access to and connectivity between existing and planned provision
- to develop a continuous right of way and greenway network and integrated ecological system;

- securing new provision in order to cater for anticipated increases in demand arising from development particularly in areas where there are existing deficiencies assessed against standards set by the Council.

Policy QE 5

Biodiversity and Geodiversity

The Council will work with partners to protect and where possible enhance Sites of recognised nature and geological value. These efforts will be guided by the principles set out in National Planning Policy and those which underpin the strategic approach to the care and management of the borough's Green Infrastructure in its widest sense.

Sites and areas recognised for their nature and geological value are shown on the Policies Map and include:

- European Sites of International Importance
- Sites of Special Scientific Interest
- Regionally Important Geological Sites
- Local Nature Reserves
- Local Wildlife Sites
- Wildlife Corridors

Proposals for development which may affect **European Sites of International Importance** will be subject to the most rigorous examination in accordance with the Habitats Directive. Development or land use change not directly connected with or necessary to the management of the Site and which is likely to have significant effects on the Site (either individually or in combination with other plans or projects) and which would affect the integrity of the Site, will not be permitted unless the Council is satisfied that;

- there is no alternative solution; and
- there are imperative reasons of over-riding public interest for the development or land use change.

Proposals for development in or likely to affect **Sites of Special Scientific Interest (SSSI)** will be subject to special scrutiny. Where such development may have an adverse effect, directly or indirectly, on the SSSI it will not be permitted unless the reasons for the development clearly outweigh the nature conservation value of the Site itself and the national policy to safeguard the national network of such Sites.

Proposals for development likely to have an adverse effect on **regionally and locally designated Sites** will not be permitted unless it can be clearly demonstrated that there are reasons for the development which outweigh the need to safeguard the substantive nature conservation value of the Site or feature.

Proposals for development which may adversely affect the integrity or continuity of UK Key habitats or other habitats of local importance, or adversely affect EU Protected Species, UK Priority Species or other species of local importance, or which are the subject of Local Biodiversity Action Plans will only be permitted if it can be shown that the reasons for the development clearly outweigh the need to retain the habitats or species affected and that mitigating measures can be provided which would reinstate the habitats or provide equally viable alternative refuge Sites for the species affected.

All development proposals affecting protected Sites, wildlife corridors, key habitats or priority species (as identified in Local Biodiversity Action Plans) should be accompanied by information proportionate to their nature conservation value including;

- a Site survey where necessary to identify features of nature and geological conservation importance; an assessment of the likely impacts of the proposed development proposals for the protection and management of features identified for retention;
- an assessment of whether the reasons for the development clearly outweigh the nature conservation value of the Site, area or species; and
- proposals for compensating for features damaged or destroyed during the development process

Where development is permitted, the Council will consider the use of conditions or planning obligations to ensure the protection and enhancement of the Site's nature conservation interest and/or to provide appropriate compensatory measures.

3. Consultations

3.1. Table 5.1 (below) summarises the consultation responses received at the time of writing, this includes formal responses to the Scoping Request Report submitted to Warrington Borough Council (WBC) on 20th December 2018 (ES Part 1, Appendix 17) and WBC scoping opinion dated 13th February 2019 (ES Part 1, Appendix 18). Discussions with Natural England, Environment Agency and GMEU are ongoing.

Theme / Issue	Date	Consultee	Method	Summary of Discussion	Outcome / Output
Scope of surveys	November 2018	Greater Manchester Ecological Unit (GMEU)	Phone call	Discussed the proposed scope of Phase II surveys following completion of the PEA.	No additional survey requirements were noted.
Scoping response	January 2019	Greater Manchester Ecological Unit (GMEU)	Emailed scoping response dated 14th January 2019	The site is within 1km of parts of the Manchester Mosses Special Area of Conservation (SAC), in particular Holcroft Moss and Risley Moss. I would recommend that potential impacts on the special nature conservation interests of these sites are properly considered in the Environmental Statement. The potential of the development to cause – • Indirect hydrological changes and • Increases in diffuse air pollution arising from increased traffic generation In terms of how the underlying substrate on the site (peat) is to be treated to facilitate the development an Assessment of potential options should be made. In addition to the above I would agree with the Scope of the Ecological Assessment as proposed by the applicant; that is, the following impacts need to be considered in the ES – • Direct Habitat loss and indirect lighting impacts to bats roosting, foraging and	NE reiterated comments made as part of the pre-application with WBC.

Theme / Issue	Date	Consultee	Method	Summary of Discussion	Outcome / Output
				commuting habitats, • Loss of habitats of use to badgers, • Impacts to water vole foraging and burrowing habitat, • Impact on grass snake basking habitat, • Impacts on great crested newt terrestrial habitat, • Impacts on barn owl foraging habitat, • Impacts on wintering bird assemblages and • Impacts on breeding bird assemblages. • Impacts on habitat fragmentation I would encourage the applicant to consider how this development could contribute to Biodiversity Net Gain (NPPF para. 170).	
Scope and content of HRA	18-03-2019	GMEU	Meeting held at GMEU's Ashton Under Lyne Office	Discussion relating to whether a 'shadow' HRA is considered necessary, given the remote location of the site relative to components of the Manchester Mosses SAC	A brief shadow HRA is required to consider AQ effects in the event that there is any increase in emissions arising from vehicles at the MSA, and any hydrological effects caused by the treatment of sub surface peat deposits.
Presence of peat including peaty topsoil and deeper peat deposits within the Site.	18-03-2019	GMEU	As above	Discussed the agricultural status of the site. Discussed the importance of peat management in line with a peat management hierarchy: • Avoidance • Reuse on site • Reuse off site (habitat creation or restoration) • Reuse off site (other applications such as horticulture)	GMEU are satisfied with the methodology and outcome of the soil survey and resulting ALC grades assigned to the land. Avoid impact on peat where possible, if unavoidable, ensure the beneficially re-use of the peat on -site or off-site at suitable receptor sites.

Theme / Issue	Date	Consultee	Method	Summary of Discussion	Outcome / Output
				• Disposal GMEU provided WA with a list of known peatland restoration sites within the locale, in which peat could be beneficially re-used (i.e. potential receptor sites).	
Brook realignment and treatment of sub-surface peat deposits	09-04-2019	Environment Agency	Meeting held at EA Warrington Office	Discussed ecological survey methodology with respect to Development in general terms. Discussed opportunities for biodiversity enhancement via diversion of Silver Lane Brook. Discussed status of sub surface peat deposits.	No issue regarding survey scope or proposed Brook realignment. Confirmation to be provided to EA that the sub surface peat deposits do not meet the criteria for classification as a component of the Manchester Mosses SAC.
Status of Sub surface Peat deposits with regards to possible inclusion within Manchester Mosses SAC.	10-04-2019 and 12-04-2019	GMEU	Telephone call and emails.	Discussion on whether or not the site can be considered to be a component of the Manchester Mosses SAC suite and fits the JNCC criteria for degraded peat bogs still capable of natural regeneration.	GMEU have confirmed that the site **does not meet the JNCC criteria** as it is not capable of natural regeneration and the current land use is not one of the land cover types falling within the definition.
Scoping Response	10th January 2019	Natural England	Written scoping response	The key issues that we consider to require consideration in the EIA are as follows: Designated sites – as identified in the above paragraph, the Impact Risk Zones for Risley Moss SSSI and Holcroft Moss SSSI are triggered for this development site. These SSSI's form part of the internationally designated site Manchester Mosses SAC so the EIA will need to conduct a full assessment to ensure that development on this site would not lead to hydrological impacts on the designated site. Changes to air quality as a result of changes to traffic volume/flow should also be considered. Peat – Natural England advise that development on peat should be avoided. It is an irreplaceable habitat with a high biodiversity value but also performs an important role in carbon storage and water catchment management. Ecological connectivity – Manchester Mosses SAC comprises of a fragmented cluster of sites therefore, connectivity between the sites	N/a

Theme / Issue	Date	Consultee	Method	Summary of Discussion	Outcome / Output
				is essential for them to function well. Connectivity of the sites should be considered when assessing the impacts of the development and should be strengthened through mitigation design. Ponds are an important habitat in this ecological network and should be retained, enhanced and created. We would like to see this development strive to achieve biodiversity net gain in line with the NPPF. HS2 – HS2 is proposed in this area which will lead to further habitat fragmentation between the sites. We recommend that the in-combination effects are considered in the EIA.	
Discussions with Natural England's Planning team and Peatlands Specialist Dr Paul Thomas	4th June 2019	Paul Thomas and Janet Baguley	Site meeting and follow up email received 10th June 2019.	Status of peat habitats was discussed and whether or no the site can be considered to be EU Annex 1 habitat, and whether the peat resource can be considered to be 'irreplaceable' as per NPPF19.	**Natural England confirm that there is no Annex 1 Habitats on the proposed development site**. **Natural England cannot confirm that the habitats on the proposed development site do not meet the criteria to be considered 'irreplaceable' as defined by the NPPF** as a good proportion of the site has been confirmed as deep peat. The NPPF does provide examples of habitats that are 'irreplaceable' but the list is not definitive so the definition is open to interpretation. **Natural England advise that relocating peat is undesirable** as it will lose the ability to hold water and will degrade. There are no local nature reserves/sites where it would feasible or desirable to re-locate peat. The most desirable mitigation (if the development was to go ahead) would be wetland creation on a neighboring parcel of land. • Consider retaining peat in situ so it does not lose carbon.

Theme / Issue	Date	Consultee	Method	Summary of Discussion	Outcome / Output
					• Wet woodland is a potential consideration for habitat creation on the development site. • Water from the brook and the proposed SUDS scheme are not compatible with peat, only rainfall. • Natural England advise that the proposed development site is fundamental to our Lowland Wetland Nature Recovery Network as it is suitable for restoration that will bolster the lowland wetland ecological network.

Table 5.1: Summary of Consultations and Discussions

4. Methodology and Approach

4.1. The assessment of significance of impacts has been determined by identifying the presence of ecological features; evaluating their importance, or value, and defining magnitude of the effects. In order to objectively assess effects arising from a particular development/activity it is essential to establish the sensitivity of each ecological receptor. The sensitivity has been evaluated within a geographical context, with each receptor falling into one (or more) of the following categories detailed within the table below.

Receptors

4.2. Ecological receptors are evaluated according to the following definitions.

Designation	Receptors
International	Examples: • An internationally designated Site or candidate Site. • A viable area of a habitat type listed in Annex I of the Habitats Directive, or smaller areas of such habitat, which are essential to maintain the viability of a larger whole. • Any regularly occurring population of an internationally important species, which is threatened or rare in the UK. • Any regularly occurring, nationally significant population/number of any internationally important species.
National	Examples: • A nationally designated Site. • A viable area of a priority habitat identified in the UK BAP, or smaller areas of such habitat, which are essential to maintain the viability of a larger whole. • Any regularly occurring population of a nationally important species, which is threatened or rare in the region or county. • A regularly occurring regionally or county significant population/number of any nationally important species. • A feature identified as of critical importance in the UK BAP.

Regional	Examples: • Viable areas of key habitat identified in the Regional BAP or smaller areas of such habitat, which are essential to maintain the viability of a larger whole. • A regularly occurring, locally significant number of a regionally important species.
County	Examples: • County designated Sites. • A viable area of a habitat type identified in the County BAP. • Any regularly occurring, locally significant population of a species which is listed in a County "red data book" or BAP on account of its regional rarity or localisation. • A regularly occurring, locally significant number of a species important in a County context.
Borough/District	Examples: • Area of habitat considered to appreciably enrich the habitat resource within the context of the Parish. • Local Nature Reserves
Local/Neighbourhood[2]	Examples: • Habitats and species that contribute to local/Site biodiversity, could only be replicated in the medium term, but are common in the local area. • Loss of such habitats would ideally be mitigated if local/Site biodiversity is to be conserved and enhanced.

Table 5.2: Receptors

4.3. A Receptor Plan for Ecology is included at ES Part 1, Appendix 5, Parameter Plans.

Environmental Impacts

4.4. The magnitude of impacts is defined below in Table 5.3 (below).

[2] Also including 'Site/Zone of Influence' levels.

Magnitude	Environmental Impact
Substantial	Permanent impact(s) resulting in the total loss the integrity of the Site or conservation status of a habitat, species assemblage/community population or group.
	Significant improvements of resource quality, restoration and enhancement on an extensive scale, significant improvement of attribute quality. Significant improvement in Local Green Infrastructure
High	Permanent or long term impact(s) on the integrity of the Site or conservation status of a habitat, species assemblage/community population or group, which is likely to threaten its sustainability.
	Large scale or major improvement of resource quality; extensive restoration or enhancement; major improvement of attribute quality.
Moderate	Permanent or long term impact(s) on the integrity of the Site or conservation status of a habitat, species assemblage/community population or group, which is unlikely to threaten its sustainability.
	Benefit to, or addition of, key characteristics, features or elements; improvement of attribute quality.
Minor	Short term and reversible impact(s) on the integrity of the Site or conservation status of a habitat, species assemblage/community population or group that is within the range of variation normally experienced between years.
	Minor benefit to, or addition of, one (maybe more) key characteristics, features or elements; some beneficial impact on attribute or a reduced risk of negative impact occurring.
Negligible	Short term and reversible impact that is within the range of annual variation.
	Very minor benefit to or positive addition of one or more characteristics, features or elements

Table 5.3: Environmental Impacts

Significance of Effects

4.5. The significance of effect is determined using the significance matrix in Section 6 of the Environmental Statement Part 1 Report. This identifies the receptor level across the top of the matrix and the magnitude of environmental impact down the side and where they meet within the matrix identifies the significance of the effect. Significant effects are those which are assessed as being Moderate Adverse, High Adverse or Substantial Adverse. Not significant effects are those which are assessed as being Minor Adverse, Negligible or Neutral, as well as beneficial effects.

Impact Prediction Confidence

4.6. It is also of value to attribute a level of confidence by which the predicted impact has been assessed. The criteria for these definitions are set out below:

Confidence Level	Description
High	The predicted impact is either certain i.e. a direct impact, or believed to be very likely to occur, based on reliable information or previous experience.
Low	The predicted impact and its levels are best estimates, generally derived from first principles of relevant theory and experience of the assessor. More information may be needed to improve confidence levels.

Table 5.4: Confidence Levels

5. Baseline Information

Desk Study

5.1. Summary methods are provided below with additional detailed contained within the individual technical appendices. The desktop study was informed by review of existing available information provided by RECORD (Local Records Centre) and from available internet-based resources for a 2km search radius, extending to 5Km for Special Protected Area's (SPA's), Special Areas of Conservation (SAC's) and Ramsar Sites. An update to the desktop study was undertaken in September 2021.

5.2. Specific information was sought for:

- Statutory designated Sites;
- Locally designated Sites;
- Ancient woodland;
- Protected and/or notable species;
- NERCs.41 Priority Habitats and Species; and
- Local Biodiversity Action Plan (LBAP) priority habitats and species.

5.3. Statutory conservation Sites located within the 2-5 km search radii include Manchester Mosses (SAC) Astley & Bedford Mosses (SAC and SSSI), Risley Moss (SAC and SSSI), LNR, Rixton Clay Pits (SAC and SSSI) and LNR, Holcroft Moss (SAC SSSI), and Woolston Eyes (SSSI).

5.4. The closest statutory Site is Holcroft Moss which is c.890m from the Proposed Development to the west and is separated from it by the M62. Astley and Bedford Mosses, and Risley Moss are (together with Holcroft Moss) components of the internationally designated Manchester Mosses SAC suite, which all lie more distant from the Proposed Development. Manchester Mosses SAC is designated for the presence of Annex 1 Habitats namely *Degraded raised bogs still capable of natural regeneration.*

5.5. The development area will be partly located over deposits of sub-surface peat. These deposits do not appear to be hydrologically associated with other areas of continuous degraded peatlands elsewhere and are covered by agricultural soils. Consequently, they do not form a component of the Manchester Mosses SAC, furthermore the site cannot be considered to be analogous with the Annex I Habitat Degraded Bogs still capable of regeneration as it fails to meet the necessary criteria. This assessment is confirmed by GMEU in their emailed consultation response dated 12th April 2019. Consequently, peatland habitats are not considered furthermore in this Paper in the context of the sub-surface peat deposits, however re-use of excavated peat is described as part of the ecological enhancement/mitigation

proposals. The Manchester Mosses SAC suite is also discussed in Appendix 5.1 Information to Support a Habitats Regulations Assessment. All assessment provided in this technical paper are provided without prejudice to the Habitats Regulations Assessment (HRA).

5.6. The Manchester Mosses SAC is evaluated at **International value**. Woolston Eyes SSSI and Rixton Clay Pits are scoped out of the assessment, being of c.4.5Km and 3Km respectively, from the Proposed Development with no hydrological connectivity or habitat linkage (due to the presence of the M62).

5.7. Non-statutory conservation Sites located within the 2km search radius are Pestfurlong Moss (Local Wildlife Site) Gorse Covert Mounds (LWS), Rixton Moss (LWS) and Silver Lane Risley (LWS).

5.8. Pestfulong Moss LWS supports lowland raised bog habitat with scrub and woodland. It is evaluated at **Borough** level and will be considered through the assessment due to its connectivity with Risley Moss and presence of peatland habitats. Silver Lane Risley LWS is adjacent to Site and ecologically connected by a water course (Silver Lane Brook) and associated vegetation and is therefore carried through the assessment as a **Borough** value receptor.

5.9. Gorse Covert Mounds and Rixton Moss LWS are scoped out of further assessment on the basis of limited/absent ecological connectivity and separation distance from the Proposed Development.

Extended Phase 1 Habitat Survey

5.10. The aim of the Extended Phase 1 Habitat survey are the recording of broad habitat types present on Site, as well as to identify evidence of protected or notable species or habitats with the potential to support these species. An Extended Phase 1 Habitat Survey of the Site was undertaken on 31st October 2018 and was updated during September 2021. The surveys followed the 'Extended Phase 1' methodology (Institute of Environmental Assessment (IEA), 1995 and JNCC 2010). The survey area for habitats includes all within the Site. The updated PEA report is supplied as Appendix 5.15. The purpose of the update was to check for any material changes to the habitats previously described and to consider whether any further updates are required covering specific receptors.

5.11. The survey recorded no habitats which are considered to be of intrinsic ecological value via their inclusion on NERC s.41 and none are considered to be intrinsically notable at Local

scales or higher however all habitat losses are considered through the assessment process in compliance with NPPF ~~19~~ 2021 which requires the delivery of a net gain in biodiversity from all Proposed Development. A Biodiversity Offsetting Assessment is provided as Appendix 5.11 an extract from which is provided in section 9.5-9.6.

5.12. In particular the Paper considers impacts to the Silver Lane Brook as it will be necessary to close and divert a section of the existing Brook totaling 755m in length. This is discussed in detail in Paper 9 Water Resources. The diversion of the Brook presents an opportunity to address water quality issues and enhance the biodiversity value of the current channel. The proposals are also considered in Appendix 5.2 Water Framework Directive Report. The Silver Lane Brook is valued at **Borough** level.

5.13. The Preliminary Ecological Appraisal, utilizing data gathered from the Desk Study and habitat information from the Extended Phase 1 Habitat Survey has evaluated the following species receptors as being potentially subject to adverse effects (in the absence of mitigation):

- Protected species (Great Crested Newt, Bats, Badger, Water Vole, Reptiles);
- Barn Owl; and
- Breeding and Wintering birds.

5.14. Additionally, stands of Himalayan balsam *Impatiens glandulifera* are located along the eastern boundary of the site, as well as well as along the Silver Lane Brook and on site ditch. Methods for the control of this species are included to prevent its accidental dispersal during in particular, the construction phase of the Development.

5.15. The 2021 update confirmed the findings of the previous surveys, with the habitats baseline being little changed from the earlier survey, with the exception of scrub patches which now appear greater in extent in places and a reduction in rush coverage within an area previously labelled as marshy grassland adjacent to the Silver Lane Brook. This area now supports a mosaic of tussocky neutral grassland and tall ruderals, with perhaps greater coverage of common reed *Phragmites australis* colonizing the habitat from the north. Potential badger *Meles meles* excavations were recorded along the eastern boundary of the site although these were later confirmed by camera trap survey to support rabbit *Oryctolagus cuniculus* and not badger.

5.16. The update recommended that surveys are repeated for breeding and wintering Birds and for water vole however the current survey remain valid with the data typically valid if site conditions have not altered, which the 2021 update surveys confirm is the case in this instance.

Nonetheless, update surveys are in hand for water vole and wintering birds, the results of which will be available to inform the detailed design of the proposals. Currently, wintering birds surveys have been undertaken during October, November and December 2021 and will continue (monthly) through until March 2022. An interim report is provided as Appendix 5.14 Wintering Birds Survey Update Interim Technical Note.

5.17. Further to the completion of the original surveys a small stand of Japanese rose *Rosa rugosa* was recorded within the application site along the course of the Silver Lane Brook. Methods for preventing accidental dispersal are included.

Arboricultural Survey

5.18. All trees on or immediately bordering the site were inspected from ground level and classified in line with BS5837:2012 Trees in Relation to Design, Demolition and Construction – Recommendations, on April 1st 2019. Each tree was identified, and a series of measurements were made, including: Stem diameters; Branch/crown spread estimates (North, East, South and West); and Tree height and canopy height. The Arboricultural Report is provided as ES Part I Appendix 15.

5.19. Where the age distribution and species mix was relatively uniform, or where trees formed distinct woodlands, trees were plotted as groups or woodlands. An indication of each tree's life stage, estimated retaining contribution in years and any observations on the form, position, structural and/or physical condition of the tree was also noted. The trees were then classified in accordance with the BS5837:2012 tree quality assessment categories A, B, C and U.

Great Crested Newt (GCN) Survey

5.20. HSI assessment was undertaken of accessible ponds within, and up to ~500m from, the Site boundary. The HSI assessment was conducted in accordance with good practice guidelines (English Nature and Langton et al. 2001). This HSI scoring system assesses a waterbodies' suitability as an aquatic habitat for GCN following ARG UK (2010) methodology which is based on Oldham et al (2000). The HSI is a simple model to provide an informed view of the value of a waterbody to support breeding populations of GCN, which involves assessing waterbodies based on ten habitat parameters that are known to influence breeding populations of GCN.

5.21. EDNA sampling of all waterbodies (regardless of HSI status) was undertaken on 15th April 2019 and 3rd May 2019. The methods for sampling followed methodology according to (Biggs et al 2014), undertaken by suitably qualified ecologists with the samples analyzed by an

accredited laboratory. The results are provided in full in Appendix 5.3. In summary no GCN eDNA was recorded by the surveys.

5.22. During the course of the reptile surveys an adult male GCN was recorded sheltering beneath one of the artificial refuges deployed as a reptile survey aid. This incidental record of a lone individual does not indicate the presence of a breeding population, which if present would have been recorded by the presence of eDNA in the waterbodies. As there are no ponds within the site itself and very limited potential terrestrial habitat for this species, no adverse effects to this species are anticipated and hence GCN are not considered further in this report.

5.23. As a precautionary measure, further sampling of the waterbodies will be undertaken prior to the onset of construction and licensing considerations provided in the event that a positive survey result is received. This procedure will be included within the Construction Environmental Management Plan (CEMP).

Bat Surveys

5.24. Three bat activity surveys have been undertaken using transect and automated detector sampling during October 2018, April 2019 and June 2019. The surveys were led by a Natural England Bat Licensed Surveyor and methods were in accordance with standard practice guidelines (Collins 2015). In terms of foraging and commuting habitats, the habitats within the Site are considered to be of 'Low' habitat quality, given their predominantly arable nature. The baseline survey report including detailed methods and results are provided as Appendix 5.5.

5.25. Two Song Meter SM2BAT+ Ultrasonic Recorder (Wildlife Acoustics, Inc.) automated bat detector units were deployed for five consecutive nights during October 2018, April and June 2019. Transect survey were undertaken in October 2018, April and June 2019. The bat activity surveys conclude that the site is of **Local** value to foraging and commuting bats, given that only 6 species have been recorded infrequently during the surveys, and reflecting the lack of supporting habitats across the majority of the site.

5.26. In addition to bat activity surveys a ground based inspection of all trees within and immediately adjacent to the Site has been undertaken to check for the presence of roosts within trees. There are no buildings on site other than a dilapidated pig arc which has no features of potential value to roosting bats.

5.27. Climbed inspection of trees is not considered necessary as no potential bat roost features were present 'at height' and only a very limited number of features were noted at lower levels. These were directly inspected by a suitably qualified (and licenced) ecologist using an endoscope, according to standard methodology (Collins 2015). No bat roosts were recorded.

5.28. Given the absence of bat roost evidence at the time of survey and the paucity of features, roosting bats are considered to be absent from site and are not considered further in this assessment.

Badgers

5.29. No evidence of badger presence was recorded during the Extended Phase I Habitat Surveys, however suitable sett creation habitat exists on Site in the form of linear woodland/lines of trees and scrub around the southern and eastern margins of the Site. Consequently, a targeted badger survey was undertaken on 15th January 2019 according to the methodology proposed by Harris et al (1989). The detailed methodology and results are presented in Appendix 5.6. No badger evidence was recorded by the surveys hence badgers are excluded from further assessment.

Water Vole

5.30. The habitats on Site associated with Silver Lane Brook provide sub-optimal habitat for foraging and burrowing, with no evidence seen during the Extended Phase I Habitat Survey. A water vole survey has been undertaken in accordance with standard guidelines (Strachan & Moorhouse 2006). This comprised a scoping survey during February 2019 followed by presence/absence surveys during April and June 2019. The surveys confirmed the presence of c. 3 potential water vole burrows with characteristic of those typically excavated by water vole, however no evidence of current presence was confirmed by the survey and it is considered likely that this species is absent, and hence is not considered further. Appendix 5.12 provides detailed survey methodology and results. Although the surveys remain valid update surveys are to be undertaken during spring/summer 2022, the results of which will be available to inform the detailed design of the proposals.

Reptiles

5.31. The survey area includes suitable grass snake habitat in the form of grassland associated with linear waterbodies. In addition, suitable basking habitat is present on the open shorter areas of grassland along the western Site boundary. Given the presence of suitable habitat, further detailed surveys have been undertaken via the deployment and checking of artificial refugia.

No reptiles have been recorded, and this group are excluded from further assessment. Survey details are provided in Appendix 5.13.

Breeding Birds (including Barn Owl)

5.32. The Site does not support suitable breeding habitat for barn owl, given the lack of mature trees with open/large cavities, or suitable agricultural buildings. However, the scrub habitat on Site, field margins and bordering scrub habitat are viable foraging habitat for hunting barn owl.

5.33. A targeted desk study for barn owl has been undertaken to ascertain the importance of the Site for barn owl, via consultation with the Barn Owl Conservation Trust (BOCT). The data trawl includes all records over the previous 5 years within a 5Km radius of the site. Data provided by the BOCT shows a single barn owl sighting recorded 2.5km from the site during 2019. Data provided by Cheshire and Wirral Ornithological Society (CAWOS) shows an average of 8.8 barn owl sightings per year in the last 5 years, the closest being within 100m of the survey site.

5.34. The full desk study is provided within the Breeding Birds Survey baseline report as Appendix 5.7. Given the paucity of recent records of this species within the desk study parameters and the lack of any observations through the course of the breeding bird surveys (or anecdotal records from the evening bat activity surveys), this species is considered likely absent from the site and is not considered further in the assessment, however the proposals to enhance the eastern boundary of the site by provision of scrub/trees within an acid grassland mosaic will provide an enhanced foraging resource for this species should it colonise the site in the future.

5.35. In addition, given the availability of nesting habitat within the survey area five breeding season bird surveys have been undertaken during March, April (x2), May and June. The survey methodology is based upon, and adapted from, generic British Trust for Ornithology survey methods including transect/Common Bird Census (CBC) (Gilbert et al 1998 and Bibby, Burgess & Hill 1992). The detailed methods and results are provided in Appendix 5.7.

5.36. To date 42 breeding bird species have been recorded of which 9 are 'Priority' species as defined by the NERC Act (2006) and 7 are red listed species of 'conservation concern' (Eaton et al 2015) of which shall be reported in due course. In accordance with the Fuller (Ref) evaluation system, the site supported assemblage recorded to date is considered to be of **Local** level importance. Although the surveys remain valid update surveys are to be

undertaken during spring/summer 2022, the results of which will be available to inform the detailed design of the proposals.

5.37.

Wintering Birds

5.38. The open arable habitats on Site and within the wider landscape are potentially attractive to waterbirds which aggregate into flocks during winter. Wintering bird surveys (WBS) have therefore been undertaken during the period October 2018 to March 2019. Field survey methods were based upon, and adapted from, transect/Common Bird Census (CBC) (Brown and Shepherd 1993 and Gilbert *et al* 1998). A suitably qualified ecologist conducted the surveys. The WBS methods and results are presented in full within Appendix 5.8 and are updated in Appendix 5.14

5.39. The WBS recorded a total of 35 species, of which 10 are 'Priority' species as defined by the NERC Act (2006) and 8 are red listed species of 'conservation concern'. In accordance with the Fuller (Ref) evaluation system, the site supported assemblage recorded to date is considered to be of **Local** level importance.

5.40. The most notable species recorded to date is Willow tit *Poecile montanus* which was recorded on a single occasion along the western boundary of the site feeding in willow scrub in the vicinity of the Silver Lane Brook, and also during the 2021 update surveys. There is no breeding habitat for this species on site although the wet woodland associated with Silver Lane LWS to the north west of the Site may support low numbers. The development is not considered to present any disturbance or loss of habitat to this species and consequently it is not considered necessary to undertake a detailed individual assessment. It should be noted however that the woodland planting enhancement in the vicinity of the realigned Silver Lane Brook will present an increase in habitat availability for this species, the retention of a line of over mature birch trees along the eastern site boundary may result in the availability of deadwood breeding habitat for this species.

5.41. The 2021 update surveys (partially complete) suggest that in general terms the previous baseline surveys remain relevant with the exception of an area of rush dominated land within the Site centre which supports a small flock of wintering snipe *Gallinago gallinago* (up to 14 birds) and occasional low numbers (peak count 1 bird) of jack snipe *Lymnocryptes minimus*.

The presence of these species does not influence the overall evaluation of the site at 'Local' level.

Entomological Assessment

5.42. Surveys sampling terrestrial and aquatic invertebrates have been undertake across the site and including Silver Lane Brook. The full methodology and results are presented in Appendix 5.9.

5.43. A walkover habitat assessment of the whole site was undertaken on 9th April 2019, to assess the value of the site for aquatic and terrestrial invertebrates. The main habitat types present were identified and assessed for their potential to support species of importance. Following the habitat assessment terrestrial invertebrate sampling and aquatic invertebrate sampling was undertaken, within those areas of the site which had the greatest potential to support species of conservation importance. The following sample methods were employed:

- Hand searching – involved searching in suitable areas of habitat for ground dwelling species;
- Sweep netting – using a robust framed sweep net through vegetation herbaceous and tall herb vegetation;
- Spot sweeping – a net with a lighter frame to collect more active species of target taxa flying over vegetation, or at rest in prominent locations;
- Beating – scrub and tree branches were agitated briskly, invertebrates dislodged from the vegetation fall onto a white sheet held beneath the branches; and
- Aquatic Sampling - using a standard FBA pond net to sample accessible open water, a three minute timed sample was employed (Drake et al 2007), together with additional sampling when the habitat variation present indicated this may result in collection of significant additional data.

5.44. Specimens collected were identified to species level using standard keys and through comparison with a reference collection.

5.45. The majority of the site comprises arable fields, which are of negligible value for invertebrates of conservation importance. Small areas of other terrestrial habitats have little potential to support populations of significant species due to the small areas present, poor floristic diversity, lack of structural variation and absence of features of importance for species with specialist requirements (such as dead wood, loose soil, habitat mosaics).

5.46. The aquatic habitats support common species typical of the slow-moving, heavily vegetated open water habitats present in the survey area. Overall the site is considered to be of **Local** value for invertebrates.

Likely Evolution of the Baseline

5.47. It is anticipated that without the Proposed Development the identified baseline scenario for ecology will not change significantly as a result of natural processes, as the majority of the site is given over to intensively farmed arable land. Hence the habitats are potentially influenced by changes in agricultural practices. These changes may include, a shift from arable to pastoral agriculture, or a change in the agricultural drainage regime. It can be assumed that the Site soils would continue to get progressively wetter unless drainage is restored and maintained. A shift towards livestock farming may result in a minor increase in site diversity associated with the creation of a grassy sward although this is somewhat unlikely and ultimately dependent on economic factors.

5.48. In summary, as there is little potential for the baseline presented in this technical paper to change significantly, it is reasonable to adopt the current baseline for use in the assessment.

6. Alternatives Considered

6.1. The final layout of the Proposed Development has been heavily influenced by the location of several areas of sub-surface peat deposits this is due to engineering considerations, as well as to minimize the extent of required peat movements to ensure that the capacity of the sub-surface deposits to store sequestered carbon is not compromised by exposure to the air.

6.2. The location and characteristics of the peat deposits are discussed in Paper 10 Agricultural Land and Soils. The final design sought to avoid much of the sub surface areas of deep peat deposits to the east and southeast of the Site and in total an estimated 22,700m^3 will be retained, undisturbed. Despite this it is estimated that approximately 22,600$m^3$of peat will require excavation to allow the creation of a stable development platform.

6.3. Several options have been considered during scheme evolution to maximise the beneficial use of the excavated peat These have included:

- Relocating the majority of disturbed peat into the base of SuDS ponds and at selected locations along the re-aligned Brook corridor.
- donation of peat to a range of nearby degraded peatland sites within the Manchester Mosses Special Area of Conservation (SAC) or other sites requiring reinstatement / restoration
- export of surplus peat for reuse (recycling) elsewhere through an appropriate soil recycling contractor; and
- identifying a Peatland Habitat Zone (PHZ) on site to relocate excavated peat into, to be managed as a peatland type habitat.

6.4. Given the apparent lack of availability of conservation sites involved in peatland restoration projects, the option of retaining the majority of the peat into a PHZ has been selected. This is considered preferable to export of peat for recycling given that a use is available on site, where a conservation benefit can be derived. The retention of peat in situ and development of a biodiverse peatland type habitat accords with the recommendations provided by Natural England in the preliminary DAS discussions.

6.5. The proposals for developing the PHZ are fully described within the Agricultural land and Soils (Paper 10), however, in summary the peat will be excavated and retained within a bunded area to the south and east of the main development platform. The horizons of peaty agricultural soil will be removed so that the relocated peat will form a continuous layer with retained deep peat deposits beneath the PHZ. At all times during relocation, the peat will be

maintained in a wetted state, and water levels maintained at or close to peat surface, which will both prevent drying and oxidation leading to carbon release.

6.6. The construction of the bunds retaining the PHZ is further discussed in Technical Paper 1 Geology and Ground Conditions, however the exact design will be finalized following further consultation with Natural England and other relevant consultees during detailed design stages. Rather than creating a single bunded PHZ, it may be preferable to create a number of smaller bunded areas, each with slightly differing hydrological regimes and peat depths relative to sub-surface water accessibility; however all will be rainwater fed and will have varied surface topography. The raised sections will be drier in general terms and are expected to support a heath/acid grassland community with boggier hollows perhaps supporting sphagnum mosses around open pools. A full description of the objectives for the establishment of vegetation in the PHZ areas is provided as Appendix 5.10 Framework Habitat Management Plan.

6.7. The Development will necessitate the diversion of the Silver Lane Brook, which currently follows a fairly straight path along the western boundary of the Site, various options regarding the design and location of the realigned Brook have been considered, and these are outlined in detail in the Water Resources Technical Paper (3). The following objectives and final design has been selected in order to maximise the ecological benefits and hence contributing towards net biodiversity gain as required by NPPF~~19~~ 2021:

- Design the channel profile with varied bank treatments and angles to provide a greater diversity of aquatic habitats, to include shallow berms, areas of dense marginal planting, alder and willow tree plantings.
- Design the realigned section with range of features of conservation benefit including in channel features and diverse marginal habitats. These will include riffles, areas of slow/static flow, deep peaty sediment;
- Design the route the realigned section of Brook to follow a more natural 'sinuous' form (where possible);
- Include specific mitigation features for aquatic and terrestrial invertebrates (including dragonflies and damselflies), as well as enhancements for fish, kingfisher and other 'Priority' species such as water vole;
- Create a wildlife corridor - linking habitats within the biodiverse landscaped areas on Site and Silver Lane Local Wildlife Site to the north and west;
- Marshy (acid) grassland: habitats will be established especially in the margins of the brook and within the easement of the HPGM.

6.8. The realigned corridor of the Brook will lie immediately adjacent to the PHZ and will therefore in time develop a complimentary habitat system along the entire length of the eastern side of the Development. This will contribute significantly towards Natural England's

Wetland Network Model which is a developing project seeking to map potential wetland linkages and 'stepping stones' across the Cheshire and Greater Manchester region.

7. Potential Environmental Effects

7.1. From data gathered during the baseline survey work, and via consultation with local data sources, the following (detailed below) sites and habitats are considered further in the report as 'valued ecological receptors', with their assigned value in parenthesis. The location of which are detailed within the receptor plan (ES Part 1 Report, Appendix 6). This section includes an assessment of the significance of impacts on sensitive ecology in the absence of mitigation, the following receptors are considered:

- Manchester Mosses SAC/SSSI suite (International);
- Pestfurlong Moss LWS (Borough);
- Silver Lane LWS (Borough);
- Silver Lane Brook (Local);
- Scattered Trees and woodland (plantation) (Local);
- Foraging and commuting bats (Local)
- Breeding Birds (Local;
- Wintering Birds (Local);
- Bats (Local)
- Terrestrial and aquatic Invertebrates (Local)

7.2. From data gathered during field work, the consultation with local data sources and the habitats present on Site, impacts on Woolston Eyes (SSSI) Gorse Covert Mounds (LWS) and Silver Lane (LWS) can be scoped out due to lack of ecological connectivity and/or separation distance from the Proposed Development.

7.3. In terms of species receptors, brown hare, *Lepus europaeus*, hedgehog *Erinaceus europaeus*, dormouse *Muscardinus avellanarius*, water vole, great crested newt, all reptile species, eurasian otter *Lutra lutra*, protected/notable plants, and white-clawed crayfish *Austropotamobius pallipes* are considered highly unlikely to be present on Site, given the lack of supporting habitats, or perceived marginal adverse effects for species such as brown hare, great crested newt, common toad and hedgehog. Such receptors will therefore not be considered in detail within the ES assessments. These receptors are therefore scoped out. Assessment of impacts to aquatic invertebrates is scoped in given the proposed diversion of Silver Lane Brook.

Construction Phase

7.4. The following potential impacts are considered, which may arise from the construction phase of the development.

- Hydrological impacts to Manchester Mosses SAC and Pestfurlong Moss LWS.
- Loss of vegetated habitats features and trees (including impacts to root protection areas) arising from the clearance of the development platform and related construction operations.
- Disturbance, displacement and incidental mortality (loss of breeding habitat) on breeding bird assemblages, and loss of active nests present on or adjacent to Site during the breeding season (including barn owl).
- Disturbance/displacement of significant aggregations of wintering birds.
- Disturbance/displacement of foraging and commuting bats.
- Loss of habitats supporting terrestrial and aquatic invertebrates.
- Accidental dispersal of invasive weeds (WCA schedule 9 listed plants including Himalayan Balsam).

7.5. The construction phase will result in increased vehicle and pedestrian movements over the short term, approximately 15 to 18 months. This phase of works will involve site clearance, installation of a temporary site compound, ground works and installation of permanent features including the new access to the site from the junction with the M62 Motorway Junction 11 roundabout, car parks, SUDs scheme, and buildings and landscaping.

Hydrological modifications to Manchester Mosses (Astley and Bedford Mosses, Risley Moss and Holcroft Moss) SAC and Silver Lane LWS.

7.6. This impact is discussed in detail within the Appendix 5.1 Report to Inform a Habitats Regulations Assessment. In summary, borehole evidence suggests that the subsurface peat located on site and to be excavated, lies above a 'perched water table'. As such there is no hydrological connectivity between the site and the peatland habitats which form the SAC. A detailed hydrological assessment is provided in Paper 3: Water Resources. The HRA concludes that there will be no likely adverse effect and hence the impact in EIA terms is **negligible**. This assessment also applies to hydrological impacts to Silver Lane LWS which will also be **negligible**.

Habitat Loss

7.7. The development will require the removal of semi-natural habitats in order to accommodate the planned infrastructure (buildings, roads, car parking etc). The vast majority of this will be agricultural land (totaling 11.56 hectares) of limited ecological value. A summary of habitat removal is provided in Table 5.5 below.

Habitat	Extent of loss (ha)	Evaluation
Arable	11.44	Negligible
Marshy Grassland	0.69	Minor Adverse
Semi-improved neutral grassland	1.16	Minor Adverse

Broad-leaved semi-natural woodland	0.37	Minor Adverse
Waterbody	0.01	Minor Adverse
Scrub	0.23	Minor Adverse
Tall Herb	0.24	Minor Adverse
Ruderal	0.91	Minor Adverse

Table 5.5: Habitat Losses summary

7.8. Approximately 659 m of the Silver Lane Brook will also be removed to accommodate the Development and diverted along the eastern boundary of the Site. The removal will include scattered trees, and tall neutral grassland/tall ruderal habitats along the corridor of the Brook. This will result in an impact of Moderate Magnitude, which is permanent, and a **Minor Adverse** effect at a Borough scale, in absence of mitigation.

7.9. In total, 0.37 hectares of woodland will be removed to enable the formation of the main vehicular assess into the site. This will impact a shelter belt of semi-mature and mature poplar trees located on the motorway embankment in the south west corner of the site. In the absence of mitigation, there would also potentially be root damage to the trees surrounding the access road. This will result in a minor magnitude and **Minor adverse** effect at Local scale. Woodland/tree losses and impacts are further considered in the Arboricultural Report (ES Part I Appendix 15).

Impacts to Breeding Birds

7.10. Direct loss of woodland, scrub, grassland and arable farmland habitats will result in a reduction of the carrying capacity of the site to support breeding birds in general terms. Foraging, perching and shelter / cover habitats would be permanently reduced in extent. The following species will be exposed to a reduction in the availability of breeding[3] habitat[4] , in the absence of mitigation:

- Dunnock - temporary loss of 3 territories;
- Lapwing – loss of one territory;
- Reed bunting - temporary loss of a single territory;
- Song thrush- loss of 3 territories;
- Skylark – Loss of 7 territories;

[3] A breeding bird is defined as displaying breeding behaviour including singing, pairs, carrying nesting material, presence at nest, with young, courtship displays and mating

[4] For those species which were confirmed as breeding within the survey area, the minimum number of breeding territories has been calculated based on likely territory clusters. A loss is considered when one of those territories falls within the application site

- Willow warbler – Loss of 3 territories.

7.11. During the construction phase, the surrounding habitats will be subject to disturbance effects from increased human activity, noise and lighting, which would result in the displacement of breeding/foraging birds from the retained habitats surrounding site. Dunnock, lapwing, reed bunting, song thrush, and willow warbler would be exposed to a temporary reduction in availability of breeding habitat, however their supporting habitats will be replaced and enhanced by the proposals to re-route the Silver Lane Brook, with riparian habitats, grassland and trees all anticipated to support such species once established. Lapwing, would be exposed to a permanent reduction in availability of breeding habitat onsite.

7.12. The recorded assemblage is considered to be of Local value, and impacts are not anticipated to result in any reduction in the sustainability of populations beyond the vicinity of the site itself.

7.13. Given the anticipated loss of habitat, the legal status of active bird nests and the potential for their loss in the absence of mitigation, the overall significance of impact on site breeding birds is of Moderate Magnitude and a **Minor Adverse** effect at Local scale, in the absence of mitigation. The effect is described as being of minor adverse magnitude because the site supported bird assemblage has almost certainly developed with (and possibly habituated to) a degree of anthropogenic disturbance from the adjacent M62.

Wintering Birds

7.14. Direct loss of arable fields, hedgerows, woodland blocks and grassland habitats will result in a reduction of the carrying capacity of the site to support overwintering birds in general terms. Foraging, perching and shelter / cover habitats would be permanently reduced.

7.15. A number of species will be subject to temporary loss of overwintering habitat including Bullfinch (single individuals recorded regularly), dunnock (maximum of five individuals onsite), fieldfare and redwing (small flocks recorded regularly), linnet (maximum of 20 individuals, recorded on the arable land), reed bunting (maximum of two recorded within marshy grassland) , song thrush (recorded regularly along western site boundary – Silver Lane Brook corridor), willow tit (single calling individual recorded along the Silver Lane Brook during October), ~~and~~ yellowhammer (single individual recorded during March along Silver Lane Brook). Certain species, which are strongly associated with arable land would undergo permanent losses of overwintering resource including lapwing (maximum of 6 recorded),

skylark (peak count of 20 recorded over arable land), snipe (peak count of 14) and a single jack snipe) and starling (maximum of 50 individuals recorded foraging on arable land).

7.16. During the construction phase, the surrounding habitats may be subject to disturbance impacts from increased human activity, noise and lighting, and dust, which may result in the displacement of foraging birds from the retained habitats surrounding site. The above species may have a temporary reduction in the availability of overwintering habitat. The overall significance of impact on wintering birds is of minor Magnitude and a **Minor Adverse** effect at Local scale, in the absence of mitigation.

Bats

7.17. Given that the Development is to be located primarily within arable land, there will be negligible removal of habitats which are typically utilized by foraging and commuting bats. Such habitat is restricted to a triangle of tall ruderal/marshy grassland along the western boundary of the site (measuring 0.69 Ha) impacts via habitat loss are therefor considered to be **negligible**. No roosts have been identified and as such there will be no loss of roosting habitat.

7.18. Impacts during construction will be restricted to activities which may cause disturbance to foraging bats utilizing the boundary habitats to the east of the Site where a line of mature birch trees are located. The survey evidence gathered at the time of writing suggests that this habitat is utilized by a low number of common species only (common pipistrelle), nevertheless construction lighting could result in the displacement of bats which would be a minor Magnitude and a **Minor Adverse** effect at Local scale. Notwithstanding the assessment of limited adverse effect, habitat enhancement measures to the corridor of the realigned Silver Lane Brook will deliver a benefit to foraging bats overall as more favorable habitats such as tree plantings and a grassland/scrub habitat mosaic will be included.

Invertebrates

7.19. The invertebrate survey report confirms that there are no likely populations of note within the site and hence although there will be a reduction in habitat extent until the habitats proposed by the landscape design are sufficiently matured.

7.20. The scale of most invertebrate populations is such that the greatest threats are more likely to arise from loss and fragmentation of habitat rather than the death of relatively small numbers of individuals. Habitats to be lost within the site area are dominated by open arable land and

as such are unlikely to result in adverse effects although such impacts would be permanent and of minor magnitude (**Minor Adverse**) at Local scale overall.

Himalayan Balsam and Japanese Rose

7.21. It will be necessary to implement control measures, to be included in the CEMP document, to prevent accidental dispersal of these invasive non native plant species. In the absence of such measures, the spread of the existing stands could have a deleterious effect on native vegetation which is of minor Magnitude and **Minor Adverse** at Local scale.

Nature of Impact	Receptor	Environmental Impact	Significance of Effect	Confidence Level
Indirect localised hydrological modifications to Manchester Mosses (Astley and Bedford Mosses, Risley Moss and Holcroft Moss) SAC	International	Negligible	Negligible	High
Indirect localised hydrological modifications to Silver Lane LWS	Borough	Negligible	Negligible	High
Loss of vegetated Habitat (including section of Silver Lane Brook)	Up to Borough	Minor Negative	Minor Adverse	High
Loss of trees and impacts to adjacent RPA's	Local	Minor Negative	Minor Adverse	High
Loss and disturbance of bird breeding habitat	Local	Minor Negative	Minor Adverse	High
Loss and disturbance of wintering bird habitat	Local	Minor Negative	Minor Adverse	High
Loss and disturbance of Bat foraging habitat	Local	Minor Negative	Minor Adverse	High

Terrestrial and aquatic invertebrates	Local	Minor Negative	Minor Adverse	High
Incidental spread of Himalayan balsam and Japanese rose	Local[5]	Minor Negative	Minor Adverse	High

Table 5.6: Significance of Effect - Construction Phase

7.22. It is concluded that there are no significant effects arising from the construction of the development.

Operational Phase

7.23. The following potential impacts are considered, which may arise from the operational phase of the development.

- Air quality impacts leading to increased Nitrogen deposition to Manchester Mosses SAC.
- Accidental pollution and /or sediment transfer to Silver Lane LWS.
- Inundation and exceedance of surface water drainage network during extreme rainfall event, leading to damage of local sites.
- Disturbance to habitats including Silver Lane LWS by recreational users of the Development.
- Accidental pollution and sediment transfer to Silver Lane Brook
- Disturbance, of breeding and wintering bird assemblages on habitats adjacent to site by vehicle movements and increased lighting.
- Disturbance/displacement of foraging and commuting bats via vehicle movements and site lighting.
- Loss of invertebrate populations through accidental pollution and / or sediment transfer,

Air quality impacts leading to increased Nitrogen deposition to Manchester Mosses SAC.

7.24. The Air Quality Paper (Paper 8 Air Quality, Odour and Dust) provides a detailed assessment on the impacts of air quality emissions to the statutory conservation sites, which is also considered in Appendix 5.1 (Report to inform a Habitats Regulations Assessment). In summary, as the operation of the site is for the existing users of the motorway network, and

[5] Value of habitats to be impacted.

given the separation distance between the source and the SAC (c1.4Km) impacts are considered not to result in a likely significant effect, and hence in EIA terms are **Negligible**.

Accidental pollution and /or sediment transfer to Silver Lane LWS.

7.25. During the operational phase, the re-aligned Brook and further downstream, the ponds associated with Silver Lane LWS may be subject to indirect impacts such as accidental pollution and / or sediment transfer, resulting in the permanent damage of the aquatic habitats. Such deterioration to offsite habitats is of High Magnitude and **Minor Adverse** effect at a Local scale, in the absence of mitigation

Inundation and exceedance of surface water drainage network during extreme rainfall event, leading to erosion damage to habitats

7.26. The drainage scheme for the Development will include a SuDS mechanism for ameliorating potential damaging effects from flooding of localized habitats during/following extreme rainfall events. This is considered in detail in Paper 3 Water Resources. In the absence of such control measures a High Magnitude and **Minor Adverse** effect at a Local scale, is predicted in the absence of mitigation.

Disturbance to habitats including Silver Lane LWS by recreational users.

7.27. The increased number of the public utilising the area could result in the permanent damage of habitats through erosion and damage of the floral assemblage. However the site lies adjacent to a network of already established footpaths which are well signed and hence any additional users of the network are not anticipated to result in the creation of additional 'desire lines' or significant trampling of otherwise intact vegetation. Furthermore, as the habitats at Silver Lane LWS are relatively recent in origin, they are anticipated to be fairly resilient to such effects. Any deterioration of habitats is Such deterioration to offsite habitats is likely to be of minor Magnitude and **Minor Adverse** effect at a Local scale, in the absence of mitigation.

Disturbance, of breeding and wintering bird assemblages on habitats adjacent to site.

7.28. Impacts associated with anthropogenic disturbance via vehicle movements, increased lighting / lightspill into adjacent habitats and noise would be apparent in a zone surrounding the operational MSA. Canadian research reported a reduction in bird pairing success at noisy industrial sites compared with other quieter locations (Habib et al 2007). It is likely that anthropogenic noise interferes with male bird song. Such impacts are considered to be permanent (i.e. for the lifetime of the MSA), albeit reversible.

7.29. The extent/severity of this effect is dependent upon the sensitivity of the species present and in general terms the species assemblage recorded is not sensitive, i.e. most species are widespread and commonly recorded in association with higher levels of human disturbance (for example arable farmland, suburban parks and gardens). There are no large areas of woodland habitats on/adjacent to the site and hence significant numbers of nocturnal or crepuscular species which may otherwise be impacted by the lighting scheme are not anticipated.

7.30. The location of the Site, being adjacent to the M62 is also factored into the assessment as birds are likely to be habituated to a certain extent to such adverse effects. The disturbance of onsite breeding and wintering bird habitat would result in an impact of Moderate Magnitude, and a **Minor Adverse** effect at Local scale, in absence of mitigation.

Disturbance/displacement of foraging and commuting bats via vehicle movements and site lighting.

7.31. No bat roosts have been identified on/adjacent to Site and hence there will be no adverse effects to roosting bats from lighting and disturbance associated with vehicular movements.

7.32. Studies (Berthinussen, 2012) on the impacts of major roads on foraging bats have indicated that the abundance of bats increases with increased distance from roads as would be expected, indicating that disturbance from associated noise/lighting effects can have a measurable impact on bat populations. Therefore, major roads and it is postulated, similar schemes, including new MSA developments; can increase the 'baseline' disturbance level. It should also be noted however that the Site may already have a reduced carrying capacity for bats due to the presence of disturbance associated with the M62. Furthermore, the paucity of suitable foraging habitat for bats on site will influence baseline activity levels and hence site sensitivity.

7.33. An assessment of predicted lightspill, comparing pre (baseline) and post construction lighting conditions is described in ES Part 1 Appendix 16 Lighting Assessment. Fifteen locations sampled for potential adverse effects on bat forging activity were included within the Illumination Impacts Profile, to aid lighting assessments on the extant bat population. These included locations around the perimeter of the site only. Central locations were not selected due to the absence of sensitivity of such (arable farmland) habitats.

7.34. The site is currently subject to existing lighting associated with the M62 corridor, which affects the baseline illuminance levels.

7.35. Figure 5 1, below is extracted from the Lighting Assessment report. This shows the predicted illuminance levels (Lux) at all of the ecological receptor locations – all of these relate to the perimeter of the site as the central habitats are not considered to be of value to foraging/commuting bats. The rows highlighted in yellow denotes a notable increase in obtrusive light which is likely to result in an adverse impact to foraging and commuting bats in the absence of mitigation. It should be noted however that bats flying at tree canopy level would be exposed to only very minor increases in lighting levels (at 5m) with such increases dissipating completely at 10m above ground level, as a result of the highly directional characteristics of the luminaires.

Ecology	1) Vertical Illuminance (Lux) at time of Baseline Survey 2) Amended Baseline -Simulated vertical illuminance EXCLUDING lighting scheduled as being subject to replacement (Lux)						Calculated Max. Vertical Illuminance (Lux), the sum of: 1 – Proposed lighting within the MSA Site 2 – Proposed replacement lighting to the roundabout 3 – Existing and retained lighting to the motorway and slip roads			Resultant Vertical Illuminance (Lux)		
	2m high		5m high		10m high		2m high	5m high	10 m high	2m high	5m high	10m high
	1	2	1	2	1	2						
E01 – Bat Foraging & Commuting - North West Site Area	0.06	0.06	0.06	0.06	0.06	0.06	0.31	0.01	0	0.37	0.07	0.06
E02 – Bat Foraging & Commuting - North West Site Area	0.06	0.06	0.06	0.06	0.06	0.06	0.01	0	0	0.07	0.06	0.06
E03 – Bat Foraging & Commuting – West Site Area	0.06	0.06	0.06	0.06	0.06	0.06	0.07	0.01	0	0.13	0.07	0.06
E04 – Bat Foraging & Commuting – South West Site Area	0.09	0.09	0.06	0.06	0.06	0.06	2.35	0.12	0	2.44	0.18	0.06
E05 – Bat Foraging & Commuting - South West Site Area	0.22	0.22	0.13	0.13	0.06	0.06	0.07	0	0	0.29	0.13	0.06
E06 – Bat Foraging & Commuting - South Site Area	3.13	3.13	1.89	1.89	0.06	0.06	6.29	7.04	1.6	9.42	8.93	2.2
E07 – Bat Foraging & Commuting - South Site Area	3.13	3.11	1.89	1.87	0.06	0.06	0.17	0.09	0.02	3.28	1.96	0.08
E08 – Bat Foraging & Commuting - South Site Area	3.1	3.1	1.86	1.86	0.06	0.06	0.14	0.03	0	3.24	1.89	0.06
E09 – Bat Foraging & Commuting - South Site Area	3.12	3.12	1.87	1.87	0.06	0.06	0.02	0.01	0	3.14	1.88	0.06
E10 – Bat Foraging & Commuting - South Site Area	3.87	3.87	2.32	2.32	0.06	0.06	0.01	0	0	3.88	2.32	0.06
E11 – Bat Foraging & Commuting - South East Site Area	0.13	0.12	0.08	0.07	0.06	0.06	0.03	0.02	0.01	0.15	0.09	0.07
E12 – Bat Foraging & Commuting - South East Site Area	0.07	0.07	0.06	0.06	0.06	0.06	0.02	0.01	0.01	0.09	0.07	0.07

Ecology	1) Vertical Illuminance (Lux) at time of Baseline Survey 2) Amended Baseline -Simulated vertical illuminance EXCLUDING lighting scheduled as being subject to replacement (Lux)						Calculated Max. Vertical Illuminance (Lux), the sum of: 1 – Proposed lighting within the MSA Site 2 – Proposed replacement lighting to the roundabout 3 – Existing and retained lighting to the motorway and slip roads			Resultant Vertical Illuminance (Lux)		
	2m high		5m high		10m high		2m high	5m high	10 m high	2m high	5m high	10m high
	1	2	1	2	1	2						
E13 – Bat Foraging & Commuting - East Site Area	0.06	0.06	0.06	0.06	0.06	0.06	0.01	0.01	0	0.07	0.07	0.06
E14 – Bat Foraging & Commuting – North East Site Area	0.06	0.06	0.06	0.06	0.06	0.06	0	0	0	0.06	0.06	0.06
E15 – Bat Foraging & Commuting – North East Site Area	0.06	0.06	0.06	0.06	0.06	0.06	0.07	0.01	0	0.13	0.07	0.06
E16 – Bat Foraging & Commuting – North Site Area	0.06	0.06	0.06	0.06	0.06	0.06	15.84	21.23	1.50	15.9	21.29	1.56
E17 – Bat Foraging & Commuting – North Site Area	3.87	1.6	2.32	0.06	0.06	0.06	21.71	23.13	12.97	23.31	23.19	13.03
E18 – Bat Foraging & Commuting – North Site Area	0.13	0.12	0.08	0.07	0.06	0.05	0.41	0.17	0.03	0.53	0.24	0.08
E19 – Bat Foraging & Commuting – North Site Area	0.07	0.06	0.06	0.06	0.06	0.06	0.11	0.01	0	0.17	0.07	0.06
E20 – Bat Foraging & Commuting – North Site Area	0.06	0.06	0.06	0.06	0.06	0.06	0.01	0	0	0.07	0.06	0.06

Figure 5.1: Results of lighting assessment on ecological receptors (Bat foraging/commuting habitat) receptor locations are provided in Lighting Impact Assessment Report (Appendix 16 of ES Part 1 report).

7.36. Given the lighting assessment comparing the baseline with lux levels after the installation of the Development lighting scheme it is anticipated that the habitats to the north, south and south west may be significantly adversely affected by light spill, which may cause foraging bats to be dissuaded from such habitats, in absence of mitigation. This could result in an impact to

suitable bat foraging habitat which is of moderate Magnitude, and is **Minor Adverse** at a Local scale, in the absence of mitigation.

Loss of invertebrate populations through accidental pollution and / or sediment transfer

7.37. The overall aquatic invertebrate scores for Silver Lane Brook are not representative of high water quality, and hence the baseline assemblage is already impoverished. During the operational phase, aquatic habitats may be subject to indirect impacts such as accidental pollution and / or sediment transfer, resulting in the permanent damage. Consequent loss of invertebrate communities is of minor Magnitude and is a **Minor Adverse** effect at Local scale, in the absence of mitigation.

Nature of Impact	Receptor	Environmental Impact	Significance of Effect	Confidence Level
Air quality impacts leading to increased Nitrogen deposition to Manchester Mosses SAC	International	Negligible	Negligible	High
Accidental pollution and /or sediment transfer to Silver Lane LWS.	Borough	High[6]Negative	Moderate Adverse	High
Inundation and exceedance of surface water drainage network during extreme rainfall event, leading to erosion damage to habitats	Local	High Negative	Minor Adverse	High
Disturbance to habitats including Silver Lane LWS by recreational users.	Borough	Minor Negative	Minor Adverse	High
Disturbance, of breeding and wintering bird assemblages on habitats adjacent to site.	Local	Moderate Negative	Minor Adverse	High
Disturbance/displacement of foraging and commuting bats via vehicle movements and site lighting.	Local	Moderate Negative	Minor Adverse	High
Loss of invertebrate populations through accidental pollution and / or sediment transfer	Local	Minor Negative	Minor Adverse	High

Table 5.7: Significance of Effect - Operational Phase

[6] Impacts arising from accidental pollution occurrences are variable, depending on the level of pollution, the type of pollutant and the time of year of the event. For the purposes of this assessment a precautionary assessment of a High magnitude adverse effect is assumed

7.38. It is concluded that in the absence of mitigation there are no significant adverse effects arising from the operational phase of the development with the exception of a precautionary Moderate Adverse and Significant effect to Silver Lane LWS as a result of accidental pollution and/or sediment transfer.

8. Proposed Mitigation

8.1. Adverse effects have been predicted for certain receptors assessed during the construction and operation phases of development. These effects are not assessed as being significant based on the criteria given in section 4 however mitigation is proposed to further reduce the magnitude of such impacts, with compensation included where necessary to address any residual impacts. It should be noted that the mitigation hierarchy has been adhered to; in accordance with NPPF19 the process being as follows

Step 1 Consider Site Selection

8.2. Alternative site options are fully considered in the Alternatives Sites Assessment (ES Part 1 Appendix 12).

Step 2 Assess biological resources and consider impacts

8.3. This has been achieved by discussing a scope of required surveys with GMEU and subsequently undertaking the baseline surveys, as discussed in the preceding sections.

Step 3 Design site to minimise impacts

8.4. This has been achieved by identifying habitats, which are considered as ecological notable and designing the development to avoid direct losses.

Step 4 Mitigate/protect to reduce potential impacts

8.5. In addition to the critical design provisions to accommodate Step 3, a range of mitigation procedures are discussed to minimise harm.

Step 5 Consider residual impacts

8.6. No significant residual impacts have been identified which cannot be mitigated for, non significant impacts have been addressed by compensation e.g. the planting of replacement trees.

Step 6 Compensate/offset residual impacts

8.7. Measures including the planting of trees, creation of habitats to address the requirement for an overall biodiversity gain and the creation of a wildlife corridor provide compensation for non significant residual effects and an overall enhancement of biodiversity.

Construction Phase

8.8. A Construction Environmental Management Plan (CEMP) will be finalised and agreed with the Local Planning Authority prior to construction commencement. The CEMP will contain all measures required to mitigate identified adverse effects, especially with regard to the scheme drainage design, pollution/sediment prevention measures and excavation and relocation of excavated peat. The CEMP will also include specific measures required for species protection, including update survey and invasive species control.

8.9. The CEMP would also include measures to mitigate for pollution, sediment and dust impacts during the construction period. For example, dust would be controlled by means of dust suppression measures such as dampening down of roads and covering of storage areas. These measures would protect adjacent habitat, which is important for invertebrate, breeding bird, wintering bird and bat populations. In addition, it will include dedicated offsite protected areas during construction, where on site workers will be informed that are 'no access' areas, to minimise the working footprint and disturbance issues where possible. The CEMP will also include a number of measures to control Himalayan balsam and Japanese rose as well as the necessary monitoring of any regrowth and remedial action. A framework CEMP is provided as ES Part 1 Appendix 11.

8.10. Habitat enhancement and compensation measures will be in accordance with the measures included in Paper 4 Landscape and Visual Impact Assessment and Illustrative Masterplan provided as and ES Part 1, Appendix 8, Indicative Landscape Masterplan.

8.11. A Framework Habitat Management Plan (HMP) is provided as Appendix 5.10 including habitat creation and management provisions, including measures in mitigation for the loss and subsequent re-alignment of the Silver Lane Brook corridor. These objectives are as follows:

- Design the channel profile with varied bank treatments and angles to provide a greater diversity of aquatic habitats, to include shallow berms, areas of dense marginal planting, alder and willow tree plantings.

- Design the realigned section with range of features of conservation benefit including in channel features and diverse marginal habitats. These will include riffles, areas of slow/static flow, deep peaty sediment;
- Design the route the realigned section of Brook to follow a more natural 'sinuous' form (where possible);
- Include specific mitigation features for aquatic and terrestrial invertebrates (including dragonflies and damselflies), as well as enhancements for fish, kingfisher and other 'Priority' species such as water vole;
- Create a wildlife corridor - linking habitats within the biodiverse landscaped areas on Site and Silver Lane Local Wildlife Site to the north and west;
- Marshy (acid) grassland: habitats will be established especially in the margins of the brook and within the easement of the HPGM.

8.12. The Framework Habitat Management Plan also includes objectives for the creation of the Peat Habitat Zone (PHZ) as follows:

- The translocated peat will be subject to a different and likely variable hydrological regime and a peatland type habitat will be created with variable peat depth and topography, providing a range of micro-habitats from dry to permanently wet; creating varied habitats for a range of flora and fauna.
- Plant material from 'high quality' peatland vegetation from nearby designated sites will be sourced where possible or existing established nurseries supplying those sites where re-vegetation is taking place, to ensure plants of local provenance establish on site.
- It is expected that the peatland habitat zone will receive water both from rain and from groundwater, given that the external bunds will be semi-permeable and hence allow a degree of continuity with external hydrology. It will therefore be possible to create hollows around groundwater level and to mound areas which will become largely dry heath vegetation. By creating a diversity of topography and habitats, the area will be more resistant to seasonal change as well as climate change.
- During the management phase, parts of the peatland habitat zone would be permitted to develop natural tree and scrub regeneration, with species such as birch willow and alder likely to self-seed from surrounding habitat. This would attract species such as willow warbler, willow tit, and reed bunting. In other areas, trees and scrub may be prevented from establishing, such as parts of the developing floristically diverse heathland and near to the proposed bog pools. This would benefit species of invertebrate that are reliant on open water.

8.13. Creation of new native tree planting and enhancement of retained vegetation within the Site will also be undertaken as well as creation of species-rich grassland and scrub mosaic including along the route of the High Pressure Gas Main which follows the eastern boundary of the site.

8.14. An Ecological Clerk of Works (ECoW) in the form of a suitably qualified ecologist, would oversee all activities during construction and to ensure that mitigation measures and procedures set out in the CEMP are implemented.

8.15. Due to the likely presence of nesting bird within the development area, initial site clearance works will be undertaken outside of the usual bird breeding season (normally taken to be March – July inclusive) where possible. If such timescales cannot be accommodated, a check for the presence of active nests, and nesting birds would be undertaken by a suitably qualified ecologist prior to the commencement of works. Any active nests would be identified and protected subject to the relevant legal provisions until the nesting attempt is complete.

8.16. Pre-construction surveys of the proposed culverted section of Silver Lane Brook in order to ensure the baseline assessment for water vole remain accurate. Any modifications to the baseline assessments will be described and precautionary measures, such as translocation or habitat manipulation and hence avoiding impacts (including appropriate buffers) will be included within the CEMP and subject to the necessary prior consents.

8.17. To avoid soil compaction, and impact on tree root of retained trees; root protection measures, covering the Root Protection Area (RPA), together with barrier protection, should be provided for trees, which lie close to construction areas, both within and outside of site. If these areas cannot be avoided, either the trees due to be impacted should be removed to enable construction and replaced post-construction, given that all trees on site have a low retention value or any track sub-bases, which fall within an RPA, should comprise a geotextile layer overlain with clean angular lime-free stone.

Operational Phase

8.18. The CEMP will include reference to the site drainage design, which includes a number of features to prevent flooding of adjacent land during extreme rainfall events. Measures such as the inclusion of oil and fuel separators will also be included in the drainage design to ensure there will be no incidental pollution of aquatic features.

8.19. In order to avoid increased public pressure to Silver Lane LWS a new network of footpath signage within (and potentially outwith) the Development will be installed to direct visitors to the formalized paths already established around the LWS as well as providing optional routes within the Development landscaped areas.

8.20. Creation of a sensitive lighting scheme to ensure that the wildlife corridor created by the realigned Brook remains available to foraging and commuting bats. The lighting scheme will

include lighting restrictions both during and post-construction, which may include the following methods, taken from the Bats and Lighting Guidance (Stone, 2013):

- Avoidance of light spill using directional and or baffled lighting;
- The addition of cowls to the fixed lighting installations to ensure the lighting is as directional as possible;
- Variable lighting regimes (VLR) – switching off when human activity levels are low i.e. 21:00 to 05:30;
- Avoid use of blue-white short wavelength lights and high UV content; or
- Creating light barriers utilising tree planting.

8.21. The landscape design for the Development will include a number of tree plantings around the eastern and northern boundaries of the site, this will mitigate for disturbance effects to faunal species occupying the arable farmland habitats to the north of the site, including the limited assemblage of wintering birds.

8.22. It is proposed that a program of vegetation monitoring is implemented to consider any necessary remedial actions to ensure the development of the wildlife corridor habitats along the route of the re-aligned Silver Lane Brook. This will include checks to assess the hydrological conditions of relocated peat deposits, to ensure these areas remain wet, and develop a typical peatland flora. In addition, the structural and species composition of newly created habitats will be monitored by vegetation survey and potentially by fixed point photography. Such monitoring measures will also be included with a Landscape and Habitat Management Plan (LHMP).

9. Potential Residual Effects

9.1. Overall, the proposed MSA development will result in direct and indirect habitat loss, disturbance impacts (during construction and operation), increased levels of public pressure and potential accidental pollution and sediment transfer. Following mitigation, there will be no adverse residual effects which are significant in EIA terms.

Potential Residual Effects – Construction Phase

9.2. The overall impact of the proposal in terms of Ecology and Nature Conservation issues during the construction phase is highlighted in the table below:

Nature of Impact	Receptor	Environmental Impact	Significance of Effect	Confidence Level	Mitigation	Residual Significance of Effect
Indirect localised hydrological modifications to Manchester Mosses (Astley and Bedford Mosses, Risley Moss and Holcroft Moss) SAC	International	Negligible	Neutral	High	None	Neutral
Indirect localised hydrological modifications to Silver Lane LWS	Borough	Negligible	Negligible	High	None	Neutral
Loss of vegetated Habitat (including section of Silver Lane Brook)	Up to Borough	Minor Negative	Minor Adverse	High	Creation of a wildlife corridor and re-alignment of Silver Lane Brook	Minor Benefit
Loss of trees and impacts to adjacent RPA's	Local	Minor Negative	Minor Adverse	High	Use of geocell/cell web and no dig methods to prevent damage within the RPA's of adjacent trees.	Minor Adverse

Nature of Impact	Receptor	Environmental Impact	Significance of Effect	Confidence Level	Mitigation	Residual Significance of Effect
Loss and disturbance of bird breeding habitat	Local	Minor Negative	Minor Adverse	High	Time initial site clearance operations outside bird breeding season.	Minor Adverse
Loss and disturbance of wintering bird habitat	Local	Minor Negative	Minor Adverse	High	ECoW will monitor site works for to ensure no critical disturbance to wintering birds	Minor Adverse
Disturbance of Bat foraging habitat	Local	Minor Negative	Minor Adverse	High	CEMP controls regarding working times – no nigh time working allowed.	Neutral
Terrestrial and aquatic invertebrates	Local	Minor Negative	Minor Adverse	High	None	Minor Adverse
Incidental spread of Himalayan balsam	Local[7]	Minor Negative	Minor Adverse	High	Removal measures to be included in CEMP	Neutral

Table 5.8: Residual Significance of Effect - Construction Phase

Potential Residual Effects – Operational Phase

9.3. The overall impact of the proposal in terms of Ecology and Nature Conservation issues during the operational phase is highlighted in the table below:

[7] Value of habitats to be impacted.

Nature of Impact	Receptor	Environmental Impact	Significance of Effect	Confidence Level	Mitigation	Residual Significance of Effect
Air quality impacts leading to increased Nitrogen deposition to Manchester Mosses SAC	International	Negligible	Negligible	High	None	Neutral
Accidental pollution and /or sediment transfer to Silver Lane LWS.	Borough	High[8] Negative	Minor Adverse	High	Measures included in drainage design for Development including fuel interceptors and SuDS	Neutral
Inundation and exceedance of surface water drainage network during extreme rainfall event, leading to erosion damage to habitats	Local	High Negative	Minor Adverse	High	Measures included in drainage design for Development including SuDS	Neutral
Disturbance to habitats including Silver Lane LWS by recreational users.	Borough	Minor Negative	Minor Adverse	High	Signage improvements and clearly defined path network.	Neutral
Disturbance, of breeding and wintering bird assemblages on habitats adjacent to site.	Local	Moderate Negative	Minor Adverse	High	Screening provided by landscape plantings	Neutral
Disturbance/displacement of foraging and commuting bats via vehicle movements and site lighting.	Local	Minor Negative	Minor Adverse	High	Screening provided by landscape plantings	Neutral
Loss of invertebrate populations through accidental pollution and / or sediment transfer	Local	Minor Negative	Minor Adverse	High	Sediment and pollution control measures	Neutral

Table 5.9: Residual Significance of Effect - Operation Phase

9.4. None of the Impacts identified above are significant in EIA terms, however it is not possible to mitigate for the following adverse effects:

[8] Impacts arising from accidental pollution occurrences are variable, depending on the level of pollution, the type of pollutant and the time of year of the event. For the purposes of this assessment a precautionary assessment of a High magnitude adverse effect is assumed

- Loss of trees during the construction phase – losses will be compensated for by the planting of new native tree stock
- Loss of habitats including Breeding and Wintering Bird Habitat through the construction of the Development – losses will be compensated by the enhancement of retained areas including along the re-aligned Brook corridor.

9.5. The overall impact of the habitat losses and gains arising from the construction of the Development site are summarized in Table 5.10 which indicates that a 'net biodiversity gain' of +9.11 Biodiversity Units will be achieved.

Habitats	**Area (ha)**	**Habitat Biodiversity Value**
Total existing area on site	16.5	39.08
Habitats negatively impacted by Proposed Development Habitat Impact Score	16.48	38.72
On site habitat mitigation - Habitat Mitigation Score		47.83
Habitat Biodiversity Impact Score If negative further compensation required		**9.11**
Hedgerow Impact Assessment	**Length (km)**	**Hedge Biodiversity Value**
Total existing length on site	0.62	2.47
Hedgerow features negatively impacted by Proposed Development Hedge Impact Score (HIS)	0	0
On site linear mitigation Hedge Mitigation Score (HMS)		0
Hedgerow Biodiversity Impact Score If negative further compensation required		**0**
Connectivity Impact Assessment	**Length (km)**	**Connectivity Biodiversity Value**
Total existing length on site	0.48	0.95
Connectivity features negatively impacted by Proposed Development Connectivity Impact Score (CIS)	0	0
On site linear mitigation Connectivity Mitigation Score (CMS)		0
Connectivity Biodiversity Impact Score If negative further compensation required		**0**

Table 5.10 Biodiversity Offsetting Metric (summary)

9.6. The Biodiversity Offsetting metric concludes that the areas of landscape plantings and new peatland type habitat to be created over the current site of an arable field are adequate to compensate for the losses of such land to the construction of the MSA Development. The inclusion of higher 'quality' habitats compensates for the losses of habitats such as arable which are considered as lower 'quality' habitats and have lower biodiversity value. It should be noted that 'Good' condition habitats are created following the development to ensure the 'net biodiversity gain' is achieved.

9.7. The Biodiversity Net Gain assessment has been updated in 2022, this is based on the DEFRA Metric 3 assessment model, rather than Metric 2 which was previously used. In addition, a site based condition assessment has been undertaken by Aspect Ecology (presented as Appendix 5.16) including a Modular River Physical Survey (MoRPH) (BEACH 2017) assessment of the Silver Lane Brook. The updated assessment confirms that based on the current plans there will be a net gain of 28.91% for habitat units, 39.30 for hedgerow units and 10.28 for River units

9.8. An extract from the 2022 Metric 3 assessment is provided below, with the full breakdown available in the report supplied as Appendix 5.16

Headline Results

Return to results menu

On-site baseline	*Habitat units*	38.90
	Hedgerow units	2.02
	River units	5.16
On-site post-intervention (Including habitat retention, creation & enhancement)	*Habitat units*	50.14
	Hedgerow units	2.81
	River units	5.69
On-site net % change (Including habitat retention, creation & enhancement)	*Habitat units*	28.91%
	Hedgerow units	39.30%
	River units	10.28%
Off-site baseline	*Habitat units*	0.00
	Hedgerow units	0.00
	River units	0.00
Off-site post-intervention (Including habitat retention, creation & enhancement)	*Habitat units*	0.00
	Hedgerow units	0.00
	River units	0.00
Total net unit change (including all on-site & off-site habitat retention, creation & enhancement)	*Habitat units*	11.24
	Hedgerow units	0.79
	River units	0.53
Total on-site net % change plus off-site surplus (including all on-site & off-site habitat retention, creation & enhancement)	*Habitat units*	28.91%
	Hedgerow units	39.30%
	River units	10.28%
Trading rules Satisfied?		**Yes**

10. Additive Impacts (Cumulative Impacts and their Effects)

10.1. For the purposes of this ES we define the additive cumulative effects as:

> 'Those that result from additive impacts (cumulative) caused by other existing and/or approved projects together with the project itself'

10.2. The developments that are likely to have a cumulative impact when considered with the proposed development have been scoped with the Local Authority and Key Consultees during the preparation of this ES (a full list is included within Section 9 of the ES Part One Report). The following table includes the agreed list of cumulative developments that have been assessed in respect of Ecology and Nature Conservation. These are also shown geographically on the plan included at ES Part 1, Appendix 14, Cumulative Developments Plan.

No.	Cumulative Development	Details	Status	Justification for Inclusion in Cumulative Assessment
3	HS2 (adjacent to the Site)	Land safeguarded for the HS2 route Government consultation.	Current programme: ~~Advanced works Q4 2022~~ Advanced enabling works 2025-2027 ~~Development Q4 2024~~ Construction 2025-2035/2040 ~~Commissioning Q4 2031 – Q3 2033~~ Operation 2035-2040	Given the spatial proximity of the Development to the site, it is deemed relevant to the Ecology assessment.

Table 5.11: Cumulative Development

10.3. Both Construction and Operational phases will be considered and the short, medium and long term impacts assessed.

10.4. As indicated in section 1 (above) additional information is now available regarding how the construction of HS2 relates to the Proposed Development. The project description and plans for HS2 can be cross referenced to the ES Part 1 Section 9 and Appendix 14.

Short Term

10.5. The HS2 development is scheduled to undergo construction in ~~Q4 2022~~ 2025. ~~thus will likely occur within the first 5 years of the Proposed Development and may coincide with the construction of the MSA Development.~~ The MSA Development will likely occur during the period prior to this i.e. 2023 – 2025. Hence, the MSA will be virtually or fully completed prior to the construction of HS2. Any short term impacts arising additively from both schemes will therefore will include displacement of fauna (mainly birds) from the combined development areas. It is therefore possible that wintering birds including lapwing, starling and skylark may initially be displaced onto the arable fields to the north of the Development Site during construction of the MSA. These flocks would then be further displaced during the construction of HS2, into the remaining supporting habitats within the local area.

10.6. In terms of mixed winter flocks of finches and buntings which exploit weedy stubble fields during winter, it is possible that there may be a cumulative loss of such habitats by the construction of both schemes, however the availability or absence of such habitat is principally governed by farming practices. In wetter years there will inevitably be a greater local availability of stubbles as has been observed on land to the north of the MSA Development during winter 2021-22, however during dryer conditions, such habitats are more likely to be cultivated in autumn and set with autumn sown cereals of little benefit to flocking finches/buntings. The permanent loss of such habitat is acknowledged, although the contribution to the overall local resource from habitats lost to the Development is considered to be minimal.

10.7. ~~This overlap in timeframes may result in increased pressure on ecology receptors, particularly breeding and overwintering bird populations, utilising site and the wider area during the short term.~~ Such cumulative impacts are not considered to be significant however, given the wide availability of similar habitats (arable land) within the Borough, although there would be an anticipated cumulative loss of available habitat.

10.8. In addition, further information regarding HS2's requirements have been released as detailed in ES Part 1 Report – Extract of Cumulative Assessment (Section 9 of main ES Part 1 report). The details include works which would be accommodated on Site - within the MSA Development to:

- allow HS2 construction vehicles access to their site, this includes the partial culverting of the diverted section of Silver Lane Brook, and work within its riparian buffer,
- provide a permanent maintenance/operational access through the built area of the Development, but crossing some landscaped areas and the diverted Silver Lane Brook; and
- providing temporary access for works associated with the gas pipeline (to be diverted by HS2).

10.9. The proposals are summarised in Table 5.12 (below) with impacts considered in the final column.

HS2 Requirement	**Application Parameter**	**Timescale and Comments**	**Impacts**
Zone of HS2 Southern Construction Access	Extent of proposed access in and out of the Site area	Temporary during HS2 construction. Use of Warrington MSA access road from J11 M62.	The area required for access into HS2 construction site would be temporarily re-purposed for HS2 construction access following MSA related earthworks, and prior to MSA landscape plantings. There would be a Minor and temporary increase in disturbance to faunal receptors (birds and bats) from construction traffic using the access road, and Minor increase in potential fatalities due to increased traffic movements along the access road. There would be no loss of habitat associated with the creation of the HS2 construction access as the area would already have been cleared for earthworks required to accommodate the MSA Development platform. A small section of the diverted Silver Lane Brook will be culverted to carry the HS2 construction access. Impacts would include minor and temporary loss of bankside habitat, although no landscape planting would occur in advance as the culvert would be removed after HS2 use
	Existing and proposed landscaping, including ecological habitats and drainage (adjacent main access in and out of the Site)	Temporary during HS2 construction. Warrington MSA scheme landscape planting either side of HS2 construction access road. However landscaping of access road and its margins deferred until after HS2 construction access no longer required. After which time, the Warrington MSA landscape scheme can be completed.	
	Landscaped vehicle parking and circulation zone including drainage and ecological features.	Temporary during HS2 construction.	

HS2 Requirement	Application Parameter	Timescale and Comments	Impacts
	Corridor for Silver Lane Brook diversion and associated ecological habitat and landscaping	Temporary during HS2 construction. Warrington MSA scheme landscape planting either side of HS2 construction access road. However landscaping of access road and its margins deferred until after HS2 construction access no longer required. After which time, the Warrington MSA landscape scheme can be completed.	is concluded. It is therefore anticipated that the banks would be subject to sparse natural regeneration at the time of culverting. The riparian corridor to the south of the diverted Silver Lane Brook will be encroached upon by the HS2 construction access, this corridor will have been cleared of existing vegetation in advance in creation of the MSA Development platform and no new landscape planting will occur prior to the creation of the HS2 access, i.e. the MSA landscape planting will be deferred. Impacts are **Minor Adverse** and **not significant**.
	Existing and proposed landscaping, including ecological habitats and drainage (to the east of the Silver Lane Brook corridor)	Temporary during HS2 construction. Warrington MSA scheme landscape planting either side of HS2 construction access road. However, landscaping of access road and its margins deferred until after HS2 construction access no longer required. After which time, the Warrington MSA landscape scheme can be completed.	As above, the current vegetation will have been cleared as part of the creation of the MSA Development platform in advance of the creation of the HS2 construction access. Hence, there will be no further loss of (landscape) plantings as these will be deferred in the areas to accommodate HS2 construction access. Impacts are **Minor Adverse** and **not significant**.
Utility Connection Zone (D) (Construction Phase)	Existing and proposed landscaping, including ecological habitats and drainage	Temporary zone for connection of the gas pipe. Warrington MSA planting deferred until completion of gas main diversion (expected to be within first 12 months of HS2 enabling works)	One or two simple crossing points (bridges) would be required to enable HS2 construction vehicles to cross from a temporary compound located in the MSA Development's northern HGV parking area (Zone D) and access the gas pipeline to the east (Zone E). As above this area will have been cleared as part of the preparatory MSA works, but no planting/seeding or management of established vegetation will have been undertaken prior to the creation of the HS2 crossing points, i.e. the MSA landscape planting will be deferred. Any vegetation present would therefore be reasonably anticipated to be sparse
Utility Construction Zone (E) (Construction Phase)	Landscaped vehicle parking and circulation zone including drainage and ecological features	Temporary zone for the construction compound required for works to the gas pipe.	

HS2 Requirement	Application Parameter	Timescale and Comments	Impacts
	Corridor for Silver Lane Brook diversion and associated ecological habitat and landscaping	Temporary zone for the construction phase to enable access between the compound and the utility connection zone.	natural pioneer communities, of limited ecological value. Impacts are **Minor Adverse** and **not significant.**
Zone of HS2 Southern Operational Access (points A to B)	Extent of proposed access in and out of the Site area	Use of Warrington MSA access road from J11 M62 for occasional maintenance vehicles during HS2 operation.	There will be a maintenance access route for occasional use by light vehicles once HS2 becomes operational. The majority of this route will fall within the hard landscaped areas of the MSA or will utilise the existing internal MSA road network, however it will cross an area of land to be subject to MSA landscaping works in the south east of the site. The current habitats will have been cleared in preparation for the MSA Development and no plantings in this area will have occurred i.e. the MSA landscape planting will be deferred. Habitat losses will be restricted to recently colonised plant communities of limited ecological value. There will be a new minor crossing point (bridge) created over the diverted Silver Lane Brook, in the south east of the site to accommodate occasional maintenance vehicles during the operation of HS2. As above this area will have been cleared as part of the preparatory MSA works, but no planting/seeding or management of established vegetation will have been undertaken prior to the creation of the HS2 crossing points, i.e. the MSA landscape planting will be deferred. Any vegetation present would therefore be reasonably anticipated to be sparse natural pioneer communities, of limited ecological value. Impacts are **Minor Adverse** and **not significant.**
	Landscaped vehicle parking and circulation zone including drainage and ecological features	Use of internal MSA access roads for occasional maintenance access.	
	Corridor for Silver Lane Brook diversion and associated ecological habitat and landscaping	Junction with internal MSA access road, across a lightweight crossing over diverted Silver Lane Brook for occasional maintenance access (small van)	
	Existing and proposed landscaping, including ecological habitats and drainage	Links to HS2 construction access road which will be downgraded for the operational phase for occasional use. Set within a landscaped and tree lined area. Access route to be grass-crete surfacing (or similar).	
Zone of HS2 Northern Operational Access (points A to C)	Landscaped vehicle parking and circulation zone including drainage and ecological features	Use of Warrington MSA access road from J11 M62 and internal access roads for maintenance vehicles during HS2 operation	As above a second maintenance route is required by HS2 during operation. This will primarily fall within the sealed surfaces of the MSA Development, although a small section will cross undeveloped land to the north west. The

HS2 Requirement	Application Parameter	Timescale and Comments	Impacts
	Corridor for Silver Lane Brook diversion and associated ecological habitat and landscaping	To the northeastern point of the internal access roads junction to allow HS2 northern operational access to continue to the north, beyond the Application Site. HS2 access road can be accommodated to the west of where the diverted Silver Lane Brook reconnects with the existing brook.	habitats in this location will have been cleared to accommodate the MSA, footpath diversion and re-aligned Silver Lane Brook, but will not be subject to planting/re-seeding prior to the creation of the HS2 access i.e. the MSA landscape planting will be deferred. Any vegetation present would therefore be reasonably anticipated to be sparse natural pioneer communities, of limited ecological value. Impacts are **Minor Adverse** and **not significant.**
	Diverted footpath zone and associated ecological habitat and landscaping	Landscaped corridor accommodating the diverted footpath adjacent to HS2 operational access road.	

Table 5.12 Summary of Warrington MSA and HS2 proposals, with Impacts

10.10. Overall, the impacts associated with details now available to accommodate the construction and operation of the MSA are Minor and not Significant.

Medium Term

10.11. The HS2 construction would continue through the 6-10 year 'medium term' period and would result in the permanent loss of mainly arable habitats associated with notable and protected species, but especially breeding and wintering birds. However, the MSA Development will be completed and operational at this time, and hence there will be a benefit to many species, including breeding birds via the enhancements to the re-aligned Brook corridor. The combined loss in bird overwinting (arable) habitat would increase the pressure on the wider habitats, however it should be noted that there are widespread alternative provisions elsewhere in the borough. ~~It should also be noted that there is currently limited information available to make the assessment and hence confidence levels are low.~~

Long Term

10.12. In the longer term the operational impacts of both developments would result in an additive effect via disturbance to a range of ecological receptors, this may lead to displacement of breeding and wintering birds and minor displacement of foraging and commuting bats. As the

MSA proposals will be fully mitigated, the impacts of the HS2 development are anticipated to be not significant once mitigation/compensation has been applied, hence additive effects will be of limited significance overall. ~~At the time of writing no confirmation of mitigation/compensation proposals is available and therefore no detailed assessment can be undertaken.~~ The HS2 proposals include significant areas of wetland and grassland creation together with new large ponds which would be of benefit to the birds displaced by the HS2 development.

11. Conclusion

11.1. The following ecological receptors are assessed in this technical Paper, as identified as being potentially subject to adverse effects by a range of surveys and local records undertaken during 2018 and 2019 (evaluations are provided in parentheses), with updates undertaken during 2021 (PEA, Winter Birds Survey, Badger Survey and BNG Calculations):

- Manchester Mosses SAC/SSSI suite (International);
- Pestfurlong Moss LWS (Borough);
- Silver Lane LWS (Borough);
- Silver Lane Brook (Local);
- Scattered Trees and woodland (plantation) (Local);
- Foraging and commuting bats (Local)
- Breeding Birds (Local;
- Wintering Birds (Local);
- Bats (Local)
- Terrestrial and aquatic Invertebrates (Local)

11.2. The Paper identifies the following likely effects during the construction phase of the Development:

- Hydrological impacts to Manchester Mosses SAC and Pestfurlong Moss LWS.
- Loss of vegetated habitats features and trees (including impacts to root protection areas) arising from the clearance of the development platform and related construction operations.
- Disturbance, displacement and incidental mortality (loss of breeding habitat) on breeding bird assemblages, and loss of active nests present on or adjacent to Site during the breeding season (including barn owl).
- Disturbance/displacement of significant aggregations of wintering birds.
- Disturbance/displacement of foraging and commuting bats.
- Loss of habitats supporting terrestrial and aquatic invertebrates.
- Accidental dispersal of invasive weeds (WCA schedule 9 listed plants including Himalayan Balsam).

11.3. The Paper also identifies the following likely operational phase impacts:

- Air quality impacts leading to increased Nitrogen deposition to Manchester Mosses SAC.
- Accidental pollution and /or sediment transfer to Silver Lane LWS.
- Inundation and exceedance of surface water drainage network during extreme rainfall event, leading to damage of local sites.
- Disturbance to habitats including Silver Lane LWS by recreational users of the Development.
- Accidental pollution and sediment transfer to Silver Lane Brook
- Disturbance, of breeding and wintering bird assemblages on habitats adjacent to site by vehicle movements and increased lighting.

- Disturbance/displacement of foraging and commuting bats via vehicle movements and site lighting.
- Loss of invertebrate populations through accidental pollution and / or sediment transfer.

11.4. Mitigation proposals include the provision of a CEMP including a number of protective measures, as the securing of a ECoW to oversee the construction works. Habitat enhancement and compensation measures will be in accordance with the Landscape Design Strategy and Illustrative Masterplan (REFS), and within a Habitat Management Plan (HMP). Framework HMP and CEMP documents are supplied as appendices 5.10 and ES Part 1 Appendix 12.

11.5. Following the application of mitigation none of the impacts are considered to be significant in EIA terms although the following impacts require compensatory measures to ensure there is a net biodiversity benefit:

- Loss of trees during the construction phase – losses will be compensated for by the planting of new native tree stock
- Loss of habitats including Breeding and Wintering Bird Habitat through the construction of the Development – losses will be compensated by the enhancement of retained areas including along the re-aligned Brook corridor.

11.6. Regarding cumulative effects the operational impacts of the Development and the proposals for HS2 would result in an additive effect via disturbance to a range of ecological receptors, this may lead to displacement of breeding and wintering birds and minor displacement of foraging and commuting bats. As the MSA proposals will be fully mitigated, the impacts of the HS2 development are anticipated to be not significant once mitigation/compensation has been applied, hence additive effects will be of limited significance overall. <u>This includes the addition of infrastructure within the MSA Development required in construction of HS2 and its maintenance/operation.</u>

11.7. Overall, there will be no significant adverse effects in EIA terms and the Development will deliver a net gain in biodiversity in accordance with NPPF~~19~~ <u>2021</u>. This will principally be achieved by the enhancement of currently arable habitats along the southern, eastern and northern boundaries of the site, incorporating the re-alignment of the Silver Lane Brook and the provision of a new peatland type habitat within a bunder area of translocated peat excavated from beneath the development platform. Specific measures to maximise biodiversity benefit associated with the realignment of the Brook will include:

- Design the channel profile with varied bank treatments and angles to provide a greater diversity of aquatic habitats, to include shallow berms, areas of dense marginal planting, alder and willow tree plantings.
- Design the realigned section with range of features of conservation benefit including in channel features and diverse marginal habitats. These will include riffles, areas of slow/static flow, deep peaty sediment;
- Design the route the realigned section of Brook to follow a more natural 'sinuous' form (where possible);
- Include specific mitigation features for aquatic and terrestrial invertebrates (including dragonflies and damselflies), as well as enhancements for fish, kingfisher and other 'Priority' species such as water vole;
- Create a wildlife corridor - linking habitats within the biodiverse landscaped areas on Site and Silver Lane Local Wildlife Site to the north and west;
- Marshy (acid) grassland: habitats will be established especially in the margins of the brook and within the easement of the HPGM.

11.8. The Framework Habitat Management Plan also includes objectives for the creation of the Peat Habitat Zone (PHZ) as follows:

- The translocated peat will be subject to a different and likely variable hydrological regime and a peatland type habitat will be created with variable peat depth and topography, providing a range of micro-habitats from dry to permanently wet; creating varied habitats for a range of flora and fauna.
- Plant material from 'high quality' peatland vegetation from nearby designated sites will be sourced where possible or existing established nurseries supplying those sites where re-vegetation is taking place, to ensure plants of local provenance establish on site.
- It is expected that the peatland habitat zone will receive water both from rain and from groundwater, given that the external bunds will be semi-permeable and hence allow a degree of continuity with external hydrology. It will therefore be possible to create hollows around groundwater level and to mound areas which will become largely dry heath vegetation. By creating a diversity of topography and habitats, the area will be more resistant to seasonal change as well as climate change.
- During the management phase, parts of the peatland habitat zone would be permitted to develop natural tree and scrub regeneration, with species such as birch willow and alder likely to self-seed from surrounding habitat. This would attract species such as willow warbler, willow tit, and reed bunting. In other areas, trees and scrub may be prevented from establishing, such as parts of the developing floristically diverse heathland and near to the proposed bog pools. This would benefit species of invertebrate that are reliant on open water.

11.9. The monitoring program also to be included within the LHMP will ensure that the peat does not dry and begin to lose its stored carbon and may in time begin to actively sequester carbon.

12. Reference List

12.1. Baillie, S.R., Marchant, J.H., Leech, D.I. et al (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford.

12.2. BEACH, E., 2017. MoRPh: a citizen science tool for monitoring and appraising physical habitat changes in rivers. Water and Environment Journal, 31(3): 418-424.

12.3. Bibby, C.J., Burgess, N.D., Hill, D.A & Mustoe, S.H. (2000) Bird census techniques. Academic Press, London, UK.

12.4. Biggs J, Ewald N, Valentini A, Gaboriaud C, Griffiths RA, Foster J, Wilkinson J, Arnett A, Williams P and Dunn F 2014. Analytical and methodological development for improved surveillance of the Great Crested Newt. Appendix 5. Technical advice note for field and laboratory sampling of great crested newt (Triturus cristatus) environmental DNA. Freshwater Habitats Trust, Oxford

12.5. CIEEM (2016) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal, 2nd Edition. Chartered Institute of Ecology and Environmental Management, Winchester

12.6. Chanin P (2003), Ecology of the European Otter, Conserving Natura 2000 Rivers Ecology Series No. 10. English Nature, Peterborough.Froglife (1999) - Froglife Advice Sheet 10: Reptile Survey leaflet.

12.7. Collins, J. [Editor] (2016). Bat Surveys – Good Practice Guidelines (3rd Edition). Bat Conservation Trust, London.

12.8. Dietz, C., Heleversen, O. V. and Nill, D. (2009) [English Edition] Bats of Britain, Europe and Northern Africa. A & C Black Publishers Ltd, London

12.9. Fuller (1980) A method for assessing the ornithological interest of sites for conservation. Bioloical Conservation: Applied Science Publishers Ltd, England.

12.10. Gent A. H. & Gibson S. D. (2003). Herpetofauna Workers Manual, Peterborough, Joint Nature Conservation Committee.

12.11. Gilbert, G, Gibbons, D.W. & Evans, J, (1998) Bird monitoring methods: A manual of techniques for key UK species. Royal Society for the Protection of Birds (RSPB) The RSPB, Sandy, UK.

12.12. Institute of Environmental Assessment, (1995) Guidelines for Baseline Ecological Assessment.

12.13. Joint Nature Conservation Committee, Handbook for Phase 1 habitat survey: A technique for environmental audit (2007), English Field Unit, Nature Conservancy Council.

12.14. Natural England (formally, English Nature), Great Crested Newt Mitigation Guidelines'(2001). Natural England, Peterborough.

12.15. Oldham, R.S., Humphries, R.N., 2000. Evaluating the success of great crested newt (Triturus cristatus) translocations. Herpetological Journal 10, 183–190

12.16. Russ. J, (2012). British Bat Calls: A Guide to Species Identification. Pelagic Publishing, Exeter

12.17. Russ, J. M., Hutson, A. M., Montgomery, W. I,, Racey, P. A. and Speakman, J. R. (2001) The status of Nathusius' pipistrelle (Pipistrellus nathusii Keyserling & Balsius, 1939) in the British Isles. Journal if Zoology: 254, 91 – 100. London.

12.18. Strachan, R. & Moorhouse, T. (2006) Water vole conservation handbook 2nd edition. Wildlife Conservation Research Unit, Oxford, 132pp.

12.19. Wray, S. Wells, D. Long, E. and Mitchell-Jones, T. (2010) Valuing Bats in Ecological Impact Assessment. In Practice: No. 70, December 2010, Pg. 23- 25. Bulletin of the Institute of Ecology and Environmental Management: Hampshire.

13. Appendices

~~Appendix 5.1 – Information to Support a Habitats Regulations Assessment~~

Appendix 5.2 – Revised Water Framework Directive Assessment

wardell-armstrong.com

ENERGY AND CLIMATE CHANGE
ENVIRONMENT AND SUSTAINABILITY
INFRASTRUCTURE AND UTILITIES
LAND AND PROPERTY
MINING AND MINERAL PROCESSING
MINERAL ESTATES
WASTE RESOURCE MANAGEMENT

EXTRA MSA GROUP

WARRINGTON MOTORWAY SERVICE AREA, J11 M62

REVISED WATER FRAMEWORK DIRECTIVE SCREENING ASSESSMENT

MARCH 2020

wardell armstrong

Wardell Armstrong
Sir Henry Doulton House, Forge Lane, Etruria, Stoke-on-Trent, ST1 5BD, United Kingdom
Telephone: +44 (0)1782 276 700 www.wardell-armstrong.com

DATE ISSUED:	**20/03/2020**
JOB NUMBER:	**SH11739**
REPORT NUMBER:	**008**
VERSION:	**V.05**
STATUS:	**Draft**

EXTRA MSA GROUP

WARRINGTON MOTORWAY SERVICE AREA, J11 M62

REVISED WATER FRAMEWORK DIRECTIVE SCREENING ASSESSMENT

MARCH 2020

PREPARED BY:

Dr Craig Speed Associate Director .....

REVIEWED AND APPROVED BY:

Lauren Ballarini Technical Director .....

CONTENTS

TABLES

DRAWINGS

SH11739-001 Site Location Plan

SH11739-002 Site Plan

SH11739-002D Brook Diversion Layout and Sections

1 INTRODUCTION

1.1.1 This Water Framework Directive (WFD) assessment is an updated assessment intended to replace Appendix 5.2 of Paper 5: Ecology and Nature Conservation Technical Paper of the Environmental Statement and Appendix 3.3 of Paper 3: Water Resources Technical Paper of the Environmental Statement.

1.1.2 Directive 2000/60/EC of the European Parliament and Council (the Water Framework Directive) came into force on 22nd December 2000 and established a framework for community action in the field of water policy. The WFD has been transposed into UK regulations and required each UK nation to aim to reach good chemical and ecological status in inland and coastal waters by 2015. The WFD is designed to enhance the status and prevent further deterioration of aquatic ecosystems and associated wetlands, to promote sustainable water use, to reduce pollution of water and to ensure a progressive reduction in groundwater pollution. The WFD established a strategic framework for managing the water environment and requires a Management Plan for each river basin to be developed every six years. In cases where good status / potential could not be achieved by 2015, a provision is given under Article 4(4) of the WFD extending the deadline to 2021 or 2027. The date has been extended to 2027 in respect of a large number of waterbodies. Within England, the competent authority for delivering the WFD is the Environment Agency (EA).

1.1.3 The role of a WFD assessment is to evaluate the potential deterioration in the overall status of a water body from a Proposed Development, based on the 2015 River Basin Management Plan (RBMP). The WFD assessment also determines whether the Proposed Development may hinder any existing programmes of measures in returning a failing water body to Good status.

2 PROJECT DESCRIPTION

2.1 Introduction

2.1.1 This section identifies the Proposed Development's location and context and describes the Proposed Development, summarised from the Environmental Statement (ES) Project Description[1].

2.2 Proposed Development description

2.2.1 The application will be an outline planning application for the erection of a Motorway Service Area including Facilities Building, up to 100 bedroom Hotel, service yard, Fuel Filling Station, Electric Charging Station, parking facilities for each category of vehicle, access and internal circulation roads, structured and natural landscaping with outside amenity space/picnic space and dog walking zone, pedestrian and cycle links, boundary fencing, surface water drainage areas, ecological mitigation, pumping station(s), substation(s), retaining structures and associated infrastructure and earthworks.

2.3 Proposed Development Location and Context

2.3.1 The Proposed Development is located in the North West of England, within the local authority area of Warrington. The Proposed Development location and regional context is shown on the Site location plan in Drawing SH11739-001.

2.3.2 The Proposed Development is located to the northeast of the urban area of Warrington, approximately 8.5km (5 miles) from the centre of Warrington. The centre of Manchester is located approximately 17.5km (11 miles) to the east of the Proposed Development and the centre of Liverpool, approximately 32 km (20 miles) to the west.

2.3.3 The Proposed Development is located to the north of the M62 Motorway at Junction 11, within its north east quadrant and has direct access to Junction 11 via a spur to the motorway junction roundabout (Birchwood Way). The M62 Motorway also provides access to the wider Strategic Road Network, with the M6 Motorway running north/south, approximately 4km (2.5 miles) to the west of the Proposed

[1] Extra MSA Group Warrington Motorway Service Area, J11 M62, ES Project Description, Revision C 23 July 2019.

Development, and the M60 Motorway, which runs around Manchester, approximately 10km (6.1 miles) to the east of the Proposed Development.

2.3.4 Immediately to the west of the Proposed Development is a former landfill site, Risley Landfill (Figure 2.3), where landfilling began in 1979, but which has now ceased, and the landfill site has been restored and planted as Risley Country Park. To the east and north is arable farmland. A disused railway line crosses the farmland that is beyond the Proposed Development boundary, and arches to the east and north approximately 0.6km (0.4 miles) from the Proposed Development boundary. To the east and north of the Application Proposed Development are agricultural fields.

2.3.5 The planning application redline encompasses the M62 J11 Motorway Roundabout, spur from the roundabout and the main part of the Proposed Development. The main part of the Proposed Development relates to an area of land of approximately 15ha in extent, whilst the total land within the redline and therefore including highway works to M62 J11 Motorway Roundabout is c.16ha (see Drawing SH11739-002 showing the site boundary).

2.4 Land Use

2.4.1 The Proposed Development area is greenfield and located within the Green Belt. It comprises agricultural land and rough grassland. The agricultural land within the Proposed Development area comprises a large arable field (c.11. ha). A small triangular area of unmanaged neutral grassland is present to the west of the Proposed Development (approximately 1.0 ha), this land previously formed part of a larger agricultural field, the majority of which was incorporated into the Risley Landfill site. The remnant field area was removed from agricultural use by the operation of the landfill site and is therefore considered to be non-agricultural. All other land within the Proposed Development area is also non-agricultural comprising areas of restored landfill and hardstanding. The agricultural land is partially located over peat deposits, which are located predominantly to the south eastern section of the Proposed Development.

2.5 Hydrology

2.5.1 The following description of the Hydrology of the Proposed Development is taken from the Wardell Armstrong report entitled Flood Risk Assessment and Surface and Foul Water Drainage Strategies (Version 4 Final) forming Appendix 3.1 to the Environmental Statement.

2.5.2 The nearest named watercourse to the Proposed Development is the Silver Lane Brook, designated as a main river. The Silver Lane Brook flows along the western boundary as a linear watercourse and flows partly into north western edge of the Proposed Development for a short section.

2.5.3 The Silver Lane Brook starts at the southern end of the Proposed Development and is fed by a 900mm diameter culvert which receives surface water flows from the restored Risley Landfill to the west. This watercourse has a variable channel profile, typically having a base width of 1m or more and a depth of 0.8m or more. The watercourse's longitudinal gradient varies between 1 in 600 to 1 in 2000. There are a number of culverted crossing points allowing access to the eastern field.

2.5.4 The Silver Lane Brook, after passing the north west corner of the Proposed Development, flows north into Willow Brook which in turn flows eastward to Glaze Brook, which is approximately 1.4km east of the Proposed Development.

2.5.5 An unnamed watercourse also runs approximately three quarters of the length of the Proposed Development along the eastern boundary from the south to north. At this point it is culverted to the north and is understood to discharge to the Silver Lane Brook to the north of the Proposed Development. A culvert to the south end of the watercourse also exists and this connects into the motorway drainage system to the south via a backdrop. The watercourse falls from south to north and was observed to be dry during a site visit described in the August 2019 Flood Risk Assessment and Drainage Strategy Report[2]. This watercourse has never been observed to be holding water.

[2] Wardell Armstrong, 2019. EXTRA MSA GROUP Warrington MSA, J11 M62 Flood Risk Assessment and Surface and Foul Water Drainage Strategies, August 2019 (ref. SH11739 Appendix 3.1 V4.0 (final))

2.6 Hydrogeology

2.6.1 The Proposed Development is located upon the Helsby Sandstone Formation, a designated Principal aquifer which provides the water resource for private and public water supplies in the regional vicinity of the Proposed Development. The Proposed Development is located within Source Protection Zone 3 (SPZ 3) of two abstractions operated by United Utilities (New Land End, Houghton Green). The Helsby Sandstone is overlain by peat and glacial till which forms a stiff clay unit between 7 and 13m thick which confines the sandstone. The public water supplies and other controlled water receptors are recognised as sensitive and important groundwater receptors and resources.

2.7 Designated Ecological Sites

2.7.1 The Proposed Development lies within 5km of Manchester Mosses SAC and within 2km of Risley Moss SSSI and LNR and Holcroft Moss SSSI. Beyond the M62 Motorway, to the south of the Proposed Development is Pestfurlong Moss, a Local Wildlife Site. To the north west of the Proposed Development is Silver Lane Risley, which is also a Local Wildlife site and incorporates the ponds to the north of the restored landfill site.

3 PROPOSED DEVELOPMENT

3.1 Silver Lane Brook Diversion

3.1.1 The following description of the Silver Lane Brook diversion is extracted from the Wardell Armstrong report entitled Flood Risk Assessment and Surface and Foul Water Drainage Strategies (Version 4 Final) forming Appendix 3.1 to the Environmental Statement, which is illustrated by Drawing SH11739-002D entitled 'Brook Diversion Layout and Sections' shows the preliminary diversion proposals.

3.1.2 Part of the development proposal is to divert the Silver Lane Brook around the eastern Proposed Development boundary. The existing brook is a relative narrow, channel width being 1m or more, with a longitudinal gradient range between approximately 1 in 600 and 1 in 2000. The channel has two culverted crossings allowing access into the eastern agricultural fields.

3.1.3 As noted previously, the brook receives clean surface water flows from the Biffa restored Risley landfill site's surface water drainage system, via a half-submerged 900mm diameter inlet pipe to the south western corner of the Proposed Development. The water entering the brook is relatively clean as it has travelled through a variety of treatments within the landfill restoration area that removed debris and silts.

3.1.4 To divert the brook around the eastern boundary, the average longitudinal gradient will be approximate 1 in 1300 which is within the current range of the existing brook.

3.1.5 The proposed brook diversion has been designed with an alignment that follows the eastern boundary of the development with localised widening provided at available points to offer landscaping opportunities.

3.1.6 One culverted crossing is included in the design to allow access to the eastern land and the gas main. This culvert will be sized as per the inlet of the watercourse, 900mm diameter minimum, to replicate the existing flow capacity.

3.1.7 No development proposals exist to the eastern side of the brook diversion while to the west generally only the proposed development's access road and landscaping is in close proximity. The access road and landscaping areas will facilitate direct maintenance access to the brook with minimal environmental impact expected. No buildings are proposed near to the diverted brook.

3.1.8 The design ensures that the brook diversion mimics the existing brook's flow characteristics, is not a flood risk source and can be maintained throughout the life of the development.

3.1.9 The length of the diverted brook will be inspected as part of a site inspection programme to check that it is performing satisfactorily with no signs of silt/debris build up within the channel, to grilles or culverts. The inspection will include checking of the channel, banks and structures to ensure no scouring or damage is taking place.

4 REVIEW OF THE RIVER BASIN MANAGEMENT PLAN AND CATCHMENT

4.1 Surface Water

4.1.1 The Proposed Development is located within the North West River Basin District, which is monitored by the Environment Agency (EA)[3] under the WFD and the results of the WFD classification are summarised in the North West River Basin Management Plan (RBMP). The Proposed Development is in the 'Mersey Lower' management catchment, the 'Glaze' operational catchment, and the 'Glaze' surface water body (ID: GB112069061420).[4] The Glaze surface water body is 39.36km^2 in area and the river is 16.75km in length. A summary of the Glaze surface water body can be found in Table 4.1.

4.1.2 In terms of pressures identified by the WFD, the Glaze surface water body is At Risk or Probably At Risk from eutrophication, suspended sediment, physical modification, invasive species, Benzo(a)pyrene and nickel.

4.1.3 The WFD objectives are detailed in Table 4.1. The overall objective set by the EA for the Glaze surface water body is Poor by 2015. This indicates the adoption of less stringent environmental objectives under Article 4.4 of the WFD for the reason of the less stringent objective as 'Disproportionate Burdens' where the WFD timescales for achievement of Good Ecological Status (GES) is 'unreasonable'. In the case of the individual status elements for the Glaze water body, there is 'No known technical solution available'.

[3] Environment Agency (2019) Catchment Data Explore: North West River Basin District [online]. Accessed 16/04/2019. Available at: https://environment.data.gov.uk/catchment-planning/RiverBasinDistrict/12

[4] Environment Agency (2019) Catchment Data Explore: Glaze [online]. Accessed 16/04/2019. Available at: https://environment.data.gov.uk/catchment-planning/Water body/GB112069061420

Table 4.1: WFD Status of Glaze Surface Water body						
Classification Element	**2013 Cycle**	**2014 Cycle**	**2015 Cycle**	**2016 Cycle**	**Objectives**	**Reasons**
Overall Water body						
Overall Water body	Moderate	Poor	Poor	Poor	Poor by 2015	Disproportionate burdens. No known technical solution is available
Ecological						Disproportionate burdens. No known technical solution is available
Biological quality elements	Moderate	Poor	Poor	Poor	Poor by 2015	No known technical solution is available
Fish	Moderate	Moderate	Moderate	Poor	Moderate by 2015	No known technical solution is available
Invertebrates		Poor	Poor	Poor	Poor by 2015	No known technical solution is available
Macrophytes and Phytobenthos	Good	Good	Moderate	Poor	Good by 2015	-
Hydromorphological supporting elements	Supports Good	Supports Good	Supports Good	Supports Good	Supports Good by 2015	-
Physico-chemical quality elements	Moderate	Moderate	Moderate	Moderate	Moderate by 2015	Disproportionate burdens. No known technical solution is available
Ammonia	Good	Moderate	Moderate	Moderate	Good by 2027	Disproportionate burdens.
Phosphate	Poor	Poor	Poor	Poor	Poor by 2015	No known technical solution is available
Specific pollutants	Moderate	Moderate	High	High	High by 2015	
Chemical						
Priority substances	Fail	Fail	Good	Good	Good by 2015	
Other pollutants	DNRA*	DNRA	DNRA	DNRA	DNRA	
Priority hazardous substances	Good	Good	Good	Good	Good by 2015	
Note *DNRA: Does Not Require Assessment						

4.1.4 The EA have reported a list of reasons why rivers in the Glaze water body have failed to achieve good WFD status and reasons for deterioration[4], which are presented in Table 4.2.

Table 4.2: Reasons Why Glaze Surface Water body is Not Achieving Good WFD Status

Year	Classification Element Affected	Sector	Activity
2014	Phosphate	Waste water treatment	Water Industry
2014	Phosphate	Unknown (pending investigation)	Agriculture and rural land management
2014	Phosphate	Urbanisation - urban development	Urban and transport
2014	Macrophytes and Phytobenthos Combined	Sewage discharge (continuous)	Water Industry
2014	Fish	Barriers - ecological discontinuity	Industry
2014	Ammonia (Phys-Chem)	Urbanisation - urban development	Urban and transport
2014	Biochemical Oxygen Demand (BOD)	Sewage discharge (intermittent)	Water Industry
2014	Invertebrates	Sewage discharge (intermittent)	Water Industry
2014	Fish	Sewage discharge (intermittent)	Water Industry
2014	Invertebrates	Urbanisation - urban development	Urban and transport
2014	Invertebrates	Transport Drainage	Urban and transport

4.1.5 The EA have provided information on the planned Programme of Measures for the Glaze water body, which is summarised in Table 4.3. For the Glaze water body, there is only one measure planned under the current river basin management cycle, which is in relation to phosphorus reduction in the Glazebury WwTW. The other measures in Table 4.3 are for upstream or adjacent water bodies. None of the measures planned are for the downstream Mersey/Manchester Ship Canal (Irwell/Manchester Ship Canal to Bollin) water body.

Table 4.3: Summary of Programme of Measures in the Glaze Operational Catchment			
CPS Action ID	**Water Body**	**Title**	**Measure Aim**
19758	Astley Brook (Mersey)	Astley Brook 1: diffuse agricultural pollution	1. To control or manage diffuse source inputs 2. Reduce diffuse pollution at source 3. Field & Crop - Arable soils
19761	Astley Brook (Mersey)	Astley Brook 4 – Worsley WwTW P Reduction	1. To control or manage point source inputs 2. Mitigate/Remediate point source impacts on receptor 3. Install nutrient reduction
19764	Astley Brook (Mersey)	Astley Brook 7 – Tyldesley WwTW P Reduction	1. To control or manage point source inputs 2. Mitigate/Remediate point source impacts on receptor 3. Install nutrient reduction
19767	Bedford Brook	Bedford Brook 12 - WIG0082 CSO Improvements	1. To control or manage point source inputs 2. Mitigate/Remediate point source impacts on receptor 3. Change timing or frequency of discharge
20832	Hey/Borsdane Brook	Hey/Borsdane Brook 17 - Hindley Pumping Station CSO Improvements	1. To control or manage point source inputs 2. Mitigate/Remediate point source impacts on receptor 3. Change timing or frequency of discharge
19770	Pennington Brook (Glaze)	Pennington Brook (Glaze) 19 - WIG0074 CSO Improvements	1. To control or manage point source inputs 2. Mitigate/Remediate point source impacts on receptor 3. Change timing or frequency of discharge
39165	Pennington Brook (Glaze)	Pennington Brook (Glaze) 72 - Leigh WwTW P Reduction	1. To control or manage point source inputs 2. Mitigate/Remediate point source impacts on receptor 3. Install nutrient reduction
19771	Glaze	River Glaze 23 – Glazebury WwTW P Reduction	1. To control or manage point source inputs 2. Mitigate/Remediate point source impacts on receptor 3. Install nutrient reduction
19775	Westleigh Brook	Westleigh Brook 28: weir removal	1. To improve modified habitat 2. Removal or easement of barriers to fish migration 3. Enable fish passage (e.g. fish pass)
19776	Westleigh Brook	Westleigh Brook 29 - Westhoughton WwTW P Reduction	1. To control or manage point source inputs 2. Mitigate/Remediate point source impacts on receptor 3. Install nutrient reduction

4.2 Groundwater

4.2.1 The Proposed Development is located within the 'North West' groundwater management catchment, the 'Mersey Basin Lower and Merseyside North Permo-Triassic Sandstone Aq' operational catchment, and the 'Lower Mersey Basin and North Merseyside Permo-Triassic Sandstone Aquifers' groundwater body (ID: GB41201G101700).[5] This groundwater body is 627.5km^2 in area and a summary of the WFD Status and environmental objectives (together with published reasons for derogations) can be found in Table 4.4.

[5] Environment Agency (2019) Catchment Data Explore: Lower Mersey Basin and North Merseyside Permo-Triassic Sandstone Aquifers [online]. Accessed 16/04/2019. Available at: https://environment.data.gov.uk/catchment-planning/Water body/GB41201G101700

Table 4.4: WFD Status of Lower Mersey Basin and North Merseyside Permo-Triassic Sandstone Aquifers Groundwater Body						
Classification Element	**2013 Cycle**	**2014 Cycle**	**2015 Cycle**	**2016 Cycle**	**Objectives**	**Reasons**
Overall Water body						
Overall Water body	Poor	Poor	Poor	Poor	Good by 2027	Cause of adverse impact unknown
Quantitative						
Quantitative Saline Intrusion	Poor	Poor	Poor	Poor	Good by 2027	Cause of adverse impact unknown
Quantitative Water Balance	Good	Good	Good	Good	Good by 2015	Cause of adverse impact unknown
Quantitative GWDTEs test	Good	Good	Good	Good	Good by 2015	
Quantitative Dependent Surface Water body Status	Good	Good	Good	Good	Good by 2015	
Chemical (GW)						
Chemical Drinking Water Protected Area	Poor	Poor	Poor	Poor	Good by 2027	Disproportionate burdens
General Chemical Test	Good	Good	Good	Good	Good by 2015	
Chemical GWDTEs test	Good	Good	Good	Good	Good by 2015	
Chemical Dependent Surface Water body Status	Poor	Poor	Poor	Poor	Good by 2027	Cause of adverse impact unknown
Chemical Saline Intrusion	Poor	Poor	Poor	Poor	Good by 2027	Cause of adverse impact unknown

4.2.2 The EA have reported a list of reasons why the Lower Mersey Basin and North Merseyside Permo-Triassic Sandstone Aquifers groundwater body failed to achieve good WFD status and reasons for deterioration,[5] which are presented in Table 4.5.

Table 4.5: Reasons why Lower Mersey Basin and North Merseyside Permo-Triassic Sandstone Aquifers groundwater body failed to achieve Good WFD Status

Year	Classification Element Affected	Sector	Activity
2014	Chemical Drinking Water Protected Area	Wastewater treatment Other	Water Industry
2014	Chemical Drinking Water Protected Area	Unknown (pending investigation)	Other
2014	Chemical Drinking Water Protected Area	Private Sewage Treatment	No sector responsible
2014	Chemical Drinking Water Protected Area	Poor nutrient management	Agriculture and rural land management
2014	Quantitative Saline Intrusion	Saline or other intrusion	No sector responsible
2014	Chemical Drinking Water Protected Area	Poor pesticide management	Agriculture and rural land management
2015	Chemical Saline Intrusion	Saline or other intrusion	No sector responsible
2015	Chemical Dependent Surface Water Body Status	Unknown (pending investigation)	Sector under investigation
2015	Trend Assessment	Unknown (pending investigation)	Sector under investigation

5 WATER FRAMEWORK DIRECTIVE SCREENING ASSESSMENT

5.1.1 The Environment Agency's 'Water Framework Directive Risk Assessments: How to Assess the Risk of your Activity'[6] (April 2016) provides guidance as to how to undertake a WFD Assessment. The guidance identifies four stages:

1) make sure that the assessment covers the receptors that are protected by WFD;
2) demonstrate that the activity supports the objectives of the local River Basin Management Plan (RBMP). The wider environmental objectives of the RBMPs that are relevant to physical works are:
   i. to prevent deterioration of the status or potential of surface waters and groundwater; and
   ii. to aim to achieve good status for all water bodies (or for heavily modified water bodies and artificial water bodies, good ecological potential) and good surface water chemical status;
3) if a high level of confidence that your activity supports the objectives of your RBMP cannot be reached then you need to carry out more investigation into the risks on WFD receptors and possible ways of managing those risks. After amending the project to avoid, minimise, mitigate or compensate for the risks to WFD receptors the following questions need to be addressed:
   i. could the activity still cause a water body (catchment/sub-catchment) to deteriorate from one WFD status class to another or cause significant localised impacts that could contribute to this happening?
   ii. could the activity prevent or undermine action to get water bodies to good status? and
4) if the answer to the above questions is yes and your activity still does not support RBMP objectives, it will need to be demonstrated that the project meets the sustainability criteria set out in Article 4(7) of the WFD. Article 4(7) sets out stringent environmental and socio-economic tests to assess if a scheme meets strict environmental and sustainability criteria.

5.1.2 Table 6.1 summarises the risk that the development may have on the Glaze surface water body achieving its objectives. Table 6.2 summarises the risk from the

[6] Environment Agency (2016) Water Framework Directive Risk Assessment: How to Assess the Risks of your Activity [online]. Accessed15/04/2019. Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/522426/LIT_10445.pdf

development on the Lower Mersey Basin and North Merseyside Permo-Triassic Sandstone Aquifers groundwater body from achieving its objectives.

5.2 Stage 1

5.2.1 The WFD protects the surface waterbodies and groundwater bodies. This assessment covers the Glaze surface water body (ID: GB112069061420) and the Lower Mersey Basin and North Merseyside Permo-Triassic Sandstone Aquifers groundwater body (ID: GB41201G101700), therefore the assessment covers the appropriate receptors protected by the WFD.

5.3 Stage 2: Surface Water - Deterioration

5.3.1 In relation to the potential for deterioration in WFD status, the following section describes the assessment for each construction or operation phase activity in terms of the WFD status elements, which are summarised in the screening summary table (Table 6.1). The approach of this section is to assess potential impacts to identified water environment receptors through the WFD screening assessment, whether that be for aquatic ecology, water quality or hydromorphology.

Construction phase

5.3.2 The following potential construction phase activities have been identified for the Proposed Development:

- Earthworks including excavations.
- Dewatering of excavations.
- Use of machinery and storage of chemicals on Proposed Development.
- Soil stripping and vegetation removal.
- Soil compaction.
- Construction of impermeable surfaces such as roads / pavements.
- Construction of subsurface infrastructure such as foundations.
- Use of cement and concrete and lime stabilisation.
- Removal of peat (used in habitat enhancement).
- Gas pipeline – retaining wall in peat.

- Working in proximity to the water environment associated with the river diversion.
- Working in proximity to the water environment associated with watercourse crossing.

5.3.3 The following presents the above construction activities in terms of the WFD status classification elements that could be affected (Table 6.1).

5.3.4 **Biological Quality Elements:** Ecological surveys undertaken for the Proposed Development are summarised in the Environmental Statement, Part 2 – Ecology and Nature Conservation (Technical Paper 5, dated 22nd August 2019) and were as follows. The Preliminary Ecological Appraisal evaluated the presence of Aquatic Invertebrates (relevant to the WFD Assessment) as well as Protected Species including Great Crested Newts, Water Voles and Wintering Birds (not considered in WFD Classification). In terms of receptors identified on Proposed Development, water vole and great crested newt were not observed in the Silver Lane Brook and are considered highly unlikely to be present at the Proposed Development, there is a lack of suitable habitat for great crested newt and no evidence of water vole presence was observed during the surveys.. Therefore, these were scoped out of the assessment.

5.3.5 With regard to outcomes of the aquatic ecology survey for the WFD Ecological Elements, these are summarised in Table 5.1, outlined below and full detail of the survey work is provided in Appendix 1.

5.3.6 A fish survey was not undertaken of the Silver Lane Brook, due to the poor supporting habitats i.e. variable flow and shallow environment (ditch) that comprises the Silver Lane Brook in its headwaters adjacent to the Proposed Development. The only fish life in this watercourse that is considered likely to be present are Stickleback. Therefore, this type of receptor was scoped out of the ES assessment.

5.3.7 Aquatic invertebrates remained scoped into the assessment; specifically regarding the loss of habitats supporting aquatic invertebrates. Approximately 755m of the Silver Lane Brook will also be removed to accommodate the Development and diverted along the eastern boundary of the Proposed Development, which was assessed in the ES to result in a Minor Adverse (Not Significant) effect, in the absence of mitigation. The invertebrate survey report confirms that there are no likely populations of note within the Proposed Development. Therefore, any effects upon the aquatic

invertebrates would be considered to be short-lived and reversible from the construction for the Silver Lane Brook diversion, therefore, no deterioration in status is expected for the local Silver Lane Brook or the wider River Glaze water body.

Table 5.1: Summary of Aquatic Ecological Survey by Harris Lamb (Appendix 1) and Assessment Outcomes for WFD Ecological Elements

WFD Ecological Element	Element Name	Assessment of impacts
Biological Quality Element	Macrophytes and Phytobenthos	The proposed channel realignment will remove the existing macrophytes and phytobenthos from the channel in its current location. Upon reinstatement of the new channel it is considered that the flora will readily colonise the new channel. This would be aided by additional planting and reseeding of the banks where appropriate. Therefore, impacts will be temporary in nature and the new channel can be designed to allow greater diversity in macrophyte assemblages. No significant long-term negative impacts upon macrophytes or phytobenthos are anticipated and increased biodiversity is likely to be seen as a result of the Assessment of impacts development. Hence, no significant impacts upon macrophytes or phytobenthos are anticipated.
	Fish	No fish were noted within the watercourse during the site visit and due to the ditch like nature of the watercourse it is expected that only small numbers of robust species such as stickleback (*Gasterosteidae*) would be present in the reach. During works to protect and remove fish from risk of harm, the channel will be electro-fished prior to the channel being drained. Fish would be placed downstream and following the channel works they would be able to readily recolonise the site. No significant impacts upon fish are anticipated [SCREENED OUT].
	Invertebrates	The repositioning of the channel would remove invertebrates from the works footprint in the short term. However, following opening of the new channel the habitats have been designed to improve channel morphology which will be of benefit to invertebrates. Due to the ephemeral nature of invertebrates, recolonisation is anticipated to occur readily upon completion of the works and no long-term negative impacts are anticipated. No significant impacts upon benthic invertebrates are expected.

Table 5.1: Summary of Aquatic Ecological Survey by Harris Lamb (Appendix 1) and Assessment Outcomes for WFD Ecological Elements		
WFD Ecological Element	**Element Name**	**Assessment of impacts**
Hydromorphological Supporting Elements	Hydrological Regime	The new channel will be designed to improve morphology and no impacts are anticipated that could affect the hydrological regime of the watercourse in this location. The hydrological regime is expected to remain the same as it is currently albeit within the new channel location.
	Morphology - River depth and width variation	Currently the channel is straightened and shows previous management to function as a drainage ditch for the surrounding agricultural land. The new channel will be designed to increase the river length and provide additional morphological features. For example, variation in flow types will be encouraged by increasing sinuosity of the channel and through the installation of deflectors where appropriate.
	Morphology - Structure and substrate of the riverbed	Although the channel is being moved, the structure and substrate of the riverbed will be kept the same and no significant changes to this aspect of river morphology are anticipated.
	Morphology - Structure of the riparian zone	The riparian zone will be altered, but the design will be to increase the diversity and improve structure of the riparian zone from its current condition. Planting schemes will be developed to enhance the riparian zone and ensure a buffer between the development and the watercourse.

5.3.8 **Biological Quality Elements**, **Physico-chemical Quality Elements**: Earthworks, excavations, soil stripping and construction of structures have the potential to result in the release of silt-laden water (from dewatering or unmitigated Proposed Development runoff), concrete/lime leachate (from construction or lime stabilisation of soil) or hydrocarbons (from leaks and spills from machinery) to surface water to either the existing or diverted Silver Lane Brook. However, best practice sediment management incorporating settlement and, if required, active treatment (e.g. by Siltbuster) and on-Proposed Development fuel storage and refuelling in accordance with The Control of Pollution (Oil Storage) (England) Regulations 2001 would be implemented through strict adherence to the Proposed Development's Construction Environmental Management Plan (CEMP).

5.3.9 **Hydromorphological Supporting Elements**: The Proposed Development includes the diversion of 755m of the Silver Lane Brook. The channel of the existing brook has already been modified comprising a linear ditch along the toe of the former Risley Landfill. Hydromorphological Elements are responsible principally for distinguishing between Good Status and High Status, so does not contribute to the status definition of status below Good status[7]. However, further discussion will be given to this element in the Operation phase section below.

5.3.10 **Hydromorphological Supporting Elements, Biological Quality Elements**: The watercourse crossing required for access to the area between the Proposed Development and the eastern land for maintenance and access to the gas main for National Grid is proposed as a culvert (or a bridge). The crossing will only be installed prior to flow diversion to prevent pollution of the watercourse by suspended sediments from in channel works during construction. No deterioration in status is expected as a result of the construction of the watercourse crossing.

5.3.11 **Physico-chemical Quality Elements:** In relation to the Peat Habitat Zone (PHZ) construction to the east of the Proposed Development, the related PHZ piling and bunding will be completed in a phased manner with the peat removal and clay/structural fill replacement being completed prior to the watercourse diversion. Once the fill has been placed then the watercourse diversion will most likely be completed. On this basis there should not be any impact on water quality. As there is no interaction predicted between the PHZ and the diverted watercourse, it is likely that there will be no status deterioration for the local Silver Lane Brook. However, further checks will be required in relation to the watercourse tie in works at the detailed design stage.

5.3.12 As such, potential impacts from construction activities that could impact water quality and WFD status on the spatial scale (both local and water body scale) and over the timescale of surface WFD water classification (3 years) are considered unlikely to result in WFD status deterioration. In fact, for the Silver Lane Brook diversion there is the potential of betterment from the baseline condition of the existing Silver Lane Brook in relation to aspects like water quality, hydromorphology and aquatic ecology, that are included in the outline design of the Proposed Development and can be

[7] Environment Agency, 2015. Rules for assessing Surface Water Body Status and Potential. Decision document for 2015 new building block (cycle 2) Water Framework Directive classifications Version 2.0 (updated October 2015)

refined in the detailed design of the diversion. This will be presented in the Operation phase assessment that follows.

Operation phase

5.3.13 The following potential operation phase activities have been identified for the Proposed Development:

- Loss of hydrocarbons from motorised vehicles and fuel storage/refuelling facilities.
- De-Icing of roads, walkways and parking areas.
- Proximity to the water environment associated with river diversion and watercourse crossing.
- Peat used in habitat enhancement.
- New drainage regime in developed areas of the Proposed Development.
- Loss of aquatic invertebrate populations through accidental pollution and / or sediment transfer to surface water.

5.3.14 The following sections describe the elements of the design that address the above activities in terms of the WFD status classification elements:

5.3.15 **Priority Substances, Specific Pollutants:** There will be a surface water inlet to the diverted Silver Lane Brook watercourse (from a small headwall/inlet) from the on-site surface water system from the Proposed Development (excluding the petrol station forecourt as this will be taken to the foul sewer system). The Proposed Development surface water drainage will be pumped into the watercourse due to the difference levels between the surface water drains and the diverted watercourse. Potential WFD status elements that could be affected could be Priority Substances due to leaks of hydrocarbons and deposition of polycyclic aromatic hydrocarbons (PAHs) from vehicular exhausts and Specific Pollutants (heavy metals like copper from vehicles) transported in runoff from car parks. Water quality improvement measures proposed will include the use of SuDs across the Proposed Development where feasible to improve water quality for traces of hydrocarbons and heavy metals from parking areas and roadways. This will include the use of filter drains, swales, rills (in form of drainage channels), small dry basins, tanks (for water storage of significant storm events) and finally treatment through Class 1 petrol interceptors. The SuDS train should provide

attenuation of dissolved heavy metals and traces of hydrocarbons, whilst any free phase hydrocarbons will be separated out by the petrol interceptor. Therefore, no status deterioration is expected with respect to water quality impacts following implementation of these measures.

5.3.16 **Hydromorphological Supporting Elements:** Modest scour protection will be included in the diverted channel as required to protect the channel bed and banks from erosion during peak runoff events from the capping of the former Risley Landfill. The existing 900mm diameter Inlet will be retained as an existing structure including, if necessary, minor scour protection for the southern section of channel as flow makes a turn in the diverted channel at the southwest corner of the Proposed Development. No status deterioration is expected from changes in the hydromorphology following the establishment of the Silver Lane Brook diversion.

5.3.17 **Hydromorphological Supporting Elements:** The watercourse crossing required for access to the area between the Proposed Development and the eastern land for maintenance and access to the gas main for National Grid is proposed as a culvert (or a bridge) that is appropriately sized to avoid any reduction in the channel's capacity so that the channel can accommodate the envisaged flows. If the structure is to be a culvert, this would only be over a short length of watercourse, so limited debris would be expected, therefore no grilles would be proposed at either end of the crossing. No status deterioration is expected from changes in the hydromorphology resulting from the construction of the watercourse crossing.

5.3.18 **Hydromorphological Supporting Elements, Biological Quality Elements:** Retaining walls in the diverted channel: There are two lengths, to the southern boundary (70m) and also at the corner as the watercourse turns west at the northern end (40m) of retaining wall proposed in order to accommodate the channel in between the Proposed Development boundary and the road layout. Currently retaining structures are proposed to provide 0.5m and 1m of retaining height. However, this could result in the concern that this presents a reduction in the width of the riverbank area that could bring about further deterioration with respect to ecological elements of classification, albeit at the localised site scale. Further consideration would be given to the design of retaining structures and supplementary channel design features (e.g. as a low flow channel with enhanced habitat features) at the detailed design stage in order to provide a betterment where possible with respect to ecological status elements.

5.3.19 **Hydromorphological Supporting Elements:** Part of the existing watercourse will be retained in the north west of the Proposed Development under the drainage design. This retained section of Silver Lane Brook receives minor surface water runoff from the slopes from the restored landfill area and no base flow from the landfill surface water management system. This component of the design represents retained baseline conditions, so no status deterioration is expected as a result of this component.

5.3.20 **Physico-chemical Quality Elements:** As there is no interaction likely between the PHZ and the diverted watercourse, it is likely that there will be no status deterioration for the local Silver Lane Brook during the Operation phase.

5.4 Stage 2: Surface Water - Hinderance of measures

5.4.1 The need to prevent any existing WFD programmes of measures (for improvement in status) being hindered by any of the activities during the Construction and Operation phases is the second general RBMP objective. The main reasons why the Glaze water body is not achieving Good WFD status are defined by the EA as sewage discharge and urbanisation (see Table 4.2) causing impacts on the phosphate, biochemical oxygen demand and ammonia status elements.

5.4.2 Table 5.2 outlines the programme of measures that have been planned or are on-going for the Glaze Operational Catchment. Of the ten measures outlined, only one is applicable to the River Glaze water body or its downstream water body (Mersey/ Manchester Ship Canal (Irwell/Manchester Ship Canal to Bollin). Measure 19771 for "Glazebury WwTW P Reduction" is a measure to counteract the failure of the phosphate element of classification resulting from the sewage discharges from the water industry. The capacity of the foul sewage infrastructure has been confirmed with the United Utilities water company[8], which indicated that foul sewage is directed to a connection that is southwest of the Proposed Development, which indicates that this does not connect to the Glazebury WwTW and therefore does not hinder any of the programme of measures for the Glaze Operational Catchment.

[8] Wardell Armstrong, 2019. EXTRA MSA GROUP - WARRINGTON MOTORWAY SERVICE AREA, UTILITIES ASSESSMENT, AUGUST 2019 (Ref. SH11739R02 V1.0).

Table 5.2: Summary of Programme of Measures in the Glaze Operational Catchment				
CPS Action ID	**Water Body**	**Title**	**Applicable to River Glaze water body?**	**Reason**
19758	Astley Brook (Mersey)	Astley Brook 1: diffuse agricultural pollution	No	Not connected to River Glaze water body.
19761	Astley Brook (Mersey)	Astley Brook 4 – Worsley WwTW P Reduction	No	Not connected to River Glaze water body.
19764	Astley Brook (Mersey)	Astley Brook 7 – Tyldesley WwTW P Reduction	No	Not connected to River Glaze water body.
19767	Bedford Brook	Bedford Brook 12 - WIG0082 CSO Improvements	No	Upstream water body.
20832	Hey/Borsdane Brook	Hey/Borsdane Brook 17 - Hindley Pumping Station CSO Improvements	No	Upstream water body.
19770	Pennington Brook (Glaze)	Pennington Brook (Glaze) 19 - WIG0074 CSO Improvements	No	Upstream water body.
39165	Pennington Brook (Glaze)	Pennington Brook (Glaze) 72 - Leigh WwTW P Reduction	No	Upstream water body.
19771	Glaze	River Glaze 23 – Glazebury WwTW P Reduction	Yes	
19775	Westleigh Brook	Westleigh Brook 28: weir removal	No	Upstream water body.
19776	Westleigh Brook	Westleigh Brook 29 - Westhoughton WwTW P Reduction	No	Upstream water body.

5.5 Stage 2: Groundwater - Deterioration

5.5.1 The WFD objectives for the Lower Mersey Basin and North Merseyside Permo-Triassic Sandstone Aquifers groundwater body are detailed in Table 4.4. The overall objective set by the Environment Agency is Good by 2027.

5.5.2 The main reasons why the Lower Mersey Basin and North Merseyside Permo-Triassic Sandstone Aquifers groundwater body is not achieving Good WFD status is defined by the EA as agriculture and sewage treatment, however the reason for failure of three classification elements is unknown (pending investigation) (see Table 4.5).

Construction phase

5.5.3 The principal effects considered during the groundwater assessment for the Construction phase were as follows:

- Earthworks including excavations.

- Dewatering of excavations.
- Use of machinery and storage of chemicals on Proposed Development.
- Soil stripping and vegetation removal.
- Soil compaction.
- Construction of impermeable surfaces such as roads / pavements.
- Construction of subsurface infrastructure such as foundations.
- Use of cement and concrete and lime stabilisation.
- Removal of peat (used in habitat enhancement).
- Gas pipeline – retaining wall in peat.
- Installation of underground fuel storage tanks.

5.5.4 Groundwater in the Helsby Sandstone Formation bedrock was identified as the At Risk Receptor in the ES for Earthworks including excavations, Dewatering of excavations, Use of machinery and storage of chemicals on site, Construction of impermeable surfaces such as roads / pavements, Construction of subsurface infrastructure such as foundations, Use of cement and concrete. For each of these potential effects scoped in, the Significance of Effect was assessed as Minor Adverse (High confidence) or Negligible, which was deemed to be Not Significant. The other potential effects were scoped out for the Principal Aquifer.

Operation phase

5.5.5 The principal effects considered during the groundwater assessment for the Operation phase were as follows:

- Loss of hydrocarbons from motorised vehicles and fuel storage/refuelling facilities (including underground fuel storage tanks).
- De-Icing of roads, walkways and parking areas.
- Peat used in habitat enhancement.
- New drainage regime in developed areas of the Proposed Development.

5.5.6 **General Chemical Test,** Groundwater in the Helsby Sandstone Formation bedrock was identified as the At Risk Receptor in the ES for Use of motorised vehicles and storage of fuel and chemicals, De-Icing of roads and walkways and parking areas For each of

these potential effects scoped in, the Significance of Effect was assessed as Minor Adverse (High confidence) or Negligible, which was deemed to be Not Significant.

5.5.7 **Quantitative Water Balance:** Creation of new drainage regime in developed areas of the Proposed Development was assessed as Minor Adverse (High confidence) or Negligible, which was deemed to be Not Significant.

5.5.8 The other potential effects identified in the ES were scoped out for the Principal Aquifer.

5.5.9 **General Chemical Test, Chemical Drinking Water Protected Area:** The underground fuel storage tanks required additional assessment, which was undertaken as a Conceptual Site Model Report[9]. The results of the assessment conclude a negligible to low risk, travel times in the aquifer are long and likely to result in degradation and complete contaminant destruction of the principal risk drivers. Also, the aquifer quality is compromised in the downgradient area due to Risley landfill meaning it is implausible to consider a future water resource development in close proximity to the Proposed Development.

5.6 Stage 3

5.6.1 The Proposed Development, as indicated throughout the Environmental Statement (ES), would be designed and constructed in line with appropriate guidance and legislation. A Construction Environmental Management Plan (CEMP) (or equivalent) would include appropriate pollution prevention measures, which would prevent polluting materials from entering into the water environment, or minimise the effect if accidental pollution were to occur. The Proposed Development has been designed with appropriate drainage design including the incorporation of SuDS, which would mimic the natural hydrological regime.

5.6.2 Therefore, the Proposed Development is unlikely to cause a deterioration in WFD status class or prevent waterbodies in these catchments from achieving their WFD objectives.

[9] Wardell Armstrong, 2020. EXTRA MSA GROUP, WARRINGTON MSA J11/M62, CONCEPTUAL SITE MODEL REPORT , JANUARY 2020 (Ref. SH11739R019 V2.0)

5.7 Stage 4

5.7.1 Stage 4 is not required.

6 CONCLUSION

6.1.1 The Proposed Development has been determined to have no effects that are likely to cause deterioration in WFD status or prevent waterbodies from achieving their WFD objectives, provided that best practice and established guidance is adhered to.

6.1.2 Bodies of water within the WFD water body have been assessed attributing equal importance whether a watercourse was a headwater tributary or the main river channel that is the reporting unit for WFD classification.

6.1.3 The WFD Screening Assessment has presented the assessment for the local scale Silver Lane Brook and the River Glaze on the water body scale. At either scale, no effect has been identified that risks causing deterioration in WFD status at either spatial scale. The construction and operation phase activities assessed are broadly similar to those presented in the Environmental Statement, which provided impact assessment outcomes with High Confidence. In addition, the assessment for surface water was made for durations appropriate to the temporal scale of the surface water classification cycle (3 years) and the groundwater classification cycle (6 years).

6.1.4 For surface water, the risk of status deterioration for aquatic ecological, water quality and hydromorphological elements was assessed. For aquatic ecological elements, ecological surveys determined that the Proposed Development did not contain protected species or vulnerable receptors that would be impacted by the construction or operation of the Proposed Development. The diversion of the Silver Lane Brook has been assessed and found to be a short-lived and reversible effect for aquatic ecological receptors. Similarly, for hydromorphological elements, the construction will result in a channel form that is likely to lead to betterment, rather than deterioration. It should be noted that the purpose of hydromorphological elements are for defining High status or Supports Good. For surface water quality elements, the assessment presents the risk of deterioration in relation to suspended sediments (silt laden water discharges during construction), hydrocarbons (from construction plant leaks, operation phase car parks and refuelling facilities), and heavy metals (operation phase car parks). These effects are effectively mitigated by the Construction Environmental Management Plan and during operation phase the Sustainable Drainage System train of treatment culminating in a Class I Petrol Interceptor, prior to discharge to the diverted Silver Lane Brook.

6.1.5 The only measure from the WFD programme of measures that applies to the River Glaze surface water body is the Phosphorus Reduction in the Glazebury WwTW measure, which is not relevant to the Proposed Development that would not affect or be served by the Glazebury WwTW.

6.1.6 Although groundwater in the Lower Mersey Basin and North Merseyside Permo-Triassic Sandstone Aquifers groundwater body is within a Principal Aquifer and a Source Protection Zone (SPZ 3), the site is overlain by a 7-13m thick cover of clay-rich Till which provides the groundwater with effective protection from groundwater pollutants. The assessment, which included the assessment of the installation and operation of underground fuel storage tanks within the Till, concluded that no deterioration in WFD status was likely from the Proposed Development.

Table 6.1: WFD Assessment Summary Table for Glaze Surface Water body (following implementation of CEMP)

Activities	WFD objective*						
	Ecological				Chemical		
	Biological quality elements	Hydromorphological supporting elements	Physio-chemical quality elements	Specific pollutants	Priority substances	Other Pollutants	Priority hazardous substances
	Poor by 2015	Supports Good by 2015	Moderate by 2015	High by 2015	Good by 2015	Does not require assessment	Good by 2015
Construction Phase							
Earthworks including excavations	L	N/A	N/A	N/A	N/A	DNRA	N/A
Dewatering of excavations	N/A	N/A	L	N/A	N/A	DNRA	N/A
Loss of hydrocarbons from motorised vehicles and fuel storage/refuelling facilities	L	N/A	L	L	L	DNRA	L
Soil stripping and vegetation removal	N/A	N/A	L	N/A	N/A	DNRA	N/A
Soil compaction	N/A	L	L	N/A	N/A	DNRA	N/A
Construction of impermeable surfaces such as roads / pavements	L	N/A	L	N/A	N/A	DNRA	N/A
Construction of subsurface infrastructure such as foundations.	L	N/A	L	N/A	N/A	DNRA	N/A
Use of cement and concrete/lime stabilisation	L	N/A	L	N/A	N/A	DNRA	N/A
Removal of peat (used in habitat enhancement).	L	N/A	L	L	L	DNRA	L
Gas pipeline – retaining wall in peat	L	N/A	L	L	L	DNRA	L
Working in proximity to the water environment associated with the river diversion	L	L	L	N/A	N/A	DNRA	L
Working in proximity to the water environment associated with watercourse crossing	L	L	L	N/A	N/A	DNRA	L
Operation Phase							
Loss of hydrocarbons from motorised vehicles	L	N/A	L	L	L	DNRA	L
De-Icing of roads, walkways and parking areas	L	N/A	L	L	L	DNRA	L
Proximity to the water environment associated with river diversion.	L	L	L	L	L	DNRA	L
Proximity to the water environment associated with watercourse crossing.	L	L	L	L	L	DNRA	L
Peat used in habitat enhancement	N/A	N/A	N/A	N/A	N/A	DNRA	N/A
Gas pipeline – retaining wall in peat	N/A	N/A	N/A	N/A	N/A	DNRA	N/A
New drainage regime in developed areas of the Proposed Development	L	L	L	N/A	N/A	DNRA	N/A

Note
* From Environment Agency's RBMP.
L - Low risk following implementation of best practice construction measures to be detailed in CEMP.
RPS – Regulatory Position Statement (for dewatering clean groundwater and discharging to surface water)

DNRA	Does not require assessment.
N/A	WFD Element is not applicable to this activity.
L	Low risk of deterioration from current surface water body WFD status.
M	Medium risk of deterioration from current surface water body WFD status.
H	High risk of deterioration from current surface water body WFD status.

Table 6.2: WFD Assessment Summary Table for Lower Mersey Basin and North Merseyside Permo-Triassic Sandstone Aquifers Groundwater Body

Activities	WFD objective*								
	Quantitative				Chemical				
	Quantitative Saline Intrusion	Quantitative Water Balance	Quantitative GWDTEs test	Quantitative Dependent Surface Water body Status	Chemical Drinking Water Protected Area	General Chemical Test	Chemical GWDTEs test	Chemical Dependent Surface Water body Status	Chemical Saline Intrusion
	Good by 2027	Good by 2015	Good by 2015	Good by 2015	Good by 2027	Good by 2015	Good by 2015	Good by 2027	Good by 2027
Construction Phase									
Earthworks including excavations	N/A	L	L	L	L	L	L	L	L
Dewatering of excavations	N/A	L	L	L	N/A	N/A	N/A	N/A	N/A
Use of machinery and storage of chemicals on Proposed Development	N/A	L	L	L	L	L	L	L	L
Soil compaction	N/A	L	L	L	N/A	N/A	N/A	N/A	N/A
Construction of impermeable surfaces such as roads / pavements	N/A	L	L	L	N/A	N/A	N/A	N/A	N/A
Construction of subsurface infrastructure such as foundations	N/A	L	L	L	N/A	N/A	N/A	N/A	N/A
Use of cement and concrete	N/A	N/A	N/A	N/A	L	L	L	L	L
Peat Stabilisation	N/A	L	L	L	L	L	L	L	L
Gas pipeline – retaining wall in peat	N/A	L	L	L	N/A	N/A	N/A	N/A	N/A
Installation of underground fuel storage tanks	N/A	N/A	N/A	N/A	L	L	L	L	L
Operation Phase									
Loss of hydrocarbons from motorised vehicles and fuel storage/refuelling facilities (including underground fuel storage tanks).	N/A	N/A	N/A	N/A	L	L	L	L	L
De-Icing of roads, walkways and parking areas	N/A	N/A	N/A	N/A	L	L	L	L	L
Peat used in habitat enhancement	N/A	L	L	L	N/A	N/A	N/A	N/A	N/A
Creation of new drainage regime in developed areas of the Proposed Development	N/A	L	L	L	N/A	N/A	N/A	N/A	N/A
Underground fuel storage tanks	N/A	N/A	N/A	N/A	L	L	L	L	L

Note
* From Environment Agency's RBMP.

DNRA	Does not require assessment.
N/A	WFD Element is not applicable to this activity.
L	Low risk of deterioration from current groundwater body WFD status.
M	Medium risk of deterioration from current groundwater body WFD status.
H	High risk of deterioration from current groundwater body WFD status.

APPENDIX 1 HARRIS LAMB PROPERTY CONSULTANCY WATER FRAMEWORK DIRECTIVE ASSESSMENT

harrislamb
PROPERTY CONSULTANCY

clearthinking
COMMERCIAL PROPERTY ADVICE

Water Framework Directive Assessment

Warrington Motorway Services

Prepared By:
Harris Lamb | Grosvenor House | 75-76 Francis Road | Edgbaston | Birmingham B16 8SP
Telephone: 0121 455 9455 Facsimile: 0121 455 6595 E-mail: rob.harrison@harrislamb.com

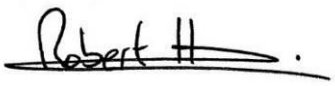
Job Ref: PE00072 Date: 30th April 2019

Water Framework Directive Assessment

Warrington Motorway Services

Main Contributors
Rob Harrison BSc MSc MCIEEM & Joshua Randhawa BSc

Issued By



Signature……

Print Name: Rob Harrison

Date: 30/04/2019

Approved By

Signature……

Print Name: Holly Smith

Date: 30/04/2019

CONTENTS

EXECUTIVE SUMMARY

Harris Lamb Property Consultants (HLPC) were commissioned by Wardell Armstrong to complete a Water Framework Directive (WFD) assessment for a new Motorway Service Area (MSA) at Warrington. The footprint of infrastructure would require the realignment of Willow Brook which is the subject of this WFD assessment. This WFD assessment reports on the likely impacts of realignment of this brook and provides recommendations for WFD compliance.

The scheme as proposed is likely to have short term impacts during construction phase which will disturb the fluvial waterbody whilst it is being repositioned. However, the new channel would be designed to have significant enhancements installed which would be of benefit to the overall ecological status of the watercourse. With the implementation of pollution prevention measures and the design to enhance the new channel, it is considered that improvements will be seen for ecological status. All WFD receptors can be screened out as having negligible impact as a result of the scheme provided the correct mitigation is applied. No deterioration is anticipated for either fluvial or ground waterbodies and WFD status would be maintained or improved.

1.0 INTRODUCTION

1.1 Background

1.1.1 A strategic review of the Motorway Service Area (MSA) provision by Extra MSA Group along the M62 / M6 / M58 / M60 / M61 corridor within the areas occupied by Greater Manchester, Warrington and St Helens has been undertaken in accordance with the Government policy set out in Circular 02/2013 'The Strategic Road Network and the Delivery of Sustainable Development' and the objective and clear recommendation of Highways England (as part of the National Planning Policy Framework).

1.1.2 This review confirmed that there was a significant gap in the MSA provision along this motorway corridor and a new MSA to address essential public road safety 'need' and provide motorists with high quality facilities to take a break, relax and refresh before continuing their journey.

1.1.3 The review also identified that Junction 11 of the M62 was an optimal location to address the gap between existing services with the proposed Site being central to the area of deficiency and development land being available within the north eastern quadrant of the junction.

1.1.4 Following the above review, full consideration and assessment of creating a new MSA on the Site has been implemented by Extra MSA Group.

1.1.5 The proposed location of the new MSA and footprint of infrastructure would require the realignment of Willow Brook. As a result, the Water Framework Directive (WFD) status of the watercourse will need to be assessed and shown to have no deterioration in status in order to be complaint with WFD legislation. This WFD assessment reports on the likely impacts of realignment of this brook and provides recommendations for WFD compliance.

1.2 Site location

1.2.1 The site is located to the north east of Warrington with junction 11 of the M62 running along the southern boundary. The site comprises c.12 hectares of arable land. The land adjacent to the west is a decommissioned landfill site which has been remediated.

Figure 1. Site location

2.0 LEGISLATION

2.1.1 The WFD came into force in 2000 and was transposed into UK law in 2003. The principal aims of the WFD are to protect and improve the water environment and promote the sustainable use of water. Environmental Quality Standards[1] for priority substances were set by the daughter directive to the WFD[2] and the Groundwater Directive[3]. The environmental objectives of the WFD are to:

- prevent deterioration of aquatic ecosystems;
- protect, enhance and restore waterbodies to Good status; which is based on ecology (with its supporting hydromorphological and physico-chemical factors) and chemical factors for surface water, and water quantity and chemical status for groundwater;
- comply with water related standards and objectives for environmentally protected areas established under other European Union (EU) legislation;
- progressively reduce pollution from priority substances and cease or phase out discharges of priority hazardous substances; and
- prevent or limit the input of pollutants into groundwater and reverse any significant or sustained upward trends in the concentration of any groundwater pollutant.

2.1.2 The WFD sets a default objective for all rivers, lakes, estuaries, groundwater and coastal waterbodies to achieve Good status by 2027 at

[1] Council Directive 2008/105/EC of the European Parliament and of the Council of 16 December 2008 on environmental quality standards in the field of water policy, amending and subsequently repealing Council Directives 82/176/EEC, 83/513/EEC, 84/156/EEC, 84/491/EEC, 86/280/EEC and amending Directive 2000/60/EC of the European Parliament and of the Council (the Priority Substances Directive).

[2] The Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015.

[3] Council Directive 2006/118/EC of the European Parliament and of the Council of 12 December 2006 on the protection of groundwater against pollution and deterioration (the Groundwater Directive) including Commission Directive 2014/80/EU which amends Annex II of the original Directive 2006/118/EC.

the latest. Where it is not possible to achieve Good status by 2027, alternative waterbody objectives can be set. The current (baseline) status, and the measures required to achieve the 2027 status objective are set out, for each waterbody, in the relevant River Basin Management Plans (RBMPs). The plans provide the baseline condition of the water environment at the time of publication, and indicate the measures needed and timescales required to attain their target status.

Surface Water / Fluvial Waterbodies

2.1.3 For surface waterbodies, overall waterbody status has an ecological and a chemical component. Ecological status is measured on the scale of high, good, moderate, poor and bad. Chemical status is measured as good or fail, based on the presence or absence of priority substances which present a risk to the environment. Good ecological status (GES) is defined as a slight variation from undisturbed natural conditions, with minimal distortion arising from human activity. The ecological status of waterbodies is determined by examining biological elements (e.g. fish, invertebrates, plants) and a number of supporting elements and conditions, including physico-chemical (e.g. metals and organic compounds), and hydromorphological (e.g. depth, width, flow, and 'structure') factors.

Ground waterbodies

2.1.4 For ground waterbodies, Good status has quantitative and chemical components that are assessed via a series of tests. Together, these provide a single final classification: good or poor status. Quantitative status is evaluated on the basis of overall aquifer water balance, impacts of abstraction on dependent surface waters or wetlands and potential for saline intrusion. Chemical status is evaluated on the basis of evidence for impacts of poor water quality on dependent surface waters or wetlands or deterioration of the quality of groundwater used for potable supply.

3.0 METHODOLOGY

3.1 Site visit / River Corridor Survey

3.1.1 To understand the site the watercourse was visited by the WFD surveyor. The aim of the site visit was to ground truth desk study information and undertake a River Corridor Survey (RCS). The RCS aims to map the habitats and features of the brook to provide a record of the existing conditions. The existing conditions can then be used to provide targets for features to include in any new channel design.

3.1.2 RCS followed the standard methodology as outlined by the National Rivers Authority RCS manual[4].

3.2 WFD methodology

3.2.1 The WFD assessment methodology follows a structure to determine potential impacts as a result of activities impacting a watercourse. This covers construction phases and operational phases. Accordingly, the WFD assessment collates data and presents the discussion on WFD status as follows:

- WFD waterbodies screened in;
- WFD waterbodies screened out;
- baseline conditions of waterbodies screened in;
- assessment of impacts;
- assessment for cumulative impacts;
- review of relevant WFD mitigation measures and whether these can be implemented;
- discussion on delivering 'Good Ecological Status', and
- conclusion on overall WFD impact as a result of the scheme.

[4] National River Authority (1992). River Corridor Survey Methods and Procedures – Conservation Technical Handbook No. 1.

3.3 Limitations

3.3.1 All survey was undertaken at an ideal time of year and during good weather and low flow conditions which is ideal for assessment.

3.3.2 Detailed design is not yet available for the scheme. Therefore, this WFD assessment is based on the outline/high level design information. This will allow the overall WFD impacts to be determined. However, the report should be updated as the design progresses to determine whether additional detail would change the findings.

3.3.3 The WFD mitigation measures for WFD Cycle 2 were requested from the Environment Agency. Their response stated that these mitigation measures have not been published for this area of the catchment. Therefore, for the purpose of this report, generic mitigation measures based of the WFD status of the waterbodies have been suggested based on the assessor's experience.

4.0 RESULTS AND DISCUSSION

4.1 River Corridor Survey

4.1.1 A River Corridor Survey has been completed for Willow Brook within the site boundary area subject to watercourse realignment. The assessment was undertaken on 29th April 2019 by Harris Lamb aquatic ecologist Rob Harrison BSc MSc MCIEEM and assisted by Miles Haslam BSc. Mapping for the RCS is provided in Appendix 1. Photographs for general character and key river features as shown on the RCS map are provided in Appendix 2.

General watercourse character

4.1.2 The general character of Willow Brook was of a straightened channel with a trapezoidal profile indicating previous realignment. The setting adjacent to an agricultural field suggests that the brook has previously been realigned to aid drainage of the field and accommodate agricultural practices. The channel emerges from a culverted section and flows north into Glaze Brook. Within the site boundary Willow Brook flows through two short c.10m culvert pipes which have been installed to allow the crossing of foot traffic and farm vehicles.

4.1.3 Surrounding land use was an arable field on the left bank, occasional scrub on the right bank with a track and decommissioned landfill site beyond.

4.1.4 Substrates were predominantly silt and the earth banks were approximately 2-3 m high on each bank with a 45º angle. There were a few short sections of bank reinforcement consisting of rip rap and gabions. The wetted channel was typically c.1.5m and c.0.2m deep. Flows were either slow or non-perceptible and it is likely that the watercourse could dry up during prolonged dry weather conditions. This was reinforced by the presence of more terrestrial species such as Coltsfoot *Tussilago farfara* within the channel in some locations.

4.1.5 Plant species identified during the survey are presented in Table 1 below. Species assemblages were typical of a eutrophic ditch/brook. No species of note were encountered other than a small patch of the invasive non-native Japanese Rose *Rosa rugosa* on the left bank top at National Grid Reference: SJ66969351.

Table 1. Vegetation recorded

Common name	Taxonomic name	Abundance (DAFOR scale)
Bank / bank top		
Japanese rose	*Rosa rugosa*	R
Greater willowherb	*Epilobium hirsutum*	O
Meadowsweet	*Filipendula ulmaria*	O
Nettle	*Urtica dioica*	F
Cleavers	*Galium aparine*	F
Broad-leaved dock	*Rumex obtusifolius*	F
Bramble	*Rubus fruticosus* agg.	F
Tufted forget-me-not	*Myosotis laxa*	O
Red campion	*Silene dioica*	O
Hogweed	*Heracleum sphondylium*	O
Bittersweet	*Solanum dulcamara*	O
Creeping thistle	*Cirsium arvense*	O
Creeping buttercup	*Ranunculus repens*	O
Cow parsley	*Anthriscus sylvestris*	O
Wavy bitter-cress	*Cardamine flexuosa*	O
Emergent		
Lesser water-parsnip	*Berula erecta*	O
Celery-leaved buttercup	*Ranunculus scleratus*	R
Water forget-me-not	*Myosotis scorpioides*	O
Soft rush	*Juncus effusus*	O
Creeping bent	*Agrostis stolonifera*	F
Bulrush	*Typha latifolia*	F
Reed canary-grass	*Phalaris arundinacea*	F
Water cress	*Rorippa nasturtium aquaticum*	O
Water plantain	*Alisima plantago aquatica*	O
Water horestail	*Equisetum fluviatile*	O
Coltsfoot	*Tussilago farfara*	R
Common comfrey	*Symphytum officinale*	O
Lesser water-parsnip	*Berula erecta*	O
Floating leaved		
Floating sweet-grass	*Glyceria fluitans*	O
Common duckweed	*Lemna minor*	O
Common water-starwort	*Callitriche stagnalis*	O
Submerged		
Green algae	*Cladophora glomerate* agg.	O

4.2 Requirement for WFD assessment

4.2.1 WFD assessment is required as the scheme involves works to divert a c.580m section of the Willow Brook on the western boundary of the site. The proposed diversion is shown on Drawing Number: SH11739-002 provided in support of this report.

4.2.2 Construction works will also involve groundworks and the extraction of peat which has the potential to impact ground waterbodies. Furthermore, operation of the MSA could have implications for water chemistry.

4.3 WFD waterbodies screened in

Fluvial Waterbodies

4.3.1 Willow Brook is a fluvial waterbody and will be directly impacted via diversion within the proposed scheme. WFD data is not published within the Environment Agency Catchment Data Explorer[5] for this waterbody, however, Willow Brook flows into the main river Glaze Brook (GB112069061420), for which there is Catchment Data Explorer data available[6]. Glaze Brook is located c.2.2km downstream of the area of Willow Brook within the proposed development area. No direct impacts are anticipated but there is potential for indirect impacts due to pollution events and water chemistry influences. Therefore, Glaze Brook (GB112069061420) has been screened into this assessment.

Ground Waterbodies

4.3.2 The works footprint is within the GB41201G101700 Lower Mersey Basin and North Merseyside Permo-Triassic Sandstone Aquifers[7]. There is potential for direct and indirect impacts as a result of works and this groundwater body has been screened into the WFD assessment.

[5] https://environment.data.gov.uk/catchment-planning/ [accessed 21/3/19]

[6] https://environment.data.gov.uk/catchment-planning/WaterBody/GB112069061420 [accessed 21.03.2019]

[7] https://environment.data.gov.uk/catchment-planning/WaterBody/GB41201G101700 [accessed 21.03.2019]

4.4 WFD waterbodies screened out

4.4.1 There are no waterbodies identified upstream of Willow Brook and this is the upstream limit of this part of the catchment.

4.4.2 The fluvial waterbody downstream of Glaze Brook is GB112069061011 Mersey/ Manchester Ship Canal (Irwell/Manchester Ship Canal to Bollin)[8] which is located c.3.8km downstream of Glaze Brook and c.6.0km from the area of Willow Brook within the proposed development area. No direct impacts are anticipated for this waterbody. Due to the significant distance and likely dilution effects of any water chemistry impacts within Willow Brook, any impacts to GB112069061011 Mersey/ Manchester Ship Canal (Irwell/Manchester Ship Canal to Bollin) are likely to be negligible. This waterbody has been screened out of this WFD assessment.

4.5 Baseline condition of waterbodies screened in

Glaze Brook (GB112069061420) fluvial waterbody

4.5.1 Table 2 below shows the current WFD cycle 2 data from the Environment Agency Catchment Data Explorer for Glaze Brook (GB112069061420) fluvial waterbody[9]. The status of the waterbody is currently classed as 'Poor' and 'not designated artificial or heavily modified'.

GB41201G101700 Lower Mersey Basin and North Merseyside Permo-Triassic Sandstone Aquifers ground waterbody

4.5.2 Table 3 below shows the current WFD cycle 2 data from the Environment Agency Catchment Data Explorer for Lower Mersey Basin and North Merseyside Permo-Triassic Sandstone Aquifers (GB41201G101700) ground waterbody[10]. The status is currently classed as 'Poor'.

[8] https://environment.data.gov.uk/catchment-planning/WaterBody/GB112069061011 [accessed 21.03.2019]

[9] https://environment.data.gov.uk/catchment-planning/WaterBody/GB112069061420 [accessed 21.03.2019]

[10] https://environment.data.gov.uk/catchment-planning/WaterBody/GB41201G101700 [accessed 21.03.2019]

Table 2. GB112069061420 Glaze Brook

Classification Item	2013	2014	2015	2016
Overall Water Body	Moderate	Poor	Poor	Poor
Ecological	Moderate	Poor	Poor	Poor
Biological quality elements	Moderate	Poor	Poor	Poor
Macrophytes and Phytobenthos Combined	Good	Good	Moderate	Poor
Fish	Moderate	Moderate	Moderate	Poor
Invertebrates	-	Poor	Poor	Poor
Hydromorphological Supporting Elements	Supports Good	Supports Good	Supports Good	Supports Good
Hydrological Regime	Supports Good	Supports Good	Supports Good	Supports Good
Morphology	Supports Good	Supports Good	Supports Good	Supports Good
Physico-chemical quality elements	Moderate	Moderate	Moderate	Moderate
Ammonia (Phys Chem)	Good	Moderate	Moderate	Moderate
Biochemical Oxygen Demand (BOD)	Good	Moderate	Moderate	Poor
Dissolved oxygen	Good	Good	Good	Good
pH	High	High	High	High
Phosphate	Poor	Poor	Poor	Poor
Temperature	High	High	High	High
Specific pollutants	Moderate	Moderate	High	High
Triclosan	Moderate	Moderate	High	High
Manganese	-	-	-	High
Copper	High	High	High	High
Iron	-	-	High	High
Zinc	High	High	High	High
Chemical	Fail	Fail	Good	Good
Priority substances	Fail	Fail	Good	Good
Lead and its Compounds	Good	Good	Good	Good
Nickel and its Compounds	Fail	Fail	Good	Good
Other Pollutants	Does not require assessment	Does not require assessment	Does not require assessment	Does not require assessment
Priority hazardous substances	Good	Good	Good	Good
Brominated diphenylether (BDPE) Calc	-	-	Good	-
Benzo (b) and (k) fluoranthene	-	-	Good	Good
Benzo (ghi) perylene and indeno (123 cd) pyrene	-	-	Good	Good
Benzo(a)pyrene	-	-	Good	Good
Cadmium and its Compounds	Good	Good	Good	Good
Di(2 ethylhexyl)phthalate (Priority hazardous)	Good	Good	Good	Good
Mercury and its Compounds	-	-	Good	Good
Nonylphenol	Good	Good	Good	Good
Tributyltin Compounds	Good	Good	-	-

Table 3. GB41201G101700 Lower Mersey Basin and North Merseyside Permo-Triassic Sandstone Aquifers

Classification Item	2013	2014	2015	2016
Overall Water Body	Poor	Poor	Poor	Poor
Quantitative	Poor	Poor	Poor	Poor
Quantitative Status element	Poor	Poor	Poor	Poor
Quantitative Saline Intrusion	Poor	Poor	Poor	Poor
Quantitative Water Balance	Good	Good	Good	Good
Quantitative GWDTEs test	Good	Good	Good	Good
Quantitative Dependent Surface Water Body Status	Good	Good	Good	Good
Chemical (GW)	Poor	Poor	Poor	Poor
Chemical Status element	Poor	Poor	Poor	Poor
Chemical Drinking Water Protected Area	Poor	Poor	Poor	Poor
General Chemical Test	Good	Good	Good	Good
Chemical GWDTEs test	Good	Good	Good	Good
Chemical Dependent Surface Water Body Status	Poor	Poor	Poor	Poor
Chemical Saline Intrusion	Poor	Poor	Poor	Poor

4.6 Assessment of impacts

4.6.1 An assessment of WFD elements that could be affected by the proposed changes in river morphology have been provided in Tables 4 and 5 below for the respective fluvial and ground waterbodies that have been screened in. Rationale for the WFD elements screened in or out has been provided.

Table 4. GB112069061420 Glaze Brook

WFD element	Assessment of impacts
Macrophytes and Phytobenthos	The proposed channel realignment will remove the existing macrophytes and phytobenthos from the channel in its current location. Upon reinstatement of the new channel it is considered that the flora will readily colonise the new channel. This would be aided by additional planting and reseeding of the banks where appropriate. Therefore, impacts will be temporary in nature and the new channel can be designed to allow greater diversity in macrophyte assemblages. No significant long-term negative impacts upon macrophytes or phytobenthos are anticipated and increased biodiversity is likely to be seen as a result of the

WFD element	Assessment of impacts
	development. In addition, the adoption of Pollution Prevention Guidelines will limit any indirect impacts upon these WFD receptors. Hence, no significant impacts upon macrophytes or phytobenthos are anticipated [SCREENED OUT].
Fish	No fish were noted within the watercourse during the site visit and due to the ditch like nature of the watercourse it is expected that only small numbers of robust species such as stickleback *Gasterosteidae* would be present in the reach. During works to protect and remove fish from harms way the channel will be electro-fished prior to the channel being drained. Fish would be placed downstream and following the channel works they would be able to readily recolonise the site. In addition, the adoption of Pollution Prevention Guidelines will limit any indirect impacts upon these WFD receptors and no significant impacts upon fish are anticipated [SCREENED OUT].
Invertebrates	The repositioning of the channel would remove invertebrates from the works footprint in the short term. However, following opening of the new channel the habitats have been designed to improve channel morphology which will be of benefit to invertebrates. Due to the ephemeral nature of invertebrates recolonisation is anticipated to occur readily upon completion of the works and no long-term negative impacts are anticipated. In addition, the adoption of Pollution Prevention Guidelines will limit any indirect impacts to these WFD receptors and no significant impacts upon benthic invertebrates are expected [SCREENED OUT].
Hydrological Regime	The new channel will be designed to improve morphology and no impacts are anticipated that could affect the hydrological regime of the watercourse in this location. The hydrological regime is expected to remain the same as it is currently albeit within the new channel location [SCREENED OUT].

WFD element	Assessment of impacts
Morphology	**River depth and width variation** – Currently the channel is straightened and shows previous management to function as a drainage ditch for the surrounding agricultural land. The new channel will be designed to increase the river length and provide additional morphological features. For example variation in flow types will be encouraged by increasing sinuosity of the channel and through the installation of deflectors where appropriate [SCREENED OUT]. **Structure and substrate of the river bed** – Although the channel is being moved, the structure and substrate of the river bed will be kept the same and no significant changes to this aspect of river morphology are anticipated [SCREENED OUT]. **Structure of the riparian zone** – The riparian zone will be altered, but the design will be to increase the diversity and improve structure of the riparian zone from its current condition. Planting schemes will be developed to enhance the riparian zone and ensure a buffer between the development and the watercourse [SCREENED OUT].
Water Chemistry/Pollution	**Thermal conditions** - the proposed works do not have the potential to significantly impact thermal conditions within the river system [SCREENED OUT]. **Oxygenation conditions** - the proposed works may cause suspension of silt and impact upon dissolved oxygen within the river. However, Pollution Prevention Guidance and silt management measures will be followed, and dissolved oxygen levels will be monitored. As a result, no significant impact upon dissolved oxygen is anticipated as a result of the planned works [SCREENED OUT]. **Salinity** – the proposed works would not cause increased salinity during construction phase. However, there is potential for the operation of the MSA to increase salinity (e.g. salt spreading during winter). However, the design of the scheme will incorporate measures to filter drainage

WFD element	Assessment of impacts
	water coming from the site. Buffers between the development and the watercourse will also be installed and planted to allow filtration of any runoff before it enters the watercourse. Provided these measures are included the developments operation should have minimal impact on salinity within the watercourse [SCREENED OUT]. **Acidification status** - works associated with the construction and operation phases are not known to have a link with acidification and are therefore not considered to have a significant impact upon this WFD receptor [SCREENED OUT]. **Nutrient conditions** – the proposed works during construction phase have the potential to suspend silt and associated nutrients which may increase nutrient concentrations within the river. However, Pollution Prevention Guidance will be followed. Similarly, the temporary nature and limited area of work is not anticipated to have any significant or permanent impact upon nutrient conditions. As a result, no significant impact upon nutrient conditions is anticipated as a result of the channel widening works. Operation phase of the MSA may also increase nutrient input as a result of increased anthropogenic activity in the area. However, the design of the scheme will incorporate measures to filter drainage water coming from the site. Buffers between the development and the watercourse will also be installed and planted to allow filtration of any runoff before it enters the watercourse. Provided these measures are included the developments operation should have minimal impact on nutrient input within the watercourse [SCREENED OUT].

Table 5. GB41201G101700 Lower Mersey Basin and North Merseyside Permo-Triassic Sandstone Aquifers

WFD element	Assessment of impacts
Quantitative status element	
Water balance	Water balance is not anticipated to be impacted as a result of the development. Although works require breaking of ground, this would not be at a depth or in an area that would impact the water balance [SCREENED OUT].
Dependent surface water body status	Within the area the GB112069061420 Glaze Brook fluvial waterbody is present and covered within this WFD assessment. No barriers would be installed that would limit water connectivity between the fluvial waterbody and the ground waterbody. Therefore, there are no anticipated impacts that could cause deterioration of a dependent surface waterbody [SCREENED OUT].
Chemical status element	
Chemical drinking water protected area	The site falls within a drinking water protected area. During construction phase pollution prevention measures will be adopted to prevent deterioration to drinking water. Similarly, during operation, the design of the scheme will incorporate measures to filter drainage water coming from the site. Buffers between the development and the watercourse will also be installed and planted to allow filtration of any runoff. Provided these measures are included the developments operation should have minimal impact on drinking water [SCREENED OUT].
General chemical test	During construction phase pollution prevention measures will be adopted to prevent deterioration to the ground waterbody. Similarly, during operation, the design of the scheme will incorporate measures to filter drainage water coming from the site. Buffers between the development and the watercourse will also be installed and planted to allow filtration of any runoff.

WFD element	Assessment of impacts
	Provided these measures are included the developments operation should have minimal impact on the chemical status of the ground waterbody [SCREENED OUT].
Chemical dependent surface water body status	During construction phase pollution prevention measures will be adopted to prevent pollution reaching the ground waterbody. Similarly, during operation, the design of the scheme will incorporate measures to filter drainage water coming from the site. Buffers between the development and the watercourse will also be installed and planted to allow filtration of any runoff. Provided these measures are included the developments operation should have minimal impact on the chemical status of the ground waterbody or any dependent surface waterbody [SCREENED OUT].
Saline intrusion	There is potential for the operation of the MSA to increase salinity e.g. salt spreading during winter. This could find its way to the ground waterbody. However, the design of the scheme will incorporate measures to filter drainage water coming from the site. Buffers between the development and the watercourse will also be installed and planted to allow filtration of any runoff before it enters the fluvial watercourse and prevent saline reaching any ground waterbody. Provided these measures are included the developments operation should have minimal impact on saline intrusion to ground waterbodies [SCREENED OUT].

4.7 Cumulative effects

4.7.1 The following schemes in the local area have been identified:

- 96/35737 – PROPOSED DEVELOPMENT OF 2 NO INDUSTRIAL/WAREHOUSE UNITS - UNIT 1 CAPABLE OF SUB-DIVISION (B2 & B8) ASSOCIATED SERVICING & CAR PARKING

- A02/46361 – CONSTRUCTION AND OPERATION OF LANDFILL GAS UTILISATION SYSTEM COMPRISING FLARING EQUIPMENT, TWO ELECTRICITY GENERATING ENGINES AND ASSOCIATED EQUIPMENT AND ELECTRICITY SUB STATION.
- A00/40869 - FULL APPLICATION FOR B2 AND B8 INDUSTRIAL UNITS AND ASSOCIATED OFFICES SERVICE AREAS AND CAR PARKING
- 2004/03623 - Remediation of Contaminated Soils using Biological Activity (Completed in 2011)
- 2009/15667 - Proposed refurbishment of vacant industrial unit to include alterations to 2 no. vehicular access & the installation of 2 external condensers at ground floor level.

4.7.2 It is not considered that any of the above schemes would have an impact on waterbodies and therefore a cumulative impact is not anticipated that could cause deterioration of WFD status.

4.8 Relevant WFD mitigation measures

4.8.1 Mitigation measures have not been published within the River Basin Management Plan for Glaze Brook GB112069061420 or GB41201G101700 Lower Mersey Basin and North Merseyside Permo-Triassic Sandstone Aquifers. Consultation was undertaken with the Environment Agency to determine whether they held any internal documentation for mitigation measures, but this information was not available. Therefore, there are no published mitigation measures that the scheme could prevent from being attained.

4.8.2 Since no published mitigation measures are available, generic mitigation has been proposed in the recommendations (see Section 5.2). Following these recommendations would ensure no deterioration to WFD status as a result of the scheme.

4.9 Delivering GES

4.9.1 The scheme as proposed will not prevent the achievement of Good Ecological Status (GES).

4.9.2 Measures would be put in place to ensure that both fluvial and ground waterbodies are protected during the construction phase and operation of the MSA. In particular, the inclusion of pollution prevention measures and scheme design to filter drainage water will limit pollution impacts which are the greatest concern from the scheme.

4.9.3 The design also incorporates enhancement of the new channel. This includes increasing the overall length and sinuosity of the channel which will provide additional habitat areas and increase biodiversity. The planting scheme also has potential to increase diversity and improve both the diversity of channel macrophytes and riparian zone structure.

4.9.4 Overall with the implementation of pollution prevention measures and the design to enhance the new channel, it is considered that improvements will be seen for ecological status and the MSA as proposed would help to deliver GES.

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusion

5.1.1 In conclusion, the scheme as proposed is likely to have short term impacts during construction phase which will disturb the fluvial waterbody whilst it is being repositioned. However, the new channel would be designed to have significant enhancements installed which would be of benefit to the overall ecological status of the watercourse. With the implementation of pollution prevention measures and the design to enhance the new channel, it is considered that improvements will be seen for ecological status. All WFD receptors can be screened out as having negligible impact as a result of the scheme provided the correct mitigation is applied. No deterioration is anticipated for either fluvial or ground waterbodies and WFD status would be maintained or improved.

5.2 Recommendations

5.2.1 The existing design proposals for the watercourse, site drainage and landscaping submitted with this application will allow compliance with the WFD and prevent deterioration of waterbodies. In addition, it is recommended that additional measures are included to cover toolbox talks, fish rescue, biosecurity and pollution prevention. These are detailed below.

Toolbox Talks

5.2.2 To ensure compliance with the WFD all site personnel should be instructed on their responsibilities via toolbox talk at site induction and a record kept to show that they have been briefed. The toolbox talk should make them aware of waterbodies and measures such as pollution prevention that they need to action on site.

Fish rescue

5.2.3 Prior to works in the wetted channel and any drainage of the channel a fish recue should be undertake. This can be done via electrofishing from a qualified and experienced fisheries consultant. Fish removed should be placed downstream away from the works area. Note that the movement of fish will require a licence from the Environment Agency and this should be applied for in advance.

Biosecurity

5.2.4 Due to the presence of invasive species associated with the brook biosecurity is required. Good biosecurity practices are vital for preventing the spread of invasive non-native species and pathogens such as waterborne fish diseases/crayfish plague. General biosecurity measures can include:

- All site personnel and visitors to be inducted in good biosecurity practices. This can include adoption of the check-clean-dry campaign: http://www.nonnativespecies.org/checkcleandry/ [site accessed: 03/05/19].
- The check-clean-dry poster could be displayed in the site office as a reminder of good biosecurity practices: http://www.nonnativespecies.org/downloadDocument.cfm?id=608 [site accessed: 03/05/19].
- If access to the water is required, particular care should be taken, and equipment and PPE should be checked and cleaned to prevent the spread of invasive species and waterborne diseases. A suitable disinfectant would be Virkon® S Aquatic. Following application of a suitable disinfectant, machinery and PPE should be allowed to fully dry for at least 72 hours before being used on another aquatic site.

Pollution Prevention

5.2.5 Appropriate mitigation measures can be implemented to ensure that habitats within proximity of the works are not degraded as a result of pollution events during the construction phase. Mitigation could include:

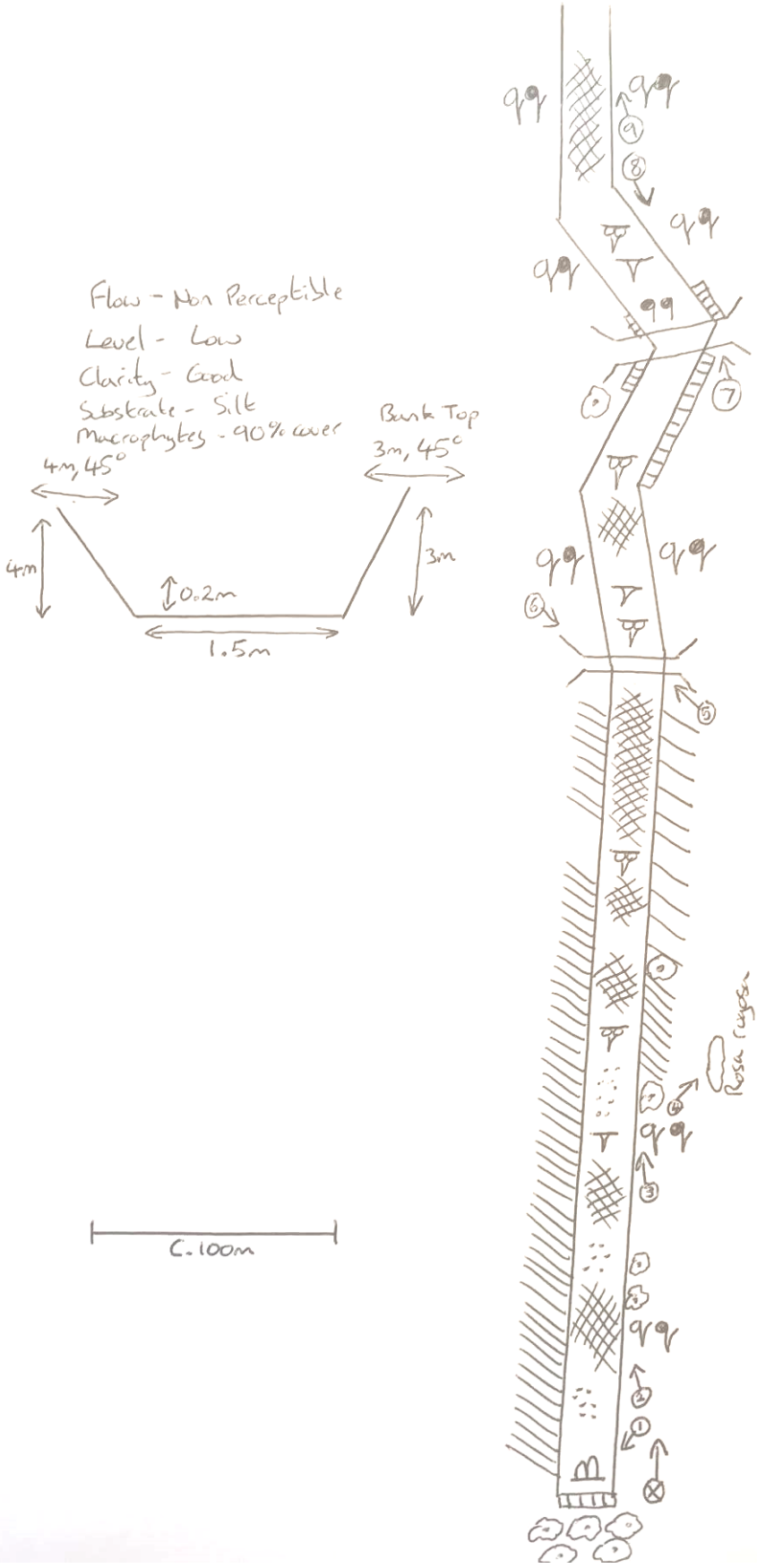
- Abiding by relevant pollution prevention measures e.g. CIRIA Guidance: Control of water pollution from construction sites. Guidance for consultants and contractors (C532D) (Masters-Williams, 2001). Information useful for Toolbox Talks on working near water and pollution prevention can be found at: https://www.ciria.org/Resources/All_toolbox_talks/Env_toolbox_talks/Working_on_or_near_watercourses.aspx [site accessed: 03/05/19].

- Preventing accidental oil and fuel leaks can be achieved by the following actions:
    - Any chemical, fuel and oil stores should be located on impervious bases within a secured bund with a storage capacity 110% of the stored volume.
    - Biodegradable oils and fuels should be used where possible.
    - Drip trays should be placed underneath any standing machinery to prevent pollution by oil/fuel leaks. Where practicable, refuelling of vehicles and machinery should be carried out on an impermeable surface in one designated area well away from any watercourse or drainage (at least 10m).
    - Emergency spill kits should be available on site and staff trained in their use.
    - Operators should check their vehicles on a daily basis before starting work to confirm the absence of leakages. Any leakages should be reported immediately.
    - Daily checks should be carried out and records kept on a weekly basis and any items that have been repaired/replaced/rejected noted and recorded. Any items of plant machinery found to be defective should be removed from site immediately or positioned in a place of safety until such time that it can be removed.
- Silt run off can be prevented by incorporating the following actions:
    - Silt curtains should be used where appropriate to prevent silt from the construction works entering the watercourse.
    - Water quality downstream of the works can be monitored to detect any changes in water quality that could indicate a pollution incident. Should monitoring indicate potential pollution from the construction activities, works should be stopped, and a solution found to prevent the pollution source entering the watercourse. Monitoring could include:
        - Visual monitoring to see if water colour has changed or if a plume is visible indicating sediment input.

- Water quality meter measurements for Dissolved Oxygen and pH.

6.0 APPENDICES

Appendix 1 – River Corridor Survey Map


Flow - Non Perceptible
Level - Low
Clarity - Good
Substrate - Silt
Macrophytes - 90% cover
4m, 45°
Bank Top
3m, 45°
4m
0.2m
3m
1.5m
C.100m
Rosa rugosa


Standard Symbols for use in River Corridor Surveys
AQUATIC AND MARGINAL ZONES
CHANNEL FEATURES
Bridge (road/track)
Footbridge
Lock
Inlet
Weir
Pool
Riffle
Rapids
Run
Waterfall
Protruding rock
Island (with vegetation)
Direction of flow
SUBSTRATE
Mud
Sand
Bare gravel/ shingle
Vegetated gravel/shingle
Cobbles
Boulders
CHANNEL VEGETATION
Emergent Monocots
Emergent Dicots
Submerged Monocots
Submerged Dicots
Bryophytes
Floating leaves
CHANNEL CROSS-SECTION
SURVEY INFORMATION
Direction of survey/bank used
Photograph
BANK AND ADJACENT LAND ZONES
BANK FEATURES
Base of bank
Top of bank
Slump
Stable earth cliff
Eroding earth cliff
Rock cliff
Artificial bank protection
Cattle drink
Shelf / berm
Spring / flush
Inflow stream
Outfall
Dredgings/spoil
ADJACENT LAND FEATURES
Fence
Gate
Road / track
Railway
Footpath
Power lines
Building
Sewage works
Flood bank
Land use category
Defined name / Phase 1 code
VEGETATION
Trees
Conifer
Broadleaf
- overhanging
- fallen
- exposed roots
Woodland + symbol for type
P + symbol
Pollarded tree
(P) + symbol
Tree needs pollarding
C + symbol
Coppiced tree
Sapling
Shrubs/hedgerows
Shrub (single)
Dense shrubs
Sparse shrubs
Hedgerow
Hedgerow with trees
Grasses and herbs
Reed / sedge
Tall grass
Tall herb / ruderal
Tall grass with herbs
Short grass
Mown

Appendix 2 - Site photographs

Plate 1. RCS photograph 1

Plate 2. RCS photograph 2

Plate 3. RCS photograph 3

Plate 4. RCS photograph 4

Plate 5. RCS photograph 5

Plate 6. RCS photograph 6

Plate 7. RCS photograph 7

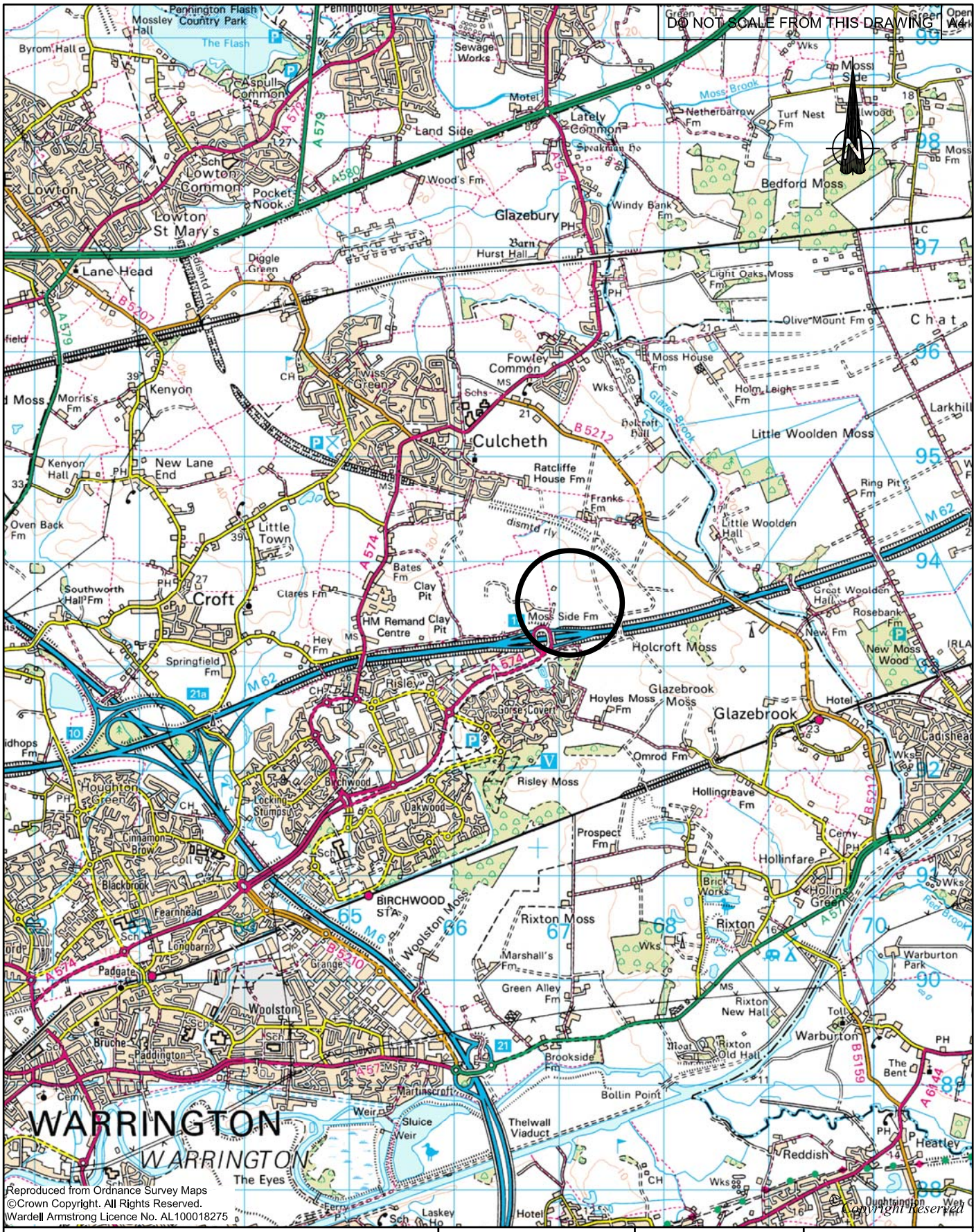
Plate 8. RCS photograph 8

Plate 9. RCS photograph 9

Plate 10. RCS photograph 10

Plate 11. Panoramic view of the application area showing the brook to the left along the boundary

DRAWINGS

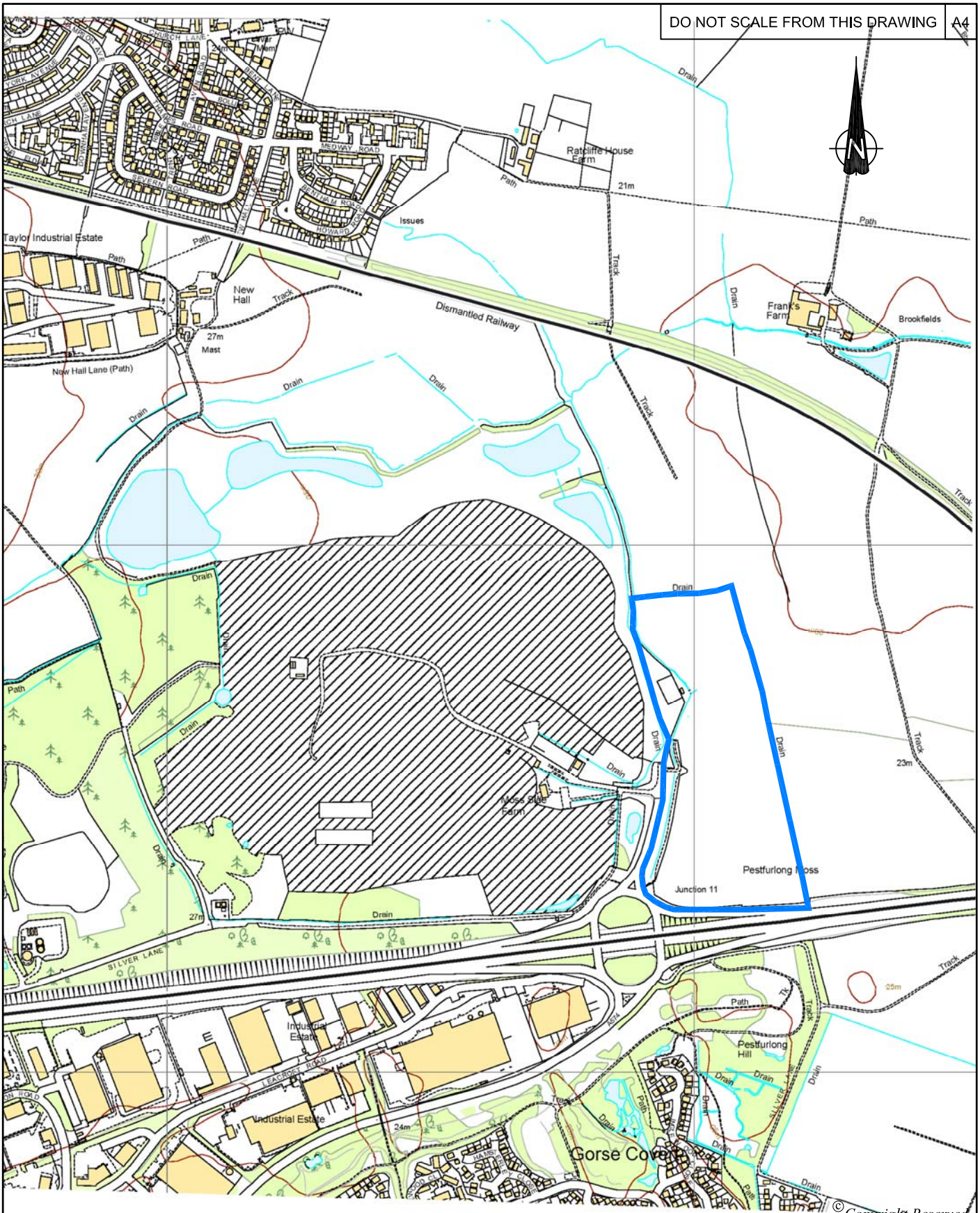


CLIENT	DRG No.	SCALE	DATE
EXTRA MOTORWAY SERVICE AREA GROUP	SH11739-001	1:50000 @ A4	27/01/16
PROJECT	**DRAWN BY**	**CHECKED BY**	**APPROVED BY**
POTENTIAL WARRINGTON MSA	DP	AJD	AJD
DRAWING TITLE			
SITE LOCATION PLAN			

wardell armstrong

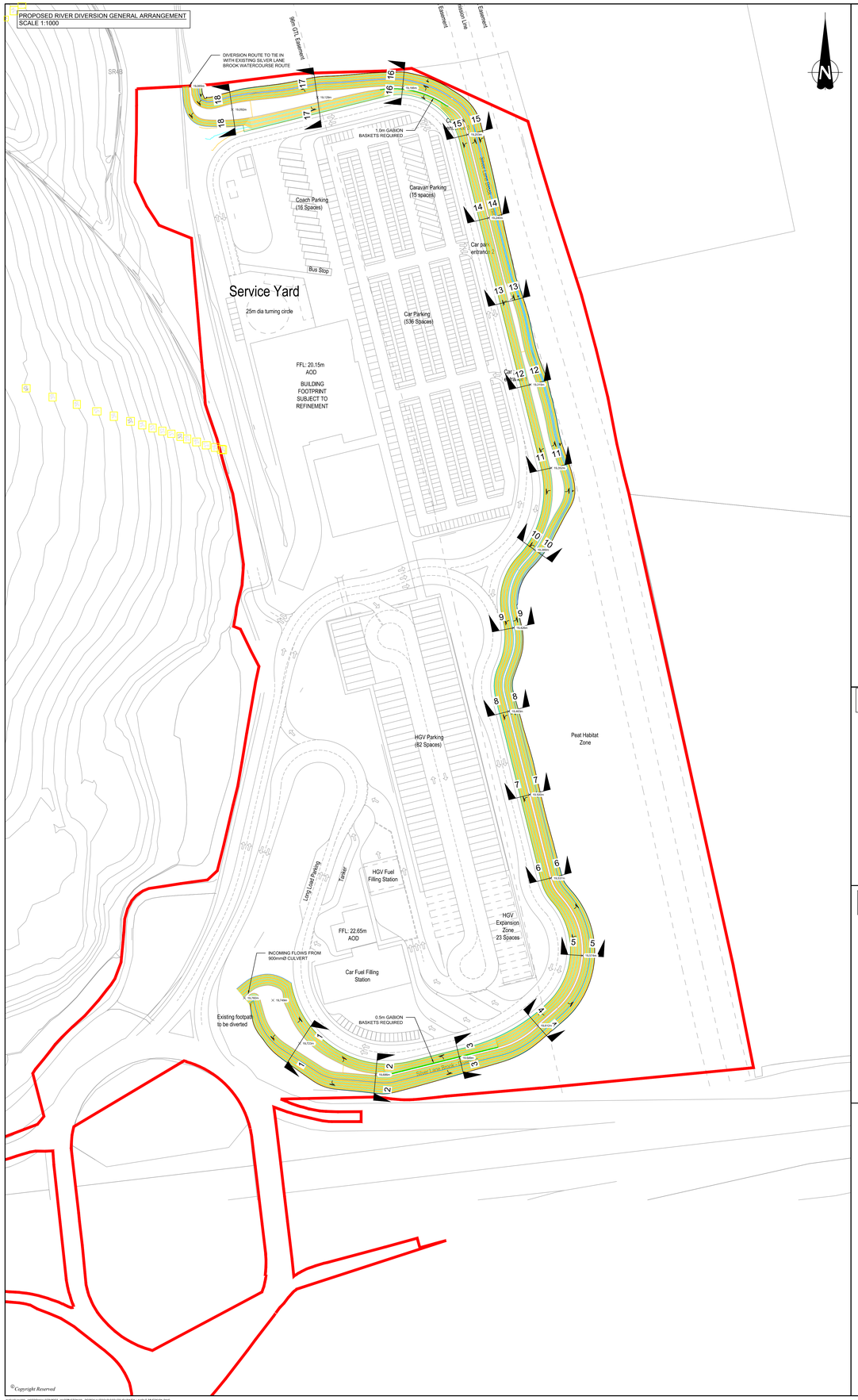
your earth our world

DO NOT SCALE FROM THIS DRAWING | A4



CLIENT: EXTRA MOTORWAY SERVICE AREA GROUP	DRG No.: SH11739-002	SCALE: 1:10000 @ A4	DATE: 27/01/16
PROJECT: POTENTIAL WARRINGTON MSA	DRAWN BY: DP	CHECKED BY: AJD	APPROVED BY: AJD
DRAWING TITLE: SITE PLAN	wardell armstrong — your earth our world		

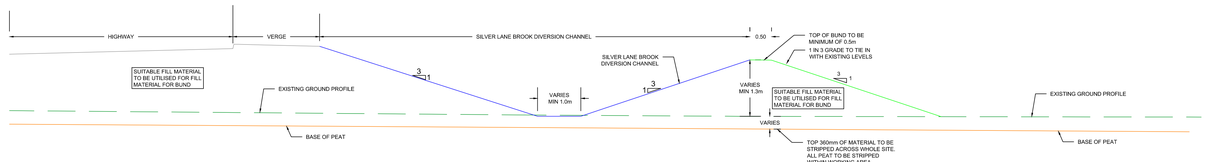
PROPOSED RIVER DIVERSION GENERAL ARRANGEMENT
SCALE 1:1000



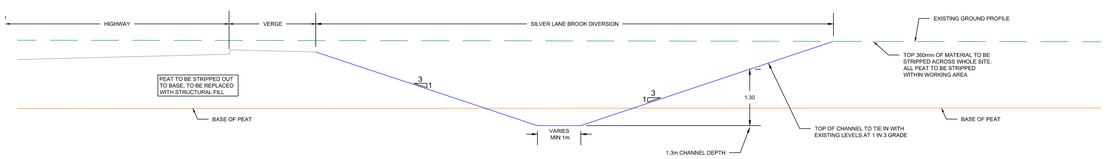
DO NOT SCALE FROM THIS DRAWING

CROSS SECTIONS
SCALE 1:500

TYPICAL SECTION OF SILVER LANE BROOK DIVERSION ABOVE EXISTING GROUND LEVELS
SCALE 1:50



TYPICAL SECTION OF SILVER LANE BROOK DIVERSION BELOW EXISTING GROUND LEVELS
SCALE 1:50



KEY

- EXISTING GROUND PROFILE
- PROPOSED ACCESS ROAD
- BROOK CHANNEL
- BASE OF PEAT

NOTES:

1. FOR OUTLINE PLANNING PURPOSES ONLY.
2. DRAWING TO READ IN CONJUNCTION WITH WARDELL ARMSTRONG FLOOD RISK ASSESSMENT DATED AUGUST 2019.
3. WATER COURSE DIVERSION SUBJECT TO DETAILED DESIGN & ENVIRONMENT AGENCY.
4. DRAWING ONLY SHOWS WATERCOURSE CORRIDOR, EXCLUDING DEVELOPMENT AND PEAT HABITAT ZONE.

REVISION	DETAILS	DATE	DRAWN	CHKD	APPD
D	PLANNING ISSUE. RED LINE BOUNDARY ADDED.	04.06.19	MB	JS	JS
C	ROUTE CHANGED TO SUIT NEW LAYOUT & RETENTION OF PEAT ONSITE	16.07.19	MB	JS	JS
B	ADDITIONAL SPOT HEIGHTS ADDED	15.08.19	MB	JS	JS
A	BROOK DIVERSION ROUTE UPDATED	16.09.19	MB	JS	JS

CLIENT
EXTRA MSA GROUP

PROJECT
MOTORWAY SERVICES, WARRINGTON

DRAWING TITLE
BROOK DIVERSION PLAN AND SECTIONS

DRG No. SH11739-002		REV D	
DRG SIZE A0	SCALE AS SHOWN	DATE 30/04/19	
DRAWN BY MB	CHECKED BY JS	APPROVED BY JS	

wardell armstrong
NEWCASTLE UPON TYNE | TEL 0191 232 0943
WWW.WARDELL-ARMSTRONG.COM
BIRMINGHAM | BOLTON | CARDIFF | CARLISLE | EDINBURGH | GLASGOW | LONDON | MANCHESTER | SHEFFIELD | STOKE ON TRENT

N:\SH\SH11739 - MOTORWAY SERVICES, WARRINGTON\03 - DESIGN\AUTOCAD\SCRATCH\PHZ\NEW LAYOUT\DRDESIGN.DWG

wardell-armstrong.com

STOKE-ON-TRENT
Sir Henry Doulton House
Forge Lane
Etruria
Stoke-on-Trent
ST1 5BD
Tel: +44 (0)1782 276 700

BIRMINGHAM
Two Devon Way
Longbridge Technology Park
Longbridge
Birmingham
B31 2TS
Tel: +44 (0)121 580 0909

BOLTON
41-50 Futura Park
Aspinall Way
Middlebrook
Bolton
BL6 6SU
Tel: +44 (0)1204 227 227

CARDIFF
Tudor House
16 Cathedral Road
Cardiff
CF11 9LJ
Tel: +44 (0)292 072 9191

CARLISLE
Marconi Road
Burgh Road Industrial Estate
Carlisle
Cumbria
CA2 7NA
Tel: +44 (0)1228 550 575

EDINBURGH
Great Michael House
14 Links Place
Edinburgh
EH6 7EZ
Tel: +44 (0)131 555 3311

GLASGOW
2 West Regent Street
Glasgow
G2 1RW
Tel: +44 (0)141 433 7210

LEEDS
36 Park Row
Leeds
LS1 5JL
Tel: +44 (0)113 831 5533

LONDON
Third Floor
46 Chancery Lane
London
WC2A 1JE
Tel: +44 (0)207 242 3243

MANCHESTER
76 King Street
Manchester
M2 4NH
Tel: +44 (0)161 817 5038

NEWCASTLE UPON TYNE
City Quadrant
11 Waterloo Square
Newcastle upon Tyne
NE1 4DP
Tel: +44 (0)191 232 0943

TRURO
Baldhu House
Wheal Jane Earth Science Park
Baldhu
Truro
TR3 6EH
Tel: +44 (0)187 256 0738

International offices:

ALMATY
29/6 Satpaev Avenue
Regency Hotel
Office Tower
Almaty
Kazakhstan
050040
Tel: +7(727) 334 1310

MOSCOW
21/5 Kuznetskiy Most St.
Moscow
Russia
Tel: +7(495) 626 07 67

wardell armstrong

Appendix 5.3 - Great Crested Newt Survey report

wardell-armstrong.com

ENERGY AND CLIMATE CHANGE
ENVIRONMENT AND SUSTAINABILITY
INFRASTRUCTURE AND UTILITIES
LAND AND PROPERTY
MINING AND MINERAL PROCESSING
MINERAL ESTATES
WASTE RESOURCE MANAGEMENT

EXTRA MSA GROUP

MOTORWAY SERVICES, WARRINGTON

GREAT CRESTED NEWT SURVEY REPORT

JULY 2019

wardell armstrong

Wardell Armstrong
41-50 Futura Park, Aspinall Way, Middlebrook, Bolton, BL6 6SU
Telephone: +44 (0)1204 227 227 www.wardell-armstrong.com

DATE ISSUED:	**JULY 2019**
JOB NUMBER:	**SH11739**
REPORT NUMBER:	**003**
VERSION:	**V1.0**
STATUS:	**FINAL**

EXTRA MSA GROUP

MOTORWAY SERVICES, WARRINGTON

GREAT CRESTED NEWT SURVEY REPORT

JULY 2019

PREPARED BY:

Jake Smith — Graduate Ecologist

REVIEWED BY:

Richard Laws — Principal Environmental Scientist/Ecologist

APPROVED BY:

Tim Palmer — Technical Director (Ecology)

CONTENTS

APPENDICES

DRAWINGS	TITLE	SCALE
SH11739-008	Waterbody Location Plan	1:5,000@A3

1 INTRODUCTION

1.1 Terms of Reference

1.1.1 Wardell Armstrong LLP (WA) was commissioned by Extra MSA Group to undertake Environmental DNA (eDNA) testing for great crested newt (GCN) at a proposed Motorway Services Area development (hereafter referred to as the 'site'), located on the northern side of the M62 at Junction 11, central Ordnance Survey (OS) grid reference: SJ 67053 93630.

1.1.2 The site is located immediately adjacent to Junction 11 of the M62, on the north side of the motorway. On site, there are two ditches (WB8 and 9) and a single pond (WB11), there are eight waterbodies located within 500m of the site boundary. All waterbodies are highlighted on Drawing number SH11739-008. Suitable GCN terrestrial habitat including grassland, scrub, arable field margins, mixed broadleaved woodland and wet grassland are present on site. The wider landscape comprises arable farmland/pasture to the east, south east and north, a capped landfill directly west of the site and Birchwood Business and Technology Park to the south west.

1.1.3 Surveys followed recommendations from a Preliminary Ecological Appraisal (PEA) undertaken by Wardell Armstrong in 2018 which recommended that the potential for presence/absence of great crested newts within the site and surrounding area should be investigated further.

1.2 Scoping Consultation

1.2.1 A scoping report was issued to Tameside Metropolitan Borough Council (TMBRC) during December 2018. Comments were returned during February 2019. The scoping response from TMBRC agreed that impacts on great crested newt terrestrial habitat need to be considered in the Environmental Statement (ES). A recommendation of biodiversity net gain was made in line with the NPPF.

1.3 Legislative Framework

1.3.1 All native amphibians receive legal protection in Great Britain arising from the following legislation:

- Wildlife and Countryside Act 1981 (as amended) (in Great Britain).
- Nature Conservation (Scotland) Act 2004.
- Conservation of Habitats and Species Regulations 2010 (as amended).

1.3.2 In England and Wales all amphibians are listed on Schedule 5 of the Wildlife and Countryside Act 1981 and the more threatened species (great crested newt, natterjack toad *Epidalea calamita* and pool frog *Pelophylax lessonae*) are also listed on Schedule 2 of the Conservation of Habitats and Species Regulations (2010 as amended).

1.3.3 It is an offence to deliberately capture, possess, disturb, kill, injure, or trade in great crested newts. In addition, it is an offence to damage or destroy the places they use for breeding or resting.

1.3.4 Other amphibian species, including smooth newt *Lissotriton vulgaris*, palmate newt *Lissotriton helveticus*, common frog *Rana temporaria* and common toad *Bufo bufo* are protected against unlicensed trade. The legislation applies to all life stages of these animals.

2 SURVEY METHODOLOGY

2.1 Desk Study

2.1.1 A desk study was carried out prior to the survey to identify suitable habitats for great crested newts, such as additional water features within the site and within 500m of the site boundary. This included a review of OS maps, aerial photographs and the Multi-Agency Geographical Information for the Countryside (MAGIC) website.

2.1.2 RECORD Local Record Centre were contacted to ascertain whether there were any known records of great crested newts within the last 10 years within a 2km radius of the central grid reference of the site. Any records exceeding a 10-year period are omitted from reference in the report.

2.2 Field Survey

2.2.1 The eDNA testing of the eleven waterbodies was carried out on the 15th April 2019 and 3rd May 2019. Methodologies were undertaken in strict accordance with the relevant DEFRA guidelines[1] (Biggs et al., 2014).

2.2.2 The following field sampling protocols were followed when taking water samples of each pond:

- Twenty sub-samples at each pond were taken and evenly spaced around the pond margin and where possible, targeted areas where there was vegetation which could be used by great crested newts for egg laying.
- Using gloves, the surveyor opened the sterile Whirl-Pak bag plastic strip and collected 20 samples of 30mL each of pond water from around the margins of the pond. The samples were emptied into the Whirl-Pak bag and closed securely and shaken for 10 seconds.
- With a fresh pair of gloves on the surveyor used the clear plastic pipette provided and take 15ml of water from the Whirl-Pak bag into a sterile tube containing 35ml of ethanol to preserve the eDNA samples. The tubes were closed and shaken for 10 seconds to mix the samples and the preservatives.
- The above process was repeated to obtain six conical tubes for each pond.
- The remaining water in the Whirl-Pak bag was emptied back into the pond.

[1] Biggs J, Ewald N, Valentini A, Gaboriaud C, Griffiths RA, Foster J, Wilkinson J, Arnett A, Williams P and Dunn F (2014). *Analytical and methodological development for improved surveillance of the Great Crested Newt. Defra Project WC1067*. Freshwater Habitats Trust: Oxford

- The above process was carried out for each pond surveyed.

2.2.3 All samples were labelled with the relevant eDNA testing kit reference and pond number.

2.2.4 The eDNA samples were returned to FERA on 16th April 2019 and Surescreen on 07th May 2019.

2.3 Constraints

2.3.1 The majority of samples give a definitive positive or negative answer for eDNA presence; however, there is a risk of a false negative result due to detecting a problem within the water sample. Sample kits contain a DNA marker, if less of this marker is detected than expected, this indicates that the DNA, including any eDNA present, may have undergone some degradation. This is potentially due to presence of enzymes (nucleases) or compounds (e.g. phenolics) which can degrade DNA. If eDNA survey results are inconclusive, full conventional GCN presence/absence surveys may be required.

3 RESULTS

3.1 Desk Study

3.1.1 RECORD provided 13 records of great crested newt within 2km of the site, the closest record being 870m east of the site.

3.2 Field Survey

3.2.1 Of the eleven waterbodies surveyed for great crested newt eDNA, none returned a positive result for the presence of eDNA. All results returned are negative showing great crested newt are absent from the ponds at the time of survey.

3.2.2 A single male great crested newt was recorded terrestrially during a reptile survey on 21st May 2019 under refugia in marshy grassland.

4 REFERENCES

Biggs J, Ewald N, Valentini A, Gaboriaud C, Griffiths RA, Foster J, Wilkinson J, Arnett A, Williams P and Dunn F (2014). *Analytical and methodological development for improved surveillance of the Great Crested Newt. Defra Project WC1067*. Freshwater Habitats Trust: Oxford.

Appendix 1

DNA Analysis Report

DNA Analysis Report - Commercial in Confidence

Customer:	Wardell Armstrong LLP
Address:	Sir Hentry Doulton House, Forge Lane Etruria Stoke-on-Trent Stoke-on-Trent ST1 5BD
Contact:	Michael Moores
Email:	m.moores@wardell-armstrong.com
Tel:	01204227227
Report date:	25-Apr-2019
Order Number:	GCN19-1021
Samples:	Pond Water
Analysis requested:	Detection of Great Crested Newt eDNA from pond water.

Thank you for submitting your samples for analysis with the Fera eDNA testing service. The details of the analysis are as follows:

Method:

The method detects pond occupancy from great crested newts (GCN) using traces of DNA shed into the pond environment (eDNA). The detection of GCN eDNA is carried out using real time PCR to amplify part of the cytochrome 1 gene found in mitochondrial DNA. The method followed is detailed in Biggs J., et al, (2014). Analytical and methodological development for improved surveillance of the Great Crested Newt. Appendix 5. Technical advice note for field and laboratory sampling of great crested newt (Triturus cristatus) environmental DNA. Freshwater Habitats Trust, Oxford.

The limits of this method are as follows: 1) the results are based on analyses of the samples supplied by the client and as received by the laboratory, 2) any variation between the characteristics of this sample and a batch will depend on the sampling procedure used. 3) the method is qualitative and therefore the levels given in the score are for information only, they do not constitute the quantification of GCN DNA against a calibration curve, 4) a 'not detected' result does not exclude presence at levels below the limit of detection.

The results are defined as follows:

Positive:	DNA from the species was detected.
eDNA Score:	Number of positive replicates from a series of twelve.
Negative:	DNA from the species was not detected; in the case of negative samples the DNA extract is further tested for PCR inhibitors and degradation of the sample.
Inconclusive:	Controls indicate degradation or inhibition of the sample, therefore the lack of detection of GCN DNA is not conclusive evidence for determining the absence of the species in the sample provided.

DNA Analysis Report - Commercial in Confidence

CustomerReference	Fera Reference	GCN Detection	eDNA Score	Inhibition	Degradation
P1	S19-015962	Negative	0	No	No
P6	S19-015963	Negative	0	No	No
P5	S19-015966	Negative	0	No	No
P2	S19-015970	Negative	0	No	No
P4	S19-015971	Negative	0	No	No
P7	S19-015950	Negative	0	No	No
P3	S19-015951	Negative	0	No	No

The results indicate that eDNA for great crested newts was not detected in any of the samples submitted. Analysis was conducted in the presence of the following controls: 1) extraction blank, 2) appropriate positive and negative PCR controls for each of the TaqMan assays (GCN, Inhibition, and Degradation). All controls performed as expected.

This test procedure was developed using research funded by the Department of Environment, Food and Rural Affairs.

Issuing officer: Steven Bryce
Tel: 01904 462 070
Email: e-dna@fera.co.uk

Appendix 2

Waterbody Descriptions, HSI and eDNA Survey Results

Appendix 2: Waterbody Descriptions and HSI Results

Waterbody Description and Photograph		HSI & eDNA Survey Results
Waterbody 1 Grid Reference SJ 65980 94037 Large open waterbody located offsite, approximately 800 m to the north-west of site boundary. Wildfowl/gulls present.		HSI Score – 0.49 – Poor eDNA Result – Negative
Waterbody 2 Grid Reference SJ 66248 94152 Large open waterbody located offsite, approximately 530m to the north-west of the site boundary. Wildfowl present.		HSI Score – 0.49 – Poor eDNA Result – Negative
Waterbody 3 Grid Reference SJ 66696 94174 Large waterbody located offsite, approximately 290m to the north-west of the site boundary.	Image not available	HSI Score – 0.49 – Poor eDNA Result – Negative

Waterbody Description and Photograph		HSI & eDNA Survey Results
Waterbody 4 Grid Reference SJ 66793 94066 Medium sized waterbody located offsite, approximately 140m to the north-west of the site boundary.	Image not available	HSI Score – 0.76 – Good eDNA Result – Negative
Waterbody 5 Grid Reference SJ 67337 94339 Medium sized waterbody located offsite, approximately 490m to the north east of the site boundary.	N/A -Access Restricted	N/A
Waterbody 6 Grid Reference SJ 66893 93531 Medium sized waterbody located adjacent to the western site boundary. Unshaded margins and surrounded by bulrush *Typha latifolia*. Low number of wildfowl observed using waterbody.		HSI Score – 0.72 – Good eDNA Result – Negative

Waterbody Description and Photograph		HSI & eDNA Survey Results
Waterbody 7 Grid Reference - SJ 67252 93599 Small waterbody located offsite, within rush pasture surrounded by acid grassland approximately 87m to the east of the site boundary.		HSI Score – 0.63 – Average eDNA Result – Negative
Waterbody 8 Grid Reference - SJ 66920 93700 Extends approximately 227m in length to the west of the public footpath with no connectivity to waterbody 9. The ditch is approximately 2.5m wide but varies in size throughout the channel. Average water depth is approximately 0.5m with areas fluctuating to 1m. Submerged, vegetation is dominated by bulrush with occasional water cress *Nasturtium officinale*, water forget me not *Myosotis scorpioides,* common water crowfoot *Ranunculus aquatilis* and brooklime *Veronica beccabunga.*		HSI Score – Not surveyed eDNA Result – Negative

Waterbody Description and Photograph		HSI & eDNA Survey Results
Waterbody 9 Grid Reference - SJ 66960 93554 Approximately 1-1.5m wide with shallow embankments. Water depth is approximately 0.5m deep with slow flowing water to the north. The embankments within the southern section heavily shaded by trees and dense scrub including bramble *Rubus fruticosa,* hawthorn *Crataegus sp.* and goat willow *Salix caprea*. In places is heavily vegetated with tall ruderals including willowherb species *Epilobium sp.* and reed canary grass *Phalaris arundinacea.*		HSI Score – Not surveyed eDNA Result – Negative
Waterbody 10 Grid Reference - SJ 66757 93317 Small waterbody located to the west of the site, adjacent to the boundary. Wildfowl observed using the waterbody.		HSI Score – Not surveyed eDNA Result – Negative

Waterbody Description and Photograph		HSI & eDNA Survey Results
Waterbody 11 Grid Reference - SJ 66863 93403 Small waterbody located within the site boundary to the south west. Shallow depth with birch *Betula spp.* trees growing within the waterbody.		HSI Score – Not surveyed eDNA Result – Negative

DRAWINGS

KEY

- Site Boundary
- Waterbodies
- Running water

Notes:

Boundaries are indicative.

Aerial imagery shown for context purposes only.

REVISION	DETAILS	DATE	DRAWN	CHK'D	APP'D
B	SITE BOUNDARY AMENDMENTS	JULY 2019	SW	TP	TP
A	FIRST ISSUE	APRIL 2019	SW	JI	TP

CLIENT

EXTRA MSA GROUP

PROJECT

MOTORWAY SERVICES, WARRINGTON

DRAWING TITLE

WATERBODY LOCATION PLAN

DRG No.		REV
SH11739/008		B
DRG SIZE	SCALE	DATE
A3	1:5,000	22/07/2019
DRAWN BY	CHECKED BY	APPROVED BY
SW	JI	TP

wardell armstrong

NEWCASTLE UPON TYNE | TEL 0191 232 0943
WWW.WARDELL-ARMSTRONG.COM

BIRMINGHAM · BOLTON · CARDIFF · CARLISLE · EDINBURGH · GLASGOW · LONDON · MANCHESTER · SHEFFIELD · STOKE ON TRENT

wardell-armstrong.com

STOKE-ON-TRENT
Sir Henry Doulton House
Forge Lane
Etruria
Stoke-on-Trent
ST1 5BD
Tel: +44 (0)1782 276 700

BIRMINGHAM
Two Devon Way
Longbridge Technology Park
Longbridge
Birmingham
B31 2TS
Tel: +44 (0)121 580 0909

BOLTON
41-50 Futura Park
Aspinall Way
Middlebrook
Bolton
BL6 6SU
Tel: +44 (0)1204 227 227

CARDIFF
Tudor House
16 Cathedral Road
Cardiff
CF11 9LJ
Tel: +44 (0)292 072 9191

CARLISLE
Marconi Road
Burgh Road Industrial Estate
Carlisle
Cumbria
CA2 7NA
Tel: +44 (0)1228 550 575

EDINBURGH
Great Michael House
14 Links Place
Edinburgh
EH6 7EZ
Tel: +44 (0)131 555 3311

GLASGOW
2 West Regent Street
Glasgow
G2 1RW
Tel: +44 (0)141 433 7210

LEEDS
36 Park Row
Leeds
LS1 5JL
Tel: +44 (0)113 831 5533

LONDON
Third Floor
46 Chancery Lane
London
WC2A 1JE
Tel: +44 (0)207 242 3243

MANCHESTER
76 King Street
Manchester
M2 4NH
Tel: +44 (0)161 817 5038

NEWCASTLE UPON TYNE
City Quadrant
11 Waterloo Square
Newcastle upon Tyne
NE1 4DP
Tel: +44 (0)191 232 0943

TRURO
Baldhu House
Wheal Jane Earth Science Park
Baldhu
Truro
TR3 6EH
Tel: +44 (0)187 256 0738

International offices:

ALMATY
29/6 Satpaev Avenue
Regency Hotel
Office Tower
Almaty
Kazakhstan
050040
Tel: +7(727) 334 1310

MOSCOW
21/5 Kuznetskiy Most St.
Moscow
Russia
Tel: +7(495) 626 07 67

wardell armstrong

Appendix 5.4 - Preliminary Ecological Appraisal

wardell-armstrong.com

ENERGY AND CLIMATE CHANGE
ENVIRONMENT AND SUSTAINABILITY
INFRASTRUCTURE AND UTILITIES
LAND AND PROPERTY
MINING AND MINERAL PROCESSING
MINERAL ESTATES
WASTE RESOURCE MANAGEMENT

EXTRA MSA GROUP

MOTORWAY SERVICES, WARRINGTON

PRELIMINARY ECOLOGICAL APPRAISAL

JULY 2019

wardell armstrong

Wardell Armstrong
41-50 Futura Park, Aspinall Way, Middlebrook, Bolton, BL6 6SU
Telephone: +44 (0)1204 227 227 www.wardell-armstrong.com

DATE ISSUED:	**JULY 2019**
JOB NUMBER:	**SH11739**
REPORT NUMBER:	**004**
VERSION:	**V1.0**
STATUS:	**FINAL**

EXTRA MSA GROUP

MOTORWAY SERVICES, WARRINGTON

PRELIMINARY ECOLOGICAL APPRAISAL

JULY 2019

PREPARED BY:

Jake Smith	Graduate Ecologist and	PP.
Tim Palmer	Technical Director (Ecology)	

REVIEWED BY:

Richard Laws	Principal Ecologist	PP.
Katie Smith	Ecologist	

APPROVED BY:

Tim Palmer	Technical Director (Ecology)	

CONTENTS

APPENDICES

DRAWINGS	TITLE	SCALE
SH11739/007	Extended Phase 1 Habitat Survey Results	1:3,000@A3
SH11739/008	Waterbody Location Plan	1:5,000@A3
SH11739/016	Location of Statutory and Non-Statutory Conservation Sites	1:40,000@A3

EXECUTIVE SUMMARY

Wardell Armstrong LLP (WA) was commissioned by Extra MSA Group to undertake a Preliminary Ecological Appraisal (PEA) of land north of M62 Junction 11. The land is the site of a proposed new Motorway Services Area.

The development will require the removal of mainly arable land with limited ecological value, a small area of scrub and unmanaged grassland and a ditch may also be directly impacted depending on final site design.

Survey recommendations have been provided given the likely/potential presence of breeding, nesting and wintering birds, badger, water vole, great crested newts, reptiles, and foraging/roosting bats, alongside ecological enhancement measures. Mitigation and enhancement measures are not proposed in this report, but provisional opportunities are considered in the associated Scoping chapter.

1 INTRODUCTION

1.1 Terms of Reference

1.1.1 Wardell Armstrong LLP (WA) was commissioned by Extra MSA Group to undertake a Preliminary Ecological Appraisal (PEA) of a proposed Motorway Services Area development (hereafter referred to as the 'development'), located on the northern side of the M62 at Junction 11, central Ordnance Survey (OS) grid reference: SJ 67053 93630.

1.1.2 This report has been produced with reference to current guidelines for Preliminary Ecological Appraisal (Chartered Institute of Ecology and Environmental Management (CIEEM 2017)) and British Standard BS 42020:2013 (BSI 2013) which involves the evaluation of the potential presence of ecological receptors and adverse effects thereon, based on Extended Phase I (Joint Nature Conservation Committee (JNCC 2010)) survey data and background desk study.

1.1.3 The following ecological features have been considered:

- Statutory and non-statutory designated conservation areas;
- Local Biodiversity Action Plan (LBAP) habitats;
- Areas of Ancient Woodland;
- Legally protected species;
- Species listed within section 41 (s.41) of the NERC Act; and
- Invasive species.

1.1.4 Mitigation and enhancement measures are not proposed in this report but provisional opportunities are considered in the associated Scoping chapter.

1.1.5 Specific habitat features are mapped on Drawing No. SH11739/001. Waterbody locations are mapped on Drawing No. SH11739/002 with appropriate reference numbers provided and Drawing No. SH11739/016 showing the Location of Statutory and Non-Statutory Conservation Sites.

1.2 Site Context

1.2.1 The proposed development is to be located immediately adjacent to Junction 11 of the M62. The survey area (Site) covers the application area plus adjacent habitats where these are relevant to the assessment of potential adverse effects.

1.2.2 The wider landscape comprises arable farmland/pasture to the east, south east and north, a capped landfill directly west of the site and Birchwood Business and Technology Park to the south west.

1.2.3 Holcroft Moss Site of Special Scientific Interest is located approximately 1,080m east and Manchester Mosses Special Area of Conservation, Risley Moss Site of Special Scientific Interest and Risley Moss Local Nature Reserve are located approximately 1.4km south of the site.

2 METHODOLOGY

2.1 Desk Study

2.1.1 The desktop study was informed by review of existing available information provided by RECORD (Local Records Centre) and from available internet-based resources for a 2km search radius. OS and satellite mapping was also used to gain contextual habitat information. In addition, a 5km search radius was used for Special Protected Area's (SPA's), Special Areas of Conservation (SAC's) and Ramsar sites due to their ecological sensitivity. The search was also extended to 5Km for statutory sites which are notified for their bat interest. OS and satellite mapping was also used to gain contextual habitat information.

2.1.2 Specific information was sought for:

- Statutory designated sites;
- Locally designated sites;
- Ancient woodland;
- Protected and/or notable species;
- NERCs.41 Priority Habitats and Species; and
- Local Biodiversity Action Plan (LBAP) priority habitats and species.

2.2 Extended Phase I Habitat Survey

2.2.1 Wardell Armstrong LLP carried out an Extended Phase I Habitat Survey of the site on 31st October 2018. The survey followed the 'Extended Phase I Habitat Survey' methodology (Institute of Environmental Assessment (IEA), 1995 and JNCC 2010). Each of the main habitats were classified according to the relevant criteria including vegetation composition expressed according to the DAFOR[1] system.

2.2.2 In addition to the mapping and description of habitats, incidental observations of protected and/or notable species and the potential for such species to occur on site (and in the surrounding landscape where relevant) were also recorded for mapping and data collection purposes.

2.2.3 Specific habitat features are mapped on Drawing No. SH11739/001.

[1] D – Dominant, A – Abundant, F – Frequent, O- Occasional, R-Rare.

2.3 Habitat Suitability Index Assessment for Great Crested Newt

2.3.1 In addition to the Extended Phase I Habitat Survey a great crested newt (GCN) *Triturus cristatus* Habitat Suitability Index (HSI) assessment was undertaken of accessible ponds within, and up to ~500m from, the site boundary.

2.3.2 This HSI assessment was conducted in accordance with good practice guidelines (Langton, Beckett and Foster 2001). This HSI scoring system assesses a waterbodies' suitability as an aquatic habitat for GCN following ARG UK (2010) methodology which is based on Oldham *et al* (2000).

2.3.3 The HSI is a simple model to provide an informed view of the value of a waterbody to support breeding populations of GCN, which involves assessing waterbodies based on ten habitat parameters that are known to influence breeding populations of GCN. A score between 0 and 1 is assigned to each parameter, based on field observations. The tenth root of the product of these parameters is then calculated, giving a figure for habitat suitability.

2.3.4 The parameters to which a quantitative figure is assigned are:

- Location;
- Pond area;
- Pond drying;
- Water quality;
- Shade;
- Wildfowl presence;
- Fish presence;
- No. of ponds within 1km;
- Quality of terrestrial habitat; and
- Presence of macrophytes.

2.3.5 The calculated HSI score is used to define the suitability of the pond on a categorical scale, as shown in Table 1 below. It should be noted, however, that the system is not sufficiently robust to reliably infer presence/absence of great crested newt.

Table 1: Great Crested Newt HSI Scoring System	
HSI Score	**Pond Suitability for GCN**
<0.5	**Poor**
0.5-0.59	**Below average**
0.6-0.69	**Average**
0.7-0.79	**Good**
>0.8	**Excellent**

2.3.6 Typically, ponds which return an HSI score of 0.5 (below average) or higher are considered be suitable for GCN and therefore require further surveys to determine GCN population class size.

2.3.7 GCN are also known to use ditches and culverts as commuting corridors, therefore any connective linear waterbodies within 500m of the study area boundary were also visually assessed for their suitability to support GCN.

2.4 Caveat & Assessment Limitations

2.4.1 Ecological surveys are limited by factors that affect the presence of plants and animals such as time of year, weather, migration patterns and behaviour. The survey was undertaken in October and therefore represents a valid sample of ecological evidence present on that date/season. The report is not designed, nor is it required to present a complete inventory of flora/fauna.

2.4.2 The absence of desk study records is not relied upon to determine absence of a particular species/habitat. Often, the absence of records is a result of under-recording within the given search area and as such the experience of the ecologist concerned together with a range of additional factors, in particular the presence/absence of potentially supporting habitat; is used to infer likely presence/absence of ecological receptors.

2.5 Nomenclature

2.5.1 Vascular plant names follow '*New Flora of the British Isles*' (Stace 2010) with vernacular names as provided in the Botanical Society of the British Isles website (BSBI, 2013). All other flora and fauna names following the National Biodiversity Network (NBN) Atlas (NBN, 2017). The common and scientific name of species/taxa is provided (if available) when first mentioned in the text, with only the vernacular name referred to thereafter.

2.6 Quality Assurance & Environmental Management

2.6.1 The surveys, assessments and the report have been checked and verified by a member of CIEEM, whom is bound by its code of professional conduct. All surveys and assessments have been undertaken with reference to the recommendations given in British Standard BS 42020, and as stated within specialist guidance, as appropriate and referenced separately.

3 RESULTS AND EVALUATION

3.1 Desk Study

Statutory and Non-Statutory Designated Sites

3.1.1 The desk study results for designated sites within a 2km search radius are evaluated in Table 2, below. Sites are also mapped on Drawing No. SH11739/016.

3.1.2 Sites which are considered potentially sensitive to the development proposals by virtue of their supported species or habitat assemblages, the distance/ecological connectivity to the application site and the nature of the perceived impacts, are highlighted in bold text and are discussed in detail in the final sections of the report.

3.1.3 Sites for which potential adverse effects are not anticipated are excluded from further assessment.

Table 2: Designated Sites Evaluation

Conservation Site Name, Status[2] and distance from development site	Reason for Designation	Potential Adverse Effects?
Manchester Mosses (SAC) and Astley & Bedford Mosses (SSSI) **3,881m north east**	**Presence of degraded raised bog which is capable of natural restoration.**	**Effects to off-site peatlands due to hydrological connectivity with subsurface peat on site and impacts thorough N deposition resulting from changes to traffic volumes/location. Further investigation required and likelihood of effect dependant on site/construction design.**
Manchester Mosses (SAC) Risley Moss (SSSI), LNR. **1,410m south**	**The breeding bird assemblage of this unit remains in favourable condition and the site is critical to the hydrological integrity of the adjacent lowland raised bog habitat, supporting areas W4a lagg fen woodland. Habitats of mossland, mixed woodland and grass meadow supporting notable species. Three distinctly different ponds lie within the woodland, supporting an important and diverse range of aquatic life.**	**As above. Limited ecological connectivity, due to presence of M62 so impacts to SSSI supported bird assemblages are likely negligible.**

[2] SPA – Specially Protected Area, SAC – Special Area for Conservation, SSSI – Site of Special Scientific Interest, NNR – National Nature Reserve, LNR – Local Nature Reserve, CWS – County Wildlife Site.

Table 2: Designated Sites Evaluation		
Conservation Site Name, Status[2] and distance from development site	**Reason for Designation**	**Potential Adverse Effects?**
Rixton Clay Pits (SAC), Rixton Clay Pits (SSSI) and LNR 3,250m south	Former clay pits with a rich mosaic of wet grassland, woodland and open water, scattered ponds and associated swamp habitats. Of national importance for its calcareous grassland communities and of international importance because the site supports the county's largest known breeding population of great crested newts.	No potential adverse effects due to separation distance and lack of connectivity.
Holcroft Moss (SSSI) **890m west**	**The moss occupies several small depressions in the Upper Terrace of the Mersey Valley and is an isolated remnant of the once extensive area of mossland formerly associated with this valley.**	**Effects to off-site habitats from N deposition resulting from changes to traffic volumes/location. Further investigation required and likelihood of effect dependant on site/construction design. As above.**
Woolston Eyes (SSSI) 4,565m south	Woolston Eyes SSSI is a nationally important site for its breeding bird assemblage of lowland open waters and their margins, and for wintering wildfowl.	No potential adverse effects due to separation distance and lack of connectivity.
Gorse Covert Mounds (LWS) 87m south	A mosaic of mixed woodland, meadows and ponds, located between Risley and the M62, connected to Risley Moss SSSI/LWS via a green corridor.	No potential adverse effects due to lack of connectivity (presence of M62).
Pestfurlong Moss (LWS) **230m south**	**A lowland raised bog habitat with scrub and woodland. Pestfurlong Moss connects the larger Risley and Holdcroft mosses.**	**Effects to off-site peatlands due to hydrological connectivity with subsurface peat on site and impacts thorough N deposition resulting from changes to traffic volumes/location. Further investigation required and likelihood of effect dependant on site/construction design.**
Silver Lane Risley (LWS) **618m west**	**Public bridleway with open pools and a mosaic of hedgerow, scrub and grassland habitats.**	**Potential adverse effects to associated species due to close proximity to the site and has ecological connectivity.**

3.1.4 The search area is extended to allow for the inclusion of Impact Risk Zones (IRZ) for SSSIs. IRZs define areas around designated nature conservation sites which could be impacted by development schemes. The zones vary depending on the particular sensitivities of the features for which the SSSI is notified and indicate the types of development proposal which could potentially have adverse impacts. Due to the presence of SSSI's mentioned in Table 2, the application site falls within several IRZ bands.

3.2 Extended Phase I Habitat Survey

Habitats

3.2.1 All habitats within the study area are described in Table 3 below, together with an indication of their suitability to support NERC s41[3] 'priority' and Cheshire region Local BAP[4] habitats. The table also provides an evaluation of the sensitivity of the habitats relative to the proposed development.

3.2.2 Habitats which are could be subject to adverse effects are indicated with bold text and are discussed in the latter sections of the report. Habitats for which potential adverse effects are not anticipated are excluded from further assessment.

3.2.3 The location and extent of habitats is shown on Drawing No. SH11739/001, Extended Phase I Habitat Survey Results.

[3] Habitats listed under section 41 of the Natural Environment and Rural Communities (NERC) Act as habitats of Principal Importance

[4] https://www.cheshirewildlifetrust.org.uk/sites/default/files/2018-06/BAP%20list%20-%20updated%20April%202011.pdf

Table 3: Habitat Description and Evaluation				
Phase I Habitats		**NERC s.41**	**LBAP**	**Adverse Effects?**
<u>Arable Land</u> Arable farmland dominates the survey area. This habitat is actively disturbed by agricultural operations and at the time of survey appeared to have been seeded with autumn sown cereals. Arable margins are scant, but where present, are dominated by cock's-foot *Dactylis glomerata*, Yorkshire-fog *Holcus lanatus*, creeping bent *Agrostis stolonifera* with occasional cleavers *Gallium aparine*, rosebay willowherb *Chamerion angustifolium*, bramble *Rubus fruiticosa* and nettle *Urtica dioica*.		×	×	This habitat is of little intrinsic ecological value.
<u>Neutral Grassland, Tall Ruderal and scrub</u> A mosaic of habitats is present along the southern and western boundaries of the site. Unmanaged neutral grassland being the dominant type with variable areas of continuous/scattered scrub and tall ruderals also present. Species present include great willowherb *Epilobium hirsutum* (D), broadleaved dock *Rumex obtusifolius* (D), creeping thistle *Cirsium arvense* (D), common reed *Phragmites australis* (A), perennial rye grass *Lolium perenne* (A), cock's foot (A), bramble (F), common nettle (F), vetch spp. (O), alder *Alnus glutinosa* (O), elder *Sambucus nigra* (R), common ragwort *Senecio jacobaea* (R) and pedunculate oak *Quercus robur* (R).		×	×	The habitat is of negligible intrinsic ecological value.

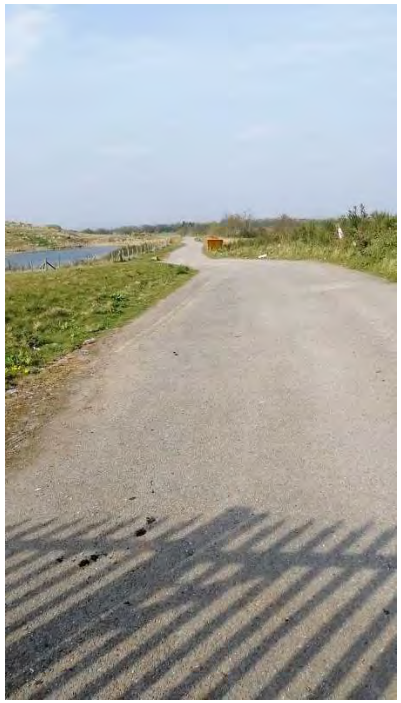
Table 3: Habitat Description and Evaluation				
Phase I Habitats		**NERC s.41**	**LBAP**	**Adverse Effects?**
<u>Marshy Grassland</u> There is a small area of wet/marshy grassland within the larger area of tall ruderal habitat located along the western boundary. The species composition includes common reed (D), cocksfoot (F), perennial rye grass (O), great willowherb (O) and marsh thistle *Cirsium pallustre*. (R).		×	×	This habitat is of negligible intrinsic ecological value.

Table 3: Habitat Description and Evaluation				
Phase I Habitats		**NERC s.41**	**LBAP**	**Adverse Effects?**
Broadleaved scattered trees Bordering the western boundary of the site is a discontinuous line of silver birch *Betula pendula* (D) trees. Species also present in the tree line are elder (F) and grey willow *Salix cinerea* (R). The ground flora is comprised of common nettle (D), fern sp. (A), mosses (A), bramble (F), cock's-foot (F) and perennial rye grass (F). Individual silver birch trees are also present along the northern boundary of the site.		×	✓	This habitat will be retained.

Table 3: Habitat Description and Evaluation				
Phase I Habitats		**NERC s.41**	**LBAP**	**Adverse Effects?**
Dry Ditch Running along the eastern boundary under the birch treeline is a dry ditch. The banks were partly bare, with eroding and exposed peat along the majority of the banks. Species present include Himalayan balsam *Impatiens glandulifera* (A), mosses (F), bramble (O), fern sp. (O), mosses and common nettle (O).		×	×	This habitat will be retained.

Table 3: Habitat Description and Evaluation				
Phase I Habitats		**NERC s.41**	**LBAP**	**Adverse Effects?**
<u>Mesotrophic Running Water</u> Along the western boundary is a wet ditch with running water from the southern boundary to beyond the northern boundary. At the time of the survey, water levels were low with the ditch approx. 1m wide. The banks are vegetated with perennial rye grass (A), cock's-foot (A), common reed (A), great willowherb (A), common nettle (F), and vetch spp. (R).		×	×	This habitat may be impacted as a result of modifications to the drainage design, however it is of limited ecological value.

Table 3: Habitat Description and Evaluation				
Phase I Habitats		**NERC s.41**	**LBAP**	**Adverse Effects?**
Semi-natural Broadleaved Woodland Within with north western and south western boundary are small areas of semi-natural broadleaved woodland with high coverage of leaf litter and dead wood. Tree species present include lombardy poplar *Populus nigra* (D), goat willow *Salix caprea* (F), hawthorn *Crataegus monogyna* (O) and alder (R). The ground layer is dominated with bramble (D) with stinging nettle (F), great willowherb (O), cleaver (O), yorkshire fog (F) and broad-leaved dock (O).		✓	✓	This habitat will be retained.

Table 3: Habitat Description and Evaluation				
Phase I Habitats		**NERC s.41**	**LBAP**	**Adverse Effects?**
Hard Standing From within south western boundary of the site, running north along the western site boundary is an area of hard standing used as parking and as an access track.		×	×	This habitat is of no intrinsic ecological value.

Species

3.2.4 Sightings and/or evidence of protected and/or invasive species from the field survey are described below.

Birds

3.2.5 All birds recorded during the survey are summarised in Table 4, below together with a preliminary assessment of potential adverse effects arising from the development.

3.2.6 All nesting birds are discussed in the final section given the general legislative provisions relating to the protection of active nests.

Table 4: Bird Species Recorded

Common name	Latin name	Status[5]	Supporting Habitat	Adverse Effects?
Blackbird	*Turdus merula*		Yes – woodland for nesting habitat with grassland and shrubs for foraging.	None – supporting habitat will be retained and is locally abundant.
Chaffinch	*Fringilla coelebs*		Yes – woodland for nesting habitat with grassland and shrubs for foraging.	None – supporting habitat will be retained and is locally abundant.
Great tit	*Parus major*		Yes – grassland and shrubs with nearby waterbodies.	None – supporting habitat will be retained and is locally abundant.
Grey heron	*Ardea cinerea*		Yes – grassland and shrub habitat for nesting and foraging	None – supporting habitat will be retained and is locally abundant.
Kestrel	*Falco tinnunculus*	AL	Yes – woodland nesting habitat and scrub, grassland foraging habitat	None – supporting habitat will be retained and is locally abundant.
Stock dove	*Columba oenas*	AL	Yes - woodland for nesting habitat with grassland and shrubs for foraging.	None – supporting habitat will be retained and is locally abundant.

[5] S1 – Schedule 1 Wildlife and Countryside Act, A1 – Annex 1 EU Birds Directive, RL - Birds of Conservation Concern 'red list', AL - Birds of Conservation Concern 'amber list', s.41- species listed under section 41 of the NERC Act as species of principal importance

Table 4: Bird Species Recorded				
Common name	**Latin name**	**Status[5]**	**Supporting Habitat**	**Adverse Effects?**
Skylark	*Alauda arvensis*	RL, s.41	Yes - grassland and shrub habitat for nesting and foraging	None – supporting habitat will be retained and is locally abundant.
Wren	*Troglodytes troglodytes*		Yes – woodland, scrub nesting habitat and grassland and farmland foraging habitat	None – supporting habitat will be retained and is locally abundant.

Invasive Species

3.2.7 Stands of Himalayan balsam *Impatiens glandulifera* were present along the eastern boundary of the site.

3.3 Ecological Evaluation

3.3.1 Protected and LBAP species are evaluated in order to identify potential adverse effects in Table 5 below, based on the desk study records, presence, extent and viability of supporting habitat, and ecological connectivity.

3.3.2 Species for which adverse effects are predicted are indicated in bold text and are discussed in more detail in the Discussion section. Species/taxa for which potential adverse effects are not anticipated are excluded from further assessment.

Table 5: Species Evaluation				
Receptor (Species/taxa)	**Desk Study records?**	**Status[6]**	**Supporting Habitat Present?**	**Adverse Effects?**
Bats *Chiroptera*	✓	**EPS, WCA, s.41, LBAP**	**Tree line commuting habitat and tree line, scrub and wet grassland foraging habitat.**	**Adverse impacts are limited to minor disturbance to foraging bats and loss of commuting habitat, in the absence of mitigation. Impacts to roosting bats are unlikely although additional inspections will be required to establish presence of roost features within trees.**
Badger *Meles meles*	✓	**BA**	**Suitable sett creation habitat was located within the dry ditch and broadleaved scattered trees.**	**Species is likely to be absent due to high water table/wet soil conditions. However, possible sett creation habitat will be lost associated with the tree line along the eastern site boundary. Incidental harm and loss of habitat may result in the absence of mitigation.**
Brown Hare *Lepus europaeus*	✓	s.41	Open expanses of farmland and scrub habitat.	Minor loss of arable farmland habitat to development platform and minor disturbance of surrounding land. Habitat losses are not anticipated to negatively impact local populations, given the wide availability of similar habitat

[6] EPS – European Protected Species, WCA – Wildlife and Countryside Act, A1 – Annex 1 (Birds Directive), BA – Protection of Badgers Act, s.41- species listed under section 41 of the NERC Act as species of principal importance

Table 5: Species Evaluation				
Receptor (Species/taxa)	**Desk Study records?**	**Status[6]**	**Supporting Habitat Present?**	**Adverse Effects?**
European Hedgehog *Erinaceus europaeus*	No records.	s.41	Negligible suitable habitat restricted to tree line along eastern site boundary only.	As above.
Dormouse *Muscardinus avellanarius*	No records.	EPS, WCA, s.41	No suitable habitat.	N/a
Otter *Lutra lutra*	No records.	EPS, WCA, s.41	Running water habitat present on site is sub-optimal as it is shallow and unlikely to support prey species.	Presence is considered very unlikely given unsuitability of habitat and lack of historical records for area.
Water Vole *Arvicola amphibia*	**Recorded at 59m west.**	**WCA, s.41**	**The running water habitat on site is sub-optimal for water vole given the shallow water and narrow profile.**	**Minor area of sub-optimal foraging and burrowing habitat may be lost or impacted in the absence of mitigation.**
Reptiles	✓	**WCA, s.41**	**The neutral grassland and scrub habitats present on site are sub-optimal, given that they appear to be relatively recent in origin – however the ditch margins which are linked to ponds off site may support grass snake *Natrix natrix*.**	**Species are likely to be absent, other than grass snake which may utilise the ditch banks as commuting/dispersal habitat between ponds and areas of established grassland. Modification of ditches may result in incidental harm in the absence of mitigation.**
Great Crested Newt *Triturus cristatus*	**Closest record at 870m east.**	**EPS, WCA, s.41, LBAP**	**Moderate terrestrial habitat for foraging and hibernating associated with neutral grassland along western site boundary.**	**Minor loss of moderate terrestrial habitat potentially resulting incidental harm in the absence of mitigation.**
Common Toad *Bufo bufo*	✓	s.41	The scrub and running water habitats on site are sub-optimal.	Species is likely to be absent, minor losses of sub optimal terrestrial habitat would not significantly impact local populations.

Table 5: Species Evaluation				
Receptor (Species/taxa)	**Desk Study records?**	**Status[6]**	**Supporting Habitat Present?**	**Adverse Effects?**
White-clawed Crayfish *Austropotamobius pallipes*	No records.	EPS, WCA, s.41	No suitable habitat.	No adverse effects.
Birds	**Barn owl were recorded 351m from site. Amber listed species include kingfisher, kestrel, bullfinch and greenshank. Red listed species include marsh tit, corn bunting, mistle thrush and house sparrow.**	**s.41, WCA BoCC, LBAP**	**Foraging and breeding habitat is present across the site and surrounding landscape.**	**Nesting and foraging habitat will be lost or disturbed in the absence of mitigation. The open fields could support notable assemblages of waterbirds which may be displaced by the development.**
Protected/notable Plant Species	No records.	s.41, LBAP	The site is considered unsuitable to support protected plant species.	No adverse effects.
Protected/notable Invertebrate Species	No records.	s.41	As the site is dominated by arable land suitable habitats are restricted to the site margins.	Given that the majority of the development platform will be located within the intensively farmed, arable land area no adverse effects are anticipated.

4 DISCUSSION AND RECOMMENDATIONS

4.1 Sensitive Receptors

4.1.1 The following designated sites, habitats and species (receptors) have been evaluated as being potentially subject to adverse effects in the absence of mitigation:

- Statutory and non-statutory conservation sites;
- Protected species (Great Crested Newt, Bats, Badger, Water Vole, Reptiles);
- Barn Owl;
- Breeding and Wintering birds; and
- Nesting birds.

4.1.2 The nature of potential effects and any additional survey requirements are discussed below for each of the identified receptors in turn. Mitigation requirements are discussed in the separate Scoping report where appropriate to be further considered once the relevant surveys are completed.

Statutory and Non-statutory conservation sites including Manchester Mosses (SAC) and Astley & Bedford Mosses (SSSI), Risley Moss (SSSI), LNR, Rixton Clay Pits (SSSI) and LNR, Holcroft Moss (SSSI), Pestfurlong Moss (LWS) and Silver Lane Risley (LWS)

4.1.3 The development area lies wholly outwith all of the conservation sites considered within the 2km and 5km search radii. The closest statutory site is Holcroft Moss which is in excess of 1km from the application site to the west and separated from it by the M62. Holcroft Moss, Astley and Bedford Mosses, Risley Moss are components of the internationally designated Manchester Mosses SAC. The selection criteria are as follows:

> *7120 Degraded raised bogs still capable of natural regeneration*
>
> *Mossland formerly covered a very large part of low-lying Greater Manchester, Merseyside and southern Lancashire, and provided a severe obstacle to industrial and agricultural expansion. While most has been converted to agriculture or lost to development, several examples have survived as degraded raised bog, such as Risley Moss, Astley & Bedford Mosses and Holcroft Moss on the Mersey floodplain. Their surfaces are now elevated above surrounding land due to shrinkage of the surrounding tilled land, and all except Holcroft Moss have been cut for peat at some time in the past. While past drainage has produced dominant purple moor grass Molinia caerulea, bracken Pteridium aquilinum and birch Betula spp. scrub*

or woodland, wetter pockets have enabled the peat-forming species to survive. Recent rehabilitation management on all three sites has caused these to spread.

4.1.4 As the application site lies outside the SAC suite, there will be no direct loss of EU Annex 1 protected habitat however the potential for the removal and/or stabilisation of sub surface peat within the application site may result in localised hydrological changes. It is unlikely that such effects will have any impact on the integrity of the SAC suite or result in any compromise to their conservation objectives; however, the proposals will be considered in detail in this regard and a (shadow) Stage 1 Habitats Regulations 'screening assessment' will be undertaken. This document will also consider any adverse effects to the SSSI sites which are also associated with the peatland habitats.

4.1.5 Local Wildlife Site Pestfurlong Moss is within close proximity to the site but separated by the motorway, however the non-statutory site contains peatland habitats and is subject to the same impacts as mentioned above.

4.1.6 Given the locality and ecological connectivity of Silver Lane Risley (LWS) a likelihood of negative impact is predicted in the absence of mitigation. There is limited hydrological connectivity via a ditch along the western boundary of site. It is recommended that all due care be taken to ensure that any arisings from the development including pollutants are prevented from entering the watercourses in line with CIRIA guidelines for Environmental Good Practice on site (2015).

4.1.7 Due to physical separation and distance between the application site and other Local conservation sites, no adverse effects are predicted although this will be further considered through the development of the scheme design and the completion of protected species surveys.

Bats

4.1.8 The habitats adjacent to the survey area to the east and west have the potential to support foraging and commuting bats (tree lines, hedgerows, grassland, waterbodies). There is a paucity of viable roosting habitat, although this will be further investigated via a ground-based inspection of all trees to search for suitable roost features.

4.1.9 In terms of foraging and commuting habitats, the habitats within the survey area are considered to be of 'Low' habitat quality, given their predominantly arable nature; however, the mosaic of adjacent habitats which lie adjacent necessitate a 'Moderate' Habitat quality valuation. Activity surveys in line with national standard guidelines

(Collins 2015) have therefore been devised on that basis. Detailed survey results will be reported separately.

4.1.10 Any trees with bat roost features and/or commuting habitats may be subject to light spill during construction and post-development. Therefore, a sensitive lighting scheme will be devised to minimise potential adverse effects.

Badger

4.1.11 No badger setts have been recorded within the survey area (including a 50 m 'buffer' of adjacent land). Nonetheless, the survey area contains suitable habitats for foraging and sett creation (i.e. scrub and grassland), including the linear woodland along the eastern site boundary and plantation woodland, and may be utilised by badgers occupying setts located further afield. In terms of loss of potential foraging habitat, given the wide availability of habitat within the locality, a small reduction in grassland and woodland is not expected to result in the loss of favourable conservation status if indeed badgers are present within the wider area.

4.1.12 A detailed badger survey will be undertaken to inform the environmental statement and in addition, in order to ensure compliance with the relevant legislation, it is recommended that a check for the presence of mammal burrows with an entrance diameter exceeding 100 mm should be undertaken prior to the onset of works. In the event that such mammal burrows are recorded clearance operations should cease until advice has been sought from a suitably qualified ecologist.

Water Vole

4.1.13 The habitats on site provide sub-optimal habitat for foraging and burrowing, with no evidence seen during the Extended Phase I Habitat Survey. However, the species may periodically use the habitats on site due to the close location of desk study records. It is recommended that a water vole survey is undertaken in accordance with standard guidelines (Strachan & Moorhouse 2006) and mitigation is considered following any confirmation of presence.

Reptiles

4.1.14 The survey area has suitable grass snake habitat in the form of grassland associated with linear waterbodies. In addition, suitable basking habitat is present on the open shorter areas of grassland along the western site boundary.

4.1.15 Given the presence of suitable habitat, further detailed surveys will be considered. However, in the event that suitable habitats can be avoided, or effects adequately mitigated, presence will be assumed, and surveys may not be undertaken.

Great Crested Newt

4.1.16 Five ponds (as shown on Drawing No. SH11739/002) and two ditches are present within 500m of the site boundary. There are two further ponds outside of the 500m included due to close proximity and connectivity to two of the ponds within the boundary. Where access was available, the waterbodies were assessed for their suitability to support amphibians, using HSI assessment methods.

4.1.17 One pond was not subject to the survey due to access restrictions (WB5). WB 4 and 6 were assessed as being of 'Good' suitability and WB 1,2 and 3 were assessed as 'Poor'. WB7 is considered to be 'Average'.

4.1.18 The terrestrial habitat on site which will be lost to the development is mainly unsuitable for great crested newt, being regularly tilled arable land. There are stands of unmanaged neutral grassland associated with the western boundary of the site which are a viable habitat. The loss of such habitats would potentially result in incidental harm to individual newts as well as a (likely minor) impact to local populations in the absence of mitigation.

4.1.19 It is therefore recommended that great crested newt presence/absence surveys are undertaken. It is considered that the M62 motorway acts as a sufficient barrier to land and ponds to the south of the site, thus only ponds located north of the motorway will require surveys. This includes the seven ponds identified on Drawing No. SH11739/002.

4.1.20 eDNA surveys for great crested newt entail water sampling of each pond for analysis to determine the presence of genetic material deposited by great crested newts. A sampling kit will be required for each pond, and samples will be taken in accordance with Natural England guidance. The samples are then sent for analysis to a Natural England approved laboratory. Should the results confirm absence of great crested newts prior to completion of the conventional surveys, then no further surveys would be required. Should the results confirm presence then it will be necessary to undertake detailed population assessment surveys via a further 6 survey visits.

Barn Owl

4.1.21 The site does not support suitable breeding habitat for barn owl. However, the scrub habitat on site, field margins and bordering scrub habitat are considered to be viable foraging habitat for hunting barn owl. The arable land on and surrounding the site is not considered optimum habitat due to the likely low numbers of small mammals it supports. It is recommended a barn owl desk study is carried out to ascertain the importance of the site for barn owl, via consultation with the Barn Owl Conservation Trust.

Wintering Birds

4.1.22 The open arable habitats on site and within the wider landscape are potentially attractive to waterbirds which aggregate into flocks during winter. Birds such as Lapwing *Vanellus vanellus*, Golden plover *Pluvialis apricaria* and certain grey geese *Anser* spp could potentially utilise the fields on site as part of a wider network of wintering habitat for daytime roosting and foraging. Wintering bird surveys are therefore being undertaken and will be reported separately.

Nesting Birds

4.1.23 Due to the potential presence of nesting bird species within the scattered trees and scrub habitat it is recommended that initial development works are undertaken outside of the usual bird breeding season (i.e. between September-February). If such timescales cannot be accommodated and works are required during the nesting bird season (March-August inclusive), it is recommended that a check for the presence of active nests and nesting birds is undertaken by a suitably qualified ecologist prior to the commencement of works. Any active nests should be identified and protected subject to the relevant legal provisions until the nesting attempt is complete.

5 REFERENCES

ARG UK. (2010). ARG UK Advice note 5: Great Crested Newt Habitat Suitability Index. Retrieved from https://www.arguk.org/info-advice/advice-notes/9-great-crested-newt-habitat-suitability-index-arg-advice-note-5/file

Botanical Society of the British Isles. (2013). *Online atlas of the British and Irish Flora* http://www.brc.ac.uk/plantatlas/index.php?q=title_page

British Standards Institute. (2013). Biodiversity – Code of Practice for Planning and Development.

CIRIA. (2015). *Environmental Good Practice on Site Guide.*

Institute of Environmental Assessment. (1995). *Guidelines for Baseline Ecological Assessment*.

Chartered Institute of Ecological and Environmental Management. (2017). *Guidelines for Preliminary Ecological Appraisal*.

Joint Nature Conservation Committee. (2010). *Handbook for Phase 1 habitat survey: A technique for environmental audit*, English Field Unit, Nature Conservancy Council.

Langton, T., Beckett, C. and Foster, J. (2001). *Great Crested Newt Conservation Handbook*. Froglife, Halesworth.

National Biodiversity Network. (2017). NBN Atlas http://data.nbn.org.uk/

Oldham R., Keeble J., Swan M. & Jeffcote M. (2000). *Evaluating the suitability of habitat for the Great Crested Newt (Triturus cristatus)*. Herpetological Journal 10 (4), 143-155.

Stace. C. A. (2010). *New Flora of the British Isles*. Cambridge University Press.

Strachan, R. & Moorhouse, T. (2006). Water vole conservation handbook 2nd edition. Wildlife Conservation Research Unit, Oxford, 132pp.

Appendix 1
Legislation and Policy Summary

Appendix 1 – Legislation and Policy Summary

Legislation for Habitats/Sites

Designated Site/Habitat	Status
Ramsar Sites	Ramsar Sites are wetlands of international importance designated following The Ramsar Convention. RAMSAR sites have the same level of protection as SSSIs under the Wildlife and Countryside Act 1981 (as amended).
SPA (Special Protection Areas)	SPAs are classified in accordance with Article 4 of the EC Directive on the Conservation of Wild Birds (79/409/EEC), the Birds Directive. They are they seek to protect the habitats of rare and vulnerable birds, listed in Annex I of the Birds Directive, and for regularly occurring migratory species. The Wildlife and Countryside Act 1981 (as amended) and the Conservation of Habitats and Species Regulations 2017 implement the Birds Directive in the UK.
SAC (Special Areas for Conservation)	SACs are strictly protected areas which represent typical European Union of habitats and (non-bird) species listed in Annexes I and II of the EC Habitats Directive. The Wildlife and Countryside Act 1981 (as amended) and the Conservation of Habitats and Species Regulations 2017 implement the Habitats Directive in the UK.
SSSI (Sites of Special Scientific Interest)	SSSIs protect the best examples of the UK's flora, fauna, or geological or physiographical features. Originally notified under the National Parks and Access to the Countryside Act 1949, SSSIs were re-notified under the Wildlife and Countryside Act 1981 (as amended). Modified provisions for the protection and management of SSSIs were introduced by the Countryside and Rights of Way Act 2000.
NNR (National Nature Reserves)	NNRs are examples of some of the most important natural and semi-natural terrestrial and coastal ecosystems in Great Britain. NNRs are declared by the statutory country conservation agencies under the National Parks and Access to the Countryside Act 1949 and the Wildlife and Countryside Act 1981 (as amended). Legal protection of NNRs is provided under The Wildlife and Countryside Act 1981 (as amended).
Hedgerows	All hedgerows are protected by the Hedgerows Regulations 1997, under which it is an offence to remove or destroy certain hedgerows without planning consent or permission from the Local Planning Authority. These regulations do not apply to any hedgerow within the curtilage of, or marking the boundary of the curtilage of, a dwelling house.
LNR (Local Nature Reserves)	Designated by the National Parks and Access to the Countryside Act 1949, LNRs may be declared for nature conservation by local authorities after consultation with the relevant statutory nature conservation agency. Legal protection of LNRs is provided under The Wildlife and Countryside Act 1981 (as amended).

Legislation for Species

Species	Legal Status
European Legislation	
Creeping Marshwort, Early Gentian, Fen Orchid, Floating-leaved Water Plantain, Killarney Fern, Lady's Slipper, Shore Dock, Slender Naiad, Yellow Marsh Saxifrage	Under the Conservation of Habitats and Species Regulations 2017 (and as amended), it is illegal to deliberately pick, collect, uproot or destroy any such species.
Bats, Dormouse, Otter, Wild Cat, Great Crested Newt, Natterjack Toad, Sand Lizard, Smooth Snake, Large Blue Butterfly	These animals and their breeding sites or resting places are protected under Regulation 41 of the Conservation of Habitats and Species Regulations 2017 (and as amended), which makes it illegal to: • Deliberately capture, injure or kill any such animal or to deliberately take or destroy their eggs; • Deliberately disturb[7] such an animal; and • Damage or destroy a breeding site or resting place of such an animal. European Protected Species (EPS) licenses can be granted by Natural England in respect of development to permit activities that would otherwise be unlawful under the Conservation Regulations, providing that the following 3 tests (set out in the EC Habitats Directive) are passed, namely: • The development is for reasons of overriding public interest; • There is no satisfactory alternative; and • The favourable conservation status of the species concerned will be maintained and/or enhanced. Under Regulation 9(5) of the Conservation Regulations, Planning Authorities have a duty to 'have regard to the requirements of the EC Habitats Directive' i.e. LPA's must consider the above 3 'tests' when determining whether Planning Permission should be granted for developments likely to cause an offence under the Conservation Regulations.

[7] Under the Conservation Regulations, disturbance of protected animals includes in particular any disturbance which is likely to: (i) impair their ability to survive, breed or reproduce, or to rear or nurture their young or to hibernate or migrate; (ii) significantly affect the local distribution or abundance of the species in question.

Species	Legal Status
Domestic (UK) Legislations	
Bats, Dormouse, Great Crested Newt, Heath Fritillary, High Brown Fritillary, Large Blue, Marsh Fritillary, Natterjack Toad, Pine Martin, Otter, Red Squirrel, Sand Lizard, Smooth Snake, Swallowtail, Water Vole, Wildcat	These animals receive full protection under the Wildlife and Countryside Act 1981 (and as amended), which makes it illegal (subject to certain exceptions) to: • Intentionally kill, injure or take any such animal; • Intentionally or recklessly damage, destroy or obstruct any place used for shelter or protection by any such animal; and • Intentionally or recklessly disturb such animals while they occupy a place used for shelter or protection.
Adder, Common Lizard, Grass Snake, Slow Worm, White-clawed Crayfish	These animals receive partial protection under The Wildlife and Countryside Act 1981 (as amended by the Countryside and Rights of Way Act 2000), which provide protection against intentional killing or injury of any such animal.
Nesting Birds	All wild birds (as defined by the act) are protected under the Wildlife and Countryside Act 1981 (and as amended), which makes it illegal (subject to exceptions) to: • Intentionally kill, injure or take any wild bird; • Take, damage or destroy the nest (whilst being built or in use) or eggs of any wild bird.
WCA Schedule 1 listed Birds	Additional protection is provided to birds listed on Schedule 1 of the Wildlife and Countryside Act 1981 (and as amended). In addition to the offences detailed above relating to all wild birds, it is illegal to: • Intentionally or recklessly disturb any bird listed on Schedule 1, or their dependent young while nesting.
Badgers	The Protection of Badgers Act 1992 makes it illegal to wilfully kill or injure a Badger, or attempt to do so and to intentionally or recklessly interfere with a Badger sett. This includes: • damaging or destroying an active sett; • obstructing access to a sett; and • disturbing a Badger while it is occupying a sett. Licences can be granted to permit sett closure and/or disturbance between July and November inclusive (i.e. outside the sow pregnancy/birth period).
Wild Mammals	The Wild Mammals (Protection) Act 1996 provides legal protection to all wild mammals (as defined by the act) against the following actions: mutilate, kick, beat, nail, or otherwise impale, stab, burn, stone, drown, crush, drag or asphyxiate any wild mammal with intent to inflict unnecessary suffering.

Species	Legal Status
Invasive Species	
WCA Schedule 9 listed animals (Part 1) and plants (part 2)	Certain species of plants and animals that do not naturally occur in Great Britain have become established in the wild and represent a threat to the natural fauna and flora. Section 14 of the Wildlife & Countryside Act prohibits the release of any animal species that are: "*not ordinarily resident in and is not a regular visitor to Great Britain in a wild state*"

Policy Summary

Section 40 of the Natural Environment and Rural Communities (NERC) Act imposes a legal duty on Planning Authorities to 'have regard' to the conservation of biodiversity when considering planning applications.

Section 41 of the NERC Act requires the Secretary of State to publish a list of species and habitats of principal importance for conserving biodiversity in the UK. Such Biodiversity Action Plan (BAP) Habitats and Species (2007) do not offer the species any specific protection but help to highlight the species importance at a national level. This list is used by Local Planning Authorities to identify the species and habitats that should be afforded priority when applying the requirements of the National Planning Policy Framework (NPPF).

The NPPF underpins the Government's planning policies for England and how these are to be applied. The central theme of the NPPF is a presumption in favour of sustainable development. This presumption does not apply where development requiring Appropriate Assessment because of its potential impact on a habitats site is being planned or determined.

The NPPF states:

> *'When determining planning applications, local planning authorities should aim to conserve and enhance biodiversity by applying the following principles:*
>
> - *if significant harm resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;*
> - *proposed development on land within or outside a Site of Special Scientific Interest (SSSI) likely to have an adverse effect on a SSSI (either individually or in combination with other developments) should not normally be permitted. Where an adverse effect on the site's notified special interest features is likely, an exception should only be made where the benefits of the development, at this site, clearly outweigh both the*

impacts that it is likely to have on the features of the site that make it of special scientific interest and any broader impacts on the national network of SSSIs;

- *development proposals where the primary objective is to conserve or enhance biodiversity should be permitted;*
- *opportunities to incorporate biodiversity in and around developments should be encouraged;*
- *planning permission should be refused for development resulting in the loss or deterioration of irreplaceable habitats, including ancient woodland and the loss of aged or veteran trees found outside ancient woodland, unless there are wholly exceptional reasons and a suitable compensation strategy exists; and*
- *the following wildlife sites should be given the same protection as habitats sites: potential Special Protection Areas (SPA) and possible Special Areas of Conservation (SAC); listed or proposed Ramsar sites; and sites identified, or required, as compensatory measures for adverse effects on habitats sites, potential SPAs, possible SACs, and listed or proposed Ramsar sites.'*

The NPPF requires the Planning Authority to have a responsibility to promote the preservation, restoration and re-creation of priority habitats, ecological networks and the protection and recovery of priority species populations, linked to national and local targets, and identify suitable indicators for monitoring biodiversity in the plan. In addition, the planning system should contribute to and enhance the natural and local environment by minimising impacts on biodiversity and providing net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures.

Appendix 2

Habitat Suitability Survey

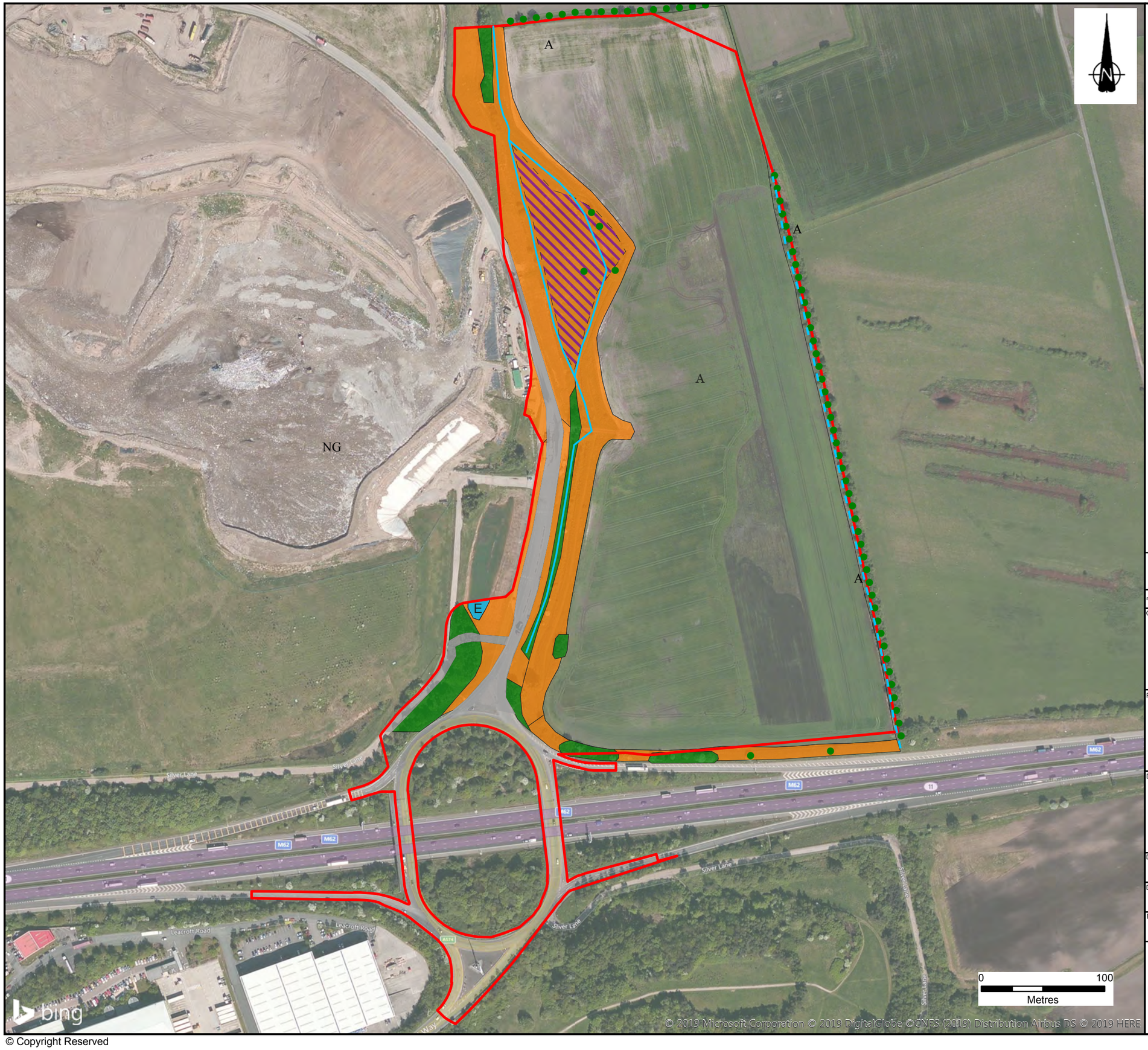
Appendix 2 – Habitat Suitability Survey

HSI Assessment Results				
Waterbody Reference	**Grid Reference**	**Photograph**	**HSI Score**	**HSI Classification**
WB1	SJ 65980 94037		0.49	**Poor**
WB2	SJ 66248 94152		0.49	**Poor**
WB3	SJ 66696 94174	Image not available	0.48	**Poor**

HSI Assessment Results				
Waterbody Reference	**Grid Reference**	**Photograph**	**HSI Score**	**HSI Classification**
WB4	SJ 66793 94066	Image not available	0.76	**Good**
WB5	SJ 67337 94339	N/A – Access Restricted	N/A	**N/A**
WB6	SJ 66893 93531		0.72	**Good**

HSI Assessment Results				
Waterbody Reference	**Grid Reference**	**Photograph**	**HSI Score**	**HSI Classification**
WB7	**SJ 67252 93599**		**0.63**	**Average**

DRAWINGS



KEY

- Site Boundary
- Broadleaved woodland - semi-natural
- Neutral grassland
- Marsh/marshy grassland
- E — Standing water - eutrophic
- A — Cultivated/disturbed land - arable
- Hardstanding
- Broadleaved Parkland/scattered trees
- Wet ditch
- Dry ditch

Notes:

Boundaries are indicative. Aerial imagery shown for context purposes only.

Classifications in accordance with Handbook for Phase 1 Habitat Survey - A technique for Environmental Audit (JNCC 2010).

REVISION	DETAILS	DATE	DRAWN	CHKD	APP'D
B	SITE BOUNDARY AMENDMENTS AND HABITAT UPDATES	JULY 2019	SW	JS	TP
A	FIRST ISSUE	APRIL 2019	SW	JS	TP

CLIENT

EXTRA MSA GROUP

PROJECT

MOTORWAY SERVICES, WARRINGTON

DRAWING TITLE

EXTENDED PHASE 1 HABITAT SURVEY RESULTS

DRG No.		REV
SH11739/007		B
DRG SIZE	SCALE	DATE
A3	1:3,000	December 2018
DRAWN BY	CHECKED BY	APPROVED BY
SW	TP	TP

wardell armstrong
NEWCASTLE UPON TYNE | TEL 0191 232 0943
WWW.WARDELL-ARMSTRONG.COM
BIRMINGHAM · BOLTON · CARDIFF · CARLISLE · EDINBURGH · GLASGOW · LONDON · MANCHESTER · SHEFFIELD · STOKE ON TRENT

KEY

- Site Boundary
- Waterbodies
- Running water

Notes:

Boundaries are indicative.

Aerial imagery shown for context purposes only.

REVISION	DETAILS	DATE	DRAWN	CHK'D	APP'D
B	SITE BOUNDARY AMENDMENTS	JULY 2019	SW	TP	TP
A	FIRST ISSUE	APRIL 2019	SW	JI	TP

CLIENT

EXTRA MSA GROUP

PROJECT

MOTORWAY SERVICES, WARRINGTON

DRAWING TITLE

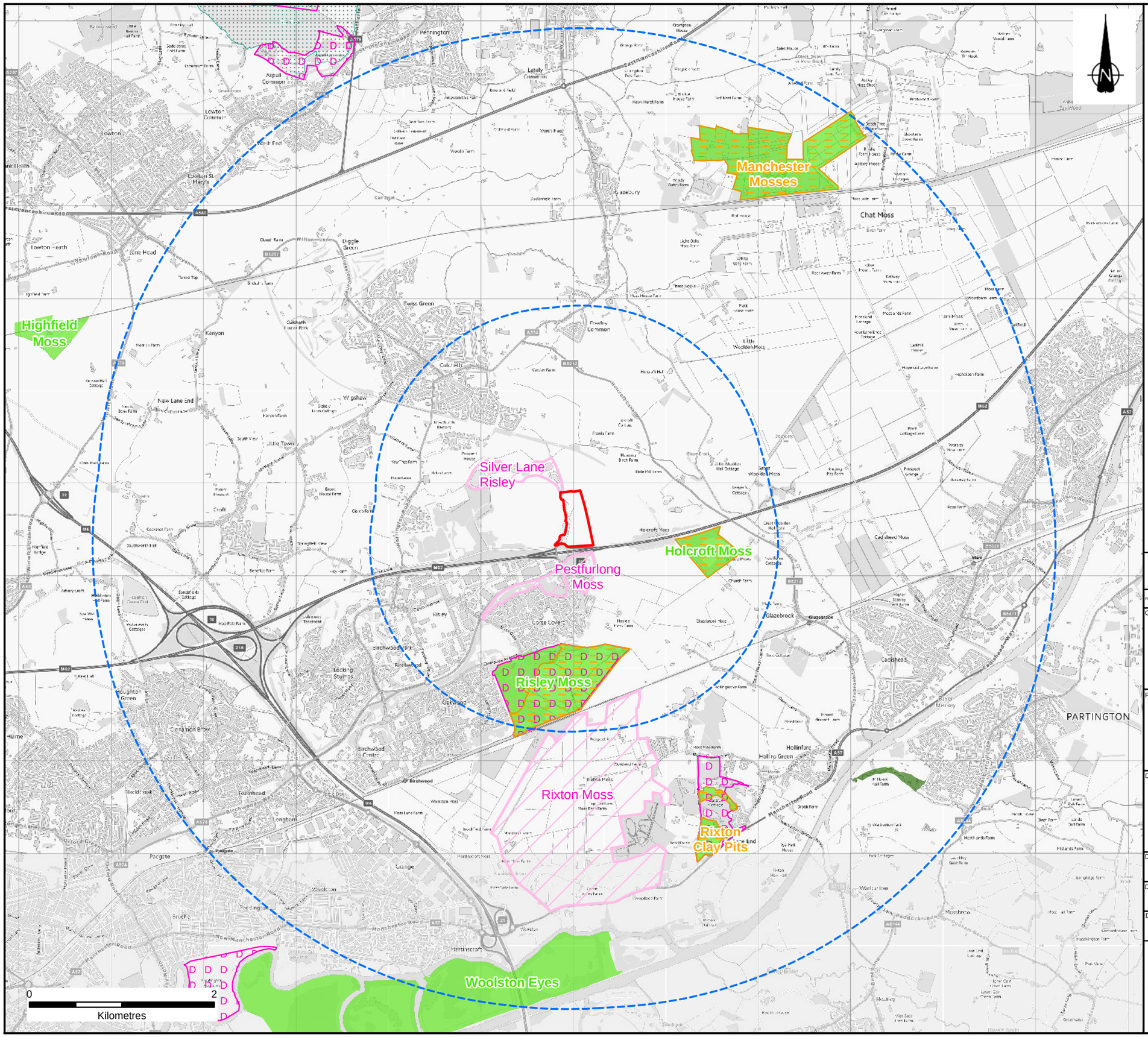
WATERBODY LOCATION PLAN

DRG No.		REV
SH11739/008		B
DRG SIZE	SCALE	DATE
A3	1:5,000	22/07/2019
DRAWN BY	CHECKED BY	APPROVED BY
SW	JI	TP

wardell armstrong

NEWCASTLE UPON TYNE | TEL 0191 232 0943
WWW.WARDELL-ARMSTRONG.COM

BIRMINGHAM, BOLTON, CARDIFF, CARLISLE, EDINBURGH, GLASGOW, LONDON, MANCHESTER, SHEFFIELD, STOKE ON TRENT



KEY

- Site Boundary
- 2km and 5km Distance Buffer
- Special Areas of Conservation
- Local Nature Reserves
- Country Parks
- Sites of Special Scientific Interest
- Ancient Woodland
- Local Wildlife Sites

REVISION	DETAILS	DATE	DRAWN	CHKD	APPD

CLIENT

EXTRA MSA GROUP

PROJECT

MOTORWAY SERVICES, WARRINGTON

DRAWING TITLE

LOCATION OF STATUTORY AND NON-STATUTORY CONSERVATION SITES

DRG No.		REV
SH11739/016		A
DRG SIZE	SCALE	DATE
A3	1:40,000	December 2018
DRAWN BY	CHECKED BY	APPROVED BY
SW	TP	MB

wardell armstrong

NEWCASTLE UPON TYNE | TEL 0191 232 0943
WWW.WARDELL-ARMSTRONG.COM

BIRMINGHAM, BOLTON, CARDIFF, CARLISLE, EDINBURGH, GLASGOW, LONDON, MANCHESTER, SHEFFIELD, STOKE ON TRENT

wardell-armstrong.com

STOKE-ON-TRENT
Sir Henry Doulton House
Forge Lane
Etruria
Stoke-on-Trent
ST1 5BD
Tel: +44 (0)1782 276 700

BIRMINGHAM
Two Devon Way
Longbridge Technology Park
Longbridge
Birmingham
B31 2TS
Tel: +44 (0)121 580 0909

BOLTON
41-50 Futura Park
Aspinall Way
Middlebrook
Bolton
BL6 6SU
Tel: +44 (0)1204 227 227

CARDIFF
Tudor House
16 Cathedral Road
Cardiff
CF11 9LJ
Tel: +44 (0)292 072 9191

CARLISLE
Marconi Road
Burgh Road Industrial Estate
Carlisle
Cumbria
CA2 7NA
Tel: +44 (0)1228 550 575

EDINBURGH
Great Michael House
14 Links Place
Edinburgh
EH6 7EZ
Tel: +44 (0)131 555 3311

GLASGOW
2 West Regent Street
Glasgow
G2 1RW
Tel: +44 (0)141 433 7210

LEEDS
36 Park Row
Leeds
LS1 5JL
Tel: +44 (0)113 831 5533

LONDON
Third Floor
46 Chancery Lane
London
WC2A 1JE
Tel: +44 (0)207 242 3243

MANCHESTER
76 King Street
Manchester
M2 4NH
Tel: +44 (0)161 817 5038

NEWCASTLE UPON TYNE
City Quadrant
11 Waterloo Square
Newcastle upon Tyne
NE1 4DP
Tel: +44 (0)191 232 0943

TRURO
Baldhu House
Wheal Jane Earth Science Park
Baldhu
Truro
TR3 6EH
Tel: +44 (0)187 256 0738

International offices:

ALMATY
29/6 Satpaev Avenue
Regency Hotel
Office Tower
Almaty
Kazakhstan
050040
Tel: +7(727) 334 1310

MOSCOW
21/5 Kuznetskiy Most St.
Moscow
Russia
Tel: +7(495) 626 07 67

wardell armstrong

Appendix 5.5 – Bat Survey Report

wardell-armstrong.com

ENERGY AND CLIMATE CHANGE
ENVIRONMENT AND SUSTAINABILITY
INFRASTRUCTURE AND UTILITIES
LAND AND PROPERTY
MINING AND MINERAL PROCESSING
MINERAL ESTATES
WASTE RESOURCE MANAGEMENT

EXTRA MSA GROUP

MOTORWAY SERVICES, WARRINGTON

BAT SURVEY REPORT

JULY 2019

wardell armstrong

Wardell Armstrong
36 Park Row Leeds, LS1 5JL, United Kingdom
Telephone: +44 (0)113 831 5533 www.wardell-armstrong.com

DATE ISSUED:	**JULY 2019**
JOB NUMBER:	**SH11739**
REPORT NUMBER:	**005**
VERSION:	**V1.0**
STATUS:	**FINAL**

EXTRA MSA GROUP

MOTORWAY SERVICES, WARRINGTON

BAT SURVEY REPORT

JULY 2019

PREPARED BY:

Alex Bingle	Ecologist	
Katie Smith	Ecologist	

REVIEWED BY:

Jamie Ingram	Senior Ecologist	

APPROVED BY:

Tim Palmer	Technical Director (Ecology)	

CONTENTS

APPENDICES

DRAWINGS	TITLE	SCALE
SH11739/037	Static Bat Detector Locations	1:3,500@A3
SH11739/038	Bat Activity Transect Route	1:3,500@A3
SH11739/039	Bat Activity Transect Survey Results Autumn 2018	1:3,500@A3

SH11739/045	Bat Activity Transect Survey Results Spring 2019	1:3,500@A3
SH11739/047	Bat Tree Roost Potential Plan	1:3,500@A3
SH11739/050	Bat Activity Transect Survey Results Summer 2019	1:3,500@A3

EXECUTIVE SUMMARY

Wardell Armstrong LLP (WA) was commissioned by Extra MSA Group to undertake bat surveys to inform a proposed motorway service area development scheme of land north of M62 Junction 11. The following surveys were undertaken, based on a 'Low' suitability site (Collins, 2016):

- Bat activity survey
- Bat transect survey
- Preliminary Bat Tree Assessment
- Bat Tree Inspection survey

The site is used mostly by commuting and foraging common pipistrelles, with noctule and brown long-eared bats also recorded. The site has very low bat activity levels in general. There are five trees with suitable bat roost features however none of the trees with suitable roost features contained any evidence of bat presence.

1 INTRODUCTION

1.1.1 Wardell Armstrong LLP (WA) was commissioned by Extra MSA Group to undertake a Bat Report of a proposed Motorway Services Area development (hereafter referred to as the 'development'), located on the northern side of the M62 at Junction 11, central Ordnance Survey (OS) grid reference: SJ 67053 93630.

1.1.2 The aim of the assessment was to determine the assemblage of bat species using the site and the levels of activity, in order that an assessment of impacts arising from the scheme can be made. The baseline information is presented in this report. The evaluation of the recorded activity will be detailed within the Ecology Chapter of the Environmental Statement.

1.2 Preliminary Ecological Appraisal

1.2.1 This report follows a Preliminary Ecological Appraisal (Wardell Armstrong 2018), which identified the presence of bat foraging and commuting habitat on site and the presence trees with potential to support roosting bats, on site and within the wider area.

1.3 Scoping Consultation

1.3.1 A scoping report was issued to Tameside Metropolitan Borough Council (TMBRC) during December 2018. Comments were returned during February 2019. The scoping response from TMBRC agreed that direct habitat loss and indirect lighting impacts to bats foraging, roosting and commuting habitats need to be considered in the Environmental Statement (ES). A recommendation of biodiversity net gain was made in line with the NPPF.

1.4 Site Context

1.4.1 The proposed development is to be located immediately adjacent to Junction 11 of the M62. The survey area (Site) covers the application area plus adjacent habitats where these are relevant to the assessment of potential bat activity.

1.4.2 The wider landscape comprises arable farmland/pasture to the east, south east and north, a capped landfill directly west of the site and Birchwood Business and Technology Park to the south west.

1.4.3 Holcroft Moss Site of Special Scientific Interest is located approximately 1,080m east and Manchester Mosses Special Area of Conservation, Risley Moss Site of Special Scientific Interest and Risley Moss Local Nature Reserve are located approximately 1.4km south of the site.

2 METHODOLOGY

2.1 Desk Study

2.1.1 The desktop study was informed by review of existing available information provided by RECORD (Local Records Centre) and from available internet-based resources for a 2km search radius. In addition, a 5km search radius was used for statutory sites which are notified for their bat interest. Ordnance Survey (OS) and satellite mapping was also used to gain contextual habitat information.

2.2 Survey Scope

2.2.1 In accordance with the Bat Survey Good Practice Guidelines (BCT Guidelines) (Collins, 2016), the appropriate level of survey effort should be based on:

- Likelihood of bats being present;
- Likely species concerned[1];
- Numbers of individuals;
- Type of habitat affected;
- Predicted impacts of the proposed development on bats; and
- Type and scale of proposed development.

2.2.2 In addition, Table 4.1 of the BCT Guidelines (Collins, 2016), was utilised to identify the suitability of the site for bats. The table lists example site descriptions in order of suitability from Low to High. Given this information, the following factors were used to define the appropriate level of survey work:

- The habitats on site are dominated by intensively farmed arable land;
- Disturbance effects from the motorway which lies to the south of site; and
- Lack of a diverse mosaic of habitats with features suitable for bats.

2.2.3 The foraging and commuting habitats on site are considered to be of 'Low' habitat suitability (Collins, 2016). Bat activity surveys in line with national standard guidelines (Collins, 2016) have, therefore, been devised on the basis of '**Low habitat suitability'**.

[1] Including the presence or likely presence of any EU Annex II bat species, which includes lesser horseshoe *Rhinolophus hipposideros*, greater horseshoe *Rhinolophus ferrumequinum*, barbastelle *Barbastellus barbastella*, and Bechstein's bat *Myotis bechsteinii*

2.3 Activity Survey

Transect Survey

2.3.1 The transect route was selected in order to cover representative habitats throughout the survey area.

2.3.2 The extent and number of habitats present on site[2] was utilised to identify the number of transects required. A single transect route, measuring approximately 1.75 km, was planned during daylight hours in order to locate any potential risk to the surveyors and to identify the location of likely good foraging bat habitats. The transect route was selected in order to cover representative habitats throughout the survey area. The transect route was walked by 2 surveyors (see Drawing Number SH11739/038).

2.3.3 Transect visits were undertaken seasonally during Autumn 2018, Spring 2019 and Summer 2019. Survey dates, times and weather conditions are detailed within the Table 1 below:

Table 1: Transect Survey Conditions

Date	Weather Conditions	Local Sunset	Start Time	End Time
25/10/2018	11°C, 8/8 cloud cover, F2 breeze, dry	17:52	17:52	19:36
15/04/2019	10°C, 4/8 cloud cover, F3 breeze, dry	20:10	19:50	22:15
04/06/2019	12°C, 8/8 cloud cover, F2 breeze, dry	21:31	21:16	23:27

2.3.4 The transect was split into sections with twelve 'point counts' positioned along the route from which bat data was sampled for a 5-minute period. The initial survey was walked in order from point count 1-12, visit 2 amended the route by lapping the site twice with a total of fourteen point count locations due to the small size of the site.

2.3.5 The transect surveys commenced approximately at sunset and continued for a minimum of 1.5 hours beyond local sunset.

2.3.6 All bat activity was recorded including both at and between point counts, and all passes tallied. This enabled a Bat Activity Index (BAI – bat passes per point count and per hour) to be calculated for each bat species recorded for each point count and for the site overall. Observations of bat behaviour, bat species, and number of bats and the direction of the flight path were also noted where possible. Additional notes were made on the time the first bat of each species was recorded and direction of flight lines, if possible.

[2] Which was identified during the Preliminary Ecological Appraisal

2.3.7 Echo Meter Touch (Wildlife Acoustics, Inc., Massachusetts) bat detectors and iPads (Apple Inc., California) were used to detect bats and the built-in Kaleidoscope classifiers were used to assist species identification. If required, the results were later analysed using BatSound sonogram analysis software (Version 3.31, Petterson Elektrik).

2.3.8 All surveys were orchestrated and led by a WA ecologist with extensive experience of undertaking bat surveys.

Automated Surveys

2.3.9 Two Song Meter SM2BAT+ Ultrasonic Recorder (Wildlife Acoustics, Inc.) automated bat detector units were deployed for at least five consecutive nights during Autumn (October) 2018, Spring (April) 2019 and Summer (June) 2019 (see Drawing SH11739/037 for Automated Detector Locations). Table 2 below shows the associated habitat at each automated detector location.

Table 2: Habitat type at each detector location	
Location 1	Habitat associated with ditch/scrub
Location 2	Habitat associated with open arable land

2.3.10 A stratified approach to placing the bat detectors was utilised. The calibrated detectors were paired to sample bat activity associated with the detector sampling volume within habitats to be lost/removed to enable development and an area predicted to have a higher level of bat activity.

2.3.11 The devices were positioned on the ground with the microphone pointing upwards at an angle of approximately 45 degrees and were programmed to record ultrasound from 30 minutes before local sunset to 30 minutes after local sunrise.

2.3.12 After retrieval of the recording devices the data files were downloaded as Waveform Audio File Format Files (WAV) and the species were analysed using Kaleidoscope.Ink auto-identification software (Version 1.1.19, Wildlife Acoustics, Inc.). If call parameters could not be accurately determined by this method, the files were then analysed using BatSound (Version 3.31, Petterson Elektrik) analysis programme. This software retains and displays amplitude information and can facilitate more accurate identification of calls with overlapping characteristics.

2.3.13 For the circumstances of this report, a bat pass is defined as a single sound file recorded via the basic set up of the SM2BAT+ unit. The unit will measure background noises between 16 kHz and 384 kHz. A sound file will be recorded if the noise detected

reaches a threshold of ≥18 dB, between these frequencies, a recording is made until no trigger is detected for a 2 second period.

2.3.14 The number of sound files recorded were utilised to calculate a Bat Activity Index Value (BAIV- Bat passes per night), for each bat species recorded for each detector location, month surveyed and for the site overall.

2.4 Preliminary Tree Roost Assessment

2.4.1 Preliminary tree inspections were undertaken on 19th March and reassessed on 4th April 2019 by a Natural England Bat Licensed (Natural England Class Licence CL18 (Bat Survey Level 2): Ecologists, from Wardell Armstrong LLP. The purpose of the preliminary tree roost assessment was to identify any trees containing potential roost features (PRF) and assess their suitability for bats. The tree assessments were based on the updated criteria given in best practice guidelines (Collins 2016).

2.4.2 The external examination of the trees were undertaken using binoculars and high powered torches to check for entry points such as cracks or holes, evidence of bat activity such as staining, droppings and feeding remains.

2.4.3 Based on the location, age and type of the tree, the potential features present and the indicating signs recorded, each tree was placed into one of the following categories (Collins, 2016):

- Confirmed roost: Bat or signs of bats discovered during the survey;
- High: A tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat;
- Moderate: A tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status;
- Low: A tree of sufficient size and age to contain PRF's but with none seen from the ground or features seen with only very limited roosting potential; and
- Negligible: Negligible habitat features on site likely to be used by bats.

2.4.4 Trees were re-assessed in terms of whether they had features capable of supporting roosting bats or not, information obtained from this survey was used to inform the inspection survey.

2.5 Tree Roost Inspection

2.5.1 A total of 5 trees on site have been identified as having bat roost potential, and are likely to be impacted directly or indirectly by the proposed works. Therefore, these five trees were inspected by a suitably qualified ecologist on 4th April 2019 and subject to a bat inspection to determine bat roost presence/likely absence. Drawing number SH11937-047 highlights the locations of these trees.

2.5.2 During the inspection, any suitable bat roosting features present on the tree were extensively examined with an endoscope to determine any evidence of roosting bats; such as the physical presence of a bat(s), bat droppings, urine stains and scratch marks.

2.5.3 Any suitable features, and if present, evidence of roosting bats was documented accordingly. See Appendix 3 for details.

2.6 Analysis

2.6.1 Transect Bat Activity Index Values (BAIV) are calculated for each recorded species by averaging the number of passes recorded during the transect survey period to give the mean number of passes per hour.

2.6.2 Bat Activity Index Values (BAIV) are calculated to allow comparisons of activity recorded over the active bat season and between sample locations/habitats. Automated detector BAIVs are calculated using the automated survey data, taking mean nightly pass rates for all survey sessions and each survey location.

2.7 Calibration

2.7.1 To ensure compliance with the current Good Practice Guidelines (Collin, 2016); each detector and microphone is subject to a yearly service, calibration and sensitivity check. In addition, each unit is subject to a system check prior to being utilised on site. Calibration and system checks are undertaken, to ensure that results are comparable, as far as reasonably possible.

2.8 Limitations

2.8.1 Standard methodologies have been used, which are accepted by Natural England and other statutory conservation bodies. No responsibility will be accepted where these methodologies fail to identify all species on site. Wardell Armstrong cannot take

responsibility where Government, national bodies or industry subsequently modify standards.

2.8.2 The absence of desk study records has not been relied upon to infer absence of a species/habitat. Often, the absence of records is a result of under-recording within the given search area.

2.8.3 It should be noted that Long-eared bats *Plecotus* spp. and barbastelle *Barbastella barbastellus* in particular echolocate more quietly than other bat species and so can sometimes be more difficult to detect.

2.8.4 Specific species are notoriously difficult to identify precisely in the field and from recorded sonograms, as there is considerable overlap in their echolocation characteristics. Where the bat species cannot be accurately determined from sampled calls, only the genus is stated i.e. *Nyctalus* or *Myotis* spp.

2.9 Quality

2.9.1 All Ecologists employed by WA are members of CIEEM and are bound by its code of professional conduct. All surveys and assessments have been undertaken with reference to the recommendations given in British Standard BS 42020: 2015.

3 RESULTS AND EVALUATION

3.1 Desk Study

3.1.1 There are no statutory sites designated for bats within 5 km. There are three Local Wildlife Sites none of which are designated specifically for bats.

3.1.2 There are existing records for at least three species of bat occurring within the desk study search area; namely: common pipistrelle (*Pipistrellus pipistrellus*), soprano pipistrelle (*Pipistrellus pygmaeus*), and noctule (*Nyctalus noctula*). A single common pipistrelle roost was recorded 1.87 km south west of the site boundary. See Table 3, below for details.

3.1.3 The remaining records were either sightings or auditory, none of which were recorded on site.

Table 3: Desk Study Evaluation							
Species	**Date Recorded**	**Number of Bats**	**Location**	**Distance to Site**	**Suitable Roost Features Present On/Near Site**	**Recorded on site?**	
						Transect	**Automated**
Common Pipistrelle	24/082017	1	SJ651929	1.87km southwest	Few trees suitable to support common pipistrelle on site. Suitable commuting and foraging in the form of tree lines and marshy grassland.	Yes	Yes
	10/08/2017	1					
	19/08/2017	1	SJ67119238	925m south			
	18/09/2011	n/a	SJ668921	1.24km south			
Soprano Pipistrelle	29/07/2011	n/a	SJ667918	1.5 km south	Few trees suitable to support common pipistrelle on site. Suitable commuting and foraging in the form of tree lines and marshy grassland.	Yes	Yes
Noctule	29/07/2011	n/a	SJ667918	1.5 km south	No suitable supporting roost features onsite, Suitable foraging in the form of marshy grassland and open arable land.	Yes	Yes

3.2 Bat Activity Summary

3.2.1 During the surveys, overall activity levels were highest for common pipistrelle, which was recorded far more frequently than all the other species; accounting for 35.29 % of all activity, for the total automated survey (Table 3 and Appendix 2) and 70 % of the total recorded activity during the transect survey (Table 3 and Appendix 2). The remaining 30% of activity recorded during the transect survey was soprano pipistrelle.

Transect Survey

3.2.2 A summary of the activity levels recorded during the transect surveys, are described within in Table 4 below. A full break down of the transect surveys results is provided within Appendix 2.

Common Pipistrelle (PIPI)

3.2.3 Common pipistrelle activity equates to 0.97 passes per hour. The highest levels of activity were associated with the treeline on the western and eastern boundary of the site.

3.2.4 The proportion of common pipistrelle activity was recorded more over the Spring 2.07 BAIV (55.56 % of all common pipistrelle activity) than the Summer 0.92 BAIV and Autumn 1.16 BAIV (22.22 % of all common pipistrelle activity per Summer and Autumn surveys). See Table 4 for Total Passes and BAIV per season.

Soprano Pipistrelle (PIPY)

3.2.5 Soprano pipistrelle accounted for 25 % of activity levels recorded during the transect surveys and was more prominent during the autumn transect. Soprano pipistrelle activity equates to 0.79 passes per hour and recorded at the north west corner, within the open arable land north of the site and along the southwest boundary. (See Appendix 2).

Noctule (NYNO)

3.2.6 Noctule was only recorded during the Summer transect survey, and activity equates to 0.95 passes per hour during the transect surveys. This accounts for 30 % of activity levels across all survey visits (as described in Appendix 2). Single noctule passes were recorded in central locations of the site, associated with open habitat.

Table 4: Transect Survey Summary Results					
Season	**Species Recorded**	**Species Location Summary**	**Total Passes Recorded**	**% of Activity Recorded**	**BAIV (passes per hour)**
Autumn 2018	Common Pipistrelle	Recorded commuting over open arable fields.	2	50%	1.16
	Soprano Pipistrelle	Recorded commuting over open fields and along treelines in the northwest.	2	50%	1.16
Spring 2019	Common Pipistrelle	Dominant species recorded during Spring. Recorded along much of south eastern treeline both foraging and commuting as well as north western treeline.	5	83.33%	2.07
	Soprano Pipistrelle	Recorded in only one location, treeline in north western corner	1	16.67%	0.41
Summer 2019	Common pipistrelle	Recorded in the southeast and along the western boundary along treelines adjacent to open fields.	2	20%	0.92
	Soprano pipistrelle	Recorded in two locations along the southern boundary of the site.	2	20%	0.92
	Noctule	Dominant species recorded during Summer. Recorded in multiple locations across the site, predominantly in central, open habitat locations.	6	60%	2.75

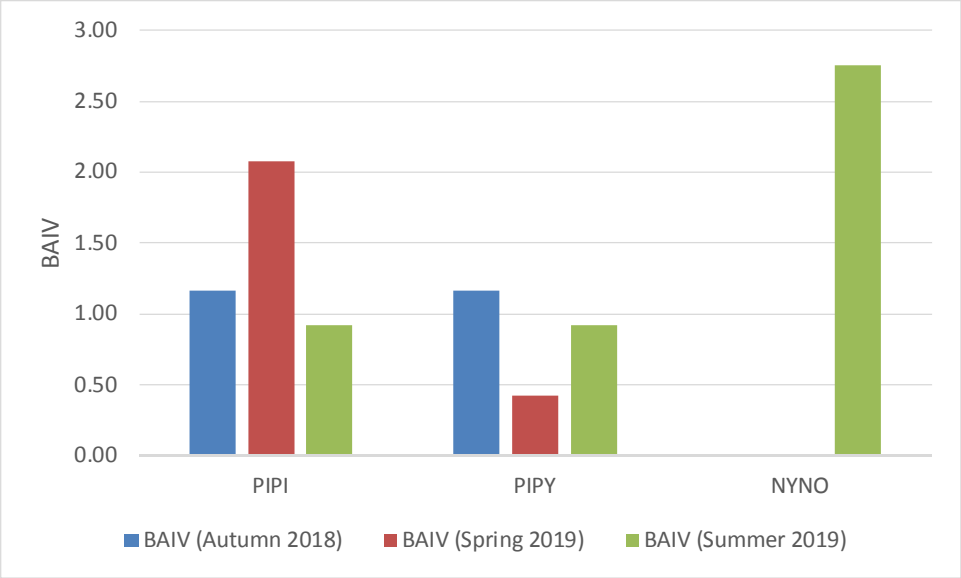


Figure 1: Bar Graph of Common pipistrelle, Soprano Pipistrelle and Noctule Transect Activity Across Site

3.2.7 Figure 1 details the bat activity for common pipistrelle, soprano pipistrelle, and noctule recorded during the transect surveys. Similar levels of common and soprano pipistrelle activity were recorded during autumn and summer. In spring, the highest common pipistrelle activity was recorded, and the lowest soprano pipistrelle activity was recorded. Noctule activity was only recorded during the summer transect survey.

Automated Survey

3.2.8 The automated survey results are summarised within in Table 5, below. A full breakdown of the automated surveys results is provided within Appendix 4.

Table 5: Automated Survey Summary per detector location		
Species[3]	**BAIV at Location 1 (Passes per night)**	**BAIV at Location 2 (Passes per night)**
MYsp	1.39	0.06
NYNO	3.28	0.33
NYsp	0.44	0
NYLE	0.06	0
PIPI	5.28	1.56
PIPY	3.89	0.33
PLAUR	1.39	0.11
Total	**15.72**	**2.39**

[3] MYsp – Myotis spp.; NYsp – Nyctalus spp.; NYLE – Leisler's Bat; NYNO- Noctule; PIPI- Common Pipistrelle; PIPY – Soprano Pipistrelle; PLAUR- Brown Long-eared Bat;

Myotis Species (MYsp)

3.2.9 The automated surveys recorded *Myotis* spp. equating to 7.98% of all activity on site. Activity levels were recorded at both locations, with higher activity levels recorded in scrub habitat at Location 1, 1.39 passes per night compared to 0.06 passes per night at Location 2 in open arable habitat. See Figure 2 and Appendix 4 for results and Drawing SH11739/037 for Automated Detector Locations.

3.2.10 The highest *Myotis* spp. activity levels were recorded during the summer survey, with 1.5 passes per night, and low activity also recorded during the spring survey (0.8 passes per night). Figure 3 and Appendix 4 highlight this information. No activity was recorded during the autumn survey period.

Noctule (NYNO), Leisler's bat (NYLE) and *Nyctalus spp. (NYsp)*

3.2.11 Noctule, Leisler's bat and *Nyctalus spp.* represent 22.7% of the total bat activity on site over all surveys carried out. 19.9% of this activity was of noctule, 0.31% was of Leisler's bat and 2.45% of this activity was of *Nyctalus spp*. activity.

3.2.12 Leisler's bat *and Nyctalus spp.* were only recorded within scrub habitat at Location 1 (0.06 passes per night and 0.44 passes per night). Noctule was recorded at both locations, with higher activity levels associated with scrub habitat (3.28 passes per night at this location). No activity for the genus was recorded during the autumn survey period, and the highest levels of activity were recorded by the automated detectors during the summer survey (4, 0.08 and 0.58 passes per night for noctule, Leisler's bat and *Nyctalus spp*. respectively). Figures 2 and 3 and Appendix 4 highlight this information.

Common Pipistrelle (PIPI)

3.2.13 Common pipistrelle was recorded more frequently than any other species and accounts for 37.7% of activity surveys, with a total BAIV of 3.42 passes per night.

3.2.14 Common pipistrelle activity was recorded at both automated detector locations with higher activity levels recorded in scrub habitat at Location 1 (5.28 passes per night) compared with open habitat at Location 2 (1.56 passes per night). Common pipistrelle activity levels were recorded much higher during spring and summer than autumn automated surveys (4.7, 6.25 and 0.7 passes per night, respectively). Figures 2 and 3 and Appendix 4 highlight this information.

Soprano Pipistrelle (PIPY)

3.2.15 Soprano pipistrelle activity was recorded at both automated detector locations with 3.89 passes per night within scrub habitat and 0.33 passes per night in open arable habitat. Soprano pipistrelle activity was highest during spring (4.3 passes per night) and overall accounted for 23.3% of bat activity. See Figures 2 and 3 and Appendix 4 for details.

Brown Long-eared Bat (PLAUR)

3.2.16 Brown long-eared bat activity levels were recorded at both automated detector locations, with higher activity recorded in scrub habitat at Location 1 compared with open habitat at Location 2 (1.39 and 0.11 passes per night, respectively). No activity was recorded for this species during the autumn automated survey and highest activity levels were recorded during spring with 1.9 passes per night. Brown long eared bat activity accounted for 8.9% of overall activity recorded during the surveys. See Figures 2 and 3 and Appendix 4 for details.

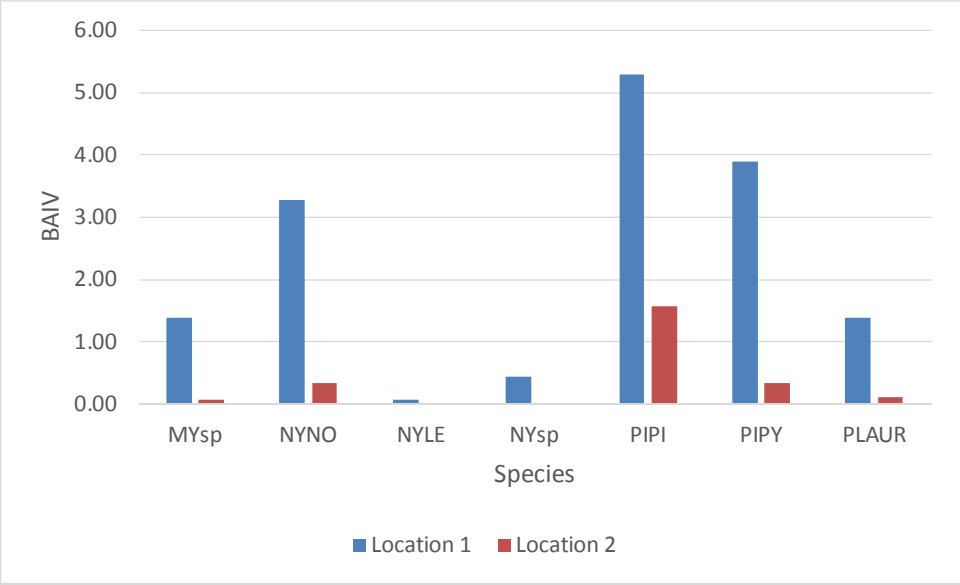


Figure 2: Bar Graph of all Species at Automated Survey Locations 1 and 2

3.2.17 Figure 2 details the activity levels for each species recorded at each of the automated detector locations. across all species, higher activity levels were recorded at Location 1 (scrub habitat) compared with open arable habitat at Location 2.

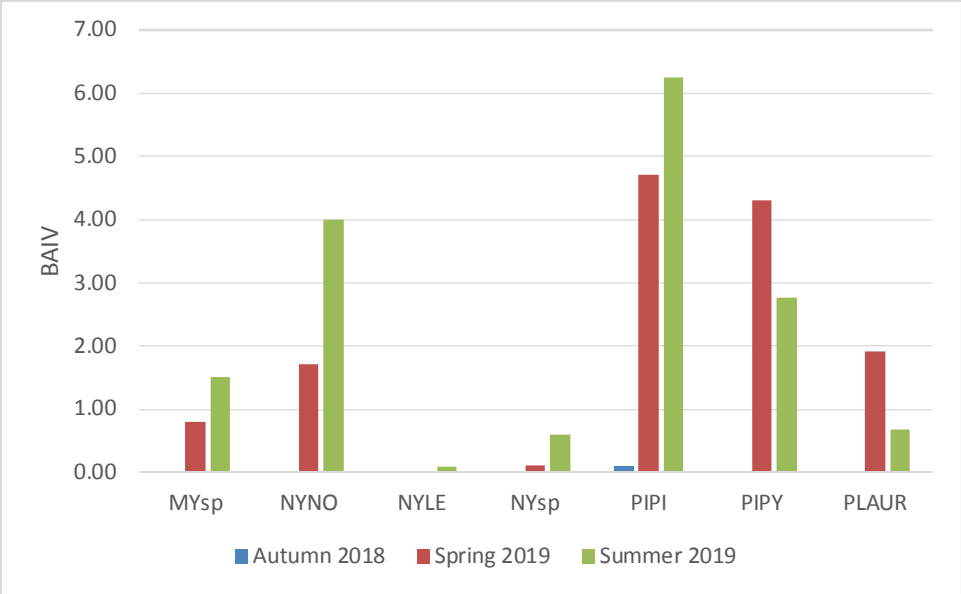


Figure 3: Bar Graph of Automated Surveys for Each Survey Season

3.2.18 Figure 3 shows the species activity recorded during each survey season, for all detector locations. Activity levels were more abundant for all species during spring and summer with only low activity for common pipistrelle recorded during autumn 2018.

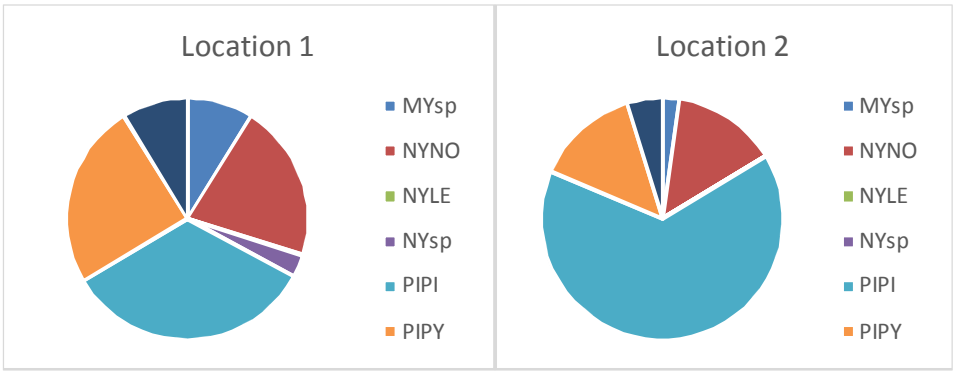


Figure 4: Pie charts to show Breakdown of each Species recorded per Automated Detector

3.2.19 Figure 4 above shows the breakdown of species recorded at each location across all surveys. Common pipistrelle were recorded most frequently at both locations, followed by soprano pipistrelle and noctule (37.7%, 23.3% and 20% of activity respectively).

3.3 Preliminary Tree Roost Assessment and Bat Tree Inspection Survey

3.3.1 A total of five trees were considered to have suitable roost features present categorised between 'low-moderate' suitability for roosting bats. See Table 6 below and Appendix 4 for details.

3.3.2 No evidence of roosting bats was documented within the five trees subject to a bat inspection. Following the inspection, the bat roost suitability categories assigned to each tree has been updated[4], as shown below in Table 6. The full details from the climbed inspection survey are provided in Appendix 4, and highlighted in Drawing number SH11739-047.

Table 6: Bat Roost Classification for Trees Subject to Inspection

Tree Reference	Bat Roost Classification identified during PEA survey (WA, 2017)	Bat Roost Potential Classification following climbed bat inspection	All Features Fully Inspected	Evidence of Bats recorded
T1	Moderate	Moderate	✓	×
T2	Moderate	Low	✓	×
T3	Moderate	Low	✓	×
T4	Low	Negligible	✓	×
T5	Low	Negligible	✓	×

3.4 Site Evaluation

3.4.1 Table 7 (below) provides the site evaluation value according to categories which broadly follow the Wray *et al* (2010) evaluation system, including:

- Activity Type Recorded;
- National Rarity;
- Activity;
- Site/Nearby Roost Potential; and
- Type & Complexity of Linear Features/ Foraging habitat.

3.4.2 The national rarity of the *Myotis* species included within Table 5 is species dependent. *Myotis* spp. within the UK can range from one of Britain's rarest species to common and widespread. Given the location of the site, the limited distribution of the species (BCT, 2016[5]) and habitat selection of the species, it is considered unlikely that the *Myotis* species recorded onsite is a rarer *Myotis* species, such as Bechstein's bat *Myotis bechsteinii or Alcathoe bat Myotis alcathoe*. It is considered that the species present on site could be, one or a combination of the following

[4] From those stated in the earlier ground based assessments.
[5] Bat Conservation Trust Bechstein's bat survey final report September 2007- September 2011- http://www.bats.org.uk/data/files/publications/Bechsteins_bat_survey_final_report.pdf

species: Daubenton's bat *Myotis Daubentonii*, Natterer's bat, whiskered bat or Brandt's bat.

3.4.3 Overall, the Site is of local value to common pipistrelle; however, given lower bat activity levels, for all other species the relative paucity of supporting habitats and reduced species composition; it is considered that the site is of Local value to bats overall.

Table 7: Site and Species Evaluations						
Species	**Activity Type Recorded**	**National Rarity**	**Activity**	**Site/Nearby Roost Potential**	**Type & Complexity of Linear Features/ Foraging Habitat**	**Value**
Myotis species	Foraging	Ranging between widespread and common/widespread.	Lowest levels of activity recorded onsite.	Multiple suitable trees (c.5) are located on site. With the additional of suitable trees and buildings in the wider area.	Suitable foraging and commuting habitat present on site, including ditch and scrub edge, tree lines and waterbodies onsite and adjacent.	County
Noctule and *Nyctalus spp.*	Commuting	Relatively widespread in England, Wales and to south-west Scotland.	On average, less than one pass per night recorded	Multiple suitable trees (c.5) are located on site, with the additional of suitable trees immediately adjacent to site.	Optimal linear routes present across site, however, this is less likely to influence the *Nyctalus* species.	Local
Common Pipistrelle	Foraging	Common and widespread	Highest levels of activity recorded onsite, within each of the surveys.	Multiple suitable trees (c.5) are located on site. With the additional of suitable trees and buildings immediately adjacent to site.	Optimal habitat present on and immediately adjacent to site, including ditch and scrub edge, tree lines and waterbodies onsite and adjacent. including burn/woodland edge, hedgerows with sheltered grassland, waterbodies.	County
Soprano Pipistrelle	Foraging	Common and widespread	Joint second highest levels of activity recorded onsite, within each of the surveys.			County
Brown Long-eared bat	Foraging	Common and widespread	Joint second highest levels of activity recorded onsite, within each of the surveys.		Optimal linear routes present across site, and leading further afield, including tree lines and ditches.	Local

4 IMPACT ASSESSMENT

4.1 Short Term Impacts

4.1.1 Optimal habitats onsite e.g. ditch, scrub, waterbody, marshy grassland and tree line will either be lost to the development or indirectly impacted by the increase in noise, lighting, dust and vibration during the site clearance and operational phases, which could result in a functional loss of the foraging habitat.

4.2 Long Term Impacts

4.2.1 In the absence of mitigation, direct loss of foraging habitat will result in a reduction of the carrying capacity of the wider area. Habitats on site are largely sub-optimal habitats, including large areas of arable habitat and unsheltered grazed pasture.

4.2.2 Some optimal habitat will be lost to the proposed development. The optimal habitats due to be lost include ditch, scrub, waterbody, marshy grassland and tree line, which provide commuting routes as well as shelter for foraging, and which provide a prey source.

5 REFERENCES

Collins, J. (ed.) (2016) Bat Survey Guidelines for Professional Ecologist: Good Practice Guidelines (3rd edn). The Bat Conservation Trust, London. ISBN-13 978-1-872745-96-1

Russ. J, (2012). British Bat Calls: A Guide to Species Identification. Pelagic Publishing, Exeter

Wardell Armstrong (2018) Motorway Services, Warrington: Preliminary Ecological Appraisal. Wardell Armstrong: Sheffield.

Wray, S. Wells, D. Long, E. and Mitchell-Jones, T. (2010) Valuing Bats in Ecological Impact Assessment. In Practice: No. 70, December 2010, Pg. 23- 25. Bulletin of the Institute of Ecology and Environmental Management: Hampshire.

Appendix 1

Legislation and Policy Summary

Appendix 1: Legislation and Policy Summary

All UK bat species are listed under Schedule 2 of the Conservation of Habitats and Species Regulations 2012 and as such receive protection under Regulation 41, which makes it an offence to:

- Deliberately capture or kill a bat;
- Deliberately disturb a bat; and
- Damage or destroy a breeding site or resting place of a bat.

Under the 2012 Regulations, disturbance of bats includes in particular any disturbance which is likely to:

- Impair their ability to survive, breed or reproduce, or to rear or nurture their young or to hibernate or migrate; and
- Significantly affect the local distribution or abundance of the species in question.

European Protected Species (EPS) licenses can be granted by Natural England in respect of development to permit activities that would otherwise be unlawful, providing that 'favourable conservation status' is maintained.

All UK bat species are also listed under Schedule 5 of the Wildlife and Countryside Act 1981 and therefore receive protection under Section 9 of this Act (as amended). Among other things, this legislation makes it an offence to.

- Intentionally kill, injure or take a bat;
- Intentionally or recklessly damage, destroy or obstruct access to any place that a bat uses for shelter or protection; and
- Intentionally or recklessly disturb any bat whilst it is occupying a structure or place that it uses for shelter or protection.

Protection Afforded by the Planning System

The National Planning Policy Framework (NPPF) (Department for Communities and Local Government (DCLG), 2012) sets out national policy towards biodiversity in planning decisions. Under the NPPF the presence of a protected species is a material consideration where a development proposal that, if carried out, would be likely to result in harm to the species or its habitat.

The NPPF states that:

- *'When determining planning applications, local planning authorities should aim to conserve and enhance biodiversity by applying the following principles:*
- *if significant harm resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;*
- *proposed development on land within or outside a Site of Special Scientific Interest (SSSI) likely to have an adverse effect on a SSSI (either individually or in combination with other developments) should not normally be permitted. Where an adverse effect on the site's notified special interest features is likely, an exception should only be made where the benefits of the development, at this site, clearly outweigh both the impacts that it is likely to have on the features of the site that make it of special scientific interest and any broader impacts on the national network of SSSIs;*
- *development proposals where the primary objective is to conserve or enhance biodiversity should be permitted;*
- *opportunities to incorporate biodiversity in and around developments should be encouraged;*
- *the following wildlife sites should be given the same protection as European sites: potential Special Protection Areas (SPA) and possible Special Areas of Conservation (SAC); listed or proposed Ramsar sites; and sites identified, or required, as compensatory measures for adverse effects on European sites, potential SPAs, possible SACs, and listed or proposed Ramsar sites.'*

Under Section 40 of the Natural Environment and Rural Communities (NERC) Act 2006 public bodies, including Local and Regional Planning Authorities have a duty to 'have regard' to the conservation of biodiversity in England when carrying out their normal functions, which includes consideration of planning applications. In compliance with Section 41 of the Act, the Secretary of State has published a list of species considered to be of principal importance for conserving biodiversity in England. This is The England Biodiversity List, of which there are 941 'priority' species. Regional Planning Bodies and Local Planning Authorities use the list to identify the species that should be afforded priority when applying the requirements of the NPPF to promote the protection and recovery of species populations, via national and local targets.

Seven bat species are NERC s.41 Priority Species. These are:

- Barbastelle Barbastelle barbastellus;

- Bechstein's bat Myotis bechsteinii;
- Noctule;
- Soprano Pipistrelle Pipistrellus pygmaeus;
- Brown Long-eared bat;
- Greater horseshoe bat Rhinolophus ferrumequinum; and
- Lesser horseshoe bat Rhinolophus hipposideros.

Foraging Areas & Commuting Routes

Bat foraging areas and commuting routes are not directly protected under the legislation described above. However, loss of important foraging areas and/or commuting routes could potentially constitute a disturbance offence, as defined by the 2012 Regulations[6], in addition, the loss of a commuting route providing the only access to a roost could also potentially constitute indirect damage/destruction of a breeding site/resting place and damage/destruction/obstruction of a places used for shelter/protection under the Wildlife and Countryside Act 1981.

[6] Where such actions result in a loss of the ecological functionality of the roost.

Appendix 2

Transect and Automated Detector Survey Results

Appendix 2: Transect and Automated Detector Survey Results

Transect Results

Bat Activity Index Values (BAIV) (Bat Passes per five Minutes) were calculated for each point count and each species. All bat passes at each point count were tallied for each species. This total was then divided by the number of survey visits. Total passes and BAIV's recorded are provided within the tables below.

Summary of all activity (raw data) recorded at and between point counts:

Visit	Point count	PIPI	PIPY	NYNO
Autumn 2018	4	0	1	0
	5	1	0	0
	5-6	0	1	0
	7-8	1	0	0
Spring 2019	6-7	4	0	0
	10	1	1	0
Summer 2019	7-8	0	0	1
	9	0	0	1
	10	1	0	0
	11	0	1	0
	1	0	0	1
	1-2	0	1	1
	2-3	1	0	2
Total		9	5	6
%		45	25	30
BAIV - SITE		0.97	0.79	0.95

Automated Survey

Bat Activity Index Values (BAIV) (Bat Passes per Night) were calculated for automated detector location and each species. All bat passes at each location were tallied for each species. This total was then divided by the number of night's surveys. Total passes recorded and BAIVs are provided within the tables below for locations and months.

Overall Summary

	MYsp	NYNO	NYLE	NYsp	PIPI	PIPY	PLAUR	Grand Total
Total passes	26	65	1	8	123	76	27	326
BAIV	1.44	3.61	0.06	0.44	6.83	4.22	1.50	18.11
%	7.98	19.94	0.31	2.45	37.73	23.31	8.28	100.00

Total Passes per Species per Season

Season	MYsp	NYNO	NYLE	NYsp	PIPI	PIPY	PLAUR	Grand Total
Autumn 2018	0	0	0	0	1	0	0	1
Spring 2019	8	17	0	1	47	43	19	135
Summer 2019	18	48	1	7	75	33	8	190
Grand Total	26	65	1	8	123	76	27	326

BAIV per Species per Season

Season	MYsp	NYNO	NYLE	NYsp	PIPI	PIPY	PLAUR	Grand Total
Autumn 2018	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.07
Spring 2019	0.8	1.7	0	0.1	4.7	4.3	1.9	13.5
Summer 2019	1.5	4	0.08	0.58	6.25	2.75	0.67	15.83
Grand Total	0.72	1.81	0.03	0.22	3.42	2.11	0.75	9.06

Total Passes per Species per Location

Location	MYsp	NYNO	NYLE	NYsp	PIPI	PIPY	PLAUR	Grand Total
Location 1	25	59	1	8	95	70	25	283
Location 2	1	6	0	0	28	6	2	43
Grand Total	26	65	1	8	123	76	27	326

BAIV per Species per Location

Location	MYsp	NYNO	NYLE	NYsp	PIPI	PIPY	PLAUR	Grand Total
Location 1	1.39	3.28	0.06	0.44	5.28	3.89	1.39	15.72
Location 2	0.06	0.33	0	0	1.56	0.33	0.11	2.39
Grand Total	1.44	3.61	0.06	0.44	6.83	4.22	1.50	18.11

Appendix 3

Bat Tree Roost Potential Descriptions

Appendix 3: Bat Tree Roost Potential Descriptions

Tree or Tree Group Number	Description	Photograph	Bat Features Present	Preliminary Tree Category	Roost Inspection Category	Evidence of Bat found
T1	Downy Birch – semi-mature on northern boundary		Several decayed cavities from old wounds vertical along stems.	Moderate	Moderate	None
T2	Downy Birch semi-mature on northern boundary		Cavity at base of the stem	Low	Negligible	None

Tree or Tree Group Number	Description	Photograph	Bat Features Present	Preliminary Tree Category	Roost Inspection Category	Evidence of Bat found
T3	Downy Birch - semi-mature on northern boundary		Ivy growth and decayed cavity on wound - exposed	Moderate	Low	None
T4	Oak spp. - mature on western boundary		Large branch/trunk broken, scars	Low	Negligible	None

Tree or Tree Group Number	Description	Photograph	Bat Features Present	Preliminary Tree Category	Roost Inspection Category	Evidence of Bat found
T5	Crack Willow		Snapped limbs and peeling bark- all exposed to elements	Low	Negligible	None

Appendix 4

Bat Evaluation System

Appendix 4: Bat Evaluation System

The valuation system used in this report is modified from Wray *et al.* (2010). Values are assigned using a geographic frame of reference as shown in *Table A*. The scores used to assign these values are calculated using *Table B*. 'National Rarity' values used in *Table B* are based on the categorisation system shown in *Table C*.

TABLE A: SITE/SPECIES VALUATION SYSTEM	
Geographic Frame of Reference	**Score**
Site	1 – 10
Local	11 – 20
County	21 – 30
Regional	31 – 40
National/UK	41 – 50
International	>50

TABLE B: CALCULATION OF FORAGING HABITAT SCORES (SHOWN IN BRACKETS)			
National Rarity	**Activity**	**Site/Nearby Roost Potential**	**Habitat Characteristics**
Common (2)	Low (5)	None (1)	Industrial or other site without established vegetation (1)
-	-	Small number (3)	Suburban areas or intensive arable land (2)
Rarer (5)	Moderate (10)	Moderate number / not known (4)	Isolated woodland patches, less intensive arable and/or small towns and villages (3)
-	-	Large no. of roosts, or close to a SSSI for the species (5)	Larger or connected woodland blocks, mixed agriculture (small field sizes with well-grown and small villages/hamlets (4)
Rarest (20)	High (20)	Close to or within a SAC for the species (20)	Mosaic of pasture (small fields), woodlands and wetland areas (5)

TABLE C: CALCULATION OF COMMUTING HABITAT SCORES (SHOWN IN BRACKETS)			
National Rarity	**Activity**	**Site/Nearby Roost Potential**	**Type and complexity of linear features**
Common (2)	Low (5)	None (1)	Absence of (other) linear features (1)
-	-	Small number (3)	Unvegetated fences and large field sizes (2)
Rarer (5)	Moderate (10)	Moderate number / not known (4)	Walls, gappy or failed hedgerows, isolated well-grown hedgerows, and moderate sized fields (3)
-	-	Large no. of roosts, or close to a SSSI for the species (5)	Well- grown and well-connected hedgerows, small field sizes (4)
Rarest (20)	High (20)	Close to or within a SAC for the species (20)	Complex network of mature well-established hedgerows, small fields and rivers/streams (5)

TABLE D: CATEGORISATION OF BATS BY NATIONAL RARITY				
Rarity within Range	**England**	**Wales**	**Scotland**	**Northern Ireland**
Common (population. over 100,000)	Common Pipistrelle Soprano Pipistrelle Brown Long-eared	Common Pipistrelle Soprano Pipistrelle	Common Pipistrelle Soprano Pipistrelle	Common Pipistrelle Soprano Pipistrelle
Rarer (population. 10,000 – 100,000)	Lesser Horseshoe Whiskered Brandt's Daubenton's Natterer's Leisler's Noctule Nathusius' Pipistrelle Serotine	Lesser Horseshoe Daubenton's Natterer's Brown Long-eared	Daubenton's Natterer's Brown Long-eared	Daubenton's Natterer's Leisler's Nathusius' Pipistrelle Brown Long-eared
Rarest (population. under 10,000)	Greater Horseshoe Bechstein's Alcathoe Greater Mouse-eared Barbastelle Grey Long-eared	Greater Horse-shoe Whiskered Brandt's Bechstein's Alcathoe Noctule Nathusius' Pipistrelle Serotine Barbastelle	Whiskered Brandt's Alcathoe Noctule Nathusius' Pipistrelle Leisler's	Whiskered

Appendix 5

Automated Detector Weather Conditions

Appendix 5: Automated Detector Weather Conditions

Season Surveyed	Date	Weather Conditions
Autumn 2018	25/10/2018	11-8°C, 16mph wind speed, passing clouds and dry
	26/10/2018	6-3°C, 7mph wind speed, clear and dry
	27/10/2018	5-4°C 12mph wind speed, passing clouds and dry
	28/10/2018	2-0°C, 5mph wind speed, clear and dry
	29/10/2018	4-1°C, 8mph wind speed, clear and dry
	30/10/2018	4-2°C, 6mph wind speed, passing clouds and dry
	31/10/2018	9-7°C, 7mph wind speed, scattered clouds and dry
Spring 2019	18/04/2019	11-8°C, 7mph wind speed, passing clouds and dry
	19/04/2019	13-9°C, 6mph wind speed, clear and dry
	20/04/2019	13-9 °C, 4mph wind speed, clear and dry
	21/04/2019	12-8 °C, 6mph wind speed, clear and dry
	22/04/2019	16-11 °C, 8mph wind speed, clear and dry
	23/04/2019	11-7°C, 7mph wind speed, clear and dry
Summer 2019	04/06/2019	12-10°C, 9mph wind speed, passing clouds, very light rain
	05/06/2019	10-7°C, 4mph wind speed, clear and dry
	06/06/2019	11-9°C, 4mph wind speed, clear and dry
	07/06/2019	12-11°C, 9mph wind speed, partly cloudy and light rain
	08/06/2019	12-10°C, 7mph wind speed, clear and dry
	09/06/2019	10-7°C, 2mph wind speed, clear and dry
	10/06/2019	11-10°C, 11mph wind speed, passing clouds and light rain

DRAWINGS

KEY

- Site Boundary
- Static Bat Detector Locations

Notes:

Aerial imagery shown for context purposes only.

Boundaries are indicative.

REVISION	DETAILS	DATE	DRAWN	CHK'D	APP'D

CLIENT

EXTRA MOTORWAY SERVICE AREA GROUP

PROJECT

WARRINGTON MOTORWAY SERVICE AREA, J11 M62

DRAWING TITLE

STATIC BAT DETECTOR LOCATIONS

DRG No.		REV
SH11739/037		A
DRG SIZE	SCALE	DATE
A3	1:3,500	24/07/2019
DRAWN BY	CHECKED BY	APPROVED BY
SW	KS	TP

wardell armstrong
NEWCASTLE UPON TYNE | TEL 0191 232 0943
WWW.WARDELL-ARMSTRONG.COM
BIRMINGHAM · BOLTON · CARDIFF · CARLISLE · EDINBURGH · GLASGOW · LONDON · MANCHESTER · SHEFFIELD · STOKE ON TRENT

Notes:

Aerial imagery shown for context purposes only.

Boundaries are indicative.

REVISION	DETAILS	DATE	DRAWN	CHK'D	APP'D

CLIENT

EXTRA MOTORWAY SERVICE AREA GROUP

PROJECT

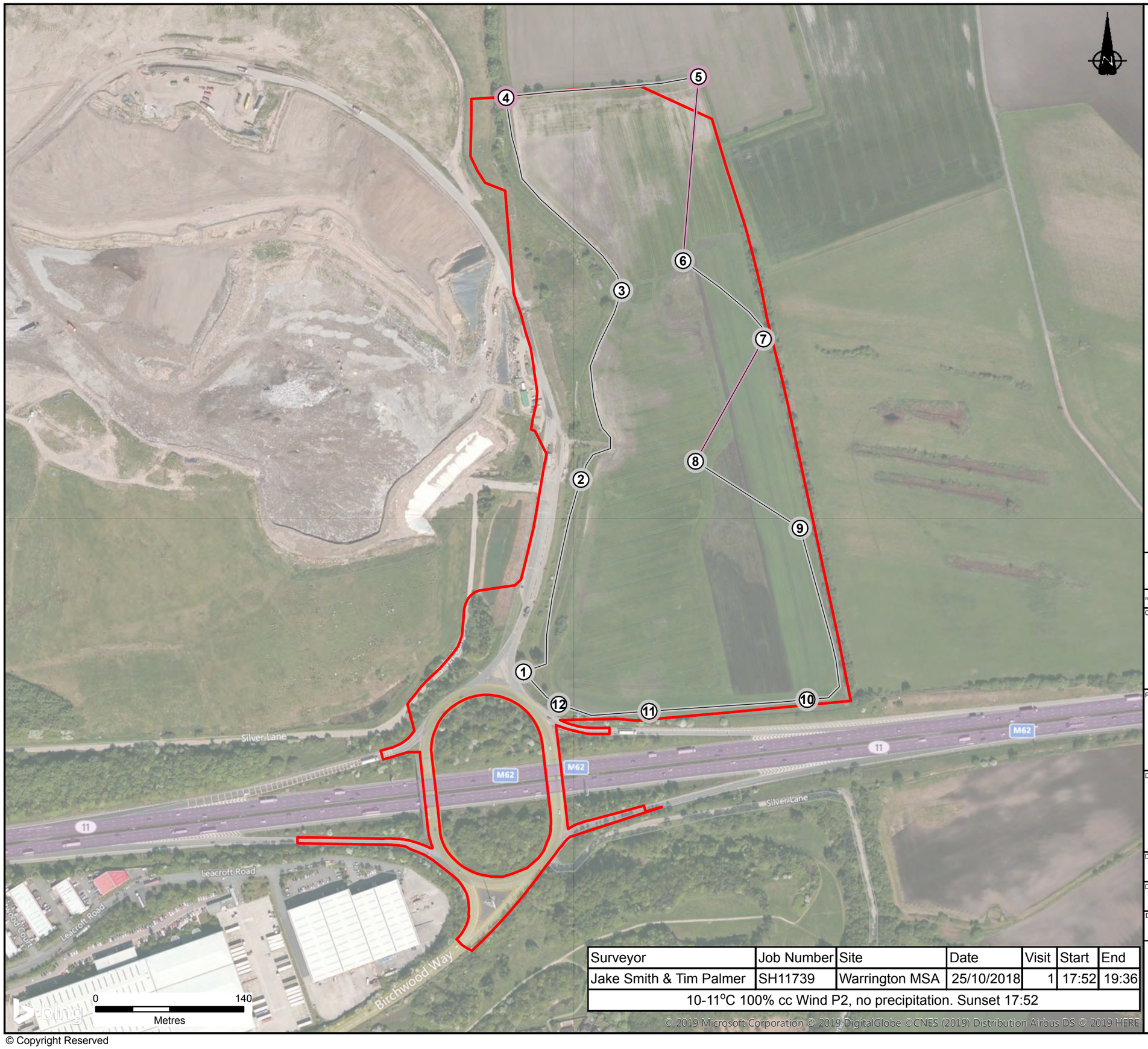
WARRINGTON MOTORWAY SERVICE AREA,
J11 M62

DRAWING TITLE

BAT ACTIVITY TRANSECT ROUTE
AUTUMN 2018

DRG No.		REV
SH11739/038		A
DRG SIZE	SCALE	DATE
A3	1:3,500	24/07/2019
DRAWN BY	CHECKED BY	APPROVED BY
SW	KS	TP

wardell armstrong
NEWCASTLE UPON TYNE | TEL 0191 232 0943
WWW.WARDELL-ARMSTRONG.COM
BIRMINGHAM · BOLTON · CARDIFF · CARLISLE · EDINBURGH · GLASGOW · LONDON · MANCHESTER · SHEFFIELD · STOKE ON TRENT



KEY

- Transect Route
- Point Count Location

Number of Passes in the Transect Route

- 0 Passes
- 1-5 Passes

Number of Passes at Point Count Locations

- 0 Passes
- 1-5 Passes
- Site Boundary

Notes:

Aerial imagery shown for context purposes only.

Boundaries are indicative.

Surveyor	Job Number	Site	Date	Visit	Start	End
Jake Smith & Tim Palmer	SH11739	Warrington MSA	25/10/2018	1	17:52	19:36
10-11°C 100% cc Wind P2, no precipitation. Sunset 17:52						

REVISION	DETAILS	DATE	DRAWN	CHK'D	APP'D

CLIENT

EXTRA MOTORWAY SERVICE AREA GROUP

PROJECT

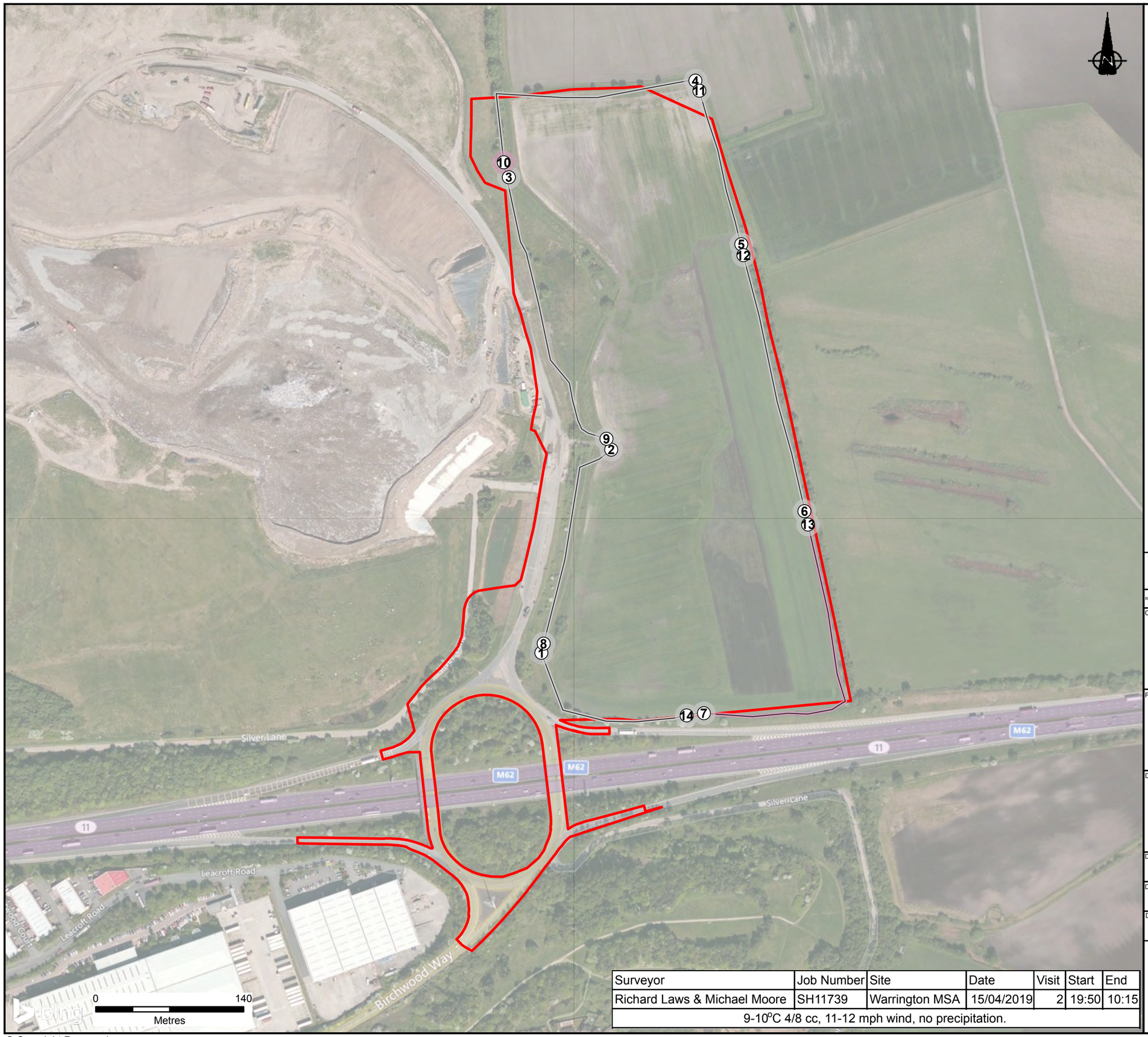
WARRINGTON MOTORWAY SERVICE AREA, J11 M62

DRAWING TITLE

BAT ACTIVITY TRANSECT SURVEY RESULTS AUTUMN 2018

DRG No.		REV
SH11739/039		A
DRG SIZE	SCALE	DATE
A3	1:3,500	24/07/2019
DRAWN BY	CHECKED BY	APPROVED BY
SW	KS	TP

wardell armstrong
NEWCASTLE UPON TYNE | TEL 0191 232 0943
WWW.WARDELL-ARMSTRONG.COM
BIRMINGHAM · BOLTON · CARDIFF · CARLISLE · EDINBURGH · GLASGOW · LONDON · MANCHESTER · SHEFFIELD · STOKE ON TRENT



KEY

- Site Boundary
- Transect Route
- ① Point Count Location

Number of Passes in the Transect Route

- 0 Passes
- 1-5 Passes

Number of Passes at Point Count Locations

- 0 Passes
- 1-5 Passes

Notes:

Aerial imagery shown for context purposes only.

Boundaries are indicative.

REVISION	DETAILS	DATE	DRAWN	CHK'D	APP'D

CLIENT

EXTRA MOTORWAY SERVICE AREA GROUP

PROJECT

WARRINGTON MOTORWAY SERVICE AREA, J11 M62

DRAWING TITLE

BAT ACTIVITY TRANSECT SURVEY RESULTS SPRING 2019

DRG No.		REV
SH11739/045		A
DRG SIZE	SCALE	DATE
A3	1:3,500	24/07/2019
DRAWN BY	CHECKED BY	APPROVED BY
SW	KS	TP

Surveyor	Job Number	Site	Date	Visit	Start	End
Richard Laws & Michael Moore	SH11739	Warrington MSA	15/04/2019	2	19:50	10:15
9-10°C 4/8 cc, 11-12 mph wind, no precipitation.						

wardell armstrong
NEWCASTLE UPON TYNE | TEL 0191 232 0943
WWW.WARDELL-ARMSTRONG.COM
BIRMINGHAM · BOLTON · CARDIFF · CARLISLE · EDINBURGH · GLASGOW · LONDON · MANCHESTER · SHEFFIELD · STOKE ON TRENT

KEY

Site Boundary

Bat Roost Potential

- Moderate Potential
- Low Potential
- Negligible Potential

Notes:

Aerial imagery shown for context purposes only.

Boundaries are indicative.

REVISION	DETAILS	DATE	DRAWN	CHK'D	APP'D

CLIENT

EXTRA MOTORWAY SERVICE AREA GROUP

PROJECT

WARRINGTON MOTORWAY SERVICE AREA, J11 M62

DRAWING TITLE

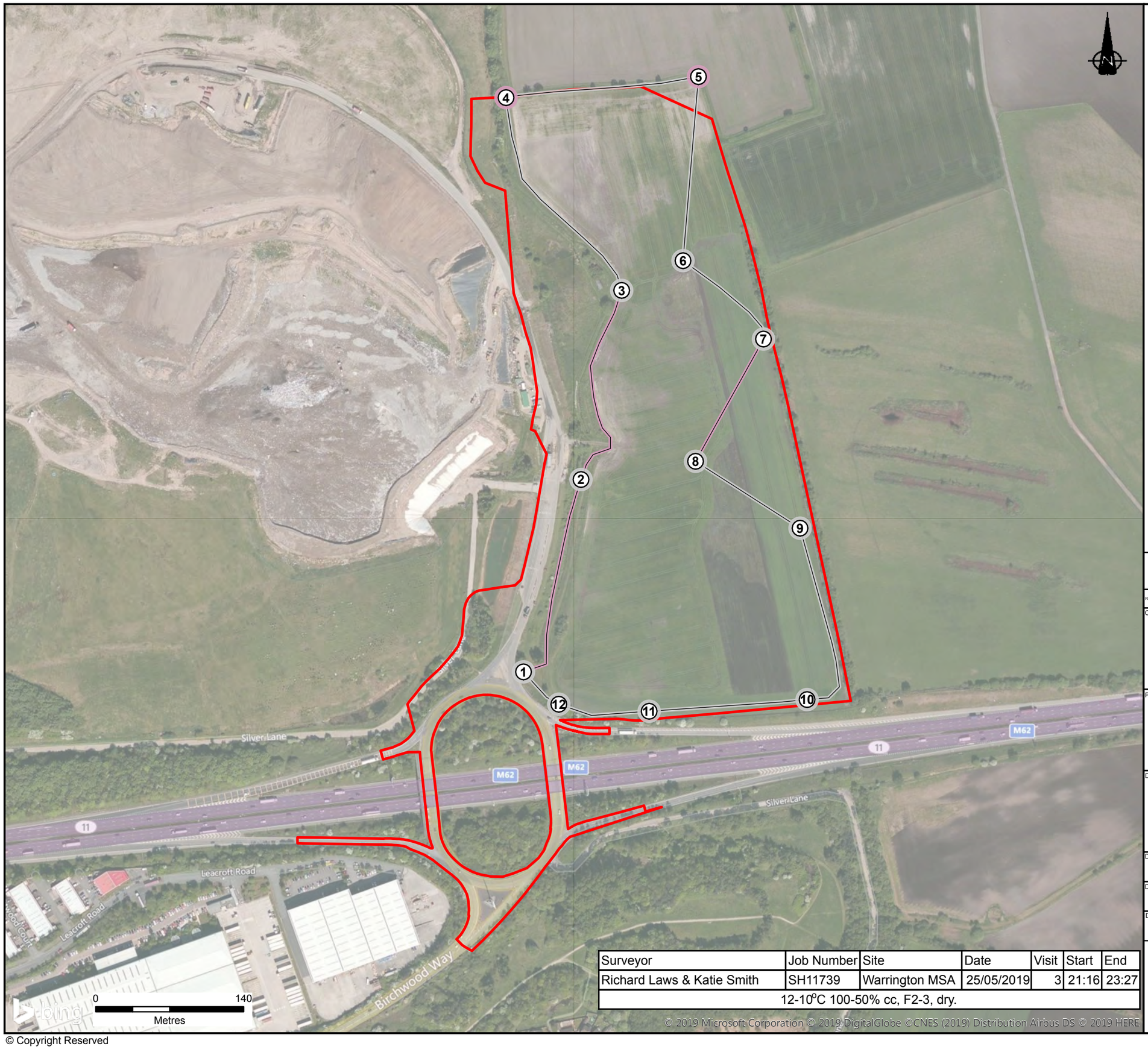
BAT TREE ROOST POTENTIAL PLAN

DRG No.		REV
SH11739/047		A
DRG SIZE	SCALE	DATE
A3	1:3,500	24/07/2019
DRAWN BY	CHECKED BY	APPROVED BY
SW	KS	TP

wardell armstrong

NEWCASTLE UPON TYNE | TEL 0191 232 0943
WWW.WARDELL-ARMSTRONG.COM

BIRMINGHAM · BOLTON · CARDIFF · CARLISLE · EDINBURGH · GLASGOW · LONDON · MANCHESTER · SHEFFIELD · STOKE ON TRENT



KEY

- Site Boundary
- Transect Route
- (1) Point Count Location

Number of Passes at Point Count Locations

- 0 Passes
- 1-5 Passes

Number of Passes in the Transect Route

- 0 Passes
- 1-5 Passes

Notes:

Aerial imagery shown for context purposes only.

Boundaries are indicative.

REVISION	DETAILS	DATE	DRAWN	CHK'D	APP'D

CLIENT

EXTRA MOTORWAY SERVICE AREA GROUP

PROJECT

WARRINGTON MOTORWAY SERVICE AREA, J11 M62

DRAWING TITLE

BAT ACTIVITY TRANSECT SURVEY RESULTS SUMMER 2019

DRG No.		REV
SH11739/050		A
DRG SIZE	SCALE	DATE
A3	1:3,500	24/07/2019
DRAWN BY	CHECKED BY	APPROVED BY
SW	KS	TP

Surveyor	Job Number	Site	Date	Visit	Start	End
Richard Laws & Katie Smith	SH11739	Warrington MSA	25/05/2019	3	21:16	23:27
12-10°C 100-50% cc, F2-3, dry.						

wardell armstrong
NEWCASTLE UPON TYNE | TEL 0191 232 0943
WWW.WARDELL-ARMSTRONG.COM
BIRMINGHAM · BOLTON · CARDIFF · CARLISLE · EDINBURGH · GLASGOW · LONDON · MANCHESTER · SHEFFIELD · STOKE ON TRENT

wardell-armstrong.com

STOKE-ON-TRENT
Sir Henry Doulton House
Forge Lane
Etruria
Stoke-on-Trent
ST1 5BD
Tel: +44 (0)1782 276 700

BIRMINGHAM
Two Devon Way
Longbridge Technology Park
Longbridge
Birmingham
B31 2TS
Tel: +44 (0)121 580 0909

BOLTON
41-50 Futura Park
Aspinall Way
Middlebrook
Bolton
BL6 6SU
Tel: +44 (0)1204 227 227

CARDIFF
Tudor House
16 Cathedral Road
Cardiff
CF11 9LJ
Tel: +44 (0)292 072 9191

CARLISLE
Marconi Road
Burgh Road Industrial Estate
Carlisle
Cumbria
CA2 7NA
Tel: +44 (0)1228 550 575

EDINBURGH
Great Michael House
14 Links Place
Edinburgh
EH6 7EZ
Tel: +44 (0)131 555 3311

GLASGOW
2 West Regent Street
Glasgow
G2 1RW
Tel: +44 (0)141 433 7210

LEEDS
36 Park Row
Leeds
LS1 5JL
Tel: +44 (0)113 831 5533

LONDON
Third Floor
46 Chancery Lane
London
WC2A 1JE
Tel: +44 (0)207 242 3243

MANCHESTER
76 King Street
Manchester
M2 4NH
Tel: +44 (0)161 817 5038

NEWCASTLE UPON TYNE
City Quadrant
11 Waterloo Square
Newcastle upon Tyne
NE1 4DP
Tel: +44 (0)191 232 0943

TRURO
Baldhu House
Wheal Jane Earth Science Park
Baldhu
Truro
TR3 6EH
Tel: +44 (0)187 256 0738

International offices:

ALMATY
29/6 Satpaev Avenue
Regency Hotel
Office Tower
Almaty
Kazakhstan
050040
Tel: +7(727) 334 1310

MOSCOW
21/5 Kuznetskiy Most St.
Moscow
Russia
Tel: +7(495) 626 07 67

wardell armstrong

Appendix 5.6 – Badger Survey Report

wardell-armstrong.com

ENERGY AND CLIMATE CHANGE
ENVIRONMENT AND SUSTAINABILITY
INFRASTRUCTURE AND UTILITIES
LAND AND PROPERTY
MINING AND MINERAL PROCESSING
MINERAL ESTATES
WASTE RESOURCE MANAGEMENT

EXTRA MSA GROUP

MOTORWAY SERVICES, WARRINGTON

BADGER SURVEY REPORT

JULY 2019

wardell armstrong

Wardell Armstrong
36 Park Row Leeds, LS1 5JL, United Kingdom
Telephone: +44 (0)113 831 5533 www.wardell-armstrong.com

DATE ISSUED:	**JULY 2019**
JOB NUMBER:	**SH11739**
REPORT NUMBER:	**006**
VERSION:	**V1.0**
STATUS:	**FINAL**

EXTRA MSA GROUP

MOTORWAY SERVICES, WARRINGTON

BADGER SURVEY REPORT

JULY 2019

PREPARED BY:

Jake Smith — Graduate Ecologist

REVIEWED BY:

Katie Smith — Ecologist

Richard Laws — Principal Environmental Scientist/Ecologist

APPROVED BY:

Tim Palmer — Technical Director (Ecology)

CONTENTS

1 INTRODUCTION

1.1.1 Wardell Armstrong LLP (WA) were commissioned by Extra MSA Group to undertake a badger survey of a proposed Motorway Services Area development (hereafter after referred to as the 'development'), located on the northern side of the M62 at Junction 11, central Ordnance Survey (OS) grid reference: SJ 6705393630.

1.1.2 This report should remain confidential and be circulated to bona fide individuals and organisations only.

1.2 Background

1.2.1 It is proposed that the development will include a main services area with food and retail facilities and a hotel, car, coach and HGV parking, a fuel station and associated road infrastructure.

1.2.2 A full Ecological Assessment has been undertaken for the development by WA in December 2018.

1.2.3 WA undertook the badger survey on the 15th January 2019. The aim of the badger survey was to identify and assess the current level of badger activity within the site, to inform any changes in their status since the PEA and detail any potential constraints for future development stages.

1.3 Scoping Consultation

1.3.1 A scoping report was issued to Tameside Metropolitan Borough Council (TMBRC) during December 2018. Comments were returned during February 2019. The scoping response from TMBRC agreed that loss of habitats of use to badgers needs to be considered in the Environmental Statement (ES). A recommendation of biodiversity net gain was made in line with the NPPF.

1.4 Proposed Development

1.4.1 The proposed development area covers approximately 15.8 hectares (ha). The majority of the development is cultivated land with a broadleaved treeline along the eastern boundary. Along the western and southern boundaries were areas of neutral grassland with small areas of broadleaved woodland along the south western boundary and marshy grassland within the western boundary.

1.4.2 The site bound by cultivated land and grazing pasture to the east, cultivated land to the north and a capped landfill to the west. Directly south of the southern boundary

is the M62 motorway with cultivated land to the south east and Birchwood Business and Technology Park to the south west.

1.5 Legislation

1.5.1 The Protection of Badgers Act 1992 consolidates the previous Badger Acts of 1973 and 1991. The legislation aims to protect the species from persecution, rather than being a response to an unfavourable conservation status, as the species is in fact common within Britain.

1.5.2 As well as protecting the animal itself, the 1992 Act also makes the intentional or reckless destruction, damage or obstruction of a badger sett an offence. A sett is defined as "any structure or place, which displays signs indicating current use by badgers".

1.5.3 In addition, the intentional elimination of sufficient foraging area to support a known social group of badgers may, in certain circumstances, be construed as an offence by constituting the 'cruel ill treatment' of a badger.

1.6 Licensing Requirements

1.6.1 Works that may lead to the disturbance of badgers is illegal without a licence. Natural England (NE) firstly developed guidelines on the types of activity that should be licensed within certain distances of sett entrances in its publication "*Badgers and Development* (2002)". These activities include the use of heavy machinery within 30m of any entrance to an active sett, and lighter machinery within 20m, or light work such as hand digging within 10m, all of which may require a licence. This guideline has been updated in the publication "*Badgers and Development: A Guide to Best Practice and Licensing* (2009)" which includes a more flexible approach to zoning depending on the activities to be undertaken.

1.7 Badger Ecology

1.7.1 Badgers are a member of the weasel family (*Mustelidae*) and as mentioned previously are widespread throughout Britain. It has been estimated that Britain supports in the region of 250,000 badgers. However, they are not uniformly distributed and are less common in upland areas.

1.7.2 Badgers are very social animals and, in most instances, live in social groups. The national average social group size is approximately six adults, although Roper (2010) found that group sizes have increased overtime, to such an extent that groups of a dozen or so individuals are now common and groups of thirty or more are not

unknown. Badger setts are normally excavated into suitably firm and free draining substrate and as a result are often located in steep banks and mounds,

1.7.3 In lowland Britain earthworms are a staple food item, although cereals and fruit may figure significantly in their seasonal diet. They will also feed on a range of other invertebrates and animals such as frogs, young rabbits and wasp grubs.

1.7.4 Badgers normally have a number of setts in their territory of which the main sett is occupied year-round and is the most important for the social group. In addition, a social group will also occasionally maintain annex, subsidiary and outlier setts each of which is of decreasing importance to the group as a whole (see 2.3.4 for definitions).

2 SURVEY METHODOLOGY

2.1 Desk Study

2.1.1 A desk study was informed by the full Ecological Assessment carried out by WA and data provided by RECORD (Local Records Centre).

2.2 Field Survey

2.2.1 The specific aim of the survey was to:

- map the distribution of badger setts, latrines, paths and, where possible, territorial boundaries;
- describe the status of setts;
- assess the quality of badger foraging habitat;
- identify road crossing points;
- relate data on sett location and status to future development proposals;
- identify areas where more detailed surveys may be required; and
- identify general principles for integrating development and badger conservation.

2.2.2 Within the search area all fence lines, grassland, woodland and scrub habitats were systematically surveyed for evidence of badgers in the form of:

- faeces: badgers usually deposit faeces in characteristic excavated pits, concentrations of which (latrine sites) are typically found at home-range boundaries;
- setts: comprising either single isolated holes or a series of holes likely to be interconnected underground;
- paths between setts or leading to feeding areas;
- scratching posts at the base of tree trunks;
- hair traces;
- snuffle holes: formed during foraging and comprising characteristically disturbed ground vegetation; and
- footprints.

2.2.3 Where setts were found, levels of use were assessed using the following criteria:

- number of sett entrances with features suggesting current use (i.e. well-worn entrance; freshly excavated soil);
- number of partially used holes (leaves or twigs in entrance and/or mosses and other plants growing in or around entrance);
- number of disused holes (partially or completely blocked, with considerable amount of excavation required for reoccupation);
- presence of bedding material;
- any additional signs from para 2.3.2.

2.2.4 Setts were classified using the conventions shown in Table 1.

Table 1: Conventions used in classifying badger setts

Sett Type	Definition
Main	Can comprise of one or several holes often with large spoil heaps and obvious paths emanating from and between sett entrances. A number of activity features suggesting continuous presence and use. A breeding site.
Annex	Normally less than 150m from main sett, comprising several holes. May not be in use all the time, even if main sett is very active.
Subsidiary	Usually at least 50m from main sett with no obvious paths connecting to other setts. May be used regularly/intermittently often relating to clan/territory size, and changes in foraging regimes i.e. crop growing times.
Outlier	Little spoil outside holes. No obvious paths connecting to other setts and only used sporadically. May be used by foxes and rabbits.

2.2.5 The field survey methods described above are consistent with those advocated by Harris et al. (1989). Evidence recorded is then used to demine whether a sett is in "current use" (as per Natural England Guidance on 'Current Use' in the Determining of a Badger Sett, 2009).

2.2.6 In order to provide a measure of habitat quality, broad habitats within and immediately surrounding the development site boundary were recorded while undertaking the badger survey (i.e. semi-improved grassland, scattered scrub and broadleaved woodland).

3 SURVEY RESULTS

3.1 Desk Study

3.1.1 The desk study data provided by RECORD (Local Records Centre) identified 1 record of badger within the 2km search radius being approximately 1.3km east of the proposed development.

3.2 Habitat Description

3.2.1 The habitats on site are suitable for foraging badger, with the majority of the habitat on site, cultivated land, and neutral grassland and broadleaved woodland being secondary foraging habitat. Suitable sett creation habitat lies along the eastern boundary within the broadleaved tree line, however, due to the peaty soil conditions and high-water table, this is not considered optimal sett creation habitat.

3.2.2 The surrounding land in the wider landscape provide both primary and secondary foraging habitat along with suitable sett creation habitats. The path along the western boundary allows connectivity to further areas of woodland, scrub and rough grassland.

3.3 Field Survey

3.3.1 During the survey, no evidence of badger was identified within the proposed development area or within 50m from the boundary. However, there were two partially collapsed rabbit entrances that have potential to be utilised by badger. Also identified during the survey were a large amount of rabbit entrances with two possible fox dens.

Table 2: Badger signs identified within the site boundary		
Field Sign	**Description**	**Photo**
Partially collapsed rabbit entrances	A rabbit warren was recorded along the eastern boundary, within the earth bank of the dry ditch. The warren comprised of three entrances with two of these entrances being partially collapsed, making the entrances larger. The entrances contained leaf litter and debris and old soil material, indicating no recent activity. There was also a high number of rabbit field signs including partial prints, droppings and a large number of other rabbit holes within close vicinity The pathways still visible narrowed and not considered to be wide enough for badger. There were no field signs of badger present within the entrance or surrounding area. From the evidence gathered, it is considered that these entrances are used by rabbit and not used by badger. However, they provide suitable opportunity for badger sett creation.	

4 REFERENCES

English Nature (now Natural England). (2002). *Badgers and development*.

Harris, S., Creswell. P., and Jefferies, D.J. (1989). *Surveying badgers*. Mammal Society, London.

Natural England. (2009). *Badgers and Development: A Guide to Best Practice and Licensing.*

Roper, T. (2010). *Badger.* New Naturalist, HarperCollins, London

wardell-armstrong.com

STOKE-ON-TRENT
Sir Henry Doulton House
Forge Lane
Etruria
Stoke-on-Trent
ST1 5BD
Tel: +44 (0)1782 276 700

BIRMINGHAM
Two Devon Way
Longbridge Technology Park
Longbridge
Birmingham
B31 2TS
Tel: +44 (0)121 580 0909

BOLTON
41-50 Futura Park
Aspinall Way
Middlebrook
Bolton
BL6 6SU
Tel: +44 (0)1204 227 227

CARDIFF
Tudor House
16 Cathedral Road
Cardiff
CF11 9LJ
Tel: +44 (0)292 072 9191

CARLISLE
Marconi Road
Burgh Road Industrial Estate
Carlisle
Cumbria
CA2 7NA
Tel: +44 (0)1228 550 575

EDINBURGH
Great Michael House
14 Links Place
Edinburgh
EH6 7EZ
Tel: +44 (0)131 555 3311

GLASGOW
2 West Regent Street
Glasgow
G2 1RW
Tel: +44 (0)141 433 7210

LEEDS
36 Park Row
Leeds
LS1 5JL
Tel: +44 (0)113 831 5533

LONDON
Third Floor
46 Chancery Lane
London
WC2A 1JE
Tel: +44 (0)207 242 3243

MANCHESTER
76 King Street
Manchester
M2 4NH
Tel: +44 (0)161 817 5038

NEWCASTLE UPON TYNE
City Quadrant
11 Waterloo Square
Newcastle upon Tyne
NE1 4DP
Tel: +44 (0)191 232 0943

TRURO
Baldhu House
Wheal Jane Earth Science Park
Baldhu
Truro
TR3 6EH
Tel: +44 (0)187 256 0738

International offices:

ALMATY
29/6 Satpaev Avenue
Regency Hotel
Office Tower
Almaty
Kazakhstan
050040
Tel: +7(727) 334 1310

MOSCOW
21/5 Kuznetskiy Most St.
Moscow
Russia
Tel: +7(495) 626 07 67

wardell armstrong

Appendix 5.7 – Breeding Birds Survey Report

wardell-armstrong.com

ENERGY AND CLIMATE CHANGE
ENVIRONMENT AND SUSTAINABILITY
INFRASTRUCTURE AND UTILITIES
LAND AND PROPERTY
MINING AND MINERAL PROCESSING
MINERAL ESTATES
WASTE RESOURCE MANAGEMENT

EXTRA MSA GROUP

MOTORWAY SERVICES, WARRINGTON

BREEDING BIRD SURVEY REPORT

JULY 2019

wardell armstrong

Wardell Armstrong
36 Park Row Leeds, LS1 5JL, United Kingdom
Telephone: +44 (0)113 831 5533 www.wardell-armstrong.com

DATE ISSUED:	**JULY 2019**
JOB NUMBER:	**SH11739**
REPORT NUMBER:	**007**
VERSION:	**V1.0**
STATUS:	**FINAL**

EXTRA MSA GROUP

MOTORWAY SERVICES, WARRINGTON

BREEDING BIRD SURVEY REPORT REPORT

JULY 2019

PREPARED BY:

Alex Bingle Ecologist

Jamie Ingram Senior Ecologist

REVIEWED AND APPROVED BY:

Tim Palmer Technical Director (Ecology)

CONTENTS

APPENDICES

DRAWINGS	TITLE	SCALE
SH11739-035	Breeding Bird Survey Results (Visit 1)	1:3,500@A3
SH11739-036	Breeding Bird Survey Results (Visit 2)	1:3,500@A3
SH11739-040	Dunnock Territory Plan	1:3,500@A3
SH11739-041	Lapwing Territory Plan	1:3,500@A3
SH11739-042	Skylark Territory Plan	1:3,500@A3
SH11739-043	Song Thrush Territory Plan	1:3,500@A3
SH11739-046	Breeding Bird Survey Results (Visit 3)	1:3,500@A3
SH11739-049	Breeding Bird Survey Results (Visit 4)	1:3,500@A3
SH11739-051	Breeding Bird Survey Results (Visit 5)	1:3,500@A3
SH11739-053	Reed Bunting Territory Plan	1:3,500@A3
SH11739-054	Willow Warbler Territory Plan	1:3,500@A3

1 METHODOLOGY

1.1 Scoping Consultation

1.1.1 A scoping report was issued to Tameside Metropolitan Borough Council (TMBRC) during December 2018. Comments were returned during February 2019. The scoping response from TMBRC agreed that impacts on bird assemblages and barn owl foraging habitat need to be considered in the Environmental Statement (ES). A recommendation of biodiversity net gain was made in line with the NPPF.

1.2 Desk Study

1.2.1 The desktop study was informed by review of existing available information provided by RECORD (Local Records Centre), Cheshire and Wirral Ornithological Society (CAWOS), Barn Owl Conservation Trust and from available internet-based resources for a 2km search radius from the site boundaries. OS and satellite mapping were also used to gain contextual habitat information. Other organisations and recorders approached included:

- Greater Manchester Local Record Centre (GMLRC).

1.3 Field Surveys

Breeding Bird Survey

1.3.1 Following identification of optimal habitat types and the presence of Birds of Conservation Concern (BoCC) species from the initial surveys (as described in Preliminary Ecological Appraisal report Wardell Armstrong 2018), breeding bird surveys were undertaken on site. The methodology used was based on techniques devised by British Trust of Ornithology (BTO)/ Joint Nature Conservation committee (JNCC) / Royal Society for the Protection of Birds (RSPB) Common Bird Census (CBC) survey technique (Gilbert *et al* 1998).

1.3.2 During the breeding bird season (March - September), many birds, especially passerines, mark their territories by singing conspicuously, displaying or periodically disputing with rival neighbours (Bibby *et al* 2000). An amended and indicative territory mapping survey (Bibby *et al* 2000) was undertaken in which all displaying birds associated with the site were recorded. Following the BTO survey guidelines, a singing bird is classed as a territorial male and thus indicative of the presence of a breeding pair.

1.3.3 The common bird census (CBC) methodology has adopted ten visits as standard. Ideally spread uniformly between mid-March and mid-July. For any one species all ten visits are rarely needed to identify breeding presence.

1.3.4 The survey approach recommended for this site consisted of an amended CBC methodology, involving five visits between the months March to June.

1.3.5 A transect route was mapped out prior to the surveys being undertaken, paying particular attention to linear features (such as hedgerows and tree lines) and natural landscape features (such as watercourses and areas of scrub).

1.3.6 Utilising standard BTO notation[1] the locations of the singing birds were marked on site maps to indicate territory locations. Care was taken to ensure each individual was marked only once. However, all behaviour was marked, including, movements using standard symbols, as detailed in Bibby et al. (1992). The estimated centre of the territories can then be plotted using the results from each visit (based on mean positions of the data sets).

1.3.7 For species which do not sing e.g. *corvids*, breeding is considered confirmed only if one or more of the following is recorded:

- Presence of a nest;
- Mating;
- Breeding display;
- Territorial behaviour; and
- Presence of young.

1.3.8 The surveys commenced early morning, around an hour after sunrise to encapsulate peak periods of displaying bird activity and consisted of a plotted transect circuit to limit the effects of double counting.

1.3.9 To provide an indication of the total bird species diversity in the local area, all species observed on site, and within the 100 m zone of influence, were recorded as part of the survey (See Appendix 1).

1.3.10 An evaluation of the site assemblage has been undertaken according to Fuller, R.J (1980) *A Method for Assessing the Ornithological Interest of Sites for Conservation*.

[1] A full list of species occurring in Britain and their BTO species code can be found here: http://www.bto.org/about-birds/birdfacts/british-list

Biological Conservation 17 P-229-239. The Fuller method uses the total number of all species (including non-notable species) recorded within a surveyed area to provide an indication of species richness. The criteria according to Fuller (1980) are provided in Table 1.

Table 1: Breeding Bird Species Richness Criteria (Fuller 1980)			
Local	**County**	**Regional**	**National**
25-49	50-69	70-84	85+

1.3.11 Dates and weather conditions of the surveys are provided in Table 2:

Table 2: Breeding Bird Survey Weather				
Visit	**Date**	**Weather**	**Survey time**	**Sunrise time**
BBS 1	20/03/2019	9°C, 4/8 Cloud Cover, F2 wind and sunny	08:30 -10:00	06:14
BBS 2	04/04/2019	4°C, 7/8 Cloud Cover, F3 wind and dry	08:30 – 10:46	06:38
BBS 3	23/04/2019	11-12°C, 7/8 to 8/8 Cloud Cover, F2/3 wind and dry	07:30-09:25	05:53
BBS 4	14/05/2019	11-12°C, 2/8 to 4/8 light Cloud Cover, F1 wind and dry	07:00-08:30	05:12
BBS 5	06/06/2019	12-15°C, 0 Cloud Cover, F1 wind and dry	06:00-07:45	04:45

1.3.12 Drawings showing the sightings and indicative territory locations of NERC s.41 and BoCC species identified on site are provided as Drawings numbered SH11739-035/036/040/041/042/043/046/049/051/053 and 054.

1.4 Limitations

1.4.1 Ornithological surveys are affected by a variety of factors which affect the presence of birds such as season, weather, food availability, species behaviour and disturbance. The absence of any particular species within the survey area should not be taken as conclusive evidence that the species is not present or that it will not be present in the future.

2 RESULTS

2.1 Desk Study

2.1.1 Data from RECORD, CAWOS and BOCT highlighted the presence of a wide range of notable breeding bird species with the potential to breed on site during the breeding season, suggesting that the site offers both potential foraging and nesting opportunities throughout the breeding period March - September. Notable records include barn owl *Tyto alba*, bullfinch *Pyrrhula pyrrhula*, cuckoo *Cuculus canorus*, dunnock *Prunella modularis,* grasshopper warbler *Locustella naevia*, grey partridge *Perdix perdix,* lapwing *Vanellus vanellus*, linnet *Carduelis cannabina,* mistle thrush *Turdus viscivorus*, Quail *Coturnix coturnix,* reed bunting *Emberiza schoeniclus,* skylark *Alauda arvensis*, song thrush *Turdus philomelos*, starling *Sturnus vulgaris*, stock dove *Columba oenas*, tawny owl *Strix aluco*, tree sparrow *Passer montanus*, willow warbler *Phylloscopus trochilus*, yellow wagtail *Motacilla flava,* and yellowhammer *Emberiza citronella*.

2.1.2 Data provided by the BOCT shows a single barn owl sighting recorded 2.5km from the site during 2019.

2.1.3 Data provided by CAWOS shows an average of 8.8 barn owl sightings per year in the last 5 years, the closest being within 100m of the survey site.

2.1.4 No data was provided by the following organisations or recorders, due to the organisation or recorder not covering that area fully and contains no additional records or due to the group not responding:

- Greater Manchester Local Record Centre (GMLRC).

2.2 Field Surveys

Breeding Bird Survey (BBS)

2.2.1 During the BBS, a total of forty-two species were recorded on site across all survey visits. A complete table of species recorded on site during the BBS can be seen in Appendix 1 and is also displayed in Drawings numbered SH11739-035/036/046/049 and 051. Territory plans have been created for six species (dunnock, lapwing, skylark, song thrush, reed bunting and willow warbler) and are presented in Drawings numbered SH11739-040/041/042/043/053 and 054.

2.2.2 No barn owl were recorded on site or in the surrounding area during the breeding or wintering bird surveys, or anecdotally during other surveys such as the bat activity surveys. The site is not considered to support optimal barn owl foraging habitat.

Species Accounts

2.2.3 Species accounts for all Annex 1, Schedule 1, Red/Amber-listed BoCC and s.41 species are provided, below. These accounts provide a brief description of species use of the site and activity, a summary table is included of the species for each group of protected species. The BBS results plans, including territory plans (Drawing No. SH11739-035/036/040/041/042/043/046/049 and 051), also highlight the locations of sightings and accompanies the text below.

Annex 1 birds

2.2.4 The desk study revealed the presence of 18 Annex 1 species within 2km of the site, none of which have the potential to breed on site.

2.2.5 During the BBS no EU Annex 1 listed bird species were recorded.

2.2.6 All Annex 1 species desk study records are shown in Table 3, below.

Table 3: Annex 1 species data

Species	Desk Study	Supporting Breeding Habitat Onsite	BBS (total[2]/peak count[3])	Likely Breeding Pairs	Potentially significant Effects
Artic Tern	✓	x	N/a	N/a	x
Barnacle Goose	✓	x	N/a	N/a	x
Bittern	✓	x	N/a	N/a	x
Common Tern	✓	x	N/a	N/a	x
Crane	✓	x	N/a	N/a	x
Golden Plover	✓	x	N/a	N/a	x
Hen Harrier	✓	x	N/a	N/a	x
Kingfisher	✓	x	N/a	N/a	x
Marsh Harrier	✓	x	N/a	N/a	x
Mediterranean Gull	✓	x	N/a	N/a	x
Osprey	✓	x	N/a	N/a	x
Peregrine	✓	x	N/a	N/a	x
Red Kite	✓	x	N/a	N/a	x
Red-Backed Shrike	✓	x	N/a	N/a	x
Ruff	✓	x	N/a	N/a	x
Short-eared Owl	✓	x	N/a	N/a	x
Whooper Swan	✓	x	N/a	N/a	x
Wood Sandpiper	✓	x	N/a	N/a	x

[2] Total number of registrations on or through study area.
[3] Peak count – i.e. maximum flock size at any point during survey, or total count if no risk of double counting.

Schedule 1 birds

2.2.7 The desk study revealed the presence of twenty-eight Schedule 1 species within 2 km of the site, barn owl and quail have potential to occur within the survey area during the breeding survey period.

2.2.8 During the BBS one Schedule 1 species was recorded, namely fieldfare. The species account is written below.

Fieldfare

2.2.9 Fieldfare species are Schedule 1 listed birds due to having very small breeding populations in the far north of Scotland. Up to 680,000 fieldfare overwinter in the UK from Scandinavia, Russia and Iceland, roving through the countryside feeding on berries, fruit and invertebrates (Robinson 2005). RECORD records (2014 and 2015) shows small wintering and passage flock numbers are consistently present in the area during winter. A flock of seven were recorded to east of site during 23rd April 2019, likely to be migrating back to their summer grounds and not to be breeding.

2.2.10 Both desk study data and BBS results for Schedule 1 species are summarised in Table 4, below.

Table 4: Schedule 1 species data

Species	Desk Study	Supporting Breeding Habitat Onsite	BBS (total[4]/peak count[5])	Likely Breeding Pairs	Potentially significant Effects
Barn Owl	✓	✓	**N/a**	**N/a**	✓
Bittern	✓	x	N/a	N/a	x
Black-necked Grebe	✓	x	N/a	N/a	x
Black-tailed Godwit	✓	x	N/a	N/a	x
Brambling	✓	x	N/a	N/a	x
Cetti's warbler	✓	x	N/a	N/a	x
Common crossbill	✓	x	N/a	N/a	x
Fieldfare	✓	x	7/7	N/a	x
Firecrest	✓	x	N/a	N/a	x
Garganey	✓	x	N/a	N/a	x
Green sandpiper	✓	x	N/a	N/a	x
Greenshank	✓	x	N/a	N/a	x
Hen Harrier	✓	x	N/a	N/a	x
Hobby	✓	x	N/a	N/a	x

[4] Total number of registrations on or through study area.
[5] Peak count – i.e. maximum flock size at any point during survey, or total count if no risk of double counting.

Table 4: Schedule 1 species data					
Species	**Desk Study**	**Supporting Breeding Habitat Onsite**	**BBS (total[4]/peak count[5])**	**Likely Breeding Pairs**	**Potentially significant Effects**
Kingfisher	✓	x	N/a	N/a	x
Little ringed plover	✓	x	N/a	N/a	x
Long tailed Duck	✓	x	N/a	N/a	x
Marsh Harrier	✓	x	N/a	N/a	x
Mediterranean Gull	✓	x	N/a	N/a	x
Merlin	✓	x	N/a	N/a	x
Osprey	✓	x	N/a	N/a	x
Peregrine	✓	x	N/a	N/a	x
Quail	✓	✓	N/a	N/a	x
Red Kite	✓	x	N/a	N/a	x
Red-Backed Shrike	✓	x	N/a	N/a	x
Redwing	✓	x	12/6	N/a	x
Ruff	✓	x	N/a	N/a	x
Whimbrel	✓	x	N/a	N/a	x
Whooper Swan	✓	x	N/a	N/a	x
Wood Sandpiper	✓	x	N/a	N/a	x

NERC s.41 Species

2.2.11 The desk study revealed the presence of 28 s.41 species within 2 km of the site, with 13 species having the potential to breed on site during the survey period.

2.2.12 During the BBS, nine s.41 species were recorded on site. These consisted of bullfinch, dunnock, herring gull, lapwing, linnet, reed bunting, skylark, song thrush and starling.

Bullfinch

2.2.13 Bullfinch is a common, widespread but declining resident that primarily associates with thick woodland undergrowth, thickets, scrub and hedgerow habitats (Snow et al. 1998). It is both Amber-listed and a s.41 species due to moderate population decline in recent decades (Eaton et al. 2015). Bullfinch was recorded in association with hedgerow and scrub in the south site and is considered to be resident throughout the year.

Dunnock

2.2.14 This species is both a BoCC Amber Listed and s.41 listed species as it is still recovering from population declines during the 1970s and 1980s. Dunnock is primarily insectivorous, although small seeds are an important food source over winter (Snow *et al.* 1998). This species was recorded occasionally within the site boundary during

the survey period in association with scrub and tree lined habitats on the boundaries of the site. It is considered that there are four territories of likely breeding pairs.

Herring gull

2.2.15 Herring gull is both Red and s.41 listed due to recent sharp declines in its breeding population (Eaton et al. 2015). This species was recorded once during visit 3 flying over the site with a maximum count of three recorded. There is no potential for this species to breed onsite.

Lapwing

2.2.16 Lapwing is both Red and s.41 listed due to rapid, long-term population decline associated with changes in farming practice and the reduction in suitable breeding habitat (Baillie *et al.* 2014). In the desk study a single individual was record onsite and a larger flock in fields adjacent north east of site. The rest of the records were observed some distance from site. This species was recorded adjacent to site outwith the northern site boundary, flying over the northern part of the site, and during visit 2 and 3 lapwing were recorded displaying aggressive behaviour to a carrion crow.

Linnet

2.2.17 This species is Red and s.41 listed due to undergoing severe population declines in recent decades (Eaton at al. 2015). Two individuals were recorded flying over the site near the linear scrub on the west of the development site. No observations of breeding were recorded.

Reed bunting

2.2.18 This species is s.41 listed due to steep population declines in the 1970s (Baillie *et al.* 2015). The species most commonly associates with wetland and reedbed habitats, although it is often found in arable farmland, especially in winter. A singing male and pair were recorded during different visits within a reedbed on the western boundary. A total of one territory of likely breeding pairs was recorded across all visits.

Skylark

2.2.19 Skylark is Red and s.41 listed due to sharp population declines in recent decades (Eaton *et al.* 2015). Displaying males and individuals were recorded across the site and to the west of the site on adjacent land across all survey visits. A total of seven territories of likely breeding pairs were recorded over all visits.

Song thrush

2.2.20 Song thrush is Red and s.41 listed due to nationally sharp population declines in recent decades (Eaton *et al.* 2015). This species occurs in any habitat where trees and hedgerows are found in association with grassland and/or leaf litter that support large numbers of invertebrates (Snow *et al.* 1998). Individuals were recorded singing during several survey visits in association with tree lined habitats displaying presence of at least four likely breeding pairs.

Starling

2.2.21 This species is Red and s.41 listed due to an ongoing population decline (Eaton et al. 2015). Starling associate with areas of short vegetation (e.g. arable stubble) and grassland on which they forage for invertebrate prey (Snow et al. 1998). Starlings were recorded as flyovers (two individuals) over the arable field in small numbers on site during visit 3.

2.2.22 Both desk study data and BBS results are summarised in Table 5, below.

Table 5: NERC s.41 species data

Species	Desk Study	Supporting Breeding Habitat Onsite	BBS (total[6]/peak count[7])	Likely Breeding Pairs	Potentially significant Effects
Bittern	✓	x	N/a	N/a	x
Black-tailed Godwit	✓	x	N/a	N/a	x
Bullfinch	✓	✓	1/1	0	x
Corn bunting	✓	x	N/a	N/a	x
Cuckoo	✓	✓	N/a	N/a	x
Curlew	✓	x	N/a	N/a	x
Dunnock	x	✓	20/2	4	x
Grasshopper warbler	✓	✓	N/a	N/a	x
Grey partridge	✓	✓	N/a	N/a	x
Herring gull	✓	x	3/3	0	x
House sparrow	✓	x	N/a	N/a	x
Lapwing	✓	✓	11/2	2	x
Lesser redpoll	✓	x	N/a	N/a	x
Linnet	✓	✓	4/2	0	x
Marsh Tit	✓	x	N/a	N/a	x
Red-backed Shrike	✓	x	N/a	N/a	x
Reed bunting	✓	✓	5/2	2	x

[6] Total number of registrations on or through study area.
[7] Peak count – i.e. maximum flock size at any point during survey, or total count if no risk of double counting.

Table 5: NERC s.41 species data					
Species	**Desk Study**	**Supporting Breeding Habitat Onsite**	**BBS (total[6]/peak count[7])**	**Likely Breeding Pairs**	**Potentially significant Effects**
Ring Ouzel	✓	x	N/a	N/a	x
Skylark	✓	✓	44/2	16	x
Song thrush	✓	✓	14/2	3	x
Spotted Flycatcher	✓	x	N/a	N/a	x
Starling	✓	✓	2/2	0	x
Tree pipit	✓	x	N/a	N/a	x
Tree Sparrow	✓	x	N/a	N/a	x
Willow tit	✓	x	N/a	N/a	x
Yellow wagtail	✓	✓	N/a	N/a	x
Yellowhammer	✓	✓	N/a	N/a	x

Birds of Conservation Concern (BoCC)

2.2.23 A total of 36 Red listed BoCC were recorded within 2km of survey area, 12 of which have the potential to breed onsite. A total of 49 Amber listed BoCC were within 2km of survey area, eight of which have potential to breed onsite.

2.2.24 During the BBS, seven BoCC Red list species were recorded on site. These consisted of fieldfare, herring gull, lapwing, lapwing, linnet, skylark, song thrush and starling. Only three of which were observed showing breeding behaviour. A total of eleven BoCC Amber list species were recorded onsite, these consisted of black-headed gull, dunnock, kestrel, mallard, oystercatcher, reed bunting, shelduck, teal and willow warbler. Only three of these species were considered to be breeding onsite.

2.2.25 Species including dunnock, herring gull, lapwing, linnet, reed bunting, skylark, song thrush and starling have BBS accounts which are already mentioned above and so are not included below.

Black-headed gull

2.2.26 Black-headed gull is a BoCC amber list species due to moderate declines in non-breeding populations (Eaton et al. 2015). This species is typically associated with coastal and inland wetlands, using both natural and manmade waterbodies (BTO no date). Few individuals were recorded flying over site during three of the survey visits. This species is not considered to be breeding onsite.

Kestrel

2.2.27 Kestrel is a BoCC amber list species due to declines since the 1970's (Baillie et al. 2015). The kestrel breeds at high density in mixed farmland across much of England (Baillie et al. 2015). This species was observed hunting onsite and adjacent to the western boundary. No breeding behaviour has been observed during the surveys.

Mallard

2.2.28 Mallard species has recently been moved from the green to the amber list on the strength of decline in parts of the UK wintering populations (Baillie et al. 2015). This species is typically associated with waterbodies. This species was recorded in association with the pond onsite in the south west. No breeding behaviour has been observed during the surveys.

Meadow Pipit

2.2.29 Meadow pipit is a BoCC amber list species due to a downward population trend since the mid 1970's (Baillie et al. 2015). This species is typically associated with grassland. This species was recorded in an adjacent field of the eastern boundary which is unmanaged grassland. A single breeding pair is likely due to territorial behaviour being recorded from an individual during visit 5.

Oystercatcher

2.2.30 Oystercatcher is a BoCC amber list species due to significant declines in Scotland (Baillie et al. 2015). This species is typically associated with estuaries, gravel banks and soft soil for foraging. This species was recorded in an adjacent field of the northern boundary which had an ephemeral pond from waterlogged ground, and was also recorded flying along the western boundary. No breeding behaviour has been observed during the surveys.

Shelduck

2.2.31 Shelduck is a BoCC amber list species due to declines since the 1980's and has been falling again since the mid 1990's (Baillie et al. 2015). This species is typically associated with waterbodies, estuaries and soft soil for foraging. This species was recorded in an adjacent field of the northern boundary which had an ephemeral pond from waterlogged ground. No breeding behaviour has been observed during the surveys.

Teal

2.2.32 Teal is a BoCC amber list species due to declines since the 1970's (Eaton et al. 2015). This species is typically associated with waterbodies. This species was recorded in association with the pond onsite in the south west. No breeding behaviour has been observed during the surveys.

Willow warbler

2.2.33 Willow warbler is a BoCC amber list species due to rapid decline during the 1980s and early 1990s (Baillie et al. 2015). This species is typically associated with woodlands and scrub habitats. This species was recorded across the site mainly in association with the tree line and scrub on the western boundary. At least three breeding pairs are considered to have been recorded on site.

2.2.34 Both desk study data and BBS results are summarised in Table 6 and 7, below.

Table 6: BoCC Red list species data

Species	Desk Study	Supporting Breeding Habitat Onsite	BBS (total[8]/peak count[9])	Likely Breeding Pairs	Potentially significant Effects
Black-tailed Godwit	✓	x	N/a	N/a	x
Corn Bunting	✓	x	N/a	N/a	x
Cuckoo	✓	✓	N/a	N/a	x
Curlew	✓	x	N/a	N/a	x
Fieldfare	✓	x	7/7	0	x
Grasshopper Warbler	✓	✓	N/a	N/a	x
Grey Partridge	x	✓	N/a	N/a	x
Grey Wagtail	✓	x	N/a	N/a	x
Hen Harrier	✓	x	N/a	N/a	x
Herring Gull	✓	x	3/3	0	x
House Sparrow	✓	x	N/a	N/a	x
Lapwing	✓	✓	11/2	2	x
Lesser Redpoll	✓	x	N/a	N/a	x
Linnet	✓	x	4/2	0	x
Long-tailed Duck	✓	x	N/a	N/a	x
Marsh Tit	✓	x	N/a	N/a	x
Merlin	✓	x	N/a	N/a	x
Mistle Thrush	✓	x	N/a	N/a	x
Nightingale	✓	x	N/a	N/a	x

[8] Total number of registrations on or through study area.
[9] Peak count – i.e. maximum flock size at any point during survey, or total count if no risk of double counting.

Table 6: BoCC Red list species data					
Species	**Desk Study**	**Supporting Breeding Habitat Onsite**	**BBS (total[8]/peak count[9])**	**Likely Breeding Pairs**	**Potentially significant Effects**
Pochard	✓	x	N/a	N/a	x
Redwing	✓	x	N/a	N/a	x
Ring Ouzel	✓	x	N/a	N/a	x
Ringed Plover	✓	x	N/a	N/a	x
Ruff	✓	x	N/a	N/a	x
Skylark	✓	✓	44/2	16	x
Song Thrush	✓	✓	14/2	3	x
Spotted Flycatcher	✓	x	N/a	N/a	x
Starling	✓	✓	2/2	0	x
Tree Pipit	✓	x	N/a	N/a	x
Tree Sparrow	✓	✓	N/a	N/a	x
Whimbrel	✓	x	N/a	N/a	x
Whinchat	✓	x	N/a	N/a	x
Willow Tit	✓	x	N/a	N/a	x
Woodcock	✓	x	N/a	N/a	x
Yellow Wagtail	✓	✓	N/a	N/a	x
Yellowhammer	✓	✓	N/a	N/a	x

Table 7: BoCC Amber list species data					
Species	**Desk Study**	**Supporting Breeding Habitat Onsite**	**BBS (total[10]/peak count[11])**	**Likely Breeding Pairs**	**Potentially significant Effects**
Arctic Tern	✓	x	N/a	N/a	x
Barnacle Goose	✓	x	N/a	N/a	x
Bittern	✓	x	N/a	N/a	x
Black-headed Gull	✓	x	4/3	0	x
Black-necked Grebe	✓	x	N/a	N/a	x
Bullfinch	✓	✓	1/1	0	x
Common Gull	x	x	N/a	N/a	x
Common Sandpiper	✓	x	N/a	N/a	x
Common Tern	✓	x	N/a	N/a	x
Crane	✓	x	N/a	N/a	x
Dunnock	✓	✓	20/2	4	x
Dunlin	✓	x	N/a	N/a	x
Gadwall	✓	x	N/a	N/a	x

[10] Total number of registrations on or through study area.
[11] Peak count – i.e. maximum flock size at any point during survey, or total count if no risk of double counting.

Table 7: BoCC Amber list species data					
Species	**Desk Study**	**Supporting Breeding Habitat Onsite**	**BBS (total[10]/peak count[11])**	**Likely Breeding Pairs**	**Potentially significant Effects**
Gannet	✓	x	N/a	N/a	x
Garganey	✓	x	N/a	N/a	x
Goldeneye	✓	x	N/a	N/a	x
Great Black-backed Gull	✓	x	N/a	N/a	x
Green Sandpiper	✓	x	N/a	N/a	x
Greenshank	✓	x	N/a	N/a	x
Greylag Goose	✓	x	N/a	N/a	x
House Martin	✓	x	N/a	N/a	x
Iceland Gull	✓	x	N/a	N/a	x
Kestrel	✓	x	4/1	0	x
Kingfisher	✓	x	N/a	N/a	x
Lesser Black-backed Gull	✓	x	N/a	N/a	x
Mallard	✓	✓	2/1	0	x
Marsh Harrier	✓	x	N/a	N/a	x
Meadow Pipit	✓	x	1/1	0	x
Mediterranean Gull	✓	x	N/a	N/a	x
Mute Swan	✓	x	N/a	N/a	x
Northern Shoveler	✓	x	N/a	N/a	x
Osprey	✓	x	N/a	N/a	x
Oystercatcher	✓	x	3/1	0	x
Pink-footed Goose	✓	x	N/a	N/a	x
Pintail	✓	x	N/a	N/a	x
Quail	✓	✓	N/a	N/a	x
Redshank	✓	x	N/a	N/a	x
Reed Bunting	✓	✓	5/2	2	x
Shelduck	✓	x	2/2	0	x
Short-eared Owl	✓	x	N/a	N/a	x
Snipe	✓	x	N/a	N/a	x
Stock Dove	✓	✓	N/a	N/a	x
Swift	✓	x	N/a	N/a	x
Tawny Owl	✓	✓	N/a	N/a	x
Teal	✓	x	1/1	0	x
Whooper Swan	✓	x	N/a	N/a	x
Wigeon	✓	x	N/a	N/a	x

Table 7: BoCC Amber list species data					
Species	**Desk Study**	**Supporting Breeding Habitat Onsite**	**BBS (total[10]/peak count[11])**	**Likely Breeding Pairs**	**Potentially significant Effects**
Willow Warbler	✓	✓	15/2	5[12]	x
Wood Sandpiper	✓	x	N/a	N/a	x
Yellow-legged Gull	✓	x	N/a	N/a	x

[12] At least three pairs based on indicative territory analysis

3 REFERENCES

Baillie, S.R., Marchant, J.H., Leech, D.I. et al (2014) BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 662. BTO, Thetford.

BTO. (no date). Understanding birds: Black-headed gull. Retrieved from https://www.bto.org/understanding-birds/species-focus/black-headed-gull

Bibby, C.J., Burgess, N.D., Hill, D.A & Mustoe, S.H. (2000) *Bird census techniques*. Academic Press, London, UK.

Eaton MA, Brown AF, Noble DG, Musgrove AJ, Hearn R, Aebischer NJ, Gibbons DW, Evans A and Gregory RD (2009). Birds of Conservation Concern 3: the population status of birds in the United Kingdom, Channel Islands and the Isle of Man. British Birds 102, pp296-341.

Gibbons, D.W., Reid, J.B. & Chapman, R.A. (1993) The New Atlas of Breeding Birds in Britain and Ireland: 1988–1991. T. & A.D. Poyser, London.

Gilbert, G, Gibbons, D.W. & Evans, J, (1998) *Bird monitoring methods: A manual of techniques for key UK species*. Royal Society for the Protection of Birds (RSPB) The RSPB, Sandy, UK.

Kuijper, D.P.J., Oosterveld, E. & Wymenga, E. (2009) Decline and potential recovery of the European Grey Partridge (Perdix perdix) population – a review. European Journal of Wildlife Research 55: 455–463

Robinson, R.A., Siriwardena, G.M. & Crick, H.Q.P. (2002) *Status and population trends of the Starling Sturnus vulgaris in Great Britain*. In H.Q.P. Crick, R.A. Robinson, G.F. Appleton, N.A. Clark & A.D. Rickard (eds) *Investigation into the causes of the decline of Starlings and House Sparrows in Great Britain.* BTO Research Report No 290, pp 11-31. DEFRA, Bristol.

Snow, D.W., Perrins, C.M., Gillmoor, R., Hillcoat, B., Roselaar, C.S., Vincent, D., Wallace, D.I.M. & Wilson, M.G. (1998). *The birds of the Western Palearctic Concise Edition*. Oxford University Press, UK.

Thomson. D.L & Cotton, P.A, (2000) *Understanding the Population Decline of the Britisth Population of Song Thrushes Turdus Philomelos*. Ecology & Conservation of Lowland Farmland Birds p.151-155.Wilson, A.M., Vickery, J.A. & Browne, S.J. (2001) Numbers and distribution of Northern Lapwings *Vanellus vanellus* breeding in England and Wales in 1998. Bird Study 48: 2–17.

Appendix 1

Warrington MSA Breeding Bird Survey Table (2019)

Appendix 1: Warrington MSA Breeding Bird Survey Table (2019)												
Species	**A1**	**S1**	**s.41**	**Latin**	**V1**	**V2**	**V3**	**V4**	**V5**	**All visits**	**Peak Count**	**Likely Breeding Pairs**
Blackbird				*Turdus merula*	4	4	5	7	5	25	1	4
Blackcap				*Sylvia atricapilla*	0	0	8	2	5	15	3	5
Black-headed Gull				*Chroicocephalus ridibundus*	0	3	1	0	0	4	3	0
Blue Tit				*Cyanistes caeruleus*	10	5	7	5	3	30	3	8
Bullfinch			✓	*Pyrrhula pyrrhula*	0	0	0	0	1	1	1	0
Buzzard				*Buteo buteo*	2	2	1	2	0	7	1	0
Canada Goose				*Branta canadensis*	0	0	2	0	0	2	2	0
Carrion Crow				*Corvus corone*	3	3	3	0	2	11	3	1
Chaffinch				*Fringilla coelebs*	0	1	0	0	2	3	1	1
Chiffchaff				*Phylloscopus collybita*	0	0	3	4	1	8	1	4
Coot				*Fulica atra*	2	0	1	0	2	5	1	1
Dunnock			✓	*Prunella modularis*	5	4	3	5	3	20	2	4
Fieldfare		**1**		*Turdus pilaris*	0	0	7	0	0	7	7	0
Goldcrest				*Regulus regulus*	1	0	0	0	0	1	1	1
Goldfinch				*Carduelis carduelis*	4	21	8	11	7	51	6	7
Great Tit				*Parus major*	5	1	5	2	4	17	4	5
Herring Gull			✓	*Larus argentatus*	0	0	3	0	0	3	3	0
Jackdaw				*Corvus monedula*	0	0	0	1	0	1	1	0
Kestrel				*Falco tinnunculus*	1	0	2	1	0	4	1	0
Lapwing			✓	*Vanellus vanellus*	3	1	6	0	1	11	2	2
Linnet			✓	*Carduelis cannabina*	0	0	0	2	2	4	2	0
Little Grebe				*Tachybaptus ruficollis*	0	0	0	0	1	1	1	1
Long-tailed Tit				*Aegithalos caudatus*	9	0	4	0	19	32	6	8

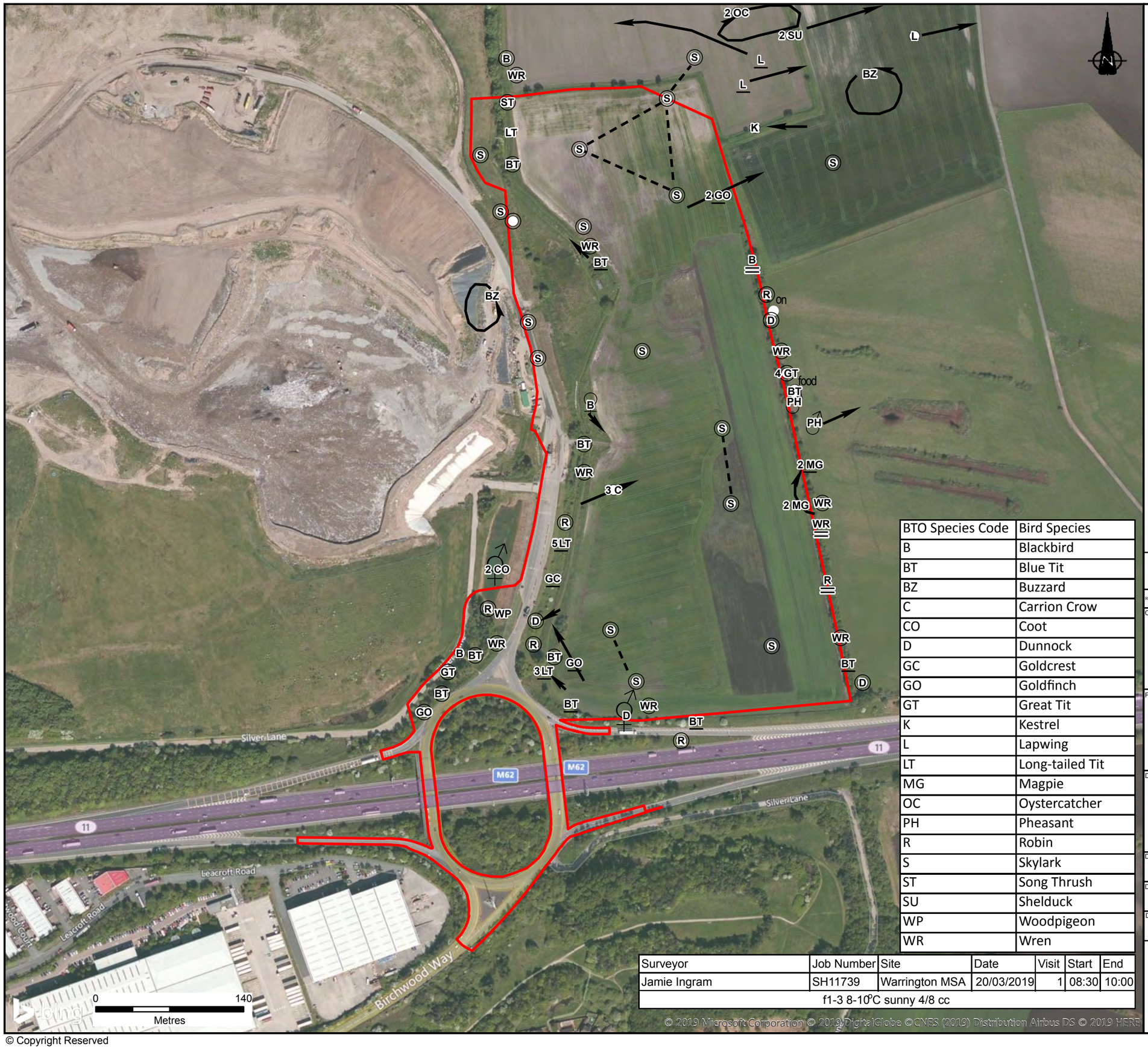
Appendix 1: Warrington MSA Breeding Bird Survey Table (2019)

Species	A1	S1	s.41	Latin	V1	V2	V3	V4	V5	All visits	Peak Count	Likely Breeding Pairs
Magpie				*Pica pica*	2	0	3	0	1	6	3	2
Mallard				*Anas platyrhynchos*	0	0	2	0	0	2	1	0
Meadow Pipit				*Anthus pratensis*	0	0	0	0	1	1	1	0
Moorhen				*Gallinula chloropus*	0	0	1	0	0	1	1	0
Oystercatcher				*Haematopus ostralegus*	2	0	1	0	0	3	1	0
Pheasant				*Phasianus colchicus*	2	1	1	1	2	7	1	0
Reed Bunting			✓	*Emberiza schoeniclus*	0	0	1	2	2	5	2	2
Robin				*Erithacus rubecula*	6	4	3	5	3	21	1	6
Sedge Warbler				*Acrocephalus schoenobaenus*	0	0	0	3	3	6	3	3
Shelduck				*Tadorna tadorna*	0	2	0	0	0	2	2	0
Skylark			✓	*Alauda arvensis*	16	9	7	6	6	44	2	16
Song Thrush			✓	*Turdus philomelos*	1	0	7	2	4	14	2	3
Sparrowhawk				*Accipiter nisus*	0	0	1	0	0	1	1	0
Starling			✓	*Sturnus vulgaris*	0	0	2	0	0	2	2	0
Teal				*Anas crecca*	0	1	0	0	0	1	1	0
Whitethroat				*Sylvia communis*	0	0	5	14	9	28	3	11
Willow Warbler				*Phylloscopus trochilus*	0	2	5	5	3	15	2	5
Woodpigeon				*Columba palumbus*	1	2	4	3	6	16	6	0
Wren				*Troglodytes troglodytes*	11	9	7	6	11	44	2	11

Total Annex 1	0
Total WCA Schedule 1	1
Total BoCC Red List	7

Appendix 1: Warrington MSA Breeding Bird Survey Table (2019)												
Species	**A1**	**S1**	**s.41**	**Latin**	**V1**	**V2**	**V3**	**V4**	**V5**	**All visits**	**Peak Count**	**Likely Breeding Pairs**
Total BoCC Amber List	11											
Total NERC s.41	9											

DRAWINGS



KEY

- Site Boundary
- Pair of birds
- Bird(s) repeatedly calling
- Sighting of Bird(s)
- Calling bird(s)
- food — Bird carrying food
- A female bird
- A male bird
- * on — Bird nest with adult sitting.
- Singing bird(s)
- Bird(s) in flight
- Two birds in song at the same time

BTO Species Code	Bird Species
B	Blackbird
BT	Blue Tit
BZ	Buzzard
C	Carrion Crow
CO	Coot
D	Dunnock
GC	Goldcrest
GO	Goldfinch
GT	Great Tit
K	Kestrel
L	Lapwing
LT	Long-tailed Tit
MG	Magpie
OC	Oystercatcher
PH	Pheasant
R	Robin
S	Skylark
ST	Song Thrush
SU	Shelduck
WP	Woodpigeon
WR	Wren

Surveyor	Job Number	Site	Date	Visit	Start	End
Jamie Ingram	SH11739	Warrington MSA	20/03/2019	1	08:30	10:00
f1-3 8-10°C sunny 4/8 cc						

Notes:

Aerial imagery shown for context purposes only.

Boundaries are indicative.

REVISION	DETAILS	DATE	DRAWN	CHK'D	APP'D

CLIENT

EXTRA MOTORWAY SERVICE AREA GROUP

PROJECT

WARRINGTON MOTORWAY SERVICE AREA, J11 M62

DRAWING TITLE

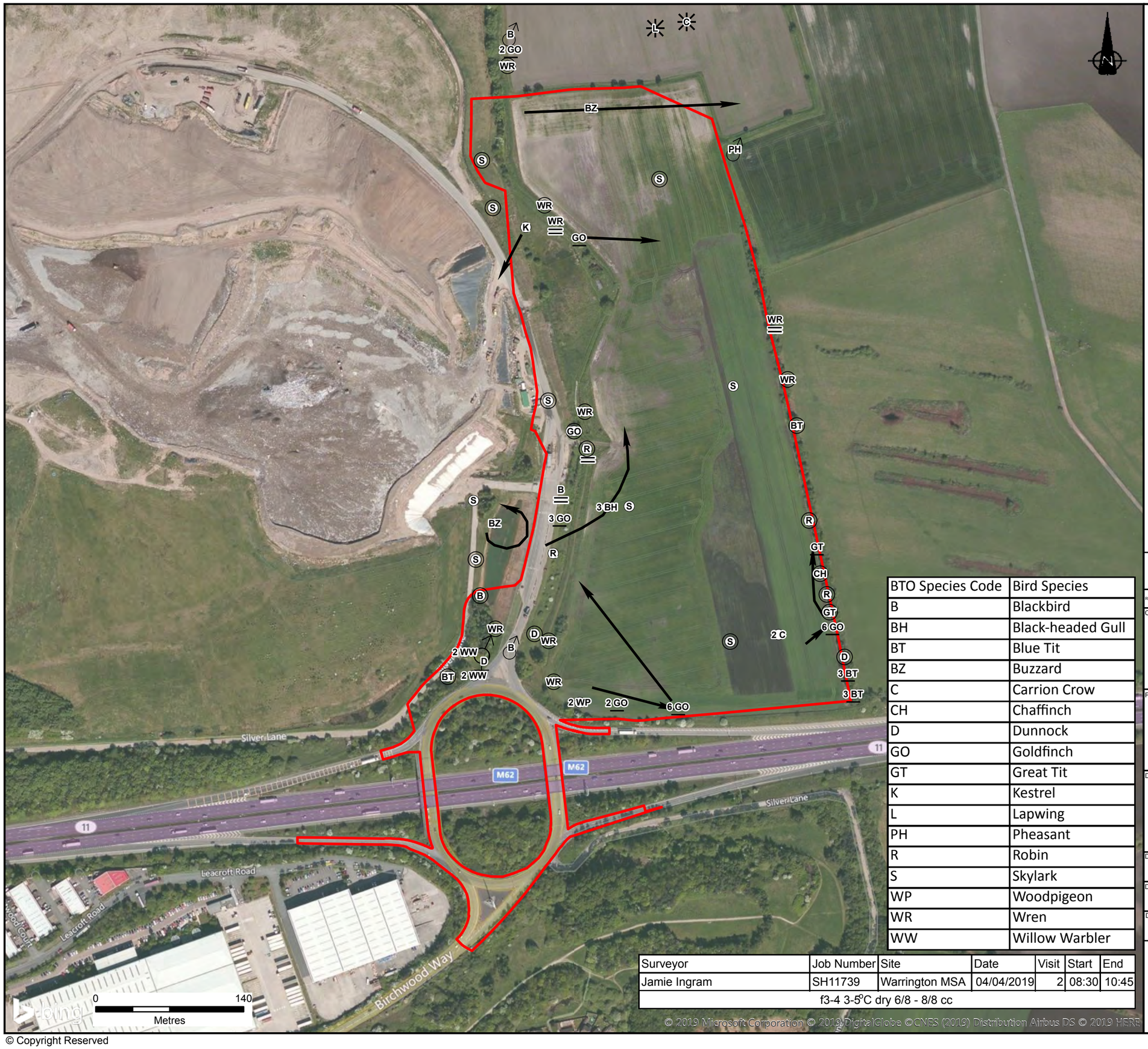
BREEDING BIRD SURVEY RESULTS (VISIT 1)

DRG No.	REV
SH11739/035	A

DRG SIZE	SCALE	DATE
A3	1:3,500	24/07/2019

DRAWN BY	CHECKED BY	APPROVED BY
SW	KS	TP

wardell armstrong
NEWCASTLE UPON TYNE | TEL 0191 232 0943
WWW.WARDELL-ARMSTRONG.COM
BIRMINGHAM · BOLTON · CARDIFF · CARLISLE · EDINBURGH · GLASGOW · LONDON · MANCHESTER · SHEFFIELD · STOKE ON TRENT



KEY

- Site Boundary
- Pair of birds
- Bird(s) repeatedly calling
- Sighting of Bird(s)
- An aggressive accounter between two birds
- Calling bird(s)
- A male bird
- Singing bird(s)
- Bird(s) in flight

Notes:

Aerial imagery shown for context purposes only.

Boundaries are indicative.

BTO Species Code	Bird Species
B	Blackbird
BH	Black-headed Gull
BT	Blue Tit
BZ	Buzzard
C	Carrion Crow
CH	Chaffinch
D	Dunnock
GO	Goldfinch
GT	Great Tit
K	Kestrel
L	Lapwing
PH	Pheasant
R	Robin
S	Skylark
WP	Woodpigeon
WR	Wren
WW	Willow Warbler

Surveyor	Job Number	Site	Date	Visit	Start	End
Jamie Ingram	SH11739	Warrington MSA	04/04/2019	2	08:30	10:45
f3-4 3-5°C dry 6/8 - 8/8 cc						

REVISION	DETAILS	DATE	DRAWN	CHKD	APP'D

CLIENT

EXTRA MOTORWAY SERVICE AREA GROUP

PROJECT

WARRINGTON MOTORWAY SERVICE AREA, J11 M62

DRAWING TITLE

BREEDING BIRD SURVEY RESULTS (VISIT 2)

DRG No.	REV
SH11739/036	A

DRG SIZE	SCALE	DATE
A3	1:3,500	25/07/2019

DRAWN BY	CHECKED BY	APPROVED BY
SW	KS	TP

wardell armstrong
NEWCASTLE UPON TYNE | TEL 0191 232 0943
WWW.WARDELL-ARMSTRONG.COM
BIRMINGHAM · BOLTON · CARDIFF · CARLISLE · EDINBURGH · GLASGOW · LONDON · MANCHESTER · SHEFFIELD · STOKE ON TRENT

KEY

- Site Boundary
- Sighting of Bird(s)
- Pair of birds
- Singing bird(s)
- Territories

Notes:

Aerial imagery shown for context purposes only.

Boundaries are indicative.

Sightings of Dunnock from visit 1 (20/03/2019) are shown in orange, visit 2 (19/04/2019) are shown in blue, visit 3 (23/04/2019) are shown in purple, visit 4 (14/05/2019) are shown in green and visit 5 (06/06/2019) are shown in red.

REVISION	DETAILS	DATE	DRAWN	CHK'D	APP'D

CLIENT

EXTRA MOTORWAY SERVICE AREA GROUP

PROJECT

WARRINGTON MOTORWAY SERVICE AREA, J11 M62

DRAWING TITLE

DUNNOCK TERRITORY PLAN

DRG No.		REV
SH11739/040		A
DRG SIZE	SCALE	DATE
A3	1:3,500	24/07/2019
DRAWN BY	CHECKED BY	APPROVED BY
SW	KS	TP

wardell armstrong
NEWCASTLE UPON TYNE | TEL 0191 232 0943
WWW.WARDELL-ARMSTRONG.COM
BIRMINGHAM · BOLTON · CARDIFF · CARLISLE · EDINBURGH · GLASGOW · LONDON · MANCHESTER · SHEFFIELD · STOKE ON TRENT

KEY

- Site Boundary
- Sighting of Bird(s)
- Calling bird(s)
- An aggressive accounter between two birds
- Lapwing Territories

Notes:

Aerial imagery shown for context purposes only.

Boundaries are indicative.

Sightings of Lapwing from visit 1 (20/03/2019) are shown in orange, visit 2 (19/04/2019) are shown in blue, visit 3 (23/04/2019) are shown in purple and visit 5 (06/06/2019) are shown in red.

REVISION	DETAILS	DATE	DRAWN	CHK'D	APP'D

CLIENT

EXTRA MOTORWAY SERVICE AREA GROUP

PROJECT

WARRINGTON MOTORWAY SERVICE AREA, J11 M62

DRAWING TITLE

LAPWING TERRITORY PLAN

DRG No.		REV
SH11739/041		A
DRG SIZE	SCALE	DATE
A3	1:3,500	24/07/2019
DRAWN BY	CHECKED BY	APPROVED BY
SW	KS	TP

wardell armstrong
NEWCASTLE UPON TYNE | TEL 0191 232 0943
WWW.WARDELL-ARMSTRONG.COM
BIRMINGHAM · BOLTON · CARDIFF · CARLISLE · EDINBURGH · GLASGOW · LONDON · MANCHESTER · SHEFFIELD · STOKE ON TRENT

KEY

- Site Boundary
- Sighting of Bird(s)
- Singing bird(s)
- Skylark Territories

Notes:

Aerial imagery shown for context purposes only.

Boundaries are indicative.

Sightings of Skylark from visit 1 (20/03/2019) are shown in orange, visit 2 (19/04/2019) are shown in blue, visit 3 (23/04/2019) are shown in purple, visit 4 (14/05/2019) are shown in green and visit 5 (06/06/2019) are shown in red.

REVISION	DETAILS	DATE	DRAWN	CHK'D	APP'D

CLIENT

EXTRA MOTORWAY SERVICE AREA GROUP

PROJECT

WARRINGTON MOTORWAY SERVICE AREA, J11 M62

DRAWING TITLE

SKYLARK TERRITORY PLAN

DRG No.		REV
SH11739/042		A
DRG SIZE	SCALE	DATE
A3	1:3,500	24/07/2019
DRAWN BY	CHECKED BY	APPROVED BY
SW	KS	TP

wardell armstrong

NEWCASTLE UPON TYNE | TEL 0191 232 0943
WWW.WARDELL-ARMSTRONG.COM

BIRMINGHAM · BOLTON · CARDIFF · CARLISLE · EDINBURGH · GLASGOW · LONDON · MANCHESTER · SHEFFIELD · STOKE ON TRENT

KEY

- Site Boundary
- Sighting of Bird(s)
- mat — Bird carrying nest material.
- Singing bird(s)
- Sighting of Bird(s)
- food — Bird carrying food
- Territories

Notes:

Aerial imagery shown for context purposes only.

Boundaries are indicative.

Sightings of Song Thrush from visit 1 (20/03/2019) are shown in orange, visit 2 (19/04/2019) are shown in blue, visit 3 (23/04/2019) are shown in purple, visit 4 (14/05/2019) are shown in green and visit 5 (06/06/2019) are shown in red.

REVISION	DETAILS	DATE	DRAWN	CHKD	APP'D

CLIENT

EXTRA MOTORWAY SERVICE AREA GROUP

PROJECT

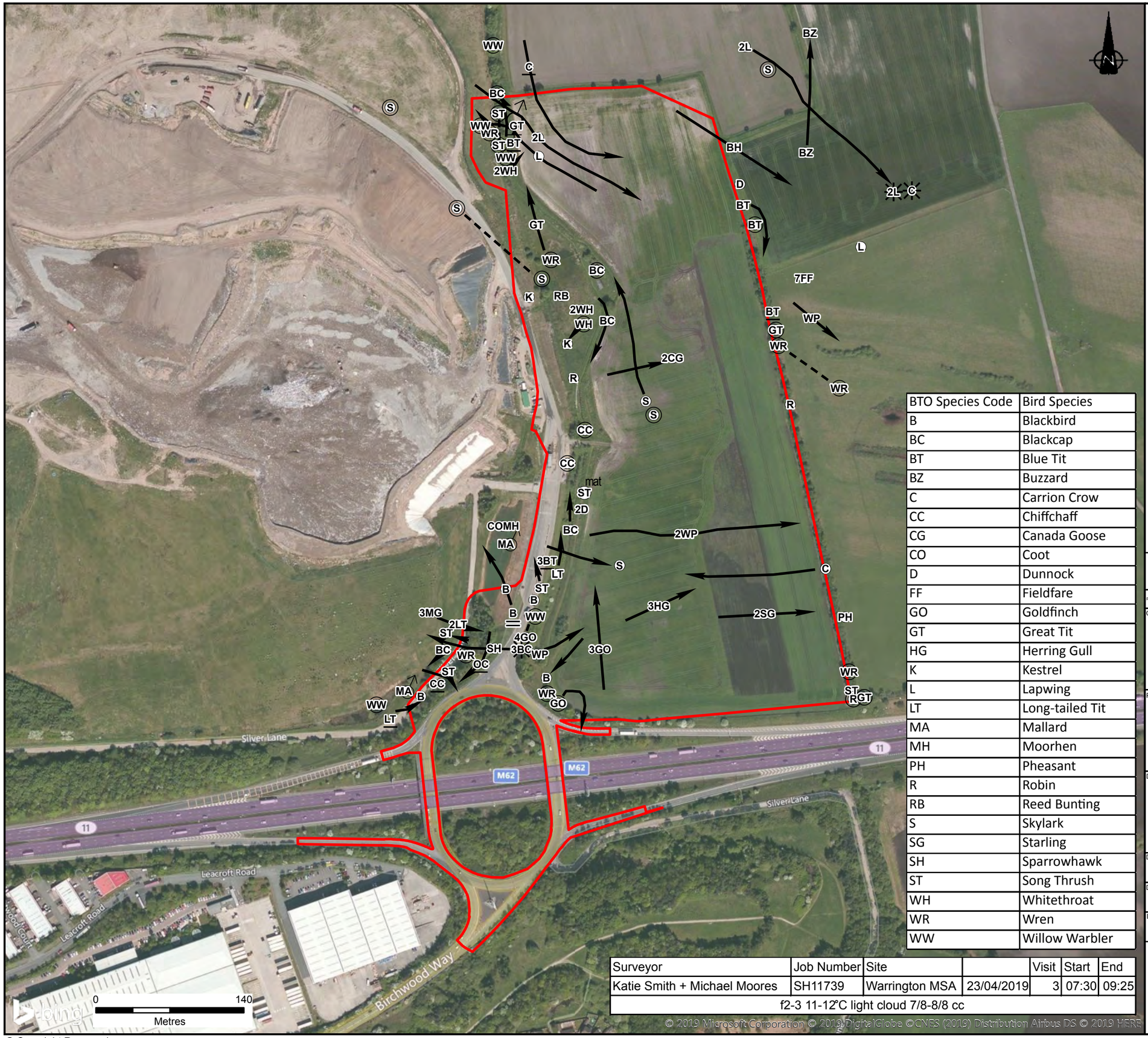
WARRINGTON MOTORWAY SERVICE AREA, J11 M62

DRAWING TITLE

SONG THRUSH TERRITORY PLAN

DRG No.		REV
SH11739/043		A
DRG SIZE	SCALE	DATE
A3	1:3,500	25/07/2019
DRAWN BY	CHECKED BY	APPROVED BY
SW	KS	TP

wardell armstrong
NEWCASTLE UPON TYNE | TEL 0191 232 0943
WWW.WARDELL-ARMSTRONG.COM
BIRMINGHAM · BOLTON · CARDIFF · CARLISLE · EDINBURGH · GLASGOW · LONDON · MANCHESTER · SHEFFIELD · STOKE ON TRENT



BTO Species Code	Bird Species
B	Blackbird
BC	Blackcap
BT	Blue Tit
BZ	Buzzard
C	Carrion Crow
CC	Chiffchaff
CG	Canada Goose
CO	Coot
D	Dunnock
FF	Fieldfare
GO	Goldfinch
GT	Great Tit
HG	Herring Gull
K	Kestrel
L	Lapwing
LT	Long-tailed Tit
MA	Mallard
MH	Moorhen
PH	Pheasant
R	Robin
RB	Reed Bunting
S	Skylark
SG	Starling
SH	Sparrowhawk
ST	Song Thrush
WH	Whitethroat
WR	Wren
WW	Willow Warbler

Surveyor	Job Number	Site		Visit	Start	End
Katie Smith + Michael Moores	SH11739	Warrington MSA	23/04/2019	3	07:30	09:25
f2-3 11-12°C light cloud 7/8-8/8 cc						

KEY

- Site Boundary
- Pair of birds
- Bird(s) repeatedly calling
- Sighting of Bird(s)
- An aggressive accounter between two birds
- Calling bird(s)
- A male bird
- mat — Bird carrying nest material.
- Singing bird(s)
- Bird(s) in flight
- Two birds in song at the same time

Notes:

Aerial imagery shown for context purposes only.

Boundaries are indicative.

REVISION	DETAILS	DATE	DRAWN	CHKD	APP'D

CLIENT

EXTRA MOTORWAY SERVICE AREA GROUP

PROJECT

WARRINGTON MOTORWAY SERVICE AREA, J11 M62

DRAWING TITLE

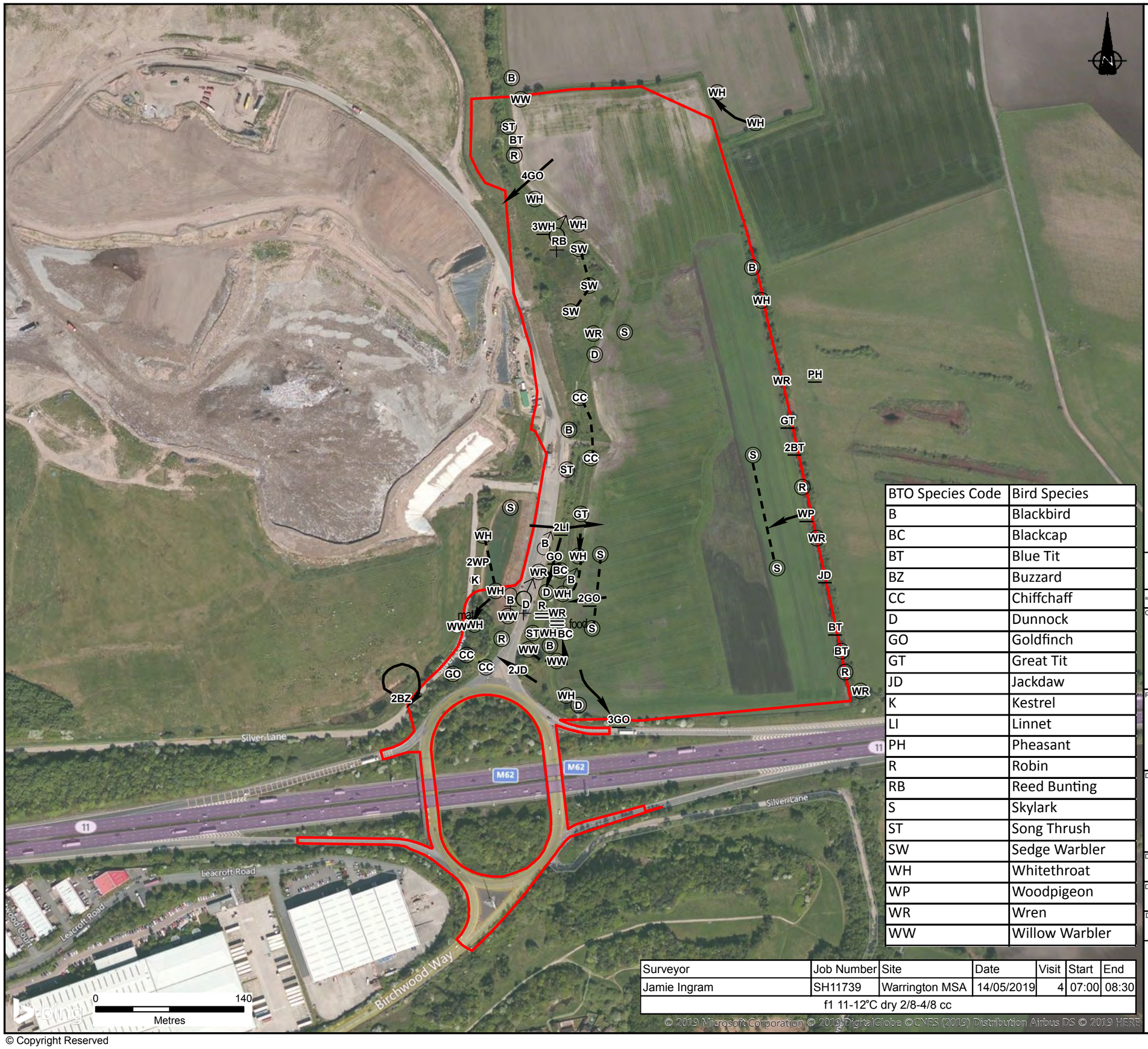
BREEDING BIRD SURVEY RESULTS (VISIT 3)

DRG No.	REV
SH11739/046	A

DRG SIZE	SCALE	DATE
A3	1:3,500	24/07/2019

DRAWN BY	CHECKED BY	APPROVED BY
EF	KS	TP

wardell armstrong
NEWCASTLE UPON TYNE | TEL 0191 232 0943
WWW.WARDELL-ARMSTRONG.COM
BIRMINGHAM · BOLTON · CARDIFF · CARLISLE · EDINBURGH · GLASGOW · LONDON · MANCHESTER · SHEFFIELD · STOKE ON TRENT



BTO Species Code	Bird Species
B	Blackbird
BC	Blackcap
BT	Blue Tit
BZ	Buzzard
CC	Chiffchaff
D	Dunnock
GO	Goldfinch
GT	Great Tit
JD	Jackdaw
K	Kestrel
LI	Linnet
PH	Pheasant
R	Robin
RB	Reed Bunting
S	Skylark
ST	Song Thrush
SW	Sedge Warbler
WH	Whitethroat
WP	Woodpigeon
WR	Wren
WW	Willow Warbler

Surveyor	Job Number	Site	Date	Visit	Start	End
Jamie Ingram	SH11739	Warrington MSA	14/05/2019	4	07:00	08:30
f1 11-12°C dry 2/8-4/8 cc						

KEY

- Site Boundary
- Pair of birds
- Bird(s) repeatedly calling
- Sighting of Bird(s)
- Calling bird(s)
- Bird carrying food
- A female bird
- A male bird
- Bird carrying nest material.
- Singing bird(s)
- Bird(s) in flight
- Two birds in song at the same time

Notes:

Aerial imagery shown for context purposes only.

Boundaries are indicative.

REVISION	DETAILS	DATE	DRAWN	CHK'D	APP'D

CLIENT

EXTRA MOTORWAY SERVICE AREA GROUP

PROJECT

WARRINGTON MOTORWAY SERVICE AREA, J11 M62

DRAWING TITLE

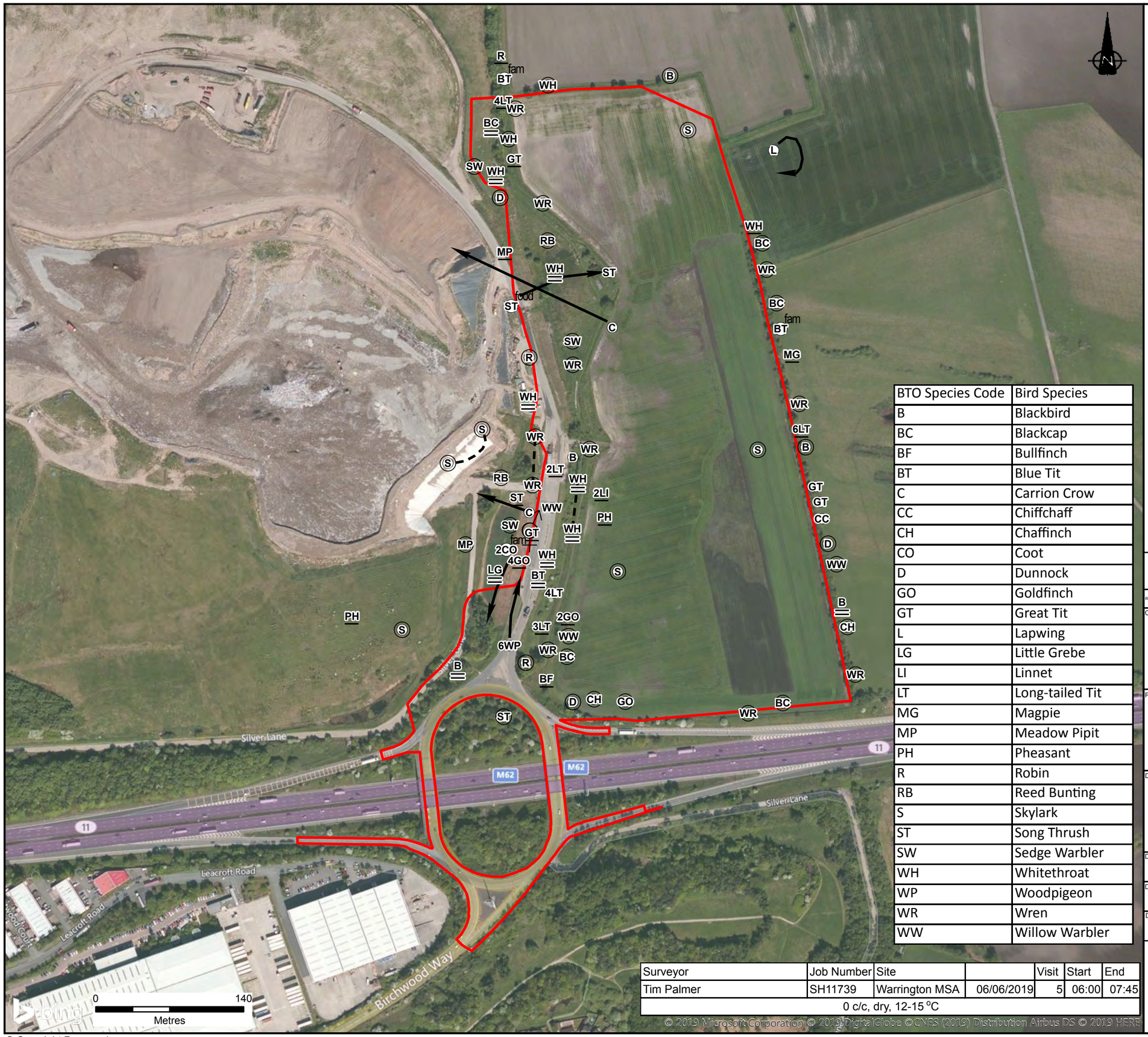
BREEDING BIRD SURVEY RESULTS (VISIT 4)

DRG No.	REV
SH11739/049	A

DRG SIZE	SCALE	DATE
A3	1:3,500	24/07/2019

DRAWN BY	CHECKED BY	APPROVED BY
EF	KS	TP

wardell armstrong
NEWCASTLE UPON TYNE | TEL 0191 232 0943
WWW.WARDELL-ARMSTRONG.COM
BIRMINGHAM · BOLTON · CARDIFF · CARLISLE · EDINBURGH · GLASGOW · LONDON · MANCHESTER · SHEFFIELD · STOKE ON TRENT



KEY

- Site Boundary
- Pair of birds
- Bird(s) repeatedly calling
- Sighting of Bird(s)
- Calling bird(s)
- Bird carrying food
- Juvenile with parent(s)
- Singing bird(s)
- Bird(s) in flight
- Two birds in song at the same time

BTO Species Code	Bird Species
B	Blackbird
BC	Blackcap
BF	Bullfinch
BT	Blue Tit
C	Carrion Crow
CC	Chiffchaff
CH	Chaffinch
CO	Coot
D	Dunnock
GO	Goldfinch
GT	Great Tit
L	Lapwing
LG	Little Grebe
LI	Linnet
LT	Long-tailed Tit
MG	Magpie
MP	Meadow Pipit
PH	Pheasant
R	Robin
RB	Reed Bunting
S	Skylark
ST	Song Thrush
SW	Sedge Warbler
WH	Whitethroat
WP	Woodpigeon
WR	Wren
WW	Willow Warbler

Surveyor	Job Number	Site		Visit	Start	End
Tim Palmer	SH11739	Warrington MSA	06/06/2019	5	06:00	07:45
0 c/c, dry, 12-15 °C						

Notes:

Aerial imagery shown for context purposes only.

Boundaries are indicative.

REVISION	DETAILS	DATE	DRAWN	CHKD	APP'D

CLIENT

EXTRA MOTORWAY SERVICE AREA GROUP

PROJECT

WARRINGTON MOTORWAY SERVICE AREA, J11 M62

DRAWING TITLE

BREEDING BIRD SURVEY RESULTS (VISIT 5)

DRG No.	REV
SH11739/051	A

DRG SIZE	SCALE	DATE
A3	1:3,500	24/07/2019

DRAWN BY	CHECKED BY	APPROVED BY
SW	TP	KS

wardell armstrong
NEWCASTLE UPON TYNE | TEL 0191 232 0943
WWW.WARDELL-ARMSTRONG.COM
BIRMINGHAM GLASGOW
BOLTON LONDON
CARDIFF MANCHESTER
CARLISLE SHEFFIELD
EDINBURGH STOKE ON TRENT

KEY

- Site Boundary
- Pair of birds
- Sighting of Bird(s)
- Singing bird(s)
- Territories

Notes:

Aerial imagery shown for context purposes only.

Boundaries are indicative.

Sightings of Reed Bunting visit 3 (23/04/2019) are shown in purple, visit 4 (14/05/2019) are shown in green and visit 5 (06/06/2019) are shown in red.

REVISION	DETAILS	DATE	DRAWN	CHK'D	APP'D

CLIENT

EXTRA MOTORWAY SERVICE AREA GROUP

PROJECT

WARRINGTON MOTORWAY SERVICE AREA, J11 M62

DRAWING TITLE

REED BUNTING TERRITORY PLAN

DRG No.		REV
SH11739/053		A
DRG SIZE	SCALE	DATE
A3	1:3,500	25/07/2019
DRAWN BY	CHECKED BY	APPROVED BY
SW	KS	TP

wardell armstrong
NEWCASTLE UPON TYNE | TEL 0191 232 0943
WWW.WARDELL-ARMSTRONG.COM
BIRMINGHAM · BOLTON · CARDIFF · CARLISLE · EDINBURGH · GLASGOW · LONDON · MANCHESTER · SHEFFIELD · STOKE ON TRENT

KEY

- Site Boundary
- mat — Bird carrying nest material.
- Sighting of Bird(s)
- Singing bird(s)
- Territories

Notes:

Aerial imagery shown for context purposes only.

Boundaries are indicative.

Sightings of Willow Warbler from visit 2 (19/04/2019) are shown in blue, visit 3 (23/04/2019) are shown in purple, visit 4 (14/05/2019) are shown in green and visit 5 (06/06/2019) are shown in red.

REVISION	DETAILS	DATE	DRAWN	CHK'D	APP'D

CLIENT

EXTRA MOTORWAY SERVICE AREA GROUP

PROJECT

WARRINGTON MOTORWAY SERVICE AREA, J11 M62

DRAWING TITLE

WILLOW WARBLER TERRITORY PLAN

DRG No.		REV
SH11739/054		A
DRG SIZE	SCALE	DATE
A3	1:3,500	25/07/2019
DRAWN BY	CHECKED BY	APPROVED BY
SW	KS	TP

wardell armstrong
NEWCASTLE UPON TYNE | TEL 0191 232 0943
WWW.WARDELL-ARMSTRONG.COM
BIRMINGHAM · BOLTON · CARDIFF · CARLISLE · EDINBURGH · GLASGOW · LONDON · MANCHESTER · SHEFFIELD · STOKE ON TRENT

wardell-armstrong.com

STOKE-ON-TRENT
Sir Henry Doulton House
Forge Lane
Etruria
Stoke-on-Trent
ST1 5BD
Tel: +44 (0)1782 276 700

BIRMINGHAM
Two Devon Way
Longbridge Technology Park
Longbridge
Birmingham
B31 2TS
Tel: +44 (0)121 580 0909

BOLTON
41-50 Futura Park
Aspinall Way
Middlebrook
Bolton
BL6 6SU
Tel: +44 (0)1204 227 227

CARDIFF
Tudor House
16 Cathedral Road
Cardiff
CF11 9LJ
Tel: +44 (0)292 072 9191

CARLISLE
Marconi Road
Burgh Road Industrial Estate
Carlisle
Cumbria
CA2 7NA
Tel: +44 (0)1228 550 575

EDINBURGH
Great Michael House
14 Links Place
Edinburgh
EH6 7EZ
Tel: +44 (0)131 555 3311

GLASGOW
2 West Regent Street
Glasgow
G2 1RW
Tel: +44 (0)141 433 7210

LEEDS
36 Park Row
Leeds
LS1 5JL
Tel: +44 (0)113 831 5533

LONDON
Third Floor
46 Chancery Lane
London
WC2A 1JE
Tel: +44 (0)207 242 3243

MANCHESTER
76 King Street
Manchester
M2 4NH
Tel: +44 (0)161 817 5038

NEWCASTLE UPON TYNE
City Quadrant
11 Waterloo Square
Newcastle upon Tyne
NE1 4DP
Tel: +44 (0)191 232 0943

TRURO
Baldhu House
Wheal Jane Earth Science Park
Baldhu
Truro
TR3 6EH
Tel: +44 (0)187 256 0738

International offices:

ALMATY
29/6 Satpaev Avenue
Regency Hotel
Office Tower
Almaty
Kazakhstan
050040
Tel: +7(727) 334 1310

MOSCOW
21/5 Kuznetskiy Most St.
Moscow
Russia
Tel: +7(495) 626 07 67

wardell armstrong

Appendix 5.8 – Wintering Birds Survey Report

wardell-armstrong.com

ENERGY AND CLIMATE CHANGE
ENVIRONMENT AND SUSTAINABILITY
INFRASTRUCTURE AND UTILITIES
LAND AND PROPERTY
MINING AND MINERAL PROCESSING
MINERAL ESTATES
WASTE RESOURCE MANAGEMENT

EXTRA MSA GROUP

MOTORWAY SERVICES, WARRINGTON

WINTERING BIRD SURVEY

JULY 2019

wardell armstrong

Wardell Armstrong
36 Park Row Leeds, LS1 5JL, United Kingdom
Telephone: +44 (0)113 831 5533 www.wardell-armstrong.com

DATE ISSUED:	**JULY 2019**
JOB NUMBER:	**SH11739**
REPORT NUMBER:	**008**
VERSION:	**V1.0**
STATUS:	**FINAL**

EXTRA MSA GROUP

MOTORWAY SERVICES, WARRINGTON

WINTERING BIRD SURVEY

JULY 2019

PREPARED BY:

Jamie Ingram — Senior Ecologist

REVIEWED BY:

Katie Smith — Ecologist

Richard Laws — Principal Ecologist

APPROVED BY:

Tim Palmer — Technical Director (Ecology)

CONTENTS

APPENDICES

DRAWINGS	TITLE	SCALE
SH11739-023	Wintering Bird Survey Results January 2018	1:3,500@A3
SH11739-024	Wintering Bird Survey Results February 2018	1:3,500@A3
SH11739-025	Wintering Bird Survey Results March 2018	1:3,500@A3
SH11739-026	Wintering Bird Survey Results October 2018	1:3,500@A3
SH11739-027	Wintering Bird Survey Results November 2018	1:3,500@A3
SH11739-028	Wintering Bird Survey Results December 2018	1:3,500@A3

1 METHODOLOGY

1.1 Scoping Consultation

1.1.1 A scoping report was issued to Tameside Metropolitan Borough Council (TMBRC) during December 2018. Comments were returned during February 2019. The scoping response from TMBRC agreed that impacts on wintering bird assemblages need to be considered in the Environmental Statement (ES). A recommendation of biodiversity net gain was made in line with the NPPF.

1.2 Desk Study

1.2.1 The desktop study was informed by review of existing available information provided by RECORD (Local Records Centre), Cheshire and Wirral Ornithological Society (CAWOS), Barn Owl Conservation Trust (BOCT) and from available internet-based resources for a 2km search radius from the site boundaries. OS and satellite mapping were also used to gain contextual habitat information. Other organisations and recorders approached included:

- Greater Manchester Local Record Centre (GMLRC).

1.3 Field Surveys

Wintering Bird Survey

1.3.1 Field survey methods were based upon and adapted from British Trust for Ornithology (BTO) winter farmland bird survey methodology (Gillings *et al.* 2008). The survey visits consisted of systematic walkovers of the site, recording all bird species observed or heard, and counts of numbers within wintering flocks.

1.3.2 A transect route was mapped out prior to the surveys being undertaken, paying particular attention to linear features (such as hedgerows and tree lines) and natural landscape features (such as watercourses and areas of scrub). The site was visited six times during winter months of 2018 including January to March (inclusive) and October to December (inclusive) with a single visit per month. All surveys were conducted between the hours of 08:30 and 15:30, surveys consisted of an alternate dawn and dusk survey per month to cover a range of species behavioural traits at varying times of the day. All fields were viewed from linear boundaries and all habitat features were surveyed to within 100 m where possible.

1.3.3 Bird surveys were scheduled to include variable weather conditions to ensure weather dependant winter bird movements were included within the survey, as bird dispersal can occur during periods of prolonged cold spells or during periods of rapid thaw.

1.3.4 The surveyor recorded all contacts with birds (either by sight or sound) by walking the pre-designated transect at a steady pace. The positions of the recorded birds were plotted as accurately as possible (to the nearest 10 – 20 m) on a suitably scaled base map. Standard BTO codes and symbols were used for mapping species, including, where detectable, sex and age (e.g. juvenile, immature or adult) and bird activity, including singing, alarm-calling, foraging, flight path and location.

1.3.5 An evaluation of the site assemblage has been undertaken according to Fuller, R.J (1980) *A Method for Assessing the Ornithological Interest of Sites for Conservation*. Biological Conservation 17 P-229-239. The Fuller method uses the total number of all species (including non-notable species) recorded within a surveyed area to provide an indication of species richness. The criteria according to Fuller (1980) are provided in Table 1.

Table 1: Breeding Bird Species Richness Criteria (Fuller 1980)

Local	County	Regional	National
25-49	50-69	70-84	85+

1.3.6 Dates and weather conditions of the Wintering Bird Surveys are provided in Table 2, below:

Table 2: 2018 Wintering Bird Survey Weather Conditions

Date	Weather	Sunrise/Sunset (Warrington)	Time on site
19/01/2019	Cloud 2-5/8, Wind F2-3, Dry – Rain Showers, Temp 4-6˚C	08:13/16:28	09:00– 11:00
19/02/2019	Cloud 8/8, Wind F1, Dry, Temp 9-10˚C	07:20/17:28	09:15 – 12:00
22/03/2019	Cloud 6/8, Wind F2, Dry, Temp 7-8˚C	06:08/18:27	08:30 – 11:30
25/10/2018	Cloud 4/8, Wind F2, Dry, Temp 9˚C	07:55/17:52	10:00 – 12:00
21/11/2018	Cloud 8-6/8, Wind F2, Dry, Temp 4˚C	07:46/16:05	09:15 – 10:45
29/12/2018	Cloud 5-6/8, Wind F3, Dry, Temp 10-9˚C	08:26/15:58	14:00– 15:30

1.3.7 Ornithological surveys are affected by a variety of factors that influence the presence of birds. These include weather, food availability, species behaviour and disturbance. The absence of any particular species within the survey area should not be taken as conclusive evidence that the species is not present or that it will not be present in the future.

2 RESULTS

2.1 Desk Study

2.1.1 Data from RECORD, CAWOS and the BOCT highlighted the presence of a wide range of declining waterfowl, geese, farmland and woodland species with the potential to occur on site between October and March, suggesting that the site offers potential foraging and resting opportunities throughout the winter period. Notable records include barn owl *Tyto alba*, bullfinch *Pyrrhula pyrrhula*, dunnock *Prunella modularis,* fieldfare *Turdus pilaris,* golden plover *Pluvialis apricaria,* grey partridge *Perdix perdix,* house sparrow *Passer domesticus*, kestrel *Falco tinnunculus,* lapwing *Vanellus vanellus*, linnet *Carduelis cannabina,* mallard *Anas platyrhynchos*, meadow pipit *Anthus pratensis,* mistle thrush *Turdus viscivorus*, redwing *Turdus iliacus,* reed bunting *Emberiza schoeniclus*, skylark *Alauda arvensis*, snipe *Gallinago gallinago*, song thrush *Turdus philomelos*, starling *Sturnus vulgaris*, stock dove *Columba oenas*, tawny owl *Strix aluco*, tree sparrow *Passer montanus*, willow tit *Parus montanus*, and yellowhammer *Emberiza citronella*. Appendix 2 gives further details of species recorded in the desk study data.

2.1.2 Data provided by CAWOS shows an average of 8.8 barn owl sightings per year in the last 5 years, the closest being within 100m of the survey site north west.

2.1.3 No data was provided by the following organisations or recorders, due to the organisation or recorder not covering that area fully, contains no additional records or due to the group not responding:

- Greater Manchester Local Record Centre (GMLRC).

2.2 Field Surveys

Wintering Bird Survey (WBS)

2.2.1 During the WBS, a total of 35 species were recorded within the entire surveyed area. A complete list of the species recorded on the development site and within the wider surveyed area during the course of the survey is included within Appendix 1 and displayed in Drawings numbered SH11739/023 – 028.

2.3 Species Accounts

2.3.1 Species accounts for all Annex 1, Schedule 1, Red/Amber-listed BoCC and s.41[1] species are provided, below. These accounts provide a brief description of species use of the site and activity, a summary table is included of the species for each group of protected species. The WBS results plans (Drawing No. SH11739-023 to 028) also highlight the locations of sightings and accompanies the text below.

Annex 1 Birds

2.3.2 The desk study revealed the presence of 18 Annex 1 species within 2km of the site, with the potential to occur on site during the winter survey period.

2.3.3 During the WBS no EU Annex 1 listed bird species were recorded.

2.3.4 Desk study data results are summarised in Table 3, below.

Table 3: Annex 1 species data

Species	Desk Study	Supporting Wintering Habitat Onsite	WBS (total[2]/peak count[3])	Potentially significant Effects
Artic Tern	✓	x	N/a	x
Barn Owl	✓	✓	N/a	✓
Barnacle Goose	✓	x	N/a	x
Bittern	✓	x	N/a	x
Common Tern	✓	x	N/a	x
Crane	✓	x	N/a	x
Golden Plover	✓	✓	N/a	✓
Hen Harrier	✓	x	N/a	x
Kingfisher	✓	x	N/a	x
Marsh Harrier	✓	x	N/a	x
Mediterranean Gull	✓	x	N/a	x
Osprey	✓	x	N/a	x
Peregrine	✓	x	N/a	x
Red Kite	✓	x	N/a	x
Red-Backed Shrike	✓	x	N/a	x
Ruff	✓	x	N/a	x
Short-eared Owl	✓	x	N/a	x
Whooper Swan	✓	x	N/a	x

[1] Annex 1 - Birds Directive, Schedule 1 - Wildlife and Countryside Act (1981), s.41 - Natural Environment and Rural Communities Act (NERC) Section 41, BoCC – Birds of Conservation Concern Red list and Amber list

[2] Total number of registrations on or through study area.

[3] Peak count – i.e. maximum flock size at any point during survey, or total count if no risk of double counting.

Table 3: Annex 1 species data				
Species	**Desk Study**	**Supporting Wintering Habitat Onsite**	**WBS (total[2]/peak count[3])**	**Potentially significant Effects**
Wood Sandpiper	✓	x	N/a	x

Schedule 1 Birds

2.3.5 The desk study revealed the presence of ten Schedule 1 species within 2 km of the site, with potential to occur within the survey area during the winter survey period. These consisted of barn owl, brambling, cetti's warbler, common crossbill, fieldfare, green sandpiper *Tringa ochropus*, hobby, peregrine, redwing and little ringed plover.

2.3.6 During the WBS, two Schedule 1 listed species were recorded on site. These consisted of fieldfare and redwing.

Fieldfare & redwing

2.3.7 Both species are Schedule 1 listed birds due to having very small breeding populations in the far north of Scotland. Up to 680,000 fieldfare and 650,000 redwing overwinter in the UK from Scandinavia, Russia and Iceland, roving through the countryside feeding on berries, fruit and invertebrates (Robinson 2005). RECORD records (2014 and 2015) shows small wintering and passage flock numbers are consistently present in the area during winter. Fieldfare and redwing were recorded foraging within the development site in very small numbers or as individuals during the survey period.

2.3.8 Both desk study data and WBS results are summarised in Table 4, below.

Table 4: Schedule 1 species data				
Species	**Desk Study**	**Supporting Wintering Habitat Onsite**	**WBS (total[4]/peak count[5])**	**Potentially significant Effects**
Barn Owl	✓	✓	N/a	✓
Bittern	✓	x	N/a	x
Black-necked Grebe	✓	x	N/a	x
Black-tailed Godwit	✓	x	N/a	x
Brambling	✓	x	N/a	x
Cetti's warbler	✓	x	N/a	x
Common crossbill	✓	x	N/a	x
Fieldfare	✓	✓	5/3	x
Firecrest	✓	x	N/a	x
Garganey	✓	x	N/a	x

[4] Total number of registrations on or through study area.
[5] Peak count – i.e. maximum flock size at any point during survey, or total count if no risk of double counting.

Table 4: Schedule 1 species data				
Species	**Desk Study**	**Supporting Wintering Habitat Onsite**	**WBS (total[4]/peak count[5])**	**Potentially significant Effects**
Green sandpiper	✓	x	N/a	x
Greenshank	✓	x	N/a	x
Hen Harrier	✓	x	N/a	x
Hobby	✓	x	N/a	x
Kingfisher	✓	x	N/a	x
Little ringed plover	✓	x	N/a	x
Long tailed Duck	✓	x	N/a	x
Marsh Harrier	✓	x	N/a	x
Mediterranean Gull	✓	x	N/a	x
Merlin	✓	x	N/a	x
Osprey	✓	x	N/a	x
Peregrine	✓	x	N/a	x
Quail	✓	x	N/a	x
Red Kite	✓	x	N/a	x
Red-Backed Shrike	✓	x	N/a	x
Redwing	✓	✓	12/6	x
Ruff	✓	x	N/a	x
Whimbrel	✓	x	N/a	x
Whooper Swan	✓	x	N/a	x
Wood Sandpiper	✓	x	N/a	x

NERC s.41 Species

2.3.9 The desk study revealed the presence of 28 s.41 species within 2 km of the site, 14 of which have the potential to occur on site during the winter survey period. These consisted of bullfinch, dunnock, grey partridge, house sparrow, lapwing, linnet, reed bunting, skylark, song thrush, starling, tree sparrow, willow tit, yellow wagtail and yellowhammer.

2.3.10 During the WBS, 10 s.41 species were recorded on site. These consisted of bullfinch, dunnock, lapwing, linnet, reed bunting, skylark, song thrush, starling, willow tit, yellowhammer.

Bullfinch (Pyrrhula pyrrhula)

2.3.11 Bullfinch is a common, widespread but declining resident that primarily associates with thick woodland undergrowth, thickets, scrub and hedgerow habitats (Snow *et al.* 1998). It is both Amber-listed and a NERC s.41 species due to moderate population decline in recent decades (Eaton *et al.* 2015). Bullfinch were recorded frequently in

the desk study data within 2km. During the WBS bullfinch was recorded in association with scrubby tree lined habitat on the southwestern boundary of the site throughout the visits.

Dunnock (Prunella modularis)

2.3.12 This species is both a BoCC Amber Listed and s.41 listed species as it is still recovering from the drop in abundance during the 1970s and 1980s. Dunnock is primarily insectivorous, although small seeds are an important food source over winter (Snow *et al.* 1998). This species was recorded occasionally within the site boundary during the survey period in association with scrubby tree lined habitats on southwestern and western boundary of the site on three visits.

Lapwing

2.3.13 Lapwing is both Red and s.41 listed due to rapid, long-term population decline associated with changes in farming practice and the reduction in suitable breeding habitat (Baillie *et al.* 2014). In the desk study a single individual was record onsite and a larger flock in fields adjacent north east of site. The rest of the records were observed some distance from site. This species was recorded on site in the wider survey during the majority of the surveys, with a peak count of 150 in February and October, the flocks were observed in the adjacent eastern field taking off and flying over the site before heading eastward. February was the only visit where an individual was recorded utilising the site.

Linnet

2.3.14 This species is Red and s.41 listed due to undergoing severe population declines in recent decades (Eaton *at al.* 2015). Small flock numbers (peak count 20) were recorded adjacent to site in association with open arable land outwith the northern boundary and unmanaged grassland outwith the western site boundary.

Reed bunting

2.3.15 This species is an Amber and s.41 listed due to steep population declines in the 1970s (Baillie *et al.* 2014). The species most commonly associates with wetland and reedbed habitats, although it is often found in arable farmland, especially in winter. Recorded in very low numbers with individuals recorded within marshy grassland habitat on the western boundary, within open arable land onsite and within the broadleaved woodland habitat within the eastern site boundary.

Skylark

2.3.16 Skylark is Red and s.41 listed due to sharp population declines in recent decades (Eaton *et al.* 2015). Displaying males were recorded on site during February, March and October. A flock with a peak count of 20 were recorded in February on adjacent land east of site with individual recorded sparsely throughout the site and the wider survey area. Considered to be foraging on site in association with arable fields in low numbers throughout the winter period.

Song thrush

2.3.17 Song thrush is Red and s.41 listed due to nationally sharp population declines in recent decades (Eaton *et al.* 2015). This species occurs in any habitat where trees and hedgerows are found in association with grassland and/or leaf litter that support large numbers of invertebrates (Snow *et al.* 1998). Recorded throughout the winter period in very low/individual numbers in association with tree lined habitats on site and is considered resident on site throughout the winter.

Starling

2.3.18 This species is Red and s.41 listed due to an ongoing population decline (Eaton *et al.* 2015). Starling associate with areas of short vegetation (e.g. arable stubble) and grassland on which they forage for invertebrate prey (Snow *et al.* 1998). Starlings were recorded as flyovers and in association with hedgerow habitats adjacent to site, with small numbers (peak count 50) on site throughout the winter period.

Willow tit

2.3.19 Willow tits have been in decline since the mid-1970s and have become locally extinct in an ever-growing number of former haunts (Baillie *et al.* 2014). A single individual was recorded during October.

Yellowhammer

2.3.20 Yellowhammer is Red and s.41 listed due to sharp population declines since the mid-1980s, thought to be due to reduced annual survival (Baillie *et al.* 2014). Recorded individually within scrubby habitats on site and hedgerow habitat adjacent to site during March survey only.

2.3.21 Both desk study data and WBS results are summarised in Table 5, below.

Table 5: NERC s.41 species data				
Species	**Desk Study**	**Supporting Wintering Habitat Onsite**	**WBS (total[6]/peak count[7])**	**Potentially significant Effects**
Bittern	✓	x	N/a	x
Black-tailed Godwit	✓	x	N/a	x
Bullfinch	✓	✓	8/2	x
Corn bunting	✓	x	N/a	x
Cuckoo	✓	x	N/a	x
Curlew	✓	x	N/a	x
Dunnock	✓	✓	5/1	x
Grasshopper warbler	✓	x	N/a	x
Grey partridge	✓	✓	N/a	✓
Herring gull	✓	x	N/a	x
House sparrow	✓	x	N/a	x
Lapwing	✓	✓	328/150	✓
Lesser redpoll	✓	x	N/a	x
Linnet	✓	✓	27/20	x
Marsh Tit	✓	x	N/a	x
Red-backed Shrike	✓	x	N/a	x
Reed bunting	✓	✓	3/1	x
Ring Ouzel	✓	x	N/a	x
Skylark	✓	✓	56/20	✓
Song thrush	✓	✓	4/1	x
Spotted Flycatcher	✓	x	N/a	x
Starling	✓	✓	12/6	x
Tree pipit	✓	x	132/50	x
Tree Sparrow	✓	✓	N/a	x
Willow tit	✓	✓	1/1	x
Yellow wagtail	✓	x	N/a	x
Yellowhammer	✓	✓	3/1	x

BoCC Red List Species

2.3.22 The desk study revealed the presence of 36 BoCC Red List species within 2 km of the site, 13 of which have the potential to occur on site during the winter survey period. These consisted of fieldfare, grey partridge, house sparrow, lapwing, linnet, mistle

[6] Total number of registrations on or through study area.
[7] Peak count – i.e. maximum flock size at any point during survey, or total count if no risk of double counting.

thrush, redwing, skylark, song thrush, starling, tree sparrow, willow tit, and yellowhammer.

2.3.23 During the WBS, eight BoCC Red List species were recorded on site. These consisted of fieldfare, lapwing, linnet, redwing, skylark, song thrush, starling, willow tit, yellowhammer.

2.3.24 Species accounts for these are detailed above in Schedule 1 and s.41 sections above.

2.3.25 Both desk study data and WBS results are summarised in Table 6, below.

Table 6: BoCC Red List species data

Species	Desk Study	Supporting Wintering Habitat Onsite	WBS (total[8]/peak count[9])	Potentially significant Effects
Black-tailed Godwit	✓	x	N/a	x
Corn bunting	✓	x	N/a	x
Cuckoo	✓	x	N/a	x
Curlew	✓	x	N/a	x
Fieldfare	✓	✓	5/3	x
Grasshopper warbler	✓	x	N/a	x
Grey partridge	✓	✓	N/a	✓
Grey wagtail	✓	x	N/a	x
Hen Harrier	✓	x	N/a	x
Herring gull	✓	x	N/a	x
House sparrow	✓	✓	N/a	x
Lapwing	✓	✓	328/150	x
Lesser redpoll	✓	x	N/a	x
Linnet	✓	✓	27/20	x
Long-tailed duck	✓	x	N/a	x
Marsh tit	✓	x	N/a	x
Merlin	✓	x	N/a	x
Mistle thrush	✓	✓	N/a	x
Nightingale	✓	x	N/a	x
Pochard	✓	x	N/a	x
Redwing	✓	✓	12/6	x
Ring ouzel	✓	x	N/a	x
Ringed Plover	✓	x	N/a	x
Ruff	✓	x	N/a	x
Skylark	✓	✓	56/20	✓

[8] Total number of registrations on or through study area.
[9] Peak count – i.e. maximum flock size at any point during survey, or total count if no risk of double counting.

Table 6: BoCC Red List species data				
Species	**Desk Study**	**Supporting Wintering Habitat Onsite**	**WBS (total[8]/peak count[9])**	**Potentially significant Effects**
Song thrush	✓	✓	4/1	x
Starling	✓	✓	132/50	x
Tree pipit	✓	x	N/a	x
Tree Sparrow	✓	✓	N/a	x
Whimbrel	✓	x	N/a	x
Whinchat	✓	x	N/a	x
Willow tit	✓	✓	1/1	x
Woodcock	✓	x	N/a	x
Yellow wagtail	✓	x	N/a	x
Yellowhammer	✓	✓	3/1	✓

BoCC Amber List Species

2.3.26 The desk study revealed the presence of 48 BoCC Amber List species within 2 km of the site, nine of which have the potential to occur on site during the winter survey period. These consisted of a bullfinch, dunnock, kestrel, mallard, meadow pipit, reed bunting, snipe, stock dove, and tawny owl.

2.3.27 During the WBS, seven BoCC Amber List species were recorded on site. These consisted of black-headed gull, bullfinch, dunnock, kestrel, mallard, reed bunting, and snipe.

2.3.28 Species accounts for these are detailed as previously mentioned in the s.41 section above, with the exception of the species listed below.

Black-headed gull (Chroicocephalus ridibundus)

2.3.29 This species is both Amber and s.41 listed species as there has been an increase in the abundance index during the late 1980s, but a decline thereafter until 2003.The trend has been upward since then although has declined in 2015 (Baillie et al. 2014). The black-headed gull is the most widely distributed seabird breeding in the UK, with similar numbers breeding inland as on the coast (Baillie et al. 2014). This species was recorded in small flocks (peak count 30) typically flying over site or adjacent to site.

Kestrel

2.3.30 Kestrel is both Amber and s.41 listed due to the lethal and sublethal effects of organochlorine pesticides by the mid 1970s, the recovery probably driven by improving nesting success, but subsequently entered a decline. Since the mid 1980s,

the English population has fluctuated without a long-term trend being apparent but there are significant declines over the BBS period in England and especially in Scotland. (Baillie *et al.* 2014). This species was recorded on site and the wider survey during the majority of the surveys, individuals were recorded foraging on site.

Mallard

2.3.31 This species is both a BoCC Amber Listed and s.41 listed species as winter populations have declined since at least the late 1980s (Austin et al. 2014). Small flock numbers (peak count 8) were recorded adjacent to site in association with waterlogged open arable land outwith the northern boundary and within marshy grassland and open water on west of site.

Snipe

2.3.32 This species is an Amber and s.41 listed due to steep population declines in the 1970s (Baillie *et al.* 2014). The species most commonly associates with wetland and reedbed habitats, although it is often found in arable farmland, especially in winter. An individual was recorded during March only within an adjacent waterlogged arable field beyond the north-eastern boundary.

2.3.33 Both desk study data and WBS results are summarised in Table 7, below.

Table 7: BoCC Amber List species data

Species	Desk Study	Supporting Wintering Habitat Onsite	WBS (total[10]/peak count[11])	Potentially significant Effects
Arctic Tern	✓	x	N/a	x
Barnacle Goose	✓	x	N/a	x
Bittern	✓	x	N/a	x
Black-headed gull	✓	x	23/2	x
Black-necked Grebe	✓	x	N/a	x
Bullfinch	✓	✓	8/2	x
Common gull	✓	x	N/a	x
Common sandpiper	✓	x	5/3	x
Common Tern	✓	x	N/a	x
Crane	✓	x	N/a	x
Dunlin	✓	x	N/a	x
Dunnock	✓	✓	5/1	
Gadwall	✓	x	N/a	x

[10] Total number of registrations on or through study area.
[11] Peak count – i.e. maximum flock size at any point during survey, or total count if no risk of double counting.

Table 7: BoCC Amber List species data				
Species	**Desk Study**	**Supporting Wintering Habitat Onsite**	**WBS (total[10]/peak count[11])**	**Potentially significant Effects**
Gannet	✓	x	N/a	x
Garganey	✓	x	N/a	x
Goldeneye	✓	x	N/a	x
Great Black-backed Gull	✓	x	N/a	x
Green sandpiper	✓	x	N/a	x
Greenshank	✓	x	N/a	x
Greylag Goose	✓	x	N/a	x
House martin	✓	x	N/a	x
Iceland Gull	✓	x	N/a	x
Kestrel	✓	✓	5/1	x
Kingfisher	✓	x	N/a	x
Lesser black-backed gull	✓	x	N/a	x
Mallard	✓	✓	12/8	x
Marsh Harrier	✓	x	N/a	x
Meadow Pipit	✓	✓	N/a	✓
Mediterranean Gull	✓	x	N/a	x
Mute swan	✓	x	N/a	x
Northern shoveler	✓	x	N/a	x
Osprey	✓	x	N/a	x
Oystercatcher	✓	x	N/a	x
Pinkfooted goose	✓	x	N/a	x
Pintail	✓	x	N/a	x
Quail	✓	x	N/a	x
Redshank	✓	x	N/a	x
Reedbunting	✓	✓	3/1	x
Shelduck	✓	x	N/a	x
Short-eared Owl	✓	x	N/a	x
Snipe	✓	✓	1/1	x
Stock dove	✓	✓	N/a	x
Swift	✓	x	N/a	x
Tawny owl	✓	✓	N/a	x
Teal	✓	x	N/a	x
Whooper Swan	✓	x	N/a	x
Wigeon	✓	x	N/a	x
Willow warbler	✓	x	N/a	x
Wood Sandpiper	✓	x	N/a	x

Table 7: BoCC Amber List species data				
Species	**Desk Study**	**Supporting Wintering Habitat Onsite**	**WBS (total[10]/peak count[11])**	**Potentially significant Effects**
Yellow-legged Gull	✓	x	N/a	x

2.3.34 In conclusion, the update survey recorded a total of 35 bird species on site, including two Schedule 1 species, eight red and seven amber listed BoCC species were also recorded. In addition, there are ten species which are also considered to be 'Priority' species as defined by NERC s41 (2006).

2.3.35 The total number of all species (including non-notable species) recorded within a surveyed area provides an indication of the species richness of a site. Fuller (1980) provides such criteria in Table 1, within the Methodology section.

2.3.36 Based upon the criteria provided by Fuller, the site is of **Local** value for wintering birds.

3 REFERENCES

Austin, G.E., Read, W.J., Calbrade, N.A., Mellan, H.J., Musgrove, A.J., Skellorn, W., Hearn, R.D., Stroud, D.A., Wotton, S.R. & Holt, C.A. (2014). Waterbirds in the UK 2011/12: the Wetland Bird Survey. BTO, RSPB and JNCC in association with WWT, BTO, Thetford.

Baillie, S.R., Marchant, J.H., Leech, D.I. *et al.* (2014). *BirdTrends 2014: trends in numbers, breeding success and survival for UK breeding birds*. BTO Research Report 662. BTO, Thetford.

Eaton M.A., Aebischer N.J., Brown A.F., Hearn R.D., Lock L., Musgrove A.J., Noble D.G., Stroud D.A. & Gregory R.D. (2015). *Birds of Conservation Concern 4: the population status of birds in the UK, Channel Islands and Isle of Man*. British Birds 108: 708-346.

Fuller, R.J (1980). *A Method for Assessing the Ornithological Interest of Sites for Conservation*. Biological Conservation 17 P-229-239.

Gillings, S., Wilson, A.M., Conway, G.J., Vickery, J.A. & Fuller, R.J. (2008). *Winter Farmland Bird Survey.* BTO Research Report No.494

Harrison, G. & Harrison, J. (2005). *The New Birds of the West Midlands*. West Midlands Bird Club, Warwickshire, UK.

Ratcliffe, D.A. (1977). *A Nature Conservation Review*. Cambridge University Press.

Robinson, R.A. (2005). *Bird Facts: Profiles of Birds occurring in Britain and Ireland (BTO Research Report 407)*. BTO, Thetford.

Snow, D.W., Perrins, C.M., Gillmoor, R., Hillcoat, B., Roselaar, C.S., Vincent, D., Wallace, D.I.M. & Wilson, M.G. (1998). *The birds of the Western Palearctic Concise Edition*. Oxford University Press, UK.

Appendix 1

Wintering Bird Survey Results (2018/19)

Appendix 1: Wintering Bird Survey Results 2018/19

Species	A1	S1	NERC s.41	Latin	V1	V2	V3	V4	V5	V6	All visits	Peak Count
Blackbird				*Turdus merula*	4	8	2	2	5	2	**23**	2
Black-headed Gull				*Chroicocephalus ridibundus*	32	1	8			1	**42**	30
Blue Tit				*Cyanistes caeruleus*	2	3	5	10	4	5	**29**	6
Bullfinch			✓	*Pyrrhula pyrrhula*	2		2	2		2	**8**	2
Buzzard				*Buteo buteo*	5	2	2	1		1	**11**	2
Canada Goose				*Branta canadensis*		1					**1**	1
Carrion Crow				*Corvus corone*	8	3	4		3	1	**19**	4
Chaffinch				*Fringilla coelebs*	1			1			**2**	1
Coot				*Fulica atra*		1					**1**	1
Dunnock			✓	*Prunella modularis*		1	1	3			**5**	1
Fieldfare		1		*Turdus pilaris*	1	3			1		**5**	3
Goldfinch				*Carduelis carduelis*	26	5	4	2	40	21	**98**	24
Great Tit				*Parus major*	1	4	1	5	1	1	**13**	4
Greenfinch				*Carduelis chloris*	1			7			**8**	1
Grey Heron				*Ardea cinerea*				2			**2**	2
Jay				*Garrulus glandarius*					1		**1**	1
Kestrel				*Falco tinnunculus*	1		1		2	1	**5**	1
Lapwing			✓	*Vanellus vanellus*	150	20	8	150			**328**	150
Linnet			✓	*Carduelis cannabina*		20			7		**27**	20
Long-tailed Tit				*Aegithalos caudatus*	1	6	1	9			**17**	6
Magpie				*Pica pica*					1		**1**	1
Mallard				*Anas platyrhynchos*		8	2			2	**12**	8
Pheasant				*Phasianus colchicus*	2		2				**4**	2
Redwing		1		*Turdus iliacus*	6				3	3	**12**	6
Reed Bunting			✓	*Emberiza schoeniclus*				2	1		**3**	1

Appendix 1: Wintering Bird Survey Results 2018/19

Species	A1	S1	NERC s.41	Latin	V1	V2	V3	V4	V5	V6	All visits	Peak Count
Robin				*Erithacus rubecula*	1	5	6	2	4	3	**21**	1
Rook				*Corvus frugilegus*		1					**1**	1
Skylark			✓	*Alauda arvensis*		40	8	8			**56**	20
Snipe				*Gallinago gallinago*			1				**1**	1
Song Thrush			✓	*Turdus philomelos*		2		1	1		**4**	1
Starling			✓	*Sturnus vulgaris*	74	7	31		20		**132**	50
Willow Tit			✓	*Poecile montana*				2			**2**	2
Woodpigeon				*Columba palumbus*	12	6	5			1	**24**	10
Wren				*Troglodytes troglodytes*	5	3	3	2	1	1	**15**	1
Yellowhammer			✓	*Emberiza citrinella*			3				**3**	3

Total Annex 1	0
Total WCA Schedule 1	2
Total BoCC Red List	8
Total BoCC Orange List	7
Total BAP	10

Eaton M.A., Aebischer N.J., Brown A.F., Hearn R.D., Lock L., Musgrove A.J., Noble D.G., Stroud D.A. & Gregory R.D. (2015). **Birds of Conservation Concern 4**: the population status of birds in the UK, Channel Islands and Isle of Man. British Birds 108: 708-346.

Appendix 2

Desk Study Data (RECORD and CAWOS)

Appendix 2: Desk Study Data (RECORD and CAWOS)						
Species	**A1**	**S1**	**BAP**	**Latin**	**RECORD**	**CAWOS**
Arctic Tern	**A1**			*Sterna paradisaea*		✓
Barn Owl		**1**		*Tyto alba*	✓	✓
Barnacle Goose	**A1**			*Branta leucopsis*		✓
Bittern	**A1**	**1**	✓	*Botaurus stellaris*		✓
Blackbird				*Turdus merula*	✓	✓
Blackcap				*Sylvia atricapilla*	✓	✓
Black-headed Gull				*Chroicocephalus ridibundus*	✓	✓
Black-necked Grebe		**1**		*Podiceps nigricollis*		✓
Black-tailed Godwit		**1**	✓	*Limosa limosa*		✓
Blue Tit				*Cyanistes caeruleus*		✓
Blue Rock Thrush				*Monticola solitarius*	✓	
Brambling		**1**		*Fringilla montifringilla*	✓	✓
Bullfinch			✓	*Pyrrhula pyrrhula*	✓	✓
Buzzard				*Buteo buteo*	✓	✓
Canada Goose				*Branta canadensis*	✓	✓
Carrion Crow				*Corvus corone*	✓	✓
Chaffinch				*Fringilla coelebs*	✓	✓
Cetti's Warbler		**1**		*Cettia cetti*	✓	
Chiffchaff				*Phylloscopus collybita*		✓
Coal Tit				*Periparus ater*	✓	✓
Collared Dove				*Streptopelia decaocto*		✓
Common Gull				*Larus canus*	✓	✓
Common Crossbill		**1**		*Loxia curvirostra*	✓	
Common Sandpiper				*Actitis hypoleucos*	✓	✓
Common Tern	**A1**			*Sterna hirundo*		✓
Coot				*Fulica atra*	✓	✓
Cormorant				*Phalacrocorax carbo*	✓	✓
Corn Bunting			✓	*Emberiza calandra*	✓	✓
Crane	**A1**			*Grus grus*		✓
Cuckoo			✓	*Cuculus canorus*	✓	✓
Curlew			✓	*Numenius arquata*	✓	✓
Dunnock			✓	*Prunella modularis*		✓
Dunlin				*Calidris alpina*	✓	
Fieldfare		**1**		*Turdus pilaris*	✓	✓
Firecrest		**1**		*Regulus ignicapilla*		✓
Gadwall				*Anas strepera*	✓	✓
Gannet				*Morus bassanus*		✓
Garden Warbler				*Sylvia borin*	✓	✓
Garganey		**1**		*Anas querquedula*		✓
Goldcrest				*Regulus regulus*	✓	✓

Appendix 2: Desk Study Data (RECORD and CAWOS)						
Species	**A1**	**S1**	**BAP**	**Latin**	**RECORD**	**CAWOS**
Golden Plover	A1			*Pluvialis apricaria*		✓
Goldeneye				*Bucephala clangula*		✓
Goldfinch				*Carduelis carduelis*	✓	✓
Goosander				*Mergus merganser*		✓
Grasshopper Warbler			✓	*Locustella naevia*	✓	✓
Great Black-backed Gull				*Larus marinus*		✓
Great Crested Grebe				*Podiceps cristatus*	✓	✓
Great Spotted Woodpecker				*Dendrocopos major*	✓	✓
Great Tit				*Parus major*	✓	✓
Green Sandpiper		1		*Tringa ochropus*	✓	✓
Green Woodpecker				*Picus viridis*	✓	✓
Greenfinch				*Carduelis chloris*	✓	✓
Greenshank		1		*Tringa nebularia*		✓
Grey Heron				*Ardea cinerea*	✓	✓
Grey Partridge			✓	*Perdix perdix*	✓	✓
Grey Wagtail				*Motacilla cinerea*	✓	✓
Greylag Goose				*Anser anser*	✓	✓
Hen Harrier	A1	1		*Circus cyaneus*		✓
Herring Gull			✓	*Larus argentatus*	✓	✓
Hobby		1		*Falco subbuteo*	✓	✓
Hooded Crow				*Corvus cornix*		✓
House Martin				*Delichon urbicum*	✓	✓
House Sparrow			✓	*Passer domesticus*	✓	✓
Iceland Gull				*Larus glaucoides*		✓
Jack Snipe				*Lymnocryptes minimus*	✓	✓
Jackdaw				*Corvus monedula*	✓	✓
Jay				*Garrulus glandarius*	✓	✓
Kestrel				*Falco tinnunculus*	✓	✓
Kingfisher	A1	1		*Alcedo atthis*		✓
Lapwing			✓	*Vanellus vanellus*	✓	✓
Lesser Black-backed Gull				*Larus fuscus*	✓	✓
Lesser Redpoll			✓	*Carduelis cabaret*	✓	✓
Lesser Whitethroat				*Sylvia curruca*		✓
Linnet			✓	*Carduelis cannabina*	✓	✓
Little Grebe				*Tachybaptus ruficollis*	✓	✓
Little Owl				*Athene noctua*	✓	✓
Little Ringed Plover		1		*Charadrius dubius*	✓	✓
Long-eared Owl				*Asio otus*	✓	✓
Long-tailed Duck		1		*Clangula hyemalis*		✓
Long-tailed Tit				*Aegithalos caudatus*	✓	✓

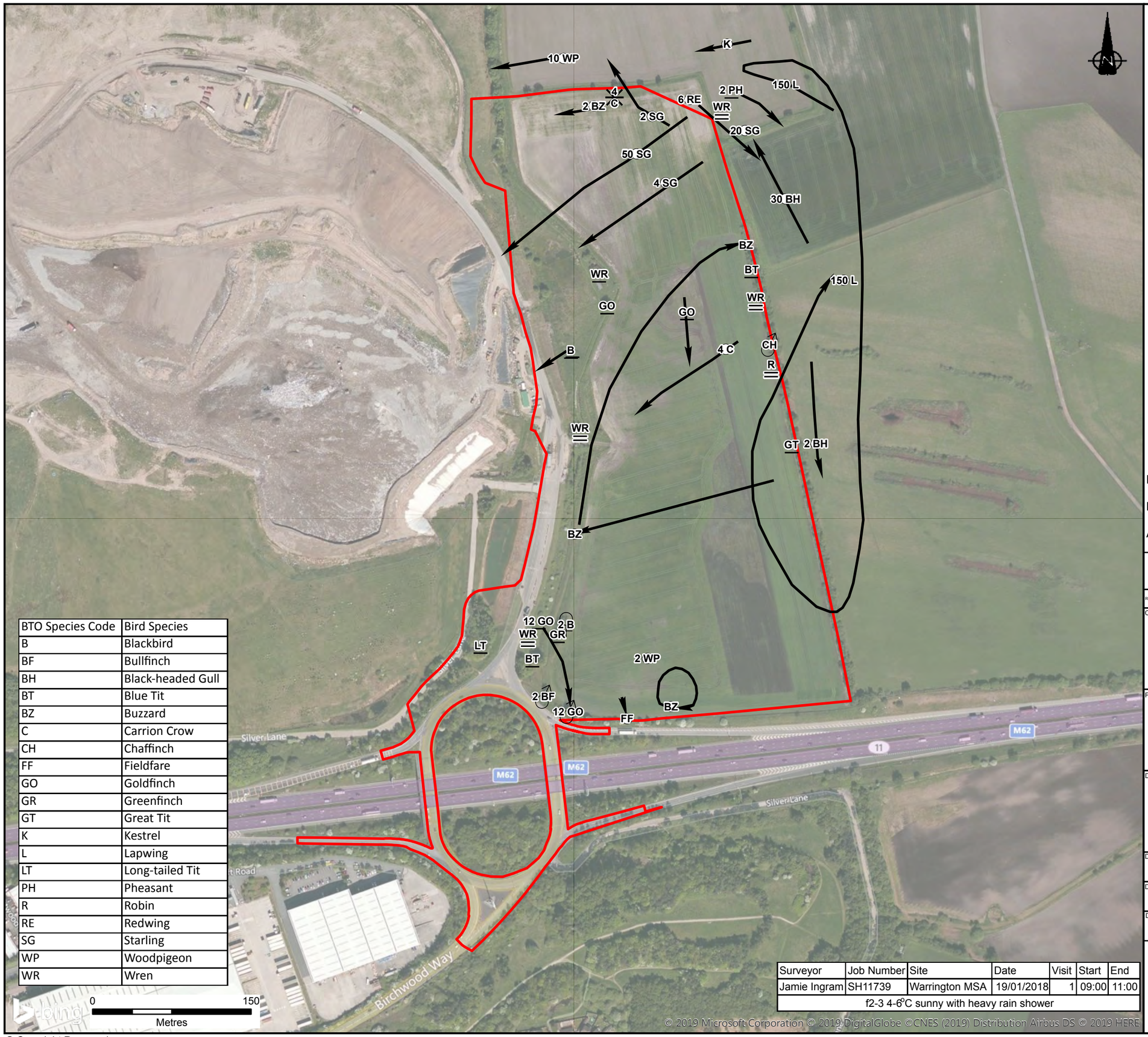
Appendix 2: Desk Study Data (RECORD and CAWOS)						
Species	**A1**	**S1**	**BAP**	**Latin**	**RECORD**	**CAWOS**
Magpie				*Pica pica*	✓	✓
Mallard				*Anas platyrhynchos*	✓	✓
Marsh Harrier	**A1**	**1**		*Circus aeruginosus*		✓
Marsh Tit			✓	*Poecile palustris*		✓
Meadow Pipit				*Anthus pratensis*	✓	✓
Mediterranean Gull	**A1**	**1**		*Larus melanocephalus*		✓
Merlin	**A1**	**1**		*Falco columbarius*		✓
Mistle Thrush				*Turdus viscivorus*	✓	✓
Moorhen				*Gallinula chloropus*	✓	✓
Mute Swan				*Cygnus olor*	✓	✓
Nightingale				*Luscinia megarhynchos*		✓
Northern Shoveler				*Anas clypeata*	✓	✓
Northern Wheatear				*Oenanthe oenanthe*	✓	✓
Nuthatch				*Sitta europaea*	✓	✓
Osprey	**A1**	**1**		*Pandion haliaetus*		✓
Oystercatcher				*Haematopus ostralegus*	✓	✓
Peregrine	**A1**	**1**		*Falco peregrinus*	✓	✓
Pheasant				*Phasianus colchicus*	✓	✓
Pied Wagtail				*Motacilla alba*	✓	✓
Pink-footed Goose				*Anser brachyrhynchus*	✓	✓
Pintail				*Anas acuta*	✓	
Pochard				*Aythya ferina*	✓	✓
Quail		**1**		*Coturnix coturnix*		✓
Raven				*Corvus corax*	✓	✓
Red Kite	**A1**	**1**		*Milvus milvus*		✓
Red-backed Shrike	**A1**	**1**	✓	*Lanius collurio*		✓
Red-crested Pochard				*Netta rufina*		✓
Red-legged Partridge				*Alectoris rufa*	✓	✓
Redshank				*Tringa totanus*		✓
Redwing		**1**		*Turdus iliacus*	✓	✓
Reed Bunting			✓	*Emberiza schoeniclus*	✓	✓
Reed Warbler				*Acrocephalus scirpaceus*	✓	✓
Ring Ouzel			✓	*Turdus torquatus*		✓
Ringed Plover				*Charadrius hiaticula*		✓
Ring-necked Parakeet				*Psittacula krameri*		✓
Robin				*Erithacus rubecula*	✓	✓
Rock Dove / Feral Pigeon				*Columba livia*		✓
Rook				*Corvus frugilegus*		✓
Ruddy Duck				*Oxyura jamaicensis*		✓
Ruff	**A1**	**1**		*Philomachus pugnax*		✓

Appendix 2: Desk Study Data (RECORD and CAWOS)						
Species	**A1**	**S1**	**BAP**	**Latin**	**RECORD**	**CAWOS**
Sand Martin				*Riparia riparia*	✓	✓
Sedge Warbler				*Acrocephalus schoenobaenus*	✓	✓
Shelduck				*Tadorna tadorna*	✓	✓
Short-eared Owl	**A1**			*Asio flammeus*		✓
Siskin				*Carduelis spinus*	✓	✓
Skylark			✓	*Alauda arvensis*	✓	✓
Snipe				*Gallinago gallinago*	✓	✓
Song Thrush			✓	*Turdus philomelos*	✓	✓
Sparrowhawk				*Accipiter nisus*	✓	✓
Spotted Flycatcher			✓	*Muscicapa striata*		✓
Starling			✓	*Sturnus vulgaris*	✓	✓
Stock Dove				*Columba oenas*	✓	✓
Stonechat				*Saxicola torquatus*	✓	✓
Swallow				*Hirundo rustica*	✓	✓
Swift				*Apus apus*	✓	✓
Tawny Owl				*Strix aluco*	✓	✓
Teal				*Anas crecca*	✓	✓
Tree Pipit			✓	*Anthus trivialis*	✓	✓
Tree Sparrow			✓	*Passer montanus*		✓
Treecreeper				*Certhia familiaris*		✓
Tufted Duck				*Aythya fuligula*	✓	✓
Water Rail				*Rallus aquaticus*	✓	✓
Whimbrel		**1**		*Numenius phaeopus*		✓
Whinchat				*Saxicola rubetra*		✓
Whitethroat				*Sylvia communis*	✓	✓
Whooper Swan	**A1**	**1**		*Cygnus cygnus*		✓
Wigeon				*Anas penelope*	✓	✓
Willow Tit			✓	*Poecile montana*	✓	✓
Willow Warbler				*Phylloscopus trochilus*	✓	✓
Wood Sandpiper	**A1**	**1**		*Tringa glareola*		✓
Woodcock				*Scolopax rusticola*	✓	✓
Woodpigeon				*Columba palumbus*	✓	✓
Wren				*Troglodytes troglodytes*	✓	✓
Yellow Wagtail			✓	*Motacilla flava*	✓	✓
Yellowhammer			✓	*Emberiza citrinella*	✓	✓
Yellow-legged Gull				*Larus michahellis*		✓

Total Annex 1					1	18
Total WCA Schedule 1					10	28
Total BoCC Red List					23	36

Appendix 2: Desk Study Data (RECORD and CAWOS)						
Species	**A1**	**S1**	**BAP**	**Latin**	**RECORD**	**CAWOS**
Total BoCC Orange List					27	48
Total NERC s.41					19	28

DRAWINGS



BTO Species Code	Bird Species
B	Blackbird
BF	Bullfinch
BH	Black-headed Gull
BT	Blue Tit
BZ	Buzzard
C	Carrion Crow
CH	Chaffinch
FF	Fieldfare
GO	Goldfinch
GR	Greenfinch
GT	Great Tit
K	Kestrel
L	Lapwing
LT	Long-tailed Tit
PH	Pheasant
R	Robin
RE	Redwing
SG	Starling
WP	Woodpigeon
WR	Wren

KEY

- Site Boundary
- Bird(s) repeatedly calling
- Sighting of Bird(s)
- An aggressive accounter between two birds
- Calling bird(s)
- A female bird
- A male bird
- Bird(s) in flight

Notes:

Boundaries are indicative.

Aerial imagery shown for context purposes only.

Surveyor	Job Number	Site	Date	Visit	Start	End
Jamie Ingram	SH11739	Warrington MSA	19/01/2018	1	09:00	11:00
f2-3 4-6°C sunny with heavy rain shower						

REVISION	DETAILS	DATE	DRAWN	CHK'D	APP'D

CLIENT

EXTRA MSA GROUP

PROJECT

WARRINGTON MSA

DRAWING TITLE

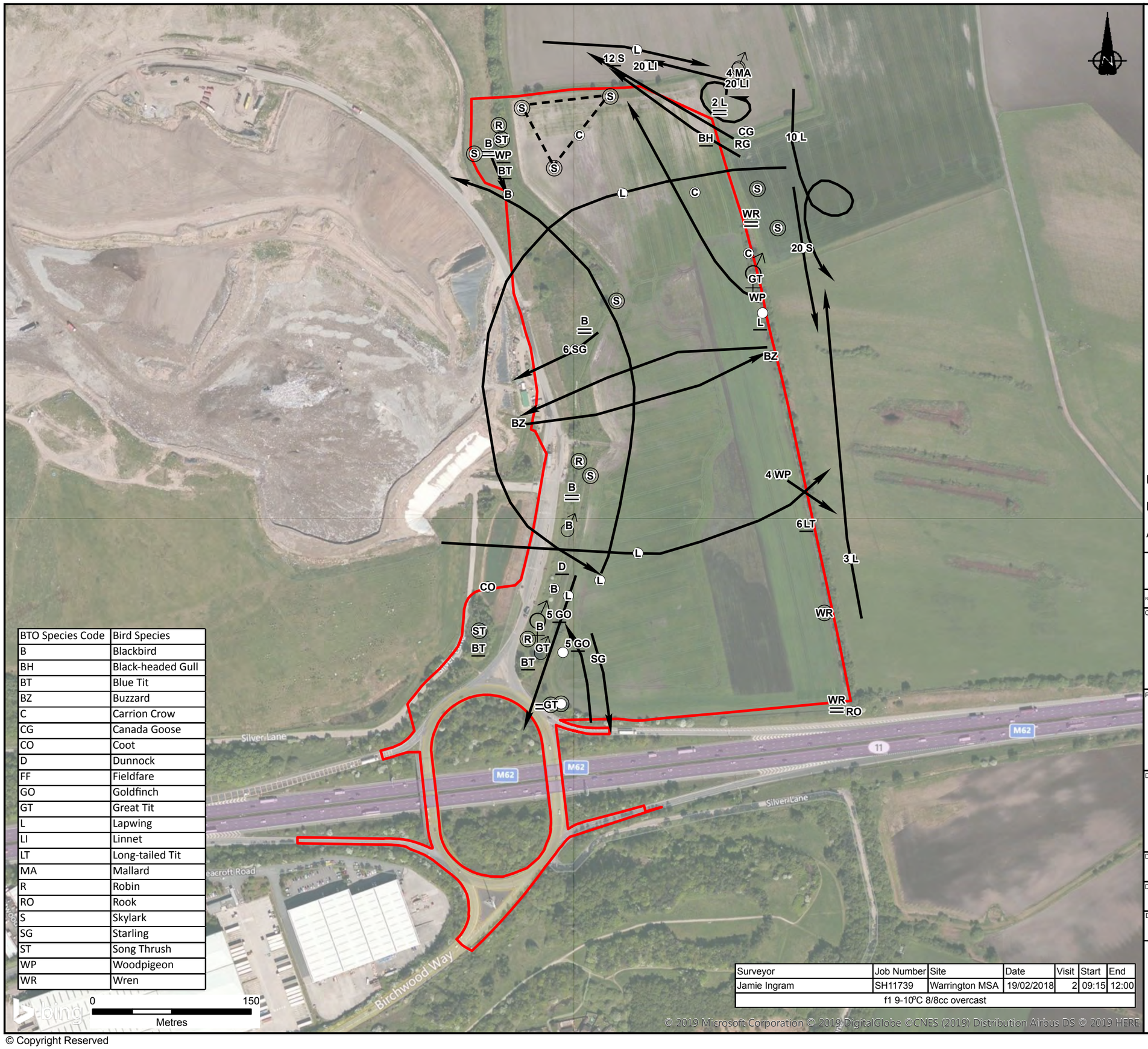
WINTERING BIRD SURVEY RESULTS - JANUARY 2018

DRG No.	REV
SH11739/023	A

DRG SIZE	SCALE	DATE
A3	1:3,500	24/07/2019

DRAWN BY	CHECKED BY	APPROVED BY
SW	KS	TP

wardell armstrong
NEWCASTLE UPON TYNE | TEL 0191 232 0943
WWW.WARDELL-ARMSTRONG.COM
BIRMINGHAM GLASGOW
BOLTON LONDON
CARDIFF MANCHESTER
CARLISLE SHEFFIELD
EDINBURGH STOKE ON TRENT



BTO Species Code	Bird Species
B	Blackbird
BH	Black-headed Gull
BT	Blue Tit
BZ	Buzzard
C	Carrion Crow
CG	Canada Goose
CO	Coot
D	Dunnock
FF	Fieldfare
GO	Goldfinch
GT	Great Tit
L	Lapwing
LI	Linnet
LT	Long-tailed Tit
MA	Mallard
R	Robin
RO	Rook
S	Skylark
SG	Starling
ST	Song Thrush
WP	Woodpigeon
WR	Wren

Surveyor	Job Number	Site	Date	Visit	Start	End
Jamie Ingram	SH11739	Warrington MSA	19/02/2018	2	09:15	12:00
f1 9-10°C 8/8cc overcast						

KEY

- Site Boundary
- Pair of birds
- Bird(s) repeatedly calling
- Sighting of Bird(s)
- Calling bird(s)
- A female bird
- A male bird
- Singing bird(s)
- Bird(s) in flight
- Two birds in song at the same time

Notes:

Boundaries are indicative.

Aerial imagery shown for context purposes only.

REVISION	DETAILS	DATE	DRAWN	CHK'D	APP'D

CLIENT

EXTRA MSA GROUP

PROJECT

WARRINGTON MSA

DRAWING TITLE

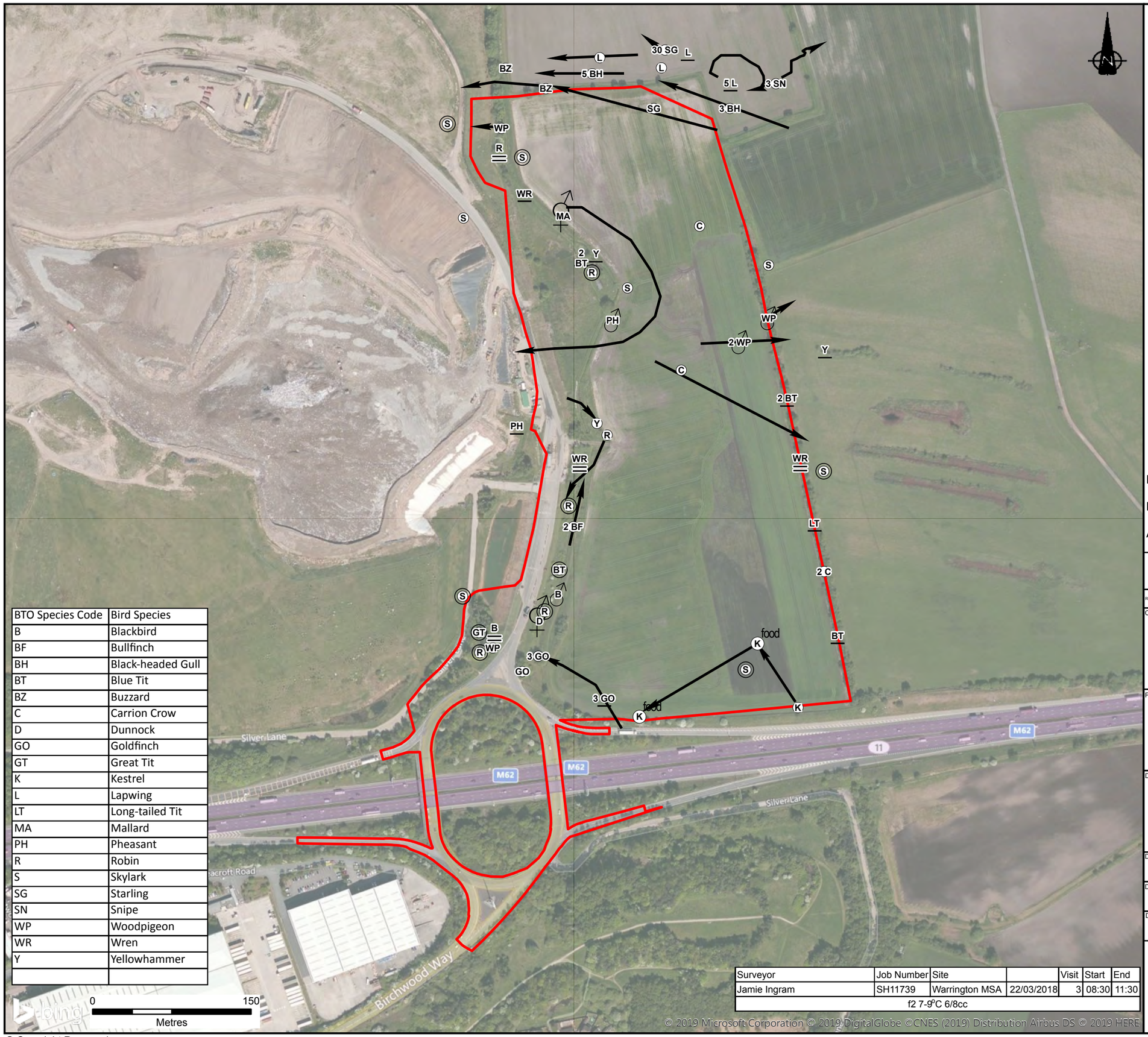
WINTERING BIRD SURVEY RESULTS - FEBRUARY 2018

DRG No.	REV
SH11739/024	A

DRG SIZE	SCALE	DATE
A3	1:3,500	24/07/2019

DRAWN BY	CHECKED BY	APPROVED BY
SW	KS	TP

wardell armstrong
NEWCASTLE UPON TYNE | TEL 0191 232 0943
WWW.WARDELL-ARMSTRONG.COM
BIRMINGHAM · BOLTON · CARDIFF · CARLISLE · EDINBURGH · GLASGOW · LONDON · MANCHESTER · SHEFFIELD · STOKE ON TRENT



BTO Species Code	Bird Species
B	Blackbird
BF	Bullfinch
BH	Black-headed Gull
BT	Blue Tit
BZ	Buzzard
C	Carrion Crow
D	Dunnock
GO	Goldfinch
GT	Great Tit
K	Kestrel
L	Lapwing
LT	Long-tailed Tit
MA	Mallard
PH	Pheasant
R	Robin
S	Skylark
SG	Starling
SN	Snipe
WP	Woodpigeon
WR	Wren
Y	Yellowhammer

KEY

- Site Boundary
- Pair of birds
- Bird(s) repeatedly calling
- Sighting of Bird(s)
- Calling bird(s)
- Bird carrying food
- A male bird
- Singing bird(s)
- Bird(s) in flight

Notes:

Boundaries are indicative.

Aerial imagery shown for context purposes only.

REVISION	DETAILS	DATE	DRAWN	CHK'D	APP'D

CLIENT

EXTRA MSA GROUP

PROJECT

WARRINGTON MSA

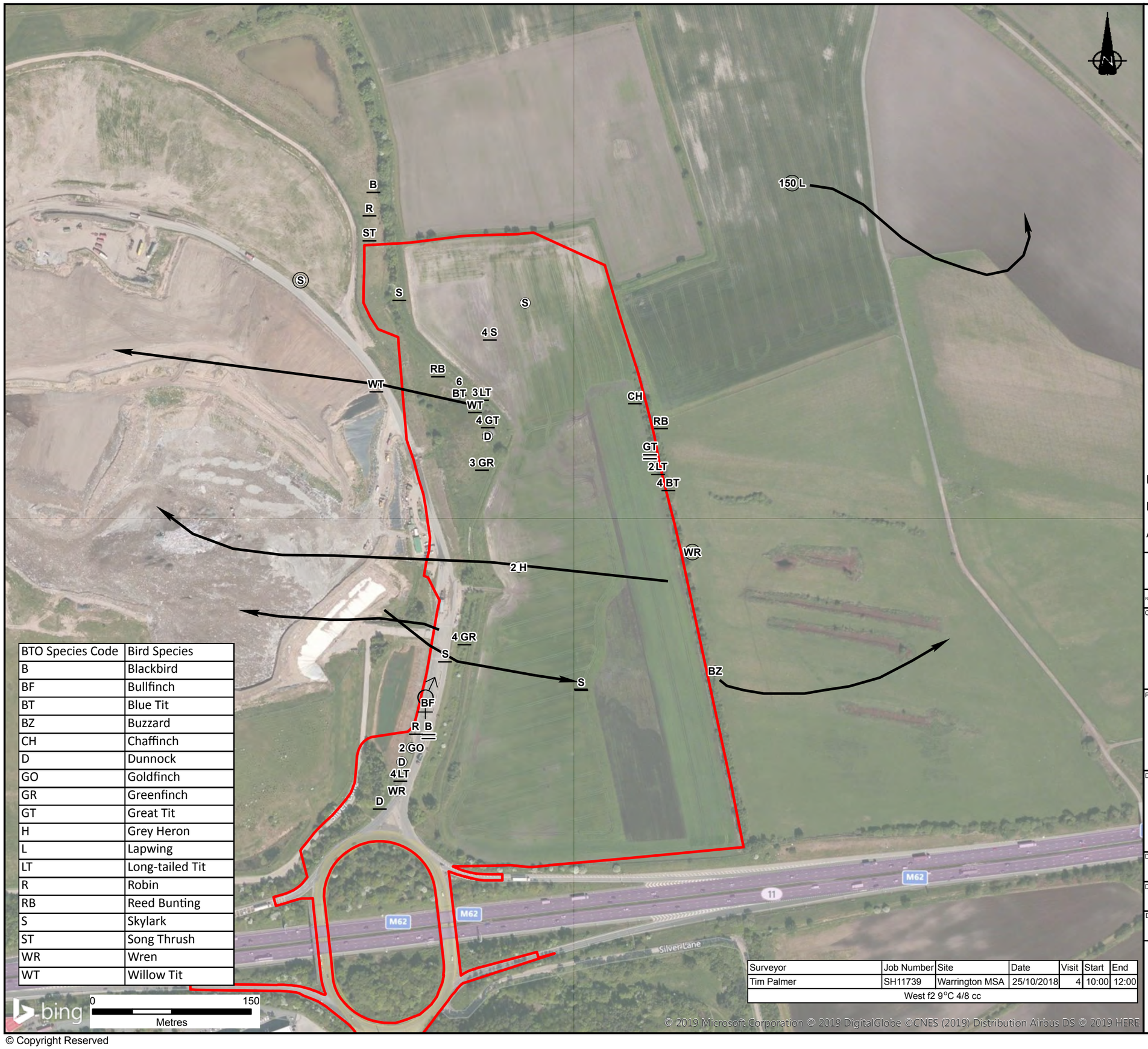
DRAWING TITLE

WINTERING BIRD SURVEY RESULTS - MARCH 2018

DRG No.		REV
SH11739/025		A
DRG SIZE	SCALE	DATE
A3	1:3,500	25/07/2019
DRAWN BY	CHECKED BY	APPROVED BY
SW	KS	TP

Surveyor	Job Number	Site		Visit	Start	End
Jamie Ingram	SH11739	Warrington MSA	22/03/2018	3	08:30	11:30
f2 7-9°C 6/8cc						

wardell armstrong
NEWCASTLE UPON TYNE | TEL 0191 232 0943
WWW.WARDELL-ARMSTRONG.COM
BIRMINGHAM · BOLTON · CARDIFF · CARLISLE · EDINBURGH · GLASGOW · LONDON · MANCHESTER · SHEFFIELD · STOKE ON TRENT



BTO Species Code	Bird Species
B	Blackbird
BF	Bullfinch
BT	Blue Tit
BZ	Buzzard
CH	Chaffinch
D	Dunnock
GO	Goldfinch
GR	Greenfinch
GT	Great Tit
H	Grey Heron
L	Lapwing
LT	Long-tailed Tit
R	Robin
RB	Reed Bunting
S	Skylark
ST	Song Thrush
WR	Wren
WT	Willow Tit

Surveyor	Job Number	Site	Date	Visit	Start	End
Tim Palmer	SH11739	Warrington MSA	25/10/2018	4	10:00	12:00
West f2 9°C 4/8 cc						

KEY

- Site Boundary
- Pair of birds
- Bird(s) repeatedly calling
- Sighting of Bird(s)
- Calling bird(s)
- A group of birds
- Singing bird(s)
- Bird(s) in flight

Notes:

Boundaries are indicative.

Aerial imagery shown for context purposes only.

REVISION	DETAILS	DATE	DRAWN	CHKD	APP'D

CLIENT

EXTRA MSA GROUP

PROJECT

WARRINGTON MSA

DRAWING TITLE

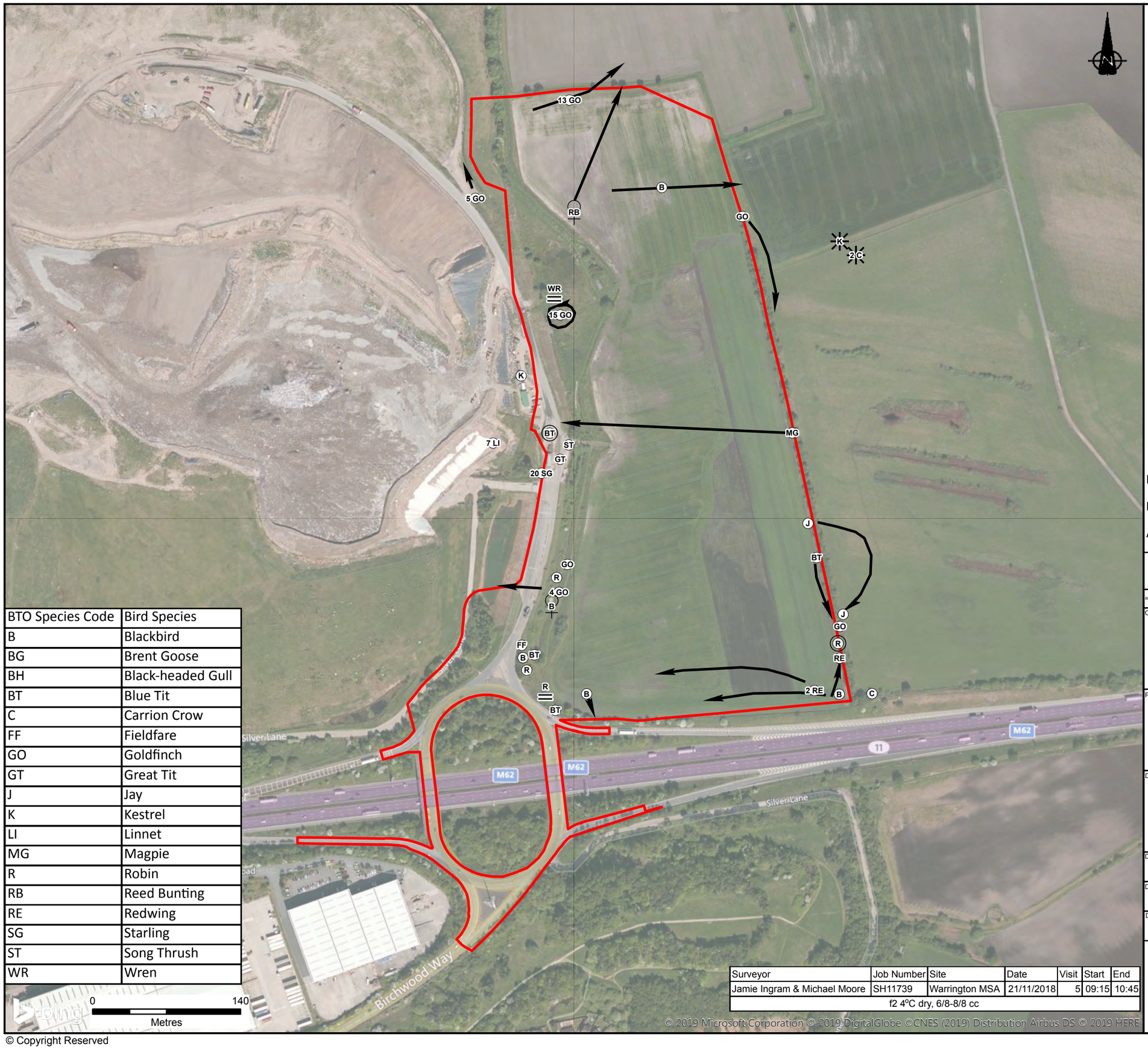
WINTERING BIRD SURVEY RESULTS - OCTOBER 2018

DRG No.	REV
SH11739/026	A

DRG SIZE	SCALE	DATE
A3	1:3,500	24/07/2019

DRAWN BY	CHECKED BY	APPROVED BY
SW	KS	TP

wardell armstrong
NEWCASTLE UPON TYNE | TEL 0191 232 0943
WWW.WARDELL-ARMSTRONG.COM
BIRMINGHAM · BOLTON · CARDIFF · CARLISLE · EDINBURGH · GLASGOW · LONDON · MANCHESTER · SHEFFIELD · STOKE ON TRENT



BTO Species Code	Bird Species
B	Blackbird
BG	Brent Goose
BH	Black-headed Gull
BT	Blue Tit
C	Carrion Crow
FF	Fieldfare
GO	Goldfinch
GT	Great Tit
J	Jay
K	Kestrel
LI	Linnet
MG	Magpie
R	Robin
RB	Reed Bunting
RE	Redwing
SG	Starling
ST	Song Thrush
WR	Wren

KEY

- Bird(s) repeatedly calling
- Sighting of Bird(s)
- An aggressive accounter between two birds
- A female bird
- Singing bird(s)
- Bird(s) in flight
- Site Boundary

Notes:

Boundaries are indicative.

Aerial imagery shown for context purposes only.

Surveyor	Job Number	Site	Date	Visit	Start	End
Jamie Ingram & Michael Moore	SH11739	Warrington MSA	21/11/2018	5	09:15	10:45
f2 4°C dry, 6/8-8/8 cc						

REVISION	DETAILS	DATE	DRAWN	CHK'D	APP'D

CLIENT

EXTRA MSA GROUP

PROJECT

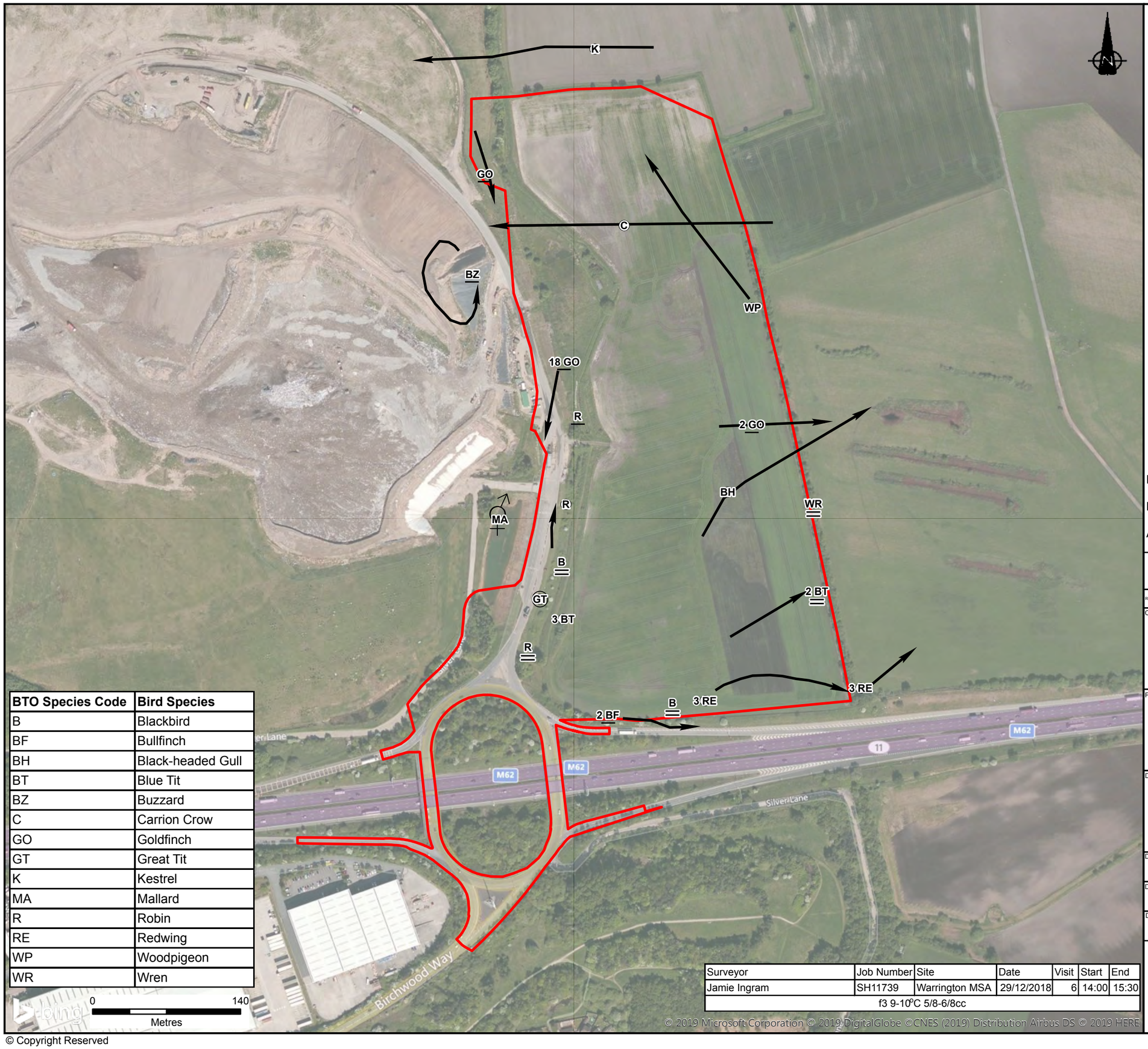
WARRINGTON MSA

DRAWING TITLE

WINTERING BIRD SURVEY RESULTS - NOVEMBER 2018

DRG No.		REV
SH11739/027		A
DRG SIZE	SCALE	DATE
A3	1:3,500	25/07/2019
DRAWN BY	CHECKED BY	APPROVED BY
SW	KS	TP

wardell armstrong
NEWCASTLE UPON TYNE | TEL 0191 232 0943
WWW.WARDELL-ARMSTRONG.COM
BIRMINGHAM · BOLTON · CARDIFF · CARLISLE · EDINBURGH · GLASGOW · LONDON · MANCHESTER · SHEFFIELD · STOKE ON TRENT



BTO Species Code	Bird Species
B	Blackbird
BF	Bullfinch
BH	Black-headed Gull
BT	Blue Tit
BZ	Buzzard
C	Carrion Crow
GO	Goldfinch
GT	Great Tit
K	Kestrel
MA	Mallard
R	Robin
RE	Redwing
WP	Woodpigeon
WR	Wren

KEY

- Site Boundary
- Pair of birds
- Bird(s) repeatedly calling
- Sighting of Bird(s)
- Calling bird(s)
- Singing bird(s)
- Bird(s) in flight

Notes:

Boundaries are indicative.

Aerial imagery shown for context purposes only.

Surveyor	Job Number	Site	Date	Visit	Start	End
Jamie Ingram	SH11739	Warrington MSA	29/12/2018	6	14:00	15:30
f3 9-10°C 5/8-6/8cc						

REVISION	DETAILS	DATE	DRAWN	CHK'D	APP'D

CLIENT: EXTRA MSA GROUP

PROJECT: WARRINGTON MSA

DRAWING TITLE: BREEDING BIRD SURVEY RESULTS - DECEMBER 2018

DRG No.	REV
SH11739/028	A

DRG SIZE	SCALE	DATE
A3	1:3,500	24/07/2019

DRAWN BY	CHECKED BY	APPROVED BY
SW	LG	NB

wardell armstrong
NEWCASTLE UPON TYNE | TEL 0191 232 0943
WWW.WARDELL-ARMSTRONG.COM
BIRMINGHAM · BOLTON · CARDIFF · CARLISLE · EDINBURGH · GLASGOW · LONDON · MANCHESTER · SHEFFIELD · STOKE ON TRENT

wardell-armstrong.com

STOKE-ON-TRENT
Sir Henry Doulton House
Forge Lane
Etruria
Stoke-on-Trent
ST1 5BD
Tel: +44 (0)1782 276 700

BIRMINGHAM
Two Devon Way
Longbridge Technology Park
Longbridge
Birmingham
B31 2TS
Tel: +44 (0)121 580 0909

BOLTON
41-50 Futura Park
Aspinall Way
Middlebrook
Bolton
BL6 6SU
Tel: +44 (0)1204 227 227

CARDIFF
Tudor House
16 Cathedral Road
Cardiff
CF11 9LJ
Tel: +44 (0)292 072 9191

CARLISLE
Marconi Road
Burgh Road Industrial Estate
Carlisle
Cumbria
CA2 7NA
Tel: +44 (0)1228 550 575

EDINBURGH
Great Michael House
14 Links Place
Edinburgh
EH6 7EZ
Tel: +44 (0)131 555 3311

GLASGOW
2 West Regent Street
Glasgow
G2 1RW
Tel: +44 (0)141 433 7210

LEEDS
36 Park Row
Leeds
LS1 5JL
Tel: +44 (0)113 831 5533

LONDON
Third Floor
46 Chancery Lane
London
WC2A 1JE
Tel: +44 (0)207 242 3243

MANCHESTER
76 King Street
Manchester
M2 4NH
Tel: +44 (0)161 817 5038

NEWCASTLE UPON TYNE
City Quadrant
11 Waterloo Square
Newcastle upon Tyne
NE1 4DP
Tel: +44 (0)191 232 0943

TRURO
Baldhu House
Wheal Jane Earth Science Park
Baldhu
Truro
TR3 6EH
Tel: +44 (0)187 256 0738

International offices:

ALMATY
29/6 Satpaev Avenue
Regency Hotel
Office Tower
Almaty
Kazakhstan
050040
Tel: +7(727) 334 1310

MOSCOW
21/5 Kuznetskiy Most St.
Moscow
Russia
Tel: +7(495) 626 07 67

wardell armstrong

Appendix 5.9 – Invertebrate Survey Report

wardell-armstrong.com

ENERGY AND CLIMATE CHANGE
ENVIRONMENT AND SUSTAINABILITY
INFRASTRUCTURE AND UTILITIES
LAND AND PROPERTY
MINING AND MINERAL PROCESSING
MINERAL ESTATES
WASTE RESOURCE MANAGEMENT

EXTRA MSA

MOTORWAY SERVICES, WARRINGTON

TERRESTRIAL AND AQUATIC INVERTEBRATE ASSESSMENT REPORT

JULY 2019

wardell armstrong

Wardell Armstrong
41-50 Futura Park, Aspinall Way, Middlebrook, Bolton, BL6 6SU
Telephone: +44 (0)1204 227 227 www.wardell-armstrong.com

DATE ISSUED:	**JULY 2019**
JOB NUMBER:	**SH11739**
REPORT NUMBER:	**010**
VERSION:	**V1.0**
STATUS:	**FINAL**

EXTRA MSA

MOTORWAY SERVICES, WARRINGTON

TERRESTRIAL AND AQUATIC INVERTEBRATE ASSESSMENT REPORT

JULY 2019

PREPARED BY:

Jake Smith Graduate Ecologist

REVIEWED BY:

Katie Smith Ecologist

APPROVED BY:

Tim Palmer Technical Director (Ecology)

CONTENTS

DRAWINGS	TITLE	SCALE
SH11739-007	Extended Phase 1 Habitat Survey Results	1:3,000
Drawing 2	Aquatic Sample Locations	

1 INTRODUCTION

1.1 Terms of Reference

1.1.1 Wardell Armstrong LLP (WA) was commissioned by Extra MSA Group to undertake a Terrestrial and Water Invertebrate Assessment of a proposed Motorway Services Area development, located on the northern side of the M62 at Junction 11, central Ordnance Survey (OS) grid reference: SJ 67053 93630. On behalf of Wardell Armstrong, specialist sub-contractor Steve Muddiman completed the assessment.

1.1.2 This report presents a habitat assessment to determine potential for significant invertebrates together with the results of aquatic invertebrate sampling on land for a proposed Motorway Service Area off the M62 at Birchwood (J11) Warrington.

1.1.3 The site has been subject to a Preliminary Ecological Appraisal, including a Phase 1 habitat survey (Wardell Armstrong Dec. 2018).

1.1.4 The site is predominantly arable in nature, with sparse hedges and ditches around the periphery.

1.1.5 The invertebrate study comprises a desk review of existing invertebrate data, a walkover, habitat based, assessment of the site and sampling of aquatic invertebrates from open water within the study area.

1.1.6 The aim of this assessment is to define the potential of habitats on the site to support invertebrate species or assemblages of conservation importance.

1.2 Scoping Consultation

1.2.1 A scoping report was issued to Tameside Metropolitan Borough Council (TMBRC) during December 2018. Comments were returned during February 2019. The scoping response from TMBRC gave a recommendation of achieving biodiversity net gain in line with the NPPF.

2 METHODOLOGY

2.1 Desk Study

2.1.1 Data from the Preliminary Ecological Assessment, comprising existing available information provided by RECORD (Local Records Centre) and from available internet-based resources for a 2km search radius was be reviewed in order to define profiles of key characteristics of the site which may hold invertebrate species and assemblages of ecological value.

2.2 Habitat Assessment

2.2.1 A walkover of the whole site was carried out on 9th April 2019, to assess the potential value of the site for invertebrates.

2.2.2 The habitat types present were identified and assessed for their potential to support species of importance (including those from historical data). The key features of each habitat which were assessed comprised:

- **Physical Assessment**: the physical features of a habitat (aspect, soil type, hydrology) can have an effect on the assemblage of invertebrates which can make full use of the resources present.
- **Structural Assessment**: Density and height of vegetation can be of particular importance for predatory invertebrates and also those dependent on high daytime temperatures.
- **Plant species composition**: A higher plant species diversity is likely to correlate with a more diverse invertebrate assemblage. Some invertebrate species of conservation importance are associated with particular plant species.
- **Breeding/nesting**: Specific features within a habitat may be of value in maintaining a sustainable invertebrate population through the provision of habitat for breeding and overwintering e.g. the presence of dead wood/plant stems or dense grass tussocks.
- **Feeding/foraging**; the potential of the habitat to provide feeding opportunities such as nectar, pollen and open areas for predators to hunt is assessed.
- **Movement/migration**: the connectivity of habitat with similar areas, or habitats necessary for other life-stages is considered e.g. connectivity between open water for the development of aquatic larvae associated with suitable feeding habitat for emergent adults.

2.3 Sampling

2.3.1 A standard pond net was used to take invertebrate samples on 9th April 2019 from three areas within the only ditch with significant open water within the site (see Drawing 2: Aquatic Sample Locations).

2.3.2 A standard pond net sampling methodology was employed, with three-minute timed samples being carried out within each area. Particular attention was paid to sampling from the full range of habitats present. Samples were identified to the most detailed taxonomic level possible, using standard reference material.

3 RESULTS

3.1 Desk Study

3.1.1 As reported in the PEA, no desk study records for significant invertebrate species were returned from the data request.

3.2 Habitat Assessment

3.2.1 Table 1 presents a summary of the assessment undertaken of the habitats present within the site, as mapped in Drawing number SH11739-007, together with an indication of the potential habitat value for invertebrates, and a reasoned explanation for the assigned level.

Table 1: Habitat Assessment Summary

Habitat/Feature	Potential Value for invertebrates of significance	Rationale
Arable	Negligible	Unsuitable for any invertebrate species of conservation significance
Neutral Grassland, Tall Ruderal and scrub	Low	Habitat is species poor, with limited pollen and nectar resources. Structural variation is limited, without extensive nesting, breeding or foraging opportunities. Likely to support common and widespread invertebrate species only.
Marshy Grassland/Swamp	Low	Small area of generally uniform vegetation with limited plant diversity. Willowherb and meadowsweet offer some pollen and nectar resources at suitable times of year. Potential to support common and widespread species only.
Broadleaved scattered trees	Low	Sparse distribution of trees, each of which is of limited potential value, supporting no significant dead wood or other refugia. Likely to have a limited range of common and widespread invertebrate species only
Dry Ditches	Low	Lack of open water, small size and lack of significant morphological features severely limit potential of this habitat.
Ditch with water	Low	

3.3 Aquatic Invertebrate Survey

3.3.1 Tables 1 to 4 below present the results of the aquatic invertebrate survey from the sampled locations (see Drawing 2).

Table 2: Aquatic Invertebrate Results of Sample 1		
Species	**Family**	**Numbers**
Asellus aquaticus	Asellidae	5-20
Gammarus sp.	Gammaridae	5-20
Lymnaea stagnalis	Lymnaeidae	5-20
Lymnaea peregra	Lymnaeidae	10-50
Limnephilus lunatus	Limnephilidae	10-20
Polycelis tenuis	Platyhelminthes	2
Indet.	Culicidae	5-10
Hydrobius fuscipes	Hydrophilidae	1
Helophorus aequalis	Hydrophilidae	1

3.3.2 Sample 1 was taken along a reed choked length of ditch with a channel approx. 1m wide with steep banks between 0.25 and 1m in height which comprised sparse grasses and herb species.

Table 3: Aquatic Invertebrate Results of Sample 2		
Species	**Family**	**Numbers**
Lymnaea stagnalis	Lymnaeidae	5-20
Lymnaea peregra	Lymnaeidae	10-50
Indet.	Ceratopogonidae	1
Indet. larva	Dytiscidae	1
Indet.	Culicidae	5-10
Limnephilus lunatus	Limnephilidae	5-15
Anacaena globulus	Hydrophilidae	3
Anacaena limbata	Hydrophilidae	1
Helophorus sp.	Hydrophilidae	1

3.3.3 Sample 2 was from a channel approximately 0.75m wide with reed across its entire width, extending up the bank, together with areas of light bramble scrub. Bank height from 1 to 1.5m.

Table 4: Aquatic Invertebrate Results of Sample 3		
Species	**Family**	**Numbers**
Lymnaea stagnalis	Lymnaeidae	5-10
Lymnaea peregra	Lymnaeidae	5-10
Asellus aquaticus	Asellidae	1-5
Anax imperator	Aeshnidae	1
Diamesinae sp.	Chironomidae	1
Indet. larva	Dytiscidae	5
Rhantus frontalis	Dytiscidae	1
Helophorus grandis	Hydrophilidae	2
Haliplus lineatocollis	Haliplidae	1-5

Table 4: Aquatic Invertebrate Results of Sample 3		
Species	**Family**	**Numbers**
Ranatra linearis	Nepidae	1
Sigara dorsalis	Corixidae	2
Hesperocorixa sahlbergi	Corixidae	2
Limnephilus flavicornis	Limnephilidae	1
Limnephilus lunatus	Limnephilidae	5-10
Cloeon dipterum	Baetidae	5-10

3.3.4 Sample 3 was from an area with channel width of 2.5m. Channel with dense reedmace, duckweed in the open areas. Bank height 0.5 to 1.5m with a made footpath along one edge.

3.3.5 The samples show an increase in species diversity reaching a maximum in sample 3. Further to the south of this sample location, the ditch becomes more shaded with overhanging young trees and supported less open water.

3.3.6 All of the invertebrates recorded are common and widespread, typical of slow moving or still water with extensive vegetation.

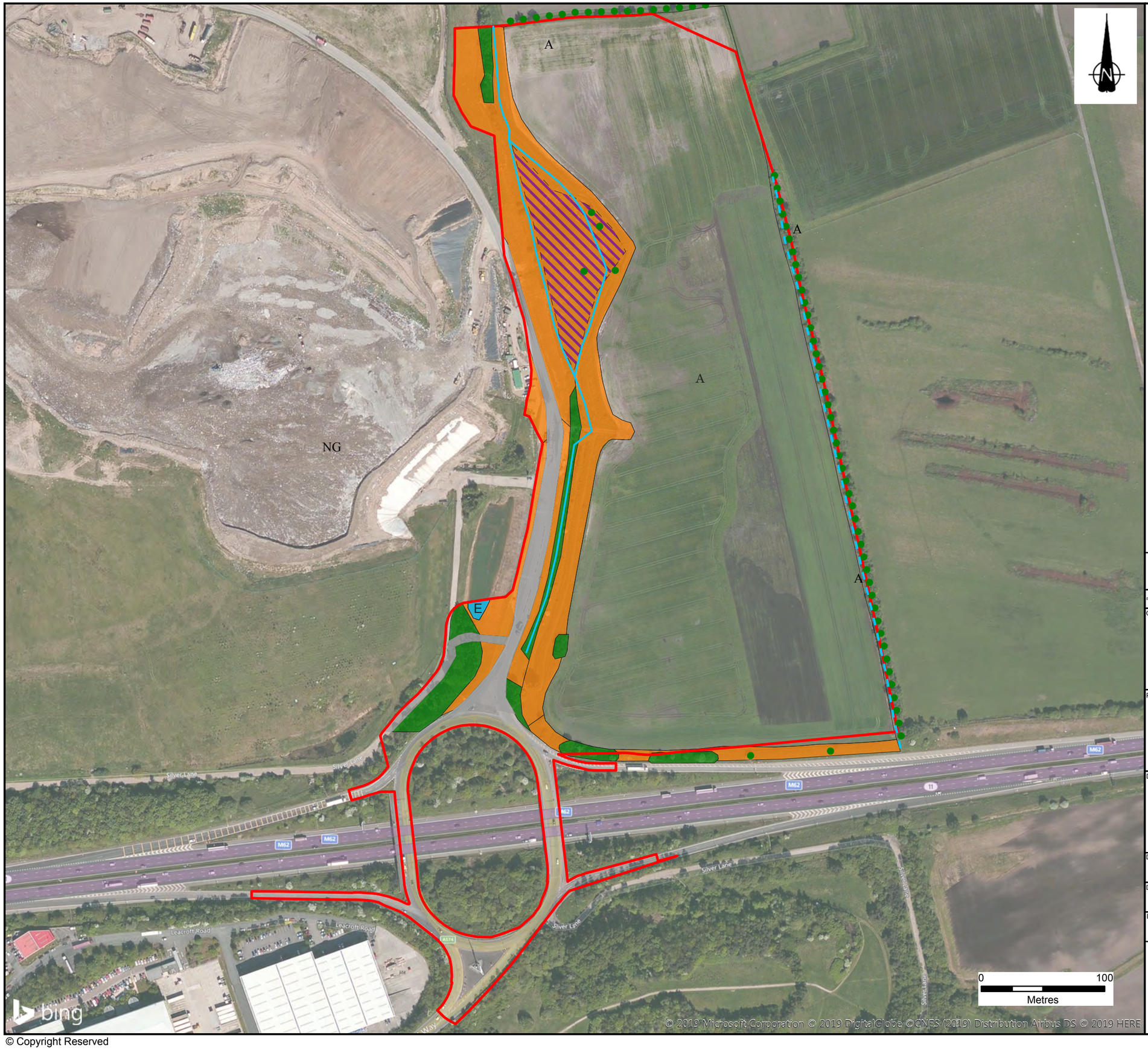
3.4 Conclusions

3.4.1 The majority of the site comprises arable fields, which are of negligible value for invertebrates of conservation importance.

3.4.2 Other terrestrial habitats are likely to support a range of common and widespread invertebrates, but have little potential to support populations of significant species due to the small areas present, poor floristic diversity, lack of structural variation and absence of features of importance for species with specialist requirements (such as dead wood, loose soil, habitat mosaics).

3.4.3 The aquatic habitats support common species typical of the slow-moving, heavily vegetated open water habitats present in the survey area.

DRAWINGS



KEY

- Site Boundary
- Broadleaved woodland - semi-natural
- Neutral grassland
- Marsh/marshy grassland
- E — Standing water - eutrophic
- A — Cultivated/disturbed land - arable
- Hardstanding
- Broadleaved Parkland/scattered trees
- Wet ditch
- Dry ditch

Notes:

Boundaries are indicative. Aerial imagery shown for context purposes only.

Classifications in accordance with Handbook for Phase 1 Habitat Survey - A technique for Environmental Audit (JNCC 2010).

REVISION	DETAILS	DATE	DRAWN	CHKD	APP'D
B	SITE BOUNDARY AMENDMENTS AND HABITAT UPDATES	JULY 2019	SW	JS	TP
A	FIRST ISSUE	APRIL 2019	SW	JS	TP

CLIENT

EXTRA MSA GROUP

PROJECT

MOTORWAY SERVICES, WARRINGTON

DRAWING TITLE

EXTENDED PHASE 1 HABITAT SURVEY RESULTS

DRG No.		REV
SH11739/007		B
DRG SIZE	SCALE	DATE
A3	1:3,000	December 2018
DRAWN BY	CHECKED BY	APPROVED BY
SW	TP	TP

wardell armstrong
NEWCASTLE UPON TYNE | TEL 0191 232 0943
WWW.WARDELL-ARMSTRONG.COM
BIRMINGHAM · BOLTON · CARDIFF · CARLISLE · EDINBURGH · GLASGOW · LONDON · MANCHESTER · SHEFFIELD · STOKE ON TRENT


Sample 1
Sample 2
No open water
Sample 3

wardell-armstrong.com

STOKE-ON-TRENT
Sir Henry Doulton House
Forge Lane
Etruria
Stoke-on-Trent
ST1 5BD
Tel: +44 (0)1782 276 700

BIRMINGHAM
Two Devon Way
Longbridge Technology Park
Longbridge
Birmingham
B31 2TS
Tel: +44 (0)121 580 0909

BOLTON
41-50 Futura Park
Aspinall Way
Middlebrook
Bolton
BL6 6SU
Tel: +44 (0)1204 227 227

CARDIFF
Tudor House
16 Cathedral Road
Cardiff
CF11 9LJ
Tel: +44 (0)292 072 9191

CARLISLE
Marconi Road
Burgh Road Industrial Estate
Carlisle
Cumbria
CA2 7NA
Tel: +44 (0)1228 550 575

EDINBURGH
Great Michael House
14 Links Place
Edinburgh
EH6 7EZ
Tel: +44 (0)131 555 3311

GLASGOW
2 West Regent Street
Glasgow
G2 1RW
Tel: +44 (0)141 433 7210

LEEDS
36 Park Row
Leeds
LS1 5JL
Tel: +44 (0)113 831 5533

LONDON
Third Floor
46 Chancery Lane
London
WC2A 1JE
Tel: +44 (0)207 242 3243

MANCHESTER
76 King Street
Manchester
M2 4NH
Tel: +44 (0)161 817 5038

NEWCASTLE UPON TYNE
City Quadrant
11 Waterloo Square
Newcastle upon Tyne
NE1 4DP
Tel: +44 (0)191 232 0943

TRURO
Baldhu House
Wheal Jane Earth Science Park
Baldhu
Truro
TR3 6EH
Tel: +44 (0)187 256 0738

International offices:

ALMATY
29/6 Satpaev Avenue
Regency Hotel
Office Tower
Almaty
Kazakhstan
050040
Tel: +7(727) 334 1310

MOSCOW
21/5 Kuznetskiy Most St.
Moscow
Russia
Tel: +7(495) 626 07 67

wardell armstrong

Appendix 5.10 – Framework Habitat Management Plan

wardell-armstrong.com

ENERGY AND CLIMATE CHANGE
ENVIRONMENT AND SUSTAINABILITY
INFRASTRUCTURE AND UTILITIES
LAND AND PROPERTY
MINING AND MINERAL PROCESSING
MINERAL ESTATES
WASTE RESOURCE MANAGEMENT

EXTRA MSA GROUP

MOTORWAY SERVICES, WARRINGTON

FRAMEWORK ECOLOGICAL MANAGEMENT PLAN

JULY 2019

wardell armstrong

Wardell Armstrong
36 Park Row, Leeds, LS1 5JL United Kingdom
Telephone: +44 (0)113 8315533 www.wardell-armstrong.com

DATE ISSUED:	**JULY 2019**
JOB NUMBER:	**SH11739**
REPORT NUMBER:	**010**
VERSION:	**V1.0**
STATUS:	**FINAL**

EXTRA MSA GROUP

MOTORWAY SERVICES, WARRINGTON

FRAMEWORK ECOLOGICAL MANAGEMENT PLAN

JULY 2019

PREPARED BY:

James Richardson	Principal Ecologist & Landscape Architect
Tim Palmer	Technical Director

CHECKED & APPROVED BY:

Tim Palmer	Technical Director

CONTENTS

1 INTRODUCTION

1.1 Terms of Reference

1.1.1 Wardell Armstrong LLP (WA) is advising Extra MSA Group (hereafter referred to as Extra) in respect of a proposed development of a new Motorway Service Area (MSA) (hereafter referred to as the 'development'), located on the northern side of the M62 at Junction 11, central Ordnance Survey (OS) grid reference: SJ 67053 93630.

1.1.2 The proposals include the following:

- Extraction of an area of sub-surface peat and relocation to the surface in order to form a new peatland type habitat;
- the realignment of a Brook and the optimisation of newly created river corridor habitats;
- enhancement of retained areas of tree lines; and
- the establishment of flower rich meadow grassland habitats.

1.1.3 Both the enhanced and the newly created habitats will be brought under a formal programme of management, to ensure the new planting establishes fully and then is maintained in the long-term to provide ongoing biodiversity and amenity benefits.

1.1.4 Such a programme of management will be set out within an Ecological Management and Mitigation Plan, or Landscape and Ecological Management Plan (LEMP), which could be secured through a Condition of planning consent or a legal agreement. A recommended framework management plan is set out below, which could form the basis of the detailed Habitat Management Plan.

2 AIMS AND OBJECTIVES

2.1 Tenure and Responsibility

2.1.1 The entirety of the land covered by this Framework Management Plan is within the control of the applicant, Extra MSA Group (Extra). The implementation of the detailed management plan will be the responsibility of Extra.

2.2 Ecological Constraints

2.2.1 The site has supports protected species, i.e. nesting birds, and an area of sub-surface peat. However ecological constraints are fairly limited given that the site is predominantly an area of intensively farmed arable land. A High Pressure Gas Main (HPGM) runs along the eastern boundary of the site with associated easements to allow for maintenance of the sub-surface pipeline. Consequently, it will be necessary to maintain minimal vegetation growth within this area, this will be achieved by the reversion of the current arable land to flower rich grassland.

2.2.2 Safeguards will be implemented to ensure the protection of birds, where appropriate, during habitat clearance. As such, the detailed Management Plan should set out measures to avoid grassland/tree clearance during the bird nesting season.

2.3 Areas Covered by the Framework Management Plan

2.3.1 For the purposes of this Framework Management Plan, the site has been divided into general management zones, with their objectives broadly outlined below:

- New peatland habitat zone;
- Brook realignment zone;
- Enhancement of existing tree lines and creation of new woodlands; and
- Establishment of new meadows.

2.4 Framework for Enhancement of Existing Tree Lines and Creation of New Woodlands

2.4.1 The woodland on site currently comprises a typical, mixed species shelterbelt planting of Lombardy poplar in the south west corner of the site on the roundabout embankment – this provides some screening to the adjacent fields, it is largely devoid of shrub and ground flora being heavily shaded. A line of mature and over mature downy birch define the eastern and northern boundary of the site, there are frequent gaps especially within the northern stand, to the east the line is more or less continuous. Goat willow, hazel and crack willow and red oak are also present around the western and southern boundary of the site either as single trees or as small groups.

2.4.2 Birch and Scot's pine woodland is a characteristic feature of the area, and woodland dominated by birch is distinguished by a generally dense canopy with a sparse understorey. New woodland will be planted around the margins of the scheme especially to the south and west, the new woodlands will include the following:

- promotion of mature standard trees, providing an important habitat resource in terms of deadwood and nesting and roosting features for birds and bats;
- Creating a graduated 'ecotone' at the edges of the woodlands through scrub/young trees to tall grassland;
- Creation of standing deadwood where appropriate; and
- Creation of new faunal habitat features, including log piles, brash piles and windrows to form refugia and hibernacula for a range of wildlife species, and provision of bat and bird boxes.

2.4.3 Management of the newly created woodland will initially aim to ensure the successful establishment of the trees, followed by long-term maintenance to provide long-term ecological benefits. This will be achieved through the following objectives:

- Planting of native tree and shrub species in a random pattern, in clusters leaving gaps for natural regeneration and woodland rides/glades;
- Considering the establishment of native species with drought tolerance ideally where they are locally native, for example field maple *Acer campestre,* Scot's pine *Pinus sylvestris,* small-leaved lime *Tilia cordata* or wild service tree *Sorbus torminalis,* so that the new woodlands are able to adapt to climate change.
- Retention in particular of older downy birch specimens at the eastern boundary as potential nesting habitat for Willow tit, and appropriate veteranisation methods to promote further (standing) deadwood resource;
- Permitting natural regeneration where appropriate and appreciating the value of scrub and ruderal vegetation as intermediate habitats;
- Maintain and replace trees and shrubs to ensure their healthy establishment;
- Establish and maintain a species-rich grassland ground flora during establishment; and

2.4.4 Management of the site should initially comprise an establishment period for at least the first year. This would include weed control around newly planted trees using non-herbicide methods such as coir matting, application of mulch, watering and

replacement, using biodegradable trees guards and replacement of failed specimens in the following season with the same species, as required.

2.4.5 In the longer-term, traditional, low intensity management using coppicing techniques should be introduced to create an on-going regime for broadleaved woodland that meets the UK Priority Habitat definition, creating a varied structure of benefit to invertebrates and bird diversity in particular. This can be maintained by establishing and maintaining glades and rides through new woodland areas.

2.4.6 The establishment period should include watering during drought conditions within the first 5 years, replacement of specimens (as required), removal and disposal of litter and treatment of non-native species as required.

2.5 Management Framework for New Peatland Habitat Zone

2.5.1 The translocated peat will be subject to a different and likely variable hydrological regime and therefore unlikely to provide conditions suitable for 'active raised bog'. However, it will be necessary to ensure the Peat Habitat Zone (PHZ) is successful by being adaptable to a variable hydrological regime. This can be achieved by designing a habitat of variable peat depth and topography, providing a range of micro-habitats from dry to permanently wet; creating varied habitats for a range of flora and fauna.

2.5.2 Plant material from 'high quality' peatland vegetation from nearby designated sites should be considered where possible or existing established nurseries supplying those sites where re-vegetation is taking place, to ensure plants of local provenance establish on site.

2.5.3 A Habitat Management Plan will be provided that incorporates natural processes such as vegetation succession where appropriate, as well as ensuring any invasive species are removed.

2.5.4 There is an opportunity to create different habitats such regenerating scrub, dry and wet heathland areas and bog pools, rather than focussing on trying to create a flat raised rainwater-fed mire system. It is expected that the PHZ will receive water both from rain and from groundwater, given that the external bunds will be semi-permeable and hence allow a degree of continuity with external hydrology. It will therefore be possible to create hollows around groundwater level and to mound areas which will become largely dry heath vegetation. By creating a diversity of topography and habitats, the area will be more resistant to seasonal change as well as climate change.

2.5.5 The Chat Moss Project are in the process of restoring Mosslands nearby and this provides an opportunity to source vegetation locally to aid restoration. Bare peat is vulnerable to wind and solar ablation and erosion and so quick revegetation will be imperative to stabilising the peat. This can be achieved through plug planting, hydroseeding, or pre-planted coir matting and rolls.

2.5.6 Plant species and choice of planting process would be influenced by the finalised topography of the translocated peat. Pre-planted coir matting and rolls establish most effectively when partially submerged whereas hydroseeding and plug planting are likely to be more effective in drier areas. Pre-planted coir matting can be specified an ordered from companies such as Salix.

2.5.7 The vegetation once established is likely to conform to a habitat which is broadly analogous to 'degraded raised bog'. An extract from the JNCC Habitat account – '7120 Degraded raised bogs still capable of natural regeneration' – is provided below:

> *"Degraded raised bogs occur where there has been widespread disruption, usually by man, to the structure and function of the peat body. This can involve changes to the hydrology, vegetation, and physical structure of the bog, leading to desiccation, oxidation and loss of species or changes in the balance of the species composition. In contrast to 7110 Active raised bogs, peat is not currently forming in degraded bog. The vegetation of degraded bog contains several, but not all, of the species typical of Active raised bogs, but the relative abundance and distribution of individual species differs:*
>
> - *…Scrub woodland (usually birch Betula spp.);*
> - *Bare peat;*
> - *Impoverished vegetation dominated by species including purple moor grass Molinia caerulea, hare's-tail cottongrass Eriophorum vaginatum and heather Calluna vulgaris, and lacking significant cover of bog-mosses Sphagnum species"*

2.5.8 Other key species that can be targeted for re-introduction as part of the as part of the revegetation work include; cross-leaved heath *Erica tetralix*, round-leaved sundew *Drosera rotundifolia*, cranberry *Vaccinium oxycoccos*, bog asphodel *Narthecium ossifragum* and bog-rosemary *Andromeda polifolia*.

2.5.9 Monitoring through the restoration process will enable timely interventions, ensuring any less successful areas of revegetation are able to establish successfully. For

example it may be necessary to use fertiliser or lime on areas of substrate which are found to be too acidic.

2.5.10 There is an opportunity to establish locally uncommon species such as aspen *Populus tremula* and native black poplar *Populus nigra* ssp. *betulifolia*

2.5.11 During the management phase, parts of the PHZ would be permitted to develop natural tree and scrub regeneration, with species such as birch *Betula spp*., willow *Salix spp*., and alder *Alnus glutinosa* likely to self-seed from surrounding habitat. This would attract species such as willow warbler *Phylloscopus trochillus*, stonechat *Saxicola rubicola* and reed bunting *Emberiza schoeniculus*.

2.5.12 In other areas, trees and scrub could be prevented from establishing, such as parts of the developing floristically diverse heathland and near to the proposed bog pools. This would benefit species of invertebrate that are reliant on open water such black darter *Sympetrum danae* & common hawker *Aeshna juncea* dragonflies which are bog habitat specialists. Grasshopper warbler *Locustella naevia* and quail *Coturnix coturnix* have been recorded locally and may benefit from the more open habitats.

2.5.13 Example photos are provided below.

Plate 1: Open birch woodland growing over peat soils. The edges of the peatland type habitat should be allowed to develop into a similar composition.

Plate 2: Open mire with boggy pools and dominant cotton grass.

Plate 3: Mire with heathland. The Heathland habitat could be replicated on drier (raised) sections within the Peat Habitat Zone.

2.6 Management Framework for Newly Created Meadows/grassland

2.6.1 Overall aims for meadow vegetation at the site will be to create species rich grasslands of various types, from tall infrequently managed to short-grazed areas.

2.6.2 The grassland to be created within the easement of the HPGM will be a tall species rich sward with high floristic diversity; this will be subject to a single cut during late summer/autumn as is the case for a traditional 'hay meadow'. The arisings should be gathered up and removed from site to progressively lower the nutrient status of the soil. The margins of this habitat should be left to a reduced mowing frequency to allow tussocky grassland to develop for the benefit of small mammals and invertebrates.

2.6.3 These areas will be seeded and planted with a suitable wildflower mix containing a range of neutral/acid grassland species. Within the mix it will be important to include yellow rattle *Rhinanthus minor* which will help to maintain the floral diversity in the long term by reducing the vigour of coarse grasses.

2.6.4 Areas of new meadow plantings around the margins of the newly planted woodlands should be left unmown to develop into coarse tussocky grassland with blackthorn, hawthorn or gorse scrub, within adjacent areas working outwards from the woodland edges more frequent cutting should be employed to allow tall grassland to develop, which is mown once/year in late summer. Closer to paths and amenity areas, the grassland should be mown more frequently still such that short grassland is maintained.

Establishment

2.6.5 Management will initially aim to ensure the successful establishment of the meadow areas, followed by maintenance to provide long-term ecological benefits. This will be achieved through the following objectives in the first year:

- Preparation of a 'sterile' seed bed to reduce the competitive advantage of annual weeds through topsoil stripping or inversion. If topsoil is stripped, it could then be used to create topographical variation in the open mosaic habitats.
- Sowing the wild flower meadow mix in the appropriate rate, during early spring or autumn; and
- Controlling the weed growth by cutting or grazing as necessary.

Cutting Option

2.6.6 Following establishment, the bulk of the grassland should be cut once a year in late summer and arisings removed and composted in the corner of the fields. A 5m wide strip around the margins of the new meadows should be left uncut to maintain tussocky grassland for small mammals and their predators.

2.6.7 After 5 years, the management will be reviewed at which point it should be clear which areas are of highest floristic value, which areas can be permitted for vegetation succession and which areas are favoured by livestock, should they be the preferred option.

2.7 Framework Management for Brook Re-alignment

2.7.1 Silver Lane Brook, which is designated "main river", originates at the south western end of the proposed MSA and is fed by a culvert entering from off site from the south.

2.7.2 Silver Lane Brook ultimately drains a further 0.4km to the north to the Willow Brook and then which discharges 1.7km to the east to join the Glaze Brook.

2.7.3 The watercourse, as it runs down the western boundary of the site, is a relative narrow and shallow channel with steep banks, creating quite a constrained river corridor. The watercourse runs the full length of the western boundary, approximately 0.6km, and has a longitudinal gradient range of between approximately 1 in 400 and 1 in 2000. The channel has two culverted crossings allowing access into the eastern agricultural fields and there are numerous areas of standing water along the channel.

2.7.4 The diversion will be designed to contain meanders and in channel features within the open land areas and the channel will be enhanced through landscaping and ecological betterment with an aim to improve water quality and biodiversity. Where land is available, the surrounding areas to the diversion will be reprofile to endeavour to create variation and a natural landform. These measures will include consideration of the following features in order to maximise biodiversity benefit[1]:

- The channel should be designed to be as ‘sinuous’ as possible to maximise linear length and to create diversity in flows and depth;
- Riffles, gravel beds and sediment bars should be created to create habitats for a wide range of invertebrates and aquatic plants;
- Backwaters with static flows which become isolated from the channel during periods of low flows should be encouraged;
- The adjacent habitats should include as much structural diversity as possible with areas of dense marginal and emergent plant growth on shallow margins of great

[1] Stephen Addy, Susan Cooksley, Nikki Dodd, Kerry Waylen, Jenni Stockan, Anja Byg and Kirsty Holstead (2016) River Restoration and Biodiversity: Nature-based solutions for restoring rivers in the UK and Republic of Ireland. CREW reference: CRW2014/10

benefit to water vole, tree lined sections (with willow and alder) to allow roots to stabilise the banks and create important fish refuges and underwater habitats and vertical soil banks to provide nesting opportunities for kingfisher and sand martin.

- adjacent to the channel there should be an area of unmanaged 'riparian' habitat which in time should be allowed to develop a mosaic of fen habitat with wet woodland, scrub and areas of drier grassland.

2.7.5 Due to the ground conditions being partly in peat, the channel will be lined in these areas to reduce infiltration loss to the surrounding ground. Ground water ingress into the channel will also be discouraged by channel lining although this will be carefully designed to allow areas of marshy habitat to develop on adjacent land.

2.7.6 In terms of ongoing management this would be minimal to allow the habitats to develop in a natural manner. It may be necessary to monitor the development of the vegetation and river channel, to ensure that excessive erosion does not occur and to ensure it does not become blocked by fallen trees etc. Monitoring and remedial measures would be proposed in the detailed Habitat Management Plan.

2.7.7 Examples of channel features are provided in the plates below:

Plate 4: Riffle features comprising areas of faster flow, shallow high energy water and exposed boulders/cobbles

Plate 5: **Pool areas of deeper water and lower flows.**

Plate 6: Backwaters – areas of very low/static flow which may become detached from the main channel during summer.

Plate 7: Exposed sediment, marginal growth and sediment 'cliff' providing nesting habitat for kingfisher and sand martin as well as refuge for solitary bees and wasps.

wardell-armstrong.com

STOKE-ON-TRENT
Sir Henry Doulton House
Forge Lane
Etruria
Stoke-on-Trent
ST1 5BD
Tel: +44 (0)1782 276 700

BIRMINGHAM
Two Devon Way
Longbridge Technology Park
Longbridge
Birmingham
B31 2TS
Tel: +44 (0)121 580 0909

BOLTON
41-50 Futura Park
Aspinall Way
Middlebrook
Bolton
BL6 6SU
Tel: +44 (0)1204 227 227

CARDIFF
Tudor House
16 Cathedral Road
Cardiff
CF11 9LJ
Tel: +44 (0)292 072 9191

CARLISLE
Marconi Road
Burgh Road Industrial Estate
Carlisle
Cumbria
CA2 7NA
Tel: +44 (0)1228 550 575

EDINBURGH
Great Michael House
14 Links Place
Edinburgh
EH6 7EZ
Tel: +44 (0)131 555 3311

GLASGOW
2 West Regent Street
Glasgow
G2 1RW
Tel: +44 (0)141 433 7210

LEEDS
36 Park Row
Leeds
LS1 5JL
Tel: +44 (0)113 831 5533

LONDON
Third Floor
46 Chancery Lane
London
WC2A 1JE
Tel: +44 (0)207 242 3243

MANCHESTER
76 King Street
Manchester
M2 4NH
Tel: +44 (0)161 817 5038

NEWCASTLE UPON TYNE
City Quadrant
11 Waterloo Square
Newcastle upon Tyne
NE1 4DP
Tel: +44 (0)191 232 0943

TRURO
Baldhu House
Wheal Jane Earth Science Park
Baldhu
Truro
TR3 6EH
Tel: +44 (0)187 256 0738

International offices:

ALMATY
29/6 Satpaev Avenue
Regency Hotel
Office Tower
Almaty
Kazakhstan
050040
Tel: +7(727) 334 1310

MOSCOW
21/5 Kuznetskiy Most St.
Moscow
Russia
Tel: +7(495) 626 07 67

wardell armstrong

Appendix 5.11 – Biodiversity Offsetting Report

wardell-armstrong.com

ENERGY AND CLIMATE CHANGE
ENVIRONMENT AND SUSTAINABILITY
INFRASTRUCTURE AND UTILITIES
LAND AND PROPERTY
MINING AND MINERAL PROCESSING
MINERAL ESTATES
WASTE RESOURCE MANAGEMENT

EXTRA MSA GROUP

MOTORWAY SERVICES, WARRINGTON

BIODIVERSITY OFFSETTING REPORT

DECEMBER 2019

wardell armstrong

Wardell Armstrong
36 Park Row Leeds, LS1 5JL, United Kingdom
Telephone: +44 (0)113 831 5533 www.wardell-armstrong.com

DATE ISSUED:	**DECEMBER 2019**
JOB NUMBER:	**SH11739**
REPORT NUMBER:	**011**
VERSION:	**V0.1**
STATUS:	**FINAL**

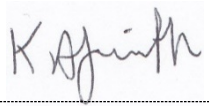
EXTRA MSA GROUP

MOTORWAY SERVICES, WARRINGTON

BIODIVERSITY OFFSETTING REPORT

DECEMBER 2019

PREPARED BY:

Katie Smith	Ecologist	
Callum Salter	Ecologist	

REVIEWED BY:

James Richardson	Principal Ecologist & Landscape Architect	

APPROVED BY:

Tim Palmer	Technical Director – Ecology	

CONTENTS

APPENDICES

DRAWINGS	TITLE	SCALE
SH11739/007	Extended Phase 1 Habitat Survey Results	1:3,000@A3
LC-1	Warrington MSA J11/M62 Indicative Wider Landscape Context	1:5,000@A2
0751	Indicative Site Plan Warrington MSA, J11 M62	1:1250@A1

1 INTRODUCTION

1.1 Scope of Report

1.1.1 A scoping report was issued to Warrington Borough Council (WBC) during December 2018 in relation to the proposed Warrington Motorway Service Area (MSA) scheme. This reported included a calculation of biodiversity change arising from the proposed development. Initially, The Warwickshire, Coventry and Solihull – Biodiversity Impact Assessment (BIA) calculator was been used to conduct this assessment.

1.1.2 In clarification of this initial work, and following consultation with Natural England this data has now been entered into the DEFRA Biodiversity Metric 2.0 as this is now considered the industry standard. This report updates the previous version and discusses differences in the results.

1.1.3 In order to calculate the areas of habitat, both drawings LC-1- Warrington MSA J11/M62 Indicative Wider Landscape Context and 0751- Indicative Site Plan Warrington MSA, J11, M62 were used.

2 METHODS

2.1 Distinctiveness

2.1.1 Existing information on habitat types within the Application Site is taken from the Extended Phase 1 Habitat Survey data (Wardell Armstrong, 2018), and shown on Drawing No. SH11739/007. This data is then inputted into the biodiversity metric 2.0 and habitats are pre-assigned to one of four habitat bands, based on their distinctiveness:

- High: 6
- Medium: 4
- Low: 2
- None 0

2.1.2 Distinctiveness is defined as a collective measure of biodiversity based on parameters including species richness, diversity and rarity.

2.2 Condition Assessment

2.2.1 Each habitat type identified is then given a condition weighting. The methodology used to assign a condition weighting to each habitat type is based on the 'Higher Level Stewardship Scheme: Farm Environment Plan (FEP) Manual' (Natural England 2010[1]), although ecological expertise and experience is also used. Condition weightings are:

- Good: 3
- Moderate: 2
- Poor: 1

2.2.2 In the FEP manual, each habitat type is assigned a number of habitat assessment criteria and it is these that allow an assessment of condition to be made:

- Good condition: All criteria met
- Moderate Condition: All but one criterion met
- Poor Condition: Two or more criteria failed

2.2.3 Drawing number LC-1 'Warrington MSA J11/M62 Indicative Wider Landscape - Landscape Context' provided by SLR (July 2019) has been used to inform details of proposed habitats following completion of the development.

[1] http://adlib.everysite.co.uk/resources/000/251/202/NE264.pdf

3 RESULTS

3.1 The Biodiversity Metric 2.0

The results of the Biodiversity Matrix 2.0 are summarised below, taken from the full metric which is provided in Appendix 2. Plate 1 provides an extract from the headline results table.

On-site baseline	*Habitat units*	43.30
	Hedgerow units	2.48
	River units	19.02
On-site post-intervention (Including habitat retention, creation, enhancement & succession)	*Habitat units*	50.68
	Hedgerow units	2.48
	River units	20.61
Off-site baseline	*Habitat units*	0.00
	Hedgerow units	0.00
	River units	0.00
Off-site post-intervention (Including habitat retention, creation, enhancement &	*Habitat units*	0.00
	Hedgerow units	0.00
	River units	0.00
Total net unit change (including all on-site & off-site habitat retention/creation)	*Habitat units*	7.38
	Hedgerow units	0.00
	River units	1.59
Total net % change (including all on-site & off-site habitat creation + retained habitats)	*Habitat units*	17.05%
	Hedgerow units	0.00%
	River units	8.37%

Plate 1: Extract from DEFRA Metric 'Headline Results' summary

3.1.1 The existing habitats within the application site have a biodiversity value of 43.30 units. For area-based habitats, 50.68 units will be created and enhanced as a result of the proposed development, resulting in an overall Habitat Biodiversity Impact Score of +**7.38/17.05% (Gain)**.

3.1.2 The Proposed Development will result in no change in hedge or connectivity biodiversity value, as hedge and connectivity features will be retained. The overall Hedgerow Biodiversity Impact Score is **0.00/0% (no change)**.

3.1.3 The Proposed Development will result in an overall River Impact Score of +**1.59/8.37% (Gain)**.

4 CONCLUSION

4.1.1 Originally the BIA metric results demonstrated that the landscape proposals within the site boundary are adequate to mitigate biodiversity losses. 'Good' condition habitats should be targeted following the development. The landscape proposals will result in a percentage increase of 22% in biodiversity value overall, using the original BIA metric.

4.1.2 The DEFRA Metric 2.0 concludes that the total biodiversity net gain results are a percentage increase of 17.05% in biodiversity value overall, therefore further off-site mitigation through an offset provider is not considered necessary. This is the final biodiversity net gain for the site.

4.1.3 The updated metric 2.0 resulted in some minor changes to the net change of biodiversity on site. Most noticeably the previous BIA included the rivers within the habitats impact score, in the revised metric 2.0 this is now an independent feature instead of the connectivity impact assessment. This was an important feature to distinguish as the habitat creation involved removing previous running waterways and redirecting the waterways, which in turn increased the length of the waterways. The final result of the revised metric 2.0 returned a slightly lower value of net unit change (7.38 as opposed to 9.11).

APPENDICES

Appendix 1

Biodiversity Impact Assessment (BIA) Calculator

Warwickshire, Coventry & Solihull - Habitat Impact Assessment Calculator

KEY	
	No action required
	Enter value
	Drop-down menu
	Calculation
	Automatic lookup
	Automatic Condition setting
	Result

Local Planning Authority:	Other
Site name:	Warrington Motorway Service Area
Planning application reference number:	
Assessor:	K Smith
Date:	02/08/2019

Please fill in both tables

Please do not edit the formulae or structure

To condense the form for display hide vacant rows, do not delete them

If additional rows are required, or to provide feedback on the calculator please contact WCC Ecological Services 01926 418060

	Existing habitats on site Please enter all habitats within the site boundary			**Habitat distinctiveness**		**Habitat condition**		**Habitat Biodiversity Value**						
								Habitats to be retained with no change within development		**Habitats to be retained and enhanced within development**		**Habitats to be lost within development**		
T. Note	code	Phase 1 habitat description	*Habitat area (ha)*	*Distinctiveness*	*Score*	*Condition*	*Score*	*Area (ha)*	*Existing value*	*Area (ha)*	*Existing value*	*Area (ha)*	*Existing value*	***Comment***
		Direct Impacts and retained habitats			A		B	C	A x B x C = D	E	A x B x E = F	G	A x B x G = H	
	J11	Other: Arable	11.56	Low	2	Poor	1					11.56	**23.12**	Condition assessment preset. Lost to development and new habitat proposals.
	B5	Grassland: Marsh / Marshy grassland	0.69	High	6	Poor	1					0.69	**4.14**	Considered poor condition due to presence of undesireable species. Lost to development and new habitat propos
	B22	Grassland: Semi-improved neutral grassland	1.86	Medium	4	Poor	1					1.86	**7.44**	Considered poor condition due to presence of undesireable species. Lost to development and new habitat propos
	A111	Woodland: Broad-leaved semi-natural woodland	0.57	High	6	Poor	1					0.57	**3.42**	Considered poor condition. Lost to development and new habitat proposals.
	n/a	Built Environment: Buildings/hardstanding	1.70	none	0	Poor	1					1.70	**0.00**	Condition assessment preset. Lost to development and new habitat proposals.
	G1	Wetland: Standing water	0.02	High	6	Good	3	0.02	0.36					Standing Water - Eutrophic. Condition assessment W03. Considered good condition. Retained
	G2	Wetland: Running water	0.10	High	6	Poor	1					0.10	**0.60**	Wet Ditch. Assessed as area habitat due to realignment and increased width following development.
		Total	16.50				Total	0.02	0.36	0.00	0.00	16.48	38.72 J	
													∑D + ∑F + ∑H	
											Site habitat biodiversity value		39.08	

Before/after impact	**Indirect Negative Impacts** Including off site habitats	K	Value of loss from indirect impacts K x A x B = Li, Lii	Li - Lii
Before				
After				
Before				
After				
Before				
After				
Before				
After				
Before				
After				
	Total	0.00		0.00 M

	HIS = J + M
Habitat Impact Score (HIS)	**38.72**

CAUTION - Destruction of habitats of high distinctiveness, e.g. lowland meadow or ancient woodland, may be against local policy. Has the mitigation hierarchy been followed, can impact to these habitats be avoided?
Any unavoidable loss of habitats of high distinctiveness must be replaced like-for-like.

	Proposed habitats on site (Onsite mitigation)			Target habitats distinctiveness		Target habitat condition			Time till target condition		Difficulty of creation / restoration		*Habitat biodiversity value*	
T. Note	code	Phase 1 habitat description	*Area (ha)*	*Distinctiveness*	*Score*	*Condition*	*Score*		*Time (years)*	*Score*	*Difficulty*	*Score*	(N x O x P) / Q / R	***Comment***
		Habitat Creation	N		O		P			Q		R		
	n/a	Built Environment: Buildings/hardstanding	7.72	none	0	Poor	1		3 Years	1.1	Low	1	**0.00**	Time till target condtiion N/A
	A132	Woodland: Mixed plantation	1.61	Low	2	Good	3		32+ years	3	Medium	1.5	**2.15**	Target good condition for overall net gain.
	G2	Wetland: Running water	0.29	High	6	Good	3		5 years	1.2	Medium	1.5	**2.93**	Target good condition for overall net gain.
	B12	Grassland: Semi-improved acidic grassland	3.67	Medium-High	5	Good	3		5 years	1.2	Medium	1.5	**30.58**	Target good condition for overall net gain.
	J12	Grassland: Amenity grassland	3.19	Low	2	Good	3		3 Years	1.1	Low	1	**17.40**	Target good condition for overall net gain.
		Total	**16.48**											
		Habitat Enhancement						Existing value S (= F)					((NxOxP)-S)/Q/R	
		Total	**0.00**								Trading down correction value		-5.23	
											Habitat Mitigation Score (HMS)		**47.83**	
													HBIS = HMS - HIS	
											Habitat Biodiversity Impact Score		**9.11**	Gain
											Percentage of biodiversity impact loss			

	Loss	Gain	Impact
Woodland Habitat	3.42	2.15	**-1.27**
Grassland Habitat	11.58	47.98	**36.40**
Wetland Habitat	0.60	2.93	**2.33**
Other Habitat (including Built Environment)	23.12	0.00	**-23.12**
Total	38.72	53.06	**14.34**
		Trading down	**-5.23**
			9.11

Warwickshire, Coventry & Solihull - Hedge Impact Assessment Calculator

KEY	
	No action required
	Enter value
	Drop-down menu
	Calculation
	Automatic lookup
	Result

This sheet calculates the impacts to hedges and lines of trees in and around the site.

These units are not transferrable as compensation for either the Habitat or Connectivity Impact Assessment scores.

Please fill in both tables

Please do not edit the formulae or structure
To condense the form for display hide vacant rows, do not delete them
If additional rows are required, or to provide feedback on the calculator please contact WCC Ecological Services

	Existing Hedgerow features on site			Hedgerow distinctiveness		Hedgerow condition assessments									Hedgerow Biodiversity Value: Hedgerow features to be retained with no change within development		Hedgerow features to be retained and enhanced within development		Hedgerow features to be lost within development		
T. Note	code	Hedgerow habitat description	*Feature length (km)*	*Distinctiveness*	*Score*	*A1*	*A2*	*B1*	*B2*	*C1*	*C2*	*D1*	*D2*	***Condition Score***	*Length (km)*	*Existing value*	*Length (km)*	*Existing value*	*Length (km)*	*Existing value*	***Comment***
		Direct Impacts and retained features			A										C	A x B x C = D	E	A x B x E = F	G	A x B x G = H	
	n/a	Hedges: Line of trees	0.62	Low	2	Pass	Pass	Pass	Fail	Pass	Fail	Fail	Pass	2	0.62	**2.47**					Retained line of trees. B1 not applicable. Presence of invasive plant species.
		Total	0.62											Totals	0.62	2.47	0.00	0.00	0.00	0.00	J
																				∑D + ∑F + ∑H	
																		Site Hedge Biodiversity Value		2.47	
Before/after impact		**Indirect Negative Impacts**	K												Value of loss from indirect impacts: K x A x B = Li, Lii	Li - Lii					
	Before																				
	After																				
	Before																				
	After																				
	Before																				
	After																				
	Before																				
	After																				
	Before																				
	After																				
		Total	0.00													0.00	M			HIS = J + M	
																		Hedge Impact Score (HIS)		0.00	

	Proposed hedge features on site (Onsite mitigation)			Target hedge distinctiveness		Hedgerow condition assessments										Time till target condition		Difficulty of creation / restoration		***Linear biodiversity value***	***Comment***
T. Note	code	Phase 1 habitat description	*Length (km)*	*Distinctiveness*	*Score*	*A1*	*A2*	*B1*	*B2*	*C1*	*C2*	*D1*	*D2*	*Condition Score*		*Time (years)*	*Score*	*Difficulty*	*Score*		
		Hedgerow Creation	N		O												Q		R	(N x O x P) / Q / R	
		Total	0.00																		
		Hedgerow Enhancement													Existing value S (= F)					((N x O x P) - S) / Q / R	
		Total	0.00															Trading down correction value		0.00	
																		Hedge Mitigation Score (HMS)		**0.00**	

	HBIS = HMS - HBIS
Hedge Biodiversity Impact Score	**0.00**
Percentage of linear impact loss	

KEY	
	No action required
	Action required
	Drop-down menu
	Calculation
	Automatic lookup
	Overall Gain
	Overall Loss

Warwickshire Coventry and Solihull - Connectivity Impact Assessment [optional]

KEY	
	No action required
	Enter value
	Drop-down menu
	Calculation
	Automatic lookup
	Result

Connectivity Features
This sheet gives and indication as to whether the development will enhance connectivity thorugh or around the site.

These units are not transferrable as compensation for either the Habitat or Hedgerow Impact Assessment scores.

Please fill in both tables

Please do not edit the formulae or structure
To condense the form for display hide vacant rows, do not delete them
If additional rows are required, or to provide feedback on the calculator please contact WCC Ecological Services

	Existing Connectivity features on site			Connectivity distinctiveness		Connectivity condition		Connectivity Biodiversity Value: Connectivity features to be retained with no change within development		Connectivity features to be retained and enhanced within development		Connectivity features to be lost within development		
T. Note	code	Phase 1 habitat description	*Feature length (km)*	*Distinctiveness*	*Score*	*Condition*	*Score*	*Length (km)*	*Existing value*	*Length (km)*	*Existing value*	*Length (km)*	*Existing value*	***Comment***
		Direct impacts and retained features			A		B	C	A x B x C = D	E	A x B x E = F	G	A x B x G = H	
	J26	Ditches: Dry ditch	0.48	Low	2	Poor	1	0.48	**0.95**					Dry ditch retained. Condition poor due to presence of invasive plant species.
		Total	0.48				Total	0.48	0.95	0.00	0.00	0.00	0.00 J	
													∑D + ∑F + ∑H	
											Site Connectivity Biodiversity Value		0.95	

Before/after impact	Indirect Negative Impacts	K					Value of loss from indirect impacts: K x A x B = Li, Lii	Li - Lii		
Before										
After										
Before										
After										
Before										
After										
Before										
After										
Before										
After										
	Total	0.00						0.00 M		CIS = J + M
									Connectivity Impact Score (CIS)	**0.00**

		Proposed linear features on site (Onsite mitigation)		Target Connectivity distinctiveness		Target Connectivity condition			Time till target condition		Difficulty of creation / restoration		*Connectivity biodiversity value*	
T. Note	code	Phase 1 habitat description	*Length (km)*	*Distinctiveness*	*Score*	*Condition*	*Score*		*Time (years)*	*Score*	*Difficulty*	*Score*	***biodiversity value***	**Comment**
		Connectivity Creation	N		O		P			Q		R	(N x O x P) / Q / R	
		Total	0.00											
		Connectivity Enhancement						Existing value S (= F)					((N x O x P) - S) / Q / R	
		Total	0.00								Trading down correction value		0.00	
											Connectivity Mitigation Score (CMS)		**0.00**	
													CBIS = CMS - CIS	
											Connectivity Biodiversity Impact Score		**0.00**	
											Percentage of linear impact loss			

APPENDIX 2
BIODIVERSITY METRIC 2.0 CALCULATION TOOL

	Habitats and areas			Habitat distinctiveness		Habitat condition		Ecological connectivity			Strategic significance			Suggested action to address habitat losses	Ecological baseline	Retention category biodiversity value								Bespoke compensation agreed for unacceptable losses	Comments	
Ref	Broad Habitat	Habitat type	Area (hectares)	Distinctiveness	Score	Condition	Score	Ecological connectivity	Connectivity	Connectivity multiplier	Strategic significance	Strategic significance	Strategic position multiplier		Total habitat units	Area retained	Area enhanced	Area succession	Baseline units retained	Baseline units enhanced	Baseline units succession	Area lost	Units lost		Assessor comments	Reviewer comments
1	Cropland	Cropland - Cereal crops	11.37	Low	2	N/A - Agricultural	1	Low	Unconnected habitat	1	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	Same distinctiveness or better habitat required	22.74				0.00	0.00	0.00	11.37	22.74		Condition assessment preset. Lost to development and new habitat proposals.	
2	Wetland	Wetland - Reedbeds	0.69	High	6	Moderate	2	Low	Unconnected habitat	1	Location ecologically desirable but not in local strategy	Medium strategic significance	1.1	Same habitat required	9.11				0.00	0.00	0.00	0.69	9.11		Relatively uniform stands of neutral grassland of low species fiversity and recently created from former agricultural	
3	Sparsely vegetated land	Sparsely vegetated land - Rudural/Ephemeral	1.86	Low	2	Fairly Poor	1.5	Medium	Moderately connected habitat	1.1	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	Same distinctiveness or better habitat required	6.14				0.00	0.00	0.00	1.86	6.14		Tall ruderal habitat of fairly poor diversity (precautionary) with invasives (R.rugosa and I.glandulifera).	
4	Woodland and forest	oodland and forest - Lowland mixed deciduous woodl	0.57	High	6	Fairly Poor	1.5	Low	Unconnected habitat	1	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	Same habitat required	5.13				0.00	0.00	0.00	0.57	5.13		Isolated stand of woodland within Mersey Forest area but insignificant contribution to overall network	
5	Urban	Urban - Developed land; sealed surface	1.7	V.Low	0	N/A - Other	0	N/A	Assessment not appropriate	1	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	Compensation Not Required	0.00				0.00	0.00	0.00	1.70	0.00			
6	Lakes	Lakes - Ponds (Non- Priority Habitat)	0.02	High	6	Fairly Poor	1.5	Low	Unconnected habitat	1	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	Same habitat required	0.18	0.02			0.18	0.00	0.00	0.00	0.00		Standing Water - Eutrophic. Retained.	
		Total site area ha	**16.21**											**Total Site baseline**	**43.30**	**0.02**	**0.00**	**0.00**	**0.18**	**0.00**	**0.00**	**16.19**	**43.12**			

						Post development/ post intervention habitats										
						Spatial Quality						Risk Multipliers				
						Ecological connectivity			Strategic significance			Temporal multiplier		Difficulty multipliers		
Proposed habitat	Area (hectares)	Distinctiveness	Score	Condition	Score	Ecological connectivity	Connectivity	Connectivity multiplier	Strategic significance	Strategic significance	Strategic position multiplier	Time to target condition/years	Time to target multiplier	Difficulty of creation category	Difficulty of creation multiplier	Habitat units delivered
Urban - Developed land; sealed surface	7.72	V.Low	0	N/A - Other	0	N/A	Assessment not appropriate	1	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	0	1.000	Low	1	0.00
Woodland and forest - Other woodland; mixe	1.61	Medium	4	Good	3	High	Highly connected habitat	1.15	Location ecologically desirable but not in local strategy	Medium strategic significance	1.1	32+	0.320	Medium	0.67	5.24
Grassland - Other neutral grassland	3.67	Medium	4	Good	3	High	Highly connected habitat	1.15	Location ecologically desirable but not in local strategy	Medium strategic significance	1.1	15	0.586	Low	1	32.65
Urban - Amenity grassland	3.19	Low	2	Moderate	2	Medium	Moderately connected habitat	1.1	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	3	0.899	Low	1	12.61
Totals	**0.00**														**Total Units**	**50.50**

	UK Habitats - existing habitats			Habitat distinctiveness		Habitat condition		Ecological connectivity			Strategic significance				Ecological baseline
Baseline ref	Hedge number	Hedgerow type	length KM	Distinctiveness	Score	Condition	Score	Ecological connectivity	Connectivity	Connectivity multiplier	Strategic significance	Strategic significance	Strategic position multiplier	Suggested action to address habitat losses	Total hedgerow units
1		Line of Trees	0.62	Low	2	Moderate	2	Low	Unconnected habitat	1	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	Same distinctiveness band or better	2.48
		Total Site length/KM	**0.62**											**Total Site baseline**	**2.48**

Retention category biodiversity value						Comments	
Length retained	Length enhanced	Units retained	Units enhanced	Length lost	Units lost	Assessor comments	Reviewer comments
0.62		2.48	0	0	0		
0.62	**0.00**	**2.48**	**0.00**	**0.00**	**0.00**		

Existing river type			Habitat distinctiveness		Habitat condition		Strategic significance			Sugested action	Ecological baseline
Baseline ref	River type	length KM	Distinctiveness	Score	Condition	Score	Strategic significance	Strategic significance	Strategic position multiplier		Total river units
1	Class 4 or 5 - Riv	0.48	Medium	4	Poor	1	Low potential/ action not identified in any plan.	Low Strategic Significance	1	Avoid	1.92
2	Class 2 or 3 -Rive	0.57	High	6	Good	5	Low potential/ action not identified in any plan.	Low Strategic Significance	1	Avoid	17.1
	Total site length KM	**1.05**								**Total Site baseline**	**19.02**

Retention category biodiversity value						Comments	
Length retained	Length enhanced	Units retained	Units enhanced	Length impacted	Units Lost	Assessor Comments	Reviewer comments
0.48		1.92	0	0	0	Dry Ditch	
0.57		17.1	0	0	0	Running Water	
1.05	**0.00**	**19.02**	**0.00**	**0.00**	**0.00**		

	Proposed habitats		Habitat distinctiveness		Habitat condition		Strategic significance			Temporal multiplier		Difficulty of creation category	Difficulty of creation multiplier	Riparian encroachment		River units delivered	Comments	
Baseline ref	River type	Length km	Distinctiveness	Score	Condition	Score	Strategic significance	Strategic significance	Strategic position multiplier	Time to target condition/years	Time to target multiplier			Extent of encroachment	Multiplier		Assessor comments	Reviewer comments
1	Class 2 or 3 -River Naturalness Assessment	0.27	High	6	Good	5	Low potential/ action not identified in any plan.	Low Strategic Significance	1	10	0.700	High	0.33	4.01 - 6 m	0.85	1.59	Extension of running water	
	Creation Length/KM	0.27														1.59		

DRAWINGS

N

LEGEND

- APPLICATION SITE BOUNDARY
- EXISTING WOODLAND / TREE
- GAS MAIN
- EXISTING POND
- EXISTING WATERCOURSE
- EXISTING DEVELOPMENT
- PERMISSIVE BRIDLEWAY
- PERMISSIVE FOOTPATH
- PUBLIC FOOTPATH

PROPOSED DEVELOPMENT STRATEGY

- NEW STRATEGIC GREEN LINK
- AMENITY BUILDING
- FUEL FILLING STATION / ELECTRIC CHARGING STATION
- CHILDREN'S PLAY AREA

LANDSCAPE PROPOSALS

- PROPOSED AREA OF MIXED WOODLAND / TREE AND SHRUB PLANTING
- ROUGH GRASSLAND
- WILDFLOWER MEADOW
- AMENITY GRASSLAND WITHIN MSA
- FLOWER RICH ACID GRASSLAND WITHIN MSA
- DIVERTED SILVER LANE BROOK, MARGINS AND/ MARSHY ACID GRASSLAND

EXTRA

SLR global environmental solutions
ASPECT HOUSE
ASPECT BUSINESS PARK
BENNERLEY ROAD
NOTTINGHAM. NG6 8WR
T: 01159 647280
F: 01159 751576
www.slrconsulting.com

WARRINGTON MSA J11/M62

INDICATIVE WIDER LANDSCAPE

LANDSCAPE CONTEXT

LC-1

Scale 1:5,000 @A2

Date JULY 2019

190724-403.08062.00001_Warrington MSA_LM-1-LC-1-LC-2.dwg

1:1250

0 25 50 125 m

N

KEY

Application Boundary

NOTES:

The site boundary is based on Wardell Armstrong drawing no SH11739-006 with amendments discussed with Wardell Armstrong, Shoosmiths, Spawforths and i-transport and approved by Extra.

This red line boundary is to be used for planning purposes only.

Site and surrounding information based on Ordnance Survey Plan Information supplied by Spawforths. Licence no. 100022432.

Area of restored landfill site amended to reflect current site conditions.

Location of HS2 safe guarding zone as Wardell Armstrong drawing SH11739-003.

This drawing is indicative and the plan, elevation, massing and detailing are all subject to change within the bounds of the parameter drawings submitted as part of this application.

Rev:	Date:	Description:	By:	Rvw:
P7	19.07.19	Building plan updated. Additional colour and detail added	JLR	TW
P6	16.07.19	Site plan updated in accordance with comments from highway engineer	JLR	TW
P5	11.07.19	New site layout to incorporate peat habitat zone	JLR	TW
P4	22.05.19	Planning Draft For Review	TW	NAB
P3	02.05.19	Play area moved in line with HSE comments. Parking adjusted to accomodate revised play area. Bus stop added following public consultation in line with Extra instruction. Pedestrian link from car parking to PROW added in line with Spawforths comments.	TW	TW
P2	11.04.19	Context coordination. FFS update	JLR	TW
P1	20.03.19	i-Transpoty access plan added, amenity building updated	TW	TW

architecture 519

a. The Studio, Candle House, 1 Wharf Approach, Granary Wharf, Leeds, LS1 4GH
e. Leeds@architecture519.com
w. www.architecture519.com
t. 0113 213 5656

Client:

EXTRA MSA GROUP

Project No: 2562

Project Name: WARRINGTON MOTORWAY SERVICE AREA, J11 M62

Document Reference:

Project - Originator - Volume - Level - Type - Role - Number

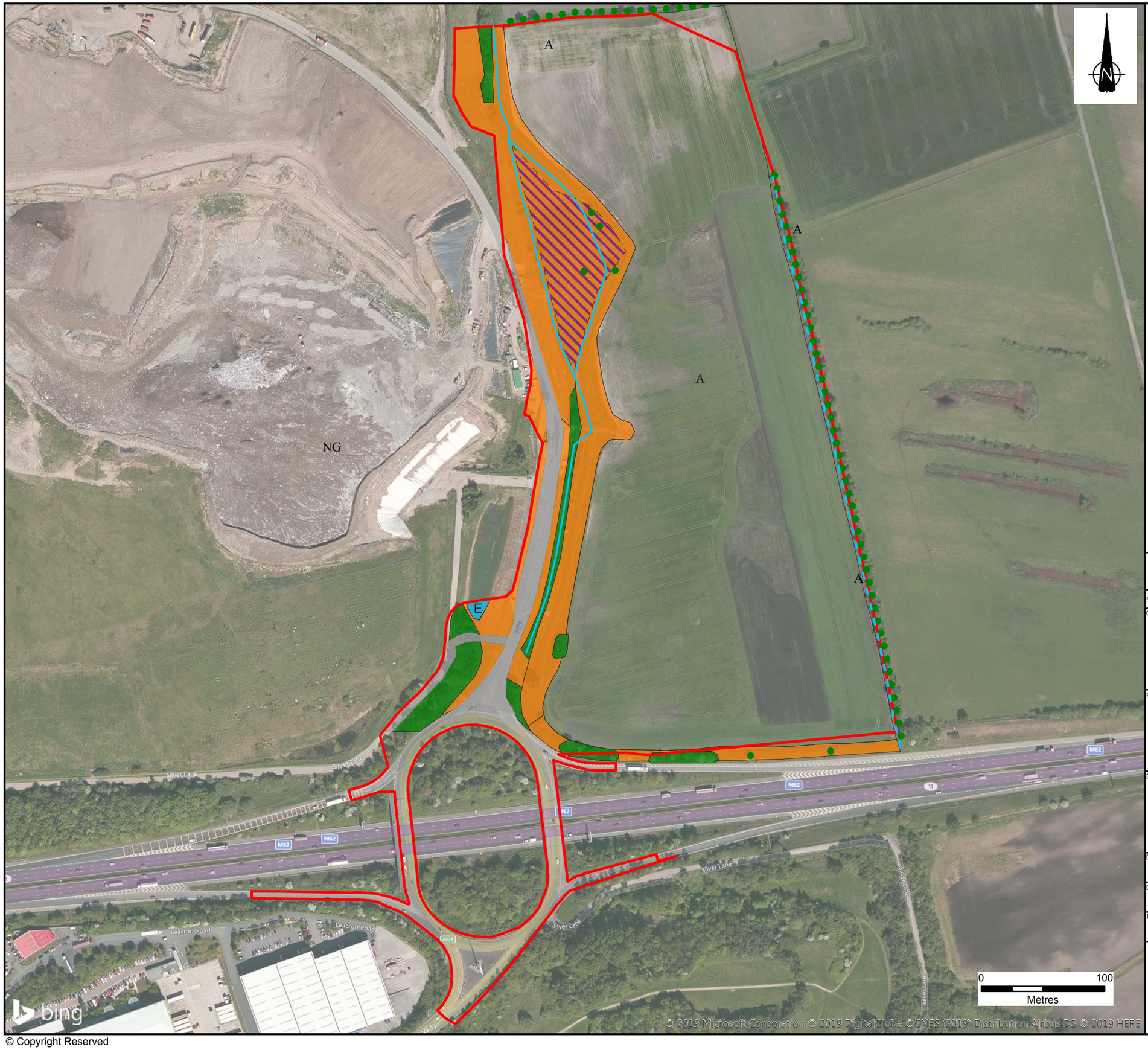
RMS - 519 - ZZ - XX - DR - A - 0751

INDICATIVE SITE PLAN

Status: Code: Suitability description

Revision: Code: P7 Revision status: Preliminary

Created By:	Reviewed By:	Date:	Scale at A1:
JLR	TW	01.04.19	1 : 1250



KEY

- Site Boundary
- Broadleaved woodland - semi-natural
- Neutral grassland
- Marsh/marshy grassland
- E — Standing water - eutrophic
- A — Cultivated/disturbed land - arable
- Hardstanding
- Broadleaved Parkland/scattered trees
- Wet ditch
- Dry ditch

Notes:

Boundaries are indicative. Aerial imagery shown for context purposes only.

Classifications in accordance with Handbook for Phase 1 Habitat Survey - A technique for Environmental Audit (JNCC 2010).

REVISION	DETAILS	DATE	DRAWN	CHK'D	APP'D
B	SITE BOUNDARY AMENDMENTS AND HABITAT UPDATES	JULY 2019	SW	JS	TP
A	FIRST ISSUE	APRIL 2019	SW	JS	TP

CLIENT

EXTRA MSA GROUP

PROJECT

MOTORWAY SERVICES, WARRINGTON

DRAWING TITLE

EXTENDED PHASE 1 HABITAT SURVEY RESULTS

DRG No.	REV
SH11739/007	B

DRG SIZE	SCALE	DATE
A3	1:3,000	December 2018

DRAWN BY	CHECKED BY	APPROVED BY
SW	TP	TP

wardell armstrong

NEWCASTLE UPON TYNE | TEL 0191 232 0943
WWW.WARDELL-ARMSTRONG.COM

BIRMINGHAM, BOLTON, CARDIFF, CARLISLE, EDINBURGH, GLASGOW, LONDON, MANCHESTER, SHEFFIELD, STOKE ON TRENT

wardell-armstrong.com

STOKE-ON-TRENT
Sir Henry Doulton House
Forge Lane
Etruria
Stoke-on-Trent
ST1 5BD
Tel: +44 (0)1782 276 700

BIRMINGHAM
Two Devon Way
Longbridge Technology Park
Longbridge
Birmingham
B31 2TS
Tel: +44 (0)121 580 0909

BOLTON
41-50 Futura Park
Aspinall Way
Middlebrook
Bolton
BL6 6SU
Tel: +44 (0)1204 227 227

CARDIFF
Tudor House
16 Cathedral Road
Cardiff
CF11 9LJ
Tel: +44 (0)292 072 9191

CARLISLE
Marconi Road
Burgh Road Industrial Estate
Carlisle
Cumbria
CA2 7NA
Tel: +44 (0)1228 550 575

EDINBURGH
Great Michael House
14 Links Place
Edinburgh
EH6 7EZ
Tel: +44 (0)131 555 3311

GLASGOW
2 West Regent Street
Glasgow
G2 1RW
Tel: +44 (0)141 433 7210

LEEDS
36 Park Row
Leeds
LS1 5JL
Tel: +44 (0)113 831 5533

LONDON
Third Floor
46 Chancery Lane
London
WC2A 1JE
Tel: +44 (0)207 242 3243

MANCHESTER
76 King Street
Manchester
M2 4NH
Tel: +44 (0)161 817 5038

NEWCASTLE UPON TYNE
City Quadrant
11 Waterloo Square
Newcastle upon Tyne
NE1 4DP
Tel: +44 (0)191 232 0943

TRURO
Baldhu House
Wheal Jane Earth Science Park
Baldhu
Truro
TR3 6EH
Tel: +44 (0)187 256 0738

International offices:

ALMATY
29/6 Satpaev Avenue
Regency Hotel
Office Tower
Almaty
Kazakhstan
050040
Tel: +7(727) 334 1310

MOSCOW
21/5 Kuznetskiy Most St.
Moscow
Russia
Tel: +7(495) 626 07 67

wardell armstrong

Appendix 5.12 – Water Vole Survey Report

wardell-armstrong.com

ENERGY AND CLIMATE CHANGE
ENVIRONMENT AND SUSTAINABILITY
INFRASTRUCTURE AND UTILITIES
LAND AND PROPERTY
MINING AND MINERAL PROCESSING
MINERAL ESTATES
WASTE RESOURCE MANAGEMENT

EXTRA MSA GROUP

MOTORWAY SERVICES, WARRINGTON

WATER VOLE SURVEY REPORT

JULY 2019

wardell armstrong

Wardell Armstrong
41-50 Futura Park, Aspinall Way, Middlebrook, Bolton, BL6 6SU
Telephone: +44 (0)1204 227 227 www.wardell-armstrong.com

DATE ISSUED:	**JULY 2019**
JOB NUMBER:	**SH11739**
REPORT NUMBER:	**012**
VERSION:	**V1.0**
STATUS:	**FINAL**

EXTRA MSA GROUP

MOTORWAY SERVICES, WARRINGTON

WATER VOLE SURVEY REPORT

JULY 2019

PREPARED BY:

Michael Moores — Graduate Ecologist

m.moores

REVIEWED BY:

Richard Laws — Principal Environmental Scientist/Ecologist

R. Laws

APPROVED BY:

Tim Palmer — Technical Director (Ecology)

T.R. Palmer

CONTENTS

DRAWINGS	TITLE	SCALE
SH11739-022	Water Vole Survey Results	1:1,000@A3

1 INTRODUCTION

1.1.1 Wardell Armstrong LLP (WA) were commissioned by Extra MSA Group to undertake a water vole survey of a proposed Motorway Services Area development (hereafter after referred to as the 'site'), located on the northern side of the M62 at Junction 11, central Ordnance Survey (OS) grid reference: SJ 6705393630.

1.1.2 WA undertook the water vole habitat assessment on the 12th February 2019 with subsequent presence/absence visits on the 15th April and 4th June 2019. The aims of the water vole surveys were to determine the likely presence/absence of water vole along the watercourses on or adjacent to site, ii) determine the likely impacts of the proposed development, iii) determine the levels of activity and distribution, iv) to inform whether a Natural England Species Licence for water vole is required and inform appropriate mitigation measures.

1.2 Background

1.2.1 It is proposed that the development will include a main services area with food and retail facilities and a hotel, car, coach and HGV parking, a fuel station and associated road infrastructure.

1.3 Scoping Consultation

1.3.1 A scoping report was issued to Tameside Metropolitan Borough Council (TMBRC) during December 2018. Comments were returned during February 2019. The scoping response from TMBRC agreed that impacts to water vole foraging and burrowing habitat need to be considered in the Environmental Statement (ES). A recommendation of biodiversity net gain was made in line with the NPPF.

1.4 Site Context

1.4.1 The majority of the site is cultivated land with the boundary habitats consisting of broadleaved treeline, drainage ditches/running water, neutral grassland, broadleaved woodland and marshy grassland.

1.4.2 The site is bound by cultivated land and grazing pasture to the east, cultivated land to the north, a capped landfill to the west and the M62 motorway to the south. The wider area includes arable land and the Birchwood settlement

1.5 Legislative framework

1.5.1 Water voles receive full protection under Section 9 of Schedule 5 Wildlife and Countryside Act, 1981 (as amended). Under this legislation it is an offence to:

- Damage, destroy or obstruct access to, a structure or place which is used by a water vole for shelter or protection [Section 9(4) (a)];
- Disturb a water vole whilst it is occupying such as structure or place which it is using for that purpose [Section 9 (4)(b)];
- Intentionally kill, injure or to take a water vole [Section 9 (1)];
- Have in one's possession or control any live or dead water voles or derivatives of [Section 9(2)]; or
- Sell, or offer to sell a water vole, or to be found in possession of, or to transport, a water vole for the purpose of sale. This includes publishing any advertisement for the sale of water voles [Section 9 (5a & 5b)].

1.5.2 Water vole are a priority species in England and are listed s.41 species of principal importance, NERC Act 2006.

1.5.3 **Licensing Requirements**

1.5.4 The design of the proposed development should seek to avoid disturbing water voles if at all possible. However, if disturbance and damage to habitats cannot be avoided then it is recommended that ecological advice is sought as to whether or not a licence application should be made to Natural England. It is not possible to obtain a licence for the specific purpose of development but in some circumstances Natural England will consider issuing a licence in relation to a development proposal if the licensed action is going to provide a conservation benefit for water voles. A licence application would be needed if any capture and translocation of water voles is considered necessary.

1.6 Water Vole Ecology

1.6.1 Water voles live in colonies, comprising a series of adjoining territories along a watercourse. These territories can range between 30m and 300m depending on the season, habitat quality and population density.

1.6.2 Typically, water vole favour riparian habitat with dense patches of grasses, rushes, sedges and reed (the *Poaceae* family). They may be found on rivers, streams, brooks, canals, lakes, reservoirs, gravel pits and ponds. They create an underground burrow system, up to 3m in length, usually with an underwater entrance and an above-water entrance on the bank.

1.6.3 Sites that are subject to periods of excessive drought or flood may be unsuitable and they are also discouraged by livestock grazing or bank management and excessive shading by trees and shrubs.

1.6.4 Water voles are largely herbivorous and although the *Poaceae* form a large part of their diet, they may consume up to 240 different species including, rarely, snails and crayfish.

1.6.5 They were once common throughout lowland Britain but have suffered a significant decline in numbers and distribution, with populations in some areas falling by over 95% in the last century[1].

1.7 Caveats

1.7.1 Ecological surveys are limited by factors that affect species presence such as time of year, weather, migration patterns and behaviour. Water vole surveys can be carried out any time of year. The optimum time for surveying water vole is between April and October.

[1] http://www.whitchurchwatervoles.co.uk/index.php/en/

2 SURVEY METHODOLOGY

2.1 Desk Study

2.1.1 A desk study was undertaken within the Ecological Assessment carried out by WA with data records provided by RECORD (Local Records Centre), including for water vole within 2km development.

2.2 Field Survey

2.2.1 A detailed search of the area to be directly affected by works associated with the proposed development was undertaken by experienced surveyors on the 12th February during a habitat assessment and during survey visits 1 and 2 on the 15th April and 4th June 2019. Wherever possible, the survey was undertaken from within the watercourses, in order to allow for a close search for signs of water voles.

2.2.2 A brook and drainage ditch located adjacent to the western boundary of site were surveyed for the presence/absence of water vole as shown on Drawing Number SH11739-022.

2.2.3 The specific aims of the survey were to:

- map the distribution of water vole burrows, latrines, paths and, where possible, territorial boundaries;
- describe the status/structure of burrows;
- assess the quality of water vole foraging habitat; and
- identify areas where more detailed surveys may be required.

2.2.4 Survey techniques were undertaken in accordance with the Water Vole Conservation Handbook (Strachan & Moorhouse, 2006). Within the search area both brook habitats have been systematically surveyed for evidence of water vole in the form of:

- faeces: water vole usually deposit faeces (latrine) in concentrations along the waters bank of which (latrine sites) are typically found at home-range boundaries where females mark territories during the breeding season;
- burrows: comprising either single isolated holes or a series of holes slightly above the water's edge or under water surface known as bolt holes;
- tracks: form as water vole leave burrows either to the water or bank tops leading to lawns;

- feeding stations: form and consist of cut vegetation usually on a 45°-degree angle and often stems are stripped leaving behind white flesh piles;
- footprints; prints are usually about 15-25mm from toe to heel, often evident in soft muddy substrate along water's edge or banking and outside burrows; and
- visual observation of water vole during the survey.

2.2.5 Latrines are indicators of terrestrial behaviour, which in turn generally correlates with breeding activity. It is therefore considered that watercourses/bodies which display latrines, burrows and feeding signs form breeding sites for water voles.

Camera Traps

2.2.6 Two passive infra-red (PIR) triggered optical cameras were placed at the site near to suspected water vole field signs (burrows and feeding piles) found within the drainage ditch in order to monitor activity from the 9th February to 5th March 2019.

2.2.7 PIR cameras were placed approximately 1m from the chosen area to ensure that the animals were not disturbed. The cameras were protected by a camouflage casing and produce no 'mechanical' sounds.

2.3 Population estimates

2.3.1 The number of latrines along a watercourse can be used to obtain an estimate of water vole population size. This is based on live trapping of water voles and latrine counts at three sites in the North York Moors National Park, (Morris et al, 1998) which presented a predictive equation to calculate approximate population size from the number of latrines, as presented below:

- Number of water voles = 0.68 x (Number of latrines) + 1.48.

2.3.2 Additionally, guidance within *The Water Vole Mitigation Handbook* (Dean et al, 2016) states that numbers of latrines recorded by the survey will give an indication of relative population site and can be helpful in identifying the most valuable parts of a site for water voles. The survey area can be subdivided into areas supporting water voles at 'high', 'medium' or 'low' density, which could be interpreted as shown in Table 1 below.

Table 1: Relative Population Size

Relative Population Density	First half of survey season (mid-April to end of June	Second half of survey season (July to September)
High	10 or more	20 or more
Medium	3 – 9	6 – 19

Table 1: Relative Population Size		
Relative Population Density	**First half of survey season (mid-April to end of June**	**Second half of survey season (July to September)**
Low	≤ 2 (or none, but with other confirmatory field signs)	≤ 5 (or none, but with other confirmatory field signs)

2.3.3 It is not possible to make robust estimates of absolute numbers of water vole from latrine counts. However, latrines provide relative indices of activity suitable for the purposes of assessing impacts or designing mitigation.

2.4 Survey Limitations

2.4.1 During the survey, dense marginal vegetation (namely reed bulrush *Typha latifolia* and other ruderal species) obscured small sections of the banks and limited access to some parts of the watercourses. However, the character of these areas is similar to those that are accessible and therefore the presence of vegetation is not likely to have compromised the conclusions within this report.

3 SURVEY RESULTS

3.1 Desk Study

3.1.1 The desk study data provided by RECORD (Local Records Centre) identified 1 record of water vole 59m west of the proposed development.

3.2 Field Survey

Habitat Assessment

3.2.1 The habitats on site are not considered optimal water vole habitat, however, do present optimal features in some areas of the two watercourses. The brook/drainage ditch provide bank characteristics with suitable gradient and height that allows burrow creation at varying heights above the water level. Riparian vegetation present provided suitable food source for water vole and additional connectivity to wider landscape including the Risley Moss SSSI via a culvert to the south.

Brook One

3.2.2 Brook one extends approximately 1km adjacent the western boundary of the site adjacent a public footpath. The brook is approximately 1-1.5m wide with shallow embankments. Water depth is approximately 0.5m deep with slow flowing water to the north. The embankments within the southern section, after the initial culvert, were heavily shaded by trees and dense scrub including bramble *Rubus fruticosa,* hawthorn *Crataegus sp.* and goat willow *Salix caprea*. In addition, the channel had very low water levels and heavily vegetated with tall ruderals including willowherb species *Epilobium sp.* and reed canary grass *Phalaris arundinacea.* Therefore, this section was considered sub-optimal water vole habitat and unlikely to support them. Subsequently, the southern section was excluded from further survey.

Photograph 1 –Northern Section

Photograph 2 – Southern Section

Photograph 3– Dense stands of vegetation along the banks of Brook One

Drainage Ditch

3.2.3 The drainage ditch extends approximately 227m in length to the west of the public footpath with no connectivity to brook one. The ditch is approximately 2.5m wide but varies in size throughout the channel. Average water depth is approximately 0.5m with areas fluctuating to 1m. The western embankment is large and steep, and the eastern embankment is short and steep, approximately 3m from the public footpath in the northern section. The bankside habitat included a combination of scattered scrub, tall ruderal and grassland with species present being perennial rye grass *Lolium perenne,* cocksfoot *Dactylis glomerate*, Yorkshire fog *Holcus lanatus*, bramble, common nettle *Urtica dioica*, vetch *Vicia* sp, reed canary-grass and rosebay willowherb *Chamerion angustifolium*. Sections of bank habitat were heavily shaded with tree species such as goat willow, hawthorn and alder *Alnus glutinosa.* These sections were considered sub-optimal habitat providing minimal ground vegetation for cover and food resource. Marginal vegetation included soft-rush *Juncus effuses*, pendulous sedge *Carex pendula,* lesser celandine *Ranunculus ficaria,* bulrush *Typha latifolia* and common reed *Phragmites australis*.

3.2.4 In channel, submerged, vegetation is dominated by bulrush with occasional water cress *Nasturtium officinale*, water forget me not *Myosotis scorpioides,* common water crowfoot *Ranunculus aquatilis* and brooklime *Veronica beccabunga.*

Photograph 4 – Drainage ditch during habitat assessment

Photograph 5 - Drainage ditch during survey visit 1

Photograph 6– Dense stands of vegetation along the banks to the north

Potential water vole signs

3.2.5 No evidence of water vole was identified within brook one. Several burrows and one latrine are present but considered to be bank vole *Myodes glareolus*.

3.2.6 Three possible water vole burrows were observed along the western bank of the drainage ditch, one in the mid-section and two in the southern section. Additionally, four possible feeding stations were identified along the eastern bank. No latrines were observed that are considered to be water vole.

3.2.1 The approximate location of water vole signs identified during the habitat assessment are shown on Drawing SH11739-022.

Photograph 7- Possible water vole burrow

Photograph 8 – Possible feeding station

Water Vole Survey Visit 1

3.2.2 During the presence/absence survey, no evidence of water vole was identified within the brook or drainage ditch. The water level within the drainage ditch had significantly dropped with only a small area holding a low level of water. This is due to the water levels in the drainage ditch being managed by the adjacent restored landfill as part of their previous surface water management.

3.2.3 A number of adult toads *Bufo bufo* were found during the search in brook one and juveniles were present in the drainage ditch, which suggests the watercourses are suitable breeding habitat.

Survey Visit 2

3.2.4 During the second survey, no evidence of water vole was identified within both brooks. The burrows and latrine found are considered too small to be water vole.

3.2.5 A number of adult toads *Bufo bufo* were found during the search in brook one and juveniles were present in brook two, which suggests the brooks are being used for breeding.

4 REFERENCES

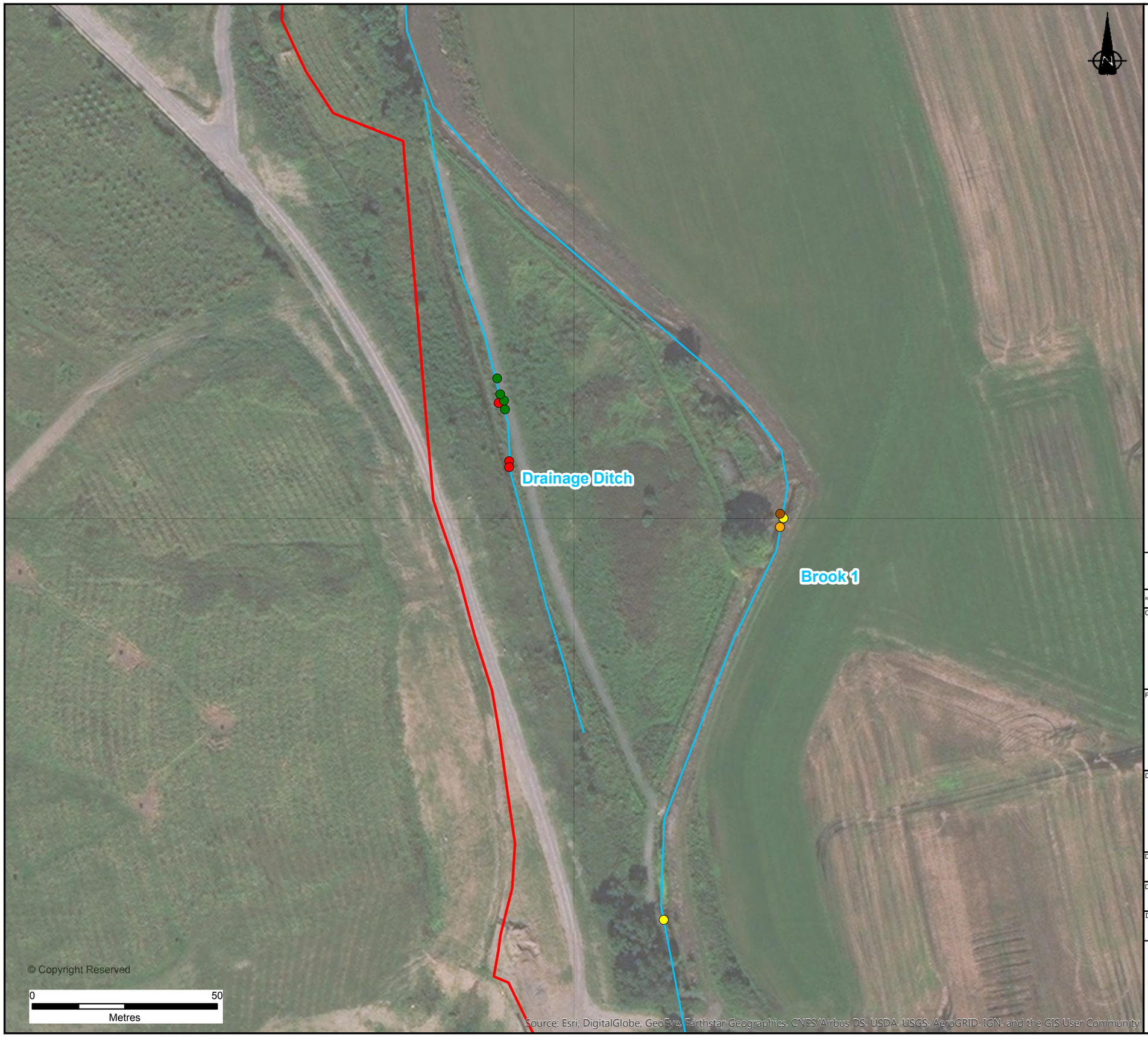
Dean *et al*, 2016, The *Water Vole mitigation handbook* (The Mammal Society Mitigation Guidance Series). Eds Fiona Mathews and Paul Channin. The Mammal Society, London.

Natural England (2008), *Water voles – the law in practice – Guidance for planners and developers.*

WILDCRU (2011), *Water Vole Conservation handbook (3rd edition)*, The Wildlife Conservation Research Unit. Abington, UK.

The Water Vole Channel. Home page. http://www.whitchurchwatervoles.co.uk/index.php/en/index.

DRAWINGS



KEY

- Site Boundary
- Watercourse
- Brick Bank
- Potential Burrows
- Concrete Bank
- Culvert
- Potential Feeding Pile

Notes:
Coordinates to British National Grid

REVISION	DETAILS	DATE	DRAWN	CHK'D	APP'D

CLIENT

EXTRA MSA GROUP

PROJECT

MOTORWAY SERVICES, WARRINGTON

DRAWING TITLE

WATER VOLE SURVEY RESULTS

DRG No.	REV
SH11739-022	A

DRG SIZE	SCALE	DATE
A3	1:1,000	24/07/2019

DRAWN BY	CHECKED BY	APPROVED BY
CT	KS	TP

wardell armstrong
BOLTON | TEL 01204 227 227
WWW.WARDELL-ARMSTRONG.COM
BIRMINGHAM · CARDIFF · CARLISLE · EDINBRUGH · GLASGOW
LONDON · MANCHESTER · NEWCASTLE UPON TYNE · SHEFFIELD · STOKE ON TRENT

wardell-armstrong.com

STOKE-ON-TRENT
Sir Henry Doulton House
Forge Lane
Etruria
Stoke-on-Trent
ST1 5BD
Tel: +44 (0)1782 276 700

BIRMINGHAM
Two Devon Way
Longbridge Technology Park
Longbridge
Birmingham
B31 2TS
Tel: +44 (0)121 580 0909

BOLTON
41-50 Futura Park
Aspinall Way
Middlebrook
Bolton
BL6 6SU
Tel: +44 (0)1204 227 227

CARDIFF
Tudor House
16 Cathedral Road
Cardiff
CF11 9LJ
Tel: +44 (0)292 072 9191

CARLISLE
Marconi Road
Burgh Road Industrial Estate
Carlisle
Cumbria
CA2 7NA
Tel: +44 (0)1228 550 575

EDINBURGH
Great Michael House
14 Links Place
Edinburgh
EH6 7EZ
Tel: +44 (0)131 555 3311

GLASGOW
2 West Regent Street
Glasgow
G2 1RW
Tel: +44 (0)141 433 7210

LEEDS
36 Park Row
Leeds
LS1 5JL
Tel: +44 (0)113 831 5533

LONDON
Third Floor
46 Chancery Lane
London
WC2A 1JE
Tel: +44 (0)207 242 3243

MANCHESTER
76 King Street
Manchester
M2 4NH
Tel: +44 (0)161 817 5038

NEWCASTLE UPON TYNE
City Quadrant
11 Waterloo Square
Newcastle upon Tyne
NE1 4DP
Tel: +44 (0)191 232 0943

TRURO
Baldhu House
Wheal Jane Earth Science Park
Baldhu
Truro
TR3 6EH
Tel: +44 (0)187 256 0738

International offices:

ALMATY
29/6 Satpaev Avenue
Regency Hotel
Office Tower
Almaty
Kazakhstan
050040
Tel: +7(727) 334 1310

MOSCOW
21/5 Kuznetskiy Most St.
Moscow
Russia
Tel: +7(495) 626 07 67

wardell armstrong

Appendix 5.13 – Reptile Survey Report

wardell-armstrong.com

ENERGY AND CLIMATE CHANGE
ENVIRONMENT AND SUSTAINABILITY
INFRASTRUCTURE AND UTILITIES
LAND AND PROPERTY
MINING AND MINERAL PROCESSING
MINERAL ESTATES
WASTE RESOURCE MANAGEMENT

EXTRA MSA GROUP

MOTORWAY SERVICES, WARRINGTON

REPTILE SURVEY REPORT

JULY 2019

wardell armstrong

Wardell Armstrong
36 Park Row Leeds, LS1 5JL, United Kingdom
Telephone: +44 (0)113 831 5533 www.wardell-armstrong.com

DATE ISSUED:	**JULY 2019**
JOB NUMBER:	**SH11739**
REPORT NUMBER:	**013**
VERSION:	**V1.0**
STATUS:	**FINAL**

EXTRA MSA GROUP

MOTORWAY SERVICES, WARRINGTON

REPTILE SURVEY REPORT

JULY 2019

PREPARED BY:

Alex Bingle Ecologist

REVIEWED BY:

Katie Smith Ecologist

APPROVED BY:

Tim Palmer Technical Director (Ecology)

CONTENTS

APPENDICES

DRAWINGS	TITLE	SCALE
SH11739/007	Extended Phase 1 Habitat Survey Results	1:3,000@A3
SH11739/055	Reptile Tin Location Plan	1:1,000@A3

1 INTRODUCTION

1.1 Terms of Reference

1.1.1 Wardell Armstrong LLP (WA) was commissioned by Extra MSA Group to undertake Reptile Presence/ Absence surveys of a proposed Motorway Services Area development (hereafter referred to as the 'site'), located on the northern side of the M62 at Junction 11, central Ordnance Survey (OS) grid reference: SJ 67053 93630.

1.1.2 Surveys followed recommendations from a Preliminary Ecological Appraisal (PEA) undertaken by Wardell Armstrong in 2018 which recommended that the potential for presence/absence of reptiles within the site and surrounding area should be investigated further.

1.2 Scope of Assessment

1.2.1 The aims of the assessment are as follows:

1. determine the likely presence/absence of reptiles;
2. if present, determine the species, number and status;
3. summarise the current site condition, including arrangement of suitable habitats and connecting corridors;
4. assess whether additional surveys are required;
5. assess the conservation value of the site for reptiles;
6. to determine likely impacts of the proposed development; and
7. to inform whether a European Protected Species Licence is required and inform appropriate mitigation measures.

1.3 Background Information

1.3.1 This report follows a Preliminary Ecological Appraisal report (Wardell Armstrong 2019), which identified the presence of small areas of rough grassland, arable field margins, grassland mosaics and scrub, which were suitable to support a reptile population.

1.4 Scoping Consultation

1.4.1 A scoping report was issued to Tameside Metropolitan Borough Council (TMBRC) during December 2018. Comments were returned during February 2019. The scoping response from TMBRC agreed that the impact on grass snake *Natrix helvetica*

basking habitat needs to be considered in the Environmental Statement (ES). A recommendation of biodiversity net gain was made in line with the NPPF.

1.5 Site Context

1.5.1 The site is located immediately adjacent to Junction 11 of the M62, on the north side of the motorway. Suitable reptile habitat including grassland, scrub and arable field margins are present on site. The wider landscape comprises arable farmland/pasture to the east, south east and north, a capped landfill directly west of the site and Birchwood Business and Technology Park to the south west.

1.5.2 Holcroft Moss Site of Special Scientific Interest is located approximately 1,080m east and Manchester Mosses Special Area of Conservation, Risley Moss Site of Special Scientific Interest and Risley Moss Local Nature Reserve are located approximately 1.4km south of the site.

2 METHODOLOGY

2.1 Habitat Suitability Assessment

2.1.1 Utilising references documents (Stafford, 1987; Stafford, 1989; Froglife, 2016; Froglife, 2016b), general habitat requirements for each species were used to assess if onsite habitats are suitable to support any British reptile species.

2.1.2 Common lizard *Zootoca vivipara* occupies a wide range of habitats providing that they are structurally diverse and provide adequate cover. The more typical mosaics include, but are not limited to (Stafford, 1989):

- Open marshy heathland with south-facing banks with dense vegetation;
- Wasteland, railway embankments;
- Sand dunes;
- Edges of woodland;
- Damp meadows; and
- Gardens.

2.1.3 Slow worms *Anguis fragilis* occupy a more diverse range of habitats than common lizard, tolerating a less diverse vegetation structure and often being found on brownfield sites and within open woodland. Slow worm favour well vegetated dryer habitats with extensive ground cover, including open heaths. However, the species is not limited to this habitat and can be recorded in wetter habitats also (Stafford, 1989). Typical habitats include (Stafford, 1989):

- Steep cliffs;
- Woodland clearings;
- Old ivy-covered walls;
- Hedge and railway embankments; and
- Gardens.

2.1.4 Grass snake are generally associated with wetlands but can also be found in many other habitats that provide some cover and a degree of structural diversity. They are very mobile and do not rely on a single site for hibernation, foraging and egg-laying and it is not uncommon to see grass snake in woodland during hot weather.

2.1.5 Adder *Vipera berus* are typically associated with dry sand heaths, heathland and moorland locations and are poor colonisers of less suitable sites associated with arable/pastoral farmland. However, the species is not restricted to the above habitat. Adder have been recorded within several other habitats, including but not restricted to (Stafford, 1987):

- Pine and deciduous forest;
- Reed beds;
- Rocky hillsides, quarries and sand dunes;
- Moorland; and
- Disused railway cuttings.

2.1.6 During spring adder occupy the hibernation sites, which include dry south-facing bank covered with low vegetation. During summer individuals may then travel and disperse in to lower-lying and potentially wetter habitats, including damp river meadows, returning to hibernation sites from late August onwards (Stafford, 1987).

2.1.7 Sand lizard is restricted to lowland sandy habitats and have a limited distribution across the British Isles, mainly associated with Dorset, Hampshire and the western borders of Surrey and Berkshire (Stafford, 1989; Froglife, 2016) and Merseyside (Froglife, 2016). In addition, breeding programs have reintroduced sand lizard to areas of North Wales, Devon Cornwall and West Sussex (Froglife, 2016).

2.1.8 Smooth snake is often found in mature heather on dry, sandy, or gravel heathland, with a very limited distribution across the British Isles. Smooth snake is typically recorded in Dorset, Hampshire, Surrey and West Sussex (Froglife, 2016b).

2.2 Desk Study

2.2.1 The desktop study was informed by review of existing available information provided for a search radius of 2.5 km from a central grid reference point within the boundary of the site. Ordnance Survey (OS) and satellite mapping was also used to gain contextual habitat information. Organisations and recorders approached included:

- RECORD (The Biodiversity Information System for Cheshire, Halton, Warrington and Wirral).

2.3 Field Survey

2.3.1 The field survey methodology has been devised with reference to the requirements of all relevant legislation and good practice guidance, including the Herpetofauna Workers' Manual (Foster & Gent, 1996) and reptile survey guidance (Froglife, 1999).

2.3.2 During May 2019, twenty-one artificial refugia consisting of bituminous roofing felt and corrugated bituminous sheets (Corolyne) approximately 0.5 x 0.5 m to 0.5 x 1 m in size were placed within suitable reptile habitats (See Drawing number SH11739/055 for approximate locations). These included hedgerow bases and associated arable field margin, breaks in low scrubby vegetation, grassland and the edges of scrub.

2.3.3 The centre of the arable fields were considered as unsuitable habitat and were not surveyed. Refugia tiles were individually numbered for reference and left to settle for a period of two weeks before being checked for the first time.

2.3.4 The artificial refugia were checked from a distance using binoculars and were visually inspected on approach. The refugia were also turned to check beneath. In addition, natural (logs and stones) and semi-natural refugia, such as anthropogenic materials that have been in place for a significant time, were identified as potentially suitable for use by reptiles, and were also checked for reptile presence.

2.3.5 Refugia were visited seven times during the survey period during suitable weather conditions as defined by relevant guidance. Surveys were carried out on the following dates during 2019:

- Survey visit 1 – 3rd May 2019;
- Survey visit 2 – 7th May 2019;
- Survey visit 3 – 14th May 2019;
- Survey visit 4 – 15th May 2019;
- Survey visit 5 – 17th May 2019;
- Survey visit 6 – 20th May 2019; and
- Survey visit 7 – 24th May 2019.

2.3.6 The number of refugia used depends on many factors, such as the likelihood of disturbance, the size of the site and area of suitable habitat. In general, the more artificial refugia used, the greater the chance of finding reptiles (and the larger the number of reptiles seen), should they be present on site. For general survey purposes,

five to ten refugia per hectare is considered sufficient (Froglife, 1999). Due to the large area of unsuitable habitat less were used in this instance.

2.3.7 The site covers an area of approximately 16.6 hectares. Upon visiting the site, it was considered that approximately 1.5 hectares or 9.03% of the site was potentially suitable reptile habitat, with the remaining land being arable fields with no cover or with few sun breaks. Thus, artificial refugia were placed at a density of approximately 14 per hectare within the areas of suitable habitat.

2.3.8 A scoring system for categorising the size of reptile populations present (Foster & Gent, 1996) has been used to assess the indicative population sizes present within the site (see Table 1, below). This scoring system gives a population size estimate described as low, good or exceptional, based on "the maximum numbers of reptiles seen by observation and/or found under tiles at a density of up to 10/ha[1], by one person in one day". This approach has been applied to the results of the surveys undertaken.

Table 1: Reptile population size classification

Reptile	Low Population	Good Population	Exceptional Population
Adder	<5	5-10	>10
Grass snake	<5	5-10	>10
Common lizard	<5	5-20	>20
Slow worm	<5	5-20	>20

2.3.9 Surveys were carried out during optimum temperature and weather conditions (intermittent sunshine, temperatures between 9°C and 20°C with low winds). The ideal time to carry out surveys is between the hours of 09:00 and 11:00 and 16:00 and 19:00 when reptiles have not reached their optimum temperature and so are more easily observed; however, sunshine immediately after rain is also suitable at any time of the day so long as the temperature is greater than 9°C.

2.3.10 See Appendix 2 for weather conditions recorded during each of the surveys.

2.4 Caveat

2.4.1 The absence of desk study records is not relied upon to determine absence of reptiles. Often, the absence of records is a result of under-recording within the given search

[1] If reptiles were recorded the data will be extrapolated to match the measuring system, given the onsite refugia density of 14/ha

area and as such the experience of the ecologist concerned together with a range of additional factors, in particular the presence/absence of potentially supporting habitat; is used to infer likely presence/absence of ecological receptors.

2.5 Quality Assurance & Environmental Management

2.5.1 The surveys and assessments have been overseen by and the report checked and verified by a member of CIEEM, whom is bound by its code of professional conduct. All surveys and assessments have been undertaken with reference to the recommendations given in British Standard BS 42020, and as stated within specialist guidance, as appropriate and referenced separately.

3 RESULTS

3.1 Habitat Suitability for Reptiles

3.1.1 The majority of the site is comprised of unsuitable habitat in the form of arable fields. Suitable habitat consisting of hedgerows, scrub, ditches and grassy field margins are present around the periphery of the site. The Extended Phase 1 Habitat Survey Results plan (Drawing number SH11739/007) shows the locations of these habitats.

3.1.2 Based on information outlined in reference documents and as described in Section 2.1, it is considered that the site has potential to support common lizard, grass snake and slow worm.

3.2 Desk Study

3.2.1 Within data from RECORD there are 39 records of adder, 29 records of common lizard, 5 records of grass snake and 4 records of slow worm within 2km of the site over the past 10 years. These are predominantly recorded at Risley Moss Local Nature Reserve and other locations off site.

3.3 Field Survey

3.3.1 Throughout the 7 survey visits no reptiles were observed on site. Adult and juvenile common toads were observed during each visit, common frogs were recorded during visit 3 and visit 5 and one smooth newt was sighted during visit 1.

4 REFERENCES

Foster. J., and Gent. T. (1996). Reptile Survey Methods: proceedings of a seminar held 07 November 1995 at the Zoological Society of London's meeting rooms, Regent's Par, London. English Nature Science Series No. 27.ISBN: 1857162390

Froglife. (1999). - Froglife Advice Sheet 10: Reptile Survey leaflet

Froglife. (2016). Froglife Sand Lizard Information Webpage http://www.froglife.org/amphibians-and-reptiles/sand-lizard/

Froglife. (2016b). Froglife Smooth Snake Information Webpage http://www.froglife.org/amphibians-and-reptiles/smooth-snake/

Stafford, P. (1987). Shire Natural History: The Adder. Shire Publications Ltd. Bucks.

Stafford, P. (1989). Shire Natural History: Lizards of the British Isles. Shire Publications Ltd. Bucks.

Wardell Armstrong. (2018). Warrington MSA: Preliminary Ecological Appraisal. Wardell Armstrong: Sheffield

Appendix 1

Legislation and Policy Summary

Appendix 1 – Legislation and Policy Summary

All UK reptile species receive partial protection under The Wildlife and Countryside Act 1981 (as amended by the Countryside and Rights of Way Act 2000), which provide protection against intentional killing or injury of any such animal.

Sand Lizard and smooth snake are listed within Schedule 5 of the Wildlife and Countryside Act 1981 as amended) and receive protection under section 9 of this act, which makes it illegal (subject to certain exceptions) to:

- Intentionally kill, injure or take any such animal;
- Intentionally or recklessly damage, destroy or obstruct any place used for shelter or protection by any such animal; and
- Intentionally or recklessly disturb such animals while they occupy a place used for shelter or protection.

Smooth snake alone, is also protected under section 39 of the Conservation (Natural Habitats, &c.) Regulations 1997 (and amendments) (known as the Habitats Regulations). With this and the Wildlife and Countryside Act 1981 (as amended) taken together, the following offences apply under the combined acts:

- Deliberately or intentionally capture, injure or kill a smooth snake;
- Intentionally or recklessly damage, destroy or obstruct access to; any structure or place used for shelter or protection by a smooth snake;
- deliberately, intentionally or recklessly disturb a smooth snake;
- damage or destroy a breeding site or resting place of a smooth snake; or
- keep, transport, sell, exchange or offer for sale any smooth snake(s) or anything derived from this species.

Disturbance of animals includes in particular any disturbance, which is likely to impair their ability to survive, to breed or reproduce, or to rear or nurture their young, or in the case of animals of a hibernating or migratory species, to hibernate or migrate; or to affect significantly the local distribution or abundance of the species to which they belong.

Policy Summary

Section 40 of the Natural Environment and Rural Communities (NERC) Act imposes a legal duty on Planning Authorities to 'have regard' to the conservation of biodiversity when considering planning applications.

Section 41 of the NERC Act requires the Secretary of State to publish a list of species and habitats of principal importance for conserving biodiversity in the UK. Such Biodiversity Action Plan (BAP) Habitats and Species (2007) do not offer the species any specific protection but help to highlight the species importance at a national level. This list is used by Local Planning Authorities to identify the species and habitats that should be afforded priority when applying the requirements of the National Planning Policy Framework (NPPF).

The NPPF underpins the Government's planning policies for England and how these are to be applied. The central theme of the NPPF is a presumption in favour of sustainable development. This presumption does not apply where development requiring Appropriate Assessment under the Birds or Habitats Directives is being considered, planned or determined.

The NPPF states:

> *'When determining planning applications, local planning authorities should aim to conserve and enhance biodiversity by applying the following principles:*
>
> - *if significant harm resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;*
> - *proposed development on land within or outside a Site of Special Scientific Interest (SSSI) likely to have an adverse effect on a SSSI (either individually or in combination with other developments) should not normally be permitted. Where an adverse effect on the site's notified special interest features is likely, an exception should only be made where the benefits of the development, at this site, clearly outweigh both the impacts that it is likely to have on the features of the site that make it of special scientific interest and any broader impacts on the national network of SSSIs;*
> - *development proposals where the primary objective is to conserve or enhance biodiversity should be permitted;*
> - *opportunities to incorporate biodiversity in and around developments should be encouraged;*
> - *planning permission should be refused for development resulting in the loss or deterioration of irreplaceable habitats, including ancient woodland and the loss of aged or veteran trees found outside ancient woodland, unless the need for, and benefits of, the development in that location clearly outweigh the loss; and*

- *the following wildlife sites should be given the same protection as European sites: potential Special Protection Areas (SPA) and possible Special Areas of Conservation (SAC); listed or proposed Ramsar sites; and sites identified, or required, as compensatory measures for adverse effects on European sites, potential SPAs, possible SACs, and listed or proposed Ramsar sites.'*

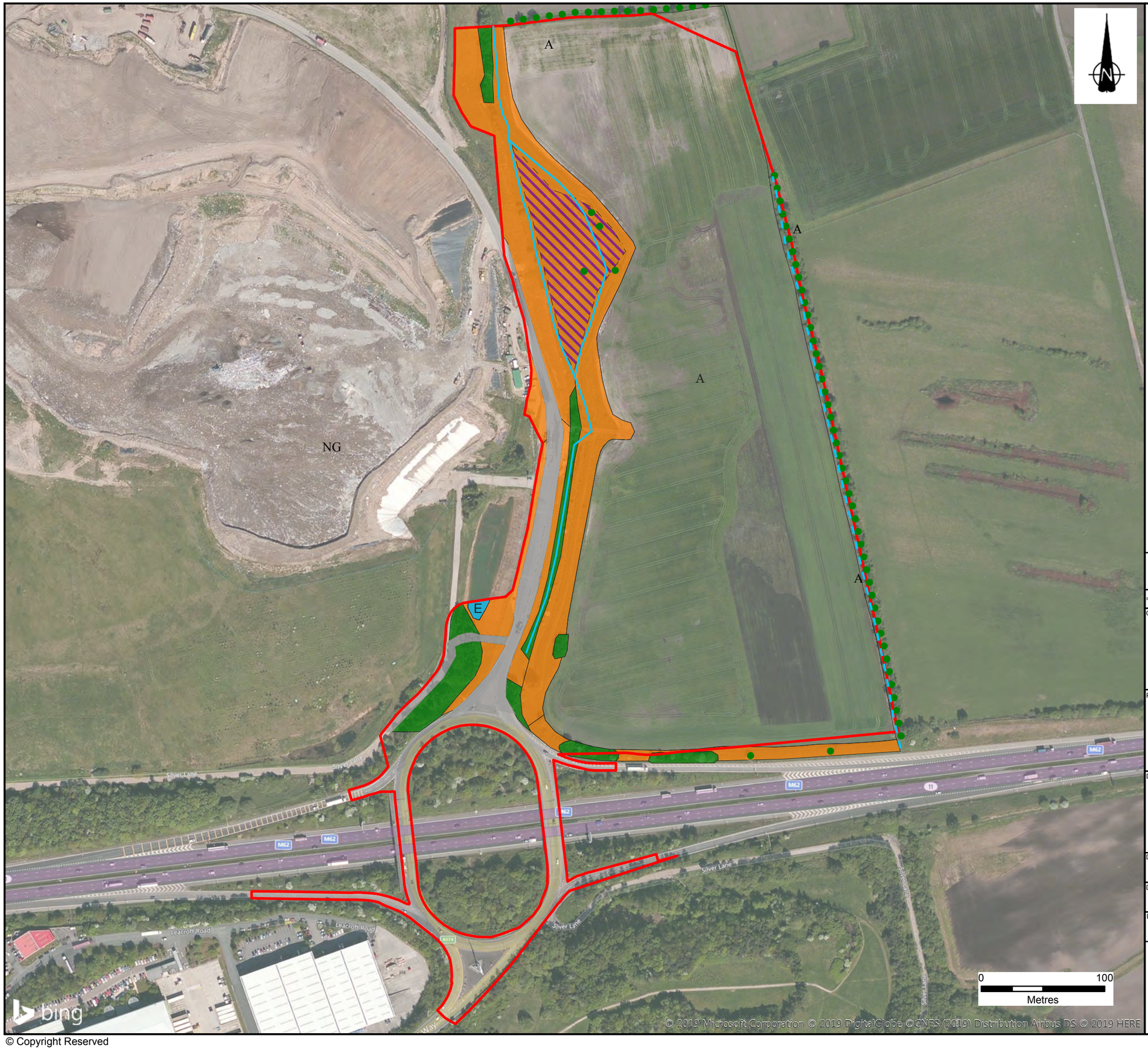
The NPPF requires the Planning Authority to have a responsibility to promote the preservation, restoration and re-creation of priority habitats, ecological networks and the protection and recovery of priority species populations, linked to national and local targets, and identify suitable indicators for monitoring biodiversity in the plan. In addition, the planning system should contribute to and enhance the natural and local environment by minimising impacts on biodiversity and providing net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures.

Appendix 2
Survey Weather Conditions

Appendix 2 - Survey Weather Conditions

Date	Time of survey	Weather data during survey
03/05/2019	11:07-12:17	10°C, 6/8 cloud cover, 2/10 wind speed, sunny spells. Rainfall prior to survey.
07/05/2019	16:30-17:00	14°C, dry, light wind, cloudy
14/05/2019	09:25-11:00	17°C, dry, light wind, clear
15/05/2019	09:30-10:30	17°C, dry, light wind, clear
17/05/2019	16:10-17:00	16°C, dry, light wind, cloudy
20/05/2019	16:10-17:10	15°C, dry, light breeze, clear
24/05/2019	16:00-16:30	18°C, dry, light wind, partially cloudy

DRAWINGS



KEY

- Site Boundary
- Broadleaved woodland - semi-natural
- Neutral grassland
- Marsh/marshy grassland
- E — Standing water - eutrophic
- A — Cultivated/disturbed land - arable
- Hardstanding
- Broadleaved Parkland/scattered trees
- Wet ditch
- Dry ditch

Notes:

Boundaries are indicative. Aerial imagery shown for context purposes only.

Classifications in accordance with Handbook for Phase 1 Habitat Survey - A technique for Environmental Audit (JNCC 2010).

REVISION	DETAILS	DATE	DRAWN	CHKD	APP'D
B	SITE BOUNDARY AMENDMENTS AND HABITAT UPDATES	JULY 2019	SW	JS	TP
A	FIRST ISSUE	APRIL 2019	SW	JS	TP

CLIENT

EXTRA MSA GROUP

PROJECT

MOTORWAY SERVICES, WARRINGTON

DRAWING TITLE

EXTENDED PHASE 1 HABITAT SURVEY RESULTS

DRG No.		REV
SH11739/007		B
DRG SIZE	SCALE	DATE
A3	1:3,000	December 2018
DRAWN BY	CHECKED BY	APPROVED BY
SW	TP	TP

wardell armstrong
NEWCASTLE UPON TYNE | TEL 0191 232 0943
WWW.WARDELL-ARMSTRONG.COM
BIRMINGHAM · BOLTON · CARDIFF · CARLISLE · EDINBURGH · GLASGOW · LONDON · MANCHESTER · SHEFFIELD · STOKE ON TRENT

DO NOT SCALE FROM THIS DRAWING

KEY

SITE BOUNDARY

REPTILE TIN LOCATIONS

REVISION	DETAILS	DATE	DRAWN	CHK'D	APP'D

CLIENT

EXTRA MSA GROUP

PROJECT

MOTORWAY SERVICES. WARRINGTON

DRAWING TITLE

REPTILE TIN LOCATION PLAN

DRG No.	REV
SH11739-055	A

DRG SIZE	SCALE	DATE
A1	1:1000	22.07.2019

DRAWN BY	CHECKED BY	APPROVED BY
HP	KS	TP

wardell armstrong

LEEDS | TEL 0113 831 5533
WWW.WARDELL-ARMSTRONG.COM

BIRMINGHAM · BOLTON · CARDIFF · CARLISLE · EDINBURGH · GLASGOW · LONDON · MANCHESTER · NEWCASTLE UPON TYNE · STOKE ON TRENT

N:\SH\SH11739 - MOTORWAY SERVICES, WARRINGTON\03 - DESIGN\AUTOCAD\SH11739-55 REPTILE TIN LOCATION.DWG

wardell-armstrong.com

STOKE-ON-TRENT
Sir Henry Doulton House
Forge Lane
Etruria
Stoke-on-Trent
ST1 5BD
Tel: +44 (0)1782 276 700

BIRMINGHAM
Two Devon Way
Longbridge Technology Park
Longbridge
Birmingham
B31 2TS
Tel: +44 (0)121 580 0909

BOLTON
41-50 Futura Park
Aspinall Way
Middlebrook
Bolton
BL6 6SU
Tel: +44 (0)1204 227 227

CARDIFF
Tudor House
16 Cathedral Road
Cardiff
CF11 9LJ
Tel: +44 (0)292 072 9191

CARLISLE
Marconi Road
Burgh Road Industrial Estate
Carlisle
Cumbria
CA2 7NA
Tel: +44 (0)1228 550 575

EDINBURGH
Great Michael House
14 Links Place
Edinburgh
EH6 7EZ
Tel: +44 (0)131 555 3311

GLASGOW
2 West Regent Street
Glasgow
G2 1RW
Tel: +44 (0)141 433 7210

LEEDS
36 Park Row
Leeds
LS1 5JL
Tel: +44 (0)113 831 5533

LONDON
Third Floor
46 Chancery Lane
London
WC2A 1JE
Tel: +44 (0)207 242 3243

MANCHESTER
76 King Street
Manchester
M2 4NH
Tel: +44 (0)161 817 5038

NEWCASTLE UPON TYNE
City Quadrant
11 Waterloo Square
Newcastle upon Tyne
NE1 4DP
Tel: +44 (0)191 232 0943

TRURO
Baldhu House
Wheal Jane Earth Science Park
Baldhu
Truro
TR3 6EH
Tel: +44 (0)187 256 0738

International offices:

ALMATY
29/6 Satpaev Avenue
Regency Hotel
Office Tower
Almaty
Kazakhstan
050040
Tel: +7(727) 334 1310

MOSCOW
21/5 Kuznetskiy Most St.
Moscow
Russia
Tel: +7(495) 626 07 67

wardell armstrong

Appendix 5.14 – Wintering Birds Survey Update Interim Technical Note

Technical Note

PROJECT:	LD10318 Extra MSA Warrington
SUBJECT:	Wintering Bird Survey Update – interim results.
NOTE REF:	001
DATE:	16/12/2021
PREPARED BY:	Thomas Frost – Ecologist
REVIEWED BY:	Tim Palmer – Technical Director

1 INTRODUCTION

1.1 Wardell Armstrong was commissioned by Extra MSA Group Ltd to undertake Wintering Bird Surveys at the site of a proposed new motorway service area at Warrington, Ordnance Survey central Grid Reference SJ 67045 93576.

1.2 The surveys involve observing birds along a walked transect route, monthly between October and March. At the time of writing three surveys have been undertaken on the 20th October, 17th November and 14th December 2021. Theis report presents an interim assessment of the results.

2 METHODOLOGY

2.1 The surveys follow and update monthly surveys undertaken between January and March and October to December 2018. During both survey periods, particular attention was paid to the presence of wetland species such as lapwing *Vanellus vanellus* and golden plover *Pluvialis apricaria*. These species typically form large flocks on arable farmland during winter and can be faithful to certain sites. Lapwing are red listed birds of conservation concern[1] and are included as priority species within Cheshire's Biodiversity Action Plan[2], both species are experiencing declines and range contraction.

2.2 Field survey methods were based upon and adapted from British Trust for Ornithology (BTO) winter farmland bird survey methodology (Gillings et al. 2008). The survey visits

[1] https://www.bto.org/sites/default/files/publications/bocc-5-a5-4pp-single-pages.pdf
[2] https://www.cheshirewildlifetrust.org.uk/sites/default/files/2018-06/BAP%20list%20-%20updated%20April%202011.pdf

consisted of systematic walkovers of the site, recording all bird species observed or heard, and counts of numbers within wintering flocks.

2.3 The surveys were undertaken by a suitably qualified ecologist from Wardell Armstrong. The transect route was mapped out prior to the surveys being undertaken, paying particular attention to linear features (such as hedgerows and tree lines) and natural landscape features (such as watercourses and areas of scrub).

2.4 All fields were viewed from linear boundaries and all habitat features were surveyed to within 100 m where possible. The surveyor recorded all contacts with birds (either by sight or sound) by walking the pre-designated transect at a steady pace. The positions of the recorded birds were plotted as accurately as possible (to the nearest 10 – 20 m) on a suitably scaled base map. Standard BTO codes and symbols were used for mapping species, including, where detectable, sex and age (e.g. juvenile, immature or adult) and bird activity, including singing, alarm-calling, foraging, flight path and location.

3 RESULTS SUMMARY

3.1 Wetland species of note that have been surveyed to date include lapwing, snipe *Gallinago gallinago*, jack snipe *Lymnocryptes minimus*, mallard *Anas platyrhynchos*, grey heron *Ardea cinerea*, and tufted duck *Aythya fuligula*. Up to 14 snipe and 1 jack snipe have been recorded within a rush dominated area close to the site centre which appears to be of at least Local value to these species. Lapwing have been recorded once in flocks of up to 24 birds, mainly using land to the north of the site.

3.2 Notable passerine species include reed bunting *Emberiza schoeniclus*, song thrush *Turdus philomelos*, mistle thrush *Turdus viscivorus*, bullfinch *Pyrrhula pyrrhula*, willow tit *Poecile montanus*, long tailed tit *Aegithalos caudatus*, dunnock *Prunella modularis*, linnet *Carduelis cannabina* greenfinch *Chloris chloris* and stonechat *Saxicola rubicola*. All of which were previously recorded on site with the exception of stonechat, a likely passage visitor.

3.3 There have also been multiple raptor species recorded on site including buzzard *Buteo buteo*, sparrowhawk *Accipiter nisus* and merlin *Falco columbarius*, the latter not having being recorded by the previous surveys, is unlikely to be a winter resident but potentially on passage to coastal habitats or utilising the nearby peatland conservation sites for winter hunting grounds.

4 CONCLUSIONS

4.1 The interim survey results confirm that the site supported bird assemblage remains comparable to that recorded previously, with the exception of merlin and stonechat, which were not previously recorded. The transect route now includes the area of rush dominated pasture in the site centre, where snipe may well have remained unobserved during the 2018 surveys.

Appendix 5.15 – Preliminary Ecological Appraisal 2021 Update

wardell-armstrong.com

ENERGY AND CLIMATE CHANGE
ENVIRONMENT AND SUSTAINABILITY
INFRASTRUCTURE AND UTILITIES
LAND AND PROPERTY
MINING AND MINERAL PROCESSING
MINERAL ESTATES
WASTE RESOURCE MANAGEMENT

EXTRA MSA GROUP

MOTORWAY SERVICES, WARRINGTON

PRELIMINARY ECOLOGICAL APPRAISAL – 2021 UPDATE

JANUARY 2022

wardell armstrong

Wardell Armstrong
36 Park Row Leeds, LS1 5JL, United Kingdom
Telephone: +44 (0)113 831 5533 www.wardell-armstrong.com

DATE ISSUED:	**JANUARY 2022**
JOB NUMBER:	**LD10318**
REPORT NUMBER:	**001**
VERSION:	**V0.2**
STATUS:	**Final**

EXTRA MSA GROUP

MOTORWAY SERVICES, WARRINGTON

PRELIMINARY ECOLOGICAL APPRAISAL – 2021 UPDATE

PREPARED BY:

Amy Scott	Ecologist	

REVIEWED BY:

Tim Palmer	Associate Director-Ecology	

APPROVED BY:

Tim Palmer	Associate Director-Ecology	

CONTENTS

APPENDICES

DRAWINGS	TITLE	SCALE
LD10276/001	Designated Sites	1:25,000@A3
LD10276/002	Waterbody Location Plan	1:6,000@A3
LD10276/003	Extended Phase 1 Habitat Survey Results (Update)	1:3,000@A3

EXECUTIVE SUMMARY

Wardell Armstrong LLP (WA) was commissioned by Extra MSA Group to undertake an updated Preliminary Ecological Appraisal (PEA) of land north of M62 Junction 11. The land is the site of a proposed new Motorway Services Area. The original PEA was undertaken in October 2018.

The update confirms that the previous survey data remain valid, with only minimal changes to the habitats on site mainly from scrub encroachment and changes in grassland composition. Notwithstanding this, and given the age of previous protected species surveys, which in the main were undertaken during 2018/19, a number of survey updates are being undertaken, the results of which will inform the detailed design proposals for the site.

Survey updates include the following taxa:

- Breeding birds;
- Wintering birds; and
- Water voles.

1 INTRODUCTION

1.1 Terms of Reference

1.1.1 Wardell Armstrong LLP (WA) was commissioned by Extra MSA Group to undertake a Preliminary Ecological Appraisal (PEA) update of a proposed Motorway Services Area development (hereafter referred to as the 'development'), located on the northern side of the M62 at Junction 11, central Ordnance Survey (OS) grid reference: SJ 67053 93630. This report updates information provided in the original PEA during October 2018.

1.1.2 This report has been produced with reference to current guidelines for Preliminary Ecological Appraisal (Chartered Institute of Ecology and Environmental Management (CIEEM 2017)) and British Standard BS 42020:2013 (BSI 2013) which involves the evaluation of the potential presence of ecological receptors and adverse effects thereon, based on Extended Phase I (Joint Nature Conservation Committee (JNCC 2010)) survey data and background desk study.

1.1.3 The following ecological features have been considered:

- Statutory and non-statutory designated conservation areas;
- Local Biodiversity Action Plan (LBAP) habitats;
- Areas of Ancient Woodland;
- Legally protected species;
- Species listed within section 41 (s.41) of the NERC Act; and
- Invasive species.

1.1.4 Specific habitat features have been recorded in the update and are mapped on Drawing No. LD10276/003. Waterbody locations are mapped on Drawing No. LD10276/002 with appropriate reference numbers provided and Drawing No. LD10276/001 showing the Location of Statutory and Non-Statutory Conservation Sites.

1.2 Site Context

1.2.1 The proposed development site remains as previously located immediately adjacent to Junction 11 of the M62. The survey area (Site) covers the application area plus adjacent habitats where these are relevant to the assessment of potential adverse effects.

1.2.2 The wider landscape comprises arable farmland/pasture to the east, south east and north, a capped landfill directly west of the site and Birchwood Business and Technology Park to the south west.

1.2.3 Holcroft Moss Site of Special Scientific Interest is located approximately 1,080m east and Manchester Mosses Special Area of Conservation, Risley Moss Site of Special Scientific Interest and Risley Moss Local Nature Reserve are located approximately 1.4km south of the site.

2 METHODOLOGY

2.1 Desk Study

2.1.1 The desktop study was informed by review of existing available information provided by RECORD (Local Records Centre) and from available internet-based resources for a 2km search radius. A new search was undertaken to inform the update report.

2.1.2 OS and satellite mapping was also used to gain contextual habitat information. In addition, a 5km search radius was used for Special Protected Area's (SPA's), Special Areas of Conservation (SAC's) and Ramsar sites due to their ecological sensitivity. The search was also extended to 5km for statutory sites which are notified for their bat interest. OS and satellite mapping was also used to gain contextual habitat information.

2.1.3 Specific information was sought for:

- Statutory designated sites;
- Locally designated sites;
- Ancient woodland;
- Protected and/or notable species;
- NERCs.41 Priority Habitats and Species; and
- Local Biodiversity Action Plan (LBAP) priority habitats and species.

2.2 Extended Phase 1 Habitat Survey

2.2.1 Wardell Armstrong LLP carried out an updated Extended Phase 1 Habitat Survey of the Site on 25th August 2021. The weather conditions during the survey were dry, 15°C with 8% cloud cover, 0 rain and force 2 wind.

2.2.2 The survey broadly followed the 'Extended Phase 1' methodology (Institute of Environmental Assessment (IEA), 1995 and JNCC 2010). Each of the main habitats were classified according to the relevant criteria including vegetation composition expressed according to the DAFOR[1] system.

2.2.3 The Phase 1 habitat survey was completed by an Associate member of CIEEM, with experience within the last three years of completing PEAs of a variety of sites.

[1] D – Dominant, A – Abundant, F – Frequent, O- Occasional, R-Rare.

2.2.4 In addition to the mapping and description of habitats, incidental observations of protected and/or notable species and the potential for such species to occur on Site (and in the surrounding landscape where relevant).

2.3 Habitat Suitability Index Assessment for Great Crested Newt

2.3.1 In addition to the Extended Phase I Habitat Survey a great crested newt (GCN) *Triturus cristatus* Habitat Suitability Index (HSI) assessment was undertaken of accessible ponds within, and up to ~500m from, the site boundary.

2.3.2 This HSI assessment was conducted in accordance with good practice guidelines (Langton, Beckett and Foster 2001). This HSI scoring system assesses a waterbodies' suitability as an aquatic habitat for GCN following ARG UK (2010) methodology which is based on Oldham *et al* (2000).

2.3.3 The HSI is a simple model to provide an informed view of the value of a waterbody to support breeding populations of GCN, which involves assessing waterbodies based on ten habitat parameters that are known to influence breeding populations of GCN. A score between 0 and 1 is assigned to each parameter, based on field observations. The tenth root of the product of these parameters is then calculated, giving a figure for habitat suitability.

2.3.4 The parameters to which a quantitative figure is assigned are:

- Location;
- Pond area;
- Pond drying;
- Water quality;
- Shade;
- Wildfowl presence;
- Fish presence;
- No. of ponds within 1km;
- Quality of terrestrial habitat; and
- Presence of macrophytes.

2.3.5 The calculated HSI score is used to define the suitability of the pond on a categorical scale, as shown in Table 1 below. It should be noted, however, that the system is not sufficiently robust to reliably infer presence/absence of great crested newt.

Table 1: Great Crested Newt HSI Scoring System	
HSI Score	**Pond Suitability for GCN**
<0.5	**Poor**
0.5-0.59	**Below average**
0.6-0.69	**Average**
0.7-0.79	**Good**
>0.8	**Excellent**

2.3.6 Typically, ponds which return an HSI score of 0.5 (below average) or higher are considered be suitable for GCN and therefore require further surveys to determine GCN population class size.

2.3.7 GCN are also known to use ditches and culverts as commuting corridors, therefore any connective linear waterbodies within 500m of the study area boundary were also visually assessed for their suitability to support GCN.

2.4 Nomenclature

2.4.1 Vascular plant names follow '*New Flora of the British Isles*' (Stace 2010) with vernacular names as provided in the Botanical Society of the British Isles website (BSBI, 2013)[2]. All other flora and fauna names following the National Biodiversity Network (NBN) Atlas (NBN, 2017). The common and scientific name of species/taxa is provided (if available) when first mentioned in the text, with only the vernacular name referred to thereafter.

2.5 Caveat

2.5.1 Ecological surveys are limited by factors that affect the presence of plants and animals such as time of year, weather, migration patterns and behaviour. The survey was undertaken in August and therefore represents a valid sample of ecological evidence present on that date/season. The report is not designed, nor is it required to present a complete inventory of flora/fauna.

2.5.2 In general terms this report remains valid for up to 2 years from the date of Extended Phase I Habitat survey, however a walkover survey within this period may be required to demonstrate whether or not the habitats have remained as described. Note, survey

[2] http://rbg-web2.rbge.org.uk/BSBI/intro.php

results for European Protected Species typically require updates within 3 months of licence applications being submitted. Additional checks may also be necessary prior to the onset of development work for certain species to ensure legal compliance.

2.5.3 The absence of desk study records is not relied upon to determine absence of a particular species/habitat. Often, the absence of records is a result of under-recording within the given search area and as such the experience of the ecologist concerned together with a range of additional factors, in particular the presence/absence of potentially supporting habitat; is used to infer likely presence/absence of ecological receptors.

2.6 Quality Assurance & Environmental Management

2.6.1 The surveys and assessments have been overseen by and the report checked and verified by a member of CIEEM, whom is bound by its code of professional conduct. All surveys and assessments have been undertaken with reference to the recommendations given in British Standard BS 42020, and as stated within specialist guidance, as appropriate and referenced separately.

3 RESULTS AND EVALUATION

3.1 Statutory and Non- Statutory Conservation Sites

3.1.1 Desk study results for conservation sites are evaluated in Table 1, below. **The assessment remains unchanged from 2018.**

3.1.2 Sites which are considered potentially sensitive to the development proposals by virtue of their supported species or habitat assemblages, the distance/ecological connectivity to the application site and the nature of the perceived impacts are highlighted in **bold text** and are discussed in detail in the final sections of the report.

3.1.3 Sites for which potential adverse effects are not anticipated are excluded from further assessment.

Table 1: Statutory and Non-Statutory Sites Evaluation

Site Name and Status[3]	Reason for Designation/identification	Proximity, and provisional assessment of impacts/update
Manchester Mosses (SAC) and Astley & Bedford Mosses (SSSI).	**Presence of degraded raised bog which is capable of natural restoration.**	**3,881m northeast.** **No changes to previous assessments required.**
Manchester Mosses (SAC) Risley Moss (SSSI), LNR.	**The breeding bird assemblage of this unit remains in favourable condition and the site is critical to the hydrological integrity of the adjacent lowland raised bog habitat, supporting areas W4a lagg fen woodland.** **Habitats of mossland, mixed woodland and grass meadow supporting notable species. Three distinctly different ponds lie within the woodland, supporting an important and diverse range of aquatic life.**	**1,410m south.** **No changes to previous assessments required.**
Rixton Clay Pits (SAC), Rixton Clay	Former clay pits with a rich mosaic of wet grassland, woodland and open	3,250m south.

[3] SPA – Specially Protected Area, SAC – Special Area for Conservation, Ramsar – site designated under the Ramsar Convention, SSSI – Site of Special Scientific Interest, NNR – National Nature Reserve, LNR – Local Nature Reserve.

Site Name and Status[3]	Reason for Designation/identification	Proximity, and provisional assessment of impacts/update
Pits (SSSI) and LNR.	water, scattered ponds and associated swamp habitats. Of national importance for its calcareous grassland communities and of international importance because the site supports the county's largest known breeding population of great crested newts.	No potential adverse effects due to separation distance and lack of connectivity.
Holcroft Moss (SSSI). **890m west**	**The moss occupies several small depressions in the Upper Terrace of the Mersey Valley and is an isolated remnant of the once extensive area of mossland formerly associated with this valley.**	**890m west.** **No changes to previous assessments required.**
Woolston Eyes (SSSI).	Woolston Eyes SSSI is a nationally important site for its breeding bird assemblage of lowland open waters and their margins, and for wintering wildfowl.	4,565m south. No potential adverse effects due to separation distance and lack of connectivity.
Gorse Covert Mounds (LWS).	A mosaic of mixed woodland, meadows and ponds, located between Risley and the M62, connected to Risley Moss SSSI/LWS via a green corridor.	87m south. No potential adverse effects due to lack of connectivity (presence of M62).
Pestfurlong Moss (LWS).	**A lowland raised bog habitat with scrub and woodland. Pestfurlong Moss connects the larger Risley and Holdcroft mosses.**	**No changes to previous assessments required.**
Silver Lane Risley (LWS)	**Public bridleway with open pools and a mosaic of hedgerow, scrub and grassland habitats.**	**618m west.** **No changes to previous assessments required.**

3.1.4 The search area is extended to allow for the inclusion of Impact Risk Zones (IRZs) for SSSIs[4]. IRZs define areas around SSSI's which could be impacted by development schemes. The zones vary depending on the particular sensitivities of the features for which the SSSI is notified and indicate the types of development proposal which could

[4]https://data.gov.uk/dataset/sssi-impact-risk-zones

potentially have adverse impacts. The desk study shows that the application site falls within an IRZ, however the MSA development is not one which is listed as potentially causing harm.

Habitats

3.1.5 All habitats within the survey area are described in Table 2, below, together with an indication of their NERC s41[5] and within the Cheshire Local BAP[6]. The table also provides an evaluation of the sensitivity of the habitats relative to the application proposals. Any changes to the habitats since the previous surveys are noted in the text.

3.1.6 Habitats which could be subject to adverse effects or have been subject to modifications since the earlier surveys are indicated with **bold text** and are discussed in the latter sections of the report. Habitats for which potential adverse effects are not anticipated are excluded from further assessment. The location and extent of habitats is shown on Drawing LD10276/003, Extended Phase 1 Habitat Survey Results (Update).

[5]Habitats listed under section 41 of the Natural Environment and Rural Communities (NERC) Act as habitats of Principal Importance

[6]https://www.cheshirewildlifetrust.org.uk/sites/default/files/2018-06/BAP%20list%20-%20updated%20April%202011.pdf

Table 2: *Habitat Description and Evaluation*

Habitat type and description	NERC s.41 Priority Habitat	LBAP Habitat
Arable Arable farmland dominates the survey area and includes an area of cereals and perennial rye-grass silage. This habitat is actively disturbed by agricultural operations and was being cut at the time at the time of survey. Narrow arable margins are present dominated by cock's-foot *Dactylis glomerata*, Yorkshire-fog *Holcus lanatus*, creeping bent *Agrostis stolonifera* with occasional cleavers *Gallium aparine*, rosebay willowherb *Chamerion angustifolium*, bramble *Rubus fruiticosus* agg. and common nettle *Urtica dioica*.  **This habitat remains as previously reported although in 2018 the crop was of autumn sown cereal (barley/wheat), additionally a small area of impeded drainage is now apparent in the southern/central parts of the site which supports dense stands of soft rush *Juncus effusus*, with frequent creeping buttercup *Rannunculus repens* and creeping bent.**	**X**	**X**
Neutral grassland, tall ruderal and scrub A mosaic of unmanaged tall ruderal, semi-improved (neutral) grassland and scrub is present along the southern and western boundaries of the site including alongside the Silver Lane Brook. Unmanaged neutral grassland being the dominant type with variable areas of continuous/scattered scrub and tall ruderal vegetation also present. Species present include great willowherb *Epilobium hirsutum* (D), broadleaved dock *Rumex obtusifolius* (D), creeping thistle *Cirsium arvense* (D), common reed *Phragmites australis* (A), perennial rye-grass *Lolium perenne* (A), cock's-foot (A), bramble (F), common nettle (F), vetch spp. (O), alder *Alnus glutinosa* (O), elder *Sambucus nigra* (R), common ragwort *Senecio jacobaea* (R) and pedunculate oak *Quercus robur (*R).	X	X

Habitat type and description	NERC s.41 Priority Habitat	LBAP Habitat
 **This habitat remains relatively unchanged from 2018 although areas of scrub appear to be marginally larger.**		
Tall Ruderal and (wet) Neutral Grassland There is a small area of neutral grassland which appears to be in places wet with marshy grassland elements (less apparent than during the earlier survey), within the larger area of tall ruderal habitat located along the western boundary. The species composition includes common bulrush *Typha latifolia* (LD) and common reed *Phragmites australis* (LD), cock's-foot (F), perennial rye-grass (O), great willowherb (O) and marsh thistle *Cirsium pallustre* (R).  **This habitat remains unchanged although marshy grassland elements are now less apparent with the sword largely dominated by tussocky neutral grassland and tall ruderals.**	**X**	**X**

Habitat type and description	NERC s.41 Priority Habitat	LBAP Habitat
<u>Broadleaved scattered trees</u> Bordering the eastern boundary of the site, a line of silver birch *Betula pendula* (D) trees is present with elder (F) and grey willow *Salix cinerea* (R). The ground flora is comprised of a large stand of Indian balsam *Impatiens glandulifera* (D), common nettle (D), fern sp. (A), moss spp., (A), bramble (F), cock's-foot (F) and perennial rye-grass (F). **The margins of this habitat (especially to the west) are wider than in previous years with dense Indian balsam in places.** A mosaic of grassland, self-set scrub vegetation and broadleaved trees of similar composition and age are also present to the west of the site, including alongside the Brook where you alder trees are dominant. Occasional birch *Betula spp.,* goat willow *Salix caprea,* crack willow *Salix fragilis* are also present.  Individual semi-mature silver birch trees are also present along the northern boundary of the site, with a dense covering of ivy present. 	**X**	**X**

Habitat type and description	NERC s.41 Priority Habitat	LBAP Habitat
<u>Mesotrophic running water</u> Along the western boundary is a wet ditch (Silver Lane Brook) with running water flowing from the southern boundary to beyond the northern boundary. At the time of the survey, water levels were low with the ditch approx. 1m wide. The banks are vegetated with perennial rye-grass (A), cock's-foot (A), common reed (A), great willowherb (A), common nettle (F), and vetch spp. (R).  This habitat remains as previously described, although a greater proportion of Buddleia scrub was noted and in places there are stands of Indian balsam.	**X**	**X**
<u>Dry ditch</u> Running along the eastern boundary under the treeline is a dry ditch. The banks were partly bare, with eroding and exposed peat along the majority of the banks. Species present include Indian balsam (D), mosses (F), bramble (O), fern sp. (O) and common nettle (O). **This habitat remains as previously described.**	X	X

Habitat type and description	NERC s.41 Priority Habitat	LBAP Habitat
		
<u>Semi-natural broadleaved woodland</u> Within with north western and south western boundary are small areas of semi-natural broadleaved woodland with high coverage of leaf litter and dead wood. Tree species present include Lombardy poplar *Populus nigra* (D), goat willow *Salix caprea* (F), birch spp., *Betula* (F), hawthorn *Crataegus monogyna* (O) and alder (R). The ground layer is dominated with bramble (D) with common nettle (F), great willowherb (O), cleaver (O), Yorkshire fog (F) and broad-leaved dock (O). **This habitat remains as previously described.** 	✓	✓
<u>Standing water</u> A dry waterbody (WB11) was present in the western extent of the survey area. Although dry at the time of survey, the pond likely holds water seasonally as bulrush *Typha latifolia* is present. The waterbody banks are vegetated with neutral grassland, tall ruderal and scrub mosaic. **This habitat remains as previously described.**	✓	✓

Habitat type and description	NERC s.41 Priority Habitat	LBAP Habitat
		
Hard Standing An area of hard standing used as parking and as an access track present along the south-west of the site.  Adjacent to the access track, a large stand of dense buddleia *Buddleia davidii* dogwood *Cornus sanguinea*, hawthorn and bramble scrub is present. 	X	X
Building/structure A dilapidated agricultural shed was present in the north western extent of the survey area. The roof was comprised of corrugated sheeting,	X	X

Habitat type and description	NERC s.41 Priority Habitat	LBAP Habitat
		

3.2 Species

3.2.1 Sightings and/or evidence of protected and/or invasive species from the field survey are described below.

Badger

3.2.2 Mammal excavations were recorded within a dense stand of Indian balsam, adjacent to a line of broadleaved trees along the eastern boundary of the Site. Spoil heaps were present, and holes were active. No badger latrines were identified at the time of survey or other badger evidence but well-worn mammal paths were noted leading beyond the Site boundary eastward.

3.2.3 Subsequently, a camera trap was placed within the eastern boundary ditch facing the entrance holes and a large part of the well-worn mammal paths within the ditch. Over 2 weeks of data were recorded from this trap and no badgers were observed during the footage recorded. Rabbits were filmed using the entrance holes and it is likely that this is part of the larger rabbit warren with enlarged entrance holes due to soil erosion. During subsequent visits to the site for wintering bird surveys, no other evidence of badger has been observed.

Invasive Plants

3.2.4 Stands of Indian balsam were identified in the eastern boundary and surrounding watercourses to the northwest. Large areas of buddleia were present adjacent to hardstanding and scrub along the eastern boundary along with a single Japanese rose *Rosa rugosa*.

3.3 Protected Species Evaluation

3.3.1 Protected and NERC s.41 Priority species are evaluated in order to identify potential adverse effects in Table 4 below, based on the following criteria:

- Desk study records;
- Evidence found during the survey;
- Presence, extent, quality, and viability of supporting on-site habitat;
- Ecological connectivity to viable off-site habitats; and
- Perceived impacts of habitat loss/impact to individuals in relation to proposals.

3.3.2 Species for which adverse effects are predicted are indicated in bold text and are discussed in more detail in the Discussion and Recommendations section. Species/taxa for which potential adverse effects are not anticipated are excluded from further assessment. In all cases, with the exception of badger, the assessment remains as previously described. Update protected species survey requirements are discussed in the final section of the report.

Table 4: Species Evaluation				
Receptor(species/taxa)	**Description of Desk Study records**	**Status[7]**	**Supporting Habitat(s)Present**	**Potential Adverse Effects**
Bats *Chiroptera*	✓	**EPS, WCA, s.41, LBAP**	**Tree line commuting habitat, scrub and wet grassland foraging habitat.**	**Adverse impacts are limited to minor disturbance to foraging bats and loss of commuting habitat, in the absence of mitigation. Impacts to roosting bats are unlikely although additional inspections will be required to establish presence of roost features within trees.**
Badger *Meles meles*	✓	**BA**	**There are no confirmed setts on site. Suitable foraging habitat is present in the immediate survey area and connected to it in the wider landscape.**	**It is possible sett creation habitat will be disturbed associated with the tree line along the eastern site boundary.**
Brown hare *Lepus europaeus*	✓	**s.41**	**Open expanses of farmland and scrub habitat.**	**Minor loss of arable farmland habitat to development platform and minor disturbance of surrounding land. Habitat losses are not anticipated to negatively impact local populations, given the wide availability of similar habitat.**

[7] EPS – European Protected Species, WCA – Wildlife and Countryside Act, A1 – Annex 1 (Birds Directive), BA – Protection of Badgers Act, s.41- species listed under section 41 of the NERC Act as species of principal importance

Table 4: Species Evaluation				
Receptor(species/taxa)	**Description of Desk Study records**	**Status[7]**	**Supporting Habitat(s)Present**	**Potential Adverse Effects**
European hedgehog *Erinaceus europaeus*	No records.	s.41	Negligible suitable habitat restricted to tree line along eastern site boundary only.	As above.
Dormouse *Muscardinus avellanarius*	No records.	EPS, WCA, s.41	No suitable habitat.	N/a
Otter *Lutra lutra*	No records.	EPS, WCA, s.41	Running water habitat present on site is sub-optimal as it is shallow and unlikely to support prey species.	Presence is considered very unlikely given unsuitability of habitat and lack of historical records for area.
Water Vole *Arvicola amphibia*	**Recorded at 59m west.**	**WCA, s.41**	**The running water habitat on site is sub-optimal for water vole given the shallow water and narrow profile.**	**Minor area of sub-optimal foraging and burrowing habitat may be lost or impacted in the absence of mitigation.**
Reptiles	✓	**WCA, s.41**	**The neutral grassland and scrub habitats present on site are sub-optimal, given that they appear to be relatively recent in origin – however the ditch margins which are linked to ponds off site may support grass snake *Natrix natrix*.**	**Species are likely to be absent, other than grass snake which may utilise the ditch banks as commuting/dispersal habitat between ponds and areas of established grassland. Modification of ditches may result in incidental harm in the absence of mitigation.**
Great Crested Newt *Triturus cristatus*	**Closest record at 870m east.**	**EPS, WCA, s.41, LBAP**	**Moderate terrestrial habitat for foraging and hibernating associated with neutral grassland along western site boundary.**	**Minor loss of moderate terrestrial habitat potentially resulting incidental harm in the absence of mitigation.**

Table 4: Species Evaluation				
Receptor(species/taxa)	**Description of Desk Study records**	**Status[7]**	**Supporting Habitat(s)Present**	**Potential Adverse Effects**
Common Toad *Bufo bufo*	✓	s.41	The scrub and running water habitats on site are sub-optimal.	Species is likely to be absent, minor losses of sub optimal terrestrial habitat would not significantly impact local populations.
White-clawed Crayfish *Austropotamobius pallipes*	No records.	EPS, WCA, s.41	No suitable habitat.	No adverse effects.
Birds	**Barn owl were recorded 351m from site. Amber listed species include kingfisher, kestrel, bullfinch and greenshank. Red listed species include marsh tit, corn bunting, mistle thrush and house sparrow.**	**s.41, WCA BoCC, LBAP**	**Foraging and breeding habitat is present across the site and surrounding landscape.**	**Nesting and foraging habitat will be lost or disturbed in the absence of mitigation. The open fields could support notable assemblages of waterbirds which may be displaced by the development.**
Protected/notable Plant Species	No records.	s.41, LBAP	The site is considered unsuitable to support protected plant species.	No adverse effects.
Protected/notable Invertebrate Species	No records.	s.41	As the site is dominated by arable land suitable habitats are restricted to the site margins.	Given that the majority of the development platform will be located within the

Table 4: Species Evaluation				
Receptor(species/taxa)	**Description of Desk Study records**	**Status[7]**	**Supporting Habitat(s)Present**	**Potential Adverse Effects**
				intensively farmed, arable land area no adverse effects are anticipated.
Bats *Chiroptera*	✓	**EPS, WCA, s.41, LBAP**	**Tree line commuting habitat and tree line, scrub and wet grassland foraging habitat.**	**Adverse impacts are limited to minor disturbance to foraging bats and loss of commuting habitat, in the absence of mitigation. Impacts to roosting bats are unlikely although additional inspections will be required to establish presence of roost features within trees.**

4 DISCUSSION AND RECOMMENDATIONS

4.1 Sensitive Receptors

4.1.1 The 2021 update assessment concludes that the original assessments still remain valid.

4.1.2 The following conservation sites, habitats, and species (receptors) still remain pertinent to the MSA application, with the EcIA assessment parameters remaining consistent with the previous work. Such receptors are as follows:

- Statutory and non-statutory conservation sites;
- Protected species (Great crested newt, bats, badger, water vole, reptiles);
- Breeding and wintering birds; and
- Nesting birds.

4.1.3 The updated PEA confirms no significant habitat changes although update surveys are being undertaken for the following species during 2021/22:

- Breeding birds;
- Wintering birds; and
- Water voles.

4.1.4 The results of the updated surveys will be available to inform the detailed design of the proposals

4.1.5 Methodology for Breeding Bird Surveys should seek to repeat the previous approach albeit six survey visits are now required under recent changes to survey guidelines and must include at least one dawn and one evening survey.

4.1.6 All birds exhibiting territorial behaviour i.e. singing, calling, alarm calling, fighting, carrying nesting material, carrying faecal sacs/egg shell fragments, nest building, mating; would be recorded using standard BTO notation (Marchant 1983). Indicative territory mapping would be undertaken based on the analysis of activity clusters as described in Marchant (1983). In addition to indicative territory analysis, further evaluation of the site assemblage would be undertaken according to Fuller, R.J (1980).

4.1.7 Wintering bird surveys would be required during October to March (inclusive). The surveys would utilise the same methodology as the breeding bird surveys outlined above.

4.1.8 All waterbodies to be impacted by the proposals should be subject to two surveys to determine presence/absence and to map the location of all evidence recorded. Each survey would comprise a search of riparian and waterbody edge habitat for characteristic signs of water vole activity, such as burrows, feeding remains, tracks, latrines, feeding 'lawns', and the animals themselves. In compliance with best practice guidelines (Strachan and Moorhouse, 2016).

4.2 Conclusion

4.2.1 The 2021 update assessment confirms that there are no significant changes to the baseline habitats and hence the previous assessments remain valid. Update surveys for breeding and wintering birds and water vole are being undertaken and will contribute towards the detailed design proposals in due course.

5 REFERENCES

ARG UK. (2010). ARG UK Advice note 5: Great Crested Newt Habitat Suitability Index. Retrieved from https://www.arguk.org/info-advice/advice-notes/9-great-crested-newt-habitat-suitability-index-arg-advice-note-5/file

Botanical Society of the British Isles. (2013). *Online atlas of the British and Irish Flora* http://www.brc.ac.uk/plantatlas/index.php?q=title_page

British Standards Institute. (2013). Biodiversity – Code of Practice for Planning and Development.

CIRIA. (2015). *Environmental Good Practice on Site Guide.*

Institute of Environmental Assessment. (1995). *Guidelines for Baseline Ecological Assessment*.

Chartered Institute of Ecological and Environmental Management. (2017). *Guidelines for Preliminary Ecological Appraisal*.

Joint Nature Conservation Committee. (2010). *Handbook for Phase 1 habitat survey: A technique for environmental audit*, English Field Unit, Nature Conservancy Council.

Langton, T., Beckett, C. and Foster, J. (2001). *Great Crested Newt Conservation Handbook*. Froglife, Halesworth.

National Biodiversity Network. (2017). NBN Atlas http://data.nbn.org.uk/

Oldham R., Keeble J., Swan M. & Jeffcote M. (2000). *Evaluating the suitability of habitat for the Great Crested Newt (Triturus cristatus)*. Herpetological Journal 10 (4), 143-155.

Stace. C. A. (2010). *New Flora of the British Isles*. Cambridge University Press.

Strachan, R. & Moorhouse, T. (2006). Water vole conservation handbook 2nd edition. Wildlife Conservation Research Unit, Oxford, 132pp.

Wardell Armstrong (2018) Preliminary Ecological Appraisal

APPENDICES

APPENDIX 1

Legislation and Policy Summary

Appendix 1 – Legislation and Policy Summary

Legislation for Habitats/Sites

Designated Site/Habitat	Status
Ramsar Sites	Ramsar Sites are wetlands of international importance designated following The Ramsar Convention. RAMSAR sites have the same level of protection as SSSIs under the Wildlife and Countryside Act 1981 (as amended).
SPA (Special Protection Areas)	SPAs seek to protect the habitats of rare and vulnerable European and UK birds. The Wildlife and Countryside Act 1981 (as amended) and the Conservation of Habitats and Species Regulations 2017 protect such sites in the UK.
SAC (Special Areas for Conservation)	SACs are strictly protected areas which represent important and threatened habitats in Europe and the UK. The Wildlife and Countryside Act 1981 (as amended) and the Conservation of Habitats and Species Regulations 2017 protect such sites in the UK.
SSSI (Sites of Special Scientific Interest)	SSSIs protect the best examples of the UK's flora, fauna, or geological or physiographical features. Originally notified under the National Parks and Access to the Countryside Act 1949, SSSIs were renotified under the Wildlife and Countryside Act 1981 (as amended). Modified provisions for the protection and management of SSSIs were introduced by the Countryside and Rights of Way Act 2000.
NNR (National Nature Reserves)	NNRs are examples of some of the most important natural and semi-natural terrestrial and coastal ecosystems in Great Britain. NNRs are declared by the statutory country conservation agencies under the National Parks and Access to the Countryside Act 1949 and the Wildlife and Countryside Act 1981 (as amended). Legal protection of NNRs is provided under The Wildlife and Countryside Act 1981 (as amended).
Hedgerows	All hedgerows are protected by the Hedgerows Regulations 1997, under which it is an offence to remove or destroy certain hedgerows without planning consent or permission from the Local Planning Authority. These regulations do not apply to any hedgerow within the curtilage of, or marking the boundary of the curtilage of, a dwelling house.
LNR (Local Nature Reserves)	Designated by the National Parks and Access to the Countryside Act 1949, LNRs may be declared for nature conservation by local authorities after consultation with the relevant statutory nature conservation agency. Legal protection of LNRs is provided under The Wildlife and Countryside Act 1981 (as amended).

Legislation for Species

Species	Legal Status
Creeping Marshwort, Early Gentian, Fen Orchid, Floating-leaved Water Plantain, Killarney Fern, Lady's Slipper, Shore Dock, Slender Naiad, Yellow Marsh Saxifrage	Under the Conservation of Habitats and Species Regulations 2017 (and as amended), it is illegal to deliberately pick, collect, uproot or destroy any such species.
Bats, Dormouse, Otter, Wild Cat, Great Crested Newt, Natterjack Toad, Sand Lizard, Smooth Snake, Large Blue Butterfly	These animals and their breeding sites or resting places are protected under Regulation 41 of the Conservation of Habitats and Species Regulations 2017 (and as amended), which makes it illegal to: • Deliberately capture, injure or kill any such animal or to deliberately take or destroy their eggs; • Deliberately disturb[8] such an animal; and • Damage or destroy a breeding site or resting place of such an animal. European Protected Species (EPS) licenses can be granted by Natural England in respect of development to permit activities that would otherwise be unlawful under the Conservation Regulations, providing that the following 3 tests (set out in the EC Habitats Directive) are passed, namely: • The development is for reasons of overriding public interest; • There is no satisfactory alternative; and • The favourable conservation status of the species concerned will be maintained and/or enhanced. LPA's must consider the above 3 'tests' when determining whether Planning Permission should be granted for developments likely to cause an offence under the Conservation Regulations.
Bats, Dormouse, Great Crested Newt, Heath Fritillary, High Brown Fritillary, Large Blue, Marsh Fritillary, Natterjack Toad, Pine Martin, Otter, Red Squirrel, Sand Lizard, Smooth Snake, Swallowtail, Water Vole, Wildcat	These animals receive full protection under the Wildlife and Countryside Act 1981 (and as amended), which makes it illegal (subject to certain exceptions) to: • Intentionally kill, injure or take any such animal; • Intentionally or recklessly damage, destroy or obstruct any place used for shelter or protection; and

[8] Under the Conservation Regulations, disturbance of protected animals includes in particular any disturbance which is likely to: (i) impair their ability to survive, breed or reproduce, or to rear or nurture their young or to hibernate or migrate; (ii) significantly affect the local distribution or abundance of the species in question.

Species	Legal Status
	• Intentionally or recklessly disturb such animals while they occupy a place used for shelter or protection.
Adder, Common Lizard, Grass Snake, Slow Worm, White-clawed Crayfish	These animals receive partial protection under The Wildlife and Countryside Act 1981 (as amended by the Countryside and Rights of Way Act 2000), which provide protection against intentional killing or injury of any such animal.
Nesting Birds	All wild birds (as defined by the act) are protected under the Wildlife and Countryside Act 1981 (and as amended), which makes it illegal (subject to exceptions) to: • Intentionally kill, injure or take any wild bird; • Take, damage or destroy the nest (whilst being built or in use) or eggs of any wild bird.
WCA Schedule 1 listed Birds	Additional protection is provided to birds listed on Schedule 1 of the Wildlife and Countryside Act 1981 (and as amended). In addition to the offences detailed above relating to all wild birds, it is illegal to intentionally or recklessly disturb any bird listed on Schedule 1, or their dependent young while nesting.
Badgers	The Protection of Badgers Act 1992 makes it illegal to wilfully kill or injure a Badger, or attempt to do so and to intentionally or recklessly interfere with a Badger sett. This includes: • damaging or destroying an active sett; • obstructing access to a sett; and • disturbing a Badger while it is occupying a sett. Licences can be granted to permit sett closure and/or disturbance between July and November inclusive (i.e. outside the sow pregnancy/birth period).
Wild Mammals	The Wild Mammals (Protection) Act 1996 provides legal protection to all wild mammals (as defined by the act) against the following actions: mutilate, kick, beat, nail, or otherwise impale, stab, burn, stone, drown, crush, drag or asphyxiate any wild mammal with intent to inflict unnecessary suffering.
WCA Schedule 9 listed invasive animals (Part 1) and plants (part 2)	Certain species of plants and animals that do not naturally occur in Great Britain have become established in the wild and represent a threat to the natural fauna and flora. Section 14 of the WCA prohibits the release or allowed escape of animals listed in Schedule 9 to the Act and planting, or allowed growth, of any plant listed in Schedule 9 to the Act.

Policy Summary

Section 40 of the Natural Environment and Rural Communities (NERC) Act imposes a legal duty on Planning Authorities to 'have regard' to the conservation of biodiversity when considering planning applications.

Section 41 of the NERC Act requires the Secretary of State to publish a list of species and habitats of principal importance for conserving biodiversity in the UK. Such Biodiversity Action Plan (BAP) Habitats and Species (2007) do not offer the species any specific protection but help to highlight the species importance at a national level. This list is used by Local Planning Authorities to identify the species and habitats that should be afforded priority when applying the requirements of the National Planning Policy Framework (NPPF).

The NPPF underpins the Government's planning policies for England and how these are to be applied. The central theme of the NPPF is a presumption in favour of sustainable development. This presumption does not apply where development requiring Appropriate Assessment because of its potential impact on a habitats site is being planned or determined.

The NPPF states:

> *Planning policies and decisions should contribute to and enhance the natural and local environment by:*
>
> - *if significant harm resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;*
> - *development on land within or outside a Site of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact on the features of the site that make it of special scientific interest, and any broader impacts on the national network of Sites of Special Scientific Interest;*
> - *development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons58 and a suitable compensation strategy exists; and;*

- *development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to incorporate biodiversity improvements in and around developments should be encouraged, especially where this can secure measurable net gains for biodiversity;*
- *The following should be given the same protection as habitats sites:*

  a) potential Special Protection Areas and possible Special Areas of Conservation;

  b) listed or proposed Ramsar sites; and

  c) sites identified, or required, as compensatory measures for adverse effects on habitats sites, potential Special Protection Areas, possible Special Areas of Conservation, and listed or proposed Ramsar sites.

The presumption in favour of sustainable development does not apply where development requiring appropriate assessment because of its potential impact on a habitats site is being planned or determined.

The NPPF requires the Planning Authority to have a responsibility to promote the preservation, restoration and re-creation of priority habitats, ecological networks and the protection and recovery of priority species populations, linked to national and local targets, and identify suitable indicators for monitoring biodiversity in the plan. In addition, the planning system should contribute to and enhance the natural and local environment by minimising impacts on biodiversity and providing net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures.

DRAWINGS

wardell-armstrong.com

STOKE-ON-TRENT
Sir Henry Doulton House
Forge Lane
Etruria
Stoke-on-Trent
ST1 5BD
Tel: +44 (0)1782 276 700

BIRMINGHAM
Two Devon Way
Longbridge Technology Park
Longbridge
Birmingham
B31 2TS
Tel: +44 (0)121 580 0909

BOLTON
41-50 Futura Park
Aspinall Way
Middlebrook
Bolton
BL6 6SU
Tel: +44 (0)1204 227 227

BRISTOL
Desklodge
2 Redcliffe Way
Bristol
BS1 6NL

BURY ST EDMUNDS
6 Brunel Business Court
Eastern Way
Bury St Edmunds
Suffolk
IP32 7AJ
Tel: +44 (0)1284 765 210

CARDIFF
Tudor House
16 Cathedral Road
Cardiff
CF11 9LJ
Tel: +44 (0)292 072 9191

CARLISLE
Marconi Road
Burgh Road Industrial
Estate Carlisle
Cumbria
CA2 7NA
Tel: +44 (0)1228 550 575

EDINBURGH
Great Michael House
14 Links Place
Edinburgh
EH6 7EZ
Tel: +44 (0)131 555 3311

GLASGOW
2 West Regent Street
Glasgow
G2 1RW
Tel: +44 (0)141 433 7210

LEEDS
36 Park Row
Leeds
LS1 5JL
Tel: +44 (0)113 831 5533

LONDON
Third Floor
46 Chancery Lane
London
WC2A 1JE
Tel: +44 (0)207 242 3243

NEWCASTLE UPON TYNE
City Quadrant
11 Waterloo Square
Newcastle upon Tyne
NE1 4DP
Tel: +44 (0)191 232 0943

TRURO
Baldhu House
Wheal Jane Earth Science Park
Baldhu
Truro
TR3 6EH
Tel: +44 (0)187 256 0738

International offices:

ALMATY
29/6 Satpaev Avenue
Hyatt Regency Hotel
Office Tower
Almaty
Kazakhstan
050040
Tel: +7(727) 334 1310

MOSCOW
21/5 Kuznetskiy Most St.
Moscow
Russia
Tel: +7(495) 626 07 67

wardell armstrong

Appendix 5.16 – 2021 Update Habitat Survey and Biodiversity Net Gain Assessment

Motorway Services, Junction 11 M62,
Warrington

Update Habitat Survey and Biodiversity Net Gain Assessment

January 2022

Quality Management	
Client:	Extra MSA
Project:	Motorway Services, Junction 11 M62, Warrington
Report Title:	Update Habitat Survey and Biodiversity Net Gain Assessment
Project Number:	ECO6397
File Reference:	6397 BNG vf /LN/AB
Date:	07/01/2022

Copyright

Legal Guidance

The information set out within this report in no way constitutes a legal opinion on the relevant legislation (refer to the relevant Appendix for the main provisions of the legislation). The opinion of a legal professional should be sought if further advice is required.

Liability

This report has been prepared for the exclusive use of the commissioning client and unless otherwise agreed in writing by Aspect Ecology no other party may use, or rely on the contents of the report. No liability is accepted by Aspect Ecology for any use of this report, other than for the purposes for which it was originally prepared and provided. No warranty, express or implied, is made as to the advice in this report. The content of this report is partly based on information provided by third parties; Aspect accepts no liability for any reliance placed on such information. This report is subject to the restrictions and limitations referenced in Aspect Ecology's standard Terms of Business.

Contact Details

Aspect Ecology Ltd
Hardwick Business Park I Noral Way I Banbury I Oxfordshire OX16 2AF
t 01295 279721 e info@aspect-ecology.com
w www.aspect-ecology.com

Contents

Text:

Plans:

Appendices:

1 Introduction

1.1 Background and Proposals

1.1.1 Aspect Ecology is advising Extra MSA Group in respect of ecological issues relating to land at Junction 11 of the M62, Warrington, proposed for a Motorway Service Area (MSA). The application is the subject of an appeal.

1.1.2 To inform the appeal, Aspect Ecology has undertaken updated habitat survey work and a biodiversity impact assessment to determine the level of biodiversity net gain that could be achieved under the scheme. This work is based on the Biodiversity Metric calculation tool Defra 3.0 developed by Natural England and informed by biodiversity net gain guidance developed by CIRIA, CIEEM and IEMA. This note sets out the results of this survey work and assessment and supersedes a previous Biodiversity Offsetting Assessment (BOA) report prepared by Wardell Armstrong (December 2019).

1.2 Biodiversity Net Gain

Environment Act

1.2.1 The Environment Act establishes a comprehensive legal framework for environmental improvement within the UK, forming one of the key measures to deliver the vision set out under the 25 Year Environment Plan.

1.2.2 The Environment Act is intended to establish the structure for long-term environmental governance and accountability and includes key measures to drive improvements for nature. In particular, it lays the foundation for a Nature Recovery Network, and introduces a mandatory requirement for biodiversity net gain in the planning system, to ensure that new developments enhance biodiversity and create new green spaces for local communities to enjoy. This will require developments to deliver a 10% improvement in biodiversity value, albeit this will not be a legal requirement until the legislation is finalised, currently anticipated to be autumn 2023.

Good Practice Principles for Development

1.2.3 CIRIA, CIEEM and IEMA have developed a set of principles on good practice to achieve Biodiversity Net Gain[1], accompanied by a practical guide[2]. These principles provide a framework that helps improve the UK's biodiversity by contributing towards strategic priorities to conserve and enhance nature while progressing with sustainable development. They also provide a way for industry to show that projects follow good practice. Ten key principles are identified:

1) **Apply the Mitigation Hierarchy.** Do everything possible to first avoid and then minimise impacts on biodiversity. Only as a last resort, and in agreement with external decision-makers where possible, compensate for losses that cannot be avoided. If compensating for losses within the development footprint is not possible or does not generate the most benefits for nature conservation, then offset biodiversity losses by gains elsewhere.

[1] CIEEM, CIRIA, IEMA (2016) *Biodiversity Net Gain: Good practice principles for development.*
[2] CIEEM, CIRIA, IEMA (2019) *Biodiversity Net Gain: Good practice principles for development. A practical guide.*

2) **Avoid losing biodiversity that cannot be offset by gains elsewhere.** Avoid impacts on irreplaceable biodiversity - these impacts cannot be offset to achieve No Net Loss or Net Gain.

3) **Be inclusive and equitable.** Engage stakeholders early, and involve them in designing, implementing, monitoring and evaluating the approach to Net Gain. Achieve Net Gain in partnership with stakeholders where possible, and share the benefits fairly among stakeholders.

4) **Address risks.** Mitigate difficulty, uncertainty and other risks to achieving Net Gain. Apply well-accepted ways to add contingency when calculating biodiversity losses and gains in order to account for any remaining risks, as well as to compensate for the time between the losses occurring and the gains being fully realised.

5) **Make a measurable Net Gain contribution.** Achieve a measurable, overall gain for biodiversity and the services ecosystems provide while directly contributing towards nature conservation priorities.

6) **Achieve the best outcomes for biodiversity.** Achieve the best outcomes for biodiversity by using robust, credible evidence and local knowledge to make clearly-justified choices when:

   - Delivering compensation that is ecologically equivalent in type, amount and condition, and that accounts for the location and timing of biodiversity losses
   - Compensating for losses of one type of biodiversity by providing a different type that delivers greater benefits for nature conservation
   - Achieving Net Gain locally to the development while also contributing towards nature conservation priorities at local, regional and national levels
   - Enhancing existing or creating new habitat
   - Enhancing ecological connectivity by creating more, bigger, better and joined areas for biodiversity

7) **Be additional.** Achieve nature conservation outcomes that demonstrably exceed existing obligations (i.e. do not deliver something that would occur anyway).

8) **Create a Net Gain legacy.** Ensure Net Gain generates long-term benefits by:

   - Engaging stakeholders and jointly agreeing practical solutions that secure Net Gain in perpetuity
   - Planning for adaptive management and securing dedicated funding for long-term management
   - Designing Net Gain for biodiversity to be resilient to external factors, especially climate change
   - Mitigating risks from other land uses
   - Avoiding displacing harmful activities from one location to another
   - Supporting local-level management of Net Gain activities

9) **Optimise sustainability.** Prioritise Biodiversity Net Gain and, where possible, optimise the wider environmental benefits for a sustainable society and economy.

10) **Be transparent.** Communicate all Net Gain activities in a transparent and timely manner, sharing the learning with all stakeholders.

2 Methodology

2.1 Habitat Survey

2.1.1 The site was surveyed in November 2021 in order to ascertain the general ecological value of the land contained within the boundaries of the site and to identify the main habitats and ecological features present.

2.1.2 The site was surveyed based on standard Phase 1 Habitat Survey methodology[3], whereby the habitat types present are identified and mapped, together with an assessment of the species composition of each habitat. The site was classified into areas of similar botanical community types, with a representative species list compiled for each habitat identified. The nomenclature used for plant species is based on the Botanical Society for the British Isles (BSBI) Checklist.

2.1.3 During the Phase 1 Habitat Survey, the condition of each habitat type was also assessed in accordance with the Defra Biodiversity Metric version 3.0 guidance (as detailed below).

2.1.4 In addition, a specific survey was undertaken of the Silver Lane Brook in January 2022 using the Modular River Physical (MoRPh) Survey method[4]. Specifically a MultiMoRPh5 survey was undertaken comprising a desktop and field survey. The desktop survey assessed an extended reach of the river to determine the indicative river type. This was combined with a field survey using 5 equally spaced sample sections of some 25 metres in length. This provided a ~20% sample of the on-site reach (~650m) of the Brook.

2.1.5 Thirty-two Condition Indicator scores are estimated from the MoRPh field survey data. The Condition Indicators score a series of 'natural' (positive) and human-impacted (negative) properties of the bank tops, bank faces and river bed within each MoRPh5 subreach. The Condition Indicators are assigned scores ranging from 0 to +4 (positive indicators) or 0 to -4 (negative indicators) based on a numerical synthesis of subsets of survey observations. The average positive and average negative Condition Indicator scores for each MoRPh5 subreach are added together to generate a Preliminary Condition score. A Final Condition assessment is then assigned to each MoRPh5 subreach based on the Preliminary Condition score and the River Type being assessed.

2.2 Survey Constraints and Limitations

2.2.1 All of the species that occur in each habitat would not necessarily be detectable during survey work carried out at any given time of the year, since different species are apparent during different seasons. The Phase 1 habitat survey was undertaken outside the optimal season. However, previous survey work has been completed at the site within the optimal season (Wardell Armstrong, August 2021) and therefore a robust assessment of the habitats and botanical interest across the site could be made.

2.2.2 A MoRPh survey can be undertaken at any time of year[4], with the optimal survey months being May and September. Hence the survey was satisfactory in nature and although undertaken outside of the optimal months, it was informed by the survey data from the previous Aquatic Ecology Assessment (River Corridor Survey) 2019[5] of the Silver Lane Brook

[3] Joint Nature Conservation Committee (2010, as amended) *'Handbook for Phase 1 habitat survey: A technique for environmental audit.'*
[4] The MoRPh Survey – Technical Reference Manual 2020 Version. Modular River Survey. Gurnell et al.
[5] Aquatic Ecology Assessment – Silver Lane Brook. Harris Lamb. May 2019

and the Preliminary Ecological Assessment September 2021 which provided seasonally favourable data and have informed the MoRPh assessment.

2.3 Biodiversity Net Gain Assessment

2.3.1 To quantify the level of biodiversity net gain that can be delivered under the proposed development, the change in biodiversity value resulting from the scheme has been calculated using the Defra Biodiversity Metric version 3.0 calculation tool and associated user guide[6]. This takes account of the size, distinctiveness and ecological condition of existing and proposed habitat areas to provide a proxy measure of the present and forecast biodiversity value of a site, and therefore determine the overall change in biodiversity value. These calculations are provided at Appendix 6397/1.

2.3.2 To establish the habitat baseline, broad habitat areas have been identified based on the survey work undertaken at the site, with habitat condition assigned based on the guidance set out in the Technical Supplement[7] and professional judgement.

2.3.3 The post-development habitat creation and enhancement is based on the 'Indicative Site Plan' RMS – 519 – ZZ – XX – DR – A – 0751 P9 (Architecture 519, 2019) and the 'Indicative Landscape Masterplan' LM1 (SLR Consulting, 2019). A number of assumptions have been made in terms of the detailed landscaping and management proposals, based on comparative developments and what is realistic and feasible under the proposed land uses and landscape space types. Further details of assumptions made in populating the metric are provided in Chapter 4 below.

[6] Natural England (July 2021) *Natural England Joint Publication JP039. Biodiversity Metric 3.0: auditing and accounting for biodiversity – User Guide.*
[7] Natural England (July 2021) *Natural England Joint Publication JP039. The Biodiversity Metric 3.0: auditing and accounting for biodiversity – Technical Supplement.*

3 Habitats and Ecological Features

3.1 Overview

3.1.1 The site is dominated by land under intensive agricultural production in the form or arable and grass leys for silage. In addition, a number of other habitats are present which are centred around the corridor of the Silver Lane Brook.

3.1.2 The following habitats/ecological features were identified within/adjacent to the site:

- Arable;
- Improved grassland
- Semi-Improved Grassland;
- Tall Ruderal;
- Woodland;
- Line of Trees;
- Scrub;
- Waterbodies;
- Watercourse;
- Drains;
- Hardstanding.

3.1.3 The locations of these habitat types and features are illustrated on Plan 4793/BNG1 and described in detail below.

3.2 Arable

3.2.1 Much of the land in the south-east of the site is under intensive arable production for cereal crops, with autumn sown Barley in the ground at the time of the 2021 survey. The arable is bordered by narrow field margins which are described separately. The land appears to be conventionally managed and is not in any agri-environment scheme, according to the MAGIC database and discussions with the land owners.

3.2.2 A condition assessment is not required for this habitat, which classifies within the metric as 'Cropland – cereal crops'.

3.3 Improved Grassland

3.3.1 The remainder of the land in the east of the site under agricultural production was down to re-seeded improved grassland at the time of survey, most likely for sileage. The sward was dominated almost exclusively by Perennial Rye-grass *Lolium perenne* with few weed species present.

3.3.2 A condition assessment is not required for this habitat, which classifies within the metric as 'temporary grass and clover leys'.

3.4 Semi-improved Grassland

3.4.1 Habitats in the west of the site located between the land in agricultural production and the restored land fill include a number of parcels of semi-improved grassland. Some seven distinct areas are present which are described below:

3.4.2 **SI1** is located in the north west of site on a moderate slope rising up from W1. SI1 comprises a long sward, dominated by coarse grasses which apparent at the time of survey included Cocksfoot *Dactylis glomerata*, Common Couch *Elytrigia repens*, Yorkshire Fog *Holcus lanatus*, False-Oat-grass *Arrhenatherum elatius* and Wood Small-reed *Calamagrostis epigejos* with Common Reed *Phragmites australis* invading grassland particularly in the south. Scattered herbs are present including Ribwort Plantain *Plantago lanceolata*, Birds-foot Trefoil *Lotus corniculatus*, Cow Parsley *Anthriscus sylvestris*, Creeping Buttercup *Ranunculus repens*, Common Vetch *Vicia sativa*, Stinging Nettle *Urtica dioica* and Creeping Thistle *Cirscium arvense*. Additional species within the grassland include Soft Rush *Juncus effusus*, Broad Leaved Dock *Rumex obtusifolius*, Male Fern *Dryopteris filix-mas* and Pendulous Sedge *Carex pendula*. The grassland is wet in places, with Hard Rush *Juncus inflexus* dominating these areas alongside Soft Rush, Great Willowherb *Epilobium hirsutum* and Common Fleabane *Pulicaria dysenterica*.

3.4.3 No apparent management is in place and as a result the grassland is being heavily invaded by scattered scrub, particularly species self-seeding from W1 such as Alder *Alnus glutinosa*, and likewise Dogwood *Cornus sanguinea* from the landscape planting in the adjacent restored landfill. Other scrub species present include Oak *Quercus robur*, non-native Buddleja *Buddleja davidii*, Willow *Salix* sp. and Hawthorn *Crataegus monogyna*, while some shrub planting is also apparent such as Gorse *Ulex europaeus* and Dog-rose *Rosa canina*.

3.4.4 The grassland is classified within the metric as 'modified grassland'. It fails three of the seven condition parameters and therefore is in 'moderate' condition (see Appendix 1).

3.4.5 **SI2** is located in the west of the site on sloping ground which rises from ditch D1 to the adjacent restored landfill. The sward is more open in nature compared to SI1, with a high frequency of moss present. Elsewhere the grassland sward is coarse in nature with dominant grasses apparent at the time of survey including Cocksfoot and Common Couch with a large patch of Wood Small-reed also present whilst Common Reed is invading in places. Herb species present include Creeping Thistle, Broad Leaved Dock, Common Fleabane, Great Willowherb, Hedge Bedstraw *Galium mollugo*, Ribwort Plantain, Soft Rush, Pendulous Sedge and Meadow Sweet *Filipendula ulmaria* while the occasional presence of Wild Parsnip *Pastinaca sativa* and Wild Carrot *Daucus carota* may suggest the area was historically seeded. Occasional scrub planting is present including of Broom *Cytisus scoparius* and non native Cotoneaster *Cotoneaster sp* with self seeded species including Willow, Birch *Betula pendula*, Bramble *Rubus fruticosus* agg and Alder. No apparent regular management appears to be in place.

3.4.6 The grassland is classified within the metric as 'modified grassland'. It fails three (and potentially four in terms of species per m2) of the seven condition parameters and therefore is in 'moderate' condition (see Appendix 1).

3.4.7 **SI3** – comprises a coarse somewhat damp grassland sward with Cocksfoot, False Oat Grass, Wood Small-reed and Yorkshire Fog apparent at the time of survey while Common Reed was heavily invading in the west. Herb species recorded include Broad-leaved Dock, Great Willowherb, Cow Parsley, Creeping Thistle and Meadowsweet. No apparent regular management appears to be in place and Bramble is invading in places.

3.4.8 The grassland is classified within the metric as 'modified grassland'. It fails three of the seven condition parameters and therefore is in 'moderate' condition (see Appendix 1).

3.4.9 **SI4** – an area species poor coarse grassland located offsite on the adjacent embankment to the motorway. The sward is invaded by frequent ruderals in the form of Spear Thistle *Cirsium vulgare*, Mugwort *Artemisia vulgaris*, Broad Leaved Dock and Stinging Nettle.

3.4.10 The grassland is classified within the metric as 'modified grassland'. It fails four of the seven condition parameters and therefore is in 'poor' condition (see Appendix 1).

3.4.11 **SI5** – is a closely mown area of grassland located close to gate to land fill area. It predominantly comprises a fine sward with grasses present including Bents and Fescues, with more occasional coarse species such as Cocksfoot. Herb species present include frequent White Clover *Trifolium repens* and mosses with more occasional Creeping Buttercup, Ribwort Plantain, Spear Thistle and Hard Rush.

3.4.12 The grassland is classified within the metric as 'modified grassland'. It fails three of the seven condition parameters and therefore is in 'moderate' condition (see Appendix 1).

3.4.13 **SI6** – supported a long sward in east and was closely mown in west (50:50 split) at the time of survey. The sward is open in places with a high moss abundance with coarse grasses dominant. Herb species include occasional Broad Leaved Dock, Hard Rush, Creeping Buttercup, White Clover, Common Mouse-ear *Cerastium fontanum*, Teasel *Dipsacus fullonum*, Ribwort Plantain, Common Fleabane, Pendulous Sedge and White Melilot *Meliotus albus*. Occasional scrub species such as Alder are invading from the adjacent wet woodland W2.

3.4.14 The grassland is classified within the metric as 'modified grassland'. It fails one of the seven condition parameters and therefore is in 'good' condition (see Appendix 1).

3.4.15 **SI7** – is a narrow band of grassland present at the northern and north-western site boundaries. It comprises a coarse sward with frequent grasses apparent at the time of survey including Cocksfoot and False Oat Grass. Occasional herbs species are present in the form of invading ruderal species including Stinging Nettle, Creeping Thistle and Cow Parsley alongside Bramble.

3.4.16 The grassland is classified within the metric as 'modified grassland'. It fails four of the seven condition parameters and therefore is in 'poor' condition (see Appendix 1).

3.4.17 **SI8** – A small patch of grassland dominated by a moderately fine leaved sward of fescues and bents alongside coarse patches with few herbs present save for occasional Daisy *Bellis perennis*, Clover, Common Vetch, Dandelion *Taraxacum officinale*, Spear Thistle, Creeping Thistle, Wild Carrot, Hard Rush, Creeping Buttercup, Ribwort Plantain and mosses.

3.4.18 The sward was of a reduced height at the time of survey to the east of ditch D3 suggesting it may receive occasional management in the form of mowing in this location. To the west of D3 it was of a long sward nature.

3.4.19 The grassland is classified within the metric as 'modified grassland'. It fails two of the seven condition parameters and therefore is in 'moderate' condition (see Appendix 1).

3.5 Tall ruderal

3.5.1 A number of areas of tall ruderal are present located on site and adjacent to the site and these are labelled R1 – R6 on Plan 6397BNG1. R1 – R5 typically support a tall sward of a

diverse range of species such as Stinging Nettle, Mugwort, Great Willowherb, Cow Parsley, Creeping Thistle, Hogweed *Heracleum sphondylium*, Common Reed and Broad-leaved Dock with some scrub invading such as Bramble, Alder and Willow. R1 – R5 are is typically in 'moderate condition' (see Appendix 1) with the exception being area R1 which supports a reduced range of species, albeit Bracken is present, while the non-native species Himalayan Balsam *Impatiens glandulifera* is also present. As R1 is assessed as being in 'poor' condition (see Appendix 1).

3.5.2 Ruderal area R6 an area of damp ground located adjacent to the Silver Lane Brook. It is dominated by Common Reed in the west blending with abundant Great Willowherb elsewhere. Overall R6 lacks the diversity of species throughout its extent seen in R2-R5. Where Common Reed does not yet fully dominate the sward, occasional other species are present including Meadowsweet, Hogweed, Stinging Nettle, non-native Himalayan Balsam, Marsh Thistle *Cirsium palustre*, Cow Parsley, Creeping Thistle, Broad Leaved Dock, Common Sorrel and Reedmace *Typha latifolia*. Scattered scrub is invading in the west along with Bramble. Ruderal area R6 is potentially most closely represented by UK Habitat Type 25b Tall Herb which is in poor condition (as it would fail four of the five condition parameters for this habitat type and would therefore be in 'poor' condition). However, as discussed at section 4.1 below, coding the habitat to Tall Herb would over value R6 in the metric (as Tall Herb is a high distinctiveness habitat type) relative to the other areas of Ruderal on site, as area R6 is of somewhat reduced value due to its reduced herb cover and diversity of species compared to R2-R5. As such this area is coded into the metric as Ruderal in 'moderate' condition as this more closely describes its ecological value.

3.6 Woodland

3.6.1 **W1** – is a narrow band of woodland which is dominated by a mature to semi-mature canopy of Alder and Willow with other canopy species present including Ash and Silver Birch. The understorey is dense in nature dominated by Alder and occasional, Ash, Oak, Birch, Hazel *Corylus avellana* and Blackthorn *Prunus spinosa*. Due to the shade cast by the canopy and understorey, the ground flora is almost entirely dominated by Ivy save for in occasional canopy gaps and at the woodland margins where Angelica *Angelica sylvestris*, Cow Parsley, Creeping Buttercup, Hemp Agrimony *Eupatorium cannabinum*, Hard Rush, Butterbur *Petasites hybridus*, Stinging Nettle, Yorkshire fog and Cock's-foot are present. No active woodland management was apparent at the time of survey.

3.6.2 The woodland is classified within the metric as 'deciduous woodland' (albeit it is close to wet woodland which would be the case if it were damper in nature). It has reduced values for four of the thirteen condition parameters and therefore is in 'moderate' condition (see Appendix 1).

3.6.3 **W2** – is a very narrow band (single line of trees in places) of riparian woodland comprising young Alder located on both sides of the brook but predominantly on the western bank. Little in the way of understorey is present due to the to the low canopy height of the young trees. The ground flora is dominated by ruderal species such as Great Willowherb while frequent Common Reed is also present. No active woodland management was apparent at the time of survey.

3.6.4 The woodland is classified within the metric as 'wet woodland'. It has reduced values for seven of the thirteen condition parameters and therefore is in 'poor' condition (see Appendix 1).

3.6.5 **W3** – is a small copse dominated by a mature to semi-mature canopy of Lombardy Poplar *Populus nigra* 'Itlaica' and Silver Birch. The understorey appears to have been planted, likely

as part of the motorway junction works, and comprises predominantly coppiced Hazel. No ground flora was apparent at the time of survey likely due to the heavy leaf litter drop and canopy shade.

3.6.6 The woodland is classified within the metric as 'other woodland broadleaved' due to its planted status. It has reduced values for seven of the thirteen condition parameters and therefore is in 'poor' condition (see Appendix 1).

3.6.7 **W4** – is dominated by a canopy Lombardy Poplar which is semi-mature to mature in nature with mature Silver Birch and Scot's Pine *Pinus sylvestris* also present canopy. The understorey comprises of Hawthorn, Oak, Elder *Sambucus nigra* and Hazel. A reduced ground flora is present due to heavy shading save for at the margins while Bramble is present locally. No active woodland management was apparent at the time of survey.

3.6.8 The woodland is classified within the metric as 'other woodland broadleaved' due to its planted status. It has reduced values for nine of the thirteen condition parameters and therefore is in 'moderate' condition (see Appendix 1).

3.7 Line of Trees

3.7.1 **LOT1** - The southern extent of Woodland W1 is replaced by a line of trees (LOT1) comprised of young to semi-mature Scot's Pine with occasional mature Alder. Occasional Hazel is present in the understory while the ground flora comprises Stinging Nettle, Ivy *Hedera helix* and Bramble with grasses at the margins alongside Meadowsweet and Creeping Thistle.

3.7.2 The line of trees fails one of the five condition parameters and therefore is in 'moderate' condition (see Appendix 1).

3.7.3 **LOT2** – A line of semi-mature to mature Silver Birch along a shallow drain. The understory comprises frequent Elder while the ground flora is limited to the margins and is formed by ruderal species including the non-nature Himalayan Balsam which is locally abundant. A drain is present within the tree line (shown as D1 on Plan 6397/BNG1) which was dry at the time of survey, the channel of which is approximately 2m wide with steep banks showing exposed peat.

3.7.4 The line of trees fails one of the five condition parameters and therefore is in 'moderate' condition (see Appendix 1).

3.8 Scrub

3.8.1 Three areas of scrub are present on site which are shown as DS1-3 on Plan 6397/BNG1. These are located on the eastern and southern site boundaries and relatively well developed in nature. They comprise a number of species such as Hawthorn, Blackthorn and Elder. They appear to be sporadically managed to ensure they do not encroach into the adjacent agricultural land.

3.8.2 All three areas fail three of the five condition criteria and are therefore in 'poor' condition.

3.9 Waterbodies

3.9.1 A single waterbody, pond P1 is present on site. This is located within the north of woodland W4. It comprises a small water body of approximately 25x10m in size which held a moderate amount of water of around 0.2m in depth at the time of survey, although it likely dries from time to time. Fish are likely absent as were water fowl and water quality appeared good.

The pond is partly shaded but sufficient light reaches the waterbody to support some emergent vegetation with Reedmace and Soft Rush present.

3.9.2 P1 passes all seven of the condition criteria and is in 'good' condition (see Appendix 1).

3.9.3 Ephemeral standing water was also present just to the north of the arable. This appears to be a slightly lower lying area with potentially a broken field drain causing water to stand in this location. Standing water in this area is anticipated to fluctuate significantly over the winter depending on rain etc and is likely to be lost altogether in the summer.

3.10 Watercourse

3.10.1 Silver Lane Brook enters the site in the south from a culvert from beneath the motorway and flows north with a moderate flow within a channel of around 2-3m in width. Water quality appeared good at the time of survey and was of a moderate depth. The channel is choked in places by abundant Common Reed and elsewhere a number of aquatic and emergent species are present. The channel sits within banks varying from steep to shallow in nature, although most are of a low height for the most part. The banks support typically tall ruderal (including the non-native Himalayan Balsam) and scrub species, save for where the Brook flows through woodlands W2 and W3.

3.10.2 A modular river survey using standard MoRPh methodology has been undertaken so as to assess the condition of the watercourse. The desktop study has determined that the River Type is classified as 'K'. The field parameters assessed are shown in Appendix 2 with an average score of the positive and negative indicators generating a preliminary condition score of 0.178. Combining this score with the River Type records a final condition assessment of 'fairly poor' condition for the reach of Silver Lane Brook.

3.11 Drains

3.11.1 Three drains are present within the site labelled D1 – D3 on Plan BNG1. D1 sits within line of trees 1 and is described therein.

3.11.2 **D2** – is a narrow drain of around 1-2m in width. It was holding a moderate depth of water at the time of survey and water quality appeared good. Frequent Reedmace is present along its length with locally frequent non-native Himalayan Balsam present. It is contained within shallow banks which are heavily colonised by ruderal species, particularly in the form of Great Willowherb, while Common Reed is invading alongside scattered scrub in the form of Alder and Willow.

3.11.3 D2 fails three of the eight condition parameters and therefore is in 'poor' condition (see Appendix 1).

D3 – is located on the site boundary in the west of the site. It is contained within a narrow channel of ~0.5m in width set within banks of around 1m in height. It appears to carry drainage from the restored landfill and at the time of survey contained a flow of water of around 0.1m in depth which is routed to the large offsite waterbody immediately to the south. Water quality appeared good at the time of survey and in channel and bankside vegetation is present with locally abundant emergent vegetation in the form of predominantly Soft Rush, Common Reed, Reedmace, Great Willowherb, Wood Small-reed, non-native Himalayan Balsam and Pendulous Sedge. As the ditch approaches the water body in the south, the channel it sits in becomes more incised and in this location it is contained within banks that are steeply sloping and ~2 metres in height.

3.11.4 D3 fails three of the eight condition parameters and therefore is in 'poor' condition (see Appendix 1).

3.12 Hardstanding

3.12.1 Areas of hardstanding are present in the form of hard tarmac surfacing for roads in the south or in the form of pathways surfaced with stone chipping for formal walking in the west.

4 Post-development Habitats

4.1 Assumptions

4.1.1 When inputting the post-development habitat areas and condition to the Defra 3.0 metric, the following assumptions have been made:

- Newly created habitat under the proposals will be managed appropriately to reach the assigned target condition. Management is discussed in detail within the Framework Ecological Management Plan (Wardell Armstrong, July 2019; Appendix 5.10 of the Environmental Statement) and the Peatland Ecological Construction and Management Plan (Wardell Armstrong, January 2020).

- A flowering lawn mix can be used within the areas of amenity grassland to maximise biodiversity benefits whilst providing an amenity habitat.

- The Indicative Landscape Masterplan shows groups of tree and shrub planting within the site. Specific habitats are not attributed to these and therefore where larger areas are to be created these have been assumed to be woodland, whilst smaller areas of planting are assumed to be mixed scrub.

- Where new grassland creation overlaps with existing grassland in locations that would not be affected by works e.g. SI1, SI2 and R5, these areas are assumed to be retained and enhanced.

- Where new tree and shrub planting overlaps with existing woodland habitat the existing habitat is assumed to be retained e.g. W1.

- Where new tree and shrub planting overlaps with existing scrub habitat the existing habitat is assumed to be retained and enhanced to woodland.

- Ruderal area R6 is most closely represented by UK Habitat Type 25b Tall Herb which is in poor condition. However, this is represented in the metric as a habitat type of high distinctiveness which is in reality is not the case due to the over dominance of Common Reed. Indeed, if it were not for this dominance, the habitat would closely resemble the other areas of Ruderal on the site which are in fact of higher ecological value than R6. To reflect this true position, professional interpretation[8] has been applied and this area is coded into the metric as Ruderal in moderate condition.

- In accordance with the Framework Ecological Management Plan, areas of grassland will be seeded with a suitable wildflower mix containing a range of neutral/acid grassland species and subject to a traditional meadow management regime. The habitat type 'other lowland acid grassland' is selected as the target, although it is recognised that more neutral species will also be present.

- The area of the brook corridor has been assumed as the area marked on the Indicative Site Plan. As part of the Silver Lane Brook diversion, a range of ecological enhancements will be incorporated, as detailed within the Framework Ecological Management Plan. The riparian zone will include diverse habitats, including areas of dense marginal and emergent plant growth, tree lined sections, and a mosaic of marshy grassland with wet woodland, scrub and drier grassland. This mosaic of habitat

[8] The Defra 3.0 User Guide acknowledges at paragraph 1.8 that "The metric is not a substitute for expert ecological advice"

cannot be accurately input to the metric in terms of area, and therefore a representative habitat type has been selected as 'other neutral grassland'. The exception to is where proposed woodland planting extends into the brook corridor, which has been included within the woodland habitat type (see Plan 6397/BNG2).

- The area of the Peat Habitat Zone (PHZ) has been taken from the Peatland Ecological Construction and Management Plan, January 2020 drawing SH11739-058 Rev A. Where proposed woodland on the Indicative Site Plan extends into the PHZ this has not been included in the post-development habitat areas as woodland.

- The Peat Habitat Zone will be created from translocated peat (see Peatland Ecological Construction and Management Plan, 2020) and a variable hydrological regime will provide a range of micro-habitats from dry to permanently wet. Natural tree and scrub colonisation would be encouraged in some areas, whilst in other areas heathland and bog pool habitat would be favoured. The Peatland Ecological Construction and Management Plan states that '*the vegetation once established is likely to conform to a habitat which is broadly analogous to 'degraded raised bog' but with additional local variation where possible.*' It is also stated that the variable hydrological regime is also unlikely to provide conditions suitable for 'active raised bog'. As such, an overall habitat type of 'lowland raised bog', in 'poor' condition has been selected as the target in the metric, albeit it is possible that with appropriate management a moderate condition habitat could develop in this area.

4.2 Good Practice Principles for Development

4.2.1 Provided below is a summary of how biodiversity net gain good practice principles have been applied at the site:

1) **Apply the Mitigation Hierarchy.** The mitigation hierarchy has been followed with the Priority Habitat tree line at the eastern boundary retained and parts of the Priority Habitat Woodland. Small areas of woodland loss are required, which are compensated through extensive new planting. The vast majority of the habitat loss arises from low distinctiveness agricultural land.

2) **Avoid losing biodiversity that cannot be offset by gains elsewhere.** No irreplaceable habitats are lost. Where high distinctiveness habitat is lost this is offset by large areas of high and very high distinctiveness habitat creation.

3) **Be inclusive and equitable.** Discussions with Natural England and Greater Manchester Ecology Unit have informed the proposals for the Peat Habitat Zone and discussions with the Environment Agency have informed the proposals for Silver Lane Brook.

4) **Address risks.** The Defra metric 3.0 has an inbuilt difficulty multiplier which allows for the time between losses and the gains to be incorporated into the final score.

5) **Make a measurable Net Gain contribution.** A measurable net gain is demonstrated by the Defra 3.0 metric. In addition, faunal specific benefits will be provided by the scheme, and the habitats, especially the Peat Habitat Zone, Silver Lane Brook and woodland will contribute to other ecosystem services.

6) **Achieve the best outcomes for biodiversity.** The proposed Peat Habitat Zone and wetland corridor along the diverted Silver Brook contribute to the objectives of the Great Manchester Wetlands Nature Improvement Area (NIA). Grassland, scrub and woodland habitat also provide a high quality mosaic of connected habitats.

7) **Be additional.** The creation of the Peat Habitat Zone includes extensive peat translocation to create an ecologically valuable habitat which would not occur on the site without significant intervention.

8) **Create a Net Gain legacy.** The mosaic of habitats to be created provides resilience from external factors such as climate change and long term management will be secured, likely by a planning condition. It will managed for the benefit of nature conservation for the lifetime of the development.

9) **Optimise sustainability.** The Peat Habitat Zone will better retain rainwater, increase peat stability and help to restore this important habitat in the local area. Overall the new habitats will provide an enhanced biodiversity network compared to the existing situation.

10) **Be transparent.** This report and associated management documents ensure the proposals are well communicated to stakeholders.

4.3 Strategic Significance

4.3.1 Strategic significance in the metric is assigned to give extra value to habitats that are located in optimal locations, or are of a type that meet local objectives for biodiversity. The site is located within the Great Manchester Wetlands NIA. Objectives include the restoration of Priority Habitats, creating stepping stones and corridors between habitats, and optimising ecosystem services provided by habitats, particularly the carbon storage function of lowland raised bog. The focus of this NIA is on networks of wetland habitats.

4.3.2 The wetland habitats present on-site pre-development and also those to be created are therefore assigned a high strategic significance within the metric. Other habitat types, although located within the NIA are assigned a low strategic significance.

4.4 Habitat Type and Condition

4.4.1 A summary of post-development habitat creation is set out in Tables 4.1, 4.2, and 4.3 below. Post-development habitats are shown at Plan 6397/BIA2.

Table 4.1. Post-development Habitat Creation

Habitat	Target Condition	Condition Rationale
Heathland and shrub – Mixed scrub	Good	Areas of native scrub planting, which will include a minimum of three woody species. No invasive or undesirable species to be included. A well-developed edge and good age range can be developed over time and planting will be in patches within wildflower grassland. The scrub is therefore expected to achieve good condition.
Woodland and forest – Other woodland; broadleaved	Moderate	Areas of diverse native woodland planting including tree and scrub species. No invasive non-native species to be included. Woodland to be managed to encourage regeneration and structural variation, with a typical woodland ground flora expected to naturally develop over time. Suitable management would ensure moderate condition could be reached in 15 years.
Woodland and forest – wet woodland	Moderate	Areas of wet woodland will be created adjacent to the Silver Lane Brook. These would be managed for the lifetime of the development and accordingly are anticipated to reach moderate condition.
Wetland – Lowland raised bog[9]	Moderate	The Peatland Ecological and Construction Management Plan 2020 states that the vegetation within the peat habitat zone once established is likely to be broadly analogous to 'degraded raised bog' with local variation. Although the new habitat may not be an active peat accumulating habitat, it is likely to meet some of the wetland condition criteria through good management. As such a precautionary estimate of 'moderate' condition is selected in the metric.
Grassland – Other lowland acid grassland	Good	Species-rich wildflower grassland will be created within the site and it is anticipated that the grassland will be able to reach good condition with suitable management.
Grassland – Other neutral grassland	Moderate	Areas of drier and damp (marshy) grassland adjacent to the diverted Silver Lane Brook. Areas of scrub will be allowed to develop, but otherwise appropriate management would allow a moderate condition grassland habitat to establish.
Grassland – Modified Grassland	Moderate	Areas of amenity grassland to be created near to the built development, within the central more formal landscaped areas, utilising a flowering lawn mix to enhance species diversity. No invasive non-native species would be included and Bracken, scrub and physical damage to be kept to minimum. The grassland is expected to pass five of the condition assessment criteria and is therefore considered likely to achieve a moderate condition.
Urban – Developed Land; Sealed Surface	N/A	This includes all roads, parking and buildings within the site. No assessment for the condition of this habitat is required.

[9] This habitat is subsequently adjusted to represent 'other neutral grassland' in the metric so as to more accurately represent the biodiversity unit gain which it will deliver (see section 5.2 below).

Table 4.2. Post-development linear feature (tree line) enhancement

Habitat	Condition Change	Condition Rationale
Line of Trees Associated with bank or ditch (LOT2)	Moderate - Good	Removal of adjacent arable land use will over time allow the existing line of trees to reach good condition.

Table 4.3. Post-development linear feature (tree line) creation

Habitat	Target Condition	Condition Rationale
Line of Trees	Moderate	Continuation of existing line of trees (LOT2) to north of the site. Expected to reach at least same condition as existing tree line, i.e. moderate, through species-rich planting and good management.

Table 4.4. Post-development watercourse creation

Habitat	Condition Change	Condition Rationale
Silver Lane Brook – new channel	Moderate	The new channel of the Silver Lane Brook will be of an increased length over the existing channel and will be designed so that it supports a range of ecological features. These include a sinuous channel, riffles, gravel beds, sediments bars and backwaters while non-native species will also be controlled along the reach.

Table 4.5. Post-development ditch creation

Habitat	Target Condition	Condition Rationale
New ditches	Poor - Moderate	A number of new ditches will be created as part of the proposals. Ditches along the northern site boundary will be located away from proposed development and will reach moderate condition. Ditches in the vicinity of the development are precautionarily coded to poor condition, albeit with appropriate management a moderate condition may be attainable.

5 Biodiversity Net Gain Assessment Results

5.1 Metric calculation

5.1.1 The data from the baseline habitat survey work and the proposed habitat enhancement and creation works have been coded into the metric.

5.1.2 In summary, the DEFRA 3.0 Biodiversity Impact Assessment Calculator indicates that the development will result in 8.17% gain in habitat units for biodiversity with the provision of lowland raised bog like habitat. The results are broken down in Table 5.1 below:

Table 5.1 Net gain with the metric coded to include lowland raised bog

	Change in Units	% Change
Habitats	3.18	8.17%
Hedgerows	0.79	39.30%
Rivers/Streams	0.75	10.28%

5.1.3 A net gain is also recorded for linear habitats (lines of trees) and River Units.

5.2 Accounting for lowland raised bog like habitat

5.2.1 Given the favourable habitat works to take place on site, the indicated biodiversity net gain for habitats in the metric appears somewhat low. Examination of the metric finds that the limited reported gain largely originates from the low value being attributed to lowland bog creation. The metric provides a low biodiversity unit outcome (0.82 units) for this habitat type based on its difficultly of creation and hence by doing so the metric discourages the creation of such habitats. As such the metric directly disincentives the creation of a very valuable habitat type. By contrast the creation of 'other neutral grassland' in good condition across this same area would lead to a biodiversity unit gain of some 9.97 biodiversity units.

5.2.2 In regard to this project, a great deal of expertise is held by the project team in peatland habitat creation while In this location an abundance of local expertise[10] in peatland habitat creation is also available associated with local peatland projects e.g. associated with Manchester Mosses SAC. Accordingly, given the expertise available, the creation of peatland habitat is considered feasible while the creation of the notable habitat type lowland raised bog like habitat is also highly desirable in ecological terms (and far more so than creating the more abundant habitat type neutral grassland).

5.2.3 The approach is in line with footnote 48 of the Defra 3.0 User Guide which states *"ecological judgement should always be applied in determining the most appropriate replacement habitats, based on the nature of the habitats being lost and the location"*. On this basis this project takes forward the creation of highly desirable lowland raised bog habitat as the much preferred ecological outcome.

5.2.4 Accordingly, professional judgement is applied in this instance to recognise this highly preferential ecological outcome, to acknowledge the elevated value of this habitat type and the local expertise of delivery available and it is coded into the metric using the proxy of

[10] For example held by Warrington Council, Mersey Forest, Cheshire Wildlife Trust and Natural England

'other neutral grassland' in good condition so as provide an equivalent gain in biodiversity units (albeit in reality a greater gain will be achieved).

5.2.5 Following this appropriate adjustment in the coding of the metric, a net gain of 31.70% in habitats is seen to be achieved. A summary of biodiversity outcomes is set out in table 5.2 below.

Table 5.2 Net gain with the metric coded to include lowland raised bog more appropriately represented by the proxy 'other neutral grassland'.

	Change in Units	% Change
Habitats	12.33	31.70%

5.3 Consideration of HS2

5.3.1 The proposed HS2 route runs close to the northern site boundary and parts of the site may be required for HS2 construction and operational access should the scheme come forward.

5.3.2 To account for this possibility and the temporary and permanent land take required, these areas have been incorporated into the biodiversity net gain calculations, as set out below. The areas and timescales presented below are taken from the ES Addendum Cumulative Assessment.

- Zone E (see Plan 4793/BNG3) has been identified as the 'Utility Construction Zone' and would contain a construction compound. This is located within an area of parking for the MSA scheme and it has been agreed that the area could be used by HS2 for their construction compound for the 12 months required. As such, there is no change to the metric as the proposed habitat remains as 'developed land; sealed surface'.

- Zone D is the 'Utility Connection Zone' and is required for works associated with the diversion of a gas main. As such, the landscaping required within Zone D would be deferred until the utility works are complete. It is assumed the enabling works would take 12 months in 2025 and therefore the habitat creation within Zone D has been entered into the metric with a delay in creation of 3 years.

- A temporary HS2 construction access would cross the south of the site, from the MSA access road to the south-east corner (see Plan 4793/BNG3). As such, the landscape planting within this access route would be deferred until HS2 construction access is no longer required, assumed to be between 2033 and 2040. For the purposes of the net gain assessment, this landscaping has therefore been entered into the metric with a delay in creation of 15 years.

- HS2 require permanent maintenance access which will connect to the MSA internal access road to the south-east corner of the site (see Plan 4793/BNG3). This is likely to be formed of grasscrete, or similar, and is therefore incorporated as an area of 'artificial unvegetated unsealed surface' within the post-development habitats.

5.3.3 The outcomes of the metric when allowing for the temporary and permanent HS2 works, in the event this project comes forward, lead to an adjusted biodiversity net gain outcome as set out in table 5.3 below:

Table 5.2 Net gain with the metric coded to include for temporary and permanent construction and operational of the HS2 scheme

	Change in Units	% Change
Habitats	11.24	28.91%
Hedgerows	0.79	39.30%
Rivers/Streams	0.75	10.28%

6 Summary and Conclusions

6.1.1 Aspect Ecology is advising Extra MSA Group in respect of ecological issues relating to land at Junction 11 of the M62, Warrington, proposed for a Motorway Service Area (MSA). The application is the subject of an appeal.

6.1.2 To inform the appeal, Aspect Ecology has undertaken a biodiversity impact assessment to determine the level of biodiversity net gain that could be achieved under the scheme, based on the Defra 3.0 Biodiversity Metric calculation tool.

6.1.3 The metrics demonstrate that a 31.70% biodiversity net gain is achieved in habitat units and 39.30% linear feature (line of trees) units and 10.28% watercourse and ditch units.

6.1.4 When adjusted to take account of the potential of the HS2 proposals coming forward the adjusted metric outcomes are a biodiversity net gain of 28.91% is achieved in habitat units with the same outcomes for linear habitats (line of trees) units and watercourse / ditch units.

Plan 6397/BNG1:

Existing Habitats

Key:

- Site Boundary
- Arable (cropland)
- Bramble Scrub
- Dense scrub (mixed scrub)
- Ephemeral standing water (cropland)
- Semi-improved grassland (modified grassland)
- Improved grassland (cropland)
- Tall Ruderal (ruderal/ ephemeral)
- Waterbody (pond non-priority habitat)
- Hardstanding (developed land; sealed surface)
- woodland (lowland mixed deciduous)
- Woodland (Other; broadleaved)
- woodland (wet woodland)
- Ditch
- Line of Trees
- Watercourse
- × Scattered Scrub
- Tree
- Localised Stands of Rushes

aspect ecology

Aspect Ecology Limited - West Court - Hardwick Business Park
Noral Way - Banbury - Oxfordshire - OX16 2AF
01295 279721 - info@aspect-ecology.com - www.aspect-ecology.com

Warrington MSA	PROJECT
Existing Habitats	TITLE
6397/BNG1	DRAWING NO.
E/BG	REV
January 2022	DATE

P:/Project/Aspect Ecology Projects/ECO 6350/1006397/Graphics/QGIS/6397 ECO3.qgs

Plan 6397/BNG2:

Post-development Habitats

Key:

- Site Boundary
- Building (developed land; sealed surface)
- Hardstanding (developed land; sealed surface)
- Other woodland; Broadleaved
- Other lowland acid grassland
- Mixed scrub
- Modified grassland
- Mixed scrub enhanced to other woodland; broadleaved
- Retained lowland mixed deciduous woodland
- Enhanced other woodland; broadleaved
- Retained other woodland; broadleaved
- Retained and enhanced modified grassland
- Tall ruderal enhanced to other neutral grassland
- Peat Habitat Zone (lowland raised bog)
- Silver Brook Corridor (other neutral grassland and wet woodland)
- Existing Line of Trees
- Proposed Line of Trees
- Ditch
- Watercourse
- Proposed Ditch

aspect ecology

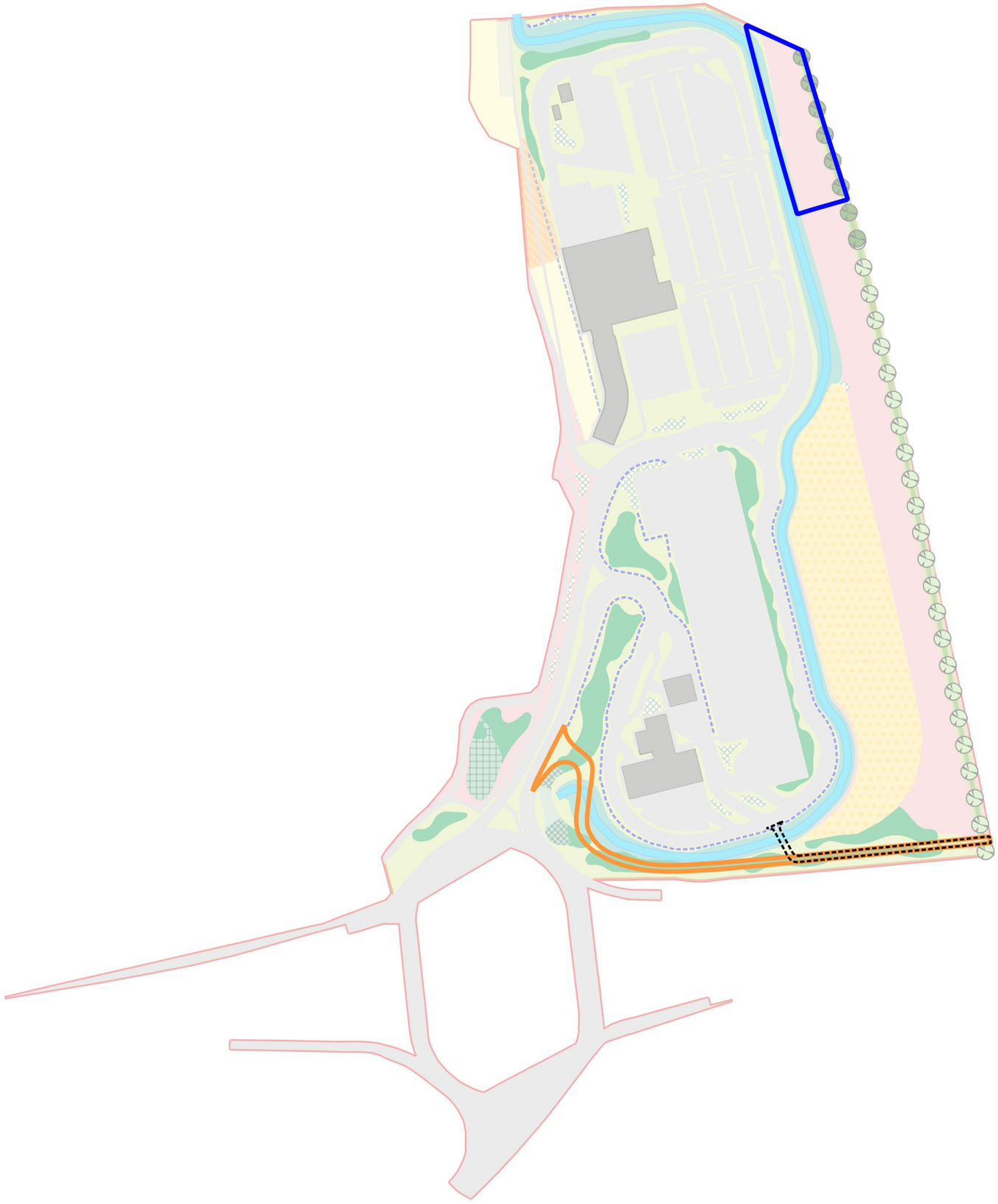
Aspect Ecology Limited - West Court - Hardwick Business Park
Noral Way - Banbury - Oxfordshire - OX16 2AF
01295 279721 - info@aspect-ecology.com - www.aspect-ecology.com

Warrington MSA	PROJECT
Proposed Habitats	TITLE
6397/BNG2	DRAWING NO.
F/BG	REV
January 2022	DATE

P:/Project/Aspect Ecology Projects/ECO 6350/1006397/Graphics/QGIS/6397 BNGA.qgs

Plan 6397/BNG3:

Post-development Habitats with HS2



Key:

- Site Boundary
- Zone D
- HS2 Construction Access
- HS2 Operational Access

Note:
HS2 Zone E is located entirely on proposed hardstanding and as such is not shown as its BNG effect is neutral.

aspect ecology

Aspect Ecology Limited - West Court - Hardwick Business Park
Noral Way - Banbury - Oxfordshire - OX16 2AF
01295 279721 - info@aspect-ecology.com - www.aspect-ecology.com

Warrington MSA	PROJECT
Post-development Habitats with HS2	TITLE
6397/BNG3	DRAWING NO.
D/BG	REV
January 2022	DATE

P:/Project/Aspect Ecology Projects/ECO 6350/1006397/Graphics/QGIS/6397_BNGA.qgs

Appendix 6397/1:

Habitat Condition Summary

HABITAT CONDITION ASSESSMENT MATRIX - Defra 3.0

PROJECT NAME: Warrington MSA
PROJECT NUMBER: 1006397

Surveyor AB
Date 30/11/2021

	Habitat type/criteria	**Feature Reference**								
	Grassland (low distinctiveness)	**SI 1**	**SI 2**	**SI 3**	**SI 4**	**SI5**	**SI 6**	**SI 7**	**SI8**	
1	6-8 species per m2	Pass	Pass	Pass	Fail	Fail	Pass	Fail	Fail	
2	Varied sward height (>20% less than 7cm, >20% more than 7cm)	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Pass	
3	Less than 20% scrub	Fail	Pass	Pass	Fail	Pass	Pass	Pass	Pass	
4	Less than 5% subject to physical damage (excessive poaching, machinery use/storage etc)	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	
5	Cover of bare ground between 1 and 5%	Fail	Fail	Fail	Fail	Fail	Fail	Fail	Fail	
6	Less than 20% bracken	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	
7	Absence of Sch9 invasive species and less than 5% undesirable species (C Thistle, Sp Thistle, Docks, Nettle, G Plantain, W Clover, Cow Parsley)	Pass	Fail	Fail	Fail	Pass	Pass	Fail	Pass	
Condition		**Moderate**	**Moderate**	**Moderate**	**Poor**	**Moderate**	**Good**	**Poor**	**Moderate**	
	Pond	**P1**								
1	Good water quality with clear water and no obvious signs of pollution. Turbidity acceptable if grazed by livestock.	Pass								
2	Semi-natural habitat (moderate distinctiveness or above) at least 10m from pond edge.	Pass								
3	Less than 10% duckweed or filamentous algae	Pass								
4	Pond not artifically connected to other waterbodies	Pass								
5	Pond water levels able to fluctuate naturally throughout year - no obvious dams, pumps or pipework	Pass								
6	Absence of non-native plant and animal species	Pass								
7	Pond is not artifically stocked with fish. If naturally contains fish is a native fish assemablage at low densities.	Pass								
8	**Non-woodland ponds only:** Emergent, submerged or floating plants cover at least 50% of pond area that is less than 3m deep	N/A								
9	**Non-woodland ponds only:** Less than 50% shaded by woody bankside species	N/A								
Condition		**Good**								
	Scrub	**DS1**	**DS2**	**DS3**						
1	Habitat is representative of UKHab description. At least 3 woody species, with no one species more than 75% cover (except Juniper, Sea Buckthorn and Box)	Pass	Pass	Pass						
2	Good age range with seedlings, young shrubs and mature shrubs present	Fail	Fail	Fail						
3	Absence of Sch9 invasive species and less than 5% undesirable species (C Thistle, Nettle, Cherry Laurel, Snowberry, Buddleia, Cotoneaster, Spanish Bluebell)	Pass	Pass	Pass						
4	Scrub has well developed edge with scattered scrub and tall grassland/herbs present between scrub and adjacent habitats	Fail	Fail	Fail						
5	Clearings, glades or rides present providing sheltered edges	Fail	Fail	Fail						
Condition		**Poor**	**Poor**	**Poor**						

Woodland (assign scores of 3/2/1 accordingly)		**W1**	**W2**	**W3**	**W4**					
1	Three/two/one age classes present	3	1	1	2					
2	No significant browsing/browsing across no more than 40% of woodland/browsing across more than 40% of woodland	3	3	3	2					
3	No invasive species/Rhododendron or Laurel absent, other species less than 10% cover/Rhododendron or Laurel present, other species more than 10% cover	3	3	3	3					
4	5+ native tree or species/3-4 native tree or shrub species/up to 2 native tree or shrub species (per 10m radius, across woodland parcel)	3	1	2	2					
5	More than 80% canopy trees and understorey shrubs are native/50-80% are native/less than 50% are native	3	3	1	2					
6	Less than 20% temporary open space, or 10-20% temporary open space if woodland over 10ha/21-40% temporary open space/more than 40% temporary open space	3	3	3	3					
7	Three/two/one classes of regeneration present - trees 4-7cm dbh; saplings/seedlings; advanced coppice regrowth	3	1	1	2					
8	Tree mortality less than 10%, no pests, diseases or crown dieback/11-25% mortality, low risk pests, diseases or crown dieback/more than 25% mortality, high risk pests or diseases	3	3	3	3					
9	Ground flora - AWI present/recognisable NVC plant community present/no recognisable NVC community	1	1	1	1					
10	Woodland vertical structure (across all survey plots) - three or more storeys/two storeys/one or less storey	2	1	2	2					
11	2+ veteran trees per ha/1 veteran tree per ha/no veteran trees	1	1	1	1					
12	50% of survey plots have standing deadwood, large dead branches, stems and stumps/25-50% deadwood/less than 25% deadwood	1	1	1	1					
13	No nutrient enrichment or damaged ground/less than 1ha nutrient enrichment or 20% damaged ground/more than 1ha nutrient enrichment or 20% damaged ground	3	3	3	3					
Condition		**Moderate**	**Poor**	**Poor**	**Moderate**					
Urban / Sparsely vegetated land - ruderal/ephemeral		**R1**	**R2**	**R3**	**R4**	**R5**	**R6**			
1	Varied vegetation structure providing opportunities for insects, birds and bats to live and breed. No more than 80% of area comprises a single habitat type (i.e. early successional vegetation, grassland, herb dominated, heathland, woodland and scrub, wetland, water features).	Fail	N/A	Fail	Fail	Fail	Pass			
2	Diverse range of flowering plant species providing nectar sources for insects.	Fail		Pass	Pass	Pass	Fail			
	- Above criteria satisfied by native species only.	Pass		Pass	Pass	Pass	N/A			
3	Sch9 invasive species cover less than 5% of total vegetated area.	Fail		Pass	Pass	Pass	Pass			
	- Complete absence of Sch9 invasive species.	Pass		Pass	Pass	Pass	Fail			
4a	**Open mosaic habitat on previously developed land only:** Forms a mosaic of at least four early successional communities (annuals; mosses/liverworts; lichens; ruderals; inundation species; open grassland; flower-rich grassland; heathland) PLUS bare substrate PLUS pools.	N/A		N/A	N/A	N/A	N/A			
4b	**Bioswale and SUDS only:** Water table is at or near the surface throughout the year - forming open water or saturation of the soil at the surface.	N/A		N/A	N/A	N/A	N/A			
Condition		**Poor**		**Moderate**	**Moderate**	**Moderate**	**Moderate**			

LINEAR HABITAT CONDITION ASSESSMENT MATRIX - Defra 3.0

PROJECT NAME: Warrington MSA
PROJECT NUMBER: 1006397

Habitat type/criteria				
Ditch		**D1**	**D2**	**D3**
1	Good water quality with clear water indicating no obvious signs of pollution	N/A	Pass	Pass
2	>10 species of emergent, floating or submerged plants in a 20m ditch length		Pass	Fail
3	Less than 10% cover of filamentous algae and/or duckweed		Pass	Pass
4	Fringe of marginal vegetation present along more than 75% of ditch		Fail	Pass
5	Physical damage evident along less than 5% of ditch (such as excessive poaching, damage from machinery usage or storage)		Pass	Pass
6	Sufficient water levels maintained - minimum summer depth of 50cm in minor ditches and 1m in main drains		Fail	Fail
7	Less than 10% of ditch is heavily shaded		Pass	Pass
8	Absence of non-native plant and animal species		Fail	Fail
Condition			**Poor**	**Poor**
Lines of Trees		**LOT1**	**LOT 2**	
1	More than 70% of trees are native species.	Fail	Pass	
2	Tree canopy is predominantly continuous with gaps in canopy cover making up <10% of total area and no individual gap being >5 m wide.	Pass	Pass	
3	Includes one or more mature or veteran tree.	Pass	Pass	
4	There is an undisturbed naturally vegetated strip of at least 6 m on both sides to protect the line of trees from farming and other anthropogenic operations.	Pass	Fail	
5	At least 95% of the trees are in a healthy condition (excluding veteran features valuable for wildlife). There is little or no evidence of an adverse impact on tree health by damage from livestock or wild animals, pests or diseases, or human activity.	Pass	Pass	
Condition		**Moderate**	**Moderate**	

Appendix 6397/2:

Results of Modular River Survey field assessment

Estimate Condition Indicator Scores*, average positive and average negative Condition Indicator Scores, Preliminary Condition Score and Final Condition for MoRPH5 subreach of Silver Lane Brook

Indicator	Indicator Name	Silver Lane Brook
	BED MATERIAL	
A7	Coarsest bed material	Silt
A8	Average bed material size class	Silt
	POSITIVE CONDITION INDICATORS	
B1	Bank top vegetation structure	2
B2	Bank top tree feature richness	0
B3	Bank top water-related features	0
C1	Bank face riparian vegetation structure	2
C2	Bank face tree feature richness	0
C3	Bank face natural bank profile extent	3
C4	Bank face natural bank profile richness	2
C5	Bank face natural bank material richness	0
C6	Bank face bare sediment extent	0
D1	Channel margin aquatic vegetation extent	3
D2	Channel margin aquatic morphotype richness	1
D3	Channel margin physical feature extent	0
D4	Channel margin physical feature richness	0
E1	Channel aquatic morphotype richness	1
E2	Channel bed tree features richness	1
E3	Channel bed hydraulic features richness	1
E4	Channel bed natural features extent	0
E5	Channel bed natural features richness	0
E6	Channel bed material richness	2
	AVERAGE POSITIVE CIs	0.95
	NEGATIVE CONDITION INDICATORS	
B4	Bank top NNIPS cover	-2
B5	Bank top managed ground cover	-2
C7	Bank face artifical bank profile extent	0
C8	Bank face reinforcement extent	0
C9	Bank face reinforcement material severity	0
C10	Bank face NNIPs cover	-2
D5	Channel margin artifical features	0
E7	Channel bed siltation	-4
E8	Channel bed reinforcment extent	0
E9	Channel bed reinforcment severity	0
E10	Channel bed artificial features severity	0
E11	Channel bed NNIPS extent	0
E12	Channel bed filamentous algae extent	0
	AVERAGE NEGATIVE CIs	-0.77
	PROVISIONAL CONDITION SCORE	**0.18**
	FINAL CONDITION SCORE (for river type K)	**Fairly Poor**

* A Guide To Assessing River Condiiton: Part of the Rivers and Streams Component of the Biodiversity Net Gain Metric (*Foster et al* ; March 2020)

Appendix 6397/3:

Defra 3.0 Biodiversity Metric Results (adjusted for HS2)

Headline Results

Return to results menu

On-site baseline	*Habitat units*	38.90
	Hedgerow units	2.02
	River units	7.32
On-site post-intervention (Including habitat retention, creation & enhancement)	*Habitat units*	50.14
	Hedgerow units	2.81
	River units	8.07
On-site net % change (Including habitat retention, creation & enhancement)	*Habitat units*	28.91%
	Hedgerow units	39.30%
	River units	10.28%
Off-site baseline	*Habitat units*	0.00
	Hedgerow units	0.00
	River units	0.00
Off-site post-intervention (Including habitat retention, creation & enhancement)	*Habitat units*	0.00
	Hedgerow units	0.00
	River units	0.00
Total net unit change (including all on-site & off-site habitat retention, creation & enhancement)	*Habitat units*	11.24
	Hedgerow units	0.79
	River units	0.75
Total on-site net % change plus off-site surplus (including all on-site & off-site habitat retention, creation & enhancement)	*Habitat units*	28.91%
	Hedgerow units	39.30%
	River units	10.28%
Trading rules Satisfied?		**Yes**

A-1 Site Habitat Baseline

Condense / Show Columns | Condense / Show Rows | Main Menu | Instructions

	Habitats and areas			Distinctiveness	Condition	Strategic significance	Suggested action to address habitat losses	Ecological baseline	Retention category biodiversity value						Bespoke compensation agreed for unacceptable losses	Comm
Ref	Broad habitat	Habitat type	Area (hectares)	Distinctiveness	Condition	Strategic significance		Total habitat units	Area retained	Area enhanced	Baseline units retained	Baseline units enhanced	Area lost	Units lost		Assessor comments
1	Cropland	Cereal crops	4.312401	Low	N/A - Agricultural	Area/compensation not in local strategy/ no local strategy	Same distinctiveness or better habitat required	8.62			0.00	0.00	4.31	8.62		A1
2	Heathland and shrub	Bramble scrub	0.049407	Medium	Poor	Area/compensation not in local strategy/ no local strategy	Same broad habitat or a higher distinctiveness habitat required	0.20			0.00	0.00	0.05	0.20		B1
3	Heathland and shrub	Mixed scrub	0.219122	Medium	Poor	Area/compensation not in local strategy/ no local strategy	Same broad habitat or a higher distinctiveness habitat required	0.88		0.033825	0.00	0.14	0.19	0.74		D1,2,3
4	Urban	Developed land; sealed surface	1.692637	V.Low	N/A - Other	Area/compensation not in local strategy/ no local strategy	Compensation Not Required	0.00			0.00	0.00	1.69	0.00		Hardstanding
5	Cropland	Temporary grass and clover leys	7.130805	Low	N/A - Agricultural	Area/compensation not in local strategy/ no local strategy	Same distinctiveness or better habitat required	14.26			0.00	0.00	7.13	14.26		I1
6	Sparsely vegetated land	Ruderal/Ephemeral	0.23316	Low	Moderate	Area/compensation not in local strategy/ no local strategy	Same distinctiveness or better habitat required	0.96			0.00	0.00	0.24	0.96		R6
7	Sparsely vegetated land	Ruderal/Ephemeral	0.408622	Low	Poor	Area/compensation not in local strategy/ no local strategy	Same distinctiveness or better habitat required	0.82			0.00	0.00	0.41	0.82		R1
8	Sparsely vegetated land	Ruderal/Ephemeral	0.62234631	Low	Moderate	Area/compensation not in local strategy/ no local strategy	Same distinctiveness or better habitat required	2.49		0.120009	0.00	0.48	0.50	2.01		R3,R4,R5, R7
9	Lakes	Ponds (Non- Priority Habitat)	0.012822	Medium	Good	Within area formally identified in local strategy	Same broad habitat or a higher distinctiveness habitat required	0.18			0.00	0.00	0.01	0.18		P1
10	Woodland and forest	Lowland mixed deciduous woodland	0.04565	High	Moderate	Area/compensation not in local strategy/ no local strategy	Same habitat required	0.55	0.04565		0.55	0.00	0.00	0.00		W1
11	Woodland and forest	Wet woodland	0.07337	High	Poor	Area/compensation not in local strategy/ no local strategy	Same habitat required	0.44			0.00	0.00	0.07	0.44		W2
12	Woodland and forest	Other woodland; broadleaved	0.053162	Medium	Poor	Area/compensation not in local strategy/ no local strategy	Same broad habitat or a higher distinctiveness habitat required	0.24		0.021744	0.00	0.09	0.04	0.15		W3
13	Woodland and forest	Other woodland; broadleaved	0.344099	Medium	Moderate	Area/compensation not in local strategy/ no local strategy	Same broad habitat or a higher distinctiveness habitat required	2.75	0.08439		0.68	0.00	0.26	2.08		W4
14	Grassland	Modified grassland	0.202362	Low	Moderate	Area/compensation not in local strategy/ no local strategy	Same distinctiveness or better habitat required	0.81		0.172897	0.00	0.69	0.03	0.12		S11
15	Grassland	Modified grassland	0.259335	Low	Moderate	Area/compensation not in local strategy/ no local strategy	Same distinctiveness or better habitat required	1.04		0.214399	0.00	0.86	0.05	0.18		S12
16	Grassland	Modified grassland	0.489458	Low	Moderate	Area/compensation not in local strategy/ no local strategy	Same distinctiveness or better habitat required	1.96			0.00	0.00	0.49	1.96		S13
17	Grassland	Modified grassland	0.107233	Low	Moderate	Area/compensation not in local strategy/ no local strategy	Same distinctiveness or better habitat required	0.43			0.00	0.00	0.11	0.43		S15
18	Grassland	Modified grassland	0.249234	Low	Good	Area/compensation not in local strategy/ no local strategy	Same distinctiveness or better habitat required	1.50			0.00	0.00	0.25	1.50		S16
19	Grassland	Modified grassland	0.083739	Low	Poor	Area/compensation not in local strategy/ no local strategy	Same distinctiveness or better habitat required	0.17			0.00	0.00	0.08	0.17		S17
20	Grassland	Modified grassland	0.15402	Low	Moderate	Area/compensation not in local strategy/ no local strategy	Same distinctiveness or better habitat required	0.62			0.00	0.00	0.15	0.62		S18
21																
22			16.76					38.90	0.13	0.56	1.22	2.25	16.06	35.42		

A-2 Site Habitat Creation

Condense / Show Columns | Condense / Show Rows | Main Menu | Instructions

Post development/ post intervention habitats

Broad Habitat	Proposed habitat	Area (hectares)	Distinctiveness	Condition	Strategic significance	Temporal multiplier		Difficulty	Habitat units delivered	Comm
			Distinctiveness	Condition	Strategic significance	Standard or adjusted time to target condition	Final time to target condition/years	Final difficulty of creation		Assessor comments
Urban	Developed land; sealed surface	7.6816126	V.Low	N/A - Other	Area/compensation not in local strategy/ no local strategy	Standard time to target condition applied	0	Medium	0.00	Hardstanding & buildings
Grassland	Modified grassland	2.3504679	Low	Moderate	Area/compensation not in local strategy/ no local strategy	Standard time to target condition applied	4	Low	8.15	Amenity grassland with flowering lawn to enhance species richness
Heathland and shrub	Mixed scrub	0.1588246	Medium	Good	Area/compensation not in local strategy/ no local strategy	Standard time to target condition applied	10	Low	1.33	Areas of tree and shrub planting assumed as native scrub
Woodland and forest	Other woodland; broadleaved	0.8027381	Medium	Moderate	Area/compensation not in local strategy/ no local strategy	Standard time to target condition applied	15	Low	3.76	Areas of tree and shrub planting assumed as woodland
Grassland	Other neutral grassland	1.4894527	Medium	Moderate	Area/compensation not in local strategy/ no local strategy	Standard time to target condition applied	5	Low	9.37	Peat Habitat Zone represented as other neutral grassland
Grassland	Other lowland acid grassland	1.814599	Medium	Good	Area/compensation not in local strategy/ no local strategy	Standard time to target condition applied	15	Low	12.76	Meadow grassland with a mix of neutral and acid grassland species
Grassland	Other neutral grassland	0.8082252	Medium	Moderate	Area/compensation not in local strategy/ no local strategy	Standard time to target condition applied	5	Low	5.41	Silver Lane Brook corridor - grassland
Woodland and forest	Wet woodland	0.25	High	Moderate	Area/compensation not in local strategy/ no local strategy	Standard time to target condition applied	15	Medium	1.18	Silver Lane Brook corridor - wet woodland
Grassland	Other neutral grassland	0.0925933	Medium	Moderate	Area/compensation not in local strategy/ no local strategy	Check details- Delay in starting habitat in required condition?	20	Low	0.36	Delayed landscaping construction access HS2
Grassland	Modified grassland	0.0779305	Low	Moderate	Area/compensation not in local strategy/ no local strategy	Check details- Delay in starting habitat in required condition?	19	Low	0.16	Delayed landscaping construction access HS2
Woodland and forest	Other woodland; broadleaved	0.1137463	Medium	Moderate	Area/compensation not in local strategy/ no local strategy	Check details- Delay in starting habitat in required condition?	30	Low	0.31	Delayed landscaping construction access HS2
Grassland	Other lowland acid grassland	0.3520911	Medium	Good	Area/compensation not in local strategy/ no local strategy	Check details- Delay in starting habitat in required condition?	18	Low	2.22	Delayed landscaping Zone D
Urban	Artificial unvegetated, unsealed surface	0.070924	V.Low	N/A - Other	Area/compensation not in local strategy/ no local strategy	Standard time to target condition applied	0	Low	0.00	HS2 operational access
	Total area	16.06							45.63	

A-3 Site Habitat Enhancement

Condense / Show Columns | Condense / Show Rows | Main Menu | Instructions

Change in broad habitat type detected. Check compliance with

Post development/ post intervention habitats

Baseline ref	Baseline habitats: Baseline habitat	Proposed Habitat (Pre-Populated but can be overridden): Proposed Broad Habitat	Proposed Habitat (Pre-Populated but can be overridden): Proposed habitat	Change in distinctiveness and condition: Distinctiveness change	Change in distinctiveness and condition: Condition change	Area (hectares)	Distinctiveness	Condition	Strategic significance: Strategic significance	Temporal risk multiplier: Standard or adjusted time to target condition	Temporal risk multiplier: Final time to target condition/yea	Difficulty risk: Final difficulty of enhancement	Habitat units delivered	Comm: Assessor comments
3	Heathland and shrub - Mixed scrub	Woodland and forest	Other woodland; broadleaved	Medium - Medium	Poor - Moderate	0.033625	Medium	Moderate	Area/compensation not in local strategy/ no local strategy	Standard time to target condition applied	10	Low	0.23	NB, informative appears on metric regarding change in broad habitat type due to succession of scrub to woodland as per adjacent habitat type.
8	Sparsely vegetated land - Ruderal/Ephemeral	Grassland	Other neutral grassland	Low - Medium	Lower Distinctiveness Habitat - Moderate	0.120003	Medium	Moderate	Area/compensation not in local strategy/ no local strategy	Standard time to target condition applied	10	Low	0.82	
12	Woodland and forest - Other woodland; broadleaved	Woodland and forest	Other woodland; broadleaved	Medium - Medium	Poor - Moderate	0.021744	Medium	Moderate	Area/compensation not in local strategy/ no local strategy	Standard time to target condition applied	10	Low	0.15	W3
14	Grassland - Modified grassland	Grassland	Modified grassland	Low - Low	Moderate - Good	0.172697	Low	Good	Area/compensation not in local strategy/ no local strategy	Standard time to target condition applied	10	Low	0.93	S11
15	Grassland - Modified grassland	Grassland	Modified grassland	Low - Low	Moderate - Good	0.214339	Low	Good	Area/compensation not in local strategy/ no local strategy	Standard time to target condition applied	10	Low	1.16	S12
						0.56							3.29	

B-1 Site Hedge Baseline

Condense / Show Columns | Condense / Show Rows | Main Menu | Instructions

	UK Habitats - existing habitats			Habitat distinctiveness	Habitat condition	Strategic significance	Suggested action to address habitat losses	Ecological baseline	Retention category biodiversity value					
Baseline ref	Hedge number	Hedgerow type	Length KM	Distinctiveness	Condition	Strategic significance		Total hedgerow units	Length retained	Length enhanced	Units retained	Units enhanced	Length lost	Units lost
1	LOT1	Line of Trees - Associated with bank or ditch	0.02929284	Low	Moderate	Location ecologically desirable but not in local strategy	Same distinctiveness band or better	0.13			0.00	0.00	0.03	0.13
2	LOT2	Line of Trees - Associated with bank or ditch	0.42945523	Low	Moderate	Location ecologically desirable but not in local strategy	Same distinctiveness band or better	1.89		0.42945523	0.00	1.89	0.00	0.00
3														
4														
5														
6														
7														
			0.46					2.02	0.00	0.43	0.00	1.89	0.03	0.13

B-2 Site Hedge Creation

Condense / Show Columns | Condense / Show Rows | Main Menu | Instructions

	Proposed habitats		Habitat distinctiveness	Habitat condition	Strategic significance	Temporal multiplier		Difficulty risk multipliers	Hedge units delivered	Comm
Baseline ref	New hedge number	Habitat type	Length km	Distinctiveness	Condition	Strategic significance	Standard or adjusted time to target condition	Final time to target condition/years	Final difficulty of creation		Assessor comments
1	LOT3	Line of Trees	0.1327788	Low	Moderate	Area/compensation not in local strategy/ no local strategy	Standard time to target condition applied	20	Low	0.26	
2											
3											
4											
5											
6											
			0.13							0.26	

B-3 Site Hedge Enhancement

Condense / Show Columns | Condense / Show Rows | Main Menu | Instructions

	Baseline Habitats		Post development/ post intervention habitats										Comm
				Change in distiacitiveness and condition			Distiactiveness	Conditio n	Strategic significance	Temporal multiplier		Difficulty risk multipliers		
Baselin e ref	Baseline habitat	Proposed (Pre-Populated but can be overridden)		Distinctiveness movement	Condition movement	Length KM	Distinctiveness	Conditio n	Strategic significance	Standard or adjusted time to target condition	Final time to target condition/year s	Final difficulty of enhancement	Hedge units delivered	Assessor comments
2	Line of Trees - Associated with bank or ditch	Line of Trees - Associated with bank or ditch			Moderate - Good	0.42946	Low	Good	Location ecologically desirable but not in local strategy	Standard time to target condition applied	10	Low	2.55	
						0.43							2.55	

C-1 Site River Baseline

Condense / Show Columns | Condense / Show Rows | Main Menu | Instructions

Existing river type			Habitat distinctiveness	Habitat condition	Strategic significance	Watercourse encroachment	Riparian encroachmen	Suggested action	Ecological baseline
Baseline ref	River type	Length KM	Distinctiveness	Condition	Strategic significance	Extent of encroachment	Extent of encroachment		Total river units
1	Ditches	0.1828	Medium	Poor	Within Local Plans	No Encroachment	No Encroachment	Restore	0.84
2	Other Rivers and Streams	0.6586	High	Fairly Poor	Within Local Plans	No Encroachment	Minor	Restore	6.48
3									
4									
5									
6									
7									
		0.84							7.32

Retention category biodiversity value						Comm
Length retained	Length enhanced	Units retained	Units enhanced	Length Lost	Units Lost	Assessor Comments
	0.18282	0.00	0.84	0.00	0.00	D2
		0.00	0.00	0.66	6.48	WC1 (SI3 2 x delapidated agricultural barns close to watercourse)
0.00	0.18	0.00	0.84	0.66	6.48	

C-2 Site River Creation

Condense / Show Columns | Condense / Show Rows | Main Menu | Instructions

	Proposed habitats		Habitat distinctiveness	Habitat condition	Strategic significance	Temporal multiplier		Difficulty multipliers	Watercourse encroachment	Riparian encroachment	River units delivered	Comm
Baseline ref	River type	Length km	Distinctiveness	Condition	Strategic significance	Standard or adjusted time to target condition	Final time to target condition/years	Final difficulty of creation	Extent of encroachment	Extent of encroachment		Assessor comments
1	Other Rivers and Streams	0.9405112	High	Moderate	Delivery within Local Plans	Standard time to target condition applied	5	High	No Encroachment	No Encroachment	3.58	
2	Ditches	0.05	Medium	Moderate	Delivery within Local Plans	Standard time to target condition applied	5	Low	No Encroachment	No Encroachment	0.38	Adajcent to Northern boundary outside watercourse zone
3	Ditches	0.932	Medium	Poor	Delivery within Local Plans	Standard time to target condition applied	1	Low	No Encroachment	Major	3.10	Adjacent to roads in development
4												
5												
6												
7												
8												
		1.92									7.07	

C-3 Site River Enhancement

Condense / Show Columns | Condense / Show Rows | Main Menu | Instructions

	Baseline habitats		Change in distinctiveness and condition		Post development/ post intervention habitats										
Baseline ref	Baseline habitat	Proposed River Type (Pre-populated can be overridden)	Distinctiveness movement	Condition movement	Length KM	Habitat distinctiveness	Habitat condition	Strategic significance	Temporal multiplier		Difficulty multipliers	Watercourse encroachment	Riparian encroachment	River units delivered
						Distinctiveness	Condition	Strategic significance	Standard or adjusted time to target condition	Final time to target condition/years	Final difficulty of enhancement	Extent of encroachment	Extent of encroachment	
1	Ditches	Ditches	Medium - Medium	Poor - Moderate	0.18282	Medium	Moderate	Delivery within Local Plans	Standard time to target condition applied	4	Medium	No Encroachment	Major	1.00
					0.18									1.00

ecology • landscape planning • arboriculture

aspect

Aspect Ecology Ltd
West Court
Hardwick Business Park
Noral Way
Banbury
Oxfordshire OX16 2AF

T: 01295 279721
E: info@aspect-ecology.com
W: www.aspect-ecology.com

Appendix 5.17 – Log of Deletions from 2018 Technical Paper

Warrington Motorway Service Area

J11, M62

ES Addendum

Text Deleted from Original ES Technical Paper Part 2 – Ecology and Nature Conservation. Technical Paper 5

Section Number / Paragraph Number / Table number / Figure Number in Original Paper	Text Deleted from Original ES	Reason
Contents Page	Appendix 5.1 – Information to Support a Habitats Regulations Assessment	Appendix removed from ES and updated report submitted during determination of Planning Application 20-01-2020
Para.1.1	Richard Laws (Principal Consultant)	Change of staff
Par 2.2, 2.3,2.4, 5.11, 6.7, 8.1, 11.7 and Table 5.1,	NPPF19	Updated NPPF
Para 2.4	incorporate improvements encouraged	Amended wording in NPPF
Table 5.11	Advanced works Q4 2022 Development Q4 2024 Construction 2025-2035/2040 Commissioning Q4 2031 – Q3 2033	Change of HS2 programme.
Para 10.4	Q4 2022 thus will likely occur within the first 5 years of the Proposed Development and may coincide with the construction of the MSA Development.	Alterations to timeframes for construction of MSA and HS2

Para 10.5	This overlap in timeframes may result in increased pressure on ecology receptors, particularly breeding and overwintering bird populations, utilising site and the wider area during the short term.	No longer correct due to amended timescales for construction.
Para 10.6	It should also be noted that there is currently limited information available to make the assessment and hence confidence levels are low.	No longer relevant.
Para 10.7	At the time of writing no confirmation of mitigation/compensation proposals is available and therefore no detailed assessment can be undertaken.	No longer relevant.