M60/M62/M66 Simister Island Interchange

TR010064

ENVIRONMENTAL STATEMENT
CHAPTER 8 BIODIVERSITY

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ENVIRONMENTAL STATEMENT
CHAPTER 8 BIODIVERSITY

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8.1 Introduction

8.1.1 This chapter presents the information required by the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 to be provided in the Environmental Statement for the M60/M62/M66 Simister Island Interchange (the 'Scheme') in respect of biodiversity.

8.1.2 Biodiversity is the biological variety and variability of life on earth and the ecological complexes that they are a part of. Construction, operation, improvement and maintenance of roads can result in environmental effects on biodiversity. In addition, biodiversity is the subject of a wide variety of legislation and policies; impacts to ecological receptors could constitute an offence under relevant legislation as well as comprising material considerations within the planning system.

8.1.3 This biodiversity assessment considers the potential for impacts to the following matters:

- Designated sites (statutory and non-statutory)
- Protected or priority habitats – habitats of conservation importance such as hedgerows, lowland mixed deciduous woodland and lowland fen
- Protected or priority species – these include animal and plant species protected by legislation, and species of conservation importance such as priority species.

8.1.4 This chapter is supported by the following Environmental Statement Figures (TR010064/APP/6.2) as well as the figures included within the biodiversity appendices of the Environmental Statement Appendices (TR010064/APP/6.3):

- Figure 8.1: Designated Sites and Affected Road Network (ARN)
- Figure 8.2: Ancient Woodland and Priority Habitats
- Figure 8.3: UK Habitats Map

8.1.5 This chapter is supported by the following Environmental Statement Appendices (TR010064/APP/6.3):

- Appendix 8.1: UK Habitat Classification (UKHab) Report
- Appendix 8.2: Designated Sites Air Quality Assessment
- Appendix 8.3: Bat Survey Report
- Appendix 8.4: Badger Survey Report (Confidential)
- Appendix 8.5: Barn Owl Survey Report (Confidential)
- Appendix 8.6: Breeding Bird Survey Report

- Appendix 8.7: Wintering Bird Survey Report
- Appendix 8.8: Great Crested Newt (GCN) Survey Report
- Appendix 8.9: Riparian Mammal Survey Report
- Appendix 8.10: Reptile Survey Report
- Appendix 8.11: Terrestrial Invertebrate Survey Report
- Appendix 8.12: Biodiversity Net Gain (BNG) Report
- Appendix 8.13: Habitats Regulations Assessment (HRA) Report
- Appendix 8.14: Draft Badger Licence Application (Confidential)
- Appendix 8.15: GCN District Level Licence (DLL) Impact Assessment and Conservation Payment Certificate (IACPC)

8.2 Competent expert evidence

8.2.1 This assessment has been undertaken and reported by a team of competent biodiversity specialists. The competent expert responsible for the assessment is an Associate Director of Ecology with a Bachelor of Science (BSc) degree and Master of Science (MSc) degree. The competent expert is a full member of the Chartered Institute of Ecology and Environmental Management (CIEEM), and Chartered Environmentalist (CEnv) with over 15 years' experience of undertaking biodiversity impact assessments for major infrastructure and linear schemes, including highways, for which the process of Environmental Impact Assessment (EIA) has been required.

8.3 Legislative and policy framework

International obligations

8.3.1 The provisions of international legislation, incorporated into UK law and relevant to this chapter, are identified below. The Convention on Wetlands of International Importance especially as Waterfowl Habitat (the 'Ramsar Convention') requires contracting parties to formulate and implement planning to promote the conservation of wetlands included in the Ramsar List and as far as possible, the wise use of wetlands in their territory.

8.3.2 The United Nations Convention on Biological Diversity 1992 and Strategic Plan for Biodiversity 2011–2020 (the 'Aichi' targets) established a legal framework for biodiversity conservation with the goals of conserving biological diversity, sustainable use of its components, and the fair and equitable sharing of the benefits arising from the use of genetic resources.

Legislation

8.3.3 The biodiversity assessment has been undertaken in accordance with the legislation set out in Table 8.1.

Table 8.1 Legislation relevant to the biodiversity assessment

Legislation	Relevance to the Scheme	How this legislation is addressed in the assessment
Environment Act 2021	Legislation strengthening measures to improve air and water quality, tackle waste, increase recycling, halt the decline of species, and improve the natural environment. With regards to biodiversity, the Act: • Strengthens biodiversity duties • Mandates biodiversity net gain to ensure developments deliver at least 10% increase in biodiversity. For Nationally Significant Infrastructure Projects this would be required from November 2025 • Delivers Local Nature Recovery Strategies to support a Nature Recovery Network • Imposes a duty upon Local Authorities to consult on street tree felling • Strengthens woodland protection and enforcement measures • Delivers Conservation Covenants • Requires Protected Site Strategies and Species Conservation Strategies to support the design and delivery of strategic approaches to deliver better outcomes for nature • Prohibits larger UK businesses from using commodities associated with wide-scale deforestation The Act requires regulated businesses to establish a system of due diligence for each regulated commodity used in their supply chain and requires regulated businesses to report on their due diligence, introduces a due diligence enforcement system.	The act introduces a 10% BNG requirement for all new developments, although this is not expected to be mandated for Nationally Significant Infrastructure Projects (NSIPs) until November 2025. On sites where these biodiversity gains are secured, they would have to be managed in the long term. Although BNG is separate from environmental impact assessment, a summary of BNG is reported upon within Section 8.12 of this chapter, with further details provided within Appendix 8.12: BNG Report of the Environmental Statement Appendices (TR010064/APP/6.3), as it is a matter of interest for stakeholders.

Legislation	Relevance to the Scheme	How this legislation is addressed in the assessment
The Conservation of Habitats and Species Regulations 2017 (as amended)	The regulations provide for the designation and protection of the "national site network"; comprising the European sites already designated under the Nature Directives, and any further sites designated under these Regulations. It also provides the framework of protection for certain flora and fauna (known as European Protected Species (EPS)).	This legislation has been considered in the assessment of construction and operational effects reported upon within the chapter which are informed by the accompanying technical appendices (in the Environmental Statement Appendices (TR010064/APP/6.3)) relevant to the Conservation of Habitats and Species Regulations 2017 (as amended): • Appendix 8.1: UKHab Report • Appendix 8.2: Designated Sites Air Quality Assessment • Appendix 8.3: Bat Survey Report • Appendix 8.8: GCN Survey Report • Appendix 8.9: Riparian Mammal Survey Report • Appendix 8.10: Reptile Survey Report • Appendix 8.13: HRA Report
Wildlife and Countryside Act 1981 (as amended)	Provides protection to a range of species of flora and fauna (including non-native invasive species) and details the law relating to Sites of Special Scientific Interest (SSSI).	Protected Sites, habitats and species listed in the relevant schedules and provisions of the Wildlife and Countryside Act 1981 (as amended) have been researched in the desk study and recorded, where present, in the survey area as reported in Section 8.7 of this chapter.

Legislation	Relevance to the Scheme	How this legislation is addressed in the assessment
		Appendix E: Outline Invasive Species Management Plan of the First Iteration Environmental Management Plan (EMP) (TR010064/APP/6.5) details how the spread of invasive species would be prevented during construction of the Scheme. This is an outline document which will be updated for the Second Iteration EMP.
Natural Environment and Rural Communities Act 2006 (NERC)	Places a duty to conserve biodiversity on public authorities in England. This requires public bodies and statutory undertakers to have regard to the purposes of conserving biodiversity in a manner that is consistent with the exercise of their normal functions (Section 40). The Act also places a duty on the Secretary of State to maintain lists of species and habitats which are regarded as being of principal importance for the conservation of biodiversity in England (Section 41), i.e. Priority habitats and Priority species.	Species/habitats listed in accordance with the requirements of Section 41 of the NERC Act 2006 have been researched in the desk study and recorded, where present, in the survey area as reported in Sections 8.7 to 8.10 of this chapter. These are informed by the accompanying biodiversity technical appendices in the Environmental Statement Appendices (TR010064/APP/6.3).
Countryside and Rights of Way Act 2000 (CROW) (as amended)	Details further measures for the management and protection of SSSIs and strengthens wildlife enforcement legislation.	This legislation has been considered in the assessment of construction and operational effects reported in Section 8.7 to 8.10 of this chapter, which are informed by the accompanying biodiversity technical appendices in the Environmental Statement Appendices (TR010064/APP/6.3).

Legislation	Relevance to the Scheme	How this legislation is addressed in the assessment
Protection of Badgers Act 1992	Protects badgers within the UK from wilful injuring, killing, taking (or attempt to do so), digging for a badger or intentionally or recklessly damaging or destroying a sett.	Badgers and their setts have been identified through desktop assessment and field surveys, as reported within Appendix 8.4: Badger Survey Report (Confidential) of the Environmental Statement Appendices (TR010064/APP/6.3). Measures to address the presence of badger within the Order Limits are reported in this chapter with additional detail provided in a draft badger sett closure licence application to Natural England in Appendix 8.14: Draft Badger Licence Application (Confidential) of the Environmental Statement Appendices (TR010064/APP/6.3).
Wild Mammals (Protection) Act 1996	The Wild Mammals (Protection) Act provides protection for wild mammals against certain acts of deliberate harm.	This legislation has been addressed through Appendix D: Outline General Ecology Management Plan and Appendix N: Outline Landscape and Ecology Management Plan (LEMP) of the First Iteration EMP (TR010064/APP/6.5), which consider how construction would be carried out to avoid unnecessary death or injury of animals.
Animal Welfare Act 2006	The Animal Welfare Act 2006 makes it an offence to cause unnecessary suffering to any animal.	This legislation has been addressed through Appendix D: Outline General Ecology Management Plan and Appendix N: Outline LEMP of the First Iteration EMP (TR010064/APP/6.5), which consider how construction would be carried out to avoid unnecessary death or injury of animals.

Legislation	Relevance to the Scheme	How this legislation is addressed in the assessment
The Hedgerows Regulations 1997	Under the Hedgerows Regulations it is an offence to remove a hedgerow (as defined within the Regulations) without applying to the local planning authority (LPA) for permission. If the hedgerow qualifies as 'Important' under the Regulations the LPA must decide whether the reasons for removal justify the loss of an 'Important Hedgerow', with a presumption for retention.	Hedgerows are assessed against the Hedgerow Regulations in Appendix 8.1: UKHab Report of the Environmental Statement Appendices (TR010064/APP/6.3).
The Invasive Alien Species (Enforcement and Permitting) Order 2019	The Invasive Alien Species (Enforcement and Permitting) Order 2019 (as amended) makes it an offence to release or allow to escape into the wild any specimen of an invasive alien species and provides for the permitting of activities relating to invasive alien species. Fourteen species are identified under the legislation as being widespread in England and Wales and requiring management.	Appendix E: Outline Invasive Species Management Plan of the First Iteration EMP (TR010064/APP/6.5) details how the spread of invasive species would be prevented during construction of the Scheme.

Policy

National Policy Statement for National Networks

8.3.4 The National Policy Statement for National Networks (NPS NN) (Department for Transport (DfT), 2014) sets out the Government's policies relating to the development of NSIPs on the national road and rail networks in England. The Secretary of State uses the NPS NN as the primary basis for making decisions on Development Consent Order (DCO) applications.

8.3.5 Table 8.2 summarises the policy requirements from the NPS NN relating to the Applicant's assessment and mitigation requirements for biodiversity and how these requirements have been addressed in the assessment. See also the NPS NN Accordance Tables (TR010064/APP/7.2) for an assessment of the Scheme's compliance with the NPS NN.

Table 8.2 NPS NN requirements for biodiversity

Paragraph reference	Applicant's assessment/mitigation requirement	How this is addressed in the assessment
5.22	*'Where the project is subject to EIA the applicant should ensure that the environmental statement clearly sets out any likely significant effects on internationally, nationally and locally designated sites of ecological or geological conservation importance (including those outside England) on protected species and on habitats and other species identified as being of principal importance for the conservation of biodiversity and that the statement considers the full range of potential impacts on ecosystems.'*	Section 8.7 of this chapter identifies the designated sites, habitats and species which could be impacted by the Scheme. Likely significant effects on internationally, nationally and locally designated sites, habitats and species are considered in Section 8.10 of this chapter which concludes no significant adverse effects on any of these receptors. The HRA Report (Appendix 8.13 of the Environmental Statement Appendices (TR010064/APP/6.3)) also assessed likely significant effects on internationally designated sites. The statement to inform an appropriate assessment concludes, beyond reasonable scientific doubt, that the Scheme will not adversely affect the integrity of the Rochdale Canal Special Area of Conservation (SAC) during its construction or operational phases, either alone or in combination with other plans or projects.
5.23	*'The applicant should show how the project has taken advantage of opportunities to conserve and enhance biodiversity and geological conservation interests.'*	Section 8.9 of this chapter describes embedded design measures, essential mitigation and enhancements to conserve and enhance biodiversity conservation interests.
5.36	*'Applicants should include appropriate mitigation measures as an integral part of their proposed development, including identifying where and how these will be secured. In particular, the applicant should demonstrate that:* • *during construction, they will seek to ensure that activities will be confined to the minimum areas required for the works;* • *during construction and operation, best practice will be followed to ensure that risk of disturbance or damage to species or habitats is minimised (including as a consequence of transport access arrangements);*	Mitigation measures are detailed within Section 8.9 of this chapter and are included in the Register of Environmental Actions and Commitments (REAC), contained within the First Iteration EMP (TR010064/APP/6.5), which is secured through Requirement 4 of the draft DCO (TR010064/APP/3.1).

Paragraph reference	Applicant's assessment/mitigation requirement	How this is addressed in the assessment
	• *habitats will, where practicable, be restored after construction works have finished;* • *developments will be designed and landscaped to provide green corridors and minimise habitat fragmentation where reasonable;* • *opportunities will be taken to enhance existing habitats and, where practicable, to create new habitats of value within the site landscaping proposals, for example through techniques such as the 'greening' of existing network crossing points, the use of green bridges and the habitat improvement of the network verge.'*	As per commitment LV3 in the REAC, contained within the First Iteration EMP (TR010064/APP/6.5), existing vegetation clearance within the temporary works areas will be minimised as far as practicable. Particular attention will be given to the retention of mature vegetation including individual trees, linear tree belts and woodlands. Best practice measures such as use of an Ecological Clerk of Works (EcoW), timing of works and exclusion zones around sensitive features will be secured by commitments B2, B3, and B5 in the REAC, contained within the First Iteration EMP (TR010064/APP/6.5) respectively. As per Section 8.9 of this chapter, landscaping has been designed to maximise connectivity of habitats within the Order Limits to habitats outside of the Order Limits, and to enhance woodland and grassland habitats.
5.192	*'The applicant should consult Natural England with regard to assessment of noise on designated nature conservation sites, protected landscapes, protected species or other wildlife. The results of any noise surveys and predictions may inform the ecological assessment. The seasonality of potentially affected species in nearby sites may also need to be taken into account.'*	The assessment of noise arising during both construction and operational phases of the Scheme on biodiversity is presented in Section 8.10 of this chapter. It includes consideration of disturbance to protected species as a result of changes in noise levels.

8.3.6 The Government published a draft replacement of the NPS NN in March 2023 (DfT, 2023). The consultation closed in June 2023 and the draft NPS NN has not yet been designated. However, it is potentially capable of being an important and relevant consideration in the decision-making process. The Environmental Statement continues to reference the 2014 NPS NN though, as it remains the relevant Government policy. Notwithstanding that position, Table 8.3 summarises the policy requirements from the draft NPS NN relating to the Applicant's assessment and mitigation requirements for biodiversity and how these have been addressed in the assessment. See also the Draft NPS NN Accordance Tables (TR010064/APP/7.3) for an assessment of the Scheme's compliance with the draft NPS NN.

Table 8.3 Draft NPS NN requirements for biodiversity

Paragraph reference	Applicant's assessment/mitigation requirement	How this is addressed in the assessment
4.12	*'Under the Habitats Regulations, the Secretary of State must consider whether it is possible that a plan or project could likely have a significant effect (either alone or in combination with other plans or projects) on a protected site which forms part of the UK National Site Network (Special Areas of Conservation and Special Protection Areas) or on any site to which the same protection is applied as a matter of policy (i.e. listed or proposed Ramsar sites, possible Special Areas of Conservation, and sites used to compensate for adverse effects of habitat sites*). The term 'habitat sites*' is used to refer collectively to such sites throughout this NPS. Such an assessment should be made with due regard to the conservation objectives of any relevant habitat site(s).'*	The impact of the Scheme on European sites of nature conservation, as defined by the Conservation of Habitats and Species Regulations 2017, has been assessed in line with the Planning Inspectorate's Advice Note Ten: Habitats Regulations Assessment Relevant to Nationally Significant Infrastructure Projects (Planning Inspectorate, 2022).
4.13	*'The applicant should seek the early advice of the appropriate Statutory Nature Conservation Body and provide the Secretary of State with such information as the Secretary of State may reasonably require, to determine whether or not the plan or project should proceed to the Appropriate Assessment stage of Habitats Regulation Assessment.'*	A Stage 1 Screening Assessment concluded that likely significant effects could not be discounted for the Rochdale Canal SAC, when considered alone or in-combination with other plans and projects. The statement to inform an appropriate assessment (Appendix 8.13: HRA Report of the Environmental Statement Appendices (TR010064/APP/6.3)) concludes, beyond reasonable scientific doubt, that the Scheme will not adversely affect the integrity of the Rochdale Canal SAC during its construction or operational phases, either alone or in combination with other plans or projects.
4.14	*'Where a proposed plan or project is considered likely to have a significant effect on a habitats site, the applicant must provide sufficient information with the application to enable the Secretary of State to make an appropriate assessment of these likely effects in view of the site's conservation objectives. The assessment may consider the effect of any mitigation measures and the Statutory Nature Conservation Body must be formally consulted on the assessment and its advice considered. The applicant should also consider agreeing an Evidence Plan with the Statutory Nature Conservation Body to help determine the information required.'*	

Paragraph reference	Applicant's assessment/mitigation requirement	How this is addressed in the assessment
4.15	*'Such plans or projects may only proceed if the assessment concludes they will not adversely affect the integrity of the site or, notwithstanding a negative assessment, there are no alternative solutions, and they must proceed for imperative reasons of overriding public interest. The applicant must demonstrate that they have sought advice from the Statutory Nature Conservation Body on whether any proposed compensation is appropriate to maintain the overall coherence of the National Sites Network. They must also show that the compensation is secured or provide an indication as to how it can be secured to maintain the overall coherence of the National Sites Network. Provision of such information will not be taken as an acceptance of adverse effects on integrity and if an applicant disputes the likelihood of adverse effects, it can provide this information without prejudice to the Secretary of State's final decision on the effects of the potential development on the habitats site. If, in these circumstances, an applicant does not supply information required for the assessment of a potential derogation, there will be no expectation that the Secretary of State will allow the applicant the opportunity to provide such information following the examination.'*	The Applicant sought the advice of Natural England through the statutory consultation in February 2023. This advice has been followed by progressing the HRA to Stage 2 appropriate assessment. Subsequent consultation with Natural England has been undertaken throughout 2023 under a Discretionary Advice Service contract and the Applicant has had due regard to Natural England's feedback in completing the assessment. Appendix 8.13: Habitats Regulations Assessment Report of the ES Appendices (TR010064/APP/6.3) has been shared with Natural England for their review and feedback and Natural England have confirmed that they agree with the conclusions of the HRA and have no further comments.
4.16	*'During the pre-application stage, and without prejudice to the formal Habitats Regulation Assessment of the submitted plan or project, if the Statutory Nature Conservation Body gives an early indication that, irrespective of any anticipated mitigation measures, the proposed development is highly likely to lead to adverse effects on the integrity of one or more habitats sites, the applicant must include with their application such information required to assess a potential derogation under the Habitats Regulations.'*	

Paragraph reference	Applicant's assessment/mitigation requirement	How this is addressed in the assessment
5.41	*'The applicant should consider the full range of potential impacts on ecosystems (including habitats and protected species) and provide environmental information proportionate to the likely impacts of the infrastructure on biodiversity and nature.'*	Section 8.7 of this chapter identifies the designated sites, habitats and species which could be impacted by the Scheme. Likely significant effects on internationally, nationally and locally designated sites, habitats and species are considered in Section 8.10 of this chapter which concludes no significant adverse effects on any of these receptors. The Habitats Regulations Assessment Report (Appendix 8.13 of the Environmental Statement Appendices (TR010064/APP/6.3)) also assessed likely significant effects on internationally designated sites. The statement to inform an appropriate assessment concludes, beyond reasonable scientific doubt, that the Scheme will not adversely affect the integrity of the Rochdale Canal SAC during its construction or operational phases, either alone or in combination with other plans or projects.
5.42	*'The applicant should show how the project has taken advantage of opportunities to conserve and enhance biodiversity and geological conservation interests as well as consider how their proposal will deliver Biodiversity net gain (…).'*	The approach of maximising biodiversity delivery is being applied to the Scheme as discussed in Section 8.12 of this chapter and Appendix 8.12: BNG Report of the Environmental Statement Appendices (TR010064/APP/6.3).
5.43	*'To avoid harm or disturbance in line with the mitigation hierarchy the applicant should demonstrate that:* • *developments are designed to avoid the risk of harm and to minimise the footprint of the development and/or to retain the site's important habitat features* • *developments are designed and landscaped to provide green corridors and minimise habitat fragmentation (for example using underpasses or green bridges to link habitats)*	Embedded and essential mitigation measures are detailed within Section 8.9 of this chapter and are included in the REAC, contained within the First Iteration EMP (TR010064/APP/6.5), which is secured through Requirement 4 of the draft DCO (TR010064/APP/3.1). Measures include: • Minimising removal of existing vegetation within the temporary works areas as far as practicable (Commitment LV3).

Paragraph reference	Applicant's assessment/mitigation requirement	How this is addressed in the assessment
	• *during construction, they will seek to ensure that activities will be confined to the minimum areas required for the works* • *during construction and operation, best practice will be followed to ensure that risk of disturbance or damage to species or habitats follows the mitigation hierarchy (including as a consequence of transport access arrangements). For example, plan for construction work to be carried out at specific times to avoid sensitive times and location, such as the breeding season for wild birds and lifecycles of migratory fish.'*	• Maximising connectivity of habitats through provision of new hedgerow planting in areas adjacent to the environmental areas, along the new highway boundary and around ponds (Commitment LV5). • Provision of new hedgerow tree planting to strengthen new and existing hedgerows (Commitment LV6). • Works will be timed to avoid sensitive periods for protected species where reasonably practicable and appropriate. Where this cannot be achieved, this will be managed in accordance with advice and, where required, supervision from an ECoW and in accordance with any protected species licence requirements. (Commitment B3). • Exclusion zones will be marked where appropriate around sensitive features such as badger setts, birds' nests and watercourses, and will be implemented as directed by the EcoW (Commitment B5).
5.44	*'If avoidance or reduction of harm is not possible, applicants should include appropriate mitigation measures, in line with the mitigation hierarchy, as an integral part of their proposed development, including identifying where and how these will be secured in the long term.'*	
5.45	*'If avoidance or bespoke mitigation measures are insufficient or not possible, as a last resort, appropriate compensation measures should be sought and implemented. For example, moving protected species out of the development site and where practicable, restore habitats after construction works have finished.'*	The Scheme has taken into account the locations of valuable and priority habitats, including important connective habitats (i.e., hedgerows, watercourses and treelines) and the location of protected species. The mitigation hierarchy has been followed to, where practicable, modify the design to avoid impacts to these features. Mitigation includes implementation of best practice measures during construction, provision of bat and bird boxes and closure of badger setts under licence. Further details of the mitigation measures are detailed in Section 8.9 of this chapter. These measures are committed to in the REAC, contained within the First Iteration EMP (TR010064/APP/6.5), which is secured through Requirement 4 of the draft DCO (TR010064/APP/3.1).

Paragraph reference	Applicant's assessment/mitigation requirement	How this is addressed in the assessment
5.46	*'The applicant should not just look to mitigate direct harms but should show how the project has taken advantage of opportunities to conserve and enhance biodiversity, having regard to any relevant Local Nature Recovery Strategy. Opportunities will be taken to enhance or expand existing habitats and create new habitats in accordance with biodiversity net gain requirements. Habitat creation, enhancement and management proposals should include measures for climate resilience, including appropriate species selection. Maintaining habitat connectivity is important for climate resilience and the biodiversity of ecological networks.'*	The Applicant has sought to maximise biodiversity delivery, with the Scheme forecasting an overall net gain of 3.68% for habitats, 58.50% for hedgerows and 0% for rivers on-site post-construction (see Section 8.12 of this chapter for further details). This includes habitat retention, creation and enhancement. Enhancement measures relevant to biodiversity for the Scheme are described in Section 8.9 of this chapter and include enhancements to woodland and grassland habitats. While the biodiversity assessment as presented in this chapter does not explicitly include a natural capital or ecosystem services assessment, impacts on habitats and species have been considered in the context of maintaining connectivity, maximising biodiversity delivery and the retention of sensitive ecological features, as demonstrated by the habitat net gains as stated above.
5.47	*'Wider ecosystem services and benefits of natural capital should also be considered when designing enhancement measures in order to maximise multifunctional benefits whilst minimising land take. For example, this can be achieved through integration of Biodiversity net gain features within a sustainable drainage system; the use of green roofs and walls to harvest rainwater and ameliorate urban heating; or the restoration of rivers to reduce flood risk and provide attractive amenity areas.'*	
5.48	*'The Secretary of State should consider what appropriate requirements should be attached to any consent and/or in any planning obligations entered into to ensure that any necessary mitigation and compensatory measures are secured, delivered, and if necessary enforced, and that biodiversity improvements are registered in accordance with Biodiversity net gain requirements.'*	Mitigation measures are described in Section 8.9 of this chapter and included in the REAC, contained within the First Iteration EMP (TR010064/APP/6.5), which is secured through Requirement 4 of the draft DCO (TR010064/APP/3.1).

Paragraph reference	Applicant's assessment/mitigation requirement	How this is addressed in the assessment
5.49	*'The Secretary of State will need to take account of the advice provided to the applicant by Natural England and/or the Marine Management Organisation, as regards any necessary mitigation measures and whether Natural England and/or or the Marine Management Organisation has granted or refused, or intends to grant or refuse, any relevant licences, including protected species mitigation licences. In advance of the formal submission, applicants are encouraged to use Natural England's Letter of No Impediment Approach and engage with Natural England.'*	The Applicant has engaged with Natural England (using the Discretionary Advice Service) regarding the presence of peat across the site, and mitigation proposals and protected species licensing for badgers and GCN (using the DLL scheme – see Section 8.10 of this chapter for further details). A development licence will be required to interfere with (to close) badger setts. A draft badger licence has been prepared based on the current baseline data for consultation with Natural England to support a Letter of No Impediment (LONI) from Natural England with respect to badgers (see Appendix 8.14: Draft Badger Licence Application (Confidential) of the Environmental Statement Appendices (TR010064/APP/6.3)). The Applicant is working with Natural England, and will submit the LONI to the Planning Inspectorate at the earliest opportunity and will provide updates as appropriate during the Examination. Mitigation measures including protected species licensing are included in the REAC, contained within the First Iteration EMP (TR010064/APP/6.5), which is secured by Requirement 4 in the draft DCO (TR010064/APP/3.1). No Marine Management Organisation (MMO) licences are required for the Scheme.

*Habitat sites – collective term for Special Areas of Conservation and Special Protection Areas used in the draft NPS NN (DfT, 2023). This term is not used in the legislation. They are referred to as European sites within this chapter.

Other relevant policy

8.3.7 In addition to the NPS NN, other relevant policies have been considered as part of the biodiversity assessment. Table 8.4 sets out other policy relevant to this aspect and how the assessment has considered/addressed these policies.

Table 8.4 Other national, regional and local policy relevant to biodiversity

Plan / Policy document	Key requirements and objectives	How this has been considered/addressed in the assessment
National		
National Planning Policy Framework (NPPF) (Department for Levelling Up, Housing and Communities (DLUHC), last updated 2023). The NPPF sets out the Government's planning policies for England and how these should be applied.	The overarching policy contained in the NPPF is a presumption in favour of sustainable development. The planning system has three overarching objectives, which are interdependent and need to be pursued in mutually supportive ways. An environmental objective is included in the plan. The objective is *'to contribute to protecting and enhancing our natural, built and historic environment; including making effective use of land, helping to improve biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy.'* Paragraph 180 sets out how the Government expects planning decisions to contribute to and enhance the natural environment through a number of measures including protecting landscapes, recognition of wider benefits from natural capital, minimising impacts on and achieving net gains for biodiversity. Paragraph 187 provides a number of principles that should be applied by LPAs when determining planning applications. These include refusing permission where significant harm cannot be avoided, mitigated, or compensated for. The NPPF states that, for the purpose of considering development proposals that may affect them, the following should be given the same protection afforded to the national site network under the Conservation of Habitats and Species Regulations: • potential Special Protection Areas and possible Special Areas of Conservation; • listed or proposed Ramsar sites; and	Paragraph 5 of the NPPF confirms it does not contain specific policies for NSIPs and therefore the NPPF is only referenced here insofar as it may be a material consideration. The NPPF includes guidance regarding sustainable transport and environmental protection. This has been considered in Appendix 8.12: BNG Report of the Environmental Statement Appendices (TR010064/APP/6.3). Section 8.9 of this chapter also details design, avoidance, mitigation and compensation measures to minimise impacts on biodiversity, in line with the NPPF requirements.

Plan / Policy document	Key requirements and objectives	How this has been considered/addressed in the assessment
	• sites identified, or required, as compensatory measures for adverse effects on habitats sites, potential Special Protection Areas, possible SACs and listed or proposed Ramsar sites.	
A Green Future: Our 25 Year Plan to Improve the Environment (Department for Environment, Food and Rural Affairs (Defra), 2021a). The 25-Year Environment Plan sets out the Government's long-term approach to protecting and enhancing the environment.	The plan lays out measures for biodiversity improvements in England and identifies the need to explore and embed 'net gain' within the planning system.	Provisions for "net gain" in the context of the Government's 25-Year Environment Plan have been considered in Appendix 8.12: BNG Report of the Environmental Statement Appendices (TR010064/APP/6.3).
Biodiversity 2020: A strategy for England's wildlife and ecosystem services (Defra, 2011) Further understanding of the Government's strategy for biodiversity improvement.	This is the most recent biodiversity strategy for England and has as its mission to halt overall biodiversity loss, support healthy ecosystems, and establish coherent ecological networks.	This has been considered in Appendix 8.12: BNG Report of the Environmental Statement Appendices (TR010064/APP/6.3). Section 8.9 of this chapter details design, avoidance, mitigation and compensation measures to minimise impacts on biodiversity, in line with the biodiversity strategy for England requirements.
Strategy for Sustainable Construction (HM Government and Strategic Forum for Construction, 2008)	Section 11 outlines the actions required to achieve the overreaching biodiversity target. The overreaching target states: • That the conservation and enhancement of biodiversity within and around construction sites is considered throughout all stages of a development.	Section 8.9 of this chapter details design, avoidance, mitigation and compensation measures to minimise impacts on biodiversity, in line with the provisional Strategy for Sustainable Construction requirements.

Plan / Policy document	Key requirements and objectives	How this has been considered/addressed in the assessment
This Government Strategy is based on the recognition of the need to deliver a radical change in the sustainability of the construction industry.		
Regional and Local		
Saved policies of the Bury Unitary Development Plan (UDP) (Adopted August 1997)	<u>Policy EN6: Conservation of the Natural Environment</u> The Council would retain, protect, and enhance the natural environment of the Borough, particularly in relation to areas of ecological, wildlife and geological importance.	The saved policies within the Bury UPD relating to biodiversity have been addressed in Sections 8.8 to 8.10 of this chapter, which describe potential impacts on designated sites, habitats and species, how these have been addressed through embedded design measures, mitigation and enhancement, and residual effects.
	<u>Policy EN6/1: Sites of Nature Conservation Interest</u> Planning permission would not be granted for development in or in the vicinity of a designated or proposed site of national or county/regional importance (Site of Special Scientific Interest or National Nature Reserve or Site of Biological Importance which has been identified as of national or county/regional importance i.e., Grade A) which would destroy or adversely affect, either directly or indirectly, the nature conservation interest of the site, unless it can be demonstrated that other material considerations outweigh the special interest of the site.	
	<u>Policy EN6/2: Sites of Nature Conservation Interest</u> Planning permission would not be granted for development which would damage either directly or indirectly, the nature conversation interests of sites of particular ecological significance (Local Nature Reserves or Grade B and C Sites of Biological Importance) unless conditions can be imposed that would acceptably mitigate those impacts.	

Plan / Policy document	Key requirements and objectives	How this has been considered/addressed in the assessment
	Policy EN6/3: Features of Ecological Value The effect of land use changes on existing features of ecological or wildlife value would be taken into account when assessing development proposals. Any proposal should seek to retain such features and incorporate them into the development.	
	Policy EN6/4: Wildlife Links and Corridors The Council would seek to consolidate and, where appropriate, strengthen wildlife links and corridors, and would not permit development which would adversely affect identified areas. In particular, the Council would seek to ensure that new development within or adjacent to identified links or corridors contributes to their effectiveness through the design, landscaping and siting of development proposals and mitigation works, where appropriate.	
	Policy EN8: Woodland and Trees The Council would support the retention of trees, woods, copses and hedgerows and encourage natural regeneration and new and replacement tree planting throughout the Borough.	
	Policy EN8/2: Woodland and Tree Planting The Council would support and encourage new woodland and tree planting in the Borough. In considering development proposals, the Council would encourage the planting of hedges, trees and woodlands using locally native species.	

Plan / Policy document	Key requirements and objectives	How this has been considered/addressed in the assessment
Bury Supplementary Planning Documents (SPDs) (2007-2020)	SPD 2: Wildlife links and corridors This Development Control Policy Guidance Note expands upon the Council's planning policy in respect of wildlife links and corridors as set out in Policy EN6/4 of the Bury UDP. Wildlife links and corridors are defined as the major routes for migration, dispersal and genetic exchange of wild species. Maintaining and enhancing a network of wildlife links and corridors increases the chance of species surviving compared to those in an isolated population.	The SPD policies relating to biodiversity have been addressed in Sections 8.8 to 8.10 of this chapter, which describe potential impacts on designated sites, habitats and species, how these have been addressed through embedded design measures, mitigation and enhancement, and residual effects.
Five-year Environment Plan for Greater Manchester (2021 – 2031) (Greater Manchester Combined Authority, 2019)	Natural Environment Priority 3: Achieving a net gain in biodiversity for new development New developments will need to deliver a net gain in biodiversity. The combined and local authorities also seek a wider strategy for nature recovery, including habitat restoration and creation, and transforming wide landscape areas into interconnected ecological networks.	The Applicant has undertaken an assessment of the biodiversity net gain which would be delivered by the Scheme, see Appendix 8.12: BNG Report of the Environmental Statement Appendices (TR010064/APP/6.3). The Scheme has sought to maximise biodiversity delivery and forecasts an overall net gain of 3.68% for habitats, 58.50% for hedgerows and 0% for rivers.

Plan / Policy document	Key requirements and objectives	How this has been considered/addressed in the assessment
Rochdale Core Strategy (October 2016) (Rochdale Borough Council, 2016)	<u>Policy G5: Managing protected open land</u> Protected open land outside the urban area needs to be managed to ensure a satisfactory balance between restricting its development to focus development and regeneration into the urban area, and its justified release to meet development needs which cannot be met within the urban area.	The saved policies within the Rochdale Core Strategy relating to biodiversity have been addressed in Sections 8.8 to 8.10 of this chapter, which describe potential impacts on designated sites, habitats and species, how these have been addressed through embedded design measures, mitigation and enhancement, and residual effects.
	<u>Policy G6: Enhancing green infrastructure</u> Enhancing green infrastructure would help support local communities, housing and economic development, by protecting against flooding and other climate change impacts, helping to deliver quality of place and a positive image and by providing a better quality of life through improved access to nature and opportunities for healthier lifestyles.	
	<u>Policy G7: Increasing the value of biodiversity and geodiversity</u> Increasing the value of biodiversity and geodiversity would protect and enhance the borough's wildlife habitats and species and key natural resources and features.	

Plan / Policy document	Key requirements and objectives	How this has been considered/addressed in the assessment
Rochdale UDP (June 2006) (Rochdale Borough Council, 2006)	Policy LT/7: Rochdale Canal The policy states that develop proposals would not be permitted that would adversely affect the watercourse and its environments or the nature conservation value of the Canal.	The saved policies within the Rochdale UDP relating to biodiversity have been addressed in Sections 8.8 to 8.10 of this chapter, which describe potential impacts on designated sites, habitats and species, how these have been addressed through embedded design measures, mitigation and enhancement, and residual effects.
	Policy G/8: Greenspace Corridors Corridors Development and other measures which would enhance Greenspace Corridors recreational, ecological or landscape and amenity value would be permitted. The Council would not permit development proposals which would cause adverse effects.	
	Policy NE/2: Designated Sites of Ecological and Geological / Geomorphological Importance Development proposals adversely affecting sites and areas of ecological and geological/geomorphological importance would not be permitted. In assessing proposals, the Council would apply national planning policy.	
Rochdale Biodiversity and development SPD (2017) (Rochdale Borough Council, 2017)	The overall objective the SPD is to ensure that no net loss of ecological interest or assets occurs and that opportunities to enhance such interest are incorporated within development proposals where possible.	The SPD policies relating to biodiversity have been addressed in Sections 8.8 to 8.10 of this chapter, which describe potential impacts on designated sites, habitats and species, how these have been addressed through embedded design measures, mitigation and enhancement, and residual effects.

Plan / Policy document	Key requirements and objectives	How this has been considered/addressed in the assessment
Salford UDP (June 2006) (Salford City Council, 2006)	<u>Policy ST13: Natural Environmental Assets</u> Development that would result in an unacceptable impact on any of the city's natural environmental assets would not be permitted.	The saved policies within the Salford UDP relating to biodiversity have been addressed in Sections 8.8 to 8.10 of this chapter, which describe potential impacts on designated sites, habitats and species, how these have been addressed through embedded design measures, mitigation and enhancement, and residual effects.
	<u>Policy EN7: Nature Conservation Sites of National Importance</u> Development that would adversely affect the special interest of a SSSI would only be permitted where: • the benefits of the development clearly outweigh the reduction in the special interest for which the site is designated as a SSSI; • the benefits of the development clearly outweigh the contribution that the site makes to retaining a full range of natural and semi-natural habitats, and geological and physiographical features, within England; and • the detrimental impact on the nature conservation interest of the site has been minimised as far as is practicable. Where appropriate, conditions or planning obligations would be used to ensure the protection, enhancement, and management of the nature conservation interest of SSSIs.	
	<u>Policy EN8: Nature Conservation Sites of Local Importance</u> Development that would adversely affect the nature conservation value of a Site of Biological Importance, a Local Nature Reserve, or a priority habitat for Salford as identified in the Greater Manchester Biodiversity Action Plan, would only be permitted when:	

Plan / Policy document	Key requirements and objectives	How this has been considered/addressed in the assessment
	• the benefits of the development clearly outweigh the reduction in the nature conservation interest for which the site is protected or identified as a priority habitat; • the detrimental impact on the nature conservation interest of the site has been minimised as far as is practicable; and • appropriate mitigation is provided to ensure that the overall nature conservation interest of the area is not diminished. Where appropriate, conditions or planning obligations would be used to ensure the protection, enhancement and management of the nature conservation interest of these sites and habitats.	
	<u>Policy EN9: Wildlife Corridors</u> Development that would affect any land that functions as a wildlife corridor, or that provides an important link or stepping stone between habitats, would not be permitted where it would unacceptably impair the movement of flora and fauna. Where development is permitted, conditions or planning obligations may be used to secure the protection, enhancement and/or management measures designed to facilitate the movement of flora and fauna across or around the site.	
	<u>Policy EN11: Mosslands</u> Where appropriate, conditions or planning obligations would be used to ensure the protection, enhancement and management of the Mosslands' nature conservation interest.	

Plan / Policy document	Key requirements and objectives	How this has been considered/addressed in the assessment
	Policy EN13: Protected Trees Development that would result in the unacceptable loss of, or damage to, protected trees would not be permitted. Where the loss of trees is considered acceptable, adequate replacement provision would be required.	
Salford City Council: Salford Local Plan (SLP): Development Management Policies and designations (DMP) and SLP: DMP Addendum (Submitted to Secretary of State June 2021) (Salford City Council, 2021)	Policy GI1: Green infrastructure requirements for development The overarching aim is to establish a comprehensive, high quality network of green infrastructure throughout Salford, extending into surrounding districts. Developments shall protect and enhance the green infrastructure network in Salford by adhering the objectives laid out in the SLP.	Sections 8.8 to 8.10 of this chapter describe potential impacts on designated sites, habitats and species, how these have been addressed through embedded design measures, mitigation and enhancement, and residual effects. In addition, Appendix 8.12: BNG Report of the Environmental Statement Appendices (TR010064/APP/6.3) addresses policies in relation to biodiversity net gain.
	Policy GI2: Chat Moss Any development within or near to Chat Moss shall be consistent with these priorities to protect and enhance Chat Moss defined in the SLP and shall ensure that the capacity of the hydrology of the area to support bog restoration is not adversely affected.	
	Policy GI6: Trees and woodland Any developments are to be designed and constructed in such a way as to minimise any adverse impacts on trees.	
	Policy BG1: Nature improvement areas Development would be carefully controlled to support the achievement of these objectives across the Great Manchester Wetlands Nature Improvement Area, and nature conservation projects would be encouraged.	

Plan / Policy document	Key requirements and objectives	How this has been considered/addressed in the assessment
	Policy BG2: Development and biodiversity All development shall deliver a net gain in biodiversity value. All major development shall deliver at least a 10% net gain in biodiversity value.	
Manchester Core Strategy (July 2012) (Manchester City Council, 2012)	Policy EN 9: Green Infrastructure New development would be expected to maintain existing green infrastructure in terms of its quantity, quality, and multiple function. Where the opportunity arises and in accordance with current Green Infrastructure Strategies the Council would encourage developers to enhance the quality and quantity of green infrastructure, improve the performance of its functions and create and improve linkages to and between areas of green infrastructure. Where the benefits of a proposed development are considered to outweigh the loss of an existing element of green infrastructure, the developer would be required to demonstrate how this loss would be mitigated in terms of quantity, quality, function and future management.	The saved policies within the Manchester Core Strategy relating to biodiversity have been addressed in Sections 8.8 to 8.10 of this chapter, which describe potential impacts on designated sites, habitats and species, how these have been addressed through embedded design measures, mitigation and enhancement, and residual effects.
	Policy EN15: Biodiversity and Geological Conservation The Council would seek to maintain or enhance sites of biodiversity and geological value throughout the City. Developers would be expected to identify and implement reasonable opportunities to enhance, restore or create new biodiversity, either on-site or adjacent to the site, contributing to linkages between valuable or potentially valuable habitat areas. Any adverse impacts on biodiversity would need to be justified against the wider benefits of the proposal, assessed against other LDF policies. Where adverse impacts are unavoidable, developers would be required to provide appropriate mitigation and/or compensation.	

Plan / Policy document	Key requirements and objectives	How this has been considered/addressed in the assessment
	Policy DM1: Development Management All development should have regard to the following specific issues in relation to biodiversity: • Effects relating to biodiversity, landscape, archaeological or built heritage. • Green Infrastructure including open space, both public and private	
Oldham Metropolitan Borough Council: Plan / Local Development Framework (LDF) Development Plan Document (DPD) (November 2011) (Oldham Metropolitan Borough Council, 2011)	Policy 6: Green Infrastructure Development proposals, where appropriate, must adhere to the objectives outlines in the LDF in order to protect, conserve and enhance Green Infrastructure.	The saved policies within the Oldham Metropolitan Borough Council Plan relating to biodiversity have been addressed in Sections 8.8 to 8.10 of this chapter, which describe potential impacts on designated sites, habitats and species, how these have been addressed through embedded design measures, mitigation and enhancement, and residual effects.
	Policy 9: Local Environment This policy outlines main issues to be addressed when development takes place in order to protect and improve the local environment.	
	Policy 21: Protecting Natural Environment Assets This policy outlines the requirements needed for new developments in order to protect, conserve and enhance local natural environments, development proposals must: • protect and maximise opportunities for Green Infrastructure at or near to the site. • protect, conserve, and enhance biodiversity and geodiversity, designated nature conservation sites, legally protected species and their habitats and Local Nature Reserves.	

8.4 Assessment methodology

Assessment scope

8.4.1 Biodiversity matters scoped in or out of the assessment are in line with the Scoping Opinion (TR010064/APP/6.7). Table 8.5 summarises which matters have been scoped in for the biodiversity assessment.

Table 8.5 Summary of biodiversity scope

Matter	Scoped in – construction	Scoped in – operation	Justification where scoped out
European designated sites (SACs, Special Protection Areas (SPAs) and Ramsar)	✓	✓	Rochdale Canal SAC and/or air quality effects only. Agreed by the Inspectorate (Scoping Opinion (TR010064/APP/6.7) – see Table 8.6 for further details).
SSSIs	✓	✓	N/A.
National Nature Reserves (NNRs)	×	×	No NNR have been identified within the study area or within 2km of the site or ARN. Agreed by the Inspectorate (Scoping Opinion (TR010064/APP/6.7) – see Table 8.6 for further details).
Local Nature Reserves (LNRs)	✓	✓	N/A.
Sites of Biological Importance (SBIs)	✓	✓	
Ancient Woodland Inventory sites and Ancient Woodland habitat	✓	✓	
Priority habitats	✓	✓	
Other habitats, including ground water dependent terrestrial habitats and habitats overlying 'peaty soils'	✓	✓	
Notable vascular plants	✓	✓	
Badgers	✓	✓	
Bats	✓	✓	
Birds – breeding, wintering and schedule 1 species (including barn owl)	✓	✓	

Matter	Scoped in – construction	Scoped in – operation	Justification where scoped out
Freshwater fauna (fish and macro-invertebrates)	✓	✓	
Great crested newts	✓	✓	
Otters	✓	✓	
Reptiles	✓	✓	
Terrestrial invertebrates	✓	✓	
Water voles	✓	✓	
Priority species	✓	✓	
Invasive non-native species (INNS) – plants and animals	✓	×	Significant effects during operation are not likely. Agreed by the Inspectorate (Scoping Opinion (TR010064/APP/6.7) – see Table 8.6 for further details).

Scoping Opinion

8.4.2 Table 8.6 summarises the key requirements from the Scoping Opinion (TR010064/APP/6.7) as relevant to the scope of the biodiversity assessment, and identifies any matters scoped out of the assessment as agreed with the Planning Inspectorate and other stakeholders. This table also explains any changes to the assessment methodology as a result of this engagement.

Table 8.6 Scoping Opinion feedback for biodiversity

Stakeholder	Comment	Response
Planning Inspectorate	ID 3.3.1 – *'The Inspectorate recommends that in order to assist the decision-making process, the Applicant uses tables to: …* *• Identify where details are contained in the Habitats Regulations Assessment (HRA) report (where relevant), such as descriptions of National Site Network sites and their locations, together with any mitigation or compensation measures, that inform the findings of the ES.'*	Noted. Table 8.8 in this chapter provides this information.
	ID 4.4.1 – *'There are no European sites or SSSI within 2km of the Proposed Development and no pathways of effect during the construction of the Proposed Development have been identified. As set out in item 4.1.1 of this Scoping Opinion, the Inspectorate does not agree that air quality effects of changes in road traffic during construction can be scoped out whilst the traffic screening exercise remains to be carried out. On this basis, the Inspectorate considers that there could be effects on the Rochdale Canal SAC and SSSI. For all other European sites and SSSI and other pathways of effect (with the exception of air quality), the Inspectorate agrees that these can be scoped out of the assessment of effects during construction.'*	Rochdale Canal SAC and SSSI is scoped in for consideration due to potential impacts from air quality. A detailed assessment of air quality impacts on designated sites is provided within Appendix 8.2: Designated Sites Air Quality Assessment of the Environmental Statement Appendices (TR010064/APP/6.3) and the SAC is assessed in Appendix 8.13: HRA Report of the Environmental Statement Appendices (TR010064/APP/6.3).
	ID 4.4.2 – *'No NNR have been identified within the study area or within 2km of the site or ARN. The Inspectorate agrees that these matters can be scoped out of the assessment.'*	Noted. NNR are scoped out of the assessment.
	ID 4.4.3 – *'Paragraphs 9.4.8 and 9.4.24 explain that potential for INNS effects during construction would be considered. However, the Inspectorate agrees that significant effects during operation are not likely and that this matter can be scoped out of the assessment.'*	Noted. Effects from INNS during operation are scoped out of the assessment.

Stakeholder	Comment	Response
	ID 4.4.4 – *'The Applicant states that "Species scoped in for further assessment at this stage may be scoped out in future if the value assigned to them is reduced following additional surveys and data collection. Receptors would only be scoped out following consultation and agreement with statutory bodies".* *Paragraphs 9.3.10 – 9.3.12 identify protected and notable species within the study area, but that "2021 surveys are ongoing and data sets are not sufficiently complete to contribute to this scoping report".* *The Inspectorate draws the Applicants attention to comments made in paragraphs 3.1.3 – 3.1.4 of this Scoping Opinion. Where matters are scoped in at this stage but later scoped out, further evidence which has been gathered to justify that approach should be clearly cited alongside agreement with relevant consultees and presented as part of the ES.'*	Since submission of the Environmental Scoping Report (TR010064/APP/6.6), field surveys have been completed (see Appendices 8.1 and 8.3 to 8.11 of the Environmental Statement Appendices (TR010064/APP/6.3) for further details). No species have been scoped out on the basis of this additional survey data and so the scoping of the assessment is the same as the scope reported in the Environmental Scoping Report (TR010064/APP/6.6).
	ID 4.4.5 – *'Chapters 10 and 15 of the Scoping Report (sections 4.5 and 4.10 of this Scoping Opinion) describe the potential presence of localised peat deposits within the study area, and their potential removal. The ecological / biodiversity value of peat as a resource is not specifically considered as part of Chapter 9 of the Scoping Report, nor is the potential loss of Section 8.7 (and any mitigation that may or may not be required) described as part of the scope of the biodiversity assessment.* *The biodiversity chapter of the ES should therefore specifically outline the potential ecological significance of effect of peat loss. In this regard the Inspectorate would expect cross reference to the assessments of Geology and Soils, Water Environment and Climate as appropriate.'*	During subsequent consultation with Natural England, further information was presented based on ground investigation (GI) and soil (Agricultural Land Classification (ALC)) survey data, and Natural England agreed that this demonstrates that the peat is not continuous and that impacts would be localised. Natural England also stated that it supports storage compound and spoil pile locations which avoid deep peat, the preparation of a peat handling strategy, and the reuse of peat on site to enhance biodiversity mitigation proposals. Peat has been added to the scope of this chapter. Section 8.7 of this chapter summarises the baseline information available with respect to potential peatland habitats. Section 8.10 assesses the effects of the

Stakeholder	Comment	Response
		Scheme on peat, including loss of peat and impacts on peat-dependent habitats. Appropriate mitigation for the management and handling of soil materials, including any peat, is described within the relevant management plans included in the First Iteration EMP (TR010064/APP/6.5). The Consultation Report (TR010064/APP/5.1) sets out the engagement that has taken place to date with Natural England. A Statement of Common Ground with Natural England will be prepared and submitted during the course of the Examination.
	ID 4.4.6 – *'Paragraphs 9.7.7 – 9.7.8 of the Scoping Report note the potential need to carry out a HRA. There are other sections of the Scoping Report which refer to HRA and which appear to be somewhat contradictory. Paragraph 5.5.2 seemingly concludes that there would be no likely significant effects on any European sites, whereas paragraphs 6.3.25, 9.7.7 and 9.7.8 identify the Rochdale Canal SAC as requiring further consideration as part of the assessment of air quality effects.* *The ES should be clear in establishing pathways of effect to European sites and ensure that any HRA is co-ordinated with the EIA in accordance with Regulation 26 of the EIA Regulations.'*	An HRA has been undertaken and reported in Appendix 8.13: HRA Report of the Environmental Statement Appendices (TR010064/APP/6.3). The results have been used to inform the assessment of effects within this chapter.

Stakeholder	Comment	Response
Appendix 2 of the Scoping Opinion		
Canal and Rivers Trust	*'The Canal & River Trust do not own any waterways within the immediate vicinity of the proposed development, our closest waterway is the Manchester Bolton, & Bury Canal which is over 3km from the existing junction. The Rochdale Canal which is a designated Site of Special Scientific Interest (SSSI) and Special Area of Conservation (SAC) due to the aquatic flora it supports, is over 4km from the junction. We do however note that the report mentions at 9.4.14 that the Rochdale Canal is within 200m of the Stage 2 Affected Road Network and as such would be scoped in as a potential receptor. We have been unable to find any further details/plans showing this within the submitted document. But we would agree with the Rochdale Canal, due to its International and National Designations is scoped into the report for further assessment.'*	Noted. Rochdale Canal SAC and SSSI are scoped into this assessment. Rochdale Canal is also assessed within Appendix 8.13: HRA Report of the Environmental Statement Appendices (TR010064/APP/6.3).
Environment Agency	*'The Government has made a commitment to include an amendment to the long-awaited Environment Bill that would add the requirement for new 'nationally significant' infrastructure projects in England – including for transport and energy – to provide net gain in biodiversity and habitats for wildlife.* *Based on scheme's construction being planned for 2025 and with the Environment Bill likely to be enacted before this date, the scope of the project should be looking to consider how biodiversity gains would be achieved either through the protection and enhancement of existing habitats, the creation of new ones, and/or the strengthening of connections between them.'*	Biodiversity Metric calculations have been undertaken and are summarised within Section 8.12 of this report. Full details of the BNG assessment are provided within Appendix 8.12: BNG Report of the Environmental Statement Appendices (TR010064/APP/6.3).

Stakeholder	Comment	Response
Natural England	*'5.5.2 Habitats Regulations Assessment* *In this paragraph it states that the HRA Screening exercise identified no source-receptor pathways to European designated sites and has therefore concluded no likely significant effect from the proposal. This conclusion does not appear to match up with the findings in the thematic chapters later on in the report. In chapters 6.3.25 and 9.3.2 it is stated that Rochdale Canal SAC is being screened in to the air quality assessment, therefore Natural England advise that the HRA cannot conclude no likely significant effect at this stage.'*	Rochdale Canal SAC is scoped in to this assessment and an HRA has been undertaken as summarised in Appendix 8.13: HRA Report of the Environmental Statement Appendices (TR010064/APP/6.3). The statement to inform an appropriate assessment concludes, beyond reasonable scientific doubt, that the Scheme will not adversely affect the integrity of the rochdale Canal SAC during its construction or operational phases, either alone or in combination with other plans or projects.
	'Table 9.4 (Summary of impact pathways) European and nationally designated sites should be included as receptors to air quality changes.'	European sites and nationally important sites have been included where there is potential for impacts from air quality changes. In accordance with Design Manual for Roads and Bridges (DMRB) LA105 this includes sites within 200m of the ARN. Refer to Appendix 8.2: Designated Sites Air Quality Assessment of the Environmental Statement Appendices (TR010064/APP/6.3) for details of the assessment.
	'We commend the reference to biodiversity enhancement in this chapter but suggest it could be strengthened by including a commitment to an ambitious biodiversity net gain target. For the wide range of habitats on this site, Natural England advocates the use of the Defra Metric to calculate any potential biodiversity losses and compensation to be measured.'	Defra Metric 3.1 has been used to calculate biodiversity losses and compensation. The project has aimed to maximise biodiversity delivery. In summary the Scheme is predicting a gain of 3.68% for habitats, 58.50% for hedgerows and 0% for rivers and streams. Further details can be found in Appendix 8.12: BNG Report of the Environmental Statement Appendices (TR010064/APP/6.3).

Statutory consultation

8.4.3 Table 8.7 identifies the key feedback received from statutory bodies during the statutory consultation. All comments raised during the statutory consultation, as well as the Applicant's responses, are included in Annex Q of the Consultation Report Annexes (TR010064/APP/5.2).

Table 8.7 Key statutory consultation feedback for biodiversity

Stakeholder	Comment*	Response
Natural England	*Further information required to determine impacts to designated sites* *'There is insufficient information in order to assess the potential impacts to Rochdale Canal Special Area of Conservation (SAC) and Rochdale Canal Site of Special Scientific Interest (SSSI).'*	Appendix 8.13: HRA Report of the Environmental Statement Appendices (TR010064/APP/6.3) provides a detailed assessment of the potential effects of air quality changes on Rochdale Canal SAC. As detailed within Appendix 8.2: Designated Sites Air Quality Assessment of the Environmental Statement Appendices (TR010064/APP/6.3), Rochdale Canal SSSI is screened out of the nitrogen deposition assessment as it is not predicted to have a combined total nitrogen deposition rate above the minimum critical load with both a predicted change in nitrogen deposition of more than 1% of the minimum critical load and of more than 0.4kg N/ha/year.
	Further information required to determine impacts to peat *'Natural England are of the opinion that peat surveys are required to determine and mitigate the impacts to peat. This would also ensure habitats have been classified correctly, in reference to Annex I habitat. Natural England do not support development on peat. Natural England advise that peat can be very difficult to restore, recreate or replace once destroyed. Therefore, impacts to peat should be fully assessed and mitigated, where required.'*	During subsequent consultation, further information was presented based on GI and soil (ALC) survey data, and Natural England agreed that this demonstrates that the peat is not continuous and that impacts would be localised. Natural England also stated that it supports storage compound and spoil pile locations which avoid deep peat, the preparation of a peat handling strategy, and the reuse of peat on site to enhance biodiversity mitigation proposals.

Stakeholder	Comment*	Response
		Peat has been added to the scope of this chapter. Section 8.7 of this chapter summarises the baseline information available with respect to potential peatland habitats. Section 8.10 assesses the effects of the Scheme on peat, including loss of peat and impacts on peat-dependent habitats. Further information in relation to the presence and potential impacts on peat can be found in the following chapters of this Environmental Statement (TR010064/APP/6.1): • Chapter 9 Geology and Soils • Chapter 10 Material Assets and Waste • Chapter 14 Climate Appropriate mitigation for the management and handling of soil materials, including any peat, is described within the relevant management plans included in the First Iteration EMP (TR010064/APP/6.5). The Consultation Report (TR010064/APP/5.1) sets out the engagement that has taken place to date with Natural England. A Statement of Common Ground with Natural England will be prepared and submitted during the course of the Examination.

Stakeholder	Comment*	Response
	<u>Further information required to determine impacts to Ancient Woodland</u> *'Natural England does not support the removal of Ancient Woodland and believes the proposal should follow the mitigation hierarchy. A full assessment of impacts during construction and operational phases should be made on the existing Ancient Woodland and its proposed mitigation habitat. We support the need for a management plan'.*	Since the Preliminary Environmental Information Report (PEIR) was produced (contained in Annex L of the Consultation Report Annexes (TR010064/APP/5.2)) the extent of the Order Limits has reduced and direct impacts on Philips Wood Ancient Woodland have been avoided, refer to Section 8.10 of this chapter. There would be no direct impacts to any other areas of Ancient Woodland. Indirect impacts to Ancient Woodland are assessed within Section 8.10 of this chapter, supported by Appendix 8.2: Designated Sites Air Quality Assessment of the Environmental Statement Appendices (TR010064/APP/6.3). The First Iteration EMP (TR010064/APP/6.5) contains further details of how landscape and ecological mitigation would be reinstated, monitored and maintained. A detailed landscape specification and maintenance schedule would be produced at the detailed design stage. Any peat stripped during construction would be reused sustainably, as detailed within Appendix F: Outline Soil Management Plan of the First Iteration EMP (TR010064/APP/6.5).
	'Tree planting should not occur on peat.'	Figure 1 of the '*Decision support framework for peatland protection, the establishment of new woodland and re-establishment of existing woodland on peatland in England'* guidance (Defra *et al.*, 2023) would be followed to ensure planting is suitable within areas identified with peat soils.

Stakeholder	Comment*	Response
	Further consideration of scheme layout and habitat design *'Habitat mitigation and enhancement can be strengthened using up to date Biodiversity Metrics for Biodiversity Net Gain. We would welcome more tailored and bespoke habitats in line with Local Nature Recovery Strategies, Best and Most Versatile (BMV) agricultural land, Ancient Woodland and peat presence. Measures should complement connecting people with nature, locally designated sites, protected species and priority habitats.'*	A BNG assessment has been undertaken, see Appendix 8.12: BNG Report of the Environmental Statement Appendices (TR010064/APP/6.3). The Scheme has aimed to maximise biodiversity delivery whilst ensuring habitats are appropriate for the location and maximise connectivity within and to areas outside of the site. It is noted that the Biodiversity Metric 4.0 has since been released (March 2023) and a 'statutory' version of the Biodiversity Metric was published in November 2023. Natural England advise that users of previous versions of the Biodiversity Metric should continue to use that metric for the duration of the project it is being used for. Switching metrics is not simply a case of putting the same numbers in a new calculator tool, as the advice regarding how the data is compiled and applied differs between different versions of the metric. As such it is also not possible to compare results from one version of the metric tool to another. The Scheme has therefore continued to report using Biodiversity Metric 3.1 given that this version of the Metric has informed the Scheme design.
	Ensure the appropriate species mitigation scheme is in place *'Natural England recommends further discussions are held with the District Level Licensing team and all protected species mitigation licences are ready to be secured.'*	The Applicant has secured an Impact Assessment and Conservation Payment Certificate (IACPC) with respect to a DLL for GCN, which has been countersigned by Natural England (see Appendix 8.15: GCN DLL IACPC of the Environmental Statement Appendices (TR010064/APP/6.3)).

Stakeholder	Comment*	Response
		A badger licence would be required to enable construction of the Scheme. The Applicant is working with Natural England to agree a draft badger licence and to secure a LONI with respect to badgers. The draft badger licence application is provided in Appendix 8.14: Draft Badger Licence Application (Confidential) of the Environmental Statement Appendices (TR010064/APP/6.3). The Applicant will submit the LONI to the Planning Inspectorate at the earliest opportunity and will provide updates as appropriate through the Examination.

*Note: only those comments directly relevant to biodiversity are included in this table.

General approach

8.4.4 The methodology for the biodiversity assessment complies with the requirements set out in the following technical standards and guidance:

- DMRB LA 108 Biodiversity (Highways England, 2020a)
- DMRB LA 105 Air Quality (Highways England, 2019)
- Guidelines for Ecological Impact Assessment in the UK and Ireland (CIEEM, 2018, Version 1.1 updated September 2019)

8.4.5 A staged approach has been taken in assessing the ecological value of the study area. This involved an initial desk study, which informed subsequent detailed baseline field surveys and assessments.

8.4.6 Species-specific and habitat surveys were carried out between February 2021 and May 2023 to establish a robust baseline and inform the design and assessment. Current best practice guidance documents for the survey and assessment of specific species and habitats have been used for all surveys and are referenced in the appropriate technical appendices that support this chapter (Appendices 8.1 to 8.11 of the Environmental Statement (TR010064/APP/6.3)).

8.4.7 The impact assessment is based on a construction phase lasting over three years, with mobilisation starting in Quarter 4 of 2025, main works commencing in 2026, and the Scheme opening for traffic in quarter 1 of 2029 (as described in Chapter 2: The Scheme of this Environmental Statement (TR010064/APP/6.1)). It has been assumed that all landscape planting would be undertaken up to 4 years after site clearance in any particular part of the Order Limits.

8.4.8 The assessment takes a worst-case scenario approach. As discussed in Chapter 5: Environmental assessment methodology of this Environmental Statement (TR010064/APP6.1), biodiversity receptors can be impacted from multiple sources. Consideration of these combined impacts (intra-project effects) is an integral part of assessing the effect on biodiversity. The assessment of the effects on biodiversity matters has therefore been informed by relevant information collated by other environmental aspects, notably Chapter 5: Air Quality, Chapter 7: Landscape and Visual, Chapter 9: Geology and Soils, Chapter 11: Noise and Vibration and Chapter 13: RDWE of this Environmental Statement (TR010064/APP/6.1).

8.4.9 Assessment of the potential air quality impacts on designated sites and habitats which are sensitive to nitrogen deposition, including SACs, SPAs, Ramsar sites, SSSIs, LNRs, SBIs, nature improvement areas, Ancient Woodland and veteran trees within 200m of the ARN, have been undertaken in accordance with DMRB LA 105 (see Chapter 5: Air Quality of this Environmental Statement (TR010064/APP/6.1)) and are reported in Appendix 8.2: Designated Sites Air Quality Assessment of the Environmental Statement Appendices (TR010064/APP/6.3).

8.4.10 The air quality assessment (Chapter 5: Air Quality of this Environmental Statement (TR010064/APP/6.1)), following DMRB LA 105, lists the sites and trees that are screened in for ecological assessment following modelling of nitrogen deposition rates. Screened-in sites have a predicted total nitrogen deposition rate above the minimum critical load, and a predicted change in nitrogen deposition of more than 1% of the lower critical load and greater than 0.4kg N/ha/year. Further assessment, based on the duration and extent of the change and characteristics of the habitats, is presented in Appendix 8.2: Designated Sites Air Quality Assessment of the Environmental Statement Appendices (TR010064/APP/6.3) and is summarised in Section 8.10 of this chapter.

8.4.11 The identification of baseline conditions has been informed by a combination of desk study, field surveys, air quality and noise modelling and stakeholder consultation.

8.4.12 Mitigation has been designed and implemented in line with Section 4.2 of Chapter 4: Environmental Assessment Methodology of this Environmental Statement (TR010064/APP/6.1). In addition to mitigation, opportunities for enhancements for biodiversity have been identified. Enhancements have not been included in the assessment of likely significant effects. Section 8.9 of this chapter sets out the mitigation and opportunities for enhancements for the biodiversity aspect.

8.4.13 The requirements of protected and controlled species legislation are detailed in Section 8.3 of this chapter. A DLL would be obtained for GCN from Natural England (see Section 8.9 of this chapter).

8.4.14 In parallel with the EIA process, the effects of the Scheme on the national site network (i.e. SPA, SAC, and Ramsar sites) have been assessed in accordance with DMRB LA 115 HRA (Highways England, 2020b), the Planning Inspectorate's Advice Note Ten: Habitats Regulations Assessment Relevant to Nationally Significant Infrastructure Projects (Planning Inspectorate, 2017a), and legislative requirements.

8.4.15 The HRA is a separate legal process from the EIA, although there is an overlap in relation to the potential impact on the national site network and the processes are undertaken in parallel. The HRA undertaken for the Scheme is available in Appendix 8.13: HRA Report of the Environmental Statement Appendices (TR010064/APP/6.3).

8.4.16 Table 8.8 provides cross references to Appendix 8.13: HRA Report of the Environmental Statement Appendices (TR010064/APP/6.3) to identify where details are contained that inform the findings of this Environmental Statement (TR010064/APP/6.1).

Table 8.8 Locations of information within the HRA Report (Appendix 8.13 of the Environmental Statement Appendices (TR010064/APP/6.3))

Detail	Location
Descriptions of the European designated sites	Section 4

Detail	Location
Locations of European designated sites	Annex E
Stage 1 screening conclusion	Section 5.4
Stage 2 appropriate assessment conclusion	Section 6.4
Mitigation measures	N/A
Compensation measures	N/A

Assessment criteria

8.4.17 The importance, level of impact (change) and significance of effect assessment criteria in DMRB LA 108 have been followed for this assessment.

Importance of receptors

8.4.18 Importance has generally been assigned to receptors according to the guidance outlined in Table 8.9 (from DMRB LA 108, Table 3.9). Although priority habitats can be of up to national importance according to Table 3.9, this assessment takes into consideration factors such as extent and habitat condition to determine the contribution of the habitat within the study area to the conservation status of that habitat type on a county, regional or national scale. Therefore, priority habitats have only been valued as nationally important where the extent and condition of the habitat within the study area mean that it is considered to make a measurable contribution to the conservation status at a national scale.

8.4.19 In Greater Manchester, Local Wildlife Sites (LWS) are known as SBI and are therefore valued as County importance.

Table 8.9 Biodiversity receptor importance

Importance	Typical description
International or European importance	**Designated sites** including: European sites: Sites of Community Importance (SCIs); SPA; potential SPA (pSPA); SAC; candidate or possible SAC (cSACs or pSACs); Wetlands of International Importance (Ramsar sites); Biogenetic Reserves; World Heritage Sites (where recognised for biodiversity value); and Biosphere Reserves. Areas which meet the selection criteria for those sites listed above but which are not themselves designated as such. **Species:** Resident of regularly occurring, populations of species which can be considered at an international or European level where: • The loss of these populations would adversely affect the conservation status or distribution of the species at an international or European scale; or • The population forms a critical part of a wider population at this scale; or • The species is at a critical phase of its life cycle at an international or European scale.
UK or National importance	**Designated sites** including: SSSI or Areas of Special Scientific Interest (ASSIs); NNR; National Parks; Marine Protected Areas (MPAs) including Marine Conservation Zones (MCZs). Areas which meet the published selection criteria for those sites listed above but which are not themselves designated as such. **Habitats** including: • Areas of UK Biodiversity Action Plan (BAP) priority habitats; • Habitats included in the relevant statutory list of priority species and habitats; • Areas of irreplaceable habitats including: Ancient Woodland; ancient or veteran trees; blanket bog; limestone pavement; sand dunes; salt marsh; lowland fen. • Areas of habitat which meet definition for habitats listed above but which are not themselves designated or listed as such. **Species:** Resident, or regularly occurring, populations of species which can be considered at an international, European, UK or national level where: • The loss of these populations would adversely affect the conservation status or distribution of the species at a UK or national scale; or • The population forms a critical part of a wider population at this scale; or • The species is at a critical phase of its life cycle at a UK or national scale.
Regional importance (north-west of England)	**Sites:** Non-statutory designated sites including heritage coasts. **Habitats:** Areas of habitats identified (including for restoration) in regional plans or strategies (where applicable).

Importance	Typical description
	Species: • Resident, or regularly occurring, populations of species which can be considered at an international, European, UK or national level where: - The loss of these populations would adversely affect the conservation status or distribution of the species at a regional scale; or - The population forms a critical part of a wider regional population; or - The species is at a critical phase of its life cycle. • Species identified in regional plans or strategies.
County or equivalent authority importance (Greater Manchester)	**Wildlife / nature conservation sites designated at a county (or equivalent level)** including: LWSs; Local Nature Conservation Sites (LNCSs); LNRs; Sites of Importance for Nature Conservation (SINCs); Sites of Nature Conservation Importance (SNCIs); County Wildlife Sites (CWSs). **Habitats:** Areas of habitats identified in county of equivalent authority plans or strategies (where applicable). **Species:** • Resident, or regularly occurring, populations of species which can be considered at an international, European, UK or national level where: - The loss of these populations would adversely affect the conservation status or distribution of the species at a county or unitary authority scale; or - The population forms a critical part of a wider county or equivalent authority area population, e.g. metapopulations; or - The species is at a critical phase of its life cycle. • Species identified in county or equivalent authority area plans or strategies
Local importance	**Sites:** Wildlife / nature conservation sites designated at a local level including: LWSs; LNCSs; LNRs; SINCs; SNCIs; and SLNCIs. **Habitats:** Areas of habitat considered to appreciably enrich the habitat resource within the local context including features of importance for migration, dispersal, or genetic exchange. **Species:** Populations / communities of species considered to appreciably enrich the habitat resource within the local context including features of importance for migration, dispersal or genetic exchange.

Level of impact (change)

8.4.20 Level of impact (change) on receptors has been assessed according to the criteria outlined in Table 8.10 (from DMRB LA 108, Table 3.11).

Table 8.10 Level of impact (change) and typical descriptions

Level of impact (change)		Typical description
Major	Adverse	• Permanent/irreversible damage to a biodiversity resource; and • The extent, magnitude, frequency, and/or timing of an impact negatively affects the integrity or key characteristics of the resource.
	Beneficial	• Permanent addition or, improvement to, or restoration of a biodiversity resource; and • The extent, magnitude, frequency, and/or timing of an impact positively affects the integrity or key characteristics of the resource.
Moderate	Adverse	• Temporary/reversible damage to a biodiversity resource; and • The extent, magnitude, frequency, and/or timing of an impact negatively affects the integrity or key characteristics of the resource.
	Beneficial	• Temporary addition of, improvement to, or restoration of a biodiversity resource; and • The extent, magnitude, frequency, and/or timing of an impact positively affects the integrity or key characteristics of the resource.
Minor	Adverse	• Permanent/irreversible damage to a biodiversity resource; and • The extent, magnitude, frequency, and/or timing of an impact does not affect the characteristics of the resource.
	Beneficial	• Permanent addition of, improvement to, or restoration of a biodiversity resource; and • The extent, magnitude, frequency, and/or timing of an impact does not affect the integrity or key characteristics of the resource.
Negligible	Adverse	• Temporary/reversible damage to a biodiversity resource; and • The extent, magnitude, frequency, and/or timing of an impact does not affect the integrity or key characteristics of the resource.
	Beneficial	• Temporary addition of, improvement to, or restoration of a biodiversity resource; and • The extent, magnitude, frequency, and/or timing of an impact does not affect the integrity or key characteristics of the resource.
No change		No observable impact, either positive or negative.

8.4.21 For the purposes of this assessment, the CIEEM (2019) definition of magnitude has been used whereby magnitude refers to size, amount, intensity and volume. It has been quantified where possible and expressed in absolute or relative terms: e.g. the amount of habitat lost, percentage change to habitat area, percentage decline in a species population.

Significance of effect

8.4.22 Significance of effect has been derived using the significance matrix in Table 8.11 (from DMRB LA 108, Table 3.13). Significance of effect is derived by combining the importance of a receptor and the level of impact on the receptor. In accordance with DMRB LA 108, where the matrix includes two significance categories, evidence has been provided to support the reporting of a single significance category. Significant effects have been assessed as those effects that remain within the moderate, large or very large categories once mitigation has been taken into account.

Table 8.11 Significance matrix

		Level of impact				
		No change	**Negligible**	**Minor**	**Moderate**	**Major**
Receptor importance	**International or European**	Neutral	Slight	Moderate or large	Large or very large	Very large
	UK or National	Neutral	Slight	Slight or moderate	Moderate or large	Large or very large
	Regional	Neutral	Neutral or slight	Slight	Moderate	Moderate or large
	County or equivalent authority	Neutral	Neutral or slight	Neutral or slight	Slight	Slight or moderate
	Local	Neutral	Neutral	Neutral or slight	Neutral or slight	Slight

8.5 Assessment assumptions and limitations

8.5.1 Where possible, nationally recognised standard survey methodologies (as detailed within the Environmental Statement Appendices (TR010064/APP/6.3)) were used to reduce limitations for ecological evaluation and impact assessment.

8.5.2 Specific limitations relevant to each survey, such as land access constraints, are detailed in the relevant technical appendices. The survey specific constraints do not represent a limitation that would compromise the ecological impact assessment, especially when taking account of the Scheme's embedded mitigation in design and best practice measures.

8.5.3 Figures in the survey reports show the Order Limits, however the buffer zones used for the surveys which are also shown are based on the provisional Order Limits from an earlier design. This is because the buffers were determined based on the red line boundary at the time the surveys were undertaken, however these generally included a wider area than the Order Limits and so encompassed all relevant land parcels.

8.5.4 This assessment has been undertaken for the Scheme design (as shown on Figure 2.2: Scheme Design of the Environmental Statement Figures (TR010064/APP/6.2)) and assumes a reasonable worst-case basis afforded by the limits of deviation (see Section 2.5 of Chapter 2: The Scheme of this Environmental Statement (TR010064/APP/6.1)).

8.5.5 As stated in Chapter 2: The Scheme of this Environmental Statement (TR010064/APP/6.1), in order to mitigate the risk of errant golf balls reaching and entering the highway, golf ball stop netting would be installed along the boundary of Pike Fold Golf Course between the M60 eastbound to M60 southbound free flow link and the realigned M66 southbound diverge link. The General Arrangement Plans (TR010064/APP/2.2) as well as Figure 2.3: Environmental Masterplan of the Environmental Statement Figures (TR010064/APP/6.2) show the preliminary design location and alignment of this golf ball netting.

8.5.6 Design work is ongoing to fully evaluate the risks associated, and that the mitigation provided by the golf ball netting~~,~~ is proportionate to the risks to motorists, maintenance operatives and third parties on or nearby the strategic network. For the purpose of this assessment, a 'worst-case' approach has been adopted with respect to impacts of the net on fauna, in particular bats and birds. It has been assumed the netting would be approximately 25m in height and would be approximately 330m long. However, it has been assumed the netting would only be required temporarily (around 15 years) whilst vegetation matures. Measures to lessen the impact on protected and notable species are included within Section 8.9 and would be considered when refining the design on the net at the detailed design stage.

8.6 Study area

8.6.1 The study area for biodiversity relates to the main areas of construction activity within the Order Limits, including the Scheme, construction compounds, storage areas, haul roads and outfalls.

8.6.2 The study area for the desk-based assessment of designated sites, protected and notable habitats and species records comprised the following:

- **SACs, SPAs, and Ramsar sites**:
  - Within 2km of the Order Limits or where there is land that may be important ecologically in supporting the populations for which the site has been designated or classified (also known as "functionally linked land") or
  - Within 30km of a SAC, where bats are noted as one of the qualifying interests or

- Crossed by, adjacent to, upstream of, or downstream of, the Scheme or
- With potential hydrological or hydrogeological linkage to the Scheme including those containing a groundwater-dependent terrestrial ecosystem (GWDTE) or
- Within 200m of the ARN (see Chapter 5: Air Quality of this Environmental Statement (TR010064/APP/6.1); or
- Which would have a direct pathway to effects

- **SSSIs, NNRs and LNRs**: within 2km of the Order Limits and 200m of the ARN, or which have hydrological connectivity to the Scheme
- **SBIs and notable habitats** such as Ancient Woodland and groundwater-dependent terrestrial ecosystems: within 1km of the Order Limits and 200m of the ARN
- **Protected and notable species records:** within 2km of the provisional Order Limits (available at the time of the data request)

8.6.3 The study area for field surveys varied for different receptors, see Table 8.12. For most surveys the study area was determined based on the provisional Order Limits available at the time of survey. The provisional Order Limits were largely concurrent with the Order Limits and any deviations are included within the wider study area and captured within the overall baseline presented below. The study areas for the habitat and species surveys are shown on the figures contained within the relevant biodiversity appendices of the Environmental Statement Appendices (TR010064/APP/6.3).

Table 8.12 Study areas for habitat and species surveys

Survey	Study area (based on provisional Order Limits available at the time of survey)
UKHab System (including invasive species, and habitat condition assessment to inform Defra Biodiversity Metric 3.1)	500m
Botanical surveys of designated sites potentially impacted by air quality	200m from the ARN
Hedgerow	Up to 250m with focus on hedgerows that would be directly impacted
Bat (ground-based assessments of trees)	100m
Bat (emergence re-entry surveys of trees)	100m
Bat (tree-climbing inspection)	100m
Bat (transect)	100m

Survey	Study area (based on provisional Order Limits available at the time of survey)
Bat (vantage point and static bat detector)	100m
Badger *Meles meles*	100m
Barn owl *Tyto alba*	500m
Breeding bird	500m
Wintering bird	500m
River condition assessment of waterbodies	Within
GCN (including Habitat Suitability Index (HSI) assessment, presence/absence survey, population size class assessment and environmental Deoxyribonucleic acid (eDNA) surveys)	500m
Otter *Lutra lutra*	250m
Water vole *Arvicola amphibius*	250m
Reptile	100m
Terrestrial invertebrates	Within – targeted sites identified as having optimal suitability

8.7 Baseline conditions

Baseline sources

Desk study

8.7.1 Greater Manchester Ecology Unit (GMEU) provided records of protected and notable species and SBIs, within 2km of the provisional Order Limits. Records from within the past 10 years have been used to inform this assessment.

8.7.2 Priority habitat data has been obtained from the Priority Habitat Inventory available from Natural England. Priority habitat data is compiled from a variety of sources and includes aerial photograph interpretation. Therefore, this data set has been interpreted with caution as habitats may not have been ground truthed before being added to the inventory.

8.7.3 International and national statutory designated sites, priority habitats and granted European Protected Species Mitigation (EPSM) Licences were identified on the Multi-Agency Geographic Information for the Countryside (MAGIC) map (Defra, 2021b).

8.7.4 The Ancient Woodland Inventory (AWI) (Natural England, 2021) was used to identify Ancient Woodland habitats. Veteran/ancient and notable trees are listed in Appendix 7.5: Arboricultural Impact Assessment of the Environmental Statement Appendices (TR010064/APP/6.3). Aerial photography and Ordnance Survey (OS) maps were also reviewed. Details of GWDTE are provided in Appendix 13.5: GWDTE Assessment Report of the Environmental Statement Appendices (TR010064/APP/6.3).

8.7.5 Freshwater fauna records (fish and macroinvertebrates) were obtained for a 5km study area (within the relative catchment) using the Ecology and Fish Data Explorer (Defra, 2023).

Field surveys

8.7.6 Habitat, botanical, bat, badger, breeding and wintering bird, barn owl, GCN, otter, water vole, reptile and terrestrial invertebrate field surveys have been undertaken between 2021 and 2023 by qualified and experienced ecologists, as reported in Appendices 8.1 to 8.11 of the Environmental Statement Appendices (TR010064/APP/6.3). The purpose of these surveys was to identify, record and map habitats and protected and notable species within the study areas defined in Section 8.6 of this chapter.

8.7.7 The scope of the following field surveys has been established through the desk study and with regard to good practice guidance for the species or species groups where this exists. The following field surveys were undertaken (with cross-reference to the biodiversity survey report appendices in the Environmental Statement Appendices (TR010064/APP/6.3) for further details):

- **UKHab System survey** including invasive species, and habitat condition assessment to inform Defra Biodiversity Metric 3.1 – Appendix 8.1: UKHab Report
- **Botanical surveys** of designated sites that would be impacted through changes in air quality– Appendix 8.2: Designated Sites Air Quality Assessment
- **Bat surveys** – Appendix 8.3: Bat Survey Report
- **Badger surveys** – Appendix 8.4: Badger Survey Report (Confidential)
- **Barn owl surveys** – Appendix 8.5: Barn Owl Survey Report (Confidential)
- **Breeding bird surveys** – Appendix 8.6: Breeding Bird Survey Report
- **Wintering bird surveys** – Appendix 8.7: Wintering Bird Report
- **GCN surveys** – Appendix 8.8: GCN Survey Report
- **Otter and water vole surveys** – Appendix 8.9: Riparian Mammal Survey Report
- **Reptile surveys** – Appendix 8.10: Reptile Survey Report

- **Terrestrial invertebrate surveys** – Appendix 8.11: Terrestrial Invertebrate Survey Report
- **River condition assessment** – Appendix 8.12: Biodiversity Net Gain Report

8.7.8 GWDTEs are presented in Appendix 13.5: GWDTE Assessment Report of the Environmental Statement Appendices (TR010064/APP/6.3).

Baseline information

Designated sites

8.7.9 The locations of designated sites and the ARN are shown on Figure 8.1: Designated Sites and ARN of the Environmental Statement Figures (TR010064/APP/6.2).

European designated sites

8.7.10 There are no SAC, SPA or Ramsar sites within 2km of the Order Limits, that are crossed by, adjacent to, upstream or downstream of the Scheme, that are hydrologically connected to the Scheme, or which would have a direct pathway to effects. There are no SAC designated for bats within 30km of the Order Limits.

8.7.11 Rochdale Canal SAC (and SSSI) is the only European site located within 200m of the ARN, on the M62. It is designated for its population of floating water plantain *Luronium natans*. The SAC is located approximately 5km east of the Order Limits. The Rochdale Canal SAC is of **International importance**.

SSSI

8.7.12 There are no SSSIs located within 2km of the Order Limits.

8.7.13 Ashclough SSSI and Nob End SSSI are hydrologically connected to the Scheme via the River Irwell, the River Roch and various tributaries of the River Roch. Although the sites are 4.8km west of the Order Limits measured ‘as the crow flies’, they are 9.5km and 11.5km downstream respectively when measured along the watercourses. Ashclough SSSI and Nob End SSSI are of **National importance**.

8.7.14 Rochdale Canal SSSI (and SAC) is located within 200m of the ARN. The site has no hydrological connectivity with the Scheme. Rochdale Canal is considered at the higher level of designation and is of **International importance**.

LNR

8.7.15 There are no LNRs within the Order Limits, however five LNRs are located within 2km of the Order Limits. Two LNRs (Nob End LNR and Moses Gate LNR) are beyond 2km but have hydrological connectivity with the Scheme. Four LNRs are within 200m of the ARN as shown in Table 8.13. The LNRs are of **County importance**.

Table 8.13 LNRs scoped in for assessment

Site	Interest/ designated features	Approximate distance and direction from the Order Limits	Within 200m of ARN	Hydrological connectivity
Alkrington Woods LNR (National Grid Reference (NGR) SD 86140 05478)	Woodland, meadow, lake, fishing lodges	1.9km south-east	Yes	Yes – upstream of Scheme
Blackley Forest LNR (NGR SD 84125 04092)	Broadleaved and plantation woodland, grassland, lake, marsh, and a river.	990m south-east	No	Yes – downstream of Scheme
Clifton Country Park LNR (NGR SD 77191 04304)	Woodland, meadow, lakes	2.8km west	Yes	Yes – upstream and downstream of Scheme
Hollins Vale LNR (NGR SD 81502 08603)	Species-rich grassland, hedgerows. Encompasses all of Hollins Plantation SBI and most of Hollins Vale SBI and)	30m west	No	Yes – downstream of Scheme
Mere Clough LNR (NGR SD 80135 03923)	Woodland and watercourse. Partially overlaps boundary of Philips Park and North Wood SBI.	0.4km west	Yes	No
Moses Gate LNR (NGR SD 743 070)	Restored industrial site.	4.8km (9.5km downstream)	No	Yes – downstream of Scheme
Nob End LNR (NGR SD 749 062)	Calcareous grassland and woodland/scrub. Overlaps the boundary of Nob End SSSI.	4.8km (11.5km downstream)	No	Yes – downstream of Scheme
Philips Park LNR (NGR SD 79745 03852)	Mixed woodland, grassland, streams, ponds, and lodges. Partially overlaps boundary of Philips Park and North Wood SBI.	420m south-west	Yes	No

SBI

8.7.16 There are eight SBIs within 1km of the Order Limits and eleven SBI within 200m of the ARN (Table 8.14). The SBIs are of **County importance**.

Table 8.14 SBI within 1km of the Order Limits or within 200m of the ARN

Site	Interest/designated features	Approximate distance and direction from the Order Limits	Within 200m of ARN	Hydrological connectivity
Alkrington Woods and Rhodes Lodges SBI (NGR SD 86140 05478)	Habitat mosaic; habitats include woodland, grassland, marsh, standing water and amenity areas	1.9km east	Yes	No
Boardman Brook SBI (NGR SD 85913 05099)	Ancient Woodland	1.9km south-east	Yes	No
Clifton Country Park SBI (NGR SD 77191 04304)	Small lodges, foraging waterfowl assemblage, wintering bird population, Ancient Woodland	3km west	Yes	No
Clifton Moss (South) SBI (NGR SD 76484 03305)	Large standing water, small lodges, Ancient Woodland and scrub	4.3km west	Yes	No
Hazlitt Wood SBI (NGR SD 83505 05325)	Small lodges, reedbed, swamp, and fen, Ancient Woodland	3m south-east	Yes	Yes – downstream of Scheme and potential GWDTE
Heaton Park Reservoir (East) SBI (NGR SD 82621 05016)	Wintering wildfowl population	0.3km south	No	No
Heaton Park Reservoir (West) SBI (NGR SD 82424 05052)	Wintering wildfowl population	0.3km south	No	No

Site	Interest/designated features	Approximate distance and direction from the Order Limits	Within 200m of ARN	Hydrological connectivity
Hollins Plantation SBI (NGR SD 80495 04532)	Ancient Woodland	30m west	No	Yes – potential GWDTE
Hollins Vale SBI (NGR SD 82045 08270)	Small lodges, and grassland	0.2km north-west	No	Yes – downstream of Scheme and potential GWDTE
Parr Brook SBI (NGR SD 81559 07296)	Grassland	0.6km west	No	Yes – downstream of Scheme
Philips Park and North Wood SBI (NGR SD 80495 04532)	Small lodges, grassland and Ancient Woodland Partially overlaps Philip's Park LNR and Mere Clough LNR.	0.2km west	Yes	Yes – upstream of Scheme and potential GWDTE
Pilsworth SBI (NGR SD 82539 08337)	Large standing water, and small lodges	0.3km north-east	No	Yes – upstream of Scheme
Ringley Woods (East) SBI (NGR SD 78981 04783)	Grassland and Ancient Woodland	1.8km west	Yes	No
Rhodes Farm Sewage Works SBI (NGR SD 78933 03879)	Large standing water, reedbed, swamp and fens, breeding bird assemblage, wintering bird population, presence of scarce breeding birds and UK Priority species	2.2km west	Yes	Yes – upstream of Scheme
Rochdale Canal (Scowcroft to Warland) SBI (NGR SD 88273 09861)	Large standing water, floating water plantain *Luronium natans* and American pondweed *Potamogeton epihydrus*	4.9km east	Yes	No

Site	Interest/designated features	Approximate distance and direction from the Order Limits	Within 200m of ARN	Hydrological connectivity
Rochdale Canal – Lock at Scowcroft Farm to Stott's Lane SBI (NGR SD 89481 03514)	Large standing water, floating water plantain *Luronium natans* and American pondweed *Potamogeton epihydrus*	6km east	Yes	No
Sudden Brook (West) SBI (NGR SD 91055 10472)	Grassland	8km east	Yes	No

AWI sites

8.7.17 There are two AWI sites within 1km of the Order Limits and four sites within 200m of the ARN (see Table 8.15 below and Figure 8.2: Ancient Woodland and Priority Habitats of the Environmental Statement Figures (TR010064/APP/6.2)). These are ancient semi-natural woodland habitats and are irreplaceable habitats of **National importance**.

Table 8.15 AWI sites within 1km of the Order Limits or within 200m of the ARN

Site	Woodland type	Approximate distance and direction from Order Limits	Within 200m of ARN
Philips Wood AWI site (NGR SD 80495 04532)	Ancient and semi-natural woodland	770m west	Yes
Mere Clough AWI site (NGR SD 80135 03923)	Ancient and semi-natural woodland	470m west	Yes
Clifton Wood AWI site (NGR SD 79502 04380)	Ancient and semi-natural woodland	3.23km west	Yes
North Wood AWI site (NGR SD 79502 04380)	Ancient and semi-natural woodland	1.5km west	Yes

Habitats

8.7.18 The desk-based study identified a number of priority habitats within 1km of the Order Limits (see Appendix 8.1: UKHab Report of the Environmental Statement Appendices (TR010064/APP/6.3) for full details). However, the confidence in these classifications as detailed on the MAGIC website is 'low', likely indicating that they have been identified remotely through aerial imagery or remote sensing and have not been ground-truthed (Defra, 2021b).

8.7.19 Field surveys undertaken in April 2021, February 2022 and May 2023 provided further detail on the priority habitats identified from the desk-based study and enabled the associated habitat parcels to be more accurately classified (see Appendix 8.1: UKHab Report of the Environmental Statement Appendices (TR010064/APP/6.3)). Field surveys were conducted according to good practice guidance (Hedgerow Survey Handbook (Defra, 2007) and UKHab user manual (Butcher *et al.,* 2020)).

8.7.20 The results of the habitats field survey are shown on Figure 8.3: UK Habitats Map of the Environmental Statement Figures (TR010064/APP/6.2). The habitat codes shown in brackets relate to the habitat type as defined by the UKHab methodology (see Appendix 8.1: UKHab Report of the Environmental Statement Appendices (TR010064/APP/6.3)).

8.7.21 The habitats identified within the Order Limits comprised a mix of urban development, modified and neutral grassland, plantation woodland and arable. The wider study area includes priority deciduous woodland and Ancient Woodland to the south-west, urban residential areas including Unsworth, Whitefield and Prestwich to the west and south and modified grassland associated with four golf courses scattered throughout.

Hedgerows (h2a) – priority habitat

8.7.22 There was a network of hedgerows surrounding/following agricultural fields, access roads and footpaths within the survey area. Only five of the surveyed hedgerows were species-rich (i.e. they have four or more woody species) with the majority dominated by hawthorn. Four hedgerows met criteria set out in the Hedgerow Regulations 1997 for importance, two for wildlife criteria and two for archaeological criteria. These are shown in Figure 8.1.6: Hedgerow Survey Results of Appendix 8.1: UKHab Report of the Environmental Statement Appendices (TR010064/APP/6.3).

8.7.23 Not all hedgerows could be accessed for survey and therefore all hedgerows are assumed to be native species hedgerows (consisting of 80% or more of at least one woody UK native species), which is a priority habitat and of **County importance** due to its status as a nationally declining habitat that it is uncommon within Greater Manchester and the study area.

Eutrophic standing water (r1a) – priority habitat

8.7.24 There are five ponds within the Order Limits (P34, P37, P38, P73, and P74 and 22 within 100m of the Order Limits, including ponds associated with adjacent golf clubs (see Appendix 8.8: GCN Survey Report of the Environmental Statement Appendices (TR010064/APP/6.3)).

8.7.25 The ponds included man-made waterbodies and depressions in fields that hold water after heavy rainfall. However, based on a precautionary assessment most of the ponds (39 ponds) within the entire field survey area (500m of the provisional Order Limits) qualified as priority habitats, as they supported a range of aquatic fauna and flora.

8.7.26 Pond 61/62 at Pike Fold Golf Course was mapped as lowland fen on the Priority Habitat inventory. However, the field survey identified this area as a golf course pond surrounded by trees and has therefore been categorised as eutrophic standing water.

8.7.27 Ponds are found in all parts of Greater Manchester and are thought to be relatively numerous for an urban area (Greater Manchester Biodiversity Project, 2009a). Nevertheless, as a declining priority habitat, eutrophic standing water habitats are of **County importance**.

Lowland dry acid grassland (g1a) – priority habitat

8.7.28 The desk study identified one area of lowland dry acid grassland (over 10ha in size) within Hollins Vale LNR, 50m north-west of the Order Limits. The presence of this habitat was confirmed through field surveys. The grassland areas were a mosaic of grassland communities with acid grassland prevalent on the valley banks. Species present included: wavy hairgrass *Avenella flexuosa*, common bent *Agrostis capillaris*, sheep fescue *Festuca ovina*, tormentil and hard fern *Blechnum spicant*. Mosses indicative of acid grassland included springy turf-moss *Rhytidiadelphus squarrosus* and common haircap *Polytrichum commune*. All areas of g1a grassland were categorised as being in good condition. The Greater Manchester Biodiversity Project (2009a) states that lowland acid grassland is increasingly rare and examples of this habitat type more than 0.2ha in extent should be regarded as important. Of relevance to the assessment of importance is that the acid grassland is associated with a county value SBI. For these reasons the acid grassland within the study area is of **County importance**.

Lowland fens (f2a) – priority habitat

8.7.29 The desk study identified 12 areas of lowland fen, the closest of which is 230m north-west of the Order Limits. Field surveys reclassified one of the areas (NGR SD 82976 07156, Pond 61/62 in Appendix 8.8: GCN Survey Report of the Environmental Statement Appendices (TR010064/APP/6.3)) as standing water and not fen, this is a pond within a golf course.

8.7.30 Field surveys did however confirm one area of lowland fen, a GWDTE, within Hollins Vale SBI, located outside of the Order Limits. The fen was within a floodplain valley leading down to Hollins Brook and was overwhelmingly dominated by meadowsweet *Filipendula ulmaria* with frequent wild angelica *Angelica sylvestris*. Other species included occasional common valerian *Valeriana officinalis* and marsh marigold *Caltha palustris*. A spring was located approximately 100m south-west of the lowland fen and the area appeared to have several areas of flushing, indicating the fen was fed by the ground water and independent from the river habitat. Species bordering the watercourse included dominant bur-reed *Sparganium* sp. And glaucous sedge *Carex flacca*. Abundant Himalayan balsam *Impatiens glandulifera* was scattered throughout the fen and therefore the habitat was categorised as being in poor condition. Lowland fen is an irreplaceable and priority habitat and is therefore of **National importance**.

Lowland mixed deciduous woodland (w1f and w1f7) – priority habitat

8.7.31 In addition to woodlands on the AWI (addressed above) the desk study identified numerous other areas of lowland mixed deciduous woodland (w1f) within the Order Limits.

8.7.32 Lowland mixed deciduous woodland habitat (w1f7) (a subset of lowland mixed deciduous woodland w1f habitat) was identified during field surveys. This habitat was recorded in two Ancient Woodland sites (Philips Wood and Mere Clough), as well as within Philips Park LNR, Hazlitt Wood SBI, Hollins Plantation SBI and in four undesignated areas: one area located south of Whitefield Golf Club; one area north-east of Prestwich Heys Football Club; and two areas around Pilsworth. All other lowland mixed deciduous woodland was outside of the Order Limits, excluding the area north-east of Prestwich Heys Football Club and a fragment near Pilsworth which are within the Order Limits.

8.7.33 Mere Clough LNR and Mere Clough Ancient Woodland overlap one another and abut Philips Park LNR that includes Philips Wood Ancient Woodland in its northern extent. Overall, these sites form an extensive area of lowland mixed deciduous woodland outside of the Order Limits, that comprises a mixture of ancient and semi-natural woodland. The canopy was dominated by pedunculate oak *Quercus robur*, beech *Fagus sylvatica*, occasional silver birch *Betula pendula* and sycamore *Acer pseudoplatanus*. The understorey was well established and diverse, comprising occasional beech, hawthorn *Crataegus monogyna*, hazel *Corylus avellana* and holly *Ilex aquifolium*. The ground layer included a number of Ancient Woodland indicator species such as native bluebell *Hyacinthoides non-scripta*, ramsons *Allium ursinum*, wood anemone *Anemone nemorosa* and remote sedge *Carex remota*. INNS rhododendron *Rhododendron ponticum*, Himalayan balsam and Japanese knotweed *Reynoutria japonica* were scattered throughout. Himalayan balsam was present throughout the ground layer and was particularly abundant in isolated locations on the banks of Bradley Brook. Due to the abundance of INNS within the ground layer, the woodland was categorised as being in poor condition.

8.7.34 Woodland in Hazlitt Wood SBI was within 3m of the Order Limits south of M60 J18. This large woodland comprised various woodland communities with the middle section dominated by beech with a sparse understorey of holly. The desk study identified this expanse of woodland as the priority habitat wood-pasture and parkland but, as no veteran trees and/or ancient trees were identified during the field survey, this area does not meet the qualifying criteria for wood-pasture and parkland. The woodland was categorised as being in good condition due to the woodland meeting the majority of the woodland condition assessment criteria.

8.7.35 To the north, woodland in Hollins Vale SBI was located within 5m of the Order Limits, on either side of the M66. The canopy was dominated by pedunculate oak transitioning to sycamore dominated woodland to the south. The understorey comprised frequent hawthorn, occasional ash *Fraxinus excelsior* and horse-chestnut *Aesculus hippocastanum* saplings. The ground layer was dominated by bramble *Rubus fruticosus* agg., native bluebell, occasional rough meadow grass *Poa trivialis,* ramsons and opposite-leaved golden-saxifrage *Chrysosplenium oppositifolium*. The woodland met the majority of condition assessment criteria and was categorised as being in good condition.

8.7.36 Lowland mixed deciduous woodland identified on the AWI is valued as nationally important (see section above). Other areas of lowland mixed deciduous woodland are valued as **County importance** due to its status as a scarce habitat within Great Manchester (Greater Manchester Biodiversity Project, 2009a) and the study area.

Open mosaic on previously developed land (u1a) – priority habitat

8.7.37 The desk study identified one area of open mosaic habitat on previously developed land, associated with Pilsworth Landfill, 290m north of the Order Limits. This habitat has not been ground-truthed due to the distance from the Order Limits and is therefore, as a precaution, valued as **nationally** important.

Purple moor grass and rush pastures – priority habitat

8.7.38 The desk study identified fragmented patches of purple moor grass and rush pastures within Hollins Vale LNR, 220m north-west of the Order Limits. However, this data is from 1991. Most of the later description of this site classify the features as neutral flush of lowland fen (see above), and the field surveys did not record purple moor grass and rush pasture as being present. It is therefore concluded this habitat is absent from the Zone of Influence (ZOI).

Traditional orchard (21) – priority habitat

8.7.39 The desk study identified three areas of orchard, the closest of which was 40m east of the Order Limits. However, field surveys confirmed that two of the areas (NGR SD 8214 0603 and SD 8212 0608) are broadleaved woodland dominated by sycamore, and therefore they do not qualify as priority habitats.

8.7.40 The remaining area is located 0.43km north-west of the Order Limits. No trees were recorded within the area coinciding with the area of traditional orchard at the time of survey, however aerial photographs of the site indicate the presence of young trees which have potentially been planted since the survey. As a precaution, it is assumed traditional orchard is present. The habitat is of **County importance** due to its status as a nationally declining habitat, and that it is an uncommon habitat within the region and the study area.

Wet woodland (w1d) – priority habitat

8.7.41 Wet woodland, which is a ground water dependent habitat, was identified north of the Scheme within Hollins Vale LNR/SBI surrounded by an area of lowland fen habitat and acid grassland fields. The woodland was dominated by crack willow *Salix fragilis* with occasional goat willow *Salix caprea*. The INNS Himalayan balsam was abundant in the ground flora. Due to the abundance of Himalayan balsam, the woodland was categorised as being in poor condition.

8.7.42 Wet woodland was also located surrounding a waterbody to the north of the Scheme, north of Brightley Brook. The woodland canopy comprised mature willow sp., silver birch and sycamore with dense bramble in the understorey. Himalayan balsam was locally abundant in two areas of the woodland and therefore the woodland was categorised as being in poor condition.

8.7.43 Although the total area of wet woodland within Greater Manchester is not known, the habitat occurs in all of the districts of Greater Manchester (Greater Manchester Biodiversity Project, 2009a). Wet woodland is therefore valued as **County importance**.

Wood pasture and parkland – priority habitat

8.7.44 The desk study identified one area of wood pasture and parkland associated with Heaton Park, 0.07km south of the Order Limits. However, field surveys confirmed that ancient/veteran trees were absent from this area and so did not meet the criteria for priority habitat. The habitat was instead categorised as lowland mixed deciduous woodland and is considered within this assessment with respect to this habitat type. Therefore, there is no wood pasture and parkland within the ZOI of the Scheme and this habitat is scoped out of this assessment.

Groundwater dependent terrestrial ecosystems

8.7.45 Desk study data and UKHab survey data (Appendix 8.1: UKHab Report of the Environmental Statement Appendices (TR010064/APP/6.3)) have been considered in the identification of potential GWDTE within the study area, see Appendix 13.5: GWDTE Assessment Report of the Environmental Statement Appendices (TR010064/APP/6.3) and Figure 13.5: GWDTEs and Groundwater Dependency Classification of the Environmental Statement Figures (TR010064/APP/6.2). The following sites have been identified within 250m of the Scheme where desk study and UKHab survey data describe a terrestrial habitat type and/or vegetation community which could be indicative of a wetland habitat:

- Philips Park LNR and Philips Park and North Wood SBI, which support an area of lowland fen
- Hazlitt Wood SBI, which supports areas of reedbed, swamp, lowland fen and ponds
- Hollins Vale LNR/SBI and Hollins Plantation SBI, which support areas of wet meadow, lowland fen, swamp and flushes, modified grassland, lowland mixed deciduous woodland

- Cowl Gate Farm, which supports two potential GWDTEs, g3c10,11 other neutral grassland with scattered scrub and trees and g3c10,17 other neutral grassland with scattered scrub and ruderal vegetation.
- The Hills South, which supports one potential GWDTE, eutrophic standing water r1a.
- Castle Brook South, which supports one potential GWDTE, g3c15 other neutral grassland with a significant component of *Juncus* (rush).
- Egypt Lane South, which supports one potential GWDTE, g3c15 other neutral grassland with a significant component of *Juncus* (rush).
- Simister Allotment Gardens, which supports one potential GWDTE, an area of wetland within w1g other woodland, broadleaved.
- Parkwood Cottages South, which supports one potential GWDTE, g3c15 other neutral grassland with a significant component of *Juncus* (rush).

8.7.46 Where GWDTE are located within a LNR or SBI, they are valued as being of **County importance**. GWDTE outside of designated sites are valued as being of **Local importance**.

Potential peatland habitats

8.7.47 Although vegetation typical of peatland substrates was not identified during field surveys, Natural England's comments on the statutory consultation (see the Consultation Report (TR010064/APP/5.1)), raised that there was the potential for underlying peat deposits at two locations: Cowl Gate Farm and Egypt Lane South. A combined agricultural land classification, soil resource survey and UKHab survey were all conducted within these areas and concluded that the peat/peaty soils were neither contiguous nor hydraulically connected, such that peatland restoration is not feasible. The surface habitats within this area (see next section) identified species-poor neutral grassland with dominant soft rush *Juncus effusus*, which is not representative of a peatland vegetation type.

8.7.48 Peat is of value as a carbon store (see Chapter 14: Climate of this Environmental Statement (TR010064/APP/6.1)), for water management (see Chapter 13: RDWE of this Environmental Statement (TR010064/APP/6.1)), for archaeology (see Chapter 6: Cultural Heritage of this Environmental Statement (TR010064/APP/6.1)) and for wildlife. The value of the peat to wildlife and impacts to peat and associated habitats and species is addressed within sections of this report relating to the associated surface habitat, which is species-poor neutral grassland.

Other habitats

8.7.49 Other habitats recorded during field survey are detailed in Appendix 8.1: UKHab Report of the Environmental Statement Appendices (TR010064/APP/6.3) and comprise:

- Broadleaved, mixed and yew woodland
- Other broadleaved woodland types

- Line of trees
- Other coniferous woodland
- Dense scrub
- Bramble scrub
- Hawthorn scrub
- Mixed scrub
- Other hedgerow
- Other neutral grassland
- Modified grassland
- Non-cereal crops
- Cereal crops
- Other rivers and streams
- Standing open water and canals
- Built-up areas and gardens
- Developed land; sealed surface
- Buildings
- Suburban/mosaic of developed/natural surface

8.7.50 These are all valued as of **Local importance** as they are common and widespread habitats, typical of this region.

Protected and notable species

Bats

8.7.51 Appendix 8.3: Bat Survey Report of the Environmental Statement Appendices (TR010064/APP/6.3) gives full details of desk study and field data relevant to bats. Field surveys for bats were undertaken with reference to the Bat Conservation Trust Good Practice Guidelines (Collins, 2016). Field surveys included ground-based tree assessment, tree climb and inspect, and bat activity, and were undertaken in 2021, 2022 and 2023. Roosts of brown long-eared bat *Plecotus auratus,* common pipistrelle *Pipistrellus pipistrellus,* soprano pipistrellus *Pipistrellus pygmaeus* and whiskered bat *Myotis mystacinus* or Brandt's *Myotis brandtii* have been recorded within 2km of the provisional Order Limits within the past 10 years. Daubenton's bat *Myotis daubentoniid*, Natterer's bat *Myotis nattereri* and noctule *Nyctalus noctule* have been recorded in flight within 2km of the provisional Order Limits within the past 10 years.

8.7.52 As structures would not be directly or indirectly affected by the Scheme, these were not surveyed for roosting bats. Fifty-four trees with bat roosting potential were identified within the survey area. Many of these were associated with Phillips Park which is not within 100m of the final Order Limits. Eight trees with bat roosting potential were recorded within the Order Limits, the closest of which was located adjacent to the Scheme M60/M62/M66 road alignment and the furthest was located at a distance of 204m east. However, no evidence of roosting bats was identified during subsequent surveys.

8.7.53 It should be noted that surveys only provide a snapshot of the roosting activity of bats in an area. Tree-roosting bat species are known to move roost sites frequently, and assemblages of bats require a large roost-resource to support a colony. As such, all mature trees supporting potential roosting features are assumed to be part of the bat roosting resource and treated accordingly.

8.7.54 Static detectors deployed within the survey area recorded four bat species: common pipistrelle; soprano pipistrelle; noctule; and brown long-eared bat. Over 90% of passes/recordings were of common pipistrelle, followed by decreasing numbers of soprano pipistrelle, noctule, and finally brown long-eared bat. The greatest level of bat activity was recorded in Philips Park LNR to the west of the Scheme, but this is beyond the ZOI for impacts on bats.

8.7.55 Bat activity recorded during transect surveys was largely associated with bats foraging along hedgerows, with occasional activity over open grassland areas.

8.7.56 Vantage point surveys were designed to determine if the hedgerows which would be removed along Egypt Lane are an important commuting corridor for bats. Surveys recorded different levels of activity in different months, with a small number of bats recorded commuting along the hedgerows. The hedgerows appear to be used by the local bat population, but not on a consistent basis for commuting reasons, and by only a small number of bats.

8.7.57 The landscape is a mix of neutral, slightly wet grassland, intensively managed grasslands, cropland, with an extensive area of woodland and parkland also present. However, these habitats are all located in close proximity to a network of motorways which reduces connectivity between these areas and therefore unlikely to support the core sustenance zones of more sensitive species or larger colonies.

8.7.58 Using the method detailed within Wray *et al.* (2010) to determine a geographic value for bats for ecological impact assessment, the bat assemblage has been valued as **Local importance** (see Appendix 8.3: Bat Survey Report of the Environmental Statement Appendices (TR010064/APP/6.3) for further details).

Badger

8.7.59 Appendix 8.4: Badger Survey Report (Confidential) of the Environmental Statement Appendices (TR010064/APP/6.3) gives full details of desk study and field data relevant to badgers. Badgers have been recorded within 2km of the provisional Order Limits within the past 10 years. Due to the confidential nature of badger records, specific locations of badger setts have not been reported within this chapter.

8.7.60 Field surveys were undertaken according to good practice guidance (Harris *et al*., 1989) in March 2021, February 2022 and April 2023. Ten badger setts were recorded within the survey area. Seven of these were recorded within the Order Limits (Setts 3, 4, 5, 6, 7, 8, and 9). Two main badger setts were identified: one within the Order Limits (Sett 4) with four holes and fresh spoil heaps; and one (Sett 1) at over 500m from the Order Limits in woodland comprising nine holes with evidence of fresh feeding signs and latrines.

8.7.61 Of the six other setts recorded within the Order Limits, three were disused (Setts 3, 6 and 9), one was an active Annex sett (Sett 5) and two were partially active outliers (Setts 7 and 8).

8.7.62 As a species, badger are common and widespread and the protection afforded to them is due to persecution, such that they are of **Local importance**.

Barn owl

8.7.63 Appendix 8.5: Barn Owl Survey Report (Confidential) of the Environmental Statement Appendices (TR010064/APP/6.3) gives full details of desk study and field data relevant to barn owls. Due to the confidential nature of barn owl records specific locations of records or potential roosting/nesting sites have not been reported within this chapter.

8.7.64 Desk based assessment and field surveys were carried out in consideration of current good practice guidance including; The Barn Owl Conservation Handbook (The Barn Owl Trust, 2012); and Barn Owl *Tyto alba*: Survey Methodology and Techniques for use in Ecological Assessment (Shawyer, 2011).

8.7.65 Correspondence with the Greater Manchester County Bird Recorder confirmed the presence of breeding barn owl within the study area within the last 10 years.

8.7.66 A barn owl habitat suitability assessment found much of the survey area to be an unsuitable foraging resource for barn owl as it was dominated by Type 3 (low value) and non-grassland habitat (including urban). However, approximately 1.92ha of Type 1 (optimal) and 13.37ha of Type 2 habitat (sub-optimal) was identified, of which 1.55ha and 1.10ha respectively is within the Order Limits.

8.7.67 Field surveys were undertaken in November 2021 and January 2023. No evidence of barn owl roosting or nesting was observed during the field surveys.

8.7.68 The features identified within the survey had the potential to host one pair of breeding pair of barn owl. As the Manchester Raptor Group recorded 56 barn owl breeding sites (Barn Owl Trust, 2021) in the Manchester region, the one pair of breeding barn owl potentially using the survey area contribute to more than 1% of the population at this geographical range. The selection criteria for SBI (GMEU, 2016) includes a criterion with relation to barn owl:

The following will be considered for selection as Grade A SBI where – Any site which regularly supports a breeding population of any species included in Schedule 1 of the Wildlife and Countryside Act 1981 (as amended).

8.7.69 Therefore, the barn owl ecological resource within the study area is of is **County importance**.

Breeding birds

8.7.70 Appendix 8.6: Breeding Bird Survey Report of the Environmental Statement Appendices (TR010064/APP/6.3) gives full details of desk study and field data relevant to breeding birds. Field surveys were undertaken in April, May and June 2021. In summary, the following Schedule 1 species were recorded within 2km of the provisional Order Limits: barn owl *Tyto alba*, bittern *Botaurus stellaris*, black-tailed godwit *Limosa limosa*, common scoter *Melanitta nigra*, hobby *Falco Subbuteo*, kingfisher *Alcedo atthis*, little ringed plover *Charadrius dubius*, peregrine falcon *Falco peregrinus* and scaup *Aythya marila.*

8.7.71 Field surveys were carried out with reference to the Common Bird Census (CBC) method, devised jointly by the BTO and JNCC (Marchant, 1983), and the Breeding Bird Survey (BBS) method, devised jointly by the BTO, the Royal Society for the Protection of Birds (RSPB) and the Joint Nature Conservancy Council (JNCC) (Gilbert *et al.*, 1998).

8.7.72 A variety of breeding bird habitats were identified within the survey area which included hedgerows, tree-lines, woodlands, watercourses, ponds, agricultural land and buildings. Seventy bird species were recorded within the breeding bird survey area. Of these, evidence of breeding was recorded for 58 species. This included (please note some overlap of conservation categories):

- Nine species listed as priority species: bullfinch *Pyrrhula pyrrhula*; dunnock *Prunella modularis*; house sparrow *Passer domesticus*; lapwing *Vanellus vanellus*; linnet *Linaria cannabina*; reed bunting *Emberiza schoeniclus*; skylark *Alauda arvensis*; song thrush *Turdus philomelos* and starling *Sturnus vulgaris*

- Eight Birds of Conservation Concern (BoCC) (Stanbury *et al.,* 2021) red listed species: greenfinch *Chloris chloris*; house martin *Delichon urbicum*; house sparrow; lapwing; linnet; mistle thrush *Turdus viscivorus*; skylark and starling

- 16 BoCC amber listed species: bullfinch; dipper *Cinclus cinclus*; dunnock; grey wagtail *Motacilla cinerea*; kestrel *Falco tinnunculus*; mallard *Anas platyrhynchos*; meadow pipit *Anthus pratensis;* moorhen *Gallinula chloropus*; oystercatcher *Haematopus ostralegus*; reed bunting; snipe *Gallinago gallinago*; song thrush; whitethroat *Numenius phaeopus*; willow warbler *Phylloscopus trochilus*; woodpigeon *Columba palumba* and wren *Troglodytes troglodytes*

8.7.73 The remaining birds were all BoCC green listed species (two introduced species were not assessed under BoCC criteria).

8.7.74 Based on the desk study and field survey findings, the numbers and species of breeding birds recorded within the survey area is considered to be typical for the range of habitats present. The number of breeding pairs per species is not considered to be significant compared with published county and national populations. Barn owl are valued in the section above. Black-necked grebe *Podiceps nigricollis* and little ringed-plover *Charadrius dubius* are breeding consistently in the survey area (but not the Order Limits) and are considered to be of **County importance**. Other breeding bird assemblages within the survey area are considered to be of **Local importance**.

Wintering birds

8.7.75 Appendix 8.7: Wintering Bird Survey Report of the Environmental Statement Appendices (TR010064/APP/6.3) gives full details of desk study and field data relevant to wintering birds. Field surveys were undertaken in February, March, October, November, December 2021 and January 2022. In summary the following Schedule 1 species were recorded within 2km of the provisional Order Limits: barn owl *Tyto alba*, bittern *Botaurus stellaris*, black-tailed godwit *Limosa limosa*, common scoter *Melanitta nigra*, hobby *Falco Subbuteo*, kingfisher *Alcedo atthis*, little ringed plover *Charadrius dubius*, peregrine falcon *Falco peregrinus* and scaup *Aythya marila.*

8.7.76 Field surveys were carried out with reference to good practice guidance; Winter Farmland Bird Survey (Gillings *et al*., 2008) and Bird Monitoring Methods (Gilbert *et al*., 1998).

8.7.77 Seventy bird species were recorded during the field surveys. The most commonly recorded field observations included lapwing *Vanellus vanellus*, herring gull *Larus argentatus*, lesser black-backed gull *Larus fuscus* and redwing *Turdus iliacus*. However, the bird species using the survey area were not considered to be solely reliant on habitats within the survey area or the Order Limits.

8.7.78 The wintering bird assemblage associated with Heaton Park Reservoir is considered to be of **County importance** as it meets the SBI criteria Br6 which states that 20 or more regular wintering bird species are present (GMEU, 2016).

8.7.79 With regards to the other species recorded during the surveys, none were recorded in significantly high numbers in relation to their known populations at a UK level (Musgrove *et al.,* 2013) or in the context of what would be expected on similar habitats in the local area.

8.7.80 The range of species and numbers recorded during the survey were considered typical of the habitats present and the overall value of wintering birds (outside of Heaton Park Reservoir SBI) is assessed **Local importance**.

GCN

8.7.81 Appendix 8.8: GCN Survey Report of the Environmental Statement Appendices (TR010064/APP/6.3) gives full details of desk study and field data relevant to GCN *Triturus cristatus*. GCN have been recorded within 2km of the provisional Order Limits within the past 10 years. Sixty-one ponds were assessed for their potential to support GCN in March 2021. Forty-six ponds were surveyed further having a HSI of more than 0.5.

8.7.82 Surveys were carried out in accordance with current good practice guidance; Evaluating the suitability of habitat for the GCN *Triturus cristatus* (Oldham *et al.,* 2000); The GCN Mitigation Guidelines (English Nature, 2001); GCN Conservation Handbook (Langton *et al*., 2001); and Technical advice note for field and laboratory sampling of GCN (*Triturus cristatus*) environmental DNA (Biggs *et al.,* 2014).

8.7.83 A combination of eDNA and traditional presence / absence surveys confirmed GCN presence within 13 ponds. These field surveys took place in April, May and June 2021. These ponds were in two assumed meta-populations: one to the north-east of M60 J18 in Pike Fold Golf Course; and a second in ponds located along Egypt Lane. The closest pond with GCN confirmed present was approximately 20m north-east of the Order Limits.

8.7.84 GCN are a priority species in England under Section 41 of the NERC Act 2006 and are listed priority species on the Greater Manchester LBAP (Greater Manchester Biodiversity Project, 2009a). A large number of GCN populations occur in the county due to the high pond density and the north-west of England is a stronghold for this species in Britain (Greater Manchester Biodiversity Project, 2009a). Field studies have identified the presence of two metapopulations within the survey area: one medium (breeding) population of GCN, and one small population. Desk study has identified further populations of GCN within the study area. It is therefore considered that GCN within the survey area are considered to be of **County importance** for biodiversity.

Riparian mammals

8.7.85 Appendix 8.9: Riparian Mammal Survey Report of the Environmental Statement Appendices (TR010064/APP/6.3) gives full details of desk study and field data relevant to otters and water voles. Otters have been recorded within 2km of the provisional Order Limits within the past 10 years.

8.7.86 Field surveys were undertaken according to good practice guidance (Strachan *et al*., 2011; Dean *et al.*, 2016; National Rivers Authority, 1993; Highways Agency, 1999) in May and September 2021. Castle Brook and Bradley Brook offered limited potential to support otter and water vole and no evidence of otter or water vole presence were identified in any field survey. No signs or evidence of American mink were recorded. Due to the lack of desktop records for water vole, and age of the record for otter (a record from 2020 from the River Roch), and considering the results of the field surveys, otter, water vole and American mink are considered likely absent from the survey area and are not discussed further in this assessment.

Reptiles

8.7.87 Appendix 8.10: Reptile Survey Report of the Environmental Statement Appendices (TR010064/APP/6.3) gives full details of desk study and field data relevant to reptiles. Slow worm *Anguis fragilis* and common lizard *Zootoca vivipara* have been recorded within 2km of the provisional Order Limits within the past 10 years. A habitat suitability assessment identified three areas of suitable reptile habitat within the survey area, two of which are within the Order Limits. Field surveys were undertaken with reference to good practice guidance (Froglife, 1999) between May and September 2021, however, no presence of reptiles was recorded.

8.7.88 Given the absence of reptiles during surveys and that only two records of common reptile species (common lizard and slow worm) were identified in the desk study within the last 10 years, reptiles have, as a precaution, been assumed as present within the survey area and valued as **Local importance**.

Terrestrial invertebrates

8.7.89 The desk study identified a single priority species; the moth species knot grass *Acronicta rumicis* located within Philips Park to the west of the Order Limits.

8.7.90 Appendix 8.11: Terrestrial Invertebrate Survey Report of the Environmental Statement Appendices (TR010064/APP/6.3) gives full details of the terrestrial invertebrate field surveys undertaken between July and September 2021. Only data relevant to Site 1 is considered within this assessment as Site 2 is now more than 400m from the Order Limits due to a reduction of the extent of the Order Limits since field surveys were undertaken.

8.7.91 Site 1 is within the Order Limits, north-east of M60 J18 around Egypt Lane and comprises marshy grassland, tall ruderal vegetation, broadleaved woodland, scrub, hedgerows and the margins of semi-improved grassland.

8.7.92 The species recorded are generally widespread and typical of the habitats present on site. The interest lies with species diversity rather than species rarity, particularly those associated with open grassland habitats such as tall ruderal vegetation and the field margins. The mosaic of this habitat with marshy grassland to the south also enhances the value of this habitat for insects.

8.7.93 Species with a designated conservation status recorded in Site 1 were:

- Cinnabar moth (SoPI – Research only[1])
- Alder leaf beetle (nationally rare – considered an agricultural pest)
- Rustic moth *Hoplodrina blanda* (SoPI – Research only[1])

[1] Not intended to be affected by requirements of the National Planning Policy Framework, Section 15, 179 (b) publication (2012), unlike other confirmed SoPI

- *Phalacrocera 69tilize6969* (Nationally Scarce[2] crane fly associated with acid and sedge peats)

8.7.94 Given that the terrestrial invertebrate assemblage identified comprised mostly common and widespread species, these have been valued as being of **Local importance**.

Other notable species

8.7.95 Common toad *Bufo bufo*, brown hare *Lepus europaeus* and hedgehog *Erinaceus europaeus* have been recorded within 2km of the provisional Order Limits within the past 10 years.

8.7.96 Brown hare and hedgehog were recorded incidentally within habitats to the north-east and north-west of the Scheme in low numbers. Both are Manchester LBAP species. Grassland, arable fields and hedgerow habitats within and around the Scheme are likely to be used by both brown hare and hedgehog.

8.7.97 Water shrew was recorded in Pond 12 (outside the Order Limits, on Pike Fold Golf Course) during GCN surveys (see Appendix 8.8: GCN Survey Report of the Environmental Statement Appendices (TR010064/APP/6.3)). Water shrew receive legal protection under the Wildlife and Countryside Act (1981) as amended (see Appendix 8.8: GCN Survey Report of the Environmental Statement Appendices (TR010064/APP/6.3)).

8.7.98 Common toad was recorded in Pond 29 (outside the Order Limits, between Egypt Lane and the M62), and Ponds 64, 65 and 70 (all on Pike Fold Golf Course, outside of the Order Limits) during GCN surveys (see Appendix 8.8: GCN Survey Report of the Environmental Statement Appendices (TR010064/APP/6.3)). Common toad is a priority species.

8.7.99 All notable species present within the study area are valued as being of **Local importance**.

Notable vascular plants

8.7.100 Appendix 8.1: UKHab Report of the Environmental Statement Appendices (TR010064/APP/6.3) gives full details of the notable vascular plant desk study and habitat survey where botanical lists were made in the field. Twenty-two vascular species have been recorded in the study area including: woodland species such as bluebell, wood sorrel *Oxalis acetosella* and wood crane's-bill *Geranium sylvaticum;* arable plants such as cornflower *Centaurea cyanus* and corn chamomile *Anthemis arvensis;* and grassland (particularly wet) species such as devil's-bit scabious *Succisa pratensis*, lesser spearwort *Ranunculus flammula* and ragged-robin *Silene flos-cuculi.*

[2] Species which have been recorded from 16-30 10km squares since 1980.

8.7.101 Lesser spearwort is listed as vulnerable on the English red list for plants (Stroh *et al.*, 2014) and was recorded within grassland to the north-west of M60 J18. An unidentified species of marsh orchid *Dactylorhiza* sp. Was also recorded in this location, but this is unlikely to be a notable species. Common spotted orchid *Dactylorhiza fuchsii* (listed as least concern) were recorded to the north-east of M60 J18. The grasslands Habitat Action Plan (Greater Manchester Biodiversity Project, 2009b) for the region notes that significant orchid communities can be a characteristic of marshy grassland and the orchids recorded are considered to be indicators for areas where the grassland was marshier than other areas. The orchid species recorded are not of conservation concern but appreciably enrich the area where they grow.

8.7.102 Overall, the distributions of notable vascular plants were either outside of the survey area or restricted to particular habitats beyond the Order Limits. As such vascular plants are considered to be of **Local importance** as they are rarely occurring and are not present in extensive areas.

Freshwater fauna

8.7.103 The local records centre data search identified records of brown trout from the River Irwell and River Roch, although neither of these rivers are crossed by the Order Limits. The Environment Agency did not have any sampling points with respective fish or invertebrate records, within 5km of the Order Limits (Defra, 2023).

8.7.104 No desk study records for white-clawed crayfish were identified and no watercourses within the study area were suitable for white-clawed crayfish, having muddy substrates. Therefore, white-clawed crayfish are considered absent from the study area and are not discussed further in this assessment.

8.7.105 No watercourses suitable for supporting assemblages of important fish species were identified. A small number of common fish and macro-invertebrate species are likely to be present within the watercourses and waterbodies within the wider study area, beyond the Order Limits. Freshwater fauna are considered to be of **Local importance**.

INNS

8.7.106 Appendix 8.1: UKHab Report of the Environmental Statement Appendices (TR010064/APP/6.3) gives full details of the plant INNS desk study and habitat survey.

8.7.107 The desk study identified ten botanical INNS species within the study area. Five of these were recorded during field surveys: Himalayan balsam; Japanese knotweed; rhododendron; Nuttall's waterweed; and variegated yellow archangel. These species are included on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) and are found throughout the survey area, with Japanese knotweed recorded within the Order Limits in woodland adjacent to Pike Fold Golf Course (SD 82454 06782), and Canadian waterweed within a pond at Pike Fold Golf Course (SD 82827 06522). Nuttall's waterweed and Himalayan balsam are also listed on The Invasive Alien Species (Enforcement and Permitting) Order 2019.

8.7.108 Botanical INNS have not been attributed an ecological importance category as they are considered a feature causing adverse impact on other biodiversity receptors rather than having a value themselves. As such they are not assessed within the latter sections of this chapter as receptors. However, the effect of spreading INNS on other biodiversity receptors is assessed where appropriate.

Future baseline

8.7.109 Increasing development and housing in the area is likely to put more pressure on the remaining natural habitats which may affect the local population and distribution of species and alter habitats present around the Scheme. It is likely that some areas of grassland used recreationally and for agriculture would remain but may become increasingly fragmented if infill housing development and large-scale housing developments occur in the area.

8.7.110 Any effect from climate change would be unlikely to significantly alter the land use, and therefore the habitats, prior to construction of the Scheme. Long term impacts from climate change could alter the species composition and types of habitats in and around the site, and therefore types and diversity of fauna. However, it is not anticipated that the combined impact of the Scheme and climate change would be any different to the impact of climate change in isolation (i.e. without the Scheme) as the habitats that would be created as part of mitigation proposals would be the same types as those found in the local area at the current time.

Importance of receptors

8.7.111 All receptors within the baseline have been assigned an importance following criteria in Table 3.9 of DMRB LA 108 and using professional judgement. Table 8.16 summarises the importance of receptors identified within the study area.

Table 8.16 Importance of receptors in the study area for biodiversity

Biodiversity resource importance	Receptors within the study area
International or European	Rochdale Canal SAC
UK or National	Sites: • Ashclough SSSI • Nob End SSSI • Rochdale Canal SSSI • Clifton Wood Ancient Woodland • Mere Clough Ancient Woodland • North Wood Ancient Woodland • Philips Wood Ancient Woodland

Biodiversity resource importance	Receptors within the study area
	Habitats: • Lowland fen • Open mosaic habitat on previously developed land (u1a)
Regional	None
County or equivalent authority importance (Greater Manchester)	Sites: • Alkrington Woods LNR • Blackley Forest LNR • Clifton Country Park LNR • Hollins Vale LNR • Mere Clough LNR • Nob End LNR • Moses Gate LNR • Philips Park LNR • Alkrington Woods and Rhodes Lodges SBI • Boardman Brook SBI • Clifton Country Park SBI • Clifton Moss (South) SBI • Hazlitt Wood SBI • Heaton Park Reservoir (East) SBI • Heaton Reservoir (West) SBI • Hollins Plantation SBI • Hollins Vale SBI • Parr Brook SBI • Philips Park and North Wood SBI • Pilsworth SBI • Rhodes Farm Sewage Works SBI • Ringley Woods SBI • Rochdale Canal – Lock at Scowcroft Farm to Stott's Lane SBI • Rochdale Canal (Scowcroft to Warland) SBI • Sudden Brook (West) SBI Habitats: • Eutrophic standing water (r1a) • Hedgerows (h2a)

Biodiversity resource importance	Receptors within the study area
	• Lowland dry acid grassland (g1a) • Lowland mixed deciduous woodland (w1f7 and w1) • Traditional orchard (21) • Wet woodland (w1d) Species: • Barn owl, black-necked grebe and little ringed plover • Great crested newt • Assemblage of wintering birds, including herring gull and black backed gull at Heaton Reservoir
Local	Habitats: • Cropland (c1d and c1c) • Line of trees (w1g6) • Modified grassland (g4) • Other broadleaved woodland (w1g7) • Non-priority hedgerows (h2b) • Other coniferous woodland (w2c) • Other neutral grassland (g3c) • Other rivers and streams (r2b) • Scrub (h3, h3d, h3f, h3h) • Non-priority ponds (r1a) Species: • Bats • Badger • Freshwater fauna: fish and macroinvertebrates excluding white clawed crayfish • Notable fauna: brown hare, hedgehog, common toad, water shrew • Notable vascular plants • Other breeding birds • Other wintering birds • Reptiles • Terrestrial invertebrates

8.8 Potential impacts

8.8.1 This section outlines potential impacts from construction and operation of the Scheme in the absence of mitigation as follows (these are discussed in further details in the following sub-sections):

- Potential construction impacts include:
  - Habitat loss to enable construction of the Scheme
  - Habitat fragmentation due to removal of connecting habitats
  - Mortality and injury due to site clearance and construction activities
  - Disturbance from changes in noise, vibration and lighting
  - Air quality impacts due to dust and nitrogen deposition
  - Hydrology impacts due to changes in the quality and flows of surface and ground water
  - Spread of INNS due to movement of plant and soils.
- Potential operation impacts include:
  - Mortality due to collision with vehicles or the golf netting bordering Pike Fold Golf Course
  - Fragmentation due to the net bordering Pike Fold Golf Course
  - Disturbance due to noise, vibration and lighting
  - Air quality impacts due to nitrogen deposition
  - Hydrology impacts due to changes in the quality and flows of surface and ground water.

Construction

Habitat loss

8.8.2 The Scheme could require the temporary and permanent loss of terrestrial habitats within the Order Limits, including priority habitats and habitats likely to support protected and notable species.

8.8.3 The priority habitats, traditional orchard, open mosaic habitat on previously developed land and lowland acid grassland are outside of the Order Limits and would not be affected by site clearance. There are no other pathways to effect for these receptors and therefore these habitats are not considered further in the assessment.

8.8.4 Natural England has raised concern over potential impacts to peat from the locations of the ponds, temporary compounds, excavations, and material storage areas, subsidence and aerial deposition of dust/contaminants. Ground investigation and a combined ALC and soil resource survey of the Scheme (Appendix 9.2: ALC Survey Report of the Environmental Statement Appendices (TR010064/APP/6.3)) only identified 'peat soils', as defined by Natural England (2008), at two soil survey locations and one GI location, with peaty soil textures or 'peat' identified in soil/GI descriptions at a total of 19 out of 195 locations investigated. In the majority of cases where peaty soil textures or 'peat' were identified, organic-mineral/peaty topsoils were found overlying mineral or peaty subsoils, with isolated small pockets of remnant buried peat that are not contiguous and are unlikely to be hydraulically connected in a meaningful way for peat restoration. The closest degraded peatland to the Scheme, Manchester Mosses SAC, is too far away (19km) for hydraulic connectivity to exist and aerial photos reveal the surrounding area to be agricultural fields that are unlikely to either be a functioning peatland body or support one. It is concluded that peat is very limited at the site with no 'wider peat mass' and that there are no peat-dependent habitats on site as evidenced by the Appendix 8.1: UKHab Report of the Environmental Statement Appendices (TR010064/APP/6.3), such that the majority of the potential impacts discussed by Natural England would not arise.

8.8.5 There is potential for impacts to peaty soils due to disturbance during construction, and these are addressed within Chapter 9: Geology and Soils of this Environmental Statement (TR010064/APP/6.1).

8.8.6 Natural England considers that construction impacts may affect the ability for peat to be restored, both on site and within the wider area (Table 8.7 of this chapter). However, the Applicant has determined that there is limited potential for peatland restoration. From the available evidence it is considered that the area may once have had contiguous areas of peat soils, but due to extensive development and peat humification, most of these soils are heavily degraded to the point that they are no longer classified as peat. The soil survey and GI show isolated pockets of thin peat layers and remnant buried peat that are not contiguous and are unlikely part of a wider hydrological unit; they would therefore be ineligible for restoration according to the International Union for Conservation of Nature (IUCN) classification, which requires a minimum depth of peat in areas contiguous with deeper peat. The peaty soils identified are mostly limited to one field, north-west of the existing junction, with no existing peatland in the surrounding land.

8.8.7 Based on the lack of peatland habitats within the Order Limits, it is assessed that there is no potential for impacts to these habitats. There is also very limited potential for restoration of the isolated pockets of peat and remnant buried peat, and therefore it is not considered that the Scheme would have any potential effect on the ability to restore peatland habitats within the Order Limits. An assessment of likely significant effects on the species poor neutral grassland which overlays the peaty soils is presented in Section 8.10 of this chapter.

8.8.8 Construction of the Scheme could potentially lead to the loss of features directly used by protected and notable species, including terrestrial habitat used by GCN, breeding and wintering birds, barn owl, invertebrates, brown hare, common toad, and water shrew.

Habitat fragmentation

8.8.9 Most of the works require the realignment or widening of existing infrastructure, which already presents a barrier to species moving through the landscape. However, additional effects from habitat fragmentation could potentially result from construction of the Northern Loop and the severance of linear habitat features such as hedgerows and lines of trees. This could potentially affect protected or notable species that rely upon such habitats for foraging, commuting, or dispersing including; bats, badger, brown hare, water shrew, barn owl, hedgehog, and common toad.

Mortality and injury

8.8.10 During the construction phase, the following activities could potentially result in mortality and injury of species receptors: site clearance, earthworks, and temporary works. Significant effects could arise if protected or notable species are present within the Order Limits, especially for less mobile species.

Disturbance

8.8.11 Disturbance to important receptors could result from changes in noise, light, vibration, or visual stimuli. During construction, disturbance could arise from the following activities: installation of fencing, earthworks, compound set up, construction, and reinstatement.

Air quality impacts

8.8.12 Air quality changes could occur through changes in nitrogen oxide (NOx) and ammonia emissions caused by construction traffic, causing changes in nitrogen deposition and potential effects on sensitive designated sites and habitats within 200m of the construction ARN. As described in paragraph 5.10.16 of Chapter 5: Air Quality of this Environmental Statement (TR010064/APP/6.1), two of the designated sites or designated habitats within 200m of the construction ARN have potentially significant effects during construction as modelled transects exceed the 1% critical load or the 0.4kg N/ha/yr criteria outlined in DMRB LA 105 (Highways England, 2019):

- Philips Park LNR
- Philips Park and North Wood SBI

8.8.13 Therefore, the effects of nitrogen deposition during construction on these sites are assessed in Section 8.10 of this chapter. The remaining designated sites within 200m of the construction ARN are not predicted to have a combined total nitrogen deposition rate above the lower critical load with both a predicted change in nitrogen deposition of more than 1% of the minimum critical load and of more than 0.4kg N/ha/year and are therefore not assessed further.

8.8.14 As stated in paragraph 5.8.3 of Chapter 5: Air Quality of this Environmental Statement (TR010064/APP/6.1), the following designated sites that are within 200m of construction activities may be impacted by dust deposition:

- Hollins Vale LNR
- Hollins Vale SBI
- Hollins Plantation SBI
- Hazlitt Woods SBI
- Philips Park and North Wood SBI

8.8.15 There are no areas of Ancient Woodland within 200m of the Order Limits and so impacts to this receptor from dust deposition are not considered further in this assessment.

Hydrological impacts

8.8.16 There is potential for hydrological changes to cause significant effects during construction where works could directly or indirectly affect watercourses through changes to surface water, or groundwater (including GWDTE). Hydrological changes are detailed in Chapter 13: RDWE of this Environmental Statement (TR010064/APP/6.1) and include changes to both water quality and quantity within nearby watercourses through surface water runoff, and within GWDTE through impacts to groundwater. Changes in hydrology, fluvial geomorphology and hydrogeology are important to terrestrial and freshwater ecology due to the following factors:

- Water quality has an important role in structuring the flora and fauna communities in watercourses, ponds and wetlands
- Sediment and other pollutant releases have the potential to adversely affect sensitive biodiversity receptors
- Biodiversity receptors can be sensitive to alterations of runoff regimes changing the quality of surface and groundwater

8.8.17 Potential GWDTEs which could be affected by hydrological effects include Philips Park LNR and Philips Park and North Wood SBI, Hazlitt Wood SBI, Hollins Vale LNR/SBI, and Hollins Plantation SBI in addition to five habitat types across six sites (Cowl Gate Farm, The Hills South, Castle Brook South, Egypt Lane South, Simister Allotment Gardens, Parkwood Cottages South):

- g3c,10,11 other neutral grassland with scattered scrub and trees
- g3c,10,17 other neutral grassland with scattered scrub and ruderal vegetation
- r1a eutrophic standing water
- g3c,15 other neutral grassland with a significant component of Juncus (rush)

- an area of wetland within w1g other woodland, broadleaved

8.8.18 Watercourses within the study area are shown on Figure 13.1: Surface Water Receptors of the Environmental Statement Figures (TR010064/APP/6.2). Designated sites that may be impacted by changes to surface water are:

- Ashclough SSSI, due to connectivity with the River Roch and River Irwell
- Nob End SSSI, due to connectivity with the River Roch and River Irwell
- Nob End LNR, due to connectivity with the River Roch and River Irwell
- Moses Gate LNR, due to connectivity with the River Roch and River Irwell
- Blackley Forest LNR, due to connectivity with the Blackfish via the River Irk
- Philips Park LNR, due to the connectivity with Bradley Brook and a tributary of the Bradley Brook
- Mere Clough LNR, due to the connectivity with Bradley Brook and a tributary of the Bradley Brook
- Hollins Vale LNR, due to the connectivity with Hollins Brook
- Hollins Vale SBI, due to the connectivity with Hollins Brook
- Philips Park and North Wood SBI, due to the connectivity with Bradley Brook and a tributary of the Bradley Brook
- Parr Brook SBI, due to connectivity along Parr Brook
- Hazlitt Wood SBI, due to connectivity with the Blackfish

8.8.19 Although Pilsworth SBI is adjacent to Brightly Brook (which connects with Hollins Brook), the site is upstream of where the Order Limits crosses Hollins Brook and therefore there is no pathway to effect.

8.8.20 Similarly, although the River Irk passes through Alkrington Woods LNR, the site is upstream of the confluence of the Blackfish and the River Irk so there is no pathway to effect.

8.8.21 Clifton Country Park LNR is upstream of the confluence of the River Irwell and Bradley Brook so there is no pathway to effect via the Bradley Brook. Whilst Clifton Park LNR is downstream of the Order Limits via a pathway from the River Irwell, River Roch and associated tributaries to the north of the Scheme, due to the significant distance along the network of watercourses, it is considered there is no pathway to effect.

8.8.22 Although Bradley Brook is adjacent to/within Mere Clough LNR, Philips Park LNR, Philips Park and North Wood SBI, Mere Clough Ancient Woodland and Philips Wood Ancient Woodland, this watercourse is not hydrologically connected to the Order Limits and therefore there is no pathway to effect with respect to surface water impacts.

Spread of INNS

8.8.23 Any introduction or spread of INNS could potentially cause significant adverse effects to sensitive habitats and designated sites. This is because of the dominance that these species can have over native species. During the construction works, topsoil and subsoil potentially containing plant INNS could be disturbed. Such soil or seed and 'propagules' could be spread during construction activities, including excavation and machinery movements. Works within water can also introduce and spread animal and plant INNS.

8.8.24 Designated sites that have potential to be impacted by introduction or spread of INNS due to their connectivity by watercourses are list above in relation to surface water impacts. In addition, Hazlitt Wood SBI has the potential to be impacted due to the proximity of the site to the Order Limits.

Operation

Mortality and injury

8.8.25 Mortality in the operation phase relates to the fact that animals may be attempting to cross a wide road, used by fast traffic, which bisects the landscape. Unlike the risk of construction direct mortality, which is a temporary risk for the duration of the construction period, direct mortality during operation of the Scheme would present a risk to wildlife for the lifetime of the Scheme.

8.8.26 The golf ball netting that would be provided at Pike Fold Golf Course has the potential to cause mortality or injury of fauna which may collide with the net when moving through the landscape. This would include flying species such as birds and bats, and animals moving on foot such as badgers, brown hare and hedgehogs.

Fragmentation

8.8.27 The golf ball netting that would be provided at Pike Fold Golf Course has the potential to cause a barrier to the movement of animals, including flying species such as birds and bats, and animals moving on foot such as badgers, brown hare and hedgehogs.

Disturbance

8.8.28 Sources of disturbance in the operational phase relate to road noise and lighting. Noise has the potential to impact upon receptors, potentially reducing the suitability of habitat close to the road, and therefore reducing the habitat available to receptors in the vicinity of the site.

8.8.29 Impacts from operational road lighting may occur, particularly in relation to bat species. The effects of road lighting are complex but include disturbance and roost abandonment; habitat severance, loss of foraging habitats for light-shy species due to light-spill; a decline in prey availability, and potential to increase traffic collisions by altering foraging behaviour. Habitats where the impact of lighting can be particularly severe include along river corridors, woodland edges, and hedgerows.

Air quality impacts

8.8.30 Air quality changes could occur through changes in NO_x and ammonia emissions caused by traffic, causing changes in nitrogen deposition and potential effects on sensitive designated sites and habitats within 200m of the operational ARN. As stated in paragraph 5.10.29 of Chapter 5: Air Quality of this Environmental Statement (TR010064/APP/6.1), the following ecological sites have been included within the assessment of potential ecological effects as they have a predicted combined total nitrogen deposition rate above the minimum critical load with both a predicted change in nitrogen deposition of more than 1% of the lower critical load and of more than 0.4kg N/ha/year:

- Clifton Country Park SBI
- Clifton Moss (South) SBI
- Clifton Wood Ancient Woodland
- Hazlitt Wood SBI
- Philips Park LNR
- Philips Park and North Wood SBI
- Rhodes Farm Sewage Works SBI
- Rochdale Canal (Scowcroft to Warland) SBI

8.8.31 Effects on these sites are therefore considered in Appendix 8.2: Designated Sites Air Quality Assessment of the Environmental Statement Appendices (TR010064/APP/6.3), a summary of which is provided in Section 8.10 of this chapter. The sites are shown on Figure 8.1: Designated Sites and ARN and Figure 8.2: Ancient Woodland and Priority Habitats of the Environmental Statement Figures (TR010064/APP/6.2).

8.8.32 The remaining designated sites within 200m of the operational ARN are not predicted to have a combined total nitrogen deposition rate above the lower critical load with both a predicted change in nitrogen deposition of more than 1% of the minimum critical load and of more than 0.4kg N/ha/year and are therefore not assessed further. These sites are Rochdale Canal SAC and SSSI, Clifton Country Park LNR, Mere Clough LNR, Alkrington Woods LNR, Alkrington Woods and Rhode Lodges SBI, Boardman Brook SBI, Ringley Woods (East) SBI, Rochdale Canal – Lock at Scowcroft Farm to Stott's Lane SBI, Sudden Brook (West) SBI, North Wood Ancient Woodland, Philips Wood Ancient Woodland, and Mere Clough Ancient Woodland. However, although the predicted change in nitrogen deposition at Rochdale Canal SAC and SSSI is less than 0.4kg N/ha/year, it is greater than 1% of the lower critical load for floating water-plantain of 3kg N/ha/yr. This site is therefore considered in Appendix 8.13: HRA Report of the Environmental Statement Appendices (TR010064/APP/6.3).

Hydrological impacts

8.8.33 Road runoff and accidental spillage have the potential to affect surface water during the operational phase of the Scheme. Pollutants on the road surface, when combined with rainfall, can run into the highway drainage system which discharges to a watercourse. This can directly or indirectly impact the water quality and aquatic habitat within a receiving watercourse.

8.8.34 There is also potential for impacts to groundwater due to changes in groundwater levels, flows and quality, due to the presence of permanent below ground structures, such as foundations for bridge abutments and sheet piles, resulting in barriers to sub-surface flows, and/or providing new pathways for groundwater migration. This could lead to subsequent changes to groundwater levels, flows, quality, and locations of discharge points, for example to GWDTEs.

8.8.35 In addition, potential ongoing de-watering effects from cuttings and widenings may cause the groundwater table to fall, impacting on GWDTEs and surface water flows. Where cuttings are required, additional assessment of the long-term dewatering requirements will be needed. However, no long-term dewatering is expected, with any excess groundwater being collected through the drainage system.

8.8.36 Lastly, the increase in areas of hardstanding has the potential to reduce recharge to the superficial aquifer, potentially impacting on groundwater levels and flows.

8.8.37 Receptors with hydrological connectivity to the Scheme due to surface water and ground water connections are detailed above with respect to potential construction impacts. The same receptors have been assessed within Section 8.10 with respect to operational impacts from hydrological changes.

8.9 Design, mitigation and enhancement measures

8.9.1 Mitigation is included in the REAC, contained within the First Iteration EMP (TR010064/APP/6.5) The First Iteration EMP will be developed into the Second Iteration EMP for implementation during construction and is secured by Requirement 4 of the draft DCO (TR010064/APP/3.1).

Embedded mitigation

8.9.2 In accordance with the mitigation hierarchy, the environment team has worked in close collaboration with the infrastructure design team to avoid or reduce environmental impacts through the Scheme design. This is referred to as embedded (or design) mitigation in DMRB LA 104 (Highways England, 2020c) (paragraph 3.24). Chapter 3: Assessment of Alternatives of this Environmental Statement (TR010064/APP/6.1) details the design alternatives that have been considered, including the environmental factors which have influenced the decision-making.

8.9.3 In addition, the design of the Scheme has taken into account the locations of valuable and priority habitats including important connective habitats (i.e. hedgerows, watercourses and tree lines) and the locations of protected species. Where practicable the design of the Environmental Masterplan (Figure 2.3 of the Environmental Statement Figures (TR010064/APP/6.2)) has been modified to avoid impacts to these features.

8.9.4 In line with the guidance within the NPPF (DLUHC, 2023) and requirement of the NPS NN (DfT, 2014), the Scheme has sought to maximise biodiversity delivery. As a key principle of the design, where habitats are lost as a result of the Scheme, new habitats of equal or greater value would be created (see Section 8.12 of this chapter).

8.9.5 As per commitment LV3 in the REAC, contained within the First Iteration EMP (TR010064/APP/6.5), clearance of existing vegetation within the temporary works areas will be minimised as far as practicable. Particular attention will be given to the retention of mature vegetation including individual trees, linear tree belts and woodlands.

8.9.6 Particular attention has been given to the retention of existing vegetation where practicable in the following locations:

- Hedgerows and woodland in the vicinity of the Northern Loop
- Linear tree belts adjacent to Prestwich Heys Football Club sports ground
- Hedgerows and vegetation along Mode Hill Lane, Egypt Lane and Corday Lane
- Linear tree belts along the verge of the M60 northbound to westbound diverge
- An important hedgerow and highways woodland belt west of Pond 5, near Heaton Park
- A narrow belt of trees and shrubs along the M60 verge adjoining Kenilworth Road.

8.9.7 The Scheme would be landscaped in accordance with Figure 2.3: Environmental Masterplan of the Environmental Statement Figures (TR010064/APP/6.2), which will be developed at detailed design. As per commitment LV4 in the REAC, contained within the First Iteration EMP (TR010064/APP/6.5), all planting and seeding will use native species as appropriate to the location and will be overseen by ecologists and arboriculturalists.

8.9.8 New road verges will support low-nutrient grassland habitats which are of high ecological value. No topsoil will be applied to these areas which will be sown with a commercial and locally native seed mix appropriate to the geology (commitment B1 in the REAC, contained within the First Iteration EMP (TR010064/APP/6.5)). The habitat will be managed in accordance with the First Iteration EMP (TR010064/APP/6.5), to maximise ecological delivery. On the inherently linear road verges of the Scheme, the creation of low-nutrient grasslands would provide an important wildlife corridor, as under these conditions native wildflowers have space to germinate and thrive amid reduced competition.

8.9.9 Connectivity of habitats will be maximised through provision of new hedgerow planting in areas adjacent to the environmental areas, along the new highway boundary and around ponds (commitment LV5 in the REAC, contained within the First Iteration EMP (TR010064/APP/6.5)). New hedgerow tree planting will also be provided to strengthen new and existing hedgerows (commitment LV6 in the REAC, contained within the First Iteration EMP (TR010064/APP/6.5)).

8.9.10 Aquatic and marginal planting will be provided at the ponds and swales to improve biodiversity and landscape integration (commitment LV8 in the REAC, contained within the First Iteration EMP (TR010064/APP/6.5)).

8.9.11 Measures to reduce noise during construction are detailed within Chapter 11: Noise and vibration of this Environmental Statement (TR010064/APP/6.1). In summary, the Scheme would be constructed in accordance with British Standard 5228- 1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 1: Noise (British Standards Institution, 2014a); and British Standard 5228-2:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration (British Standards Institution, 2014b) to minimise noise and vibration during construction.

8.9.12 The lighting design takes into consideration Bats and Artificial Lighting at Night, BCT Guidance Note GN08/23 (BCT and Institution of Lighting Professionals, 2023) to minimise impacts on wildlife including sensitive design of lighting to avoid creating a barrier to foraging bats.

8.9.13 As per commitment G7 in the REAC, contained within the First Iteration EMP (TR010064/APP/6.5), a suitable lighting strategy will be developed for implementation across the Scheme in accordance with industry standards and good practice guidance on lighting with regards to protected species. This will include:

- Avoidance of artificial lighting of watercourses, particularly during the hours of darkness to prevent impacts to fish behaviour or passage and otters.
- Avoidance of light spill using directional and or baffled lighting.
- Positioning of lighting columns away from habitats of value to foraging and commuting bats (hedgerows, trees, woodland).

- Reducing the height of lighting columns to reduce light spill onto adjacent habitats.
- Avoidance of blue-white short wavelength lights and high UV content.
- The use of construction lighting will be in accordance with industry standards and follow best available guidance on lighting with regards to protected species (e.g. Bat Conservation Trust, 2023). The construction lighting design will take into account the need to avoid illuminating sensitive mammal habitats (e.g. for bats) in locations such as: adjacent to watercourses, along woodland edges and where there is known activity identified through pre-construction ecological surveys. Where this is not possible the Principal Contractor will agree any exceptions with the EcoW, the Applicant and the relevant planning authority.

8.9.14 Embedded mitigation measures relating to surface water quality, ground water and flood risk are detailed within Section 13.9 of Chapter 13: RDWE of this Environmental Statement (TR010064/APP/6.1). In summary, attenuation storage in the form of ponds, swales and pipes would be provided to mitigate for flood risk and enable road runoff to be treated prior to discharge into receiving watercourses, mitigating pollution of surface water. These have been designed to mimic natural water bodies where possible by providing varying depths including shallow margins, native wetland plant species and macrophytes, and would be surrounded by wildflower and grassland areas seeded from an appropriate species-rich seed mix. An additional permanent water depth of 0.3m is to be designed at the bottom of the ponds to create a permanently wet pond. This would provide water quality treatment and biodiversity benefits.

8.9.15 Ponds situated on permeable strata would be lined to prevent road runoff discharging into the ground and groundwater. Furthermore, the drainage development during the detailed design phase would continue to be aligned with the “Protect groundwater and prevent groundwater pollution” guidance (Environment Agency, 2018) to protect groundwater.

8.9.16 The Scheme’s road drainage system will be designed to collect any groundwater seepages that may occur within the widenings and cuttings. Long-term drainage of cuttings is required to protect flood sensitive receptors (including the new road) from groundwater flooding during the operational phase.

8.9.17 As stated in Chapter 13: RDWE of this Environmental Statement (TR010064/APP/6.1), pollution from maintenance activities during the operational phase, such as the use of herbicides and de-icing salts as a result of responsive activities, are difficult to predict and design for. It can however be controlled through good operational management regimes by the road operator. The prevention of ice formation and the de-icing of highways within the UK is carried out almost exclusively using rock salt complying with BS3247: Specification for salt for spreading on highways for winter maintenance. Road salt is applied typically in the winter months and therefore only spread on the highway on a small number of days per year. In the Memorandum of Understanding (MoU) between the Applicant and the Environment Agency (Highways Agency and Environment Agency, 2009) Annex 1 Water Environment it is agreed that:

- Prior to the use of de-icing agents other than rock salt, the Applicant should consult with the Environment Agency.
- The Environment Agency does not require the Applicant to apply for consent for normal routine maintenance operations, including the application of de-icing agents. However, the parties are aware that the application of de-icing agents can have impacts on water quality in receiving watercourses, particularly high levels of Biological Oxygen Demand (BOD) and hence the parties are committed to investigating alternatives to conventional products currently in use.

Essential mitigation

General

8.9.18 Essential mitigation measures to reduce and if possible offset likely significant adverse environmental effects for biodiversity include the following commitments which are detailed in the REAC, contained within the First Iteration EMP (TR010064/APP/6.5):

- Commitment B2 – An ECoW will be made available during site clearance to assess and advise on retention of habitats. The ECoW will provide Toolbox Talks as appropriate. The ECoW will assess each area prior to clearance commencing and advise whether full ECoW supervision is required for the work. If full ECoW supervision is not required, the ECoW will ‘sign off’ clearance of that particular area.
- Commitment B3 – Works will be timed to avoid sensitive periods for protected species where reasonably practicable and appropriate. Where this cannot be achieved, this will be managed in accordance with advice and, where required, supervision from an ECoW and in accordance with any protected species licence requirements.
- Commitment B4 – A precautionary working method statement will be produced to detail the control measures and methods required in relation to the removal of vegetation with potential to support protected species. This will include pre-construction inspections and sensitive felling methods where appropriate.

- Commitment B5 – Exclusion zones will be marked where appropriate around protected habitat areas such as trees, woodlands, hedgerows and watercourses to avoid accidental damage. Marking of protected areas will be based on proximity and risk of encroachment, and based on these factors, markings may include physical barriers or signage.

- Commitment B6 – Barriers will be provided around the construction compounds where appropriate.

  Commitment B7 – Following inspection by the EcoW, clearance of habitats within the construction area will be conducted under appropriate supervision where there is potential for impacts to protected species. For example, where bird nesting habitat will be removed in the bird breeding season, a suitably competent person will check vegetation and habitats no more than 24 hours prior to work occurring. Any vegetation and habitats found to contain active nests will not be removed or disturbed until the nest is no longer active. What is considered 'appropriate supervision' in each scenario will be at the discretion of the EcoW and will be based on the works required and the biodiversity receptors present (e.g. in some instances the EcoW may consider themselves the most suitable supervisor, but in others with fewer risks they may deem it appropriate to delegate supervision to someone else on site with suitable briefing on the requirements of supervision).

- Commitment B8 – Creation of features which could attract wildlife into works areas will be avoided where practicable. This may include the maintenance of habitat in an unsuitable condition for species. Where appropriate, the construction site boundary will be designed to discourage wildlife entering the site.

- Commitment B9 – Important commuting features such as mammal pathways and river channels will be left clear of obstruction. Where an ECoW deems it beneficial to local wildlife, temporary fencing will be raised slightly off the ground (150mm) where reasonably practicable; if not, gaps will be provided at regular intervals (as assessed on site). Where wildlife travelling freely through fencing is considered likely to increase the risk of mortality (e.g. fencing between habitat and the existing M60), then fencing will be installed to reduce likelihood of wildlife moving freely through it where practicable, i.e. not leaving a gap beneath fencing or at regular intervals.

- Commitment B12 – Pre-construction surveys using current best practice guidance will be undertaken for bats, badgers, barn owls and reptiles to update baseline surveys prior to construction.

  Commitment B13 – Implementation of invasive species control measures. An Outline Invasive Species Management Plan has been provided in Appendix E to the First Iteration EMP (TR010064/APP/6.5). This is an outline plan and will be updated as part of the Second Iteration EMP (secured by Requirement 4 of the draft DCO (TR010064/APP/3.1)).

- Commitment B14 – Temporary and permanent lighting will be designed to avoid light spill on light-sensitive ecological features and habitats, including important bat foraging habitats which could reduce foraging resource through disturbance in accordance with best practice guidance (Bat Conservation Trust, 2023).
- Commitment B15 – Suitable exclusion zones around sensitive features such as confirmed bat roosts, badger setts, birds' nests and watercourses will be implemented as directed by the ECoW.
- Commitment B16 – Where practicable, any trenches, trial pits and excavations will be covered overnight or fenced off to prevent animals falling in and becoming trapped within excavations. Where excavations are not able to be fenced, closed or filled on a nightly basis, a means of escape will be provided.

8.9.19 General protective and control measures are detailed in the First Iteration EMP and associated Appendices (TR010064/APP/6.5). Of particular relevance to biodiversity are Appendix D: Outline General Ecology Management Plan, Appendix E: Outline Invasive Species Management Plan and Appendix N: Outline LEMP.

8.9.20 Construction effects on surface water and ground water would be mitigated through essential mitigation measures as detailed in the First Iteration EMP (TR010064/APP/6.5) and as listed within Section 13.9 of the Chapter 13: RDWE of this Environmental Statement (TR010064/APP/6.1).

8.9.21 Construction Industry Research Information Association (CIRIA) guidance will be adopted as good practice (see Chapter 13: RDWE of this Environmental Statement (TR010064/APP/6.1) for further details).

8.9.22 As stated in Chapter 5: Air Quality of this Environmental Statement (TR010064/APP/6.1), the First Iteration EMP (TR010064/APP/6.5) includes measures to control fugitive dust (and hence avoid or reduce potential impacts) in compliance with DMRB LA 105. The Principal Contractor will consult with the relevant planning authority and other relevant stakeholders regarding appropriate best practice dust mitigation prior to construction (commitment AQ1 in the REAC, contained within the First Iteration EMP (TR010064/APP/6.5)).

8.9.23 Commitment AQ2 in the REAC, contained within the First Iteration EMP (TR010064/APP/6.5), requires the Principal Contractor to implement the agreed dust mitigation during construction.

8.9.24 The design of the golf ball netting at Pike Fold Golf Course will be developed during the detailed design stage to reduce the potential for effects on species of fauna. The following measures will be considered and, where practicable, applied to the design (commitment B30 in the REAC, contained within the First Iteration EMP (TR010064/APP/6.5):

1. Increasing the gauge of the twine to make it more detectable by echolocating bats and more visible to birds.

2. Decreasing the size of the mesh to make it more detectable by echolocating bats and more visible to birds, or else, subject to consideration of the effect of wind, adding a fine mesh layer to the net.
3. Provision of visual deterrents for birds such as flags along the top, and/or reflective strips across the mesh but these would not be as effective in foggy conditions etc.)
4. Provision of a gap under the net to enable mammals (including larger species such as badger, foxes, deer) to pass underneath it without becoming trapped, or the net being a barrier to movement.
5. If feasible, designing the net to be taut so bats and birds would be more likely to 'bounce off' of the net as opposed to becoming trapped in it.

Designated sites

8.9.25 In order to prevent accidental encroachment of plant into Hazlitt Wood SBI which is situated 3m from the Order Limits, suitable exclusion zones, fencing and signage will be installed in accordance with commitments B5 and B15 in the REAC, contained within the First Iteration EMP (TR010064/APP/6.5).

Habitats

8.9.26 Essential mitigation measures for reducing the potential significance of effect caused by impacts to groundwater flow and quality to GWDTE are detailed within Section 13.9 of Chapter 13: RDWE of this Environmental Statement (TR010064/APP/6.1).

8.9.27 The following essential mitigation measures would also be put in place to further reduce impacts to groundwater flow and quality to GWDTE (commitment W27 in the REAC, contained within the First Iteration EMP (TR010064/APP/6.5):

- Bored piles associated with the Simister Pike Fold Viaduct will be designed to ensure that there is no permanent residual pathway for potential groundwater contamination at Cowl Gate Farm GWDTE site.
- Clay bunds will be used to prevent backfilled open-cut trenches from acting as a groundwater drain within the Order Limits. This will mitigate against long term potential impacts to Cowl Gate Farm, Castle Brook South, and Egypt Lane South GWDTE sites.

8.9.28 Appropriate mitigation for the management and handling of soil materials, including any peat, is described within Appendix F: Outline Soil Management Plan of the First Iteration EMP (TR010064/APP/6.5). In accordance with commitment GS7 in the REAC, contained within the First Iteration EMP (TR010064/APP/6.5), prior to construction start of works, a Soil Resource Plan will be developed, informed by the results of the soil survey (see Appendix 9.2: ALC survey report of the Environmental Statement (TR010064/APP/6.3) for further details) and consistent with Construction Code of Practice for the Sustainable Use of Soils on Construction Sites (Defra, 2009). Appropriate supervision of soil management will be put in place to ensure that soils are handled in accordance with good practice and the Outline Soil Management Plan which is an accompanying plan at Appendix F to the First Iteration EMP (TR010064/APP/6.5).

Bats

8.9.29 Pre-construction surveys for bats will be undertaken for all trees to be felled to enable construction of the Scheme, and all trees within a radius of potential disturbance effects, depending on the type of construction activity but up to a maximum distance of 50m. Should surveys confirm the presence of roosting bats, a licence will be sought from Natural England (to ensure legal compliance) and felling operations / construction will be conducted in accordance with a method statement which will require exclusion of roosting features, soft felling, and timing of works to avoid sensitive seasons for bats as appropriate (commitment B11 in the REAC, contained within the First Iteration EMP (TR010064/APP/6.5)).

8.9.30 Bat boxes will be installed in the locations shown on Figure 2.3: Environmental Masterplan of the Environmental Statement Figures (TR010064/APP/6.2). Boxes will be provided at a ratio of 2:1 for every tree with high or moderate suitability for bats lost and boxes will comprise a range of types to account for variance in bat roosting preferences (commitment B10 in the REAC, contained within the First Iteration EMP (TR010064/APP/6.5)).

8.9.31 Where impacts on bats as a result of habitat loss could not be avoided, mitigation would be provided through the provision of newly created habitat. This has been designed so that connectivity across the Scheme is maintained within the wider landscape.

8.9.32 Creation of new habitat within landscaping and mitigation areas has been designed to enhance bat foraging opportunities, for example through the provision of native flowering trees and shrubs that would attract invertebrate prey species.

Badger

8.9.33 Owing to badgers' legal status, a development licence will be required to interfere with (to close) badger setts. A draft badger licence application has been prepared, based on the current baseline data, for consultation with Natural England to support a LONI from Natural England with respect to badgers (see Appendix 8.14: Draft Badger Licence Application (Confidential) of the Environmental Statement Appendices (TR010064/APP/6.3)). The Applicant is working with Natural England and will submit the LONI to the Planning Inspectorate at the earliest opportunity and will provide updates as appropriate during the Examination.

8.9.34 Use of setts can be highly changeable, and badgers are able to quickly colonise new areas. Pre-construction surveys using current best practice guidance will be undertaken to confirm the status of all setts and also identify any new setts prior to the start of works (commitment B12 in the REAC, contained within the First Iteration EMP (TR010064/APP/6.5)). These data will be used to inform the final licence application and to amend mitigation accordingly. Following grant of the DCO this would be submitted to Natural England for approval.

8.9.35 In accordance with the draft badger licence application, which would be updated following pre-construction survey, it is anticipated the following mitigation would be undertaken.

8.9.36 Two setts (Sett 2 and 4) are located within the vicinity of a stretch of new hedgerow planting. As stated in commitment B17 in the REAC, contained within the First Iteration EMP (TR010064/APP/6.5), this planting will be undertaken by hand and will therefore avoid disturbance impacts. However, as stated in commitment B15 in the REAC, contained within the First Iteration EMP (TR010064/APP/6.5), to prevent accidental disturbance, for example from driving site vehicles close to active setts, a suitable exclusion zone will be implemented around active setts, as directed by the EcoW. Signage will be provided by the Principal Contractor to alert site staff to the presence of protected species.

8.9.37 Three setts (Setts 4, 5 and 7) are located within the vicinity of a Scheme communications duct which will be installed into a trench. The location of the trench will be determined at detailed design. As stated in commitment B18 in the REAC, contained within the First Iteration EMP (TR010064/APP/6.5), in order to minimise the potential for disturbance, the trench will be dug to maximise the distance between the setts and the trench. Installation of the communications duct, including excavation and backfill of the trench will be supervised by an EcoW and under the mitigation licence from Natural England (unless the final alignment of the trench is located more than 20m from the setts). No works will take place within 20m of Sett 4 between 1 December and 30 June in order to avoid impacts to dependent young. There is no proposal to close any of the setts as it is considered this would be more disturbing and would have a greater impact on badgers than construction of the trench, particularly considering that the badgers using the setts are likely to be habituated to high levels of disturbance from nearby traffic and would therefore be tolerant of disturbance.

8.9.38 Sett 8 (outlier) would be directly impacted by construction, and so will be closed under a licence from Natural England, as stated in commitment B19 in the REAC, contained within the First Iteration EMP (TR010064/APP/6.5). Closure of the sett would be undertaken using standard techniques as detailed within Appendix 8.14: Draft Badger Licence Application (Confidential) of the Environmental Statement Appendices (TR0100/APP/6.3). No artificial setts would be provided to mitigate the loss of this lower status sett.

8.9.39 As required by Natural England, badger exclusion works would be from 1 July and would be completed by the end of November the same year so as to avoid impacts to pregnant badgers or cubs.

8.9.40 Exclusion of the badger sett would follow standard procedures under licence, as supervised by a suitably experienced ecologist. One-way badger gates would be fitted to any entrances exhibiting current use by badgers. All other entrances would be hard stopped using wooden stakes or a similarly robust material. Heavy duty chain link, stock or weld mesh fencing, secured to the ground using metal pegs or wooden stakes and staples, would be installed around the entire sett to prevent badgers from re-entering. Exclusion would take place over a minimum period of 21 days after the last date when badgers were recorded leaving the sett. Monitoring visits would take place at least once every three days during the exclusion to determine whether badgers are still active in the sett.

8.9.41 Sett 8 would then be dismantled mechanically as per the specifics of the licence and under the direction of the licence holder or appointed accredited agent as soon as practicable after the successful completion of badger exclusion. Once each tunnel has been excavated, the excavation would be backfilled and the entire sett area covered over with chain link, stock-proof or weld mesh fencing to prevent badgers from re-excavating the sett until construction activity in the area is completed.

Barn owl

8.9.42 Pre-construction surveys for barn owls will be undertaken for all trees to be felled to enable construction of the Scheme (commitment B12 in the REAC, contained within the First Iteration EMP (TR010064/APP/6.5)). Should surveys confirm the presence of a barn owl nest, to prevent disturbance, exclusion zones will be applied to the nest based on guidance from the EcoW (commitment B15 in the REAC, contained within the First Iteration EMP (TR010064/APP/6.5)) and works will be timed to avoid impacts to the nest while active (commitment B3 in the REAC, contained within the First Iteration EMP (TR010064/APP/6.5)). Should any new barn owl roosting or nest sites be identified and determined to be lost as part of the Scheme, barn owl boxes at a ratio of 2:1 for each nest site lost will be installed at least 1.5km from the Order Limits to increase nesting opportunities and avoid increased barn owl road casualties. Barn owl boxes will be made from hard wearing materials such as exterior grade plywood or recycled plastic and locations of boxes will be identified through consultation with stakeholders (commitment B20 in the REAC, contained within the First Iteration EMP (TR010064/APP/6.5)).

Birds

8.9.43 As stated in commitment B21 in the REAC, contained within the First Iteration EMP (TR010064/APP/6.5), bird nesting boxes will be provided to mitigate for the temporary loss of nesting habitat whilst newly planted habitats mature. Bird nesting boxes will be installed in retained vegetation within the Order Limits during the pre-construction phase on new or existing structures, or on free-standing posts as appropriate (see Figure 2.3: Environmental Masterplan of the Environmental Statement Figures (TR010064/APP/6.2)). Boxes will be suitable for a variety of species, including cavity-nesting species with entrance holes of different sizes, open-fronted boxes, and larger boxes to accommodate birds of prey. The boxes will be constructed of hardwearing materials such as exterior grade plywood, recycled plastic or woodcrete.

8.9.44 Creation of new habitats such as woodland, hedgerows, trees, scrub, and grassland, as shown on Figure 2.3: Environmental Masterplan of the Environmental Statement Figures (TR010064/APP/6.2), would benefit birds through provision of new foraging and nesting opportunities, as well as mitigating the loss of other habitats.

Great crested newts

8.9.45 The Applicant will use Natural England's DLL scheme to mitigate the effects of the Scheme on GCN. The DLL scheme enables the Applicant to pay for off-site compensation ponds as an alternative to a traditional mitigation licence which requires on-site mitigation. Participation in the DLL scheme ensures the Applicant complies with legal duties to protect GCN whilst enabling mitigation to be focused strategically to deliver better outcomes for the species.

8.9.46 The Applicant has secured an IACPC with respect to a DLL for GCN, which has been countersigned by Natural England (see Appendix 8.15: GCN DLL IACPC of the Environmental Statement Appendices (TR010064/APP/6.3)). Whilst not a requirement under DLL, reasonable avoidance measures may also be adopted to minimise impacts on GCN during works. No further mitigation is required.

Reptiles

8.9.47 Although no reptiles were recorded during field surveys, due to the presence of desktop records and areas of suitable habitat to the east of the M66 and north of the M62, presence of a small population has been assumed on a precautionary basis.

8.9.48 As stated in commitment B22 in the REAC, contained within the First Iteration EMP (TR010064/APP/6.5), a reptile mitigation strategy will be developed, to include as appropriate:

- Habitat manipulation under the supervision of an EcoW to displace reptiles from localised areas of construction work where there is suitable reptile habitat in adjacent areas.
- Trapping and translocation of reptiles from areas of habitat with a larger footprint where displacement would be ineffective due to a lack of connecting habitats. Animals would be moved to retained habitats within the Order Limits.

- Destructive searches of habitats under supervision of an EcoW. Animals would be moved to retained habitats within the Order Limits.

8.9.49 Hibernacula and log piles will be provided within newly created habitats to provide sources of invertebrate prey and places of shelter for reptiles (commitment B23 in the REAC, contained within the First Iteration EMP (TR010064/APP/6.5)).

Terrestrial invertebrates

8.9.50 Measures to mitigate impacts on invertebrate assemblages would comprise the following:

- Felled vegetation and dead timber will be retained and made into habitat piles within retained vegetation and Scheme landscaping and mitigation areas under direction of a suitably experienced ecologist (commitment B24 in the REAC, contained within the First Iteration EMP (TR010064/APP/6.5)).

- Environmental mitigation areas, as well as broader landscaping, will be designed with benefits to invertebrates in mind. Designs may include the creation of new wildflower and grassland areas seeded from a species-rich seed mix, new ponds and ditches, trees and woodland, species-rich hedgerows and scrub comprising native tree, shrub and herbaceous species of local provenance (commitment B25 in the REAC, contained within the First Iteration EMP (TR010064/APP/6.5)).

Other notable species: water shrew, brown hare, hedgehog and common toad

8.9.51 Where works will impact habitats around ponds and watercourses where water shrew may be present, a suitably qualified ecologist will oversee the works and will carry a search of the bank prior to works commencing to identify any potential water shrew burrows. If any potential burrows are located, the burrow would be hand excavated and any water shew encountered encouraged to move to an area of safety outside of the footprint of works (commitment B26 in the REAC, contained within the First Iteration EMP (TR010064/APP/6.5)).

8.9.52 Pre-works checks for brown hare will be carried out ahead of site clearance to flush any brown hares that may be present away from the works into areas of safety (commitment B27 in the REAC, contained within the First Iteration EMP (TR010064/APP/6.5)).

8.9.53 As stated in Section 8.9 of this chapter, pre-works checks for hedgehog will be carried out ahead of site clearance to find and move any hedgehogs that may be present away from the works into areas of safety (commitment B28 in the REAC, contained within the First Iteration EMP (TR010064/APP/6.5)).

8.9.54 Should common toads be discovered during vegetation clearance, they will be removed to suitable terrestrial habitat outside of the working area by a suitably experienced ecologist (commitment B29 in the REAC, contained within the First Iteration EMP (TR010064/APP/6.5)).

Freshwater fauna

8.9.55 Appropriate stand-off distances will be implemented around watercourses where suitable, using physical barriers during construction works to protect aquatic plant and invertebrate species from destruction and disturbance (commitment B5 in the REAC, contained within the First Iteration EMP (TR010064/APP/6.5)).

Enhancement

8.9.56 Habitats within the Order Limits would be enhanced as part of the Scheme. Existing areas of 0.44ha of lowland mixed deciduous woodland and 7.16ha of other broadleaved woodland would be managed to improve the condition of the habitat through:

- Selective thinning
- Understorey planting with younger trees and scrub
- Artificially creating standing deadwood
- Treating invasive species where present.

8.9.57 Two existing areas of other neutral grassland totalling 1.37ha, would also be managed to improve their condition.

8.9.58 New areas of grassland seeded from a species-rich seed mix, as well as trees and woodland and species-rich hedgerows and scrub comprising native tree, shrub and herbaceous species of local provenance would be created to provide an increase in the areas of habitats.

8.9.59 Should peat be extracted, for example, as part of the SUDs/pond creation, opportunities to use this peat to provide biodiversity opportunities such as establishment of marginal planting and creation of other wet habitats would be explored.

8.9.60 Bat roosting boxes (over and above the number required for mitigating habitat losses) suitable for supporting roosts of various species ranging from summer roosts for low numbers of non-breeding male crevice-dwelling species (i.e. common pipistrelle) to larger boxes suitable for maternity roosts and hibernation boxes would be provided. Bat boxes would be made of woodcrete which is hard wearing and long lasting (20-25 years). These would be installed within retained vegetation, for example attached to tall trees, or installed on free-standing posts as appropriate.

8.9.61 Bird nesting boxes (over and above the numbers required for mitigating habitat losses) suitable for a variety of species including cavity nesting species with entrance holes of different sizes, open-fronted boxes, and larger boxes to accommodate birds of prey would be provided within retained habitats.

8.9.62 Habitat piles and hibernacula would be created from felled vegetation and dead woodland would be installed within retained habitat and designated landscaping and mitigation areas.

8.10 Assessment of likely significant effects

8.10.1 Table 8.18 and Table 8.19 summarise the likely significant residual effects of the Scheme on biodiversity during construction and operation. Impacts to receptors of less than local importance have not been considered. All effects have been qualitatively assessed based on the application of professional judgement to the DMRB LA 108 significance criteria.

8.10.2 Where effects have been identified, these would be reduced where practicable by implementing the mitigation measures outlined in Section 8.9 and by ensuring that the construction of the Scheme responds to the national regulatory or policy standards and local policy requirements relevant to this aspect.

Construction

Rochdale Canal SAC and SSSI

8.10.3 These sites have overlapping designations and so are assessed together to avoid repetition.

8.10.4 As stated in Section 8.8 of this chapter, Rochdale Canal SAC and SSSI have been excluded from the assessment of effects due to nitrogen deposition. There are no other pathways to effect for these receptors during construction.

Ashclough SSSI, Nob End SSSI and LNR, Moses Gate LNR

8.10.5 Due to their hydrological connectivity to the Scheme via the Rivers Irwell and Roch and associated tributaries, there is potential for adverse effects on these sites due to pollution of surface water during construction. However, as stated in Section 8.9, construction effects on surface water would be mitigated through essential mitigation measures and best practice as detailed in the First Iteration EMP (TR010064/APP/6.5) and as listed within Section 13.9 of Chapter 13: RDWE of this Environmental Statement (TR010064/APP/6.1), reducing the chance of any pollution events. This would likely result in, at worst, only temporary damage to a receptor which would be unlikely to affect the integrity of the resource. In addition, these sites are more than 9.5km downstream of the closest crossing point of the Order Limits and any accidental pollution would become diluted as it flowed downstream. Therefore, the level of impact is assessed as a negligible adverse effect on National (SSSI) / County (LNR) importance receptors, and therefore the significance of effect is assessed at worst as **slight adverse (not significant)** for both the SSSI and LNR designations.

8.10.6 In addition, due to the hydrological connectivity between these sites and the Scheme there is a potential pathway to effect due to the spread of INNS. Measures to prevent introduction or spread of INNS are detailed in the First Iteration EMP (TR010064/APP/6.5). With mitigation, and considering the distance between the Order Limits and the sites, the level of impact is assessed as a negligible adverse effect on National (SSSI) / County (LNR) importance receptors and therefore the significance of effect is assessed at worst as **slight adverse (not significant)** and **neutral (not significant)**, respectively.

8.10.7 There are no other pathways to effect for these sites.

8.10.8 Overall, the significance of effect on Ashclough SSSI and Nob End SSSI is assessed as **slight adverse (not significant)**, and the significance of effect on Nob End LNR and Moses Gate LNR is assessed as **neutral (not significant)**.

Alkrington Woods LNR

8.10.9 As stated in Section 8.8 of this chapter, Alkrington Woods LNR has been excluded from the assessment of effects due to nitrogen deposition and hydrological impacts during construction. There is no other pathway to effect for this receptor during construction.

Blackley Forest LNR

8.10.10 The watercourse 'Blackfish' is located partially within the Order Limits. Blackfish merges with the River Irk which flows through Blackley Forest LNR. Therefore, there is potential for adverse effects on this site due to pollution of surface water during construction.

8.10.11 However, as stated in Section 8.9, construction effects on surface water would be mitigated through essential mitigation measures and best practice as detailed in the First Iteration EMP (TR010064/APP/6.5) and as listed within Section 13.9 of Chapter 13: RDWE of this Environmental Statement (TR010064/APP/6.1), reducing the chance of any pollution events. This would likely result in at worst only temporary damage to a receptor which would be unlikely to affect the integrity of the resource. In addition, Blackley Forest LNR is more than 1km downstream of the Order Limits and any accidental pollution would become diluted as it flowed downstream and would be unlikely to have an observable impact on the ecology of these sites. Therefore, the level of impact is assessed as negligible adverse. The effect of a negligible impact level on a site of County importance could be either neutral or slight. Given that the risk of a pollution event is low, the effect is assessed as **neutral (not significant)**.

8.10.12 In addition, due to the hydrological connectivity between Blackley Forest LNR and the Scheme there is a potential pathway to effect to due the spread of INNS. Measures to prevent introduction or spread of INNS are detailed in the First Iteration EMP (TR010064/APP/6.5). With mitigation, and considering the distance between the Order Limits and the site, the level of impact is assessed as negligible adverse. The effect of a negligible impact level on a site of County importance could be either neutral or slight. The confidence in the effectiveness of identified mitigation measures is high, and therefore the significance of effect is assessed as **neutral (not significant)**.

8.10.13 Overall, the significance of effect on Blackley Forest LNR is assessed as **neutral (not significant)**.

Clifton Country Park LNR

8.10.14 As stated in Section 8.8 of this chapter, Clifton Country Park LNR has been excluded from the assessment of effects due to nitrogen deposition during construction. There is no other pathway to effect for this receptor during construction.

Hollins Vale LNR/SBI and Hollins Plantation SBI

8.10.15 The overlap between Hollins Vale SBI and Hollins Plantation SBI with Hollins Vale LNR is shown on Figure 8.1.3: Priority Habitats and Ancient Woodland of Appendix 8.1: UK Habs Report of the Environmental Statement Appendices (TR010064/APP/6.3). In summary the extent of the LNR is larger than the two SBI, therefore not all potential effects are relevant to all of the sites as their relationship to the Order Limits varies. However, as there is some overlap in the potential for effects, the sites have been assessed together.

8.10.16 Castle Brook runs adjacent to the Order Limits, before merging with Hollins Brook which flows through Hollins Vale LNR and SBI (but not Hollins Plantation SBI). Therefore, there is potential for adverse effects on Hollins Vale LNR and SBI due to pollution of surface water during construction.

8.10.17 However, as stated in Section 8.9 of this chapter, construction effects on surface water would be mitigated through essential mitigation measures and best practice as detailed in the First Iteration EMP (TR010064/APP/6.5) and as listed within Section 13.9 of Chapter 13: RDWE of this Environmental Statement (TR010064/APP/6.1), reducing the chance of any pollution events. This would likely result in at worst only temporary damage to a receptor which would be unlikely to affect the integrity of the resource. In addition, Hollins Vale LNR and SBI are more than 1km downstream of the closest point at which the Order Limits is adjacent to Castle Brook and any accidental pollution would become diluted as it flowed downstream and would be unlikely to have an observable impact on the ecology of these sites. Therefore, the level of impact is assessed as negligible adverse. The effect of a negligible impact level on sites of county importance (Hollins Vale LNR and SBI) could be either neutral or slight. Given that the risk of a pollution event is low, the effect is assessed as **neutral (not significant)**.

8.10.18 In addition, due to the hydrological connectivity between Hollins Vale LNR and SBI and the Scheme there is a potential pathway to effect due to the spread of INNS. Measures to prevent introduction or spread of INNS are detailed in the First Iteration EMP (TR010064/APP/6.5). With mitigation, and considering the distance between the Order Limits and the sites, the level of impact is assessed as negligible adverse. The effect of a negligible impact level on sites of county importance (Hollins Vale LNR and SBI) could be either neutral or slight. Confidence in the effectiveness of identified mitigation measures is high, and therefore the significance of effect is assessed as **neutral (not significant)**.

8.10.19 Groundwater dependency varies across the extent of Hollins Vale LNR as detailed within Appendix 13.5: GWDTE Assessment Report of the Environmental Statement Appendices (TR010064/APP/6.3). The north of the site which forms Hollins Vale SBI has potential to support groundwater dependent vegetation and is attributed as having a moderate groundwater dependency, whereas Hollins Vale Plantation SBI and grazing land in the south of the site (which does not form part of either SBI) are classified as having a low groundwater dependency.

8.10.20 As stated in Appendix 13.5: GWDTE Assessment Report of the Environmental Statement Appendices (TR010064/APP/6.3), the sites lie outside of the estimated dewatering ZOIs for the nearest Scheme cutting, pond and drainage connections. No dewatering impacts on groundwater flows, levels or quality at the site are therefore predicted.

8.10.21 The nearest ground disturbance, associated with ground compaction, soil stripping, vegetation clearance and construction of the Scheme gantry within the Order Limits, is situated 50m east of the far south-east corner of the site. Given the works position on the opposite side of the existing M66 southbound carriageway and groundwater flow directions in the area, impacts to groundwater flows and levels in the south-east of the site are expected to be attenuated up-gradient of the site boundary and would be negligible. No impacts to groundwater flows and levels are expected throughout the remainder of the sites. Similarly, no impacts are predicted to the GWDTE from the construction of the Scheme embankments, bridges, or drainage assets, given their distance from the site.

8.10.22 With best-practice mitigation measures as per in the First Iteration EMP (TR010064/APP/6.5), the level of impact on existing groundwater quality in the south-east of the site, due to the mobilisation of suspended solids and/or accidental spills and leaks of fuels and chemicals is expected to be negligible. No impacts to groundwater quality are expected throughout the remainder of the site. The level of impact due to changes in ground water is therefore assessed as negligible adverse. The effect of a negligible impact level on sites of county importance (Hollins Vale LNR and SBI) could be either neutral or slight. Given that the risk of a pollution event is low, the effect is assessed as **neutral (not significant)**.

8.10.23 Hollins Vale LNR and Hollins Plantation SBI are within the 0-50m distance band and so are assessed as being at high risk of dust deposition. Hollins Vale SBI is within the 100-200m distance band and so is assessed as being at low risk of dust deposition. With embedded construction phase mitigation measures in place (Section 8.9 of this chapter), it is unlikely there would be significant adverse air quality effects resulting from construction dust, and so none of these sites would be impacted through this pathway. Therefore, there would be no change in the level of impact due to dust deposition, and the significance of effect would be **neutral (not significant)**.

8.10.24 Overall, the significance of effect for Hollins Vale LNR, SBI and Hollins Plantation SBI are assessed as **neutral (not significant)**.

Mere Clough LNR

8.10.25 As stated in Section 8.8 of this chapter, Mere Clough LNR has been excluded from the assessment from effects due to nitrogen deposition and from hydrological connectivity during construction. There is no other pathway to effect for this receptor during construction.

Philips Park LNR and Philips Park and North Wood SBI

8.10.26 These sites have partially overlapping designations and so are assessed together to avoid repetition.

8.10.27 As stated in paragraph 8.8.12 of this chapter, Philips Park LNR and Philips Park and North Wood SBI are included within the assessment of potential effects due to nitrogen deposition during construction. Both sites are only affected for the final year of the construction phase and the magnitude of increase in nitrogen deposition (DS-DM) during the final year of construction is smaller than the magnitude of change during operation. The impact duration of construction alone is so short-lived (1 year) that no effect on species composition would be anticipated and therefore the impact level would be no change and the significance of effect would be **neutral (not significant)**.

8.10.28 Philips Park and North Wood SBI (but not Philips Park LNR, which is more than 200m from the Order Limits) is within the 100-200m distance band from the Order Limits and so is assessed as being at low risk of dust deposition. With embedded construction phase mitigation measures in place (Section 8.9 of this chapter), it is unlikely there would be significant adverse air quality effects resulting from construction dust, and so Philips Park and North Wood SBI would not be impacted through this pathway. Therefore, there would be no change in the level of impact due to dust deposition, and the significance of effect would be **neutral (not significant)**.

8.10.29 As stated in Appendix 13.5: GWDTE Assessment Report of the Environmental Statement Appendices (TR010064/APP/6.3), parts of Philips Park LNR and Philips Park and North Wood SBI are classified as having moderate groundwater dependency. However, the sites lie outside of the estimated dewatering ZOIs for the nearest Scheme cutting, pond and drainage connections. No dewatering impacts on groundwater flows, levels or quality at the site are therefore predicted.

8.10.30 Given that the Order Limits are located 200m north-east of the site, and the likely groundwater flow directions in the area, no impacts to groundwater flows and levels because of ground disturbance (associated with for example ground compaction, soil stripping and vegetation clearance within the Order Limits) are predicted at the site. Similarly, no impacts are predicted to the GWDTE from the construction of the Scheme cuttings, embankments, bridges, gantries, or drainage assets given their distance from the site.

8.10.31 No impacts to existing groundwater quality are also predicted to the site during the construction of the Scheme. There would be no change on the level of impact on Receptor of County importances, and therefore the significance of effect would be **neutral (not significant)**.

8.10.32 There are no other pathways to effect for these sites. The overall significance of effect would therefore be **neutral (not significant)**.

Alkrington Woods and Rhode Lodges SBI

8.10.33 As stated in Section 8.8 of this chapter, Alkrington Woods and Rhode Lodges SBI has been excluded from the assessment of effects due to nitrogen deposition during construction. There are no other pathways to effect for this receptor during construction.

Boardman Brook SBI

8.10.34 As stated in Section 8.8 of this chapter, Boardman Brook SBI has been excluded from the assessment of effects due to nitrogen deposition during construction. There are no other pathways to effect for this receptor during construction.

Clifton Country Park SBI

8.10.35 As stated in Section 8.8 of this chapter, Clifton Country Park SBI has been excluded from the assessment of effects due to nitrogen deposition during construction. There are no other pathways to effect for this receptor during construction.

Clifton Moss (South) SBI

8.10.36 As stated in Section 8.8 of this chapter, Clifton Moss (South) SBI has been excluded from the assessment of effects due to nitrogen deposition during construction. There are no other pathways to effect for this receptor during construction.

Heaton Park Reservoir SBI

8.10.37 As per Table 8.14 there is no hydrological connectivity between Heaton Park Reservoir SBI and the Scheme, and Heaton Park Reservoir SBI is not within 200m of the ARN. There are no other pathways to effect for this receptor during construction.

Hazlitt Wood SBI

8.10.38 Hazlitt Wood SBI is located 3m from the Order Limits. There is potential for accidental encroachment onto the designated site by construction machinery, however mitigation as detailed within Section 8.9 of this chapter would prevent impacts through this pathway.

8.10.39 As stated in Section 8.8 of this chapter, Hazlitt Wood SBI has been excluded from the assessment of effects due to nitrogen deposition during construction.

8.10.40 Hazlitt Wood SBI is within the 0-50m distance band and so is assessed as being at high risk of dust deposition. With embedded construction phase mitigation measures in place (Section 8.9 of this chapter), it is unlikely there would be significant adverse air quality effects resulting from construction dust, and so Hazlitt Wood SBI would not be impacted through this pathway.

8.10.41 The watercourse Blackfish is located partially within the Order Limits and flows through Hazlitt Wood SBI. Therefore, there is potential for adverse effects on this site due to pollution of surface water during construction.

8.10.42 However, as stated in Section 8.9, construction effects on surface water would be mitigated through essential mitigation measures and best practice as detailed in the First Iteration EMP (TR010064/APP/6.5) and as listed within Section 13.9 of Chapter 13: RDWE of this Environmental Statement (TR010064/APP/6.1), reducing the chance of any pollution events. This would likely result in at worst only temporary damage to a receptor which would be unlikely to affect the integrity of the resource. Therefore, the level of impact is assessed as negligible adverse. The effect of a negligible impact level on a site of County importance could be either neutral or slight. The confidence in the effectiveness of identified mitigation measures is high, and therefore the significance of effect is assessed as **neutral (not significant)**.

8.10.43 In addition, due to the hydrological connectivity between Hazlitt Wood SBI and the Scheme, and the proximity of the site to the Order Limits, there is a potential pathway to effect due to the spread of INNS. Measures to prevent introduction or spread of INNS are detailed in the First Iteration EMP (TR010064/APP/6.5). With mitigation and consideration to the distance between the Order Limits and the site, the level of impact is assessed as negligible adverse. The effect of a negligible impact level on a site of County importance could be either neutral or slight. The confidence in the effectiveness of identified mitigation measures is high, and therefore the significance of effect is assessed as **neutral (not significant)**.

8.10.44 As detailed within Appendix 13.5: GWDTE Assessment Report of the Environmental Statement Appendices (TR0100064/APP/6.3), parts of Hazlitt Wood SBI are classified as having moderate groundwater dependency.

8.10.45 The site lies outside of the estimated dewatering ZOIs for the nearest Scheme cutting and drainage connections. No dewatering impacts on groundwater flows, levels or quality at the site are therefore predicted from these assets. However, groundwater could be slightly intercepted by approximatively 0.6m during excavation of Pond 5, which lies 15m north of the site. In this instance, it is not applicable to attribute a dewatering ZOI but rather expect that groundwater level disruption would be extremely localised (i.e., expected to extend no more than 5m from the edge of the excavation) and as the SBI is 15m south of Pond 5 it is therefore not expected there would be any effect on the SBI. The remainder of the site would experience negligible or no impacts.

8.10.46 There could also be short-term disturbances to groundwater flows at the GWDTE, because of compaction-related construction activities and earthworks (such as soil stripping), that would not need dewatering. Soil stripping is assumed to take place up to a maximum of 0.5m depth and located 10m north of the site at its closest point. Considering the limited excavation depth, proximity of the earthworks to the site, and groundwater flow directions in the area, minor impacts to groundwater flows and levels could occur in the far north of the site. However as ground water dependency is low within this part of the SBI, it is not anticipated there would be an observable change in the habitats present. Negligible or no impacts are expected throughout the remainder of the site. No impacts are predicted to the GWDTE from the construction of cuttings, embankments, bridges, or gantries, given their distance from the site. Therefore, the level of impact due to changes in groundwater flow are assessed as negligible. The effect of a negligible impact level on a site of County importance could be either neutral or slight. The confidence in the effectiveness of identified mitigation measures is high, and therefore the significance of effect is assessed as **neutral (not significant)**.

8.10.47 Ground disturbance due to the above-mentioned activities could also lead to changes in groundwater quality, due to the mobilisation of suspended solids and / or accidental leaks and spills of fuels and chemicals. As described in Chapter 13: RDWE of this Environmental Statement (TR010064/APP/6.1), there are several best-practice mitigation measures contained within the First Iteration EMP (TR010064/APP/6.5) for pollution prevention including managing silt pollution (for suspended solids transport). These measures would significantly reduce the likelihood of contaminating groundwater, but do not affect the severity or consequence of an event occurring.

8.10.48 Considering the best-practice mitigation measures referred to in the First Iteration EMP (TR010064/APP/6.5), the proximity of the earthworks to the site, and groundwater flow directions in the area, impacts to groundwater quality could occur in the far north of the site only, and the effects would be temporary (for the duration of the contamination event) and would be unlikely to affect the integrity of the site because the quantity of contaminants released during a single pollution event would be unlikely to have an observable ecological effect. Negligible to no impacts on groundwater quality are expected throughout the remainder of the site, and therefore as a worst case, only a proportion of the total SBI would be affected. In addition, no impacts on groundwater quality are predicted at the site from the creation of new vertical contaminant pathways in the superficial aquifers, i.e., from the construction of cuttings, embankments, bridges, or gantries, given their distance from the site. The level of impact from changes in groundwater quality are assessed as negligible adverse. The effect of a negligible impact level on a site of County importance could be either neutral or slight. As a precaution, the significance of effect is assessed as **slight adverse (not significant)**.

8.10.49 Overall, the significance of effect on Hazlitt Wood SBI has, as a precaution, been assessed as **slight adverse (not significant)** due to the potential for effects as a result of pollution of groundwater.

Parr Brook SBI

8.10.50 Parr Brook SBI is connected directly with the Parr Brook which is located partially within the Order Limits. Therefore, there is potential for adverse effects on this site due to pollution of surface water during construction.

8.10.51 However, as stated in Section 8.9 of this chapter, construction effects on surface water would be mitigated through essential mitigation measures and best practice as detailed in the First Iteration EMP (TR010064/APP/6.5) and as listed within Section 13.9 of Chapter 13: RDWE of this Environmental Statement (TR010064/APP/6.1), reducing the chance of any pollution events. This would likely result In at worst only temporary damage to a receptor, which would be unlikely to affect the integrity of the resource. In addition, Parr Brook SBI is more than 2km downstream of the Order Limits and any accidental pollution would become diluted as it flowed downstream and would be unlikely to have an observable impact on the ecology of the site. Therefore, the level of impact is assessed as a negligible adverse. The effect of a negligible impact level on a site of County importance could be either neutral or slight. Given it is unlikely there would be an observable impact on the ecology of these sites, the significance of effect is assessed as **neutral (not significant)**.

8.10.52 In addition, due to the hydrological connectivity between Parr Brook SBI and the Scheme there is a potential pathway to effect due to the spread of INNS. Measures to prevent introduction or spread of INNS are detailed in the First Iteration EMP (TR010064/APP/6.5). With mitigation and consideration to the distance between the Order Limits and the site, the level of impact is assessed as a negligible adverse. The effect of a negligible impact level on a site of County importance could be either neutral or slight. The confidence in the effectiveness of identified mitigation measures is high, and therefore the significance of effect is assessed as **neutral (not significant)**.

8.10.53 Overall, the significance of effect on Parr Brook SBI is assessed as **neutral (not significant)**.

Pilsworth SBI

8.10.54 As stated in Section 8.8 of this chapter, Pilsworth SBI has been excluded from the assessment of effects due to hydrological changes during construction. There are no other pathways to effect for this receptor during construction.

Ringley Woods (East) SBI

8.10.55 As stated in Section 8.8 of this chapter, Ringley Woods (East) SBI has been excluded from the assessment of effects due to nitrogen deposition during construction. There are no other pathways to effect for this receptor during construction.

Rhodes Farm Sewage Works SBI

8.10.56 As stated in Section 8.8 of this chapter, Rhodes Farm Sewage Works SBI has been excluded from the assessment of effects due to nitrogen deposition during construction. There are no other pathways to effect for this receptor during construction.

Rochdale Canal (Scowcroft to Warland) SBI

8.10.57 As stated in Section 8.8 of this chapter, Rochdale Canal (Scowcroft to Warland) SBI has been excluded from the assessment of effects due to nitrogen deposition during construction. There are no other pathways to effect for this receptor during construction.

Rochdale Canal – Lock at Scowcroft Farm to Stott's Lane SBI

8.10.58 As stated in Section 8.8 of this chapter, Rochdale Canal – Lock at Scowcroft Farm to Stott's Lane SBI has been excluded from the assessment of effects due to nitrogen deposition during construction. There are no other pathways to effect for this receptor during construction.

Sudden Brook (West) SBI

8.10.59 As stated in Section 8.8 of this chapter, Sudden Brook (West) SBI has been excluded from the assessment of effects due to nitrogen deposition during construction. There are no other pathways to effect for this receptor during construction.

Ancient Woodland

8.10.60 There would be no direct loss of Ancient Woodland due to construction of the Scheme.

8.10.61 The two areas of Ancient Woodland identified within 1km of the Order Limits (Philips Wood and Mere Clough) potentially support GWDTE as their boundaries overlap Philips Park and North Wood SBI (see Appendix 13.5: GWDTE Assessment Report of the Environmental Statement Appendices (TR010064/APP/6.3). However, as stated for Philips Park and North Wood SBI, there would be no effect on groundwater flows, levels or quality and no risk of ground water pollution due to construction of the Scheme.

8.10.62 As stated in Section 8.8, Philips Wood Ancient Woodland, Mere Clough Ancient Woodland, Clifton Wood Ancient Woodland and North Wood Ancient Woodland have been excluded from the assessment of effects due to nitrogen deposition during construction. There is no pathway to effect with respect to surface water impacts for these sites.

Priority habitats

Eutrophic standing water (r1a)

8.10.63 There are five ponds within the Order Limits, (P34, P37, P38, P73, and P74, see Appendix 8.8: GCN Survey Report of the Environmental Statement Appendices (TR010064/APP/6.3)). During site clearance there would be a loss of 0.06ha of eutrophic standing water of the 0.07ha present within the Order Limits, due to the loss of ponds P34, P37, P38 and P73. Pond P74 would be retained. Pond losses would be mitigated through creation of 1.19ha of new pond habitat as shown on Figure 2.3: Environmental Masterplan of the Environmental Statement Figures (TR010064/APP/6.2), providing a net gain of 1.14ha of ponds. A precautionary approach has been taken and it is assumed these reinstated / new habitats would not qualify as priority habitat, however as the habitats mature there is potential for them to become colonised by species such as GCN which would then qualify them as priority habitat. The loss of eutrophic standing water would be a moderate adverse impact on a receptor of County importance, and the significance of effect is assessed as **slight adverse (not significant)**.

8.10.64 The Hills South has been identified as an area within the ZOI of the Scheme where there is groundwater dependent habitat. As stated within Appendix 13.5: GWDTE Assessment Report of the Environmental Statement Appendices (TR010064/APP/6.3), the pond is assumed to be surface water fed and is not considered to be a GWDTE, however the pond margins are conservatively attributed as having a low groundwater dependency.

8.10.65 The Hills South, lies outside of the estimated dewatering ZOIs for the nearest Scheme cutting, attenuation pond and drainage connections. Therefore, no dewatering impacts on groundwater flows, levels or quality at the site are predicted.

8.10.66 Ground disturbance (associated with ground compaction, soil stripping, vegetation clearance, and construction of haul roads) would occur 20m up-gradient of the site. Given the likely groundwater flow directions in the area, precautionary minor changes in groundwater levels could occur in the west of the GWDTE, which could result in adverse effects such as a reduction in the extent of the pond margins. However, these are assessed as negligible adverse as they are likely to be temporary for the duration of construction and would not affect the integrity of the pond. The effect of a negligible impact level on a site of County importance could be either neutral or slight. Given there would be no effect on the integrity of the pond, the impact is as assessed as **slight adverse (not significant)**.

8.10.67 Ground disturbance due to the above-mentioned activities could also impact existing groundwater quality, due to the mobilisation of suspended solids and/or accidental spills and leaks of fuels and chemicals. Considering the best-practice mitigation measures referred to in the First Iteration EMP (TR010064/APP/6.5), the proximity of the earthworks and groundwater flow directions in the area, precautionary minor levels of impacts on groundwater quality are predicted in the west of the pond. This would result in a temporary impact for the duration of the pollution event, however it is assessed there would unlikely be an impact on the extent or integrity of eutrophic standing water. In addition, the sheet piles required to the west of the pond for the Scheme embankment could create new vertical contaminant pathways, or cause mixing of different groundwater chemistries, between the made ground and superficial aquifers. However, impacts would be very localised and likely attenuated up-gradient of the pond, such that only negligible impacts on groundwater quality are predicted. The effect of a negligible impact level on a site of County importance could be either neutral or slight. Given there would be no effect on the integrity of the receptor, the impact is assessed as **neutral (not significant)**.

8.10.68 Overall the significance of effect for eutrophic standing water (r1a) due to the temporary loss of ponds and potential for temporary effects due to changes to ground water flow and quality, is assessed as **slight adverse (not significant)**.

Hedgerows

8.10.69 During site clearance there would be a loss of 0.88km of hedgerows of the 2.56km present within the Order Limits. This would be mitigated through creation of 1.48km of new hedgerow as shown on Figure 2.3: Environmental Masterplan of the Environmental Statement Figures (TR010064/APP/6.2), providing a net gain of 0.6km of hedgerow. The effect would therefore be temporary and as such is assessed as a moderate adverse impact on a receptor of County importance. There are no other pathways to effect for this receptor, and therefore the overall significance of effect is assessed as **slight adverse (not significant)**.

Lowland fens (f2a)

8.10.70 One area of lowland fen was identified within the northern part of Hollins Vale SBI. As detailed within Appendix 13.5: GWDTE Assessment Report of the Environmental Statement Appendices (TR010064/APP/6.3), this is ground water fed through springs from the steep scarp, and the habitat has a moderate groundwater dependency.

8.10.71 Although there is potential for ground water effects to the south-east part of Hollins Vale LNR, no effect to the levels and quality of ground water are predicted for the SBI and lowland fen habitat it supports.

8.10.72 There would be no direct loss of lowland fens.

8.10.73 Overall, the level of impact on a receptor of National importance is no change and therefore the significance of effect is assessed as **neutral (not significant)**.

Lowland mixed deciduous woodland (w1f and w1f7)

8.10.74 There would be no loss of lowland mixed deciduous woodland (w1f) habitat as the 0.008ha with the Order Limits would be retained.

8.10.75 There would however be a loss of 0.11ha of lowland mixed deciduous woodland (wlf7) (a subset of lowland mixed deciduous woodland w1f) of the 0.16ha present within the Order Limits. As per Section 8.9, the Scheme would be landscaped in accordance with Figure 2.3: Environmental Masterplan of the Environmental Statement Figures (TR010064/APP/6.2), which would be developed at detailed design. Loss of lowland mixed deciduous woodland (w1f7) would be mitigated through creation of 2.90ha of new lowland mixed deciduous woodland, 0.75ha of wet woodland and enhancement of 0.04ha of retained other lowland mixed deciduous woodland as shown on the Environmental Masterplan (Figure 2.3 of the Environmental Statement Figures (TR010064/APP/6.2)) and detailed within Section 8.9 of this chapter. It is predicted that the enhanced habitat would take 12 years to reach the target condition, and the new lowland mixed deciduous woodland and wet woodland would take 30+ years and 15 years respectively after clearance of the 0.11ha of existing habitat, to reach the target condition. Although the new and enhanced habitats would mitigate the effects in the long term, due to the time to reach target condition, the effect is, as a precaution, assessed as permanent. There would, however, be a net gain of 3.54ha of priority woodland habitat, a ratio of over 1:32.

8.10.76 The loss of lowland mixed deciduous woodland (w1f7) priority habitat would be a major adverse impact on a receptor of County importance however the significance of effect is assessed as **slight adverse (not significant)** as opposed to moderate adverse (significant) due to the ratio of habitat that would be created compared to that lost.

8.10.77 There are no other pathways to effect for this receptor, and therefore the overall significance of effect is assessed as **slight adverse (not significant)**.

Traditional orchard

8.10.78 One area of traditional orchard priority habitat is located 0.43km from the Order Limits. This habitat would not be impacted through site clearance, and there are no other pathways to effect for this receptor.

Wet woodland (w1d)

8.10.79 Two areas of wet woodland habitat were identified during field surveys. The first is located within Hollins Vale LNR and therefore impacts to this habitat are assessed in the section above in relation to this designated site.

8.10.80 The second area is located to the north of Brightley Brook. There would be no direct impacts to this habitat and therefore no loss of wet woodland due to construction of the Scheme.

8.10.81 As stated in Appendix 13.5: GWDTE Assessment Report of the Environmental Statement Appendices (TR010064/APP/6.3), sites and habitats beyond 250m from the Order Limits have been screened out as potentially significant impacts are not expected to reach beyond this distance. The wet woodland north of Brightley Brook is located more than 300m from the Order Limits and so hydrological effects to the habitat are not predicted to occur.

8.10.82 Therefore, there is no pathway to effect for wet woodland (w1d), however as stated above 0.75ha of wet woodland would be created to mitigate the loss of other lowland mixed deciduous woodland.

Other habitats

Habitat loss

8.10.83 There would be habitat losses as a result of construction of the Scheme, as shown in Table 8.17 of this chapter and on the Tree Removal Plan in Appendix 7.5: Arboricultural Impact Assessment of the Environmental Statement Appendices (TR010064/APP/6.3). The loss of non-priority habitats includes broadleaved woodland (w1g and w1g7), modified grassland (g4), non cereal crops (c1d), other neutral grassland (g3c) and scrub (h3d, h3f and h3). The 0.01ha of coniferous woodland within the Order Limits would be retained.

8.10.84 Temporary habitat losses would occur to these habitats as a result of utilities diversions, construction of haul roads, soil storage areas, and construction compounds. Permanent habitat losses would occur as a result of earthworks, excavations, carriageway widening, and construction of new carriageway.

8.10.85 There would be loss of 7.6ha of non-priority habitat ('other') broadleaved woodland during construction. Planting of other broadleaved woodland would be undertaken as part of the landscaping scheme, however there would still be a net loss of this habitat (-3.19ha), but an overall gain of 0.4ha of woodland as lowland mixed deciduous and wet woodland would be planted in preference to other broadleaved woodland, although it is acknowledged there would be a delay in establishment of this habitat. This habitat is largely in a poor condition. In addition to creation of new woodland, 7.16ha of retained areas of other broadleaved woodland would be enhanced to improve its condition. Overall, with new areas of woodland created, and others enhanced it is considered that the level of impact would be minor adverse. The effect of a minor adverse impact level on a receptor of local importance could be either neutral or slight. The significance of effect is assessed as **slight adverse (not significant)** (as opposed to neutral) due to the delay in establishment of woodland habitat.

8.10.86 The areas of non-cereal crops within the Order Limits are of limited ecological value. Loss of this habitats would have negligible adverse impact and the significance of effect would be **neutral (not significant)**.

8.10.87 The areas of modified grassland and other neutral grassland within the Order Limits are also of limited ecological value. Whilst overall there would be a net loss in the areas of grassland habitats (-2.03ha) due to construction of the Scheme, the value of these habitats would be higher post-construction as 1.37ha of existing other neutral grassland would be enhanced to improve its condition. Also, a greater area of more diverse and ecologically valuable grassland (other neutral grassland) is being created compared to less diverse and ecologically valuable modified grassland. Loss of these habitats would have negligible adverse impact and the significance of effect would be **neutral (not significant)**.

8.10.88 Loss of scrub would be mitigated through habitat creation and there would be a net gain in 0.63ha of habitat. This habitat would be relatively quick to mature (estimated to take 5 years to reach target condition), and therefore the temporary loss of this habitat would have negligible adverse impacts and the significance of effect would be **neutral (not significant)**.

Table 8.17 Summary of habitat loss/gain by broad habitat type

Habitat type	Priority habitat	Quantity					
		Within Order Limits	Retained	To be enhanced	Lost	To be created	Net loss / gain
Coniferous woodland (w2c)	No	0.01ha	0.01ha	0ha	0ha	0ha	No change
Broadleaved woodland (w1g) (including w1g7, excluding lowland mixed deciduous woodland)	No	15.05ha	0.33ha	7.16ha	7.55ha	4.41ha	-3.32ha
Hedgerows	Yes	2.56km	1.68km	0km	0.88km	1.48km	+0.60km
Lowland mixed deciduous woodland (w1f) (including w1f7 other lowland mixed deciduous woodland)	Yes	0.17ha	0.01ha	0.04ha	0.11ha	2.90ha	+2.79ha
Modified grassland (g4)	No	11.58ha	5.79ha	0ha	5.79ha	1.85ha	-3.94ha
Non cereal crops (c1d)	No	3.55ha	0.38ha	0ha	3.17ha	0ha	-3.17ha
Other neutral grassland (g3c)	No	24.86ha	1.50ha	1.37ha	21.99ha	23.50ha	+1.51ha

Habitat type	Priority habitat	Quantity					
		Within Order Limits	Retained	To be enhanced	Lost	To be created	Net loss / gain
Ponds	No	0.06ha	0.01ha	0ha	0.05ha	1.19ha	+1.14ha
Scrub (h3d hawthorn scrub, h3f bramble scrub, h3h mixed scrub, introduced shrub h3)	No	2.93ha	1.5ha	0ha	1.42ha	1.90ha	+0.48ha
Wet woodland (w1d)	Yes	0ha	0ha	0ha	0ha	0.75ha	+0.75ha

Hydrological impacts

8.10.89 Other broadleaved woodland (w1g) with potential groundwater dependency was identified at Simister Allotment Gardens. However, the habitat lies outside of the estimated dewatering ZOIs for the nearest Scheme cutting, attenuation pond and drainage connections. No dewatering impacts on groundwater flows, levels or quality for this habitat are therefore predicted.

8.10.90 The nearest ground disturbance (associated with ground compaction, soil stripping and vegetation clearance etc. within the Order Limits) is located more than 50m west of Simister Allotment Gardens. Given the presence of the existing M62 infrastructure, all potential localised impacts on groundwater levels and flows within the works footprint are expected to be attenuated prior to reaching the habitat. Due to groundwater flow directions in the area, precautionary impacts to groundwater flow are predicted to the far northwest of the area of habitat, however these impacts would be temporary and unlikely to cause an observable change in the extent or integrity of the habitat. No impacts are predicted to the GWDTE from the construction of the Scheme cuttings, embankments, gantries, bridges, or drainage assets, given their distance from the site.

8.10.91 The level of impact due to changes in groundwater flows on other broadleaved woodland is, as a precaution, assessed as negligible adverse on a receptor of Local importance, and therefore the significance of effect is assessed as **neutral (not significant)**.

8.10.92 Areas of other neutral grassland (g3c) within the Cowl Gate Farm GWDTE, have been identified as having potential for groundwater dependency (Appendix 13.5: GWDTE Assessment Report of the Environmental Statement Appendices (TR010064/APP/6.3)). However, this area of other neutral grassland would be removed to enable construction of the Scheme (see paragraph 8.10.85 in relation to loss of neutral grassland) and so there would be no effects due to changes in groundwater.

8.10.93 Other neutral grassland (g3c) with potential groundwater dependency was also identified at Castle Brook South and the adjacent Egypt Lane South (Appendix 13.5: GWDTE Assessment Report of the Environmental Statement Appendices (TR010064/APP/6.3)). However, ground disturbance (associated with ground compaction, soil stripping, vegetation clearance, and construction of Scheme new drainage connections, haul roads, compounds, and temporary works areas) would occur across the entire area of habitat in both sites which would therefore be lost to enable construction of the Scheme (see paragraph 8.10.85 in relation to loss of neutral grassland) and so there would be no effects due to changes in groundwater.

8.10.94 Other neutral grassland (g3c) with potential groundwater dependency was also identified at Parkwood Cottages South (Appendix 13.5: GWDTE Assessment Report of the Environmental Statement Appendices (TR010064/APP/6.3)). However, this habitat lies outside of the estimated dewatering ZOIs for the nearest Scheme cutting, attenuation pond and drainage connections. No dewatering impacts on groundwater flows, levels or quality are therefore predicted for this habitat.

8.10.95 Given that the Order Limits are located 40m across-gradient from Parkwood Cottage South no impacts to groundwater flows and levels because of ground disturbance (associated with ground compaction, soil stripping and vegetation clearance etc. within the Order Limits) are predicted at the site. In addition to this, no impacts are predicted to the GWDTE from the construction of the Scheme cuttings, embankments, bridges, gantries, or drainage assets, given their distance from the site.

8.10.96 No impacts to existing groundwater quality are predicted to the habitat at Parkwood Cottages South during the construction of the Scheme.

8.10.97 Considering the above in relation to ground water impacts on other neutral grassland, it is assessed there would be no pathway to effect due to either the loss of the habitat or distance from the dewatering ZOIs. Therefore, there is no change in the impact due to changes in groundwater flows on a receptor of Local importance (other neutral grassland), and therefore the significance of effect is assessed as **neutral (not significant)**.

8.10.98 Some areas of other neutral grassland overlay peaty soils. These areas of other neutral grassland are not typical peatland habitats and as stated in Section 8.7 are assessed of being as local importance. Therefore, despite the underlying substrate, impacts to these areas of other neutral grassland are not ecologically important. Effects with respect to release of carbon and soils and geology are assessed within Chapter 14: Climate and Chapter 9: Geology and Soils of this Environmental Statement (TR0100/APP/6.1), respectively.

8.10.99 Overall, it is considered that the level of impact on locally important habitats would be minor adverse due to the loss of other broadleaved woodland, and the significance of effect would be **neutral (not significant)**.

Bats

Direct mortality

8.10.100 No bats roosts were identified within the survey area through field or desktop surveys. Eight trees were identified within the Order Limits with bat roost potential although bats were absent at the time of survey. However, bats regularly change roosting sites and there is the potential for these trees to be used in the future. Should bats be present during construction of the Scheme there is potential of mortality or injury of bats.

8.10.101 As stated in Section 8.9 of this chapter, impacts to bats would be mitigated through pre-construction surveys of all trees to be felled. Should surveys confirm the presence of roosting bats, a licence would be sought from Natural England (to ensure legal compliance) and felling operations would be conducted in accordance with a method statement which would require exclusion of roosting features, soft felling, and timing of works to avoid sensitive seasons for bats as appropriate.

8.10.102 Mitigation would avoid impacts to roosting bats and therefore there would be no change on a receptor of Local importance, and therefore the significance of effect is **neutral (not significant)**.

Loss of roosting habitat

8.10.103 Construction of the Scheme may result in the temporary reduction of roosting habitat through the removal of one tree with moderate suitability to support roosting bats, though this would be mitigated by provision of alternative roosting habitat such as bat roosting boxes, which is a commonly used and effective mitigation method.

8.10.104 Mitigation would avoid impacts to bats due to loss of roosting habitat and therefore there would be no change in impact on a receptor of Local importance, and therefore the significance of effect is **neutral (not significant)**.

Loss of foraging habitat

8.10.105 Extensive areas of grassland are present within the Order Limits however most of these areas of grassland are heavily grazed, lacking the tussocky grassland that has structural diversity to support a greater range and number of invertebrates (an exception being the area north-east of J18). Construction would result in the temporary loss of bat foraging habitat including 21.99ha of other neutral grassland, 1.42ha of scrub, 7.66ha of woodland habitats, 0.06ha of ponds and 0.88km of hedgerows which bats use.

8.10.106 However, the losses of woodland and grassland would be small in comparison to the overall amount of habitat available in the surrounding area.

8.10.107 The landscaping design would provide a net gain of 1.51ha of other neutral grassland, 0.75ha of scrub, 1.42ha of ponds, 0.33ha of woodland and 0.59km of hedgerow.

8.10.108 Although there would be loss of foraging habitat the impact would be temporary and is not considered likely to affect the integrity of bat resource due to the mobility of bats and the availability of alternative foraging habitat in the wider landscape. Therefore, there would be a negligible adverse impact on a receptor of Local importance, and therefore the significance of effect is **neutral (not significant)**.

Habitat fragmentation

8.10.109 Construction of the Scheme would require the removal of 0.88km of hedgerows that are used by low numbers of common bat species as a commuting route for bats travelling from east of M60 J18 towards scrub and woodland habitat adjacent to the M60 motorway north of M60 J18, and to Pike Fold Golf Course.

8.10.110 The landscaping design incorporates replacement hedgerow on Egypt Lane and a new hedgerow to the east of the Northern Loop (see Figure 2.3: Environmental Masterplan of the Environmental Statement Figures (TR010064/APP/6.2)), which would provide north-south connectivity from Egypt Lane to Pike Fold Golf Course. This would prevent any habitat fragmentation by providing a new commuting route for bats in the area.

8.10.111 Upon implementation of the Environmental Masterplan (Figure 2.3 of the Environmental Statement Figures (TR010064/APP/6.2)) there would be a net gain of 0.6km of hedgerow, although it is acknowledged it would take time for vegetation to mature. Overall, there would be a negligible adverse impact on a receptor of Local importance, and therefore the significance of effect is **neutral (not significant)**.

Disturbance

Noise and vibration

8.10.112 As no bat roosts have been identified within the survey area, there would be no impacts from noise or vibration. As stated above with respect to mortality of bats, it is acknowledged that use of potential roost features may change and there is potential for bats to start roosting within habitats in or around the Order Limits prior to construction. This would be mitigated through preconstruction surveys of trees with the potential to be affected by disturbance impacts. Should surveys confirm the presence of roosting bats, a licence would be sought from Natural England (to ensure legal compliance) and works to be timed to minimise impacts on bats where practicable. There would be no change in the level of impact for noise and vibration on roosting bats and the significance of effect would be **neutral (not significant)**.

Lighting

8.10.113 As no bat roosts have been identified within the survey area there is no potential to affect roosting bats from light disturbance.

8.10.114 Light spill from construction activities could result in loss of small areas of bat foraging habitat or fragmentation of commuting corridors. However, the low levels of bat activity recorded across the affected areas were predominantly common, widespread, light-tolerant species that can forage in a wide variety of habitats.

8.10.115 In addition, there would be no night-time works and where task lighting is required it would be used for a limited duration and where possible would be directed away from habitats adjoining the construction area. Given the low levels of bat activity recorded, and limited nature and duration of any impacts, it is not considered that light-spill would have any observable impact on foraging or commuting bats. Therefore, there would be no change in the level of impact for disturbance from lighting, and the significance of effect would be **neutral**.

Summary

8.10.116 Taking into account the assessment of effects for the pathways to effects on bats, overall, the level of impact is considered to be at most negligible adverse, and therefore the significance of effect is **neutral (not significant)**.

Badgers

Direct mortality

8.10.117 There is potential for killing or injury of badgers should they be occupying setts within or close to construction areas at the time works are undertaken. Pre-construction surveys to establish the locations of active setts would be undertaken to prevent killing or injury of badgers during site clearance. These surveys provide up to date information on sett entrances and extents, and whether the sett is still active. Active setts which would be impacted by construction would be closed under licence from Natural England (see below).

8.10.118 Of the 10 setts within the study area, six were active at the time of survey. However only a single outlier (Sett 8) would be directly impacted by the construction of the Scheme, and therefore there is only potential for mortality of badgers in setts in this one location. Mitigation measures (Section 8.9 of this chapter) would avoid mortality of badgers.

8.10.119 There is also the potential for direct mortality or injury of badgers through collisions with construction traffic. As badgers are nocturnal, there would be no risk of collision during the day. Off-peak working may include night work, however it is considered that the risk of collision with construction traffic is negligible, particularly as the speed of plant would be restricted and task lighting would be used where required. Additionally, construction activities would not sever active badger setts from areas of foraging habitat and therefore the risk of badgers interacting with construction traffic is low.

8.10.120 Badgers could also be killed or injured if they were to fall into or become entrapped within trenches or excavations. Standard mitigation measures (Section 8.9 of this chapter) such as the use of ramps, where feasible, or appropriate contouring of earthworks to provide a means of escape, would be implemented to prevent this impact from occurring.

8.10.121 Following implementation of mitigation there would be a negligible adverse impact on a receptor of Local importance, and therefore the significance of effect is **neutral (not significant)**.

Loss of setts

8.10.122 Based on the current baseline data, construction of the Scheme would result in the loss of a single active outlier badger sett (Sett 8), and a single disused outlier (Sett 3).

8.10.123 Closure of Sett 8 would be undertaken under licence and following mitigation outlined in Section 8.9. No artificial setts would be provided due to the low status of outlier setts.

8.10.124 The loss of this low status sett is considered to have a negligible adverse impact on a receptor of Local importance, and therefore the significance of effect is **neutral (not significant)**.

Disturbance

8.10.125 Active badger setts have the potential to be impacted by disturbance from noise and vibration from construction activity, which may discourage foraging or accessing setts (Chapter 11: Noise and Vibration of this Environmental Statement (TR010064/APP/6.1)). Based on the current baseline data, there are six active setts within the study area. Sett 1 is located more than 500m from the Scheme (originally surveyed as the Order Limits extended further), and therefore there is no pathway to effect due to the distance from the Scheme.

8.10.126 Sett 2 (a subsidiary sett) is relatively isolated from the main construction but is within 15m of a new Scheme hedgerow. However, planting would be undertaken by hand within and therefore there is no potential for disturbance with mitigation outlined in Section 8.9 of this chapter.

8.10.127 Sett 4 comprises a main sett with four active holes. Like Sett 2, there is hedgerow planting to be close by, however as this would be undertaken by hand, there is no potential for disturbance. There is, however, potential for excavation of a trench for a comms duct within the vicinity of the sett (the alignment of the trench would be determined at detailed design). There is no risk of causing damage to tunnels within the sett as these are directed away from the area of potential construction activity, however there is potential for disturbance due to excavation and backfill of the trench. However, the sett is within approximately 15m of a motorway carriageway and therefore badgers are likely to be habituated to high levels of disturbance due to the noise of the nearby traffic. Mitigation outlined in Section 8.9 of this chapter would reduce the likelihood of disturbance of this sett.

8.10.128 Sett 5 (an annex sett with a single active hole) and Sett 7 (an outlier with a single active hole) are also at risk of disturbance due to excavation and backfill of the trench for the comms duct, however as above, badgers are likely to be habituated to the noise of the nearby traffic. Mitigation outlined in Section 8.9 of this chapter would reduce the likelihood of disturbance of these setts. As per Sett 4, there is no risk of damage to tunnels which are directed away from the area of potential construction activity.

8.10.129 There is no potential for disturbance of Sett 8 as this would be closed under licence to enable construction of the Scheme.

8.10.130 With mitigation, it is considered there would be a negligible adverse impact due to disturbance on a receptor of Local importance, and therefore the significance of effect is **neutral (not significant)**.

Loss of foraging habitat

8.10.131 There would be temporary loss of 7.66ha woodland, and 27.96ha of grassland habitat that is suitable for use by foraging badgers. There is abundant similar suitable habitat in the wider area and loss of the foraging habitat would be temporary as the landscaping design for the Scheme would reinstate or create similar areas of these habitats post-construction, so that, overall, there would be a net gain of 1.51ha of other neutral grassland (but a loss of -3.98ha of lower value modified grassland) and a net gain of 0.33ha of woodland, which would provide suitable foraging habitat for badgers. Therefore, the level of impact for loss of foraging habitat would be no change, the significance of effect would be **neutral**.

Habitat fragmentation

8.10.132 Construction of the Scheme would not result in the placement of any new roads (including slip roads) where it would create a barrier to the movement of badgers. The existing M60, M62 and M66 already fragment the landscape, and although the new Northern Loop has the potential to cause severance, no badger setts were recorded in that part of the Order Limits. Therefore, there would be no change in the level of impacts on badgers due to fragmentation, and the significance of effect is neutral **(not significant)**.

Summary

8.10.133 Taking into account the assessment of effects for the pathways to effects on badgers, overall, the level of impact is considered to be negligible adverse, and therefore the significance of effect is **neutral (not significant)**.

Barn owls

Direct mortality

8.10.134 There is potential for barn owl to be killed or injured due to felling of trees supporting nests and roosts or due to movement of construction traffic around the site. No barn owl roosts have been identified within the Order Limits from desktop or field surveys, but it is possible that barn owls will start to use potential roosts prior to the start of construction.

8.10.135 As stated in Section 8.9, impacts to barn owl would be mitigated through undertaking pre-construction surveys of all trees to be felled. Should surveys confirm the presence of a barn owl roost, buffer zones would be applied to the nest based on guidance from the EcoW and works would be timed to avoid impacts to the nest while in active. Mitigation would avoid impacts to roosting barn owls and therefore there would be no change on a receptor of County importance, and therefore the significance of effect is **neutral (not significant)**.

Loss of nesting/roosting sites

8.10.136 No barn owls or barn owl nesting or roosting sites were identified in the survey area. As stated in Section 8.9, impacts to barn owl would be mitigated through undertaking pre-construction surveys of all trees to be felled. Should any new nesting or roosting sites be confirmed, nest boxes would be provided (away from the Scheme) in order to mitigate the loss of the nest/roost. Therefore, there would be no change with respect to loss of nesting/roosting sites for a receptor of County importance, and the significance of effect would be **neutral (not significant)**.

Loss of foraging habitat

8.10.137 Most of the land surrounding the Scheme was found to be an unsuitable foraging resource for barn owl as it was dominated by Type 3 and non-grassland habitat (including urban). Approximately 1.55ha of Type 1 and 1.10ha of Type 2 habitat was identified within the survey area. Construction of the Scheme would result in the loss of 0.04ha of Type 1 and 1.08ha of Type 2 habitat. This equates to 2% and 8% of the available Type 1 and Type 2 habitat resource within the survey area in the short term, however in the long term the 1.51ha gain in other neutral grassland would mitigate this loss.

8.10.138 The level of impact is assessed as negligible adverse as the impact would be temporary, and therefore the significance of effect would be **slight adverse (not significant)** for a receptor of County importance.

Disturbance

8.10.139 No barn owls or barn owl nesting or roosting sites were identified within the Order Limits, and the closest records of roosts are over 250m away. Therefore, there is unlikely to be potential for disturbance from noise or vibration due to construction of the Scheme.

8.10.140 As stated in Section 8.9, pre-construction surveys would be undertaken to update the baseline. Should surveys confirm the presence of a barn owl nest, to prevent disturbance, buffer zones would be applied to the nest based on guidance from the EcoW and works would be timed to avoid impacts to the nest while in active. Therefore, there would be no change in level of impact for disturbance to roosting sites, and the significance of effect would be **neutral (not significant)**.

Summary

8.10.141 Taking into account the assessment of effects for the pathways to effects on barn owls, overall, the level of impact is considered to be negligible adverse, and therefore the significance of effect is, as a precaution, assessed as **slight adverse (not significant)** due to the temporary loss of foraging habitat.

Breeding birds

Direct mortality

8.10.142 Breeding birds may be killed or injured during removal of vegetation, site clearance, groundworks, and movement of construction traffic around the site. Ground nesting birds such as lapwing also have potential to be affected. Mitigation as detailed in the essential mitigation section of Section 8.9 (timing of works and supervision by EcoW) should prevent these impacts. Therefore, there would be no change in the level of impact**,** and the significance of effect on receptor of County importance (black-necked grebe and little ringed plover) and a receptor of Local importance (other breeding birds) would be **neutral (not significant)**.

Loss of habitat

8.10.143 Small passerines which use hedgerow and woodland habitats, and ground nesting farmland birds were recorded within the Scheme. Construction of the Scheme would lead to the temporary loss of 0.88km of hedgerows, 1.42ha of scrub, 21.99ha of other neutral grassland and 7.66ha of woodland. In the long term, this would be mitigated through implementation of the Environmental Masterplan (Figure 2.3 of the Environmental Statement Figures (TR010064/APP/6.2)) which, once habitats have matured, would lead to a net gain of 1.51ha of other neutral grassland (but a loss of 3.98ha of lower value modified grassland), 0.75ha of scrub, 0.33ha of woodland and 0.59km of hedgerow. In recognition of the time required for new habitats to mature, the level of impact is assessed as negligible adverse (as opposed to no change) however, due to the abundance of other habitats locally and the mobility of birds, the significance of effect on receptor of County importance (black-necked grebe and little ringed plover) is assessed as **neutral (not significant)**, as opposed to slight. The significance of effect on a receptor of Local importance (other breeding birds) would be **neutral (not significant)**.

Disturbance

8.10.144 There would be no night-time works and where task lighting is required it would be used for a limited duration and where possible would be directed away from habitats adjoining the construction area. The likelihood of breeding birds being impacted by lighting disturbance is therefore assessed to be low.

8.10.145 Disturbance from noise, and a general increase in human activity in some areas may affect breeding birds. Best practice measures to reduce noise and vibration would reduce any impacts and there is alternative habitat for breeding birds present in the wider local area. In addition, checks of habitats by and EcoW and sensitive timing of works would also prevent disturbance impacts. Lastly, birds are highly mobile and are able to move to other habitats in the local area. Therefore, there would be no change in the level of impact for disturbance on receptor of County importance (black-necked grebe and little ringed plover), and a receptor of Local importance (other breeding birds), and the significance of effect would be **neutral (not significant)**.

Summary

8.10.146 Taking into account the assessment of effects for the pathways to effects on breeding birds, including black-necked grebe and little ringed plover, overall, the level of impact is considered to be negligible adverse, and therefore the significance of effect would be **neutral (not significant)**.

Great crested newts

8.10.147 As per Annex C of the Planning Inspectorate's Advice Note Eleven (2017), where DLL for GCN is used, a LONI would not be required. Instead, the developer would need to provide evidence to the Examining Authority on how and where this approach has been used in relation to the Scheme, which must include a countersigned IACPC from Natural England, or a similar approval from an alternative DLL provider.

8.10.148 By demonstrating that the DLL scheme for GCN would be used, consideration of GCN in the Environmental Statement can be restricted to cross-referring to the Natural England (or alternative provider) IACPC as a justification as to why significant effects on GCN populations as a result of the Scheme would be avoided.

8.10.149 The Applicant has secured an IACPC with respect to a DLL for GCN, which has been countersigned by Natural England (see Appendix 8.15: GCN DLL IACPC of the Environmental Statement Appendices (TR010064/APP/6.3)). This would enable Natural England to deliver mitigation for GCN. Therefore, significant effects on GCN populations as a result of the Scheme would be avoided. Therefore, there would be no change in the level of impact on a receptor of County importance and the significance of effect would be **neutral (not significant)**.

Reptiles

Direct mortality

8.10.150 There is potential for mortality or injury to reptiles during removal of vegetation for site clearance, groundworks, and movement of construction traffic around the site. In the absence of any mitigation this would be a permanent negative impact. The outline mitigation detailed in Section 8.9 of this chapter, to be developed following pre-construction surveys, would avoid mortality and injury to populations. Therefore, there would be no change in the level of impact**,** and the significance of effect on a receptor of Local importance would be **neutral (not significant)**.

Loss of habitat

8.10.151 Extensive areas of grassland are present around the Order Limits however these areas of grassland are heavily grazed and are generally of limited value to reptiles. Construction would result in the temporary loss of 21.99ha of other neutral grassland, 1.42ha of scrub, 7.66ha of woodland habitats, and 0.88km of hedgerows.

8.10.152 However, the landscaping design would provide a net gain of 1.51ha of other neutral grassland (but a loss of 3.98ha of lower value modified grassland), 0.75ha of scrub, 0.33ha of woodland and 0.59km of hedgerow.

8.10.153 Considering the quality of habitats for reptiles at the time of assessment, construction of the Scheme is assessed to have a negligible adverse impact on a locally importance receptor and therefore the significance of effect **neutral (not significant)**.

Summary

8.10.154 Taking into account the assessment for the pathways to effects on reptiles, overall, the level of impact is considered to be negligible adverse, and therefore the significance of effect **neutral (not significant)**.

Wintering birds

Direct mortality

8.10.155 The assemblage of wintering birds associated with Heaton Park Reservoir is outside the Order Limits. Therefore, there would be no impacts on these birds due to direct mortality, and there would be no change in the level of impact**,** and the significance of effect on a receptor of County importance would be **neutral (not significant)**.

8.10.156 There is potential for other wintering birds within the Order Limits to be killed or injured during removal of vegetation, site clearance, groundworks, and movement of construction traffic around the site. However, unlike nesting birds (in particular young and parents sitting on nests), wintering birds are more likely to take flight and avoid injury. In addition, mitigation as detailed in the essential mitigation section of Section 8.9 of this chapter (in particular supervision by EcoW) should further prevent mortality. Therefore, there would be no change in the level of impact**,** and the significance of effect on a receptor of Local importance would be **neutral (not significant)**.

Loss of habitat

8.10.157 There would be no loss of habitat at Heaton Park Reservoir where an important wintering bird assemblage was recorded. Therefore, there would be no change in the level of impact**,** and the significance of effect on a receptor of County importance would be **neutral (not significant)**.

8.10.158 There would be temporary losses of habitats which are important for wintering birds during the construction period. These would be 3.17ha of arable, 21.99ha other neutral grassland, of 0.88km of hedgerows, 1.42ha of scrub, and 7.66ha of woodland. However, as noted in Appendix 8.7: Wintering Bird Survey Report of the Environmental Statement Appendices (TR010065/APP/6.3), the relatively large numbers of species of conservation concern (lapwing, herring gull and lesser black backed gull), were not considered to be solely reliant on habitats with the survey area. These species are likely to roam over a much larger area to utilise other foraging and roosting opportunities.

8.10.159 In the long term, loss of habitats would be mitigated through implementation of the Environmental Masterplan (Figure 2.3 of the Environmental Statement Figures (TR010064/APP/6.2)) which, once habitats have matured, would lead to a net gain of 1.51ha of other neutral grassland (but a loss of 3.98ha of lower value modified grassland), 0.75ha of scrub, 0.33ha of woodland and 0.59km of hedgerow.

8.10.160 In recognition of the time required for new habitats to mature, the level of impact is assessed as negligible adverse (as opposed to no change) however, due to the abundance of other habitats locally and the mobility of birds, the significance of effect on a receptor of Local importance is assessed as **neutral (not significant)**, as opposed to slight.

Disturbance

8.10.161 There would be no night-time works and where task lighting is required it would be used for a limited duration and where possible would be directed away from habitats adjoining the construction area. The likelihood of wintering birds being affected by lighting disturbance is therefore assessed to be low.

8.10.162 Disturbance from noise, and a general increase in human activity in some areas may affect wintering birds. Best practice measures to reduce noise and vibration would reduce any impacts and there is alternative habitat for wintering birds present in the wider local area which birds as highly mobile species would be able to access. Heaton Reservoir is 0.3km south of the Order Limits and it is assessed that the assemblage of wintering birds including herring gull and lesser black backed gull on the reservoir would be a sufficient distance away that they would not be affected by disturbance during construction. Therefore, there would be no change in the level of impact for disturbance on a receptor of Local importance, and the significance of effect would be **neutral (not significant)**.

Summary

8.10.163 Taking into account the assessment for the pathways to effects on wintering birds, overall, the level of impact is considered to be negligible adverse, and therefore the significance of effect **neutral (not significant)**.

Terrestrial invertebrates

Direct mortality

8.10.164 The majority of the field to the north-east of the interchange (Site 1, which was the part of the Order Limits with most invertebrate interest) would be cleared to enable construction of the Scheme. Mortality or injury to invertebrates would occur during removal of vegetation, site clearance, and groundworks.

8.10.165 As the species present are generally widespread and typical of the habitats present on site and within the surrounding habitats outside of the Order Limits, and due to the fact that the interest lies with species diversity rather than species rarity, no specific mitigation to prevent direct mortality has been identified.

8.10.166 It is considered likely that upon implementation of the Environmental Masterplan (Figure 2.3 of the Environmental Statement Figures (TR010064/APP/6.2)), terrestrial invertebrates would colonise newly created habitats within the site. Therefore, there would be no change in the level of impact on a receptor of Local importance, and the significance of effect would be **neutral (not significant)**.

Loss of habitat

8.10.167 Construction would lead to the loss of most of the habitat within the field to the north-east of the interchange. However, upon implementation of the Environmental Masterplan (Figure 2.3 of the Environmental Statement Figures (TR010064/APP/6.2)), the Scheme would provide several localised areas of natural habitat complexes. For example, as shown on Sheet 3 of the Environmental Masterplan, the land surrounding the Northern Loop would incorporate neutral grassland and wildflower habitat, mixed woodland, broadleaved woodland, wet woodland, wetland scrapes with marsh and wet grassland, a pond and swale supporting marsh and wet grassland at the margins, shrubs, and individual deciduous trees.

8.10.168 Where practicable, creation of standing deadwood would be undertaken in enhanced and newly created areas of woodland, and brash and log piles would be created to increase the diversity of these habitats.

8.10.169 It is acknowledged that these habitats would take time to mature and be colonised by terrestrial invertebrates, and that there would be a minor adverse impact in the short term, however upon maturation of newly created habitats the level of impact is assessed as minor beneficial and the significance of effect would be **slight beneficial (not significant)**.

Summary

8.10.170 Taking into account the assessment for the pathways to effects on terrestrial invertebrates, overall, the level of impact is considered to be minor beneficial because of the gains in habitat, but due to the impacts from direct mortality the significance of effect is, as a precaution, reduced to **neutral (not significant)**.

Notable species: Water shrew, brown hare, hedgehog and common toad

Direct mortality

8.10.171 Water shrew have only been recorded in a single pond (Pond 12) outside of the survey area at Pike Fold golf course. However, as other ponds and ditches have not been specifically surveyed for this species, it is possible they are also present within waterbodies within the Order Limits. With implementation of the mitigation in Section 8.7, there would be no change in the level of impact for direct mortality on a receptor of Local importance at a population level, the significance of effect would be **neutral (not significant)**. There would also be negligible likelihood of breach of legislation protecting water shrew with implementation of this mitigation.

8.10.172 Brown hare may be killed through vegetation clearance, earthworks and moving machinery. Young brown hare (leverets) are particularly susceptible to mortality through vegetation clearance as they have a tendency to “sit-tight” and try to hide in a form rather than run away from danger. Areas of tussocky grassland, arable land or agricultural grassland may be used by brown hare. As stated in Section 8.9, pre-works checks for brown hare would be carried out ahead of site clearance to flush any brown hares that may be present away from the works into areas of safety. Whilst it is not possible to rule out mortality of every individual animal, it is assessed that there would be no change in the level of impact for direct mortality on a receptor of Local importance at a population level, and the significance of effect would be **neutral (not significant)**.

8.10.173 Hedgehog may be killed through vegetation clearance, earthworks and moving machinery. Hedgehogs sleep and hibernate in piles of leaves and other vegetation. As stated in Section 8.9, pre-works checks for hedgehog would be carried out ahead of site clearance to find and move any hedgehogs that may be present away from the works into areas of safety. Hedgehogs can take refuge in brash piles and be killed or injured when they are cleared or moved. Any vegetation cleared during construction would be chipped or removed to prevent brash piles being created. This would mean that hedgehogs are not attracted into the works area and put at increased risk of interacting with machinery and removes the risk of killing or injuring hedgehogs when the brash piles are moved. Whilst it is not possible to rule out mortality of every individual animal, it is assessed that there would be no change in the level of impact for direct mortality on a receptor of Local importance at a population level, and the significance of effect would be **neutral (not significant)**.

8.10.174 Mortality or injury to common toad could potentially occur during removal of vegetation, site clearance, groundworks, and movement of construction traffic around the site. Toads are known to be present in the grassland habitat north-east of M60 J18 around Egypt Lane and may be present in other similar grassland habitats around the Scheme. Reasonable avoidance measures would be implemented with a walkover by a suitably qualified ecologist undertaken to search for toads ahead of machinery and to dismantle any refugia that are present by hand. Any toads found would be moved to an area of safety out of the footprint of the works. Death of individual toads would be a permanent impact, but it would not affect the integrity or key characteristics of the resource, as the wider population of toads across the local area would not be affected. Whilst it is not possible to rule out mortality of every individual animal, it is assessed that there would be no change in the level of impact for direct mortality on a receptor of Local importance at a population level, and the significance of effect would be **neutral (not significant)**.

Loss of habitat

8.10.175 There would be no loss of known water shrew habitat. Therefore, the level of impact would be no change and the significance of effect would be **neutral (not significant)**.

8.10.176 There would be a loss of 7.66ha woodland, and 21.99ha of grassland habitat that may provide suitable habitat for brown hare. Loss of habitats would be temporary and once habitats matured there would be a net gain of 1.51ha of other neutral grassland (but a loss of 3.98ha of lower value modified grassland), and 0.33ha of woodland. In addition, there is abundant similar suitable habitat in the wider area which would sustain populations of brown hare during construction and whilst new habitats matured. Therefore, there would be no change in the level of impact for loss of foraging habitat on a receptor of Local importance and the significance of effect would be **neutral (not significant)**.

8.10.177 There would be loss of 7.66ha woodland, 0.88km of hedgerow, and 21.99ha of other neutral grassland habitat that may provide suitable habitat for hedgehog. There is abundant similar suitable habitat in the wider area and loss of the habitat would be temporary until habitats shown on Figure 2.3: Environmental Masterplan of the Environmental Statement Figures (TR010064/APP/6.2) have matured. These would provide a net gain of 1.51ha of other neutral grassland (but a loss of 3.98ha of lower value modified grassland), 0.33ha of woodland and 0.59km of hedgerow. Therefore, there would be no change in the level of impact for loss of foraging habitat on a receptor of Local importance and the significance of effect would be **neutral (not significant)**.

8.10.178 There are seasonally wet depressions present within the Order Limits however these are unlikely to be successfully used by breeding common toad due to their ephemeral nature. All of the ponds in which common toad have been recorded are located outside of the Order Limits therefore there would be no loss of breeding habitat for common toad. There would be a loss of terrestrial habitat used by common toad including 21.99ha of other neutral grassland, 0.88km of hedgerow, and 1.42ha of scrub. There is abundant similar habitat available in the local area and once mature the landscaping design provide a net gain in 1.51ha of other neutral grassland, 0.75ha of scrub and 0.59km of hedgerows. Therefore, there would be no change in the level of impact for loss of foraging habitat on a receptor of Local importance and the significance of effect would be **neutral (not significant)**.

Disturbance from noise, vibration, and lighting

8.10.179 Although water shrew have not been recorded in the Order Limits, there is potential for them to be present. Water shrew may be disturbed by light, noise and vibration from construction activity, which may discourage foraging (Chapter 11: Noise and Vibration of this Environmental Statement (TR010064/APP/6.1)). There is abundant suitable habitat for water shrew in the wider area and therefore any disturbance leading to water shrew leaving foraging areas would not affect the individual's ability to survive and would have negligible impact on the species. Therefore, the level of impact for disturbance habitat would be no change, the significance of effect would be **neutral (not significant)**.

8.10.180 Brown hare may be disturbed by light, noise and vibration from construction activity, which may discourage foraging (Chapter 11: Noise and Vibration of this Environmental Statement (TR010064/APP/6.1)). There is abundant suitable foraging habitat for brown hare in the wider area and therefore any disturbance leading to brown hare leaving foraging areas would not affect the individual's ability to survive and would have negligible impact on the species. Therefore, the level of impact for disturbance habitat would be no change, the significance of effect would be **neutral (not significant)**.

8.10.181 Hedgehog may be disturbed by light, noise and vibration from construction activity, which may discourage foraging (Chapter 11: Noise and Vibration of this Environmental Statement (TR010064/APP/6.1)). There is abundant suitable foraging habitat for hedgehog in the wider area and therefore any disturbance leading to hedgehog leaving foraging areas would not affect the individual's ability to survive and would have negligible impact on the species. Therefore, the level of impact for disturbance habitat would be no change, the significance of effect would be **neutral (not significant)**.

Habitat fragmentation

8.10.182 Construction of the Scheme would cause minimal impacts due to habitat fragmentation as construction mostly relates to the existing motorway network. Construction of the Northern Loop would however lead to the isolation of a small area of habitat within the loop, but due to the extent of habitat affected it is assessed this would have a negligible impact on notable species. The level of impact for habitat loss would be negligible on receptor of Local importance and the significance would be neutral **(not significant)**.

Summary

8.10.183 Taking into account the assessment for the pathways to effects on water shrew, brown hare, hedgehog and common toad, overall, the level of impact is considered to be no change and the significance of effect is **neutral (not significant)**.

Freshwater fauna

Direct mortality

8.10.184 As stated in Chapter 2: The Scheme of this Environmental Statement (TR010064/APP/6.1), Haweswater Aqueduct, which passes underground between M60 J17 and J18, would not require modification and so there is no potential for mortality of aquatic fauna using the aqueduct. The Scheme would not require new crossings of watercourses or alterations to existing watercourse culverts.

8.10.185 There is therefore limited potential for impacts to aquatic fauna due to construction of the Scheme. The most likely pathway to effect would be via pollution of surface water which could run into nearby watercourses and could cause mortality of fauna. However, as stated in Section 8.9 of this chapter, construction effects on surface water would be mitigated through essential mitigation measures and best practice as detailed in the First Iteration EMP (TR010064/APP/6.5) and as listed within Section 13.9 of Chapter 13: RDWE of this Environmental Statement (TR010064/APP/6.1), reducing the chance of any pollution events. This would likely result in at worst only temporary effect on fauna in the immediate vicinity of the pollution event. Any pollution would likely become quickly diluted and would therefore not affect a significant proportion of the local population. However, the level of impact is precautionarily assessed as a moderate adverse effect on a receptor of Local importance, and therefore the significance of effect is assessed as worst case as **slight adverse (not significant)**.

Summary of construction effects

8.10.186 Table 8.18 provides a summary of construction effects on biodiversity receptors.

Table 8.18 Summary of construction effects on biodiversity receptors

Receptor	Significance of effect
Rochdale Canal SAC and SSSI	N/A, no pathway to effect
Ashclough SSSI	Slight adverse (not significant)
Nob End SSSI	Slight adverse (not significant)
Alkrington Woods LNR	N/A, no pathway to effect
Blackley Forest LNR	Neutral (not significant)
Clifton Country Park LNR	N/A, no pathway to effect
Hollins Vale LNR and SBI	Neutral (not significant)
Mere Clough LNR	N/A, no pathway to effect
Moses Gate LNR	Neutral (not significant)
Nob End LNR	Neutral (not significant)
Philips Park LNR	Neutral (not significant)
Alkrington Woods and Rhode Lodges SBI	N/A, no pathway to effect
Boardman Brook SBI	N/A, no pathway to effect
Clifton Country Park SBI	N/A, no pathway to effect
Clifton Moss (South) SBI	N/A, no pathway to effect
Hazlitt Wood SBI	Slight adverse (not significant)
Heaton Park Reservoir SBI	N/A, no pathway to effect

Receptor	Significance of effect
Hollins Plantation SBI	Neutral (not significant)
Parr Brook SBI	Neutral (not significant)
Philips Park and North Wood SBI	Neutral (not significant)
Pilsworth SBI	N/A, no pathway to effect
Rhodes Farm Sewage Works SBI	N/A, no pathway to effect
Ringley Woods (East) SBI	N/A, no pathway to effect
Rochdale Canal – Lock at Scowcroft Farm to Stott's Lane SBI	N/A, no pathway to effect
Rochdale Canal (Scowcroft to Warland) SBI	N/A, no pathway to effect
Sudden Brook West SBI	N/A, no pathway to effect
Ancient Woodland	N/A, no pathway to effect
Priority habitats – Wet woodland (w1d), lowland acid grassland (g1a), traditional orchard (21)	N/A, no pathway to effect
Priority habitats – Lowland fen (f2a)	Neutral (not significant)
Priority habitats – Lowland mixed deciduous woodland (w1f), other lowland mixed deciduous woodland (w1f7), eutrophic standing water (r1a), Hedgerows	Slight adverse (not significant)
Other habitats	Neutral (not significant)
Bats	Neutral (not significant)
Badgers	Neutral (not significant)
Barn owls	Slight adverse (not significant)
Breeding birds	Neutral (not significant)
GCN	Neutral (not significant)
Reptiles	Neutral (not significant)
Wintering birds	Neutral (not significant)
Terrestrial invertebrates	Neutral (not significant)
Notable species: Water shrew, brown hare, hedgehog and common toad	Neutral (not significant)
Freshwater fauna	Slight adverse (not significant)

Operation

Rochdale Canal SAC and SSSI

8.10.187 As stated in Appendix 8.13: HRA Report of the Environmental Statement Appendices (TR010064/APP/6.3), the Stage 1 Screening Assessment concluded no likely significant effects, as a result of the changes in air quality from operational vehicle emissions on the M60, for the Rochdale Canal alone and in-combination with other plans and projects, however likely significant effects could not be discounted, as a result of the changes in air quality from operational vehicle emissions on the M62, for the Rochdale Canal, when considered alone and in-combination with other plans and projects.

8.10.188 A statement to inform an appropriate assessment has been completed (Appendix 8.13: HRA Report of the Environmental Statement Appendices (TR010064/APP/6.3)), and this concludes beyond reasonable scientific doubt, that the Scheme will not adversely affect the integrity of the Rochdale Canal SAC during its (construction or) operational phases, either alone or in combination with other plans or projects. Natural England have been consulted (see Section 6.3 of Appendix 8.13: HRA Report of the Environmental Statement Appendices (TR010064/APP/6.3)) and they are in agreement with the approach used in the HRA.

8.10.189 Therefore, it is assessed there will be no change to an internationally and nationally important receptor, and therefore the significance of effect is assessed as **neutral (not significant)**.

Ashclough SSSI, Nob End SSSI and LNR, Moses Gate LNR

8.10.190 Due to their hydrological connectivity to the Scheme via the Rivers Irwell and Roch and associated tributaries, there is potential for adverse effects on these sites due to pollution of surface water during operation of the Scheme.

8.10.191 However, as stated in Section 8.9, operational effects on surface water would be mitigated through embedded mitigation. Therefore, it is assessed there is no change in the level of impact on receptors of National (SSSI) / County (LNR) importance, and therefore the significance of effect is assessed as **neutral (not significant)**.

Alkrington Woods LNR

8.10.192 As stated in Section 8.8, Alkrington Woods LNR has been excluded from the assessment of effects due to nitrogen deposition and hydrological impacts during operation. There are no other pathways to effect for this receptor during operation.

Blackley Forest LNR

8.10.193 The watercourse ‘Blackfish’ is located partially within the Order Limits. Blackfish merges with the River Irk which flows through Blackley Forest LNR. Therefore, there is potential for adverse effects on this site due to pollution of surface water during operation of the Scheme.

8.10.194 However, as stated in Section 8.9, operational effects on surface water would be mitigated through embedded mitigation. Therefore, it is assessed there is no change in effect on a receptor of County importance and therefore the significance of effect is assessed as **neutral (not significant)**.

Clifton Country Park LNR

8.10.195 As stated in Section 8.8, Clifton Country Park LNR has been excluded from the assessment of effects due to nitrogen deposition and hydrological impacts during operation. There are no other pathways to effect for this receptor during operation.

Hollins Vale LNR/SBI and Hollins Plantation SBI

8.10.196 Castle Brook runs adjacent to the Order Limits, before merging with Hollins Brook which flows through Hollins Vale LNR and SBI. Therefore, there is potential for adverse effects on Hollins Vale LNR and SBI due to pollution of surface water during operation of the Scheme.

8.10.197 However, as stated in Section 8.9 of this chapter, operational effects on surface water would be mitigated through embedded mitigation. Therefore, it is assessed there is no change in effect on receptors of County importance and therefore the significance of effect is assessed as **neutral (not significant)**.

8.10.198 Hollins Vale LNR, and the overlapping Hollins Vale SBI and Hollins Plantation SBI, support groundwater dependent habitats. However, Appendix 13.5: GWDTE Assessment Report of the Environmental Statement Appendices (TR010064/APP/6.3) states that as there are no permanent below ground Scheme structures or embankments within the vicinity of the site to locally alter groundwater levels and flows supporting GWDTE. No operational impacts to groundwater flows and levels at these sites are therefore predicted.

8.10.199 Considering the distance of the Scheme from the GWDTE, the existing M66 infrastructure, likely groundwater flow directions in the area, and the filtering effect of aquifer material, no impacts on groundwater quality are expected to the sites during the operation phase.

8.10.200 Therefore, it is assessed there is no change in effect on receptors of County importance and therefore the significance of effect is assessed as **neutral (not significant)**.

Mere Clough LNR

8.10.201 As stated in Section 8.8 of this chapter, Mere Clough LNR has been excluded from the assessment from effects due to nitrogen deposition and from hydrological connectivity during operation.

Philips Park LNR/Philips Park and North Wood SBI

8.10.202 The boundaries of Philips Park LNR and Philips Park and North Wood SBI overlap significantly but different transects were modelled, as detailed in Chapter 5: Air quality of this Environmental Statement (TR010064/APP/6.1) and they are assessed separately in Appendix 8.2: Designated Sites Air Quality Assessment of the Environmental Statement Appendices (TR010064/APP/6.3).

8.10.203 There were no nitrogen-sensitive species recorded in the habitats within the Nitrogen Affected Areas (NAA) of the LNR/SBI and therefore there is unlikely to be a discernible change in vegetation composition due to increased nitrogen deposition. Therefore, no effect on the integrity of either site was predicted. The impact duration for both sites is predicted to be temporary. As a result, the impact level was assessed as negligible adverse for both sites. Given the small proportion of the sites affected and the precautionary measures adopted throughout the assessment, the effect on these sites of county importance is assessed as **neutral (not significant)**.

8.10.204 Philips Park LNR and Philips Park and North Wood SBI support groundwater dependent habitats. However, Appendix 13.5: GWDTE Assessment Report of the Environmental Statement Appendices (TR010064/APP/6.3) states that there are no permanent below ground Scheme structures or embankments within the vicinity of the site to locally alter groundwater levels and flows supporting GWDTE. No operational impacts to groundwater flows and levels at the sites are therefore predicted.

8.10.205 Considering the distance of the Scheme from the GWDTE, and likely groundwater flow directions in the area, no impacts on groundwater quality are expected to the sites during the operation phase.

8.10.206 Therefore, it is assessed there is no change in effect on receptor of County importance and therefore the significance of effect is assessed as **neutral (not significant)**.

Alkrington Woods and Rhode Lodges SBI

8.10.207 As stated in Section 8.8 of this chapter, Alkrington Woods and Rhode Lodges SBI has been excluded from the assessment of effects due to nitrogen deposition during operation. There are no other pathways to effect for this receptor during operation.

Boardman Brook SBI

8.10.208 As stated in Section 8.8, Boardman Brook SBI has been excluded from the assessment of effects due to nitrogen deposition during operation. There are no other pathways to effect for this receptor during operation.

Clifton Country Park SBI

8.10.209 The predicted increase in nitrogen deposition (DM to DS) is reported in Chapter 5: Air quality of this Environmental Statement (TR010064/APP/6.1) and the ecological effects are assessed in Appendix 8.2: Designated Sites Air Quality Assessment of the Environmental Statement Appendices (TR010064/APP/6.3).

8.10.210 Given the existing vegetation composition in the NAA, there is no loss of species predicted or any discernible change in vegetation composition. The NAA is small relative to the total site area and therefore there is unlikely to be an effect on the key characteristics of the site or overall site integrity. The impact duration is assessed as temporary and reversible and therefore the impact level has been assessed as negligible adverse. The effect of a negligible impact level on a site of County importance could be either neutral or slight. Given the precautionary measures adopted throughout the assessment which will have led to a worst-case assessment of the impacts, and considering the small proportion of the site affected, the effect is assessed as **neutral (not significant)**.

Clifton Moss (South) SBI

8.10.211 The predicted increase in nitrogen deposition (DM to DS) is reported in Chapter 5: Air Quality of this Environmental Statement (TR010064/APP/6.1) and the ecological effects are assessed in Appendix 8.2: Designated Sites Air Quality Assessment of the Environmental Statement Appendices (TR010064/APP/6.3).

8.10.212 It is possible that an increase in nitrogen deposition could enable more nutrient tolerant species in both the woodland and grassland areas of the site to expand at the expense of the species that may be more sensitive to increased nitrogen. The NAA is small, only extending between 10m and 20m into the site and does not support any acid grassland, which is the most sensitive habitat for which the SBI is designated. Therefore, it is unlikely that there would be an effect on the key characteristics of the site or overall site integrity. The impact duration is assessed as temporary and reversible.

8.10.213 The impact level has been assessed as negligible adverse. The effect of a negligible impact level on a site of County importance could be either neutral or slight. Given the precautionary approach adopted throughout this assessment, and that the habitats affected within the site are already affected by high nutrient levels and invasive non-native species, the effect is assessed as **neutral** adverse **(not significant)**.

Hazlitt Wood SBI

8.10.214 The predicted increase in nitrogen deposition (DM to DS) is reported in Chapter 5: Air Quality of this Environmental Statement (TR010064/APP/6.1) and the ecological effects are assessed in Appendix 8.2: Designated Sites Air Quality Assessment of the Environmental Statement Appendices (TR010064/APP/6.3).

8.10.215 The absence of species sensitive to nitrogen in the NAA suggests that there would be no loss of species or any discernible change in vegetation composition due to increased nitrogen deposition and no effect on site integrity. The impact duration is assessed as temporary and reversible and therefore the impact level has been assessed as negligible adverse. The effect of a negligible impact level on a site of County importance could be either neutral or slight. Given the small proportion of the site affected and the precautionary measures adopted throughout the assessment, the effect is assessed as **neutral (not significant)**.

8.10.216 The watercourse 'Blackfish' is located partially within the Order Limits and flows through Hazlitt Wood SBI. Therefore, there is potential for adverse effects on this site due to pollution of surface water during operation.

8.10.217 However, as stated in Section 8.9, operational effects on surface water would be mitigated through embedded mitigation. Therefore, it is assessed there is no change in effect on a receptor of County importance and therefore the significance of effect is assessed as **neutral (not significant)**.

8.10.218 Hazlitt Wood SBI supports groundwater dependent habitats. Appendix 13.5: GWDTE Assessment Report of the Environmental Statement Appendices (TR010064/APP/6.3), identifies the potential for minor impacts to groundwater flows in the far north of the site due to the presence of below ground structures 15m north of the site (attenuation pond 5). However, this part of the site is also classified as having a low groundwater dependency and therefore there is not anticipated to be an observable ecological effect.

8.10.219 Considering the distance of the Scheme from the GWDTE, no impacts on groundwater quality are expected to the site during the operation phase from accidental leaks / spills of fuels and chemicals (i.e., due to road collisions), and / or routine runoff associated with the new highway.

8.10.220 Therefore, it is assessed there is no change in effect on a receptor of County importance due to effects on groundwater and the significance of effect is assessed as **neutral (not significant)**.

8.10.221 Overall, the significance of effect on Hazlitt Wood SBI is assessed as **neutral (not significant)**.

Heaton Park Reservoir SBI

8.10.222 As per Table 8.14 there is no hydrological connectivity between Heaton Park Reservoir SBI and the Scheme, and Heaton Park Reservoir SBI is not within 200m of the ARN. There are no other pathways to effect for this receptor during operation.

Parr Brook SBI

8.10.223 Parr Brook SBI is connected directly with the Parr Brook which is located partially within the Order Limits. Therefore, there is potential for adverse effects on this site due to pollution of surface water during operation.

8.10.224 However, as stated in Section 8.9, operational effects on surface water would be mitigated through embedded mitigation. Therefore, it is assessed there is no change in effect on a receptor of County importance and therefore the significance of effect is assessed as **neutral (not significant)**.

Pilsworth SBI

8.10.225 As stated in Section 8.8 of this chapter, Pilsworth SBI has been excluded from the assessment of effects due to hydrological changes during operation. There are no other pathways to effect for this receptor during operation.

Rhodes Farm Sewage Works SBI

8.10.226 The predicted increase in nitrogen deposition (DM to DS) is reported in Chapter 5: Air Quality of this Environmental Statement (TR010064/APP/6.1) and the ecological effects are assessed in Appendix 8.2: Designated Sites Air Quality Assessment of the Environmental Statement Appendices (TR010064/APP/6.3).

8.10.227 The NAA incorporates woodland habitat between the River Irwell and the Outwood Trail, the trail itself and some woodland on the other side of the trail. There are no woodland species sensitive to nitrogen and therefore there is no likely effect on overall site integrity. The impact duration is assessed as temporary and reversible and the impact level is therefore assessed as negligible adverse. The effect of a negligible impact level on a site of County importance could be either neutral or slight. Given the lack of nitrogen-sensitive species, the very small area affected and the precautionary measures adopted throughout the assessment, the effect is assessed as **neutral (not significant)**.

Ringley Woods (East) SBI

8.10.228 As stated in Section 8.8, Ringley Woods (East) SBI has been excluded from the assessment of effects due to nitrogen deposition and hydrological impacts during operation. There are no other pathways to effect for this receptor during operation.

Rochdale Canal (Scowcroft to Warland) SBI

8.10.229 The predicted increase in nitrogen deposition (DM to DS) is reported in Environmental Statement Chapter 5: Air Quality of this Environmental Statement (TR010064/APP/6.1) and the ecological effects are assessed in Appendix 8.2: Designated Sites Air Quality Assessment of the Environmental Statement Appendices (TR010064/APP/6.3).

8.10.230 The site survey recorded no emergent or marginal aquatic vegetation and therefore there is no predicted effect on the aquatic vegetation of the SBI as a result of the predicted increase in nitrogen deposition.

8.10.231 The area affected is a negligible proportion of the designated area and therefore is not predicted to result in an effect on the key characteristics of the site or overall site integrity. The impact duration is assessed as temporary and reversible but in the absence of vegetation, no effect is predicted. Therefore, the impact level on a site of County importance has been assessed as no change, which results in a **neutral** effect **(not significant)**.

Rochdale Canal – Lock at Scowcroft Farm to Stott's Lane SBI

8.10.232 As stated in Section 8.8, Rochdale Canal – Lock at Scowcroft Farm to Stott's Lane SBI has been excluded from the assessment of effects due to nitrogen deposition during operation. There are no other pathways to effect for this receptor during operation.

Sudden Brook (West) SBI

8.10.233 As stated in Section 8.8, Sudden Brook (West) SBI has been excluded from the assessment of effects due to nitrogen deposition during operation. There are no other pathways to effect for this receptor during operation.

Clifton Wood Ancient Woodland

8.10.234 The predicted increase in nitrogen deposition (DM to DS) is reported in Chapter 5: Air quality of this Environmental Statement (TR010064/APP/6.1) and the ecological effects are assessed in Appendix 8.2: Designated Sites Air Quality Assessment of the Environmental Statement Appendices (TR010064/APP/6.3).

8.10.235 Given the existing vegetation composition, and the absence of woodland species sensitive to nitrogen, there is no loss of species predicted and therefore unlikely to be an effect on the key characteristics of the site or overall site integrity. The impact duration is assessed as temporary and reversible.

8.10.236 Therefore, the impact level has been assessed as negligible adverse. The effect of a negligible impact level on a site of national value is assessed as **slight adverse (not significant)**.

Mere Clough Ancient Woodland, North Wood Ancient Woodland, and Philips Wood Ancient Woodland

8.10.237 As stated in Section 8.8, Mere Clough Ancient Woodland, North Wood Ancient Woodland and Philips Wood Ancient Woodland have been excluded from the assessment of effects due to nitrogen deposition and hydrological impacts during operation. There are no other pathways to effect for these receptors during operation.

Groundwater dependent habitats

8.10.238 Cowl Gate Farm, Castle Brook South and Egypt Lane South currently support other neutral grassland with potential ground water dependency. However, these habitats would be removed in order to enable construction of the Scheme and therefore there is no potential effect on them due to operation of the Scheme.

8.10.239 Pond margins of a golf course pond at The Hills South, are also potentially groundwater dependent. However, as stated in Appendix 13.5: GWDTE Assessment Report of the Environmental Statement Appendices (TR010064/APP/6.3), considering the distance of the Scheme from the GWDTE, the existing M66 infrastructure, and likely groundwater flow directions in the area, negligible impacts in groundwater levels and flows are predicted at the site. It is not anticipated there would be any observable change to the habitat, and therefore from an ecological perspective this effect is assessed as no change to a receptor of Local importance, and the significance of effect would be **neutral (not significant)**.

8.10.240 In addition, considering the distance of the Scheme from the GWDTE, best-practice mitigation measures referred to in the 1st Iteration of the EMP (TR010064/APP/6.5), and the likely groundwater flow directions in the area, any accidental leaks/spills of fuels and chemicals and/or routine runoff associated with the road could lead to negligible impacts on groundwater quality across The Hills South, resulting in a **neutral** significance of effect.

8.10.241 Parkwood Cottages South currently supports other neutral grassland with potential ground water dependency. However, as stated in Appendix 13.5 Groundwater Dependent Terrestrial Ecosystems Assessment Report of the Environmental Statement Appendices (TR010064/APP/6.3), there are no permanent below ground Scheme structures or embankments within the vicinity of the site to locally alter groundwater levels and flows supporting GWDTE. No operational impacts to groundwater flows and levels at the site are therefore predicted.

8.10.242 Considering the distance of the Scheme from the GWDTE, and its position across-gradient from the site, no impacts on groundwater quality are expected to the Parkwood Cottages South during the operation phase.

8.10.243 Therefore, there would be no change to groundwater dependent habitats at Parkwood Cottages South due to operation of the Scheme, and the significance of effect would be **neutral (not significant)**.

8.10.244 Simister Allotment Gardens currently supports other woodland, broadleaved, habitat with potential ground water dependency. However, as stated in Appendix 13.5: GWDTE Assessment Report of the Environmental Statement Appendices (TR010064/APP/6.3), there are no permanent below ground Scheme structures or embankments within the vicinity of the site to locally alter groundwater levels and flows supporting GWDTE. No operational impacts to groundwater flows and levels at the site are therefore predicted.

8.10.245 Considering the distance of the Scheme from the GWDTE, the existing M62 infrastructure, likely groundwater flow directions in the area, and the filtering effect of aquifer material, no impacts on groundwater quality are expected to the Simister Allotment Gardens during the operation phase.

8.10.246 Therefore, there would be no change to groundwater dependent habitats at Simister Allotment Garden due to operation of the Scheme, and the significance of effect would be **neutral (not significant)**.

8.10.247 Overall, it is concluded there would be no change to groundwater dependent habitats due to operation of the Scheme, and the significance of effect would be **neutral (not significant)**.

Bats

Direct mortality

8.10.248 Mortality in the operational phase relates to animals attempting to cross a wide road, used by fast traffic. Bats attempting to follow old flight lines along the hedgerows of Egypt Lane would potentially be subject to increased mortality as they would be attempting to cross the Northern Loop. The Northern Loop is, however, directly adjacent to an existing motorway network and the hedgerows were only used by a small number of bats for both foraging and commuting. Habitat reinstatement and habitat creation to achieve overall net gain of habitats (as reported in Environmental Statement Appendix 8.12: BNG Report of the Environmental Statement Appendices (TR010064/APP/8.12) and illustrated on Figure 2.3: Environmental Masterplan of the Environmental Statement Figures (TR010064/APP/6.2)) would be designed to provide alternative foraging/commuting habitat and reinstate flightlines. With implementation of the Scheme landscaping there would be no change in the level of impact and the significance of effect would be **neutral (not significant)**.

8.10.249 Bats would also be at risk of mortality during operation of the Scheme due to collision and entanglement with the golf ball netting at Pike Fold Golf Course. The bat surveys undertaken to inform the baseline determined that there are no key connective linear features within the Order Limits and therefore it is likely the net would only impact small numbers of bats, but nonetheless there is potential for impacts on all four species recorded within the survey area, including high flying noctules, due to the height of the netting. However, the net would only be required for around 15 years. Taking a precautionary approach and assuming the temporary impact on bat populations is sufficient to affect conservation status on a local scale, there would be moderate impact on a receptor of Local importance, and therefore the significance of effect would be (worst-case) **slight adverse (not significant)**.

Disturbance from noise

8.10.250 There are no known roosts within the study area and so there are not predicted to be any effect on bats roosts due to operational noise. It is however recognised that use of bats roosts is intermittent and that the resource of trees with bat roost potential could be used in the future by roosting bats.

8.10.251 The noise model used to inform Chapter 11: Noise and Vibration of this Environmental Statement (TR010064/APP/6.1) does not specifically model biodiversity receptors, however from the model for other receptors (primarily residential properties but also other buildings) the noise assessment concludes in the short term (the year 2029) no significant increase in operation noise for any receptor (i.e. no increase above 3dB), whereas there are significant beneficial effects predicted for 1,549 residential dwellings and seven other sensitive receptors due a reduction in noise of 3dB to 4.9dB (assessed as a moderate magnitude of change in accordance with DMRB LA 111), and there are significant beneficial effects predicted for 36 residential dwellings due a reduction in noise of more than 5dB (assessed as a major magnitude of change in accordance with DMRB LA 111).

8.10.252 However, in the long term (2044, 15 years after opening) there are no predicted changes in road traffic noise that would exceed +/- 3dB at any receptor. The significant beneficial effects that are predicted in the short-term upon scheme opening would not be experienced at receptors over the long-term, due to gradual increases in traffic growth over the time period, and an assumed reduction in performance of low noise road surfaces.

8.10.253 Whilst the provision of a conventional low noise surface (LNS) with a Road Surface Influence (RSI) of -3.5dB on the Scheme may provide some short term benefits it terms of reducing operational noise, overall, it is assessed there would be a negligible beneficial level of impact on bats, a receptor of Local importance, and therefore the significance of effect is **neutral (not significant)**.

Fragmentation from lighting

8.10.254 Road lighting has the potential to act as a barrier to commuting bats. However, as stated in Chapter 2: The Scheme of this Environmental Statement (TR010064/APP/6.1), all of the existing highways within the Scheme are lit with high discharge lamps. Proposals include lighting for the whole Scheme, with new lighting required for the Scheme for safety reasons in relation to the Northern Loop. However, some of the existing lighting would also be replaced, and these new lights would improve the control of emitted light which would give less spill into adjacent areas and reduce upward lighting.

8.10.255 The lighting design has been carried out in accordance with the latest BS 5489 Design of road lighting – Lighting of roads and public amenity areas (British Standards Institution, 2020) and National Highways specifications, and also takes into consideration guidance notes from the Institution of Lighting Professionals, including Guidance Note 1 for the Reduction of Obtrusive Light (2020) and best available guidance on lighting with regards to protected species (Bat Conservation Trust, 2023).

8.10.256 On balance it is assessed that the lighting that would be provided would be no worse, but potentially an improvement compared to the existing lighting, and no worsening of effects is predicted. It is assessed there would be no change in the level of impact on bats (a receptor of Local importance), with respect to fragmentation from lighting, and therefore the significance of effect is **neutral (not significant)**.

Prey availability

8.10.257 Road lighting has the potential to cause both positive and negative effects on bats as different species react differently to lighting. Some species such as noctule, serotine and pipistrelle bats would benefit from increased lighting as they are able to forage prey which are attracted to it. However, slower-flying broad-winged species such as barbastelle bats, brown long-eared bats and *Myotis* species are less tolerant of light which would affect their ability to forage successfully and efficiently. Should roost exits be lit, emergence is likely to be delayed, shortening the time available for foraging (BCT and Institution of Lighting Professionals, 2023).

8.10.258 In addition, bats have the potential to be indirectly adversely affected by road lighting due to impacts on invertebrate prey as it is thought road lighting attracts invertebrates from further afield and therefore may cause a reduction in the availability of prey in adjacent habitats (BCT and Institution of Lighting Professionals, 2023).

8.10.259 As stated above, it is assessed that the lighting that would be provided would be no worse, but potentially an improvement compared to the existing lighting, and no worsening of effects is predicted. It is assessed there would be no change in the level of impact on bats (a receptor of Local importance), with respect to prey availability, and therefore the significance of effect is **neutral (not significant)**.

Summary

8.10.260 Taking into account the assessment of effects for the pathways to effects on bats, overall, the level of impact is considered on a precautionary basis to be **slight adverse (not significant)** due to the potential for mortality of bats due to the netting at Pike Fold Golf Course).

Badgers

Direct mortality

8.10.261 Mortality in the operational phase relates to animals attempting to cross a wide road, used by fast traffic. There was one record of a dead badger on the hard shoulder of the M60 within the records received from the local records centre indicating that this is a pre-existing issue. Any additional impacts would occur around new Northern Loop as this part of the Scheme would require construction of a new section of highway. However, there were no badger setts recorded in the area and so an increase in mortality is not anticipated. It is therefore assessed that the level of impact would be no change, and the significance of effect would be **neutral (not significant)**.

8.10.262 Badgers would also be at risk of mortality during operation of the Scheme due to entanglement with the golf ball net at Pike Fold Golf Course. However, the net would only be required for around 15 years. Taking a precautionary approach and assuming the temporary impact on badger populations is sufficient to affect conservation status on a local scale, there would be (worst-case) **slight adverse (not significant)** for a receptor of Local importance.

Disturbance from noise

8.10.263 Operation of the Scheme could lead to disturbance caused by increased traffic noise. The habitats around the Scheme area however, already directly adjacent to an existing motorway network and are therefore already subject to disturbance.

8.10.264 The noise model used to inform Chapter 11: Noise and Vibration of this Environmental Statement (TR010064/APP/6.1) does not specifically model biodiversity receptors, however from the model for other receptors (primarily residential properties but also other buildings) the noise assessment concludes in the short term (year 2029) no significant increase in operation noise for any receptor (i.e. no increase above 3dB), whereas there are significant beneficial effects predicted for 1,549 residential dwellings and seven other sensitive receptors due a reduction in noise of 3dB to 4.9dB (assessed as a moderate magnitude of change in accordance with DMRB LA 111), and there are significant beneficial effects predicted for 36 residential dwellings due a reduction in noise of more than 5dB (assessed as a major magnitude of change in accordance with DMRB LA 111).

8.10.265 However, in the long term (2044, 15 years after opening) there are no predicted changes in road traffic noise that would exceed +/- 3dB at any receptor. The significant beneficial effects that are predicted in the short-term upon scheme opening would not be experienced at receptors over the long-term, due to gradual increases in traffic growth over the time period, and an assumed reduction in performance of low noise road surfaces.

8.10.266 Whilst the provision of a conventional LNS with an RSI of -3.5dB on the Scheme may provide some short term benefits it terms of reducing operational noise, overall, it is assessed there would be a negligible beneficial level of impact on badgers, a receptor of Local importance, and therefore the significance of effect is **neutral (not significant)**.

Summary

8.10.267 Taking into account the assessment of effects for the pathways to effects on badgers, overall, the level of impact is considered to be no change, and therefore the significance of effect is **slight adverse (not significant)**.

Barn owls

Direct mortality

8.10.268 Although the Scheme may result in an increased volume of traffic, and therefore an increased likelihood of collision with traffic, barn owl local to the Scheme are already living adjacent to the motorway network. The density of barn owls is also very low (one pair within the study area, but they are not known to roost within the Order Limits), which reduces the likelihood of collisions.

8.10.269 Hedgerow planting has been designed to link areas of habitat north and south of the Northern Loop and direct animals away from the road to minimise any effects. Considering the existing infrastructure, the level of impact is assessed as no change on a receptor of County importance, and the significance of effect would be **neutral (not significant)**.

8.10.270 Barn owl would also be at risk of mortality during operation of the Scheme due to collision and entanglement with the golf ball net at Pike Fold Golf Course. However, the net would only be required for around 15 years. Taking a precautionary approach and assuming the temporary impact on bird populations was sufficient to affect the conservation status on a local scale, there would be moderate adverse impacts on a receptor of County importance, which would result in a **slight adverse (not significant)** effect.

Disturbance from noise

8.10.271 Operation of the Scheme could lead to disturbance caused by increased traffic noise, vibration, and lighting. The habitats around the Scheme are directly adjacent to an existing motorway network and are therefore already subject to disturbance.

8.10.272 The noise model used to inform Chapter 11: Noise and Vibration of this Environmental Statement (TR010064/APP/6.1) does not specifically model biodiversity receptors, however from the model for other receptors (primarily residential properties but also other buildings) the noise assessment concludes in the short term (2029) no significant increase in operation noise for any receptor (i.e. no increase above 3dB), whereas there are significant beneficial effects predicted for 1,549 residential dwellings and seven other sensitive receptors due a reduction in noise of 3dB to 4.9dB (assessed as a moderate magnitude of change in accordance with DMRB LA 111), and there are significant beneficial effects predicted for 36 residential dwellings due a reduction in noise of more than 5dB (assessed as a major magnitude of change in accordance with DMRB LA 111).

8.10.273 However, in the long term (2044, 15 years after opening) there are no predicted changes in road traffic noise that would exceed +/- 3dB at any receptor. The significant beneficial effects that are predicted in the short-term upon scheme opening would not be experienced at receptors over the long-term, due to gradual increases in traffic growth over the time period, and an assumed reduction in performance of low noise road surfaces.

8.10.274 Whilst the provision of a conventional LNS with an RSI of -3.5dB on the Scheme may provide some short term benefits it terms of reducing operational noise, overall, it is assessed there would be a negligible beneficial level of impact on a receptor of Local importance, and therefore the significance of effect is **neutral (not significant)**.

Summary

8.10.275 Taking into account the assessment of effects for the pathways to effects on barn owl, overall, the level of impact is considered to be no change, and therefore the significance of effect is **slight adverse (not significant)**.

Breeding and wintering birds

Direct mortality

8.10.276 There may be increased likelihood of collision with traffic, however birds present around the Scheme are already living adjacent to the motorway network. Hedgerow planting has been designed to link areas of habitat north and south of the Northern Loop and direct animals away from the road. The level of impact is no change on receptors of County importance (breeding black-necked grebe and little ringed plover, and wintering bird assemblages at Heaton Park Reservoir) and receptors of Local importance (other breeding and wintering birds), and the significance of effect would be **neutral (not significant)**.

8.10.277 All species of breeding and wintering birds would also be at risk of mortality during operation of the Scheme due to collision and entanglement with the golf ball net at Pike Fold Golf Course. However, the net would only be required for around 15 years. Taking a precautionary approach and assuming the temporary impact on bird populations was sufficient to affect the conservation status on a local scale, there would be moderate adverse impacts on receptors of County importance (breeding black-necked grebe and little ringed plover, and wintering bird assemblages at Heaton Park Reservoir) and receptors of Local importance (other breeding and wintering birds), which would result in a (worst-case) **slight adverse (not significant)** effect.

Disturbance from noise and lighting

8.10.278 Increases in noise and light levels during operation could permanently negatively impact birds and their dependent young due to stress, particularly those using habitat adjacent to the road. Breeding birds would be of particular concern regarding increased noise levels due to their reliance on song and calls as part of their mating behaviour. Artificial lighting along roads can alter natural behavioural patterns in both diurnal and nocturnal species of birds, affecting both breeding and foraging behaviour. Embedded mitigation would partially mitigate these impacts (see Section 8.9 of this chapter).

8.10.279 However, as stated in Chapter 2: The Scheme of this Environmental Statement (TR010064/APP/6.1), all of the existing highways within the Scheme are lit with high discharge lamps. The Scheme design include lighting for the whole Scheme, with new lighting required for the Scheme for safety reasons in relation to the Northern Loop. However, some of the existing lighting would also be replaced, and these new lights would improve the control of emitted light which would give less spill into adjacent areas and reduce upward lighting.

8.10.280 The lighting design has been carried out in accordance with the latest BS 5489 Design of road lighting – Lighting of roads and public amenity areas (British Standards Institution, 2020) and National Highways specifications, and also takes into consideration guidance notes from the Institution of Lighting Professionals, including Guidance Note 1 for the Reduction of Obtrusive Light (2020) and Guidance Note 8 Bats and Artificial Lighting (2018).

8.10.281 On balance it is assessed that the lighting that would be provided would be no worse, but potentially an improvement compared to the existing lighting, and no worsening of effects is predicted.

8.10.282 The habitats around the Scheme area however, already directly adjacent to an existing motorway network and are therefore already subject to disturbance from noise.

8.10.283 The noise model used to inform Chapter 11: Noise and Vibration of this Environmental Statement (TR010064/APP/6.1) does not specifically model biodiversity receptors, however from the model for other receptors (primarily residential properties but also other buildings) the noise assessment concludes in the short term (2029) no significant increase in operation noise for any receptor (i.e. no increase above 3dB), whereas there are significant beneficial effects predicted for 1,549 residential dwellings and seven other sensitive receptors due to a reduction in noise of 3dB to 4.9dB (assessed as a moderate magnitude of change in accordance with DMRB LA 111), and there are significant beneficial effects predicted for 36 residential dwellings due a reduction in noise of more than 5dB (assessed as a major magnitude of change in accordance with DMRB LA 111).

8.10.284 However, in the long term (2044, 15 years after opening) there are no predicted changes in road traffic noise that would exceed +/- 3dB at any receptor. The significant beneficial effects that are predicted in the short-term upon Scheme opening would not be experienced at receptors over the long-term, due to gradual increases in traffic growth over the time period, and an assumed reduction in performance of low noise road surfaces.

8.10.285 Whilst the provision of a conventional LNS with an RSI of -3.5dB on the Scheme may provide some short term benefits in terms of reducing operational noise, and that habitat creation away from the road would increase carrying capacity for birds in alternative nearby habitats, reducing the impact on the local bird population, overall, it is assessed there would be a negligible beneficial level of impact on receptors of County importance (breeding black-necked grebe and little ringed plover, and wintering bird assemblages at Heaton Park Reservoir) and receptor of Local importance (other breeding and wintering birds), and therefore the significance of effect is **neutral (not significant)**.

Summary

8.10.286 Taking into account the assessment of effects for the pathways to effects on birds, overall, the level of impact is considered to be no change, and therefore the significance of effect is **slight adverse (not significant)**.

Great crested newts

8.10.287 As stated in relation to construction effects on GCN, GCN mitigation would be delivered through Natural England's DLL scheme as evidenced by the countersigned IACPC provided in Appendix 8.15: GCN DLL IACPC of the Environmental Statement Appendices (TR010064/APP/6.3). This mitigation would be delivered off site and therefore there is no potential for GCN to be impacted through the operation of the Scheme as there would be no pathway to effect.

8.10.288 Operational effects on any residual GCN retained in habitats following completion of construction would be limited to water quality changes and direct mortality.

8.10.289 The operation of the Northern Loop has potential to cause mortality of GCN moving between ponds in this part of the Scheme. However, hedgerow planting has been designed to link areas of habitat north and south of the Northern Loop and to guide animals around the road to minimise any effects. Due to the extent of the existing infrastructure compared to the Scheme design, it is assessed that the widening of carriageway and construction of the Northern Loop would have at worst minor adverse impacts on retained GCN populations which are of county importance, and the significance of effect is assessed as **neutral (not significant)**, due to the delivery of mitigation through DLL.

8.10.290 Only a small section of bank adjacent to a ditch/pond would be impacted by the Scheme with new outfalls constructed in these areas. Water from motorway network would be attenuated prior to discharge, which is an improvement on the current drainage arrangement. This should result in minor improvements in water quality within the affected waterbodies which may benefit GCN. Overall, therefore, the level of impact would be minor positive on a receptor of County importance, and the significance of effect would be **neutral (not significant)**.

Summary

8.10.291 Taking into account the assessment of effects for the pathways to effects on GCN and with consideration to the mitigation delivered through the DLL, overall, the level of impact is considered to be no change, and therefore the significance of effect would be **neutral (not significant)**.

Reptiles

8.10.292 Mortality in the operational phase relates to animals attempting to cross a wide road, used by fast traffic. Reptiles are unlikely to attempt to cross the motorway due to the noise and vibration from traffic and the lack of habitats to provide cover and refuge. The Scheme landscaping scheme will provide these species with additional habitat and additionally there is abundant suitable foraging habitat for them in the wider area and therefore the need for reptiles to cross the Scheme is very low/absent. The level of impact would be no change and the significance of effect would be **neutral (not significant)**.

Terrestrial invertebrates

8.10.293 Flying terrestrial invertebrates may be attracted towards the Scheme by lighting. This may lead to direct mortality of the invertebrates as they collide with traffic. As detailed within Chapter 2: The Scheme of this Environmental Statement (TR010064/APP/6.1), additional lighting is required for the Scheme for safety reasons in relation to the Northern Loop. However, some of the existing lighting would also be replaced, and these new lights would improve the control of emitted light which would give less spill into adjacent areas and reduce upward lighting.

8.10.294 The lighting design has been carried out in accordance with the latest BS 5489 Design of road lighting – Lighting of roads and public amenity areas (British Standards Institution, 2020) and National Highways specifications, and also takes into consideration guidance notes from the Institution of Lighting Professionals, including Guidance Note 1 for the Reduction of Obtrusive Light (2020) and Guidance Note 8 Bats and Artificial Lighting (2018).

8.10.295 Whilst there may be increased likelihood of collision with traffic with invertebrates attracted to lighting around the Scheme, considering the reduction in light spill in other areas, it is assessed there would be no change in the overall level of impact and therefore the significance of effect would be **neutral (not significant)**.

Priority species: Brown hare, hedgehog, water shrew and common toad

Water quality changes

8.10.296 Only a small section of bank adjacent to a ditch/pond would be impacted by the Scheme with new outfalls constructed in these areas. Water from motorway network would be attenuated prior to discharge, which is an improvement on the current drainage arrangement. This should result in minor improvements in water quality within the affected waterbodies which may benefit water shrew and common toad. Overall, therefore, the level of impact would be minor positive and the significance of effect would be **neutral**.

Direct mortality

8.10.297 Mortality in the operational phase relates to animals attempting to cross a wide road, used by fast traffic. Brown hare and hedgehog are unlikely to attempt to cross the motorway. The Scheme landscaping scheme will provide these species with additional habitat and additionally there is suitable foraging habitat for them in the wider area and therefore the need for brown hare and hedgehog to cross the Scheme is very low/absent. The level of impact would be no change and the significance of effect would be **neutral (not significant)**.

8.10.298 Brown hare and hedgehogs would also be at risk of mortality during operation of the Scheme due to entanglement with the golf ball net at Pike Fold Golf Course. However, the net would only be required for around 15 years. Taking a precautionary approach and assuming the temporary impact on brown hare and hedgehog populations is sufficient to affect conservation status on a local scale, there would be (worst-case) **slight adverse (not significant)** for a receptor of Local importance.

8.10.299 Common toad can be very loyal to habitat and routes across a landscape. Common toads were recorded in the grassland fields where the Northern Loop would be constructed as terrestrial habitat. There is therefore the possibility that common toad may try and cross the Northern Loop. The landscaping design would provide alternative terrestrial habitat for the species to attract them away from the carriageway. The level of the change would be minor adverse**,** and the significance of effect would be **neutral (not significant)**.

Summary

8.10.300 Taking into account the assessment of effects for the pathways to effects on priority species, overall, the level of impact is considered to be no change, and therefore the significance of effect is **slight adverse (not significant)**.

Summary of operational effects

8.10.301 Table 8.19 provides a summary of operational effects on biodiversity receptors.

Table 8.19 Summary of operational effects on biodiversity receptors

Receptor	Significance of effect
Rochdale Canal SAC and SSSI	Neutral (not significant)
Ashclough SSSI	Neutral (not significant)
Nob End SSSI and LNR	Neutral (not significant)
Alkrington Woods LNR	N/A, no pathway to effect
Blackley Forest LNR	Neutral (not significant)
Clifton Country Park LNR	N/A, no pathway to effect
Hollins Vale LNR and SBI	Neutral (not significant)
Mere Clough LNR	N/A, no pathway to effect
Moses Gate LNR	Neutral (not significant)
Philips Park LNR	Neutral (not significant)
Alkrington Woods and Rhode Lodges SBI	N/A, no pathway to effect
Boardman Brook SBI	N/A, no pathway to effect
Clifton Country Park SBI	Neutral (not significant)
Clifton Moss (South) SBI	Neutral (not significant)
Hazlitt Wood SBI	Neutral (not significant)
Heaton Park Reservoir SBI	N/A, no pathway to effect
Hollins Plantation SBI	Neutral (not significant)
Parr Brook SBI	Neutral (not significant)
Philips Park and North Wood SBI	Neutral (not significant)
Pilsworth SBI	N/A, no pathway to effect
Rhodes Farm Sewage Works SBI	Neutral (not significant)
Ringley Woods (East) SBI	N/A, no pathway to effect
Rochdale Canal – Lock at Scowcroft Farm to Stott's Lane SBI	N/A, no pathway to effect
Rochdale Canal (Scowcroft to Warland) SBI	Neutral (not significant)
Sudden Brook (West) SBI	N/A, no pathway to effect
Clifton Wood Ancient Woodland	Slight adverse (not significant)
Mere Clough Ancient Woodland	N/A, no pathway to effect
North Wood Ancient Woodland	N/A, no pathway to effect
Philips Wood Ancient Woodland	N/A, no pathway to effect

Receptor	Significance of effect
Groundwater dependent terrestrial habitats	Neutral (not significant)
Bats	Slight adverse (not significant)
Badgers	Slight adverse (not significant)
Barn owl	Slight adverse (not significant)
Breeding and wintering birds	Slight adverse (not significant)
GCN	Neutral (not significant)
Reptiles	Neutral (not significant)
Terrestrial invertebrates	Neutral (not significant)
Priority species: brown hare, hedgehog, water shrew and common toad	Slight adverse (not significant)

8.11 Monitoring

General

8.11.1 EcoWs would be employed where relevant to the works being undertaken to ensure all measures and method statements, including monitoring of important ecological features and biodiversity resources, are adhered to. This measure will be delivered through implementation of the Second Iteration EMP, as secured by Requirement 4 of the draft DCO (TR010064/APP/3.1).

Habitats

8.11.2 Habitats planted throughout the Scheme following construction (shown on Figure 2.3: Environmental Masterplan of the Environmental Statement Figures (TR010064/APP/6.2)), will require detailed monitoring and management as plans. These are outlined within Appendix N: Outline LEMP of the First Iteration EMP (TR010064/APP/6.5), and will be developed further in the Second Iteration EMP.

Protected and notable species

Badgers

8.11.3 In accordance with the badger licence, any setts requiring closure (whether permanent or temporary) would be subject to monitoring to confirm the ‘active’ and ‘disused’ sett entrances at each sett, and all licensable activities would be undertaken between July to November inclusive.

8.11.4 During sett closure, each sett would be monitored by an EcoW at least once every three days during the exclusion period. Monitoring would be achieved using camera traps and by placing small sticks within tunnels and in front of the one-way gates and would also be used to ensure the gates are working as expected and to assess the condition of the wire mesh overlaying hard-blocked entrance holes.

8.11.5 Full details of monitoring are outlined in Appendix 8.14: Draft Badger Licence Application (Confidential) of the Environmental Statement Appendices (TR010064/APP/6.3).

INNS

8.11.6 Monitoring of Schedule 9 and non-native invasive plants would be undertaken to ensure that where required, species have been managed in accordance with the ISMP, as outlined in the First Iteration EMP (TR010064/APP/6.5).

8.12 Biodiversity net gain

8.12.1 Appendix 8.12: BNG Report of the Environmental Statement Appendices (TR010064/APP/6.3) provides full details on the habitat loss and gain calculations (using Defra Metric v.3.1) for the Scheme. The overall total percentages and units for habitats, hedgerows and rivers are presented in Table 8.20.

Table 8.20 Summary of biodiversity net gain calculations for the Scheme

Habitat type	On-site net % change	Total net unit change
Habitat	3.68%	14.47
Hedgerows	58.50%	7.66
Rivers	0%	0

8.13 Summary

8.13.1 The Scheme is considered compliant with the requirements in the NPS NN (DfT, 2014) and draft NPS NN (DfT, 2023) for biodiversity, as detailed in Table 8.3, in that it describes significant effects on designated sites, protected and notable species. Iterations of the design have, where practicable, reduced and avoided impacts to biodiversity features, and mitigation and enhancement measures are described within this chapter. The Scheme seeks to maximise biodiversity delivery. The Scheme avoids loss of irreplaceable habitats.

8.13.2 Table 8.21 summarises residual significant effects identified for the biodiversity aspect.

Table 8.21 Summary of residual significant effects for biodiversity

Summary of residual significant effects	
Construction	**Operation**
No significant effects identified.	No significant effects identified.

Acronyms and initialisms

Acronym or initialism	Term
APIS	Air Pollution Information System
ARN	Affected Road Network
ASSI	Area of Special Scientific Interest
AWI	Ancient Woodland Inventory
BAP	Biodiversity Action Plan
BCT	Bat Conservation Trust
BOD	Biological Oxygen Demand
BNG	Biodiversity Net Gain
BSc	Bachelor of Science degree
CEnv	Chartered Environmentalist
cSAC	Candidate Special Areas of Conservation
CWS	County Wildlife Site
CIEEM	Chartered Institute of Ecology and Environmental Management
CIRIA	Construction Industry Research Information Association
CROW	Countryside and Rights of Way Act 2000 (as amended)
DCO	Development Consent Order
Defra	Department for Environment, Food and Rural Affairs
DMP	Development Management Policies
DMRB	Design Manual for Roads and Bridges
DfT	Department for Transport
DLL	District Level Licencing
DM	Do Minimum
DNA	Deoxyribonucleic acid – a molecule that determines the genetic makeup of all living organisms.
DPD	Development Plan Document
DS	Do Something
DLUHC	Department for Levelling Up, Housing and Communities
EcoW	Ecological Clerk of Works
EIA	Environmental Impact Assessment

Acronym or initialism	Term
EMP	Environmental Management Plan
EPS	European Protected Species
EPSM	European Protected Species Mitigation
EV	Ellenberg Value
GCN	Great crested newt
GMEU	Greater Manchester Ecology Unit
GWDTE	Groundwater Dependent Terrestrial Ecosystems
GI	Ground investigation
ha	Hectare
HRA	Habitats Regulations Assessment
HSI	Habitat Suitability Index
IACPC	Impact Assessment and Conservation Payment Certificate
INNS	Invasive Non-Native Species
IUCN	International Union for Conservation of Nature
LDF	Local Development Framework
LEMP	Landscape and Ecology Management Plan
LNCS	Local Nature Conservation Sites
LNR	Local Nature Reserve
LNS	Low Noise Surface
LONI	Letter of No Impediment
LWS	Local Wildlife Site
MAGIC	Multi-Agency Geographic Information for the Countryside
MCZ	Marine Conservation Zone
MHCLG	Ministry of Housing, Communities and Local Government (now called the Department for Levelling Up, Housing and Communities)
MMO	Marine Management Organisation
MMP	Materials Management Plan
MoU	Memorandum of Understanding
MPA	Marine Protected Area
MSc	Master of Science degree

Acronym or initialism	Term
N	Nitrogen
NAA	Nitrogen Affected Area
NERC	Natural Environment and Rural Communities
NGR	National Grid Reference
NNR	National Nature Reserve
NOx	Nitrogen Oxide
NPPF	National Planning Policy Framework
NPPG	National Planning Practice Guidance
NPS NN	National Policy Statement for National Networks
NSIP	Nationally Significant Infrastructure Project
OS	Ordnance Survey
PEIR	Preliminary Environmental Information Report
pSAC	Possible Special Areas of Conservation
pSPA	Potential Special Protection Areas
PWMS	Precautionary Working Method Statement
REAC	Register of Environmental Actions and Commitments
RSI	Road Surface Influence
SAC	Special Area of Conservation
SBI	Site of Biological Interest
SINC	Site of Importance for Nature Conservation
SNCI	Site of Nature Conservation Importance
SoS	Secretary of State
SPA	Special Protection Area
SPD	Supplementary Planning Documents
SSSI	Sites of Special Scientific Interest
UDP	Unitary Development Plan
UKHab	UKHab
WFD	Water Framework Directive
SLP	Salford Local Plan

Acronym or initialism	Term
ALC	Agricultural Land Classification
ARN	Affected Road Network
eDNA	environmental deoxyribonucleic acid (survey)

Glossary

Term	Definition
Affected Road Network (ARN)	All roads that trigger the traffic screening criteria from DMRB LA 105 and adjoining roads within 200m.
Ancient Woodland Inventory (AWI) site	The AWI identifies over 52,000 Ancient Woodland sites in the UK. Ancient Woodland in England is defined as woodland that has existed since 1600 or before.
Barn owl nest	A site used by barn owls for nesting and raising of young, legally protected when in use for nesting.
Bat roost	A bat's home.
District level licence	District level licences are granted and authorised by Natural England to permit developments that affect great crested newt *Triturus cristatus* and involve habitat creation and mitigation being carried out at the local authority level, providing an alternative to the standard EPSM licensing process.
Draft licence	An EPSM licence that is written, prepared and agreed prior to a Development Consent Order (DCO) being granted but which cannot be officially granted until the DCO planning consent has been given.
European protected species mitigation (EPSM) licence	The licence issued that permits an activity affecting a European protected species, that would otherwise constitute an offence under the relevant legislation.
Groundwater dependent terrestrial ecosystem (GWDTE)	Wetlands which critically depend on groundwater flows and/or chemistry.
Habitats Regulations Assessment (HRA)	A Habitats Regulations Assessment refers to the several distinct stages of assessment which must be undertaken in accordance with the Conservation of Habitats and Species Regulations 2017 (as amended) if a plan or project may affect the protected features of a habitats site, before a decision can be made on whether to authorise it.
Habitats site	Collective term for Special Areas of Conservation and Special Protection Areas used in the draft NPS NN.
Invasive Non-Native Species (INNS)	Species that have been released either deliberately or accidentally outside of their natural range, where they have become established and cause adverse ecological, environmental, or economic impacts.

Term	Definition
Local Biodiversity Action Plan (LBAP)	Local Biodiversity Action Plans set the focus for conservation of locally valued species and habitats.
Local Nature Reserve (LNR)	Sites that are designated by the local authority under Section 21 of the National Parks and Access to the Countryside Act 1949 for nature conservation, which have wildlife or geological features that are of special interest locally.
Local Wildlife Site (LWS)	Local Wildlife Sites are non-statutory designated sites that have been identified and selected for their 'substantive nature conservation value'. In Greater Manchester, Local Wildlife Sites (LWS) are known as Sites of Biological Importance (SBI).
Macrophyte	An aquatic plant large enough to be seen with the naked eye.
Nitrogen deposition	The transfer of reactive nitrogen from the atmosphere to the biosphere.
Order Limits	The spatial boundaries of the Scheme.
Priority habitats	Priority habitats are the habitats of conservation priority which are listed under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006.
Priority species	Priority species are species of conservation priority which are listed under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006.
Protected and notable species	Species of plant and animal protected by legislation, and species of conservation importance such as priority species.
Ramsar site	Wetlands of international importance designated under the Ramsar Convention 1971.
Refugia	Habitat features where an animal may take refuge.
Runoff	The movement of water above and below the surface.
Sett	A badger's home, usually consisting of a network of tunnels with multiple entrances.
Site of Biological Importance (SBI)	In Greater Manchester, Local Wildlife Sites (LWS) (see the LWS entry above) are known as Sites of Biological Importance (SBI).
Site of Special Scientific Interest (SSSI)	Site designated as being of special interest for its flora, fauna or geological or physiographical features and protected under the Wildlife and Countryside Act 1981.
Snuffle hole	Small holes in the ground made by badgers as they forage for food such as earthworms.
Special Area of Conservation (SAC)	An area which has been identified as being important for a range of vulnerable habitats, plant and animal species within the EU and is designated under the Habitats Directive.

Term	Definition
Special Protection Area (SPA)	A site designated under the Birds Directive due to its international importance for the breeding, feeding, wintering, or the migration of, rare and vulnerable species of birds.
Veteran tree	A tree that by recognised criteria shows features of biological, cultural or aesthetic value that are characteristic of, but not exclusive to, individuals surviving beyond the typical age range for the species concerned.
Zone of Influence (ZOI)	The area over which a receptor may receive impacts from the Scheme.

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