Hampshire Water Transfer and Water Recycling Project

Outline Landscape and Ecology Management Plan

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Executive Summary

1. This Outline Landscape and Ecology Management Plan (LEMP) provides the framework for delivering Green Infrastructure for the Hampshire Water Transfer and Water Recycling Project (the 'Project'). It sets out the approach to reinstating vegetation removed during construction and for implementing, maintaining and managing landscape and ecological mitigation and enhancement within the Order Limits, including within Environmental Mitigation and Enhancement Areas (EMEAs) shown on the Works plans (Document reference 2.3, DCO Volume 2) and EMEA plans within the Design Principles Document (Document reference 5.11, DCO Volume 5). Detailed LEMPs will be prepared by the Contractor post-consent which will be submitted for approval in accordance with the corresponding requirement in Schedule 2 to the draft Development Consent Order (Document reference 3.1, DCO Volume 3).
2. The Outline LEMP explains how the Project will be integrated into the landscape and wider nature network through a coordinated landscape and ecological approach. It brings together landscape character, ecological connectivity, habitat function and nature conservation interests to guide the design, management and monitoring of a cohesive green and blue infrastructure network that responds to local distinctiveness and sense of place. The strategy supports the Project's aim to secure a resilient and sustainable water supply that will protect and enhance the country's rare chalk streams, while maintaining supplies for communities and the local economy.
3. A summary of the landscape and ecology baseline describes the local context which has informed the Green Infrastructure strategy and associated maintenance and management prescriptions. The Project sits within and alongside a network of designated sites and higher-value habitats. The landscape context spans the South Hampshire Lowlands and adjoining character areas, including the coastal plain and harbours to the south, Portsdown Hill, the wooded Forest of Bere, and river valleys and floodplains such as the Itchen Valley at the western extent of the Order Limits. The area is crossed by an extensive Public Rights of Way network and includes key watercourses influencing landscape character and ecological connectivity, notably Hermitage Stream, the Wallington River, the Rivers Meon and Hamble, and the River Itchen.
4. A key component of the strategy is the reinstatement of vegetation removed during construction. Vegetation will be reinstated in accordance with its original UK Habitat Classification System type and ecological function, with replacement planting located as close as practicable to the point of loss or, where necessary, within suitable EMEAs. Where engineering or operational constraints apply - for example above the pipeline - planting within a protective strip will follow defined restrictions and indicative species guidance. Tree replacement ratios are set for trees based on category, and replacement species will, as far as practicable, match those lost where native, suitable and available, with substitutions used where necessary for biosecurity or availability reasons.
5. The Outline LEMP also establishes the responsibilities and competence requirements for delivering and verifying the Green Infrastructure strategy. A suitably qualified ecologist, landscape architect and arboriculturist will be appointed to design and oversee implementation and advise on compliance and performance. Monitoring will verify that objectives and long-term environmental functions are achieved and will

inform any necessary updates to the detailed LEMPs, to be agreed with the relevant authority.

1 Introduction

1.1.1 This document has been updated at Deadline 1 having regard to Relevant Representations to include cross-reference to Design Principle GDP_3. References to other Application documents have not been updated from the original submission. Please refer to the latest version of the Guide to the Application (Document reference 1.3, DCO Volume 1) for the list of current versions of documents.

1.1.2 This Outline Landscape and Ecology Management Plan (Outline LEMP) provides a framework for delivering Green Infrastructure for the Hampshire Water Transfer and Water Recycling Project (hereafter referred to as the 'Project') on behalf of Southern Water Services Limited (hereafter referred to as the 'Applicant'). This addresses the reinstatement of existing vegetation following construction, and the implementation, maintenance and long-term management of proposed environmental mitigation.

1.1.3 The approach to Biodiversity Net Gain (BNG) and Environmental Net Gain (ENG) is outlined within the Biodiversity Gain Plan (Document reference 7.11, DCO Volume 7) which includes the Habitat Management and Monitoring Plan (HMMP), and the Environmental Net Gain Statement (Document reference 7.12, DCO Volume 7). The HMMP for habitat sites identified within the Order Limits to deliver BNG has been prepared in accordance with this Outline LEMP. This Outline LEMP has also been prepared in accordance with the Appendix G of the Sustainable Drainage Systems Strategy in ES Appendix 19.1 Flood Risk Assessment, Volume II, (Document reference 6.2, DCO Volume 6), which sets out the operational planting and maintenance requirements for the Sustainable Drainage Systems (SuDS) features.

1.1.4 This Outline LEMP does not form part of the Environmental Statement (ES) but should be read alongside it. It is secured in draft Development Consent Order (DCO) (Document reference 3.1, DCO Volume 3) Schedule 2 under requirement 4.

1.1.5 The Project is in southern Hampshire, with parts located in and extending from Havant to Otterbourne. The Project comprises the construction, operation and maintenance of the following components:

1. Water Recycling Plant (WRP) site (Work Number 1) and associated pumping stations.
2. Pipelines between Budds Farm Wastewater Treatment Works and the WRP site (Work Number 2).
3. Pipelines between the WRP site and Bedhampton Springs (Work Number 3), connecting into pipelines being delivered by Portsmouth Water between Bedhampton Springs and Havant Thicket Reservoir.
4. Pipeline between the WRP site and Otterbourne Water Supply Works (WSW) (Work Number 4).
5. Above Ground Plant (AGP) (Work Number 5) comprising Intermediate Pumping Stations (IPS) and Break Pressure Tanks (BPT) located along the Pipeline between the WRP site and Otterbourne Water Supply Works.

1.1.6 The Project would also comprise the use of the following infrastructure:

1. Havant Thicket Reservoir (which has been consented separately by Portsmouth Water and is currently under construction) for the storage of recycled water.
2. The existing Eastney Long Sea Outfall, Eastney Pumping Station, and associated Eastney Transfer Tunnel for the release of reject water from the WRP site.
3. Pipelines and other related works (which have been consented separately by Portsmouth Water) for the transfer of recycled water and source water between Bedhampton Springs and Havant Thicket Reservoir.

1.1.7 The construction and operation of the Project would be supported by other temporary and permanent works.

1.1.8 The Project will require the demolition, disassembly and/or temporary relocation of a number of small structures.

1.1.9 A detailed description of the Project can be found in ES Chapter 3 Description of the Proposed Development, Volume I (Document reference 6.1, DCO Volume 6) and the Order Limits are shown on ES Figure 1.1 Location of the Proposed Development and Order Limits, Volume III (Document reference 6.3, DCO Volume 6).

1.1.10 This Outline LEMP applies to all areas of reinstatement of existing vegetation removed to facilitate construction and all Environmental Mitigation and Enhancement Areas (EMEAs) within the Order Limits subject to paragraph 1.1.13 regarding additional environmental enhancements.

1.1.11 The Project will deliver environmental mitigation to mitigate adverse impacts. As well as environmental mitigation, the Project also seeks to provide environmental enhancement within the Order Limits. Locations for environmental mitigation and enhancement are within the EMEAs which are set out on the Works plans (Document reference 2.3, DCO Volume 2) and the and EMEA plans within the Design Principles Document (Document reference 5.11, DCO Volume 5).

1.1.12 The Design Principles Document (Document reference 5.11, DCO Volume 5) draws a distinction between 'environmental mitigation' and 'additional environmental enhancement'. Environmental mitigation means the Applicant's proposals to mitigate the potential adverse environmental effects of the Project that have been assessed and are reported in this ES. Such environmental mitigation can take a number of different forms including habitat creation to mitigate vegetation loss, improving or enhancing existing habitats or planting to screen Above Ground Plant (AGP) and provide landscape integration. In each case, the provision of the environmental mitigation is necessary to deliver the Project within the 'Rochdale Envelope' assessed in this ES. The Applicant is seeking appropriate powers of compulsory acquisition to safeguard the delivery of the environmental mitigation. The environmental mitigation is secured in the Design Principles Document (Document reference 5.11, DCO Volume 5).

1.1.13 As well as environmental mitigation, the Project also seeks to provide additional environmental enhancement (hereafter referred to as environmental enhancements) within the Order Limits, for example habitat improvements adjacent to construction working areas. These enhancements are not necessary

for the delivery of the Project and therefore consent is sought to deliver these environmental enhancements, but these will only be implemented subject to securing agreements with landowners.

1.1.14 The Project is a 'project of national significance' as a result of the amended Direction (varied on 19 November 2024) given by the SoS under Section 35(1) of the Planning Act 2008 [1]. The Applicant is seeking a DCO for construction, operation and maintenance of the Project.

1.1.15 Detailed LEMPs will be produced in accordance with the measures contained in this OLEMP and submitted for approval as secured by the corresponding requirement in Schedule 2 to the draft DCO (Document reference 3.1, DCO Volume 3).

1.1.16 The detailed LEMPs will be developed with consideration of the Hampshire Local Nature Recovery Strategy [2].

1.2 Purpose of the document

1.2.1 The purpose of this Outline LEMP is to set out how the Project would be integrated within the landscape and wider nature network to avoid or reduce effects on landscape, visual amenity and biodiversity.

1.2.2 This document identifies the measures required for both landscape and ecology together, demonstrating a cohesive and integrated strategy that considers existing landscape character and function, landscape permeability, landform, vegetation and habitat patterns and nature conservation interests.

1.2.3 This Outline LEMP includes habitat-specific objectives and short and long-term actions that will be implemented by the Contractor to manage, maintain and monitor, to achieve the successful establishment of proposed planting and habitats within the Order Limits.

1.3 Aims and objectives

1.3.1 The Project presents an opportunity to strengthen green and blue infrastructure within the Order Limits, reflecting valued landscape characteristics, which would aid in integrating the Project within the landscape and nature network.

1.3.2 The overarching objectives of this Outline LEMP are to:

1. Promote the conservation and improvement of the physical and natural environment within the Order Limits, and to ensure that the Project is appropriately sited and integrated into its setting. The Green Infrastructure strategy, set out in section 3, is part of the essential infrastructure of the Project.
2. Improve ecological value by developing a diverse mix of habitats, restoring and enhancing existing habitats and creating new habitats of high biodiversity value that are suited to the local site conditions.
3. Guide the design, management, maintenance and monitoring of landscape and biodiversity features that respond to the character of the landscape, local distinctiveness and sense of place.

4. Ensure the mitigation proposed as part of the Project remains effective at reducing identified environmental and visual impacts as intended throughout the Project lifecycle.

2 Landscape and ecological context

2.1.1 This section summarises the baseline analysis within the ES providing an overview of the existing environment and landscape where the measures set out in this Outline LEMP will be implemented:

1. ES Chapter 8 Terrestrial and freshwater biodiversity, Volume I (Document reference 6.1, DCO Volume 6)
2. ES Chapter 13 Landscape and visual, Volume I (Document reference 6.1, DCO Volume 6)

2.1.2 The Outline Construction Environmental Management Plan (Outline CEMP) (Document reference 7.1, DCO Volume 7) sets out measures, commitments, and actions to manage environmental effects during construction, including the protection of sensitive landscape and ecology features and designations summarised in this section.

2.2 Landscape character

Study area

2.2.1 As defined in ES Chapter 13 Landscape and visual, Volume I (Document reference 6.1, DCO Volume 6), the study area for the Landscape and Visual Impact Assessment (LVIA) includes all land within the Order Limits and the area within which the construction and operation of the Project may give rise to significant landscape and visual effects, as illustrated on ES Figure 13.1 Landscape and visual impact assessment study area, Volume III (Document reference 6.3, DCO Volume 6).

Current baseline

2.2.2 The landscape to the south of the Project comprises the coastal plain which extends along the coastline between Chichester Harbour in the east, Portsmouth at the centre and Fareham in the west. This area is dominated by settlement and industry but also includes areas of open water and habitat that are rich in wildlife and important for tourism and recreation. There are open views across the harbours from the shoreline, but views tend to be limited by buildings within the areas of dense settlement.

2.2.3 North of Portsmouth the land rises steeply to form Portsdown Hill, which is a narrow ridge with panoramic views to the south across the coast and north across the Forest of Bere to the distant hills within the South Downs National Park (SDNP).

2.2.4 The Forest of Bere is lower lying and includes extensive areas of woodland. Views within this area therefore tend to be shorter. This area is crossed by several important chalk rivers that flow south from the SDNP, which is close to the Order Limits near Wickham and Lower Upham.

2.2.5 The western end of the Order Limits crosses the broad floodplain of the River Itchen and higher ground where the settlement of Otterbourne is located. The dense vegetation along the river and the steep hills either side limit longer views.

2.2.6 There are five principal watercourses that cross the study area:

3. **Hermitage Stream** runs through Havant in the east of the study area and discharges into Langstone Harbour. It defines the eastern boundary of the Water Recycling Plant (WRP) site.
4. **Wallington River** meanders gently eastward from Waterlooville across the landscape and then south through Fareham where it discharges into Portsmouth Harbour.
5. **River Meon** flows southward from the SDNP, passing through the settlement of Wickham, forming a narrow valley which cuts across the centre of the study area. It discharges into the Solent via Titchfield Haven to the west of Stubbington.
6. **River Hamble** runs in a south-westerly direction from the SDNP, passing through the settlement of Bishop's Waltham. It broadens out south of Botley to form an increasingly wide tidal channel which is lined by marinas and some industry where it opens out into Southampton Water.
7. **River Itchen** meanders from Winchester and through the western part of the SDNP to Southampton, where it forms a confluence with the River Test to form Southampton Water.

2.2.7 There are few waterbodies within the study area. There is a lagoon in the southern portion of Budds Farm, and a pond north-east of Crowdhill. More detail on locations is set out in the ES Figure 13.2 Topography and hydrology, Volume III (Document reference 6.3, DCO Volume 6).

2.2.8 The study area is crossed by an extensive network of Public Rights of Way (PRoWs). This network includes several long-distance walking routes and cycling routes which form part of the National Cycle Network (NCN). More detail on these and their locations are set out in the ES Figure 13.8 Tourism and leisure, Volume III (Document reference 6.3, DCO Volume 6).

2.2.9 As shown in ES Figure 13.11 Landscape designations, Volume III (Document reference 6.3, DCO Volume 6), the majority of the study area is not covered by landscape designations.

2.2.10 There are two nationally designated landscapes which cover parts of the study area. These are the SDNP and the Chichester Harbour National Landscape. No part of these nationally designated landscapes coincides with the Order Limits.

2.2.11 Two Areas of Special Landscape Quality (ASQL), which are local landscape designations, fall partially within the Order Limits. Both are within Fareham; ASLQ 5: Forest of Bere and North Fareham Downs and ASLQ 6: Portsdown Hill.

2.3 Nature conservation and networks

Study area

2.3.1 As defined in ES Chapter 8 Terrestrial and freshwater biodiversity, Volume I (Document reference 6.1, DCO Volume 6), the study area for assessment as it applies to terrestrial and freshwater biodiversity has been informed by:

1. The Order Limits, which includes the components of the Project and other works (e.g. temporary land take for temporary construction compounds and access routes).

2. The likely effects of the Project on ecological features within the Zone of Influence (ZoI).

2.3.2 The ZoI is the area over which ecological features may experience impacts from the Project. It covers the Order Limits and the wider landscape where pathways (ecological or hydrological links) exist for the transfer of impacts to ecological features outside the Order Limits. The ZoI for each ecological feature varies in size depending on the nature of the effects and the sensitivity of the ecological feature to those effects.

2.3.3 Different desk study and field survey areas have been applied for each category of ecological feature, as appropriate, to enable effective assessment of likely significant effects on each ecological feature. The desk study and field survey areas are presented in ES Chapter 8 Terrestrial and freshwater biodiversity, Volume I (Document reference 6.1, DCO Volume 6).

Current baseline

2.3.4 A range of National Site Networks, statutory designated sites, non-statutory designated sites, and ancient woodlands are located within the Order Limits or are hydrologically connected to the land within the Order Limits. At an international and national level, the River Itchen Special Area of Conservation (SAC) and Site of Special Scientific Interest (SSSI) is crossed by the Order Limits. The River Itchen is designated due to its chalk river status and dominance of rare water-crowfoot species *Ranunculus* spp. The Solent Maritime SAC, Chichester and Langstone Harbours Special Protection Area (SPA) and Ramsar site, and Langstone Harbour SSSI are located within the Order Limits between Budds Farm Wastewater Treatment Works (WTW) and the WRP site. They are designated for the intertidal mudflat estuarine system, rare cord-grass species *Spartina* spp., and Atlantic salt meadows, as well as the breeding, passaging, and overwintering birds that these habitats support.

2.3.5 There are 64 non-statutory designated sites within the 250m of the Order Limits. These consist of 60 Sites of Importance for Nature Conservation (SINCs) and four Road Verges of Ecological Importance (RVEIs). The vast majority of the SINCs are small areas of lowland mixed deciduous woodland and neutral and occasionally calcareous grassland meadows. The RVEIs are located around Portsdown Hill and Farlington Water Treatment Works in the east of the Order Limits.

2.3.6 The locations of designated sites are presented in:

1. ES Figure 8.1, Statutory designated sites within the desk study area, Volume III (Document reference 6.3, DCO Volume 6)
2. ES Figure 8.2, Internationally designated sites within the desk study area, Volume III (Document reference 6.3, DCO Volume 6)
3. ES Figure 8.3, Non-statutory designated sites within the desk study area, Volume III (Document reference 6.3, DCO Volume 6)

2.3.7 There are ten Ancient Semi-Natural Woodlands (ASNWs) and three Plantation on Ancient Woodland Sites (PAWS) within 30m of the Order Limits. Four are adjacent to the Order Limits, but none are located within the Order Limits.

2.3.8 A total of 23 ancient, veteran and notable trees are located within 30m of the Order Limits. These were recorded during the arboricultural survey. The arboricultural survey results are contained in ES Appendix 13.5 Arboricultural Impact Assessment, Volume II (Document reference 6.2, DCO Volume 6).

2.3.9 There are a total of 16 habitats of principal importance (HPIs) within the field survey area. These all fall within the Order Limits apart from purple moor grass and rush pastures:

1. Arable field margins
2. Lowland acid grassland
3. Lowland calcareous grassland
4. Purple moor grass and rush pastures
5. Reedbed
6. Native hedgerows
7. Eutrophic standing water
8. Ponds that may be HPI
9. Rivers
10. Coastal sand dunes
11. Coastal vegetated shingle
12. Wet woodland
13. Lowland mixed deciduous woodland
14. Coastal and floodplain grazing marsh
15. Wood-pasture and parkland
16. Open mosaic habitats on previously developed land (OMH)

2.3.10 There are 15 UK Habitat Classification System (UKHab) [3] level 3 habitats within the field survey area. These are as follows:

1. Cropland (c1)
2. Fen marsh and swamp (f2)
3. Acid grassland (g1)
4. Calcareous grassland (g2)
5. Neutral grassland (g3)
6. Grassland and modified grassland (g4)
7. Hedgerows (h2)
8. Dense scrub (h3)
9. Standing open water and canals (r1)
10. Rivers and streams (r2)
11. Supralittoral sediment (s3)
12. Littoral sediment (t2)
13. Built-up areas and gardens (u1)
14. Deciduous woodland (w1)
15. Coniferous woodland (w2)

2.3.11 Urban habitats are mainly furthest east within the Order Limits in the suburban area of Havant. There are also areas of neutral grassland, scrub, sparsely vegetated land and woodland around Bedhampton Springs, wet woodland, mixed scrub, and neutral grasslands east of Budds Farm, and open mosaic habitat on previously developed land at the WRP site, which is a HPI.

2.3.12 To the west of Havant, there are large arable fields with occasional small, fragmented grassland parcels (some of which are moderate to high value neutral and HPI calcareous grasslands) and a combination of species-poor and species-rich hedgerow borders.

2.3.13 West of Crockerhill and to the far west of the Project, the dominant habitat is modified grassland livestock grazing pasture often bordered primarily by species-rich native hedgerows. There are occasional higher quality neutral grasslands, and shelterbelts of woodland, many of which qualify as lowland mixed deciduous woodland HPI.

2.3.14 The Order Limits cross several rivers and associated wetland habitats: the Wallington River, River Meon, River Hamble, and the River Itchen, Hermitage Stream and other smaller tributaries and wet ditches. The River Meon, Bow Lake, and River Itchen are designated as chalk river HPIs. There are areas of coastal and floodplain grazing marsh HPI associated with the Wallington River, River Hamble, River Meon, River Itchen and Bow Lake.

3 Green Infrastructure strategy

3.1 Introduction

3.1.1 This section sets out the Green Infrastructure strategy. It is a framework for integrating the Project within the multi-functional green and blue network across Hampshire and the surrounding landscape. It outlines impact avoidance, reinstatement and environmental mitigation embedded in the Project design.

3.2 Green Infrastructure vision

3.2.1 The existing green and blue infrastructure network and landscape includes parks and woodlands, grasslands, fields margins, grass embankments, street trees, hedgerows. It also includes rivers, streams, ponds and harbours. Through habitat and landscape reinstatement and mitigation, the Project will help safeguard the long-term economic and environmental well-being of the wider Hampshire community, in support of the vision for the Project:

"We're transforming the way we source, treat and supply water across Hampshire. Creating a new, resilient and sustainable water supply will protect and enhance the county's rare and sensitive chalk streams, while maintaining supplies for our communities and the local economy." ES Chapter 3 Description of the Proposed Development, Volume I (Document reference 6.1, DCO Volume 6).

Design principles

3.2.2 To deliver the Project vision, a series of scheme-wide and site-specific design principles have been developed to embed good design from the outset and to control the design of the Project post-consent. These are set out in the Design Principles Document (Document reference 5.11, DCO Volume 5).

Environmental Mitigation and Enhancement Areas

3.2.3 Locations for environmental mitigation are within EMEAs which are shown on the Works plans (Document reference 2.3, DCO Volume 2) and the EMEA plans within the Design Principles Document (Document reference 5.11, DCO Volume 5). The environmental mitigation in these EMEAs is secured in the Design Principles Document (Document reference 5.11, DCO Volume 5).

3.2.4 As well as environmental mitigation, the Project also seeks to provide environmental enhancement within the Order Limits. Locations for environmental enhancements are also shown within EMEAs on the Works plans (Document reference 2.3, DCO Volume 2) and in EMEA plans within the Design Principles Document (Document reference 5.11, DCO Volume 5). Potential enhancement proposals include habitat improvements adjacent to construction working areas. The Project is seeking consent to deliver these environmental enhancements, but these will only be implemented subject to securing agreements with landowners.

3.2.5 This Outline LEMP applies to the EMEAs as outlined above, as well as all areas of reinstatement planting throughout the Order Limits. The strategy for reinstatement planting is described in section 3.4 of this document.

3.3 Impact avoidance and reduction measures

3.3.1 The impact avoidance and reduction measures aim to reduce the impact of the Project on the landscape and biodiversity features.

3.3.2 Primary (embedded) mitigation, including the avoidance of habitats where practicable, proposed planting and landforms within the EMEAs, and the reinstatement of vegetation removed during construction has been incorporated within the design of the Project.

3.3.3 ES Appendix 3.1 Primary mitigation, Volume II (Document reference 6.2, DCO Volume 6) explains this and summarises key changes to the design of the Project which have been informed by the Environmental Impact Assessment (EIA) as part of the iterative design process.

3.3.4 The implementation of these measures has been considered when assessing the likely impacts and effects of the Project on landscape and biodiversity features in ES Chapter 8 Terrestrial and freshwater biodiversity, Volume I (Document reference 6.1, DCO Volume 6) and ES Chapter 13 Landscape and visual, Volume I (Document reference 6.1, DCO Volume 6). No secondary measures are proposed for landscape and visual effects as all measures are primary and embedded in the design. This approach is explained in section 13.9 of ES Chapter 13 Landscape and visual, Volume I (Document reference 6.1, DCO Volume 6) and ES Appendix 13.2 Landscape and visual impact assessment methodology, Volume II (Document reference 6.2, DCO Volume 6).

3.3.5 Tertiary measures relating to avoiding and reducing environmental effects during construction are set out in the Outline CEMP (Document reference 7.1, DCO Volume 7). These are important to avoid damage to retained existing landscape and ecological features such as landform and vegetation which, for example, in some instances screen views. They also ensure the protection of new planting, which is likely to be carried out in phases during the construction period.

3.3.6 There will be no loss or deterioration of ancient and veteran trees.

Historic environment

3.3.7 All proposed landscape and biodiversity features and planting defined post-consent must avoid impacts to significant archaeological remains (both buried and earthwork remains) and have regard to the historic and landscape character of the area in accordance with the Design Principle GDP_3 set out in the Design Principles Document (Document reference 5.11, DCO Volume 5, Version 1). The Outline Written Scheme of Investigation (Outline WSI) (Document reference 7.6, DCO Volume 7, Version 1), and ES Chapter 7 Archaeology and cultural heritage, Volume I (Document reference 6.1, DCO Volume 6), contain more information on these assets.

3.4 Strategy for the reinstatement of existing vegetation

3.4.1 The reinstatement of existing vegetation removed to facilitate construction would reduce adverse impacts of the Project and restore landscape character and ecological connectivity. Reinstatement is an essential component of the Project

and is secured in the Design Principles Document (Document reference 5.11, DCO Volume 5) which will control the design of the Project post-consent.

3.4.2 This section sets out the general principles and approaches that will be required to be followed to reinstate landscape and ecological features impacted by the Project.

3.4.3 As described in ES Chapter 3 Description of the Proposed Development, Volume I (Document reference 6.1, DCO Volume 6) a range of primary and tertiary measures have been embedded into design of the Project to avoid or reduce environmental effects.

3.4.4 Where the removal of vegetation during construction cannot be avoided, reinstatement will be undertaken. The loss of vegetation will be mitigated with replacement planting as close to the location of the existing vegetation as practicable, except where planting over pipeline restrictions exist. Planting over pipeline restrictions are set out in paragraphs 3.4.12 to 3.4.16 of this document. Where planting near to the original loss is not practicable, mitigation planting can be undertaken within EMEAs that have been identified as suitable for that typology of habitat.

3.4.5 The design of the new planting will replicate the ecological function of the vegetation removed to facilitate construction and will also have regard to the historic and landscape character of the area.

3.4.6 Vegetation will be reinstated according to its original UKHab type, except for certain types of woodland over and near to the pipeline; shrub and tree species selection is limited according to those listed in Table A-3 in Appendix A, which would prevent the reinstatement of lowland mixed deciduous woodland and wet woodland within 10m of the pipeline.

3.4.7 Detailed plant species lists for each of the reinstated habitats and the exact extent of the vegetation removal and therefore reinstatement planting required will be defined post-consent and will be set out in the detailed LEMPs, having regard to relevant guidance.

3.4.8 The following ratios would be applied to planting to compensate for the loss:

1. Category A: For each tree removed, three trees will be planted
2. Category B: For each tree removed, two trees will be planted
3. Category C/U: For each tree removed, one tree will be planted

3.4.9 As far as practicable, trees of the same species as those lost will be planted, if the tree lost is native, commercially available and appropriate to the local ecology. Where a specific species is not commercially available (such as common ash *Fraxinus excelsior)* or where a non-native tree is removed, it will be reinstated with a native species that is appropriate to the local ecology.

3.4.10 The specification for the size of trees that will be planted is set out in section 4.2, and the maintenance and management measures are set out in Appendix B.

3.4.11 Land which is to be returned to agricultural use will be reinstated as set out in the Outline Soils Resource Management Plan (Outline SRMP), refer to Appendix B of the Outline CEMP (Document reference 7.1, DCO Volume 7). A detailed CEMP(s) will be produced, in accordance with the measures contained in the Outline CEMP (Document reference 7.1, DCO Volume 7) and submitted for approval as secured

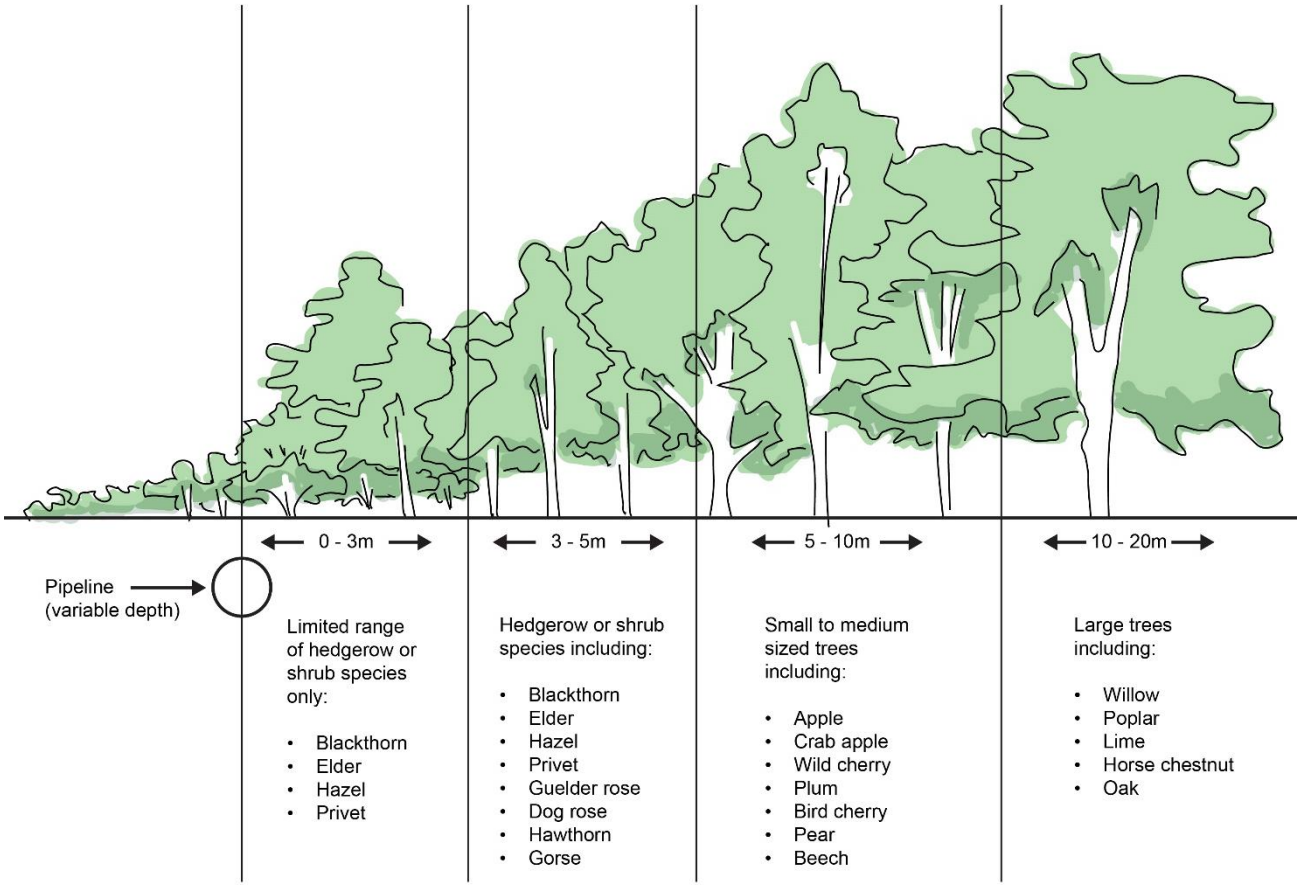
by the corresponding requirement in Schedule 2 to the draft DCO (Document reference 3.1, DCO Volume 3).

Planting over and near to the pipeline

3.4.12 The selection of species that can be planted over all the opencut sections of the pipelines is restricted to protect the pipelines and any planting undertaken as part of the Project from damage or interference.

3.4.13 The illustrative Graphic 3-1, and Table A-3 in Appendix A have been prepared to assist in determining appropriate species and planting distances from the Pipeline.

Graphic 3-1 Planting over and near to the pipeline



3.4.14 Restrictions on which species can be planted over the underground Pipeline will be followed within a protective strip of land of 10m either side of the centre line. These restrictions, which limit planting directly over the pipeline to shallow-rooted species, will take precedence over all other indicative species lists.

3.4.15 A longer indicative species list for the protective strip of land can be found Appendix A Table A-3 of this Outline LEMP. Woodlands are to be planted at least 10m from the pipeline.

3.4.16 The protective strip of land would not be required in locations where trenchless or tunnelling construction has been used as these sections would be at a greater depth.

Planting within other existing utility easements

3.4.17 All planting, including species selection and specification, within existing utility easements must adhere to the asset owners' safety and planting guidance. This includes areas beneath overhead power lines or over buried utilities and services. The requirements for each asset will be confirmed post-consent and will be set out in the detailed LEMPs with planting adapted accordingly.

3.5 Management and monitoring responsibilities

3.5.1 A suitably qualified ecologist, a landscape architect and an arboriculturist will be appointed to design, advise and oversee the implementation, establishment maintenance and long-term management and monitoring of planting and existing habitats. They should be members of the British Association of Landscape Industries (BALI) or equivalent. Their roles are defined as follows:

1. Ecologist – advising on ecological matters and requirements for compliance with relevant legislation, protected species licences and meeting objectives, providing monitoring and support as instructed.
2. Landscape architect – responsible for finalising the design and specification of proposed planting and management of existing habitats. Overseeing the planting, establishment maintenance, and long-term management and monitoring of new habitats, and advising on meeting objectives.
3. Arboriculturist – responsible for carrying out tree surveys during establishment maintenance and long-term management and monitoring of tree health having regard to the safety of the public and the operation of the Project.

3.5.2 The activities set out in Appendix B, Table B-2 relate to initial establishment and maintenance measures to be carried out during the first five years following planting of all new habitats and landscape features.

3.5.3 The activities set out in Appendix B, Table B-3 relate to long-term management measures. These will be carried out to ensure planting meets its intended environmental functions, from year six to the following time periods:

1. Within the EMEA that contains the WRP:
   a. Green roof and planting with a visual screening function will be managed for the lifetime of the Project.
   b. All other planting will be managed until established up to 15 years, to be defined in the detailed LEMPs.
3. Planting within EMEA that contain the AGPs will be managed for lifetime of the Project.
4. Planting within EMEA excluding the ones that contain the WRP and AGPs will be managed until established up to 15 years, the time frame will be dependent on the requirements of the planting and will be defined in the detailed LEMPs.

3.5.4 The activities set out in Appendix C, Table C-1 relate to monitoring of new planting to be carried out for up to 10 years.

Management of retained vegetation

3.5.5 Where the removal of vegetation for construction is not required, existing hedgerows, trees and other vegetation will be retained and will be protected during construction by measures set out in the Outline CEMP (Document reference 7.1, DCO Volume 7).

3.5.6 The management of retained vegetation within areas of permanent land-take post construction will be the same as the long-term management prescriptions of new planting as set out in section 4 and Appendix B.

Monitoring and evaluation

3.5.7 Monitoring will be undertaken to determine that the objectives within this Outline LEMP are met, ensure intended long term environmental functions are achieved, and to allow remedial action to be taken if problems arise.

3.5.8 Monitoring activities are set out in Appendix C, Table C-1 and best practice guidelines are set out in paragraph 4.1.10 of this Outline LEMP.

3.5.9 Monitoring results and reports will be made available, on request, to the relevant authority to review and make recommendations for remedial measures where objectives within the detailed LEMPs are considered not to have been met. The detailed LEMPs will be revised to take account of any agreed changes.

4 Habitat creation and management

4.1 Proposed planting

Introduction

4.1.1 This section addresses the objectives, principles and outline specification for planting and the replacement of vegetation lost due to construction. It addresses how this planting will be maintained to ensure that it successfully establishes and how it will be managed in the long-term.

General objectives

4.1.2 The proposed planting will deliver the following objectives:

1. Assist in integrating the AGP and WRP site elements of the Project into the landscape by responding to local character through layout and species selection.
2. Reinstatement of vegetation removed to facilitate construction of the Pipeline to help compensate for habitat loss and reinstate connectivity.
3. Creation of new habitats that link with existing Green Infrastructure networks to compensate for habitat loss.
4. Provide multiple functions and benefits, including visual screening of the AGP and WRP site, habitat and species mitigation, climate change resilience and amenity.

General principles

4.1.3 The following principles will guide the design of the proposed planting post-consent:

1. All planting must avoid impacts to significant archaeological remains (both buried and earthwork remains), respect the setting and character of historic assets, and seek to restore heritage features and historic landscapes where feasible and appropriate.
2. Plant species mixes will be adapted to each location to respond to local character and site conditions, with reference to UKHab and National Vegetation Classification (NVC) survey results.
3. Proposed planting will be designed to integrate with existing vegetation to provide continuous habitat as far as practicable.
4. The edges of areas of planting will be feathered to increase habitat diversity and create ecotones.
5. Native species will typically make up the vast majority of planting within the proposed Green Infrastructure.
6. Plant mixes will comprise a diversity of species and provenances to maximise resilience to pests, diseases and climate change.
7. Inter-planting will be carried out to fill gaps that may develop in existing vegetation where this provides a screening function.

8. Planting positions and species choice for replacement and new trees and shrubs will comply with the guidelines included within section 4.2, section 4.4, and Appendix A.

Outline specification

4.1.4 The method for establishing species lists involves utilising the species included in the floristic tables of the relevant NVC community/sub-community. The NVC communities and sub-communities have been identified by NVC field surveys within or in proximity to any areas of higher value habitat subjected to loss that is being mitigated. Habitats were scoped in for NVC survey if they met any of the following criteria:

1. Identified as Very High, High or potentially High distinctiveness according to the Statutory Biodiversity Metric User Guide [4].
2. Sites designated for botanical or habitat features or for potentially supporting protected or notable plant species as identified from the desk study.

4.1.5 Where a habitat has not been subject to NVC surveys, indicative species lists have been derived from the UKHab classification for that habitat type.

4.1.6 The Project is within National Character Areas (NCA) 125, 126, 128 and 130. The Order Limits and the majority of the study area lie within NCA 128: South Hampshire Lowlands. Indicative plant species lists set out in Appendix Arespond to the NCAs as defined by Natural England (NE).

4.1.7 The final species mixes, including the percentage mix of each species will be developed post-consent, and will be set out in the detailed LEMPs.

1. Species will be adapted to respond to, and reinforce, the different character areas of the landscape across the Project.
2. Species will be selected based on the habitat where they will be planted with regard to resilience and target condition.
3. Plant species percentages will be adapted from the frequency and abundance values of each species in the floristic table of the NVC community being recreated.
4. Analysis of local soil type and conditions will be used to help inform final species mixes and highlight any potential issues that could impact plant health.

4.1.8 Final species plant numbers, detailed specifications for plant material, planting, establishment maintenance and long-term management will also be developed post-consent and will be set out in the detailed LEMPs.

4.1.9 Species diversity in trees, woodland and hedgerow is important as a diverse range of plants can help cope with warmer climates and limit the damage caused by pest and disease outbreaks, enhancing biosecurity. Current Forest Research guidance stresses this, by suggesting a mix of provenances (the geographical origin of the plant material) of recommended species that are resilient and adaptable for an unpredictable future climate. This can include selecting material with a genetic origin up to 2 to 5 degrees south of the place of planting. Where practicable, this guidance will be followed. The provenance of all plant material will be recorded.

4.1.10 The specification will be developed with reference to best practice including:

1. Forestry Commission (2019) Forest Reproductive Material: Regulations controlling seed, cuttings and planting stock for forestry in Great Britain (2nd Edition) [5]
2. Forestry Commission (2023) The UK Forestry Standard: The governments' approach to sustainable forest management (5th edition) [6]
3. Landscape Institute (2019) Plant Health and Biosecurity: The Landscape Consultant's Toolkit [7]
4. Tree & Design Action Group (2019) Tree Species Selection for Green Infrastructure: A Guide for Specifiers [8]
5. Tree & Design Action Group (2014) Trees in hard landscapes: A guide for delivery [9]
6. Forest Research (2019b) The Right Trees for Changing Climate Database [10]
7. Forest Research (2018) Urban Tree Manual [11]
8. Institution of Civil Engineers (2023) ICE Manual of Blue-Green Infrastructure [12]
9. Forschungsgesellschaft Landschaftsentwicklung Landschaftsbau e.V. (2018) Green/brown roof Guidelines [13]
10. Green/brown roof Organisation (GRO) (2021) The GRO Green/brown roof Code [14]
11. Hall, J.E., Kirby, K.J. & Whitbread, A.M. (2004) National Vegetation Classification Field Guide to Woodland [15]
12. Nature Conservancy Council (1991) British Plant Communities Volume 1: Woodlands and scrub [16]
13. Nature Conservancy Council (1992) British Plant Communities Volume 3: Grasslands and Montane Communities [17]

4.1.11 Relevant standards that will be applied include:

1. PAS 100:2018 - Specification for composted materials
2. BS 3882:2015 - Specification for topsoil
3. BS 3936-1:1992 - Nursery stock - Specification for trees and shrubs
4. BS 3936-4:2007 - Nursery stock - Specification for forest trees, poplars and willows
5. BS 4428:1989 - Code of practice for general landscape operations (excluding hard surfaces)
6. BS 8545:2014 - Trees: from nursery to independence in the landscape. Recommendations
7. BS 42020:2013 - Biodiversity. Code of practice for planning and development
8. BS 8683:2021 - Process for designing and implementing Biodiversity Net Gain

General principles for establishment maintenance

4.1.12 All new planting will be subject to a five-year establishment period. During this time, all plants found to be dead or dying at the end of each growing season will be replaced within the next planting season.

4.1.13 If areas of planting are seen to be failing, additional soil samples will be taken and analysed if required to identify potential soil issues affecting plant health. Either soil remediation will be undertaken, or a more suitable species will be chosen. Any material changes to the overarching planting scheme including typology and objectives within detailed LEMPs will be approved with the relevant authority, although for the avoidance of doubt such approval will not be required for minor variations in species (for example if a particular species is unavailable and requires substitution with a similar species).

4.1.14 In the interests of wildlife, hand weeding, where feasible, will take precedence over the use of pesticides including insecticides, fungicides and herbicides. However, in the treatment of invasive non-native species, the measures set out in the Invasive Non Native Species (INNS) Biosecurity Plan (Document reference 7.10, DCO Volume 7) take precedence. The measures contained in the INNS Biosecurity Plan are secured by a requirement in Schedule 2 to the draft DCO (Document reference 3.1, DCO Volume 3).

4.1.15 The specific maintenance in Appendix B, Table B-2 will be carried out within the five-year establishment period after planting.

General principles for long-term management

4.1.16 Following the completion of the five-year establishment period, management will be carried out to ensure planting meets its intended environmental functions, the time periods of for which are set out in paragraph 3.5.3 and the principles of which are set out in Appendix B.

4.1.17 The prescribed management activities will be carried out in such a way that they will not require the removal of or compromise the function of landscape mitigation.

4.1.18 Management of existing and proposed trees, scrub and hedgerows as well as grasslands with nesting potential will, as far as practicable, be planned to avoid the bird nesting season (the main nesting bird season is nominally March to August inclusive). If essential works are required during the bird nesting season, then a suitably qualified ecologist will be required to check for the presence of active nests, or nests that are in the process of being built, prior to any works.

4.1.19 Where there are security buffer areas between or outside fences at AGP sites, these areas will be managed to act as fire breaks to manage wildfire risk at the AGP sites, including through frequent mowing of grass in such areas. This will be set out in an emergency response plan that will be prepared by the Contractor post-consent as secured by the Operational Environmental Management Plan (OEMP) (Document reference 7.7, DCO Volume 7). This aligns with guidance from Natural England [18] and the Forestry Commission [19] and relevant UK obligations under the Construction (Design and Management) Regulations 2015 [20] and Health and Safety Executive Fire safety in construction guidance [21].

4.1.20 The specific long term management Appendix B, Table B-3 will be carried out from year 6 after planting.

4.2 Trees and woodland

Introduction

4.2.1 The Project will increase woodland coverage. Existing woodland will be retained and protected, except where removal is necessary for construction. Any woodland lost will be replaced with new woodland following the reinstatement strategy set out in section 3.4.

4.2.2 Spatial typology: Four types of woodland and tree planting are proposed with different primary functions. These planting types are:

1. Woodland block planting
2. Tree planting within hedgerows
3. Scattered tree planting
4. Visual screening tree planting

4.2.3 Species typology: The woodland and tree planting types will comprise the following UKHab categories, which are broken down into NVC communities where applicable for each planting location (see Appendix A, section A.3):

1. Wet woodland (w1d)
2. Lowland mixed deciduous woodland (w1f)
3. Other woodland; broadleaved (w1g)
4. Other woodland; mixed (w1h)
5. Lines of trees (w33 and w34)

Objectives

4.2.4 The proposed tree and woodland planting seek to deliver the following objectives:

1. Trees and shrubs will be established to the density and species composition specified in the detailed LEMPs within the first five years following planting.
2. A closed canopy by year 15 of operation, excluding glades and rides, and with the exception of planting over the pipeline.
3. Reinforcement of existing woodland by interplanting to provide a more resilient age structure and species composition.
4. Connecting existing and proposed woodlands to surrounding habitats in the wider landscape, such as hedgerows and lines of trees.
5. Management which facilitates progress towards establishment of woodland with a well-developed vertical structure of three or more storeys and recognisable NVC communities:
    a. A ground layer - supporting grasses, herbs, ferns, mosses, and lichens.
    b. A field layer - supporting low-growing plants.
    c. An understory layer - consisting of low-growing shrubs and coppice stools, smaller tree species and emerging larger tree species.
    d. A canopy layer - with trees that are a range of different heights.

e. Retained deadwood – both standing and fallen, which provide habitat for invertebrates and fungi.

f. Open areas – integrating areas of open ground such as glades and rides (approximately 10%) that have no mature trees, letting light reach the understory, ground and field layers.

Principles

4.2.5 The following principles will guide the design of proposed planting post-consent:

1. Woodland planting will be designed to integrate with the surrounding landscape, including existing woodlands and hedgerows, enhancing habitat connectivity and overall landscape character. The exact number of plants and stock size will be determined post-consent and will be set out in the detailed LEMPs, taking consideration of the interface between proposed planting and existing vegetation.
2. The design will be informed by NVC survey data of existing woodlands collected in the vicinity of the new planting, which is set out in ES Appendix 8.2 Habitats, Volume II (Document reference 6.2, DCO Volume 6), and Annex A of ES Appendix 8.2 Habitats, Volume II (Document reference 6.2, DCO Volume 6). It will also be informed by the landscape character assessments in ES Appendix 13.3 Landscape baseline and effects, Volume II (Document reference 6.2, DCO Volume 6). The design will also be informed by any additional surveys carried out post-consent. This will ensure that the planting reflects the specific conditions, landscape and historic character of each location.
3. The exact density and species composition (see indicative list in Appendix A, section A.3) will be finalised post-consent. This process will consider the woodland's typology, primary function and soil type and may include defining additional sub-types if needed.
4. To reduce ongoing maintenance requirements, the density of climax trees will be planned to reduce the need for future thinning.
5. Understory planting will be sparse, particularly at the edges, to encourage natural colonization by scrub and ground flora.

Outline specification

4.2.6 The following sections provide the design requirements for the different types of new tree planting across the Project post-consent:

Woodland block planting

4.2.7 The primary purpose of the woodland planting is to mitigate habitat impacts resulting from construction. This planting will also contribute to reinforcing historic landscape patterns and local landscape character and improving biodiversity by connecting and extending existing woodlands. The following design requirements apply:

1. The central areas of the woodland will be predominantly trees, while the edges will contain a greater abundance of scrub, with gaps left to allow for natural colonisation.

2. Trees will be planted at a spacing of 2m to 3m centre-to-centre.
3. The majority of plants will be nursery transplants, ranging from 40cm to 60cm and 60cm to 80cm in height. These smaller plants establish better than larger plants as their root system adapts to their surrounding conditions as they grow.
4. Approximately 20% of the planting mix will consist of larger feathered trees, ranging from 150cm to 175cm and 200cm to 250cm in height, depending on the species.
5. All transplants will be notch planted in cultivated ground and protected by biodegradable plant tubes with appropriate support during establishment.
6. Feathered and standard trees will be pit planted, supported by appropriate timber stakes and tree shelters, installed according to the manufacturer's recommendations.
7. While English elm *Ulmus procera* was once prevalent in the South England landscape, Dutch elm disease has significantly reduced their numbers. Recognising their importance for invertebrate diversity, elm will be included in planting mixes on the basis that only disease resistant cultivars are used.
8. For Common ash, there is currently a prohibition on importation and inland movements of ash seeds, plants or other planting material. It is not therefore expected to be included in planting mixes due to susceptibility to Chalara ash dieback *Hymenoscyphus fraxineus* and lack of commercially available stock. A mixture of broadleaved species will be planted in their place to provide for as many ash-associated species as possible [22]. Research into ash dieback is ongoing and disease resistant strains may become available. The inclusion of disease resistant strains will be reviewed by the Contractor post-consent and will be set out in the detailed LEMPs.

Tree planting within hedgerows

4.2.8 Trees will be sparsely distributed in hedgerows to strengthen field margins, reinforce historic field patterns and local landscape character, and strengthen and improve biodiversity of existing and reinstated hedgerows. The following design requirements apply:

1. Trees within hedgerows will be planted at a spacing of 15m to 20m centre-to-centre, to allow them to develop full crowns without competing or producing too much shade, and with irregular spacing between them to blend with the existing landscape pattern.
2. Trees will be selected which are appropriate for the landscape character, provide shelter for wildlife and livestock, and strengthen habitats.
3. Where hedgerows contain tree species susceptible to climate change, consideration will be given to reinstating with more resilient species.
5. Natural gaps in hedgerows will be utilised for planting to allow for better establishment of newly planted trees.
6. Size of trees: Feathered to light standard trees up to 8cm in girth, 150cm to 250cm in height.

Scattered tree planting

4.2.9 Scattered trees will be delivered as landscape mitigation to integrate AGPs into the surrounding landscape pattern and historic character, and mitigate habitat impacts resulting from construction, in locations where they reinforce existing wood pasture and parkland. These habitats support a wide range of species, many of which occur only in these habitats, particularly insects, lichens and fungi which depend on dead and decaying wood.

4.2.10 The following design requirements apply:

1. Where there is existing historic wood pasture and parkland in the wider landscape, planting will be designed with consideration to its historic character and features (though it cannot replicate their exact historic condition). For example, placement of new tree planting will preserve features such as old boundaries and vistas and strengthen it by extending it in new areas where appropriate. This will be developed post-consent and will be set out in detailed the detailed LEMPs. More information on these areas can be found in the ES Chapter 7 Archaeology and cultural heritage, Volume I (Document reference 6.1, DCO Volume 6), and Outline WSI (Document reference 7.6, DCO Volume 7).
2. Scattered trees will be planted at a spacing of 15m to 20m centre-to-centre or as required to blend with surrounding landscape and historic context.
3. Trees planted in grazing fields will have extra protection from animal disturbance, (e.g. stronger guards).
4. Standing and fallen deadwood will be left on site as invertebrate habitat.
5. Size of tree: extra heavy standard trees or above, minimum 14cm in girth and 400cm in height, as larger trees are more tolerant to browsing.

Tree planting for visual screening

4.2.11 Trees will be used to visually screen or filter certain views impacted by the WRP site and AGP and integrate with the surrounding landscape structure and biodiversity. Where block planting is appropriate, it will comprise a higher density of planting and more scrub species than conventional woodland to maximise visual screening. Where lines of trees are appropriate, trees will be spaced to form a closed continuous canopy when mature. The following design requirements apply:

1. Visual screening planting will be located with consideration to historic landscape character and pattern.
2. Visual screening tree planting will be at a spacing of 1.2m to 1.8m centre-to-centre.
3. Existing tree and scrub vegetation will be retained to create a multi-layered screen with a high evergreen content (minimum 30%).
4. Maintain 3m buffer around facility fence lines and assets as required for security.
5. Size of trees: the majority of trees will be transplants, with a small proportion of approximately 20% a mix of feathered, select and heavy standard, up to 14cm in girth, 350cm in height.

Establishment maintenance

4.2.12 The specific maintenance in Appendix B, Table B-2 will be carried out within the five-year establishment period after planting.

Long-term management

4.2.13 The principles in Appendix B, Table B-3 will apply to the management of new woodland planting once it has fully established, and existing retained woodland within the EMEAs shown on the Works plans (Document reference 2.3, DCO Volume 2) and the EMEA plans within the Design Principles Document (Document reference 5.11, DCO Volume 5).

4.2.14 Detailed requirements of existing tree management are included in the ES Appendix 13.5 Arboricultural Impact Assessment, Volume II (Document reference 6.2, DCO Volume 6).

4.3 Hedgerows

Introduction

4.3.1 Native hedgerows, both with and without trees, will provide wildlife corridors throughout the Order Limits. In some locations, hedgerows, including existing hedgerows, will also provide a visual screening function. Some existing hedgerows within the Order Limits provide key connective locations (KCLs) for bat species or species groups. There are existing hedgerows within the Order Limits classified as 'important' hedgerows under the Hedgerows Regulations (1997) [23], i.e. they have existed for 30 years or more and satisfy one of several criteria listed under two categories: archaeology and history, wildlife and landscape. Reinstatement planting will consider any specific requirements around 'important' hedgerows.

4.3.2 Existing and proposed hedgerows will be managed according to the Management of Hedgerows (England) Regulations 2024.

4.3.3 Spatial typology: the Project will include the four following types of hedgerow planting:

1. Hedgerow reinstatement planting
2. Hedgerow reinstatement planting at KCLs
3. Hedgerow infill planting (see interplanting section 4.7)
4. New hedgerow creation

4.3.4 Species typology: hedgerow planting will comprise the following UKHab categories with indicative species planting lists provided in Appendix A.

1. Native hedgerow (h2a)
2. Native hedgerow with trees (h2a, 11)
3. Species-rich native hedgerow (h2a5)
4. Species-rich native hedgerow with trees (h2a5, 11)
5. Non-native and ornamental hedgerow (h2b)

Objectives

4.3.5 The proposed hedgerow planting will deliver the following:

1. Management which facilitates progress a continuous, dense hedgerows by year 15 of operation.
2. Reinforce existing hedgerows by filling out gaps along the length and between the ground and base of the canopy with a variety of native species, providing a more resilient age structure and species composition.
3. Connect existing and proposed habitats across the Project and the wider landscape.
4. Provide visual screening.
5. Reinstatement of KCLs to ensure habitat fragmentation impacts on bats are short term.

Principles

4.3.6 The following principles will guide the design of proposed planting post-consent:

1. Sections of hedgerows that will be crossed by the Project may need to be removed to facilitate construction. On completion of construction, the affected hedgerow sections will be reinstated in full, respecting the legal extent of any PRoW, and a diversity of native woody species will be used to improve their biodiversity value.
2. For 'important' hedgerows under the Hedgerows Regulations 1997 [23], all qualifying criteria will be reinstated as detailed within ES Appendix 8.2 Habitats Annex A, Volume II (Document reference 6.2, DCO Volume 6).
3. Proposed hedgerows will, as far as practicable, follow the lines of existing or historic field boundaries.
4. The extent of gapping up required will be determined post-consent and will be set out in the detailed LEMPs based on field surveys and local and historic landscape character.
5. A wide range of native woody species will be used to maximise biodiversity value, including fruit and nut bearing species to provide a food source for birds and small mammals.
6. The ultimate spread of hedgerows will be defined post-consent and will be set out in the detailed LEMPs to allow for future maintenance and proximity to PRoW when setting out, to avoid PRoWs becoming obstructed by vegetation.
7. Specific characteristics of important hedgerows will be retained where feasible. The exact species mix for each hedgerow will be developed post-consent and will be set out in the detailed LEMPs to respond to the character and context of the site and species that are prevalent in the local landscape. An indicative list of key hedgerow species is given in Appendix A.

Outline specification

4.3.7 Hedgerow plants will be notch planted into cultivated ground in a double staggered row at five plants per linear metre, with 60cm between rows. Plants will be supported by appropriate stakes and guards.

4.3.8 Gaps in existing hedgerows will be filled by interplanting with excavation by hand where necessary to reduce ground disturbance around existing plants.

4.3.9 Hedgerow planting at KCLs will be with 1.5m standards rather than whips. Hedgerow planting outside of KCLs will comprise a mix of 40cm to 60cm and 60cm to 80cm transplants.

4.3.10 Paragraph 4.2.8 sets out principles in relation to tree planting within hedgerows.

Establishment maintenance

4.3.11 The specific maintenance in Appendix B, Table B-2 will be carried out within the five-year initial establishment period after planting.

Long-term management

4.3.12 The principles in Appendix B, Table B-3 will apply to the management of existing retained hedgerows within the EMEAs and new planted hedgerows within the Order Limits once they have fully established. These are shown on the Works plans (Document reference 2.3, DCO Volume 2) and the EMEA plans within the Design Principles Document (Document reference 5.11, DCO Volume 5).

4.3.13 Detailed requirements of the management of existing trees within hedgerows are included in the ES Appendix 13.5 Arboricultural Impact Assessment, Volume II (Document reference 6.2, DCO Volume 6).

4.4 Scrub

Introduction

4.4.1 The Project will replace scrub lost during construction and introduce new scrub to integrate with existing habitats and landscape patterns. In some locations, this scrub will provide visual screening where woodland is unsuitable.

4.4.2 Spatial typology: The Project will include the following two types of scrub planting:

1. Scrub reinstatement planting
2. New mixed scrub creation

4.4.3 Species typology: The scrub planting will comprise the following UKHab types, with indicative species planting lists provided in Appendix A, section A.6.

1. Mixed scrub (h3h)
2. Hawthorn scrub (h3f)

Objectives

4.4.4 The proposed scrub will deliver the following:

1. Increase habitat diversity of other habitats including HPIs, particularly woodlands. This will include edges, glades, and rides, where appropriate and consistent with the existing habitat and landscape and historic character.
2. Connecting adjacent habitats, providing corridors for species.

3. Widen hedgerows to improve habitat diversity and provide visual screening where needed, as identified in the Design Principles Document (Document reference 5.11, DCO Volume 5).
4. Provide food sources and cover for birds and mammals, including badgers.

Principles

4.4.5 The following principles will guide the design of the proposed planting post-consent:

1. Plant species mixes will be adapted to each site to respond to local character and site conditions, and species which are prevalent in the local landscape.
2. A review of soil type and nutrient content will be undertaken post-consent and will be set out in the detailed LEMPs, to inform the method of soil preparation and final species mixes.
3. An indicative list of scrub species is given in Appendix A.
4. The exact number of plants and stock size will be determined post-consent and will be set out in the detailed LEMPs taking consideration of the interface between proposed planting and existing vegetation.

Outline specification

4.4.6 Natural regeneration is the process of allowing plants to naturally colonise the land. This can occur where there is a ready source of seed, where scrub has previously been cut down to ground level or suckers (new growth on existing plants that develops under the ground from the root or the main stem), from existing scrub. This can lead to the expansion of existing habitats and the creation of new scrub patches within grasslands. It can be promoted by exposing bare ground in areas of proposed scrub planting.

4.4.7 Natural regeneration will be considered on a site-by-site basis post-consent and based on an assessment of site suitability and the presence of desirable species which appear to naturally succeed locally.

4.4.8 Where natural regeneration is not possible:

1. Plants will be notch planted into cultivated ground at five plants per metre.
2. Plants will be supported by appropriate stakes and guards.
3. Where planted directly adjacent to hedgerows or woodland, excavation by hand will be used where necessary to reduce ground disturbance around existing plant roots.
4. Scrub planting will comprise a mix of 40cm to 60cm and 60cm to 80cm transplants.

Establishment maintenance

4.4.9 The specific maintenance in Appendix B, Table B-2 will be carried out within the five-year initial establishment period after planting.

Long-term management

4.4.10 The principles in Appendix B, Table B-3 will apply to the management of existing retained scrub and new planted scrub within the Order Limits once it has fully established. These within the EMEAs on the Works plans (Document reference 2.3, DCO Volume 2) and the EMEA plans within the Design Principles Document (Document reference 5.11, DCO Volume 5).

4.4.11 If trees are included in the scrub in the final species mix post consent, the specific maintenance in Appendix B, Table B-2 will be carried out within the five-year establishment period after planting and the principles in Appendix B, Table B-3 will apply once it has fully established.

4.5 Grassland

Introduction

4.5.1 A variety of grassland types will be planted as part of the Project. Modified grasslands will provide amenity value around infrastructure and in more publicly visible places where a more intensive management approach is suitable, and low diversity grazing pastures will be reinstated. More species-rich neutral grasslands will be planted in a variety of species-dominant subtypes to reinstate habitats, promote diversity and maintain the natural character of the landscape. A single parcel of other lowland acid grassland will be reinstated. Species-rich calcareous grassland will be reinstated and created to provide high biodiversity value and opportunities for specialised species within these habitats.

4.5.2 Grassland planting is also proposed in the wood-pasture and parkland HPI north of Winter's Hill in conjunction with grassland reinstatement. The species composition of the grassland there most closely relates to *Lolium* – *Cynosurus* neutral grassland (g3c6). An indicative species list for this grassland type can be found in Appendix A, section A.6. The grassland is currently managed through livestock grazing. Specific management practices will be adopted to maintain the overarching habitat status as wood-pasture and parkland HPI and enhance the grassland species diversity and composition to its optimal state as a *Lolium* – *Cynosurus* neutral grassland.

4.5.3 Overall, four principal types of grasslands are proposed across the Order Limits:

1. Acid grassland reinstatement
2. Calcareous grassland reinstatement and creation
3. Modified grassland reinstatement (amenity grassland and grazing pasture)
4. Neutral grassland reinstatement and creation

4.5.4 The grassland planting will comprise the following UKHab categories, which are broken down into NVC communities suitable for each planting location, see Appendix A, section A.6:

1. Other lowland acid grassland (g1d)
2. Lowland calcareous grassland (g2a)
3. Arrhenatherum neutral grassland (g3c5)
4. Lolium - Cynosurus neutral grassland (g3c6)

5. Deschampsia neutral grassland (g3c7)
6. Holcus – Juncus neutral grassland (g3c8)
7. Modified grassland (g4)

Objectives

4.5.5 The proposed grassland planting seeks to deliver the following objectives:

1. The diversification of the flora of the fields over and above that presently found within the EMEAs.
2. Mitigation for the loss of grassland due to habitat loss.
3. Habitat suitable for birds and a range of insects and other invertebrates achieving an increase in biodiversity.
4. The stabilisation of the soils where required around the AGP sites to prevent any loss of soil in run-off.

Principles

4.5.6 The following principles will guide the design of proposed grassland planting post-consent:

1. Plant species mixes will be adapted to each site to respond to local character and site conditions.
2. A review of soil type and nutrient content will be undertaken post-consent to inform the method of soil preparation and final species mixes.
3. The final species mixes will be agreed post-consent, with the relevant local planning authority and will be set out in the detailed LEMPs.
4. Priority will be given to grass seed harvested from donor grassland sites where feasible and appropriate, to maintain continuity with existing grasslands. This approach is particularly critical for the creation of new chalk grassland. If not possible, commercially sourced grass seed of local provenance should be used.
7. Localised soil reuse will be considered in areas of new chalk grassland planting adjacent to existing chalk grassland, to protect and maximise ecological benefits.
8. Reuse of chalk arisings from tunnelling activities will be considered in areas of new chalk grassland creation.
9. Soil preparation method will be planned in advance of and integrated into works to AGP sites.
10. The use of pesticides including insecticides, fungicides and herbicides will be avoided. However, in the treatment of invasive non-native species, the measures set out in the INNS Biosecurity Plan (Document reference 7.10, DCO Volume 7) take precedence.
11. The use of fertilisers and irrigation will be avoided.
12. Depending on the location of the grassland, the long-term management regime shall be suitable for the context, soil and grassland type e.g. mowing, grazing etc. Livestock grazing will be prioritised above mowing where possible, with stock quantity and seasonal timing deduced post-consent.

13. Grassland shall be monitored by the Contractor for changes in composition and structure, and future management adjusted accordingly.
14. Where chalk grassland is planted in combination with scrub and other habitat types, management must prioritize chalk grassland, as it is the more locally important habitat, and prevent the scrub and tree habitats from becoming dominant.

Outline specification

4.5.7 A list of indicative grassland species is given in Appendix A, section A.6. This will be tailored and expanded for each area of grassland planting depending on location to respond to character and context.

4.5.8 Three main grassland creation approaches will be used that respond to the different conditions and constraints across the Project, the needs of particular grassland types and the objectives of the grassland. The appropriate method for each area will be determined post-consent. These approaches include:

1. Ploughing and harrowing: ploughing followed by a light harrowing to prepare for seed sowing.
2. Soil skimming: Partial removal of the existing topsoil, primarily in areas with low chalk influence.
3. Natural regeneration: Allowing natural regeneration in selected areas, with targeted removal of undesirable species.

4.5.9 Seeding, where applicable to the method of grassland creation, will be completed in either autumn or spring and only once the receiving soils have been adequately prepared.

4.5.10 Seeding and rolling, where applicable to the method of grassland creation, will be carried out in dry weather and access will be prohibited to seeding areas until seed has germinated and a sward has established.

4.5.11 All ground preparation, digging and planting must avoid impacts to significant archaeological remains (both buried and earthwork remains) and respect the setting and character of historic assets.

Establishment maintenance

4.5.12 The specific maintenance in Appendix B, Table B-2 will be carried out within the five-year initial establishment period after planting.

Long-term management

4.5.13 The principles in Appendix B, Table B-3 will apply to the management of existing retained grassland within the EMEAs and new planted grassland within the Order Limits once fully established. These are shown on the Works plans (Document reference 2.3, DCO Volume 2) and the EMEA plans within the Design Principles Document (Document reference 5.11, DCO Volume 5).

4.6 Urban

Introduction

4.6.1 Three types of urban habitat of value to biodiversity will be reinstated and/or created:

1. Biodiverse green/brown roof at the WRP site.
2. Ground-level open mosaic habitat.
3. Sparsely vegetated land at Bedhampton Springs.

4.6.2 Open mosaic habitat on previously developed land will be replicated in the design of the WRP site green/brown roof to aid landscape integration and provide ecological mitigation for the habitat lost within the WRP site.

4.6.3 The OMH plays a crucial role in supporting biodiversity in urban environments, particularly terrestrial invertebrates, providing a large variety of micro-habitats in several mosaics at varying scales, an important early nectar resource for invertebrates through spring flowering annuals, and several rare plant species not found in other habitats.

4.6.4 The OMH HPI comprises other calcareous grassland (g2c) and *Holcus* – *Juncus* neutral grassland (g3c8). Both grasslands are largely indicative of neutral grasslands, but a portion contains enough calcareous indicator species to be classified as other calcareous grassland. The overarching NVC community was MG10b *Holcus lanatus* – *Juncus effusus* rush-pasture. Whilst the grassland type will not be directly replaced through the green/brown roof, the plant species composition will reflect the plant species of the community as far as practicable, with any species unsuitable for green/brown roof planting (primarily due to their intolerance to dry conditions) to be included in ground-level landscaped areas around the WRP buildings as part of the ecological mitigation. This planting will also extend into areas with potential for future operational use replicating the MG10b grassland NVC subcommunity.

4.6.5 The sparsely vegetated land present at Bedhampton Springs will be reinstated through the natural recolonisation of pioneering and early successional plant species in the area (left as bare earth and mixed substrates) following its use as siting temporary construction compound B1-3.

4.6.6 Urban habitat planting types are summarised as follows:

1. Biodiverse green/brown roof planting, emulating the grasslands within the WRP site wherever possible.
2. Ground-level MG10b *Holcus lanatus* – *Juncus effusus* rush-pasture planting.
3. Ground-level earth and mixed substrates left to be naturally recolonised with pioneering and early successional species at Bedhampton Springs.

4.6.7 Urban habitat planting will comprise the following UKHab categories (which is broken down into the relevant NVC community for the WRP site green/brown roof, see Appendix A, section A.7):

1. Biodiverse green/brown roof (u1b5, 87)
2. Other calcareous grassland (g2c)
3. *Holcus-Juncus* neutral grassland (g3c8)

4. Sparsely vegetated urban land (u1f)

Objectives

4.6.8 The proposed urban planting seeks to deliver the following objectives:

1. A mosaic of microhabitats will be created to maximise the variety of microhabitats within the WRP site, including bare ground, sparsely vegetated areas, patches of different vegetation types (grassland, scrub, wetland), and variations in substrate (e.g. low nutrient soil, gravel, stones, rubble).
2. Nectar-rich, drought-resilient species will be selected as part of any self-contained planter species composition.
3. The diverse habitat mosaic must be attractive to and support a variety of plants, invertebrates, reptiles, amphibians, birds, and small mammals.
4. The WRP site green/brown roof will specifically seek to replicate the OMH HPI features, namely:
    a. Ruderals
    b. Ephemeral pools
    c. Open grassland
    d. Wildflower-rich grassland
    e. Bare ground

Principles

4.6.9 The following principles will guide the design of proposed urban planting post-consent:

1. The green/brown roof will cover as large an area as reasonably practicable.
2. An indicative list of species is given in Appendix A, section A.7.
3. The design of the green/brown roof will include drainage and water management within the mosaic, creating both drier and wetter areas to replicate the OMH habitat as far as reasonably practicable.
4. Soil preparation method will be planned in advance of and integrated into works to the WRP site.
5. The use of fertilisers will be avoided.
6. The use of pesticides including insecticides, fungicides and herbicides will be avoided. However, in the treatment of invasive non-native species, the measures set out in the INNS Biosecurity Plan (Document reference 7.10, DCO Volume 7) take precedence.
7. Regular monitoring to assess performance is required, to inform adjustments and ensure target conditions are met.

Outline specification

4.6.10 Creating OMH requires recreating the processes of natural colonization and disturbance on previously developed or disturbed land such as ‘brownfield’ sites.

4.6.11 Biodiverse green/brown roof at the WRP site:

1. A mosaic of early successional communities including areas of open and wildflower-rich grasslands, both neutral and calcareous, and ruderals with areas of bare ground.
2. A pitch between 2° and 9°.
3. A low nutrient substrate will be used to ensure areas of bare ground persist. The depth shall vary from 80mm to 150mm, with areas of the substrate remaining largely exposed, or covered with only very sparse vegetation. Where reasonably practicable, existing open mosaic habitat substrates from the site will be used to retain the seedbank.
4. Plug-planting will be prioritised over seeding, as the roof-top will be more exposed, particularly to winds, rain and drying out. Plug plants are faster to establish and more resilient.

4.6.12 Ground-level open mosaic habitat:

1. A mosaic of early successional communities with varying topography, including ditches, ruderal vegetation, open and wildflower-rich grassland (both neutral and calcareous) and pools.
2. A suitable low nutrient substrate will be used to ensure that areas of bare ground persist. Where reasonably practicable, existing open mosaic habitat substrates from the site will be used to retain the seedbank.
3. Seeding will be completed in either autumn or spring and only once the receiving substrates have been tilled and adequately prepared.
4. Seeding will be carried out in dry weather and access will be prohibited to seeding areas until seed has germinated and the plants have established. The seeds will be distributed at a density and pattern designed to create a mosaic of vegetation, which will be sparser than a typical dense grass sward.
5. The appropriate method for substrate preparation to achieve this where practicable will be determined post-consent.

4.6.13 Sparsely vegetated land at Bedhampton Springs:

1. A mosaic of bare ground and variations in substrate (e.g. low nutrient soil, gravel, stones, rubble) left to be naturally recolonised with pioneering and early successional species. Further species palette design is not necessary as there are no defined species lists for this habitat type.

Establishment maintenance

4.6.14 The specific maintenance in Appendix B, Table B-2 will be carried out within the five-year initial establishment period after planting.

Long-term management

4.6.15 The principles in Appendix B, Table B-3 will apply to the management of ground level grassland and the open mosaic habitat green/brown roof once it has fully established.

4.7 Inter-planting

Introduction

4.7.1 The condition of existing woodland and hedgerows varies across the Order Limits. The Project provides an opportunity to strengthen and diversify habitat areas to increase biodiversity and resilience and improve the visual screening of infrastructure. It also creates opportunities for improving age structure, by planting trees which will eventually replace those which are towards the end of their life.

Objectives

4.7.2 The proposed inter-planting will help deliver the following:

1. Increased resilience of woodland and hedgerows to the effects of climate change and biosecurity.
2. Increase biodiversity and improve connectivity.
3. Visual screening of infrastructure.
4. Increase soil coverage to shade and crowd out weeds, reducing the need for maintenance.

Principles

4.7.3 The following principles will guide the design of proposed interplanting post-consent:

1. The exact density and location of inter-planting will be defined post-consent, based on site assessments.
2. Planting will be designed to integrate with the surrounding landscape, including existing woodlands and hedgerows, enhancing habitat connectivity and overall landscape character. The exact number of plants and stock size will be determined post-consent and will be set out in the detailed LEMPs, taking consideration of the interface between proposed planting and existing vegetation.

Outline specification

4.7.4 Localised ground clearance and soil preparation will be required to create areas for interplanting. Where planting directly adjacent to existing hedgerows or woodland, excavation by hand will be used where necessary to reduce ground disturbance.

4.7.5 Planting will be set out in groups of three, five or seven plants of the same species for shrubs and one to three plants for trees.

4.7.6 Areas of inter-planting will be clearly marked on as-built drawings for establishment maintenance and monitoring.

4.7.7 All planting will be protected against grazing by individual biodegradable tree guards.

Establishment maintenance

4.7.8 Competition within existing vegetation is higher than new planting in bare ground and therefore initial maintenance requirements in Appendix B, Table B-2 will be carried out within the five-year initial establishment period after planting.

Long-term management

4.7.9 Once established, inter-planting will be managed as part of the woodland or hedgerow in accordance with the principles set out in Appendix B, Table B-3.

4.7.10 Detailed requirements of existing tree management are included in the ES Appendix 13.5 Arboricultural Impact Assessment, Volume II (Document reference 6.2, DCO Volume 6).

4.8 Other habitat features

Introduction

4.8.1 Habitat features for protected and notable species will be included throughout the Project to improve biodiversity and support local wildlife populations.

4.8.2 Habitat features proposed across the Order Limits comprise:

1. Artificial badger setts and badger path
2. Barn owl nest boxes
3. Swift boxes
4. Hazel dormouse habitat
5. Deadwood habitat piles

Objectives

4.8.3 The habitat features seek to deliver the following objectives:

1. Create habitats that support specific protected species identified in site surveys, and which are protected by the Conservation of Habitats and Species Regulations 2017 (as amended) [24], the Wildlife and Countryside Act 1981 (as amended) [25], and the Protection of Badgers Act 1992 [26].

Principles

4.8.4 The following principles will guide the design of proposed habitat features post-consent:

1. The exact design and specification for each habitat feature will respond to the specific species and feature lost or impacted, the space available and the local ground conditions and topography.
2. The design, specifications and dimensions of each habitat feature will be developed post-consent, by a suitably qualified ecologist, and comply with any relevant Natural England licence requirements.

3. The exact location, orientation and installation height of each habitat feature will be identified on site, by a named ecologist, post-consent, and comply with any relevant Natural England licence requirements.
4. Construction and installation of habitat features will be undertaken under the supervision of a suitably qualified ecologist where Natural England licences require it.
5. Damage to existing vegetation, trees and root protection areas and installation of habitat features, particularly in relation to earthworks, fixings and fastenings, which can impact long-term tree health will be avoided.
6. Any tree work, including adding fixings or creating holes where unavoidable, will only be undertaken after prior consultation with the relevant authority and relevant statutory bodies (e.g. Natural England) if the tree is protected by a Tree Preservation Order or located within a locally or nationally designated nature reserve.
7. Damaging or destroying active nests and nests that are in the process of being built is an offence under the Wildlife and Countryside Act 1981. Therefore, works to trees, hedgerows and scrub will be avoided during the nesting season. If essential works are required during the bird nesting season, then a suitably qualified ecologist will be required to check for the presence of nests prior to any works.

Outline specification

4.8.5 This section provides the specification for wildlife features which will be incorporated within and outside the Order Limits.

4.8.6 Artificial badger setts:

1. Artificial setts will be located near to existing or new grassland, hedgerow, scrub and woodland to provide suitable foraging and sheltering habitat for badgers that is well-connected to the wider landscape.
2. Artificial setts will be built on well-drained ground.
3. Artificial setts will be located in areas away from sources of danger and disturbance including areas of public access, at least 30m from construction works and will not require the badger clan to cross a road to reach it from the original sett.
4. Planting around artificial badger setts (and other areas of high badger activity across the Project) will comprise scrub habitat to provide cover and limit disturbance. This will include species of value to foraging badgers, for example fruiting species such as elder, blackthorn and bulb species such as bluebell and ramsons.

4.8.7 Badger path at Section E: Portsdown Hill to Boarhunt:

1. A path will be maintained during construction to prevent isolation of badger sett 062 from wider foraging and territorial areas to the north. Landscape planting comprising dense scrub and hedgerow planting will be implemented at either entrance of the path to soften the approach and provide cover for badgers using the path.

4.8.8 Barn owl nest box:

1. Barn owl nest boxes will be located away from artificial light sources, within or near suitable barn owl hunting habitat, such as open areas like grasslands, field margins, and hedgerows.
2. Barn owl nest box will be securely attached to existing mature trees.
3. Barn owl nest boxes should be located at least 1km from dual carriageways.

4.8.9 Swift boxes:

1. Swift boxes will be securely attached to a building.
2. Swift boxes will be installed on buildings in groups of two to four or more boxes, with a minimum 5m clear drop beneath and in front of the box.
3. Position boxes away from direct sunshine (the north, north-east or north-west facing walls are ideal) and large mature trees and shrubs or those likely to become large in the future to maintain a clear flight path to the box, away from artificial light sources and not above doors and windows.
4. They can be placed on any aspect of a building, preferably under eaves. However, if placed on the south aspect of a building they must be shaded under wide eaves from full direct sunlight.

4.8.10 Hazel dormouse habitat:

1. Hazel dormouse populations will benefit from enhancement and creation of hedgerows and woodland. Connectivity between these features is crucial for dormice. Ensuring there is a mix of species within woodland and hedgerow planting will provide nesting and food resource for the species throughout their active season.
2. Hazel dormouse populations will benefit from double-row hedgerow planting, where this is considered practical to implement. This additional planting will increase available habitat for dormouse in the local area.
3. Hazel dormouse populations will benefit from ‘gapping-up’ of existing hedgerows to increase habitat connectivity across the wider landscape.
4. Hazel dormouse nest boxes will be placed within these suitable habitats, attached to existing tree trunks or branches.

4.8.11 Creation of deadwood habitat piles:

1. Habitat piles and hibernacula will be constructed throughout the Project areas using natural materials generated during clearance of the site, such as logs, branches, turf and grass cuttings.
2. These will provide refuge and hibernation opportunities for amphibians and reptiles, and dead wood habitat for invertebrates, which will in turn benefit fauna such as bats and birds.
3. Piles will be positioned in proximity to other habitats (woodland edges, hedgerows, ponds, scrub) to maximise connectivity and biodiversity.
4. Areas prone to flooding or standing water will be avoided.
5. Varying locations (sunny/shady, dry/damp) across the site will benefit a wider range of species.

Initial maintenance and long-term management

4.8.12 Initial maintenance and long-term management requirements are the same and are set out in Appendix B, Table B-2 and Table B-3.

4.9 Sites of Importance for Nature Conservation

Introduction

4.9.1 This section outlines the habitat reinstatement and enhancement measures proposed for two designated Sites of Importance for Nature Conservation (SINCs): Field to the West of Gillman Road SINC and Fielders Farm Meadows (Eastleigh) SINC. The works aim to ensure that habitats impacted by the Project are reinstated to a condition that is ecologically functional, resilient, and aligned with their original conservation value

Objectives

4.9.2 The objectives of the habitat reinstatement and enhancement measures for the two SINCs are:

1. To safeguard existing ecological value through habitat reinstatement methods that retain the flora seedbank
2. To reinstate or enhance grassland habitats to a condition equivalent to or better than their pre-impact state
3. Support the long-term ecological resilience of the reinstated habitats, ensuring they are capable of sustaining their conservation value.

Principles

4.9.3 The following principles will guide the design of the proposed SINC works post-consent:

1. Reinstatement measures will be developed in the detailed LEMPs post-consent, ensuring each SINC's ecological distinctiveness is reflected in the reinstatement specifications.
2. Restoration will prioritise the reinstatement of habitats to a condition that reflects their original structure, species composition, and ecological function. Techniques such as soil and turf translocation will be used wherever feasible to retain local seedbanks and maintain continuity of the pre-existing flora.
3. Reinstatement and maintenance of the reinstated area will actively address threats to habitat quality, including the removal of Himalayan balsam at Fielders Farm Meadows and targeted management of scrub encroachment to prevent the loss of open habitats.

Outline specification

4.9.4 Field to the West of Gillman Road SINC:

1. Reinstatement of lowland calcareous grassland in good condition.

2. Habitat reinstatement will consider soil translocation (preservation and restoration of the existing turf and soil layers) so that the flora seed bank is retained where possible.

4.9.5 Fielders Farm Meadows (Eastleigh) SINC:

1. Reinstatement of neutral grassland and the associated areas of tall fen and swamp.
2. Enhancement of other neutral grassland to good condition.
3. Removal of Himalayan balsam *Impatiens glandulifera*.
4. Removal of scrub encroachment.
5. Habitat reinstatement will consider soil translocation (preservation and restoration of the existing turf and soil layers) so that the flora seed bank is retained where possible.

Initial maintenance and long-term management

4.9.6 Initial maintenance and long-term management requirements will be in line with detailed LEMPs, produced post-consent.

Glossary

Table 4-1 provides definitions of technical terms used in this Outline LEMP.

Table 4-1 Glossary

Term	Definition
Above Ground Plant (AGP)	This collectively refers to the Intermediate Pumping Stations and Break Pressure Tanks.
Ancient woodland	Woodland that has existed continuously since 1600 in England, Wales and Northern Ireland and is defined as an irreplaceable habitat.
Applicant	Southern Water Services Limited.
Archaeology	The study of human activity through the recovery and analysis of material culture.
Baseline	The current environmental and social conditions within the Order Limits or within a study area. This provides a benchmark against which changes arising from the Project are assessed for each relevant assessment.
Best Practicable Means	As defined by Section 72 of the Control of Pollution Act 1974 [27].
Biodiversity	The variability among living organisms from all sources, including terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part: this includes diversity within species, between species and of ecosystems.
Biodiversity Net Gain (BNG)	This is an approach to development that delivers measurable improvements that delivers a net gain for biodiversity by creating or enhancing habitats.
Budds Farm Wastewater Treatment Works (WTW)	An existing Southern Water site that treats wastewater from the Applicant's customers prior to release into the Solent from the Eastney Long Sea Outfall. The Project would utilise highly treated wastewater from the Budds Farm WTW to produce recycled water at the Water Recycling Plant site. Reject water would be transferred from the Water Recycling Plant back to Budds Farm WTW where a connection would be made for onwards transfer to the existing Eastney Transfer Tunnel, Eastney Pumping Station and Eastney Long Sea Outfall for discharge into the Solent. Chemical filter washing at the Water Recycling Plant site would generate process waste that would be discharged via the foul sewer network to Budds Farm WTW for treatment.
Construction compounds	Temporary areas required to facilitate the construction of the Project.
Contractor	The Applicant or a person appointed by the Applicant or a person appointed by the Applicant or by anyone else having the benefit of part or all of the DCO to carry out any construction element of the Project or to operate the Project.

Term	Definition
Design	All of the decisions that shape a development throughout its design and pre-construction, construction/commissioning, operation.
Development Consent Order (DCO)	A statutory order which provides consent for a project and means that a range of other consents, such as planning permission and listed building consent, will not be required. A DCO can also include powers authorising the compulsory acquisition and temporary possession of land and rights over land which is the subject of an application. A draft DCO (Document reference 3.1, DCO Volume 3) is submitted by the applicant as part of its application [28].
Eastney Pumping Station (PS)	An existing Southern Water infrastructure component. No works are proposed to it as part of the Project. The Eastney PS receives treated wastewater flows, via gravity, from Budds Farm Wastewater Treatment Works WTW and pumps it out via the Eastney Long Sea Outfall. This pumping station also receives storm flows from the Eastney catchment area. Reject water from the Water Recycling Plant will be released from the Eastney Long Sea Outfall using the Eastney PS and Eastney Transfer Tunnel.
Effect	Term used to express the consequence of an impact. The significance of an effect is determined by correlating the magnitude of the impact with the importance, or sensitivity, of the receptor or resource in accordance with defined significance criteria.
Environmental Impact Assessment (EIA)	EIA is a process for identifying the likely significant environmental effects (beneficial and adverse) of a Project to inform the decision-making process by the Secretary of State when determining an application for a Development Consent Order.
Enhancement	Measures taken to achieve a benefit, which are unrelated to an adverse impact or which go beyond that required to mitigate/compensate for an impact. For example, restoration of a degraded habitat to leave it in a measurably better state than it was before the Project or other interventions to leave a positive legacy for the community.
Environmental Mitigation and Enhancement Areas (EMEA)	The 'Environment Mitigation and Enhancement Areas' are shown on the Works plans (Document reference 2.3, DCO Volume 2) and in the Design Principles Document (Document reference 5.11, DCO Volume 5). The EMEAs will deliver environmental mitigation to mitigate adverse impacts and provide additional environmental enhancement within the Order Limits. The environmental enhancements that are not associated with environmental mitigation will only be implemented subject to securing agreements with landowners. EMEAs are in addition to the commitment to reinstate vegetation removed to facilitate construction throughout the Order Limits.
Environmental Net Gain (ENG)	ENG is an approach to development that aims to leave the natural environment in a measurably better state than beforehand. Biodiversity net gain is an essential component

Term	Definition
	of ENG. ENG involves going further to achieve increases in the capacity of affected natural capital to deliver ecosystem services and make a scheme's wider impacts on natural capital positive.
Environmental Statement (ES) (DCO Volume 6)	A document reporting the findings of the EIA which describes the likely significant effects arising from the Project on the environment and measures proposed to mitigate any likely significant effects.
Hampshire Water Transfer and Water Recycling Project	This is the name of the Project, that is the Strategic Resource Option being delivered as part of the Water For Life Hampshire programme. A water supply scheme comprising a combination of both water transfer and water recycling technology that would play a major role in making up the shortfall in water supply across the Hampshire supply area, especially in a drought.
Havant Thicket Reservoir	The Havant Thicket Reservoir is a development under construction by Portsmouth Water that has planning permission granted by the relevant local planning authorities. Following the transfer of recycled water from the Water Recycling Plant site, the recycled water would be combined with water contained within the Havant Thicket Reservoir. The Project would use the Havant Thicket Reservoir for the storage of recycled water, before transfer to Otterbourne Water Supply Works.
Habitats of Principal Importance (HPI)	A list of habitats of principal importance in England, first identified as priority habitats in the United Kingdom Biodiversity Action Plan [29].
Impact	A change that is caused by an action/activity associated with the Project.
Indicative Environmental Masterplan (Appended to the Design Approach Document (Document reference 5.12, DCO Volume 5))	A plan setting out the Green Infrastructure focus areas, placing the multi-functional environmental mitigation and enhancement measures within the framework of the landscape design comprises a series of indicative drawings, and a series of indicative plans for each of the Above Ground Plant sites, showing potential layouts and how the sites might appear once built.
Invasive Non-Native Species (INNS) Biosecurity Plan (Document reference 7.10, DCO Volume 7)	Sets out an outline approach to the management of INNS for the Project and provides the measures required to reduce or remove the risk of introducing or spreading INNS during construction and operation phases.
Landscape and Visual Impact Assessment (LVIA)	The process by which the likely landscape and visual effects of the Project are assessed.
Mitigation	Measures intended to avoid, prevent, reduce and, where possible, offset likely significant adverse environmental effects. Measures follow the mitigation hierarchy as described in section 5.3 of ES Chapter 5 EIA approach and methodology, Volume I (Document reference 6.1, DCO Volume 6).

Term	Definition
Monitoring	Measures to ensure the systematic and ongoing collection, analysis and evaluation of data related to the implementation and performance of a development. Monitoring can be undertaken to monitor conditions in the future to verify any environmental effects identified by the EIA, the effectiveness of mitigation or enhancement measures or ensure remedial action are taken should adverse effects above a set threshold occur. All monitoring measures adopted by the Project are reflected in the Commitments Register, ES Appendix 5.5 Commitments Register, Volume II (Document reference 6.2, DCO Volume 6).
National Vegetation Classification (NVC)	Hierarchical system designed to classify natural habitats according to the vegetation they contain.
Order Limits	The 'Order Limits' represent the extent of the area within which the Project, authorised by the development consent order, may be carried out, including the permanent and temporary land needed for construction, operation and maintenance activities. The Order Limits are shown on the Works Plans (Document reference 2.3, DCO Volume 2) and Land plans (Document reference 2.2, DCO Volume 2)..
Outline Construction Environmental Management Plan (CEMP) (Document reference 7.1, DCO Volume 7)	Contains identified topic specific mitigation measures to be adopted during construction, and specifies plans and method statements to be produced by the Contractor to avoid and reduce environmental effects. Mitigation measures are generally tertiary mitigation, although some secondary mitigation measures are also included. Detailed CEMP(s) will be developed by the Contractor, in accordance with the Outline Construction Environmental Management Plan, and submitted for approval in accordance with requirement contained in Schedule 2 to the draft Development Consent Order (Document reference 3.1, DCO Volume 3)..
Outline Landscape and Ecology Management Plan (LEMP) (Document reference 7.5, DCO Volume 7)	Provides a framework for delivering the Green Infrastructure strategy for the Project. This addresses the reinstatement of existing vegetation following construction, the implementation, maintenance and long-term management of proposed environmental mitigation, as well as strategic environmental enhancements within the Order Limits. The measures contained in the Outline LEMP are secured by a requirement in Schedule 2 to the Development Consent Order. The detailed LEMPs will be required to be produced and submitted for approval in accordance with the corresponding requirement in Schedule 2 to the draft Development Consent Order (Document reference 3.1, DCO Volume 3)..
Operational Environmental Management Plan (OEMP) (Document reference 7.7, DCO Volume 7)	Provides a framework of commitments for the operational stage of the Project. These include general operational practices which have the potential to have an environmental impact, in addition to Project specific environmental mitigations.

Term	Definition
	The measures contained in the OEMP are secured by a requirement in Schedule 2 to the Development Consent Order.
Outline Written Scheme of Investigation (WSI) (Document reference 7.6, DCO Volume 7)	Sets out the proposed outline scope and commitments to archaeological survey, mitigation and subsequent reporting and publication to be undertaken post-consent. It therefore sets out an overarching mitigation strategy for effects arising on archaeological heritage assets as a result of the Project to be undertaken within the Order Limits. The measures contained in the Outline WSI are secured by a requirement in Schedule 2 to the Development Consent Order. A detailed WSI will be produced and submitted for approval in accordance with the corresponding requirement in Schedule 2 to the draft Development Consent Order (Document reference 3.1, DCO Volume 3).
Primary (inherent) mitigation	Modifications to the location or design of the Project which are a result of design evolution. Modifications which are an inherent part of the Project design for the purpose of avoiding, preventing or minimising likely significant environmental effects. For example, re-routing the Project to avoid passing through an ancient woodland.
Ramsar site	A Ramsar site is the land listed as a Wetland of International Importance under The Convention on Wetlands of International Importance Especially as Waterfowl Habitat (the Ramsar Convention) established in 1971 and came into force in 1975.
Special Area of Conservation (SAC)	Area(s) of protected habitat(s) and species as defined in the European Union Habitats Directive (92/43/EEC).
Sensitivity	The extent to which a receptor is likely to accept or respond to a change.
Site of Importance for Nature Conservation (SINC)	An important wildlife site which contributes to the ecological network in Hampshire. To safeguard these sites, they are designated as non-statutory designated SINCs. SINCs are also known nationally as Local Wildlife Sites. They represent a legacy of good management and rely upon continued stewardship by landowners.
Site of Special Scientific Interest (SSSI)	A nationally site designated by Natural England as an area of special interest by reason of any of its flora, fauna, geological or physiographical features. SSSI are legally protected under the Wildlife and Countryside Act 1981 (as amended) [25].
Solent Wader and Brent Goose Strategy (SWBGS) Sites	Network of sites around the Solent identified as being of value for waders and Brent Geese, designated by the Solent Recreation Mitigation Partnership (made up of the Solent Local Authorities). The SWBGS Sites identifies the network of sites around the Solent and determines which sites are the most valuable and why. The SWBGS aims to protect the network of non-designated terrestrial wader and brent goose sites that support the Solent Special Protection Areas from

Term	Definition
	land take and recreational pressure associated with new development.
Special Protection Area (SPA)	A designated area for birds under the European Union Directive on the Conservation of Wild Birds (2009/147/EC) [30].
Sustainable Drainage System (SuDS)	A Sustainable Drainage System that generally mimic the natural drainage patterns of an undeveloped site allowing infiltration into the ground (where feasible) and controlling outflow rates from a Project. This reduces the impact and risk of flooding and can provide additional benefits such as pollution control, increased biodiversity, and provision of water-based amenity space.
Trenchless crossings	Crossings where trenchless installation techniques will be used during construction of the Project.
Water Recycling Plant (WRP)	The Water Recycling Plant (WRP) would receive a total maximum volume of approximately 82Ml/d of treated wastewater from Budds Farm Wastewater Treatment Works. This would provide a maximum output of approximately 60Ml/d of recycled water. Approximately 22Ml/d of reject water is produced from the water recycling process and would be combined with the existing Budds Farm Wastewater Treatment Works treated wastewater flows (that are generated by the existing operation of Budds Farm Wastewater Treatment Works), and released via the existing Eastney Transfer Tunnel, Eastney Pumping Station, and Eastney Long Sea Outfall operated by the Applicant.
Works Plans (Document reference 2.3, DCO Volume 2)	The Works Plans shows the spatial extent of the works that are detailed in Schedule 1 of the draft Development Consent Order (Document reference 3.1, DCO Volume 3) to be consented and operated by the DCO when made.
Zone of Influence (ZoI)	The spatial area over which an effect from a project is likely to be experienced.

List of abbreviations

Table 4-2 provides definitions of abbreviations used in this Outline LEMP.

Table 4-2 Abbreviations

Glossary term	Description
AGP	Above Ground Plant
ASNW	Ancient Semi-Natural Woodlands
ASQL	Area of Special Landscape Quality
BALI	British Association of Landscape Industries
BNG	Biodiversity Net Gain
DCO	Development Consent Order
EMEA	Environmental Mitigation and Enhancement Area
ENG	Environmental Net Gain
ES	Environment Statement
HMMP	Habitat Management and Monitoring Plan
HPI	Habitat of Principal Importance
INNS	Invasive Non-Native Species
KCL	Key connective locations
LEMP	Landscape and Ecology Management Plan
LVIA	Landscape and visual impact assessment
m	metres
NCN	National Cycle Network
NVC	National Vegetation Classification
OEMP	Operational Environmental Management Plan
OMH	Open Mosaic Habitat
Outline CEMP	Outline Construction Environmental Management Plan
Outline LEMP	Outline Landscape and Ecology Management Plan
PAWS	Plantation on Ancient Woodland Sites
PRoW	Public Rights of Way
RVEI	Road Verges of Ecological Importance
SAC	Special Area of Conservation
SDNP	South Downs National Park
SINC	Site of Importance for Nature Conservation
SRMP	Soil Resource Management Plan

Glossary term	Description
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
WRP	Water Recycling Plant
WSI	Written Scheme of Investigation
WSW	Water Supply Works
WTW	Wastewater Treatment Works
ZoI	Zone of Influence

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Appendix A Indicative planting and grassland species lists

A.1 Introduction

A.1.1 The following sections detail indicative planting lists for all of the habitats being planted as part of the Project, broken down into habitat type sections.

A.1.2 The woodland and grassland NVC communities were identified through NVC field surveys and UKHab surveys within or in proximity to the habitats being lost.

A.1.3 The percentage of each species in each list will vary for each site. The final species mixes, including the percentage mix of each species, will be developed post-consent and will be set out in the detailed LEMPs.

A.1.4 The indicative planting lists are supplemented with additional species recorded during NVC and UKHab field surveys (marked with an asterisk) that are not typically defined within the NVC community/subcommunity identified as the best match to the habitat. This is to maximise species diversity, and also to best reflect the composition of the habitat being lost, because the outcome of the NVC field surveys in terms of the communities/subcommunities identified only reflects a best fit to pre-defined communities/subcommunities and not an exact match. The lists will be used to align new planting with lost and adjacent retained habitats.

A.2 Planting over and near to the pipeline

A.2.1 Restrictions on which species can be planted over the underground Pipeline will be followed within a protective strip of land of 10m either side of the pipeline centreline. These restrictions, which limit planting directly over the pipeline to shallow-rooted species, take precedence over all other indicative species lists. An indicative species list for the protective strip are provided in Table A-3.

Table A-3 Suggested trees and shrubs within the protective strip

Latin name	Common name	Hedge or shrub species suitable for planting over the pipeline	Hedge or shrub planting suitable to be planted from 3m of the pipeline	Individual tree species or single row suitable to be planted from 6m of the pipeline.	Individual or grouped tree species suitable to be planted from 10m + of the pipeline
Acer campestre	Field maple	X	X	X	✓
Acer pseudoplatanus	Sycamore	X	X	X	✓
Aesculus hippocastanum	Horse chestnut	X	X	X	✓
Alnus glutinosa	Alder	X	X	X	✓

Latin name	Common name	Hedge or shrub species suitable for planting over the pipeline	Hedge or shrub planting suitable to be planted from 3m of the pipeline	Individual tree species or single row suitable to be planted from 6m of the pipeline.	Individual or grouped tree species suitable to be planted from 10m + of the pipeline
Carpinus betulus	Common hornbeam	X	X	X	✓
Corylus avellana	Common hazel	X	✓	✓	✓
Crataegus monogyna	Common hawthorn	X	✓	✓	✓
Fagus sylvatica	European beech	X	X	✓	✓
Larix decidua	Common larch	X	X	X	✓
Ligustrum vulgare	European privet	X	✓	✓	✓
Malus domestica	Common apple	X	X	✓	✓
Malus sylvestris	Crab apple	X	X	✓	✓
Pinus sylvestris	Scots pine	X	X	X	
Populus alba	White poplar	X	X	X	✓
Populus nigra subspecies. betulifolia	Black poplar	X	X	X	✓
Prunus avium	Wild cherry	X	X	✓	✓
Prunus cerasifera	Cherry plum	X	X	✓	✓
Prunus padus	Bird cherry	X	X	✓	✓
Prunus spinosa	Blackthorn	X	✓	✓	✓
Pyrus communis	Common pear	X	X	✓	✓
Quercus petraea	Sessile oak	X	X	X	✓
Quercus robur	English oak	X	X	X	✓
Rosa canina	Dog rose	X	✓	✓	✓
Salix alba	White willow	X	X	X	✓
Salix cinerea	Grey willow	X	X	X	✓
Salix fragilis	Crack willow	X	X	X	✓
Sambucus nigra	Elder	X	✓	✓	✓
Taxus baccata	Common yew	X	X	X	✓

Latin name	Common name	Hedge or shrub species suitable for planting over the pipeline	Hedge or shrub planting suitable to be planted from 3m of the pipeline	Individual tree species or single row suitable to be planted from 6m of the pipeline.	Individual or grouped tree species suitable to be planted from 10m + of the pipeline
Tilia cordata	Small-leaved lime	X	X	X	✓
Tilia platyphyllos	Large-leaved lime	X	X	X	✓
Ulex europaeus	Gorse	X	✓	✓	✓
Viburnum opulus	Guelder rose	X	✓	✓	✓

A.3 Trees and woodland

Wet woodland

Table A-4 Wet woodland (W6 National Vegetation Classification subcommunities) indicative species list

Latin name	Common name	NVC Subcommunity	
		W6a	W6b
Acer pseudoplatanus	Sycamore	✓	X
Alnus glutinosa	Alder	✓	✓
*Betula pendula**	Silver birch*	N/A	N/A
Quercus robur	Pedunculate oak	✓	X
Salix fragilis	Crack willow	X	✓
Corylus avellana	Common hazel	✓	X
Crataegus monogyna	Common hawthorn	✓	✓
*Ilex aquifolium**	Common holly*	N/A	N/A
*Prunus domestica**	Wild plum*	N/A	N/A
*Prunus spinosa**	Blackthorn*	N/A	N/A
Salix caprea	Goat willow	X	✓
Salix cinerea	Grey willow	✓	✓
*Salix purpurea**	Purple willow*	N/A	N/A
*Salix triandra**	Almond willow*	N/A	N/A
Salix viminalis	Common osier	✓	X
Sambucus nigra	Elder	✓	✓
*Sorbus aucuparia**	Rowan*	N/A	N/A
Viburnum opulus	Guelder rose	✓	X

Latin name	Common name	NVC Subcommunity	
		W6a	W6b
Angelica sylvestris	Wild angelica	✓	✓
Arrhenatherum elatius	False oat-grass	✓	✓
Caltha palustris	Marsh marigold	✓	✓
Cardamine flexuosa	Wavy bitter cress	✓	✓
Carex acutiformis	Lesser pond sedge	✓	X
Carex paniculata	Greater tussock sedge	✓	X
*Carex pendula**	Pendulous sedge*	N/A	N/A
Carex riparia	Greater pond sedge	X	✓
Chrysosplenium oppositifolium	Opposite-leaved golden saxifrage	✓	X
Circaea lutetiana	Enchanter's nightshade	✓	X
Cirsium palustre	Marsh thistle	✓	✓
Dactylis glomerata	Cocksfoot	✓	X
Deschampsia cespitosa	Tufted hairgrass	✓	X
Digitalis purpurea	Common foxglove	X	✓
Dryopteris affinis agg.*	Scaly male fern*	N/A	N/A
Dryopteris dilitata	Broad buckler fern	✓	✓
Dryopteris filix-mas	Male fern	✓	X
Epilobium angustifolium	Fireweed	X	✓
Epilobium hirsutum	Great willowherb	✓	✓
Epilobium montanum	Broad-leaved willowherb	X	✓
Epilobium palustre	Marsh willowherb	X	✓
Equisetum arvense	Field horsetail	✓	X
Equisetum palustre	Marsh horsetail	✓	X
Eupatorium cannabinum	Hemp agrimony	✓	X
Filipendula ulmaria	Meadowsweet	✓	✓
Galium aparine	Cleavers	✓	✓
Galium palustre	Marsh bedstraw	✓	✓
Galium uliginosum	Fen bedstraw	✓	X
Geranium robertianum	Herb Robert	✓	X
*Geum rivale**	Water avens*	N/A	N/A
Geum urbanum	Wood avens	✓	X

Latin name	Common name	NVC Subcommunity	
		W6a	W6b
Glechoma hederacea	Ground ivy	✓	X
*Glyceria fluitans**	Floating sweetgrass*	N/A	N/A
Heracleum sphondylium	Common Hogweed	✓	✓
Holcus lanatus	Yorkshire fog	X	✓
Holcus mollis	Creeping soft grass	X	✓
Humulus lupulus	Common hop	✓	X
Iris pseudacorus	Yellow flag	✓	✓
Lysimachia vulgaris	Yellow loosestrife	✓	✓
Mentha aquatica	Water mint	✓	X
Mercurialis perennis	Dog's mercury	✓	X
Oenanthe crocata	Water hemlock	✓	✓
Phalaris arundinacea	Reed canary grass	✓	✓
Phragmites australis	Common reed	✓	X
Poa trivialis	Rough meadow grass	✓	✓
*Polystichum aculeatum**	Hard shield fern*	N/A	N/A
Ranunculus repens	Creeping buttercup	✓	✓
Rumex crispus	Curly dock	X	✓
Rumex obtusifolius	Bitter dock	✓	✓
Rumex sanguineus	Wood dock	✓	X
*Schedonorus giganteus**	Giant fescue*	N/A	N/A
Silene dioica	Red campion	✓	✓
Solanum dulcamara	Bittersweet	✓	✓
Stachys sylvatica	Hedge woundwort	✓	X
Stellaria media	Common chickweed	✓	X
*Valeriana officinalis**	Common valerian*	N/A	N/A
Veronica montana	Wood speedwell	X	✓

* Suitable species identified through NVC field surveys that are not listed as typical under the relevant subcommunities. N/A is used in cells this relates to.

Lowland mixed deciduous woodlands

A.3.1 Indicative species lists for lowland mixed deciduous woodlands (w1f) can be found in Table A-5 and Table A-6. These are based on characteristic species of the W8 NVC community (specifically subcommunities W8b, W8d, and W8e) and the W10 NVC community (specifically subcommunities W10c and W10d) [16] [31].

Table A-5 Lowland mixed deciduous woodland (W8 National Vegetation Classification subcommunities) indicative species list

Latin name	Common name	NVC subcommunity		
		W8b	W8d	W8e
Tree species				
Acer campestre	Field maple	✓	✓	✓
Acer pseudoplatanus	Sycamore	✓	✓	✓
Alnus glutinosa	Alder	✓	X	X
Betula pendula	Silver birch	✓	✓	✓
Betula pubescens	Downy birch	X	✓	✓
Carpinus betulus	Hornbeam	✓	✓	✓
Castanea sativa	Sweet chestnut	✓	X	X
Fagus sylvatica	Beech	✓	✓	✓
Larix spp.	Larch	✓	✓	✓
Malus sylvestris	Crab apple	X	✓	✓
Populus tremula	Quaking aspen	✓	✓	X
Prunus avium	Wild cherry	✓	X	X
Quercus petraea	Sessile oak	✓	✓	✓
Quercus robur	Pedunculate oak	✓	✓	✓
Taxus baccata	Yew	✓	✓	✓
Tilia cordata	Small leaved lime	✓	✓	✓
Ulmus glabra	Wych elm	✓	✓	✓
Ulmus minor	Field elm	✓	✓	X
Ulmus procera	English elm	X	✓	X
Shrub species				
Cornus sanguinea	Common dogwood	✓	✓	✓
Corylus avellana	Hazel	✓	✓	✓
Crataegus laevigata	Midland hawthorn	✓	✓	X
Crataegus monogyna	Hawthorn	✓	✓	✓
Euonymus europaeus	Spindle	X	✓	✓
Ilex aquifolium	Holly	✓	✓	✓
Ligustrum vulgare	Wild privet	✓	✓	✓
Prunus padus	Bird cherry	✓	X	X
Prunus spinosa	Blackthorn	✓	✓	✓
*Ruscus aculeatus**	Butcher's broom*	N/A	N/A	N/A
Salix caprea	Goat willow	✓	✓	✓
Salix cinerea	Grey willow	X	✓	✓
Sambucus nigra	Elder	✓	✓	✓
Sorbus aria	Whitebeam	X	✓	✓

Latin name	Common name	NVC subcommunity		
		W8b	W8d	W8e
Sorbus aucuparia	Rowan	✓	X	✓
Viburnum lantana	Wayfaring tree	✓	✓	✓
Viburnum opulus	Guelder rose	✓	✓	✓
Field layer species				
Adoxa moschatellina	Moschatel	✓	✓	✓
Ajuga reptans	Bugle	✓	✓	✓
Alliaria petiolata	Garlic mustard	X	✓	X
Allium ursinum	Ramsons	✓	✓	✓
Anemone nemorosa	Wood anemone	✓	✓	✓
Angelica sylvestris	Wild angelica	✓	✓	✓
Anthriscus sylvestris	Cow parsley	✓	✓	✓
Arctium minus	Lesser burdock	X	X	✓
Arrhenatherum elatius	False oat-grass	X	X	✓
Arum maculatum	Lords and ladies	✓	✓	✓
Asplenium scolopendrium	Hart's tongue fern	X	✓	X
Athyrium filix-femina	Lady fern	✓	✓	✓
Brachypodium sylvaticum	Wood false brome	✓	✓	✓
Bromus ramosus	Hairy brome	✓	✓	✓
Campanula latifolia	Giant bellflower	✓	X	✓
Campanula trachelium	Nettle leaved bellflower	✓	X	✓
Cardamine flexuosa	Wavy bittercress	✓	X	✓
*Carex divulsa**	Grey sedge*	N/A	N/A	N/A
*Carex pendula**	Pendulous sedge*	N/A	N/A	N/A
*Carex remota**	Remote sedge*	N/A	N/A	N/A
Carex sylvatica	Wood sedge	✓	✓	✓
Chrysosplenium oppositifolium	Opposite leaved golden saxifrage	✓	✓	✓
Circaea lutetiana	Enchanter's nightshade	✓	✓	✓
Clematis vitalba	Traveller's joy	✓	✓	✓
Conopodium majus	Pignut	✓	✓	✓
Convallaria majalis	Lily of the valley	X	X	✓
Dactylis glomerata	Cocksfoot	✓	✓	✓
Daphne laureola	Spurge laurel	X	✓	✓
Daphne mezereum	Mezereum	X	X	✓
Deschampsia cespitosa	Tufted hair grass	✓	✓	✓

Latin name	Common name	NVC subcommunity		
		W8b	W8d	W8e
Digitalis purpurea	Foxglove	X	X	✓
Dioscorea communis	Black bryony	✓	✓	✓
Dryopteris borreri	Borrer's scaly male fern	✓	✓	✓
*Dryopteris carthusiana**	Narrow buckler fern*	N/A	N/A	N/A
Dryopteris dilitata	Broad buckler fern	✓	✓	✓
Dryopteris filix-mas	Male fern	✓	✓	✓
Epilobium angustifolium	Fireweed	X	X	✓
Epilobium montanum	Broadleaved willowherb	✓	X	✓
Euphorbia amygdaloides	Wood spurge	✓	✓	✓
Festuca gigantea	Giant fescue	✓	✓	✓
Filipendula ulmaria	Meadowsweet	✓	✓	✓
Fragaria vesca	Wild strawberry	X	✓	✓
Galium aparine	Cleavers	✓	✓	✓
Galium odoratum	Woodruff	✓	✓	✓
Geranium robertianum	Herb Robert	✓	✓	✓
Geum urbanum	Wood avens	✓	✓	✓
Glechoma hederacea	Ground ivy	✓	✓	✓
Heracleum sphondylium	Hogweed	✓	✓	✓
Holcus lanatus	Yorkshire fog	✓	✓	X
Holcus mollis	Creeping softgrass	✓	X	✓
Hyacinthoides non-scripta	Bluebell	✓	✓	✓
Iris foetidissima	Stinking iris	X	✓	✓
Lactuca muralis	Wall lettuce	X	X	✓
Lamiastrum galeobdolon	Yellow archangel	✓	✓	✓
Lapsana communis	Nipplewort	✓	X	✓
Lonicera periclymenum	Honeysuckle	✓	✓	✓
Luzula sylvatica	Great wood rush	✓	X	✓
Lysimachia nemorum	Yellow pimpernel	✓	X	X
*Melampyrum pratense**	Common cow wheat*	N/A	N/A	N/A
Melica uniflora	Wood melick	✓	✓	✓
Mercurialis perennis	Dog's mercury	✓	✓	✓
Milium effusum	Wood millet	✓	X	✓
Moehringia trinervia	Three nerved sandwort	✓	X	✓

Latin name	Common name	NVC subcommunity		
		W8b	W8d	W8e
Myostis sylvatica	Wood forget-me-not	X	X	✓
Neottia ovata	Common twayblade	✓	✓	✓
Orchis mascula	Early purple orchid	✓	X	✓
Oxalis acetosella	Wood sorrel	✓	X	✓
Poa nemoralis	Wood meadow grass	✓	✓	✓
Poa trivialis	Rough meadow grass	✓	✓	✓
Polygonatum multiflorum	Solomon's seal	✓	X	✓
Polypodium vulgare	Common polypody	X	✓	✓
Polystichum aculeatum	Hard shield fern	X	X	✓
Polystichum setiferum	Soft shield fern	✓	✓	✓
Potentilla sterilis	Barren strawberry	✓	✓	✓
Primula elatior	Oxlip	✓	✓	X
Primula vulgaris	Primrose	✓	✓	✓
Prunella vulgaris	Selfheal	X	X	✓
Ranunculus acris	Meadow buttercup	X	X	✓
Ranunculus auricormus	Goldilocks buttercup	X	✓	X
Ranunculus ficaria	Lesser celandine	✓	✓	✓
Ranunculus repens	Creeping buttercup	✓	✓	✓
Ribes rubrum	Redcurrant	X	X	✓
Ribes uva-crispa	Gooseberry	✓	X	✓
Rubus idaeus	Red raspberry	✓	X	✓
Rumex crispus	Curly dock	X	X	✓
Rumex sanguineus	Wood dock	✓	✓	✓
Sanicula europaea	Sanicle	✓	✓	✓
*Scrophularia nodosa**	Common figwort*	N/A	N/A	N/A
Silene dioica	Red campion	✓	✓	✓
*Stachys officinalis**	Betony*	N/A	N/A	N/A
Stachys sylvatica	Hedge woundwort	✓	✓	✓
Stellaria holostea	Greater stitchwort	✓	✓	✓
Teucrium scorodonia	Woodland germander	✓	✓	✓
Veronica chamaedrys	Germander speedwell	✓	✓	✓
*Veronica hederifolia**	Ivy leaved speedwell*	N/A	N/A	N/A
Veronica montana	Wood speedwell	✓	X	✓
Vicia sepium	Bush vetch	X	X	✓
Viola odorata	Sweet violet	X	✓	✓

Latin name	Common name	NVC subcommunity		
		W8b	W8d	W8e
Viola recheinbachiana	Early dog violet	✓	✓	✓
Viola riviniana	Common dog violet	✓	✓	✓

* Suitable species identified through NVC field surveys that are not listed as typical under the relevant subcommunities (N/A is used in cells this relates to).

Table A-6 Lowland mixed deciduous woodland (W10 National Vegetation Classification subcommunities) indicative species list

Latin name	Common name	NVC subcommunity	
		W10c	W10d
Tree species			
Acer pseudoplatanus	Sycamore	✓	✓
Alnus glutinosa	Alder	✓	✓
Betula pendula	Silver birch	✓	✓
Betula pubescens	Downy birch	✓	✓
Carpinus betulus	Hornbeam	✓	X
Castanea sativa	Sweet chestnut	✓	✓
Fagus sylvatica	Beech	✓	✓
Larix spp.	Larch	X	✓
Pinus nigra var. maritima	Corsican pine	X	✓
Pinus sylvestris	Scot's pine	✓	✓
Populus tremula	Quaking aspen	X	✓
Prunus avium	Wild cherry	✓	✓
Pseudotsuga menziesii	Douglas fir	X	✓
Quercus petraea	Sessile oak	✓	✓
Quercus robur	Pedunculate oak	✓	✓
Taxus baccata	Yew	✓	✓
Tilia cordata	Small leaved lime	✓	X
Tilia x europaea	Common lime	X	✓
Scrub species			
Acer campestre	Field maple	✓	✓
Corylus avellana	Hazel	✓	✓
Crataegus laevigata	Midland hawthorn	✓	X
Crataegus monogyna	Hawthorn	✓	✓
*Cytisus scoparius**	Broom*	N/A	N/A
Ilex aquifolium	Holly	✓	✓
Malus sylvestris	Crab apple	✓	X
Prunus spinosa	Blackthorn	✓	✓
*Ruscus aculeatus**	Butcher's broom	N/A	N/A

Latin name	Common name	NVC subcommunity	
		W10c	W10d
Sambucus nigra	Elder	✓	X
Sorbus aucuparia	Rowan	✓	✓
Viburnum lantana	Wayfaring tree	✓	✓
Viburnum opulus	Guelder rose	✓	X
Field layer species			
Aegopodium podagraria	Ground elder	✓	X
Agrostis capillaris	Creeping bent	✓	✓
Ajuga reptans	Bugle	✓	X
Anemone nemorosa	Wood anemone	✓	X
*Angelica sylvestris**	Wild angelica*	N/A	N/A
Anthoxanthum odoratum	Sweet vernal grass	✓	✓
Anthriscus sylvestris	Cow parsley	✓	X
Arrhenatherum elatius	False oat-grass	✓	✓
Athyrium filix-femina	Lady fern	✓	X
Blechnum spicant	Hard fern	✓	✓
Brachypodium sylvaticum	Wood false brome	✓	✓
Bromus ramosus	Hairy brome	✓	X
*Carex remota**	Remote sedge*	N/A	N/A
Carex sylvatica	Wood sedge	✓	X
zCircaea lutetiana	Enchanter's nightshade	✓	X
Conopodium majus	Pignut	✓	✓
Corydalis claviculata	Climbing corydalis	✓	✓
Cytisus scoparius	Common broom	✓	✓
Dactylis glomerata	Cocksfoot	X	✓
Deschampsia cespitosa	Tufted hairgrass	✓	✓
Deschampsia flexuosa	Wavy hair grass	✓	✓
Digitalis purpurea	Foxglove	✓	✓
Dryopteris borreri	Borrer's scaly male fern	✓	X
Dryopteris dilitata	Broad buckler fern	✓	✓
Dryopteris filix-mas	Male fern	✓	✓
Epilobium angustifolium	Fireweed	✓	✓
Euphorbia amygdaloides	Wood spurge	✓	✓
Festuca ovina	Sheep's fescue	✓	✓
Fragaria vesca	Wild strawberry	✓	X
Galium aparine	Cleavers	✓	X
Galium odoratum	Woodruff	✓	X
Galium saxatile	Heath bedstraw	✓	✓

Latin name	Common name	NVC subcommunity	
		W10c	W10d
Geranium robertianum	Herb Robert	✓	X
Glechoma hederacea	Ground ivy	✓	✓
Heracleum sphondylium	Hogweed	✓	✓
Holcus lanatus	Yorkshire fog	✓	✓
Holcus mollis	Creeping soft grass	✓	✓
Hyacinthoides non-scripta	Bluebell	✓	✓
Jacobaea vulgaris	Common ragwort	X	✓
Juncus effusus	Soft rush	✓	✓
Lamiastrum galeobdolon	Yellow archangel	✓	X
Ligustrum vulgare	Wild privet	✓	X
Lonicera periclymenum	Honeysuckle	✓	✓
Luzula multiflora	Common woodrush	✓	✓
Luzula pilosa	Hairy woodrush	✓	✓
Luzula sylvatica	Great woodrush	✓	✓
Lysimachia nemorum	Yellow pimpernel	X	✓
Melampyrym pratense	Common cow wheat	✓	✓
Melica uniflora	Wood melick	✓	✓
Mercurialis perennis	Dog's mercury	✓	X
Milium effusum	Wood millet	✓	X
Narcissus pseudonarcissus	Daffodil	✓	X
Oxalis acetosella	Wood sorrel	✓	✓
Poa nemoralis	Wood meadow grass	✓	X
Poa trivialis	Rough meadow grass	✓	X
*Polygonatum multiflorum**	Solomon's seal*	N/A	N/A
*Polystichum aculeatum**	Hard shield fern*	N/A	N/A
Potentilla sterilis	Barren strawberry	✓	X
Primula vulgaris	Primrose	✓	X
Ranunculus repens	Creeping buttercup	X	✓
Rosa canina	Dog rose	✓	✓
Rubus idaeus	Red raspberry	✓	✓
Rumex acetosa	Common sorrel	✓	✓
Rumex sanguineus	Wood dock	✓	✓
Sanicula europaea	Sanicle	✓	X
Silene dioica	Red campion	✓	✓
Solidago virgaurea	European goldenrod	✓	✓
Stachys sylvatica	Hedge woundwort	✓	✓

Latin name	Common name	NVC subcommunity	
		W10c	W10d
Stellaria holostea	Greater stitchwort	✓	✓
Stellaria media	Common chickweed	✓	✓
Teucrium scorodonia	Wood sage	✓	✓
*Torilis japonica**	Upright hedge parsley*	N/A	N/A
Ulex europaeus	Gorse	✓	✓
Vaccinium myrtillus	European blueberry	✓	✓
Veronica chamaedrys	Germander speedwell	X	✓
*Veronica montana**	Wood speedwell*	N/A	N/A
Viola riviniana	Common dog violet	✓	✓

* Suitable species identified through NVC field surveys that are not listed as typical under the relevant subcommunities. (N/A is used in cells this relates to).

Other broadleaved and mixed woodlands

A.3.2 Other woodland; broadleaved (w1g) will be reinstated based on the indicative planting list in Table A-7. This list is derived from tree and shrub species identified from UKHab surveys of non HPI woodlands within the Order Limits. These woodlands do not typically have a recognisable field layer community and hence, the ground flora will be left to naturally re-establish following tree and shrub planting.

A.3.3 For other woodland; mixed (w1h) reinstatement, coniferous species will be added to the indicative species list in Table A-7 that have been identified from UKHab surveys of non HPI woodlands within the Order Limits, namely Scots pine (Pinus sylvestris).

Table A-7 Other broadleaved woodlands (w1g, w1h) indicative species list

Latin name	Common name
Tree species	
Alnus glutinosa	Alder
Betula pendula	Silver birch
Carpinus betulus	Hornbeam
Castanea sativa	Horse chestnut
Fagus sylvatica	Beech
Populus alba	White poplar
Populus x canescens	Grey poplar
Prunus avium	Bird cherry
Prunus domestica	Wild plum
Quercus robur	Pedunculate oak
Scrub species	
Acer campestre	Field maple
Acer pseudoplatanus	Sycamore
Cornus sanguinea	Dogwood

Latin name	Common name
Corylus avellana	Hazel
Crataegus monogyna	Hawthorn
Ilex aquifolium	Holly
Prunus spinosa	Blackthorn
Salix cinerea	Goat willow
Sambucus nigra	Elder
Sorbus aucuparia	Rowan

Scattered trees – wood pasture and parkland

A.3.4 Scattered trees will comprise canopy species from the NVC indicative species lists for communities W6, W8, and W10. The most suitable NVC community will be selected for planting based on the proximity of the nearest woodland NVC community from NVC field surveys.

Table A-8 Scattered trees – wood pasture and parkland indicative species list

Latin name	Common name
Quercus robur	English oak
Quercus petraea	Sessile oak
Corylus avellana	Hazel
Crataegus monogyna	Hawthorn
Fagus sylvatica	Beech
Castanea sativa	Sweet chestnut

A.4 Hedgerows

Species-rich hedgerow

A.4.1 An indicative species list for species-rich native hedgerow (h2a5) and species-rich native hedgerow with trees (h2a5, 11) is found in Table A-9. For the reinstatement of native non species-rich hedgerows (h2a), the same indicative planting list will be used, but fewer than five woody species is acceptable within a given 30m section of the hedgerow.

A.4.2 Hedgerow types requiring reinstatement and creation have been identified from hedgerow surveys. A schedule of hedgerows is found Annex A of ES Appendix 8.2 Habitats, Volume II (Document reference 6.2, DCO Volume 6). This includes the results of UKHab surveys and Hedgerows Regulations surveys.

Table A-9 Species-rich hedgerow indicative species list

Latin name	Common name
Acer campestre	Field maple
Alnus glutinosa	Alder
Corylus avellana	Hazel

Latin name	Common name
Crataegus monogyna	Hawthorn
Fagus sylvatica	Beech
Ligustrum vulgare	Privet
Prunus spinosa	Blackthorn
Quercus robur	Pedunculate oak
Rosa canina	Dog rose
Sorbus aucuparia	Rowan
Viburnum opulus	Guelder rose
Lonicera periclymenum	Honeysuckle

A.4.3 An indicative species list for non-native and ornamental hedgerow (h2b) is found in Table A-10. Percentage mix is not provided as species tend to form monocultures.

Table A-10 Ornamental and non-native hedgerow indicative species list

Latin name	Common name
Buxus sempervirens	Box
Fagus sylvatica	Beech
Ligustrum ovalifolium	Garden privet
Taxus baccata	Yew

A.5 Scrub

Hawthorn and mixed scrub

A.5.1 An indicative species list for hawthorn scrub (h3b) and mixed scrub (h3h) can be found in Table A-11. The specific percentage mix of lists post-consent will be adjusted to create a mixed or hawthorn dominant composition.

Table A-11 Hawthorn scrub and mixed scrub indicative species list

Latin name	Common name
Acer campestre	*Field maple*
Corylus avellana	*Hazel*
Crataegus monogyna	*Hawthorn*
Ligustrum vulgare	*Privet*
Prunus spinosa	*Blackthorn*
Rosa canina	*Dog rose*
Sorbus aucuparia	*Rowan*
Viburnum opulus	*Guelder-rose*

A.6 Grassland

Acid grassland

A.6.1 An indicative species list for other lowland acid grassland (g1d) can be found in Table A-12. The planting list is based on characteristic species of NVC community U1f. This NVC community was identified as the closest match to the acid grassland recorded east of Durley Street during the NVC survey. Additional species identified through the NVC field survey are marked with an asterisk.

Table A-12 Other lowland acid grassland (National Vegetation Classification community U1f) indicative species list

Latin name	Common name
Agrostis capillaris	Common bent
Agrostis stolonifera	Creeping bent
Aira praecox	Early hairgrass
Alchemilla arvensis	Parsley piert
Anthoxanthum odoratum	Sweet vernal grass
Anthyllis vulneraria	Kidney vetch
Arenaria serpyllifolia	Thyme-leaved sandwort
Calluna vulgaris	Common heather
Centaurium erythraea	Common centaury
Cerastium fontanum	Mouse-ear chickweed
Ceratadon purpureus	Redshank
Festuca ovina	Sheep's fescue
Festuca rubra	Red fescue
Hieracium peleterianum	Lepeletier's hawkweed
Holcus lanatus	Yorkshire fog
*Hypericum humifusum**	Trailing St John's wort*
Hypochaeris radicata	Cat's ear
*Juncus conglomeratus**	Compact rush*
Koeleria macrantha	Prairie Junegrass
Leontodon saxatilis	Lesser hawkbit
Lotus corniculatus	Bird's-foot trefoil
Lychnis viscaria	Sticky catchfly
Myosotis ramosissima	Early forget-me-not
Ornithopus perpusillus	Bird's-foot
Pilosella officinarum	Mouse-ear hawkweed
Plantago coronopus	Buck's-horn plantain
Plantago lanceolata	Ribwort plantain
Poa annua	Annual meadowgrass
Rumex acetosella	Sheep's sorrel
*Sagina apetala**	Annual pearlwort*

Latin name	Common name
Sedum anglicum	English stonecrop
Teesdalia nudicaulis	Shepherd's cress
Trifolium dubium	Lesser trefoil
Trifolium repens	White clover
Ulex europaeus	Gorse
Umbilicus rupestris	Navelwort
Veronica spicata	Spiked speedwell

Calcareous grassland

A.6.2 An indicative planting list for lowland calcareous grassland (g2a) can be found in Table A-13. The planting list is based on characteristic species of NVC community CG3b [17]. The CG3b NVC community was identified as the closest match to the calcareous grasslands at Farlington Water Treatment Works following NVC field surveys.

A.6.3 A second parcel of calcareous grassland HPI is intersected by the Order Limits east of temporary construction compound E-3, however no NVC field surveys have been undertaken on this grassland. NVC field survey data will be collected post consent, and a planting list will be included in the relevant site-specific detailed LEMPs.

Table A-13 Lowland calcareous grassland (National Vegetation Classification community CG3b) indicative species list

Latin name	Common name
Achillea millefolium	Yarrow
Agrimonia eupatoria	Common agrimony
Agrostis capillaris	Common bent
Agrostis stolonifera	Creeping bent
Anacamptis pyramidalis	Pyramidal orchid
Anthoxanthum odoratum	Sweet vernal grass
Anthyllis vulneraria	Kidney vetch
Arrhenatherum elatius	False oat-grass
Asperula cynanchica	Squinancywort
Avenula pratensis	Meadow oatgrass
Avenula pubescens	Downy oatgrass
Bellis perennis	Daisy
Blackstonia perfoliata	Yellow wort
Brachypodium pinnatum	Tor grass
Brachypodium sylvaticum	Wood false brome
Briza media	Quaking grass
Bromus erectus	Upright brome
Campanula glomerata	Clustered bellflower

Latin name	Common name
Campanula rotundifolia	Harebell
Carduus nutans	Musk thistle
Carex caryophyllea	Spring sedge
Carex flacca	Glaucous sedge
Carlina vulgaris	Carline thistle
Centaurea nigra	Common knapweed
Centaurea scabiosa	Greater knapweed
Centaurium erythraea	Common centaury
Cerastium fontanum	Common mouse-ear chickweed
Cirsium acaule	Dwarf thistle
Cirsium arvense	Creeping thistle
Cirsium eriophorum	Woolly thistle
Clematis vitalba	Honeysuckle
Clinopodium vulgare	Wild basil
Convolvulus arvenis	Field bindweed
Cruciata laevipes	Crosswort
Cynosarus cristatus	Crested dog's tail
Dactylis glomerata	Cocksfoot
Dactylorhiza fuchsia	Common spotted orchid
Daucus carota	Wild carrot
Euphrasia officinalis agg.	Eyebright
Festuca ovina	Sheep's fescue
Festuca rubra	Red fescue
Filipendula vulgaris	Dropwort
Galium mollugo	Hedge bedstraw
Galium verum	Lady's bedstraw
Gentianella amarella	Autumn gentian
Gymnadenia conopsea	Fragrant orchid
Helianthemum nummularium	Common rockrose
Hipocrepis comosa	HorshoeHorseshoe vetch
Holcus lanatus	Yorkshire fog
Hypochaeris maculata	Spotted cat's ear
Hypochaeris radicata	Cat's ear
Jacobaea vulgaris	Common ragwort
Knautia arvensis	Field scabious
Koeleria macrantha	Crested junegrass
Lathyrus pratensis	Meadow vetchling
Leontodon hispidus	Rough hawkbit
Leontodon saxitilis	Lesser hawkbit

Latin name	Common name
Leucanthemum vulgare	Oxeye daisy
Linum catharticum	Fairy flax
Lolium perenne	Perennial ryegrass
Lotus corniculatus	Bird's-foot trefoil
Medicaga lupulina	Black medick
Onobrychis viciifolia	Sainfoin
Ononis repens	Common restharrow
Ononis spinosa	Spiny restharrow
Ophrys apifera	Bee orchid
Origanum vulgare	Oregano
Orobanche elatior	Knapweed broomrape
Pastinaca sativa	Wild parsnip
Phleum bertolonii	Smaller cat's tail
Phleum pratense	Timothy
Phyteuma tenerum	Round-headed rampion
Picris hieracioides	Hawkweed oxtongue
Pilosella officinarum	Mouse-ear hawkweed
Pimpinella saxifraga	Burnet saxifrage
Plantago lanceolata	Ribwort plantain
Plantago media	Hoary plantain
Poa pratensis	Kentucky bluegrass
Polygala vulgaris	Common milkwort
Potentilla reptans	Creeping cinquefoil
Primula veris	Cowslip
Prunella vulgaris	Selfheal
Ranunculus bulbosus	Bulbous buttercup
Ranunculus repens	Creeping buttercup
Reseda lutea	Wild mignonette
Rhinanthus minor	Yellow rattle
Rumex acetosa	Common sorrel
Sanguisorba minor	Salad burnet
Scabiosa columbaria	Small scabious
Succisa pratensis	Devil's bit scabious
Thesium humifusum	Bastard toadflax
Thymus praecox	Mother of thyme
Thymus pulegioides	Broad-leaved thyme
Tragopogon pratensis	Goat's beard
Trifolium pratense	Red clover
Trifolium repens	White clover

Latin name	Common name
Trisetum flavescens	Yellow oatgrass
Ulex europaeus	Gorse
Veronica chamaedrys	Germander speedwell
Vicia cracca	Bird vetch
Viola hirta	Hairy violet

Neutral grasslands

A.6.4 Indicative species lists for neutral grasslands (g3c5, g3c6, g3c7, and g3c8) can be found in Table A-15, Table A-16, Table A-17andTable A-18. These indicative species lists are based on the NVC community equivalents for each neutral grassland UKHab type (see Table A-14). However, as these NVC communities are not exclusively associated with the corresponding UKHab type, each indicative species list is supplemented with characteristic species present within the UKHab definitions and UKHab surveys that are not listed as typical within the NVC community. These are marked with an asterisk.

Table A-14 Neutral grassland UKHab types and their National Vegetation Classification community equivalents

UKHab type	NVC community equivalent
Arrhenatherum neutral grassland (g3c5)	*Arrhenatherum elatius* grassland (MG1)
Deschampsia neutral grassland (g3c7)	*Holcus lanatus – Deschampsia cespitosa* grassland (MG9)
Holcus – Juncus neutral grassland (g3c8)	*Holcus lanatus – Juncus effusus* rush-pasture (MG10)
Lolium – Cynosurus neutral grassland (g3c6)	*Lolium perenne – Cynosurus cristatus* grassland (MG6)

Table A-15 *Arrhenatherum* neutral grassland (g3c5) indicative species list

Latin name	Common name
Achillea millefolium	Yarrow
Aegopodium podagraria	Ground elder
Agrimonia eupatoria	Agrimony
Agrostis capillaris	Common bent
Agrostis stolonifera	Creeping bent
Alopecurus pratensis	Meadow foxtail
Anthoxanthum odoratum	Sweet vernal grass
Anthriscus sylvestris	Cow parsley
Arrhenatherum elatius	False oat-grass
Artemisia vulgaris	Mugwort
Avenula pubescens	Downy oatgrass
Brachypodium sylvaticum	False brome
Briza media	Quaking grass
Bromus erectus	Upright brome

Latin name	Common name
Bromus hordeaecus	Soft brome
Bromus sterilis	Barren brome
*Calamagrostis epigejos**	Wood small reed*
Campanula rotundifolia	Common harebell
Capsella bursa-pastoris	Shepherd's purse
Carduus nutans	Musk thistle
Centaurea nigra	Black knapweed
Centaurea scabiosa	Greater knapweed
Cerastium fontanum	Mouse-ear chickweed
Cirsium arvense	Creeping thistle
Cirsium vulgare	Spear thistle
Clinopodium vulgare	Wild basil
Conopodium majus	Pignut
Convulvulus arvensis	Field bindweed
Cynosurus cristatus	Crested dog's tail
Dactylis glomerata	Cocksfoot
Daucus carota	Wild carrot
Elymus repens	Common couch
Epilobium angustifolium	fireweed
Epilobium hirsutum	Hairy willowherb
Festuca ovina	Sheep's fescue
Festuca pratensis	Meadow fescue
Festuca rubra	Red fescue
Filipendula ulmaria	Meadowwosweet
Galium aparine	Cleavers
Galium mollugo	Hedge bedstraw
Galium verum	Lady's bedstraw
Geranium dissectum	Cut-leaf crane's bill
Glechoma hederacea	Ground ivy
Helianthemum nummularium	Common rockrose
Heracleum sphondylium	Hogweed
Holcus lanatus	Yorkshire fog
Holcus mollis	Creeping softgrass
Hypericum perforatum	Perforate St John's wort
Hypochaeris radicata	Cat's ear
Jacobaea vulgaris	Common ragwort
Knautia arvensis	Field scabious
Lamium album	White deadnettle
Lathyrus pratensis	Meadow vetchling

Latin name	Common name
Leontodon hispidus	Rough hawkbit
Leucanthemum vulgare	Oxeye daisy
Linum catharticum	Fairy flax
Lolium perenne	Perennial ryegrass
Lotus corniculatus	Bird's foot trefoil
Lotus pedunculatus	Greater bird's foot trefoil
Luzula campestris	Field woodrush
Origanum vulgare	Oregano
Papaver dubium	Long-headed poppy
Papaver rhoeas	Common poppy
Pastinacea sativa	Wild parsnip
Phleum bertolonii	Small leaf timothy
Phleum pratense	Timothy
Pimpinella major	Greater burnet-saxifrage
Pimpinella saxifraga	Burnet saxifrage
Plantago lanceolata	Ribwort plantain
Poa pratensis	Kentucky bluegrass
Poa trivialis	Rough meadowgrass
Potentilla reptans	Creeping cinquefoil
Primula veris	Cowslip
Prunella vulgaris	Selfheal
Ranunculus acris	Meadow buttercup
Ranunculus bulbosus	Bulbous buttercup
Ranunculus ficaria	Lesser celandine
Ranunculus repens	Creeping buttercup
Rhinanthus minor	Yellow rattle
Rubus fruticosus agg.	Bramble
Rumex acetosa	Common sorrel
Rumex crispus	Curly dock
Rumex obtusifolius	Bitter dock
Sanguisorba minor	Salad burnet
Scabiosa columbaria	Small scabious
*Schedonurus arundinacea**	Tall fescue*
Silene nutans	Nottingham catchfly
Sonchus asper	Prickly sowthistle
Stellaria graminea	Lesser stitchwort
Symphytum officinale	Common comfrey
Teucrium scorodonia	Wood sage
Thymus praecox	Mother of thyme

Latin name	Common name
Trifolium pratense	Red clover
Trifolium repens	White clover
Trisetum flavescens	Yellow oatgrass
Veronica chamaedrys	Germander speedwell
Vicia cracca	Bird vetch
Vicia sativa nigra	Narrow-leaved vetch
Vicia sepium	Bush vetch

Table A-16 *Lolium – Cynosurus* neutral grassland (g3c6) indicative species list

Latin name	Common name
Achillea millefolium	Yarrow
Agrostis capillaris	Common bent
Agrostis stolonifera	Creeping bent
Alopecurus geniculatus	Marsh foxtail
Alopecurus pratensis	Meadow foxtail
Anthoxanthum odoratum	Sweet vernal grass
Arrhenatherum elatius	False oat-grass
Bellis perennis	Daisy
Bromus hordeaecus	Soft brome
Cardamine pratensis	Cuckoo flower
Centaurea nigra	Black knapweed
Cerastium fontanum	Mouse-ear chickweed
Cirsium arvense	Creeping thistle
*Cirsium palustre**	Marsh thistle*
Cirsium vulgare	Spear thistle
Cynosurus cristatus	Crested dog's tail
Dactylis glomerata	Cocksfoot
Deschampsia cespitosa	Tufted hairgrass
Festuca ovina	Sheep's fescue
Festuca pratensis	Meadow fescue
Festuca rubra	Red fescue
Holcus lanatus	Yorkshire fog
Hypochaeris radicata	Cat's ear
Iris pseudacorus	Yellow iris
Juncus effusus	Soft rush
Lathyrus pratensis	Meadow vetchling
Lolium perenne	Perennial ryegrass
Luzula campestris	Field woodrush
Medicago lupulina	Black medick
Phelum bertolonii	Small leaf timothy

Latin name	Common name
Phleum pratense	Timothy
Pimpinella saxifraga	Burnet saxifrage
Plantago lanceolata	Ribwort plantain
Plantago major	Greater plantain
Poa annua	Annual meadow grass
Poa pratensis	Kentucky bluegrass
Poa trivialis	Rough meadowgrass
Potentilla anserina	Silverweed
Potentilla reptans	Creeping cinquefoil
Prunella vulgaris	Selfheal
Ranunculus acris	Meadow buttercup
*Ranunculus repens**	Creeping buttercup*
Rhinanthus minor	Yellow rattle
Rumex acetosa	Common dock
*Rumex acetosa**	Common sorrel*
Rumex obtusifolius	Bitter dock
Scorzenoroides autumnalis	Autumn hawkbit
Trifolium dubium	Lesser trefoil
Trifolium pratense	Red clover
Trifolium repens	White clover
Trisetum flavescens	Yellow oatgrass
Veronica chamaedrys	Germander speedwell

Table A-17 *Deschampsia* neutral grassland (g3c7) indicative species list

Latin name	Common name
Achillea millefolium	Yarrow
Achillea ptarmica	Sneezewort
Agrimonia eupatoria	Hemp agrimony
Agrostis capillaris	Common bent
Agrostis stolonifera	Creeping bent
Alopecurus pratensis	Meadow foxtail
Angelica sylvestris	Wild angelica
Anthoxanthum odoratum	Sweet vernal grass
Arrhenatherum elatius	False oat-grass
Briza media	Quaking grass
Cardamine pratensis	Cuckoo flower
Carex hirta	Hairy sedge
Carex nigra	Black sedge
Carex panicea	Carnation sedge
Centaurea nigra	Black knapweed

Latin name	Common name
Cerastium fontanum	Mouse-ear chickweed
Cirsium arvense	Creeping thistle
Cirsium palustre	Marsh thistle
Cirsium vulgare	Spear thistle
Conopodium majus	Pignut
Cynosurus cristatus	Crested dog's tail
Dactylis glomerata	Cocksfoot
Dactylorhiza fuchsii	Common spotted orchid
Danthonia decumbens	Heath grass
Deschampsia cespitosa	Tufted hairgrass
Festuca arundinacea	Tall fescue
Festuca pratensis	Meadow fescue
Festuca rubra	Red fescue
Filipendula ulmaria	Meadowsweet
Galium verum	Lady's bedstraw
Glyceria fluitans	Floating sweetgrass
Heracleum sphondylium	Hogweed
Holcus lanatus	Yorkshire fog
Holcus mollis	Creeping softgrass
Hordeum secalinum	Meadow barley
Hypericum perforatum	Perforate St John's wort
Jacobaea aquaticus	Marsh ragwort
Jacobaea vulgaris	Common ragwort
Juncus articulatus	Jointed rush
Juncus effusus	Soft rush
Juncus inflexus	Hard rush
Lathyrus pratensis	Meadow vetchling
Leucanthemum vulgare	Oxeye daisy
Lolium perenne	Perennial ryegrass
Lotus corniculatus	Bird's foot trefoil
Lotus pedunculatus	Greater bird's foot trefoil
Mentha aquatica	Water mint
Phalaris arundinacea	Reed canary grass
Phleum bertolonii	Small leaf timothy
Phleum pratense	Timothy
Plantago lanceolata	Ribwort plantain
Poa pratensis	Kentucky bluegrass
*Poa trivialis**	Rough meadow grass*
*Poa trivialis**	Rough meadow grass*

Latin name	Common name
Potentilla anserina	Silverweed
Potentilla erecta	Tormentil
Primula veris	Cowslip
Prunella vulgaris	Selfheal
Pulicaria dysenterica	Common fleabane
Ranunculus acris	Meadow buttercup
Ranunculus ficaria	Lesser celandine
Ranunculus repens	Creeping buttercup
Rubus fruticosus agg.	Bramble
Rumex acetosa	Common sorrellsorrel
Rumex conglomeratus	Clustered dock
Rumex crispus	Curly dock
Rumex obtusifolius	Bitter dock
Rumex sanguineus	Wood dock
Scorzenoroides autumnalis	Autumn hawkbit
Silaum silaus	Pepper saxifrage
Succisa pratensis	Devil's bit scabious
Trifolium pratense	Red clover
Trifolium repens	White clover
Trisetum flavescens	Yellow oatgrass
Vicia cracca	Bird vetch

Table A-18 *Holcus – Juncus* neutral grassland (g3c8) indicative species list

Latin name	Common name
Agrostis capillaris	Common bent
Agrostis stolonifera	Creeping bent
Alopecurus geniculatus	Marsh foxtail
Alopecurus pratensis	Meadow foxtail
Angelica sylvestris	Wild angelica
Anthoxanthum odoratum	Sweet vernal grass
Caltha palustris	Marsh marigold
Cardamine pratensis	Cuckoo flower
Carex hirta	Hairy sedge
Carex panicea	Carnation sedge
Cerastium fontanum	Common mouse-ear chickweed
Cirsium arvense	Creeping thistle
Cirsium palustre	Marsh thistle
Cynosurus cristatus	Crested dog's tail
Dactylis glomerata	Cocksfoot
Equisetum arvense	Field horsetail

Latin name	Common name
Equisetum palustre	Marsh horsetail
Festuca pratensis	Meadow fescue
Festuca rubra	Red fescue
Filipendula ulmaria	Meadowsweet
Glyceria fluitans	Floating sweetgrass
Holcus lanatus	Yorkshire fog
Iris pseudoacorus	Yellow flag
Jacobaea aquatica	Marsh ragwort
Juncus articulatus	Jointed rush
Juncus effusus	Soft rush
Juncus inflexus	Hard rush
Lolium perenne	Perennial ryegrass
Lotus pedunculatus	Greater bird's-foot trefoil
Lychnis flos-cuculi	Ragged robin
Mentha aquatica	Water mint
Myosotis scorpioides	Water forget-me-not
Oenanthe crocata	Hemlock water dropwort
Phalaris arundinacea	Reed canary grass
Phleum pratense	Timothy
Plantago lanceolata	Ribwort plantain
Plantago major	Greater plantain
Poa pratensis	Kentucky bluegrass
Poa trivialis	Rough meadow grass
Polygonum hydropiper	Water pepper
Potentilla anserina	Silverweed
Prunella vulgaris	Selfheal
Pulicaria dysenterica	Common fleabane
Ranunculus acris	Meadow buttercup
Ranunculus repens	Creeping buttercup
Rumex acetosa	Common sorrel
Rumex conglomeratus	Clustered dock
Rumex crispus	Curly dock
Rumex obtusifolius	Broadleaved dock
Stellaria alsine	Bog stitchwort
Trifolium pratense	Red clover
Trifolium repens	White clover
Vicia cracca	Bird vetch
x Festulolium loliaceum	Hybrid fescue

Modified grasslands

A.6.5 Modified grasslands (g4, amenity grasslands and grazing pastures) will be reinstated through overseeding with a suitable amenity or agricultural grassland seed mix and therefore no specific indicative planting list is provided. This will be in accordance with the Outline SRMP, Appendix B of the Outline CEMP (Document reference 7.1, DCO Volume 7). A detailed CEMP(s) will be produced, in accordance with the measures contained in Outline CEMP, and submitted for approval as secured by the corresponding requirement in Schedule 2 to the draft DCO (Document reference 3.1, DCO Volume 3).

A.7 Urban

Green/brown roof

A.7.1 The indicative species list for the WRP site green/brown roof can be found in Table A-19. The list is based on species identified from an NVC survey at the WRP site that are considered suitable for establishment on the green/brown roof (i.e. could adapt to drier conditions). The indicative species list has also been supplemented with species noted as being present at the WRP site from the following sources:

1. Hampshire Biodiversity Information Centre (HBIC) records of county notable flora occurring within the WRP site(Work Number 1) [32]
2. Historic planning application document for the WRP site (Work Number 1) [33]

A.7.2 The NVC community identified at the WRP site from an NVC field survey most closely matched the MG10b grassland sub-community [17]. Many of the species within this sub-community are wet-adapted and thus not suitable for green/brown roof planting, but a separate full MG10b planting list has been provided in Table A-20 for ground-level planting around the permanent structure where possible to mitigate for the loss of OMH HPI.

Table A-19 Water Recycling Plant site green/brown roof species list

Latin name	Common name
Achillea millefolium	Yarrow
Agrostis gigantea	Black bent
Arrhenatherum elatius	False oat-grass
Artemisia absinthium	Common wormwood*
Avenula pubescens	Downy oatgrass
Bellis perennis	Daisy
Carduus tenuiflorus	Slender thistle*
Centaurea debeauxii	Chalk knapweed
Centaurea nigra	Black knapweed
Cerastium glomeratum	Sticky mouse-ear chickweed
Cirsium arvense	Creeping thistle
Cirsium vulgare	Spear thistle
Convolvulus arvensis	Field bindweed
Daucus carota	Wild carrot

Latin name	Common name
Dipsacus fullonum	Teasel
Elymus repens	Common couch
Festuca ovina	Sheep fescue
Galium aparine	Cleavers
Geranium dissectum	Cutleaf cranesbill
Geranium molle	Dove's foot cranesbill
Helminthotheca echioides	Bristly oxtongue
Heracleum sphondylium	Hogweed
Hordeum brachyantherum	Meadow barley**
Hypericum perforatum	Perforate St John's wort
Jacobaea vulgaris	Common ragwort
Lathyrus hirsutus	Hairy vetchling*
Lotus corniculatus	Bird's-foot trefoil
Malva sylvestris	Common mallow
Medicago lupulina	Black medick
Odontites vernus	Red bartsia
Oenanthe pimpinelloides	Corky-fruited water dropwort**
Phleum bertolonii	Smaller cat's-tail
Picris hieracioides	Hawkweed oxtongue
Poa annua	Annual meadow grass
Potentilla reptans	Creeping cinquefoil
Ranunculus sardous	Hairy buttercup*
Samolus valerandii	Brookweed*
Schedonurus pratensis	Meadow fescue
Trifolium dubium	Lesser trefoil
Tripleurospermum inodurum	Scentless mayweed
Vulpia bromoides	Squirreltail fescue

*Hampshire Biodiversity Information Centre (HBIC) records of county notable flora occurring within the WRP site

**Historic planning application document for the WRP site

Table A-20 MG10b grassland species list

Latin name	Common name
Agrostis capillaris	Common bent
Agrostis stolonifera	Creeping bent
Alopecurus geniculatus	Marsh foxtail
Cardamine pratensis	Cuckoo flower
Carex hirta	Hairy sedge
Cerastium fontanum	Common mouse-ear chickweed
Cirsium arvense	Creeping thistle

Latin name	Common name
Cirsium palustre	Marsh thistle
Cynosurus cristatus	Crested dog's tail
Dactylis glomerata	Cocksfoot
Equisetum arvense	Field horsetail
Equisetum palustre	Marsh horsetail
Festuca pratensis	Meadow fescue
Festuca rubra	Red fescue
Glyceria fluitans	Floating sweetgrass
Holcus lanatus	Yorkshire fog
Jacobaea aquatica	Marsh ragwort
Juncus effusus	Soft rush
Juncus inflexus	Hard rush
Lolium perenne	Perennial ryegrass
Lotus pedunculatus	Greater bird's-foot trefoil
Mentha aquatica	Water mint
Plantago lanceolata	Ribwort plantain
Plantago major	Greater plantain
Poa trivialis	Rough meadow grass
Polygonum hydropiper	Water pepper
Ranunculus acris	Meadow buttercup
Ranunculus repens	Creeping buttercup
Rumex acetosa	Common sorrel
Rumex conglomeratus	Clustered dock
Rumex crispus	Curly dock
Rumex obtusifolius	Broadleaved dock
Trifolium pratense	Red clover
Trifolium repens	White clover
Vicia cracca	Bird vetch
x Festulolium loliaceum	Hybrid fescue

A.8 Inter-planting

A.8.1 Inter-plating will comprise species from the NVC indicative species lists above for the relevant habitat type.

Appendix B Initial maintenance measures and long-term management measures

B.1.1 See Table B-1 Feature descriptions, Table B-2 Maintenance measures – Initial phase and Table B-3 Maintenance measures – long term.

Table B-1 Feature descriptions

Maintenance and management reference number	Outline LEMP feature	Description
Planting		
WL1	Lowland mixed deciduous woodland, broadleaved woodland, mixed woodland, individual field trees and lines of trees	Areas of semi-natural woodland containing native tree species taller than 5m when mature, on a full range of soils conditions, and with canopy cover greater than 20% and lines of trees. This habitat is important for wildlife and is a key component of the local landscape character.
WL2	Wet woodland	The wet woodland will include inundation-tolerant tree species such as alder (*Alnus glutinosa*), birch (*Betula sp*) and willow (*Salix sp*) to help to improve flood management and habitat diversity.
WL3	Scattered trees in fields	Existing and proposed individual or small groups of trees in fields.
SC1	Mixed scrub and hawthorn scrub	Proposed scrub habitat. Areas along hedgerow boundaries and field margins will be managed and enhanced for habitat diversity and to prevent encroachment onto adjacent grassland habitat.
HR1	Native hedgerow with and without trees	Existing and reinstated native hedgerows are a key component of the landscape character and provide resource for local wildlife and livestock. They define field boundaries and provide important ecological connectivity across the Project. They will be enhanced through plugging with native woody species, tree planting and the provision of a 2m grass margin.
HR2	Non-native and ornamental hedgerow	Reinstated ornamental hedges planted for visual amenity, or screening.

Maintenance and management reference number	Outline LEMP feature	Description
GL1	Neutral grassland	Proposed neutral grasslands in areas where nutrient inputs are low. A neutral pH balance in the soil that encourages valuable species-rich grass swards of a varied structure.
GL2	Acid grassland	Reinstated acid grassland in areas where nutrient inputs are low. A slightly acid pH balance in the soil encourages valuable species-rich grass swards of a varied structure. Acid grasslands are considered an important habitat in the UK.
GL3	Calcareous grassland	Chalk grasslands are considered to be one of the most threatened habitats in Europe. Proposed and existing chalk grasslands in areas where soil contains chalk and nutrient inputs are low. A slightly alkaline pH balance in the soil encourages valuable species-rich grass swards of a varied structure.
GL4	Modified grassland	Reinstated amenity grasslands and grazing pasture
OMHGR	Green/brown roof	Proposed biodiverse green/brown roof with no general access and to include open mosaic habitat, seeded or plug planted, growing in 80-150mm deep substrate to compensate for the loss of open mosaic habitat on previously developed land.
Other habitat features		
FA1	Bats	Habitat creation and enhancement works across the Project will provide foraging and commuting opportunities for bats. Hedgerow reinstatement at key connective locations (KCL) designed to ensure quick like-for-like reinstatement. Retention of temporary fencing to ensure flightlines are retained whilst the hedgerow habitat becomes sufficiently established.
FA2	Barn owl	Barn owl boxes to be installed on trees to provide nesting opportunities for local populations. Habitat creation and enhancement works across the Project will provide nesting and foraging opportunities for barn owls.
FA3	Hazel dormouse	Proposed hazel dormouse nest boxes installed on hazel trees to provide nesting opportunities for local populations. Habitat creation and enhancement works across the Project will provide foraging opportunities for hazel dormouse.

Maintenance and management reference number	Outline LEMP feature	Description
FA4	Invertebrate	Proposed invertebrate features (dead wood habitat piles) created within rural habitats to provide shelter and feeding opportunities for invertebrate populations. Habitat creation and enhancement works across the Project will provide habitat for invertebrates.
FA5	Badger	Proposed artificial badger setts in strategic locations to provide shelter and breeding opportunities. Grassland, hedgerow, scrub and woodland creation and enhancement will provide suitable foraging and sheltering habitat for badger.
FA6	Swifts	Proposed swift boxes integrated into or attached to above ground plant buildings. Habitat creation and enhancement works across the Project will provide nesting and foraging opportunities for swifts.
FA7	Sites of Importance for Nature Conservation (SINC)	Proposed habitat reinstated of Field to West of Gillman Road and Fielders Farm Meadow SINC.

Table B-2 Maintenance measures – Initial phase

Outline LEMP feature	Task	Maintenance to be undertaken	Timing
General measures			
Relevant to all plants	General inspection	Inspections will be carried out to enable effective and timely management to meet objectives and avoid negative impacts on plant health from pests, diseases and other impacts to successful establishment. Where progress against objectives within the detailed LEMPs is considered not to be sufficient, management can be adapted and the detailed LEMPs will be revised to record any changes.	Years 1-5: Four evenly spaced visits per year (including summer growing season)
Litter	Litter picking	Collect and remove from site extraneous rubbish. Checks to be undertaken at every visit.	Collection and removal of rubbish (each visit)
Planting			

Outline LEMP feature	Task	Maintenance to be undertaken	Timing
Lowland mixed deciduous woodland, broadleaved woodland, mixed woodland, and lines of trees (note, for retained woodland habitat the management activities under long term shall be followed from Year 1 instead of Year 5)	Weed control	Maintain a 1m diameter circle clear of vegetation around the base of newly planted trees inspecting bi-annually. Top up mulch as required to ensure consistent depth of 50-75mm is maintained. Clear weeds and remove off site.	Bi-annually (spring & autumn)
	Tree stakes/ties/guards	Bi-annual inspection of all tree stakes, ties, tubes and guards with necessary repairs, replacements adjustments and/or re-firming undertaken during the inspection. If the plant has rooted successfully and does not require further protection/staking then those elements to be removed (including all fixing elements with the plants). Note, do not remove earlier than two full growing seasons. All removed stakes/ties/guards to be taken off site.	Bi-annually
	Plant replacements	Replacement of any plants damaged to an extent that they are dead or dying as agreed with the Landscape Architect or Ecologist.	Plant replacement November to December
	Plant firming	Plants shall be inspected bi-annually to check for any damage from frost heave or wind rock and shall be straightened to an upright position and the ground re-firmed wherever required.	Bi-annually
	Watering	During Year 1 only, water new plants if unseasonal conditions result in a lack of adequate rainfall to aid initial growth. Water as necessary to ensure the establishment and continued thriving of all planting.	May to September only if unseasonably dry
	Scrub cutting	If bramble exists in woodland - on a rotational cycle 20% of overall bramble scrub should be cut each winter to provide a mosaic of bramble at different stages of growth. If existing scrub encroaches or establishes within first few years and interferes with tree sapling growth, remove a 1m diameter of scrub around trees.	January to February
	Ground preparation	Rides and glades should be created and managed to increase diversity. Small, open areas should be created to allow the ground flora to colonise. Leave standing and fallen deadwood to provide valuable habitat for invertebrates, reptiles and amphibians.	November to February

Outline LEMP feature	Task	Maintenance to be undertaken	Timing
	Canopy trimming & path clearance	Maintain tree canopies at a minimum distance of 5m from fencing next to roads to minimise risk of trees falling and overgrowing or wind-thrown debris causing damage. Cut back undergrowth, overgrowing or overhanging shrubs and minor tree branches from any pathways to maintain an unobstructed width of at least 2m or the existing width of the pathway, whichever is greater.	Annually as required
Wet woodland	Weed control	Maintain a 1m diameter circle clear of vegetation around the base of newly planted trees inspecting bi-annually. Top up mulch as required to ensure consistent depth of 50-75mm is maintained. Clear weeds and remove off site.	Bi-annually (spring & autumn)
	Tree stakes/ties/guards	Bi-annual inspection of all tree stakes, ties, tubes and guards with necessary repairs, replacements adjustments and/or re-firming undertaken during the inspection. If the plant has rooted successfully and does not require further protection/staking then those elements to be removed (including all fixing elements with the plants). Note, do not remove earlier than two full growing seasons. All removed stakes/ties/guards to be taken off site.	Bi-annually
	Plant replacements	Annual inspection of all new plants. Replacement of any plants damaged to an extent that they are dead or dying as agreed with the Landscape Architect or Ecologist.	Inspection – summer. Plant replacement November to December
	Plant firming	Plants shall be inspected bi-annually to check for any damage from frost heave or wind rock and shall be straightened to an upright position and the ground re-firmed wherever required.	Bi-annually
	Watering	During Year 1 only, water new plants if unseasonal conditions result in a lack of adequate rainfall to aid initial growth. Water as necessary to ensure the establishment and continued thriving of all planting.	May to September only if unseasonably dry

Outline LEMP feature	Task	Maintenance to be undertaken	Timing
	Scrub cutting	To maintain wet scrub within and around wet woodland habitat in allocated areas, rotational management is required to prevent scrub turning into woodland. Make sure scrub is not drying out wetland habitats by removing unwanted scrub.	January to February
	Ground preparation	Rides and glades should be created and managed to increase diversity. Small, open areas should be created to allow wetland species to colonise. Leave standing and fallen deadwood to provide valuable habitat for invertebrates, reptiles and amphibians.	November to February
	Canopy trimming & path clearance	Maintain tree canopies at a minimum distance of 5m from fencing next to road to minimise risk of trees falling and overgrowing or wind-thrown debris causing damage. Cut back undergrowth, overgrowing or overhanging shrubs and minor tree branches from any pathways to maintain an unobstructed width of at least 2m or the existing width of the pathway, whichever is greater.	Annually as required
Scattered trees in fields	Watering	Young trees will be watered during dry periods as required to maintain soil moisture.	May to September only if unseasonably dry
	Weed control	Maintain a 1m diameter circle clear of vegetation around the base of new trees. Inspect bi-annually. Clear weeds and use for composting. Top up mulch as required to ensure consistent depth is maintained.	Bi-annually (spring & autumn)
	Tree stakes/ties/guards	Bi-annual inspection of all tree stakes, ties, tubes and guards with necessary repairs, replacements adjustments and/or re-firming undertaken during the inspection. If the plant has rooted successfully and does not require further protection/staking then those elements to be removed (including all fixing elements with the plants). Note, do not remove earlier than two full growing seasons. As trees will be more exposed to the elements, they will need more attentive care to ensure successful establishment. Regarding trees in grazing fields, do no not remove until tree reaches at least 2.5m high. All removed stakes/ties/guards to be taken off site.	Bi-annually

Outline LEMP feature	Task	Maintenance to be undertaken	Timing
	Plant replacements	Annual inspection of all new plants. Replacement of any plants damaged to an extent that they are dead or dying.	Inspection – summer. Plant replacement November to December
	Plant firming	Plants shall be inspected bi-annually to check for any damage from frost heave or wind rock and shall be straightened to an upright position and the ground re-firmed wherever required.	Bi-annually
	Pruning	Pruning of lower branches in first few years to encourage taller canopy.	February
Mixed scrub and hawthorn scrub (note, for existing scrub habitat the long term management activities shall be followed from Year 1 instead of Year 5)	Weed control	Maintain a 1m diameter circle clear of vegetation around the base of new plants. Inspect bi-annually. Clear weeds and use for composting. Top up mulch as required to ensure consistent depth is maintained.	Bi-annually (spring & autumn)
	Plant guards and tubes	Bi-annual inspection of all plant guards and tubes with necessary repairs, replacements adjustments and/or re-firming undertaken during the inspection. If the plant has rooted successfully and does not require further protection/staking then those elements to be removed (including all fixing elements with the plants). These are not to be removed earlier than two full growing seasons. All removed stakes/ties/guards to be removed off site.	Bi-annually
	Plant replacements	Annual inspection of all new plants. Replacement of any plants damaged to an extent that they are dead or dying as agreed with the Landscape Architect or Ecologist.	Inspection – summer. Plant replacement November to December
	Plant firming	Plants shall be inspected bi-annually to check for any damage from frost heave or wind rock and shall be straightened to an upright position and the ground re-firmed wherever required.	Bi-annually
	Watering	During Year 1 only, water new plants if unseasonal conditions result in a lack of adequate rainfall to aid initial growth. Water as necessary to ensure the establishment and continued thriving of all planting.	May to September only if unseasonably dry
	Scrub cutting and disturbance	Cut existing scrub annually on a rotational cycle of 20% of overall scrub area cut each winter to provide a mosaic of species at different stages of	January and February

Outline LEMP feature	Task	Maintenance to be undertaken	Timing
		growth. Cutting new scrub areas should begin when planting is fully established and developing, no earlier than Year 3. Disturbances to the scrub areas should be non-uniform, mimicking theoretical grazing patterns of animals; trampling and browsing. If bramble becomes dominant, it may need to be chemically weed controlled with guidance from a suitably qualified Landscape Architect or Ecologist appointed by the Contractor, in accordance with the INNS Biosecurity Plan (Document reference 7.10, DCO Volume 7).	
Native hedgerow, with and without trees (note, for existing hedgerows the management activities in Long Term Management plan shall be followed from Year 1 instead of Year 5)	Weed control	Maintain a 750mm wide area clear of vegetation around the base of new plants. Inspect bi-annually. Clear weeds and remove from site. Top up mulch as required to ensure consistent depth is maintained.	Bi-annually (spring & autumn)
	Plant stakes/ties/guards	Bi-annual inspection of all plant guards and tubes with necessary repairs, replacements adjustments and/or re-firming undertaken during the inspection. If the plant has rooted successfully and does not require further protection/staking then those elements to be removed (including all fixing elements with the plants). These are not to be removed earlier than two full growing seasons. All removed stakes/ties/guards to be removed off site.	April and August
	Plant replacements	Annual inspection of all new plants. Replacement of any plants damaged to an extent that they are dead or dying as agreed with the Landscape Architect or Ecologist.	Inspection – summer. Plant replacement November to December
	Plant firming	Plants shall be inspected bi-annually to check for any damage from frost heave or wind rock and shall be straightened to an upright position and the ground re-firmed wherever required.	April and August
	Pruning of damaged branches	Initial inspection of plants shall be carried out, and then annually for dead or diseased branches and pruned back, where disease or fungus is identified agree with an Ecologist or Arboriculturist. Work is recommended to commence in dormant phase and outside the bird nesting season. Dead wood should be left on the ground to encourage natural regeneration. Diseased branches should be disposed of appropriately.	January to February

Outline LEMP feature	Task	Maintenance to be undertaken	Timing
	Watering	During Year 1 only, water new plants if unseasonal conditions result in a lack of adequate rainfall to aid initial growth. Water as necessary to ensure the establishment and continued thriving of all planting.	May to September only if unseasonably dry
	Hedgerow cutting	No cutting of planted hedgerows is anticipated within the five year establishment period.	January to February
Non-native and ornamental hedgerow	Watering	During Year 1 only, water new plants if unseasonal conditions result in a lack of adequate rainfall to aid initial growth. Water as necessary to ensure the establishment and continued thriving of all planting.	May to September only if unseasonably dry
	Pruning	Initial inspection of plants shall be carried out, and then annually for dead or diseased branches and pruned back, where disease or fungus is identified agree with an Ecologist or Arboriculturist. Work is recommended to commence in dormant phase and outside the bird nesting season. Dead wood should be left on the ground to encourage natural regeneration. Diseased branches should be disposed of appropriately. Light pruning to maintain the shape of the hedge to be carried out as required.	January to February
	Plant replacement	Annual inspection to be carried out during the summer to identify any gaps within the hedge or any plants that are damaged to an extent that they are dead or dying as agreed with the Landscape Architect or Ecologist. The replanting of new plants should be undertaken once a year, as needed during the appropriate planting season.	Inspection - summer New planting - October to April, avoiding frost conditions
	Tree stakes/ties/guards	Bi-annual inspection of all plant stakes, ties, tubes and guards with necessary repairs, replacements adjustments and/or re-firming undertaken during the inspection. Protective tubes to be removed by year 5, note, do not remove earlier than two full growing seasons. All removed stakes/ties/guards to be taken off site.	April and August
	Weed control	Maintain a 1m strip centred on the hedgerow clear of grass and weeds to reduce competition from vegetation growth. Inspect bi-annually.	Bi-annually (spring & autumn)

Outline LEMP feature	Task	Maintenance to be undertaken	Timing
	Fertilising	Apply a slow release fertiliser twice a year	Spring and autumn for the first 5 years
	Mulching	Top up mulch layer as required to ensure consistent depth (50-75mm)	Once a year, as needed
Neutral grassland, acid grassland and calcareous grassland	Weed control	Throughout the first growing season a review should be undertaken on a monthly basis to inform the need for further management and to aid establishment of the grassland sward. Control works can be undertaken as required. Control of undesirable species including docks, thistles and ragwort should be undertaken at least once a year during years 2-5, via hand pulling and/or cutting manually. No herbicide treatment permitted. Maintain overall presence of undesirable species in the site at 5% or less. (Note this does not apply to the control of INNS, which will be in accordance with the INNS Biosecurity Plan (Document reference 7.10, DCO Volume 7). For wood pasture and parkland grassland, leave standing and fallen deadwood in situ to provide valuable habitat for invertebrates and hibernacula for reptiles and amphibians.	Year 1 – review monthly Years 2-5 – each August
	Rotational grazing	If rotational grazing is preferred to cutting as the method for managing grassland, then the following guidance takes precedence over guidance on cutting. All other guidance on weed control, seeding and watering still apply. In the first year, limit the quantity and frequency of grazing to allow the grassland time to establish. The regime will vary depending on the species and the size of the field. Multi-species grazing is recommended as different livestock forage differently. Employ a grazing schedule which rotates pastures and allows grazing areas to renew. Where chalk grassland is planted in combination with scrub and other habitat types, management must prioritize chalk grassland, as it is the more	Annually

Outline LEMP feature	Task	Maintenance to be undertaken	Timing
		locally important habitat, and prevent the scrub and tree habitats from becoming dominant.	
	Initial grassland cut	Note: Rotational grazing is the preferred method of maintenance for lowland calcareous grassland and wood pasture and parkland grassland. The prescriptions for rotational grazing included in the rotational grazing section should take precedence over all guidance on cutting. Throughout the first growing season a review should be undertaken on a monthly basis to inform the need for further management to aid establishment of the grassland sward. This could include the requirement for more frequent treatment works, changes to the cutting regime, or further scarification of the sward. In the first year of establishment the grassland shall be cut in the months shown. Cuts during Year 1 shall maintain a 2-6m uncut margin around the edge of the field as a wildlife refuge. Cut material from the grassland shall be collected and removed from the site. Mowing shall be undertaken in a wildlife friendly way by starting from the inside of the site and working towards the outside in a weaving or closing fashion so as to leave a small-scale mosaic of cut and uncut patches. Note: Manual cutting may be required where operational needs or health and safety standards prevent mowing or grazing. For example on the 1:2 slope on the south face of the screening landform adjacent to the BPT/IPS-E. Where chalk grassland is planted in combination with scrub and other habitat types, management must prioritize chalk grassland, as it is the more locally important habitat, and prevent the scrub and tree habitats from becoming dominant.	May, June, July, August

Outline LEMP feature	Task	Maintenance to be undertaken	Timing
		Remove all litter and debris prior to cutting.	
	Bi-annual cut	During years 2-5 inclusive, cut 20% of the site grassland area twice annually. Cuttings to be collected and removed off site. Note: Manual cutting may be required where operational needs or health and safety standards prevent mowing or grazing. For example, on the 1:2 slope on the south face of the screening landform adjacent to the BPT/IPS-E. Where chalk grassland is planted in combination with scrub and other habitat types, management must prioritize chalk grassland, as it is the more locally important habitat, and prevent the scrub and tree habitats from becoming dominant. Remove all litter and debris prior to cutting.	Late April/early May and mid-July
	Annual cut	During years 2-5 inclusive, cut 80% of the site grassland area once annually. Cuttings to be collected and removed off site. Note: Manual cutting may be required where operational needs or health and safety standards prevent mowing or grazing. For example, on the 1:2 slope on the south face of the screening landform adjacent to the BPT/IPS-E. Where chalk grassland is planted in combination with scrub and other habitat types, management must prioritize chalk grassland, as it is the more locally important habitat. and prevent the scrub and tree habitats from becoming dominant. Remove all litter and debris prior to cutting.	Mid-July

Outline LEMP feature	Task	Maintenance to be undertaken	Timing
	Seeding	Where grassland has not established re-seeding may be required.	March-April or September
	Watering	During Year 1 only, water seed areas if unseasonal conditions result in a lack of adequate rainfall to aid germination of seed. Water as necessary to ensure the establishment and continued thriving of all seeding.	May to September only if unseasonably dry
Modified grassland	Watering	During Year 1 only, water seeded areas if unseasonal conditions result in a lack of adequate rainfall to aid germination of seed. Water as necessary to ensure the establishment and continued thriving of all seeding.	May to September only if unseasonably dry
	Weed control	Throughout the first growing season a review should be undertaken on a monthly basis to inform the need for further management and to aid establishment of the grassland sward. Control works can be undertaken as required. Control of undesirable species including docks, thistles and ragwort should be undertaken at least once a year during years 2-5, via hand pulling and/or cutting manually. No herbicide treatment permitted. Maintain overall presence of undesirable species in the site at 5% or less. (Note this does not apply to the control of INNS, which will be in accordance with the INNS Biosecurity Plan (Document reference 7.10, DCO Volume 7). For wood pasture and parkland grassland, leave standing and fallen deadwood in situ to provide valuable habitat for invertebrates and hibernacula for reptiles and amphibians.	Year 1 – review monthly Years 2-5 – each August
	Seeding	Where grassland has not established re-seeding may be required.	March-April or September
	Rotational grazing	Rotational grazing should be used to increase quantity of grazing forage, soil health, soil fertility, feed costs, need for fertilisers and risk of run off, and biodiversity value. In the first year, limit the quantity and frequency of grazing to allow the	Annually

Outline LEMP feature	Task	Maintenance to be undertaken	Timing
		grassland time to establish. The regime will vary depending on the species and the size of the field. Multi-species grazing is recommended as different livestock forage differently. Employ a grazing schedule which rotates pastures and allows grazing areas to renew. Alternatively mowing can be used as method of maintenance. In these instances, the same cutting regime as described for 'Neutral grassland, acid grassland and calcareous grassland' can be followed.	
Green/brown roof	Watering	Weekly irrigation of seeded and planted areas for first 6 – 8 weeks until established. After this period, water as necessary to ensure the establishment and continued thriving of all planting. Watering will depend on the type of green roof but all green/brown roofs require watering during extended periods of dry weather. Native species will require watering after one to two weeks without rainfall. Roofs should be monitored against the local weather and if roofs have become dried out then they should be watered heavily once every week until the vegetation and substrate are fully soaked.	Weekly for first 6 – 8 weeks, then as needed in extended dry weather. Inspections a minimum of 8 times per year.
	Weed control	Control of undesirable species should be undertaken at least twice a year during years 1-5, as determined by the Ecologist, via hand pulling and/or cutting manually. No herbicide treatment permitted. Appropriate wind-blown species should be left to naturally colonise. Species deemed appropriate should all be native and assessed by the Ecologist. Encroachment of planting into vegetation barriers, drainage outlets, inspection chambers or walkways should be removed.	Bi-annually (spring & autumn)
	Plant replacements	Replacement of any plants damaged to an extent that they are dead or dying as agreed with the Landscape Architect or Ecologist.	November to March

Outline LEMP feature	Task	Maintenance to be undertaken	Timing
	Drainage maintenance	Ensure that the drainage system is functioning correctly by clearing debris and inspecting for clogs. Clean out drainage outlets and gutters as needed.	Annually
	Substrate maintenance	Check for substrate settlements/substrate loss due to erosion etc. Make good with same suitable substrate material as specified.	Annually
Other habitat features			
Bats	Temporary fencing at KCLs	Temporary fencing at KCLs to be inspected by suitably experienced Ecologist who will advise if any remedial action is required, for example to replace damaged fencing.	Temporary fencing to be inspected once every three months, until the hedgerow has become establish.
Barn owl and swift	Maintain bird boxes	Annual inspection to ensure fixings remain sturdy and suitable, and to clear out the contents from the breeding season. Contents shall be removed off-site and disposed of. Operatives to wear gloves and use a small brush/scraper while removing contents to minimise health risks from parasites. If the bird box appears heavily soiled or full of parasites then it shall be cleaned using hot water. No chemicals/cleaning sprays shall be used. Any specialist supplier cleaning instructions to be followed in all cases. If the bird box is damaged or missing, then it shall be repaired if possible or replaced with the same make and model or an alternative to be approved by the Ecologist.	Late September to October
Hazel dormouse	Maintain Hazel dormouse nest box and habitat	Progress on habitat establishment monitored (required as part of mitigation set out in the final hazel dormouse licence) and any remedial measures undertaken.	This will be undertaken within the timeframes specified in the conditions of the licence. See Table C-1 Monitoring measures

Outline LEMP feature	Task	Maintenance to be undertaken	Timing
Invertebrate	Ensure habitat piles / hibernacula remain suitable for use.	Undertake post-construction check that the deadwood piles/hibernacula remain in place and is at least 90% of the original size. Check for any signs of waterlogging. The deadwood piles/artificial hibernacula shall be managed by replacing or depositing additional stones, logs or soil cap as appropriate to maintain the original dimensions/volumes.	April
Badger	Maintain artificial badger sett	Monitoring of artificial setts will record badger activity and integration throughout and beyond the completion of construction, for as long as deemed necessary by the Named Ecologist on the final badger licence. Continuous maintenance of landscape planting around artificial setts will be required during and following construction or as long as deemed necessary by the Named Ecologist on the final badger licence	As specified within license issued by Natural England.
Sites of Importance for Nature Conservation (SINC)	Maintain habitat	Management in line with the detailed LEMPs, produced post-consent.	As specified within the detailed LEMPs, produced post-consent.

Table B-3 Maintenance measures – long term

Outline LEMP feature	Task	Management to be undertaken	Timing
General measures			
Relevant to all plants	General inspection	Inspections will be carried out to enable effective and timely management to meet objectives and avoid negative impacts on plant health from pests, diseases and other impacts to successful establishment. Where progress against objectives within the detailed LEMPs is considered not to be sufficient, management can be adapted and the detailed LEMPs will be revised to record any changes.	Years 6-onwards for the time periods set out in paragraph 3.5.3: One visit per year and works as necessary, unless stated otherwise below or in the conditions of the licence

Outline LEMP feature	Task	Management to be undertaken	Timing
			(for example the green/brown roofs).
	Litter picking	Collect and remove from site extraneous rubbish. Checks to be undertaken at every visit.	Collection and removal of rubbish (each visit)
Planting			
Lowland mixed deciduous woodland, broadleaved woodland, mixed woodland, and lines of trees (note, for retained woodland habitat the management activities under long term shall be followed from Year 1 instead of Year 5)	General	Minimal interventions are most likely in areas of established/mature woodlands in good condition. Increased management where structure is more uniform and diversity needs improving for resiliency.	N/A
	Tree stakes/ties/guards	If after establishment phase trees still need stakes, ties tubes or guards, continue to inspect them bi-annually with necessary repairs, replacements adjustments and/or re-firming undertaken during the inspection. If the plant has rooted successfully and does not require further protection/staking, then those elements to be removed (including all fixing elements with the plants). All removed stakes/ties/guards to be taken off site. Activity shall cease when all stakes, ties, tubes and guards are removed from the site.	Bi-annually until all stakes, ties, tubes and guards are removed from the site.
	Pruning of damaged branches	Plants shall be inspected annually for dead or diseased branches and pruned back. Where disease or fungus is identified agree with an Ecologist or Arboriculturist and if instructed prune accordingly. Work is recommended to commence in the dormant phase and outside the bird nesting season. Deadwood should be left on the ground of the woodland. Diseased branches should be disposed of appropriately, as recommended by Ecologist or Arboriculturist.	January to February
	Tree thinning	Thinning and felling of selected woodland trees shall remove the less healthy or less desirable trees and give the remaining trees space to develop and will encourage a greater establishment of native species through active management. Prolific colonisers may need removing in order for desired	November to February

Outline LEMP feature	Task	Management to be undertaken	Timing
		species to establish or to maintain designated open areas. A mixed age class across the species with reduced canopy cover will create light for the field layer to develop. Drastic interventions which cause abrupt changes in light regimes shall be avoided. All arisings shall be removed from site unless otherwise agreed with the Landscape Architect or Ecologist.	
	Scrub cutting	If bramble exists in woodland - on a rotational cycle 20% of overall bramble scrub should be cut each winter to provide a mosaic of bramble at different stages of growth.	January to February
	Canopy trimming & path clearance	Maintain tree canopies at a minimum distance of 5.0m from fencing next to road to minimise risk of trees falling and overgrowing or wind-thrown debris causing damage. Cut back undergrowth, overgrowing or overhanging shrubs and minor tree branches from any pathways to maintain an unobstructed width of at least 2m or the existing width of the pathway, whichever is the greater.	Annually as required
	Ground maintenance	Rises and glades should be maintained to increase diversity. Maintain small, open areas to allow the ground flora to colonise. Leave standing and fallen deadwood to provide valuable habitat for invertebrates, reptiles and amphibians.	November to February
Wet woodland	General	Minimal interventions are most likely in areas of established/mature wet woodlands in good condition. Increased management where structure is more uniform and diversity needs improving for resiliency.	N/A
	Tree stakes/ties/guards	If after establishment phase trees still need stakes, ties tubes or guards, continue to inspect them bi-annually with necessary repairs, replacements adjustments and/or re-firming undertaken during the inspection. If the plant has rooted successfully and does not require further protection/staking than those elements to be removed (including all fixing elements with the plants). All removed stakes/ties/guards to be	Bi-annually until all stakes, ties, tubes and guards are removed from the site.

Outline LEMP feature	Task	Management to be undertaken	Timing
		removed off site. Activity shall cease when all stakes, ties, tubes and guards are removed from the site.	
	Pruning of damaged branches	Plants shall be inspected annually for dead or diseased branches and pruned back. Where disease or fungus is identified agree with an Ecologist or Arboriculturist and if instructed prune accordingly. Work is recommended to commence in the dormant phase and outside the bird nesting season. Deadwood should be left on the ground of the woodland. Diseased branches should be disposed of appropriately, as recommended by Ecologist or Arboriculturist.	January to February
	Tree thinning	If thinning is necessary in any area of wet woodland and has been advised by an ecologist or arboriculturist to improve woodland structure and encourage natural regeneration, then removal of some trees or parts of trees should be assessed. Every 10-20 years after the first 10 years of planted trees have established, coppicing of trees should take place to encourage biodiversity in woodland. Stools should be cut so enough living wood for re-growth remains. Outcompeting plants, e.g. trees, should be coppiced within northern edges and maintained as scrub. Willows can be pollarded every 2-3 years to increase the levels of light reaching the ground. When newly planted trees start to grow thicker vegetation on canopy, cut back areas where large areas of woodland are over shaded.	November to February
	Scrub cutting	To maintain wet scrub within and around wet woodland habitat in allocated areas, rotational management is required to prevent scrub turning into woodland. Make sure scrub is not drying out wetland habitats by removing unwanted scrub.	January to February
	Ground maintenance	Rises and glades should be maintained to increase diversity. Maintain small, open areas to allow for wetland species to colonise. Leave standing and fallen deadwood to provide valuable habitat for invertebrates, reptiles and amphibians.	November to February

Outline LEMP feature	Task	Management to be undertaken	Timing
Scattered trees in fields	Tree stakes/ties/guards	If after establishment phase trees still need stakes, ties tubes or guards, continue to inspect them bi-annually with necessary repairs, replacements adjustments and/or re-firming undertaken during the inspection. If the plant has rooted successfully and does not require further protection/staking than those elements to be removed (including all fixing elements with the plants). All removed stakes/ties/guards to be removed off site. Activity shall cease when all stakes, ties, tubes and guards are removed from the site.	Bi-annually until all stakes, ties, tubes and guards are removed from the site.
	Pruning of damaged branches	Plants shall be inspected annually for dead or diseased branches and pruned back. Where disease or fungus is identified agree with an Ecologist or Arboriculturist and if instructed prune accordingly. Work is recommended to commence in dormant phase and away from bird nesting season. Dead wood should be left on the ground of woodland. Diseased branch should be disposed of appropriately, recommended by Ecologist or Arboriculturist.	January to February
	Canopy trimming	Trees in grazing field - The crown needs to be regularly cut at around 2.5 meters, above the browsing height of the stock below.	Annually as required
Mixed scrub and hawthorn scrub	Tree stakes/ties/guards	If after the establishment phase plants still need stakes, ties tubes or guards, continue to inspect them bi-annually with necessary repairs, replacements adjustments and/or re-firming undertaken during the inspection. If the plant has rooted successfully and does not require further protection/staking than those elements to be removed (including all fixing elements with the plants). All removed stakes/ties/guards to be removed off site. Activity shall cease when all stakes, ties, tubes and guards are removed from the site.	Bi-annually until all stakes, ties, tubes and guards are removed from the site.
	Scrub cutting and disturbance	Cut existing scrub annually on a rotational cycle of 20% of overall scrub area cut each winter to provide a mosaic of species at different stages of growth. Disturbances to the	January and February

Outline LEMP feature	Task	Management to be undertaken	Timing
		scrub areas should be non-uniform, mimicking theoretical grazing patterns of animals; trampling and browsing. If bramble becomes dominant, it may need to be chemically weed controlled with guidance from a suitably qualified Landscape Architect or Ecologist appointed by the Contractor, in accordance with the INNS Biosecurity Plan (Document reference 7.10, DCO Volume 7).	
Native hedgerow, with and without trees	Plant stakes/ties/guards	If after establishment phase plants still need stakes, ties tubes or guards, continue to inspect them bi-annually with necessary repairs, replacements adjustments and/or re-firming undertaken during the inspection. If the plant has rooted successfully and does not require further protection/staking than those elements to be removed (including all fixing elements with the plants). All removed stakes/ties/guards to be removed off site. Activity shall cease when all stakes, ties, tubes and guards are removed from the site.	Bi-annually until all stakes, ties, tubes and guards are removed from the site.
	Pruning of damaged branches	Plants shall be inspected annually for dead or diseased branches and pruned back, where disease or fungus is identified agree with an Ecologist or Arboriculturist. Work is recommended to commence in the dormant phase and outside the bird nesting season. Dead plants should be left on ground to encourage natural regeneration. Diseased plants should be disposed of appropriately, as recommended by the Ecologist or Arboriculturist.	January to February
	Hedgerow cutting	In order to fulfil the objectives of this Outline LEMP, each hedgerow will be managed as appropriate for the local landscape character and to blend with the surrounding vegetation, i.e. by trimming, laying, coppicing, bulking up, etc. This will be defined within the detailed LEMPs post-consent. If managed by laying, this should be on a rotational basis. This is a traditional management technique and seeks to retain the structural integrity of hedgerows and maintain connections with other habitats. If trimmed, hedges should be cut on a three	January to February

Outline LEMP feature	Task	Management to be undertaken	Timing
		year rotation with only one side cut a year to help develop the desired structure. Cut back undergrowth, overgrowing or overhanging shrubs and minor tree branches from any pathways to maintain an unobstructed width of at least 2m or the existing width of the pathway, whichever is greater.	
Non-native and ornamental hedgerow	Pruning	Plants shall be inspected annually for dead or diseased branches and pruned back, where disease or fungus is identified agree with an Ecologist or Arboriculturist. Work is recommended to commence in dormant phase and outside the bird nesting season. Dead wood should be left on the ground to encourage natural regeneration. Diseased branches should be disposed of appropriately. Light pruning to maintain the shape of the hedge to be carried out as required. Renewal pruning to help regenerate older hedges to be carried out as required. Cut back to a lower, more vigorous growth point. Remove any diseased, damaged, congested or crossing shoots.	January to February
	Tree stakes/ties/guards	If after establishment phase plants still need stakes, ties tubes or guards, continue to inspect them bi-annually with necessary repairs, replacements adjustments and/or re-firming undertaken during the inspection. If the plant has rooted successfully and does not require further protection/staking than those elements to be removed (including all fixing elements with the plants). All removed stakes/ties/guards to be removed off site. Activity shall cease when all stakes, ties, tubes and guards are removed from the site.	Bi-annually until all stakes, ties, tubes and guards are removed from the site.
Neutral grassland, acid grassland and calcareous grassland	Weed control	Control of undesirable species including docks, thistles and ragwort shall be undertaken annually, via hand pulling and/or cutting manually. No herbicide treatment permitted. Maintain overall presence of undesirable species in the site at 5% or less.	August

Outline LEMP feature	Task	Management to be undertaken	Timing
		For wood pasture and parkland grassland, leave standing and fallen deadwood in situ to provide valuable habitat for invertebrates and hibernacula for reptiles and amphibians.	
	Rotational grazing	If rotational grazing is preferred to cutting as the method for managing grassland, then the following guidance takes precedence over guidance on cutting. All other guidance on weed control, seeding and watering still apply. Rotational grazing should be used to increase quantity of grazing forage, soil health, soil fertility, feed costs, need for fertilisers and risk of run off, and biodiversity value. Adapt grazing throughout the year in response to grass growth. Multi-species grazing is recommended as different livestock forage differently. Employ a grazing schedule which rotates pastures and allows grazing areas to renew. Where chalk grassland is planted in combination with scrub and other habitat types, management must prioritize chalk grassland, as it is the more locally important habitat, and prevent the scrub and tree habitats from becoming dominant.	Annually
	Bi-annual cut	Cut 20% of the site grassland area twice annually. Once established a review should be undertaken to inform the need for further management with the aim of maintaining ecological function, species diversity and controlling scrub and weeds. Cuttings to be collected and removed off site, or alternative use agreed with the named Ecologist. Note: Manual cutting may be required where operational	Late April/early May and mid-July

Outline LEMP feature	Task	Management to be undertaken	Timing
		needs or health and safety standards prevent mowing or grazing. For example, on the 1:2 slope on the south face of the screening landform adjacent to the BPT/IPS-E. Where chalk grassland is planted in combination with scrub and other habitat types, management must prioritize chalk grassland, as it is the more locally important habitat, and prevent the scrub and tree habitats from becoming dominant. Remove all litter and debris prior to cutting.	
	Seeding	Where grassland has not established re-seeding may be required.	March-April or September
	Annual cut	Cut 80% of the site grassland area once annually. Once established a review should be undertaken to inform the need for further management with the aim of maintaining ecological function, species diversity and controlling scrub and weeds. Cuttings to be collected and removed off site, or alternative use agreed with the named Ecologist. Note: Manual cutting may be required where operational needs or health and safety standards prevent mowing or grazing. For example, on the 1:2 slope on the south face of the screening landform adjacent to the BPT/IPS-E. Where chalk grassland is planted in combination with scrub and other habitat types, management must prioritize chalk grassland, as it is the more locally important habitat. and prevent the scrub and tree habitats from becoming dominant. Remove all litter and debris prior to cutting.	Mid-July

Outline LEMP feature	Task	Management to be undertaken	Timing
Modified grassland	Weed control	Control of undesirable species including docks, thistles and ragwort shall be undertaken annually, via hand pulling and/or cutting manually. No herbicide treatment permitted. Maintain overall presence of undesirable species in the site at 5% or less.	August
	Seeding	Where grassland has not established re-seeding may be required.	March-April or September
	Rotational grazing	Rotational grazing should be used to increase quantity of grazing forage, soil health, soil fertility, feed costs, need for fertilisers and risk of run off, and biodiversity value. Multi-species grazing is recommended as different livestock forage differently. Employ a grazing schedule which rotates pastures and allows grazing areas to renew. Alternatively mowing can be used as method of maintenance. In these instances, the same cutting regime as described for 'Neutral grassland, acid grassland and calcareous grassland' can be followed. Once established a review should be undertaken to inform the need for further management with the aim of maintaining ecological function, species diversity and controlling scrub and weeds.	Annually
Green/brown roof	Watering	Watering will depend on the type of green roof but all green/brown roofs require watering during extended periods of dry weather. Native species will require watering after one to two weeks without rainfall. Roofs should be monitored against the local weather and if roofs have become dried out then they should be watered heavily once every week until the vegetation and substrate are fully soaked.	As needed in extended dry weather. Inspections a minimum of 6 times per year.

Outline LEMP feature	Task	Management to be undertaken	Timing
	Weed control	Annual inspection for control of undesirable species, as determined by the Ecologist, should be undertaken once a year, via hand pulling and/or cutting manually. Any tree saplings should be manually removed. No herbicide treatment permitted. Appropriate wind-blown species should be left to naturally colonise. Species deemed appropriate should all be native and assessed by the Ecologist. Encroachment of planting into vegetation barriers, drainage outlets, inspection chambers or walkways should be removed.	May
	Plant replacements	Bi-annual inspection. If plant diversity is low, compared to the original level plant diversity as determined by the Ecologist, then replacement species selected by the Ecologist should be planted.	Bi-annual inspection. Planting in May.
	Drainage maintenance	Ensure that the drainage system is functioning correctly by clearing debris and inspecting for clogs. Clean out drainage outlets and gutters as needed.	Bi-annual inspection
	Substrate maintenance	Check for substrate settlements/substrate loss due to erosion etc. Make good with same suitable substrate material (as specified).	Annually
Other habitat features			
Barn owl and swift	Maintain bird boxes	Annual inspection to ensure fixings remain sturdy and suitable, and to clear out the contents from the breeding season. Contents shall be removed off-site and disposed of. Operatives to wear gloves and use a small brush/scraper while removing contents to minimise health risks from parasites. If the bird box appears heavily soiled or full of parasites then it shall be cleaned using hot water. No chemicals/cleaning sprays shall be used. Any specialist supplier cleaning instructions to be followed in all cases. If the bird box is damaged or missing, then it shall be repaired	Late September to October

Outline LEMP feature	Task	Management to be undertaken	Timing
		if possible or replaced with the same make and model or an alternative to be approved by the Ecologist.	
Invertebrate	Ensure habitat piles/hibernacula remain suitable for use.	Undertake post-construction check that the deadwood piles/hibernacula remain in place and is at least 90% of the original size. Check for any signs of waterlogging. The deadwood piles/artificial hibernacula shall be managed by replacing or depositing additional stones, logs or soil cap as appropriate to maintain the original dimensions/volumes.	April
Badger	Maintain artificial badger sett	Monitoring of artificial setts will record badger activity and integration throughout and beyond the completion of construction, for as long as deemed necessary by the Named Ecologist on the final badger licence. Continuous maintenance of landscape planting around artificial setts will be required during and following construction or as long as deemed necessary by the Named Ecologist on the final badger licence	As specified within license issued by Natural England.
Hazel dormouse nest box and habitat	Maintain Hazel dormouse nest box and habitat	Progress on habitat establishment monitored (required as part of mitigation set out in the final hazel dormouse licence) and any remedial measures undertaken.	This will be undertaken within the timeframes specified in the conditions of the licence. See Table C-1 Monitoring measures
Sites of Importance for Nature Conservation (SINC)	Maintain habitat	Management in line with the detailed LEMPs produced post-consent.	As specified within the detailed LEMPs, produced post-consent.

Appendix C Habitat monitoring

C.1.1 See Table C-1 Monitoring measures

Table C-1 Monitoring measures

Outline LEMP feature	Monitoring to be undertaken	Timing
General measures		
Relevant to all plants throughout monitoring duration	Appropriate monitoring will be maintained for individual habitat types to enable effective and timely management to meet objectives and avoid negative impacts on plant health from pests and diseases. Where progress against objectives within the detailed LEMPs is considered not to be sufficient, management can be adapted and the detailed LEMPs will be revised to record any changes. Ongoing monitoring pollution and contamination of road chemicals and materials that may have leached onto land should be carried out.	As listed below
Planting		
Lowland mixed deciduous woodland, broadleaved woodland, mixed woodland, and lines of trees	The successful delivery of this habitat type will be assessed through monitoring against the specific objectives detailed in this Outline LEMP and subsequent detailed LEMPs. Monitoring to be undertaken is summarised below: • Undertake structured walk through habitat creation area (a 'W' shaped transect in each area of created habitat or other shapes required given boundary dimensions) • Route should include a minimum of 10 monitoring plots (more can be utilised for larger sites or those with greater variability) • The following should be recorded as a minimum: 1. Species lists (simple presence/absence) at each monitoring point to inform DAFOR score for each species across all stops 2. Comments on overall impacts of current management regime (e.g. burning, mowing/grazing and threats to achieving target	Years 1-3 and 5; One visit per year Years 6-10: One visit every 2 years Visits to be undertaken between May and September.

Outline LEMP feature	Monitoring to be undertaken	Timing
	habitat etc.) 3. At least one fixed point photographic monitoring (panoramic or 360 degree capture) 4. Habitat condition assessment to be undertaken in line with the UK Habitat Classification guidelines for lowland mixed deciduous woodland habitat.	
Wet woodland	The successful delivery of this habitat type will be assessed through monitoring against the specific objectives detailed in this Outline LEMP and subsequent LEMPs. Monitoring to be undertaken is summarised below: • Undertake structured walk through habitat creation area (a 'W' shaped transect in each area of created habitat or other shapes required given boundary dimensions) • Route should include a minimum of 10 monitoring plots (more can be utilised for larger sites or those with greater variability) • The following should be recorded as a minimum: 1. Species lists (simple presence/absence) at each monitoring point to inform DAFOR score for each species across all stops 2. Comments on overall impacts of current management regime (e.g. burning, mowing/grazing and threats to achieving target habitat etc.) 3. At least one fixed point photographic monitoring (panoramic or 360 degree capture) 4. Habitat condition assessment to be undertaken in line with the UK Habitat Classification guidelines for wet woodland habitat.	Years 1-3 and 5; One visit per year Years 6-10: One visit every 2 years Visits to be undertaken between May and September.
Scattered trees in fields	The successful delivery of this habitat type will be assessed through monitoring against the specific objectives detailed in this Outline LEMP and subsequent detailed LEMPs. Monitoring to be undertaken is summarised below: • Undertake structured walk along the habitat creation/enhancement area • Route should include all planted and retained scattered trees	Years 1-3 and 5; One visit per year Years 6-10: One visit every 2 years Visits to be undertaken between May and September.

Outline LEMP feature	Monitoring to be undertaken	Timing
	• The following should be recorded as a minimum: 1. Species lists (simple presence/absence) at each monitoring point to inform DAFOR score for each species across all stops 2. Comments on overall impacts of current management regime (e.g. burning, mowing/grazing and threats to achieving target habitat etc.) 3. Habitat condition assessment to be undertaken in line with the UK Habitat Classification guidelines for trees (rural).	
Mixed scrub and hawthorn scrub	The successful delivery of this habitat type will be assessed through monitoring against the specific objectives detailed in this Outline LEMP and subsequent detailed LEMPs. Monitoring to be undertaken is summarised below: • Undertake structured walk through habitat creation area (a 'W' shaped transect in each area of created habitat or other shapes required given boundary dimensions) • Route should include a minimum of 10 monitoring plots (more can be utilised for larger sites or those with greater variability) • The following should be recorded as a minimum: 1. Species lists (simple presence/absence) at each monitoring point to inform DAFOR score for each species across all stops 2. Comments on overall impacts of current management regime (e.g. burning, mowing/grazing and threats to achieving target habitat etc.) 3. At least one fixed point photographic monitoring (panoramic or 360 degree capture) 4. Habitat condition assessment to be undertaken in line with the UK Habitat Classification guidelines for mixed scrub habitat.	Years 1-3 and 5; One visit per year Years 6-10: One visit every 2 years Visits to be undertaken between May and September.
Native hedgerow, with and without trees	The successful delivery of this habitat type will be assessed through monitoring against the specific objectives detailed in this Outline LEMP and subsequent detailed LEMPs. Monitoring to be undertaken is summarised below: • Undertake structured walk along the habitat	Years 1-3 and 5; One visit per year Years 6-10: One visit every 2 years Visits to be undertaken between May and September.

Outline LEMP feature	Monitoring to be undertaken	Timing
	creation/enhancement area • Route should include the KCLs where reinstatement has taken place and a minimum of 10 monitoring plots (more can be utilised for larger sites or those with greater variability) • The following should be recorded as a minimum: 1. Species lists at each monitoring point to inform DAFOR score for each species across all plots 2. Comments on overall impacts of current management regime (e.g. burning, mowing/grazing and threats to achieving target habitat etc.) 3. At least one fixed point photographic monitoring (panoramic or 360 degree capture)	
Non-native and ornamental hedgerow	• Regular monitoring for pests and diseases, apply necessary control measures as soon as possible. • Monitor hedgerow quality and species composition.	Years 1-3 and 5; One visit per year Years 6-10: One visit every 2 years Visits to be undertaken between May and September.
Neutral grassland, acid grassland and calcareous grassland	The successful delivery of this habitat type will be assessed through monitoring against the specific objectives detailed in this Outline LEMP and subsequent detailed LEMPs. Monitoring to be undertaken is summarised below: •Undertake structured walk through habitat creation area (a 'W' shaped transect in each area of created grassland habitat or other shapes required given boundary dimensions) •Route should include a minimum of 10 monitoring plots (more can be utilised for larger sites or those with greater variability) •The following should be recorded as a minimum: 1.Species lists at each monitoring point to inform DAFOR score for each species across all plots 2.Comments on overall impacts of current management regime (e.g. burning, mowing/grazing, deadwood retention, and threats to achieving target habitat etc.) 3.At least one fixed point photographic monitoring (panoramic or 360 degree capture)	Years 1-3 and 5; One visit per year Years 6-10: One visit every 2 years Visits to be undertaken between May and September.

Outline LEMP feature	Monitoring to be undertaken	Timing
	4.Habitat condition assessment to be undertaken in line with the UK Habitat Classification guidelines for relevant grassland habitat.	
Modified grassland	The successful delivery of this habitat type will be assessed through monitoring against the specific objectives detailed in this Outline LEMP and subsequent detailed LEMPs. Monitoring to be undertaken is summarised below: •Undertake structured walk through habitat creation area (a 'W' shaped transect in each area of created grassland habitat or other shapes required given boundary dimensions) •Route should include a minimum of 10 monitoring plots (more can be utilised for larger sites or those with greater variability) •The following should be recorded as a minimum: 1.Species lists (simple presence/absence) at each monitoring point to inform DAFOR score for each species across all stops 2.Comments on overall impacts of current management regime (e.g. burning, mowing/grazing and threats to achieving target habitat etc.) 3.At least one fixed point photographic monitoring (panoramic or 360 degree capture) 4.Habitat condition assessment to be undertaken in line with the UK Habitat Classification guidelines for modified grassland (good condition) habitat	Years 1-3 and 5; One visit per year Years 6-10: One visit every 2 years Visits to be undertaken between May and September.
Open mosaic habitat green/brown roof	The successful delivery of this habitat type will be assessed through monitoring against the specific objectives detailed in this Outline LEMP and subsequent detailed LEMPs. Monitoring to be undertaken is summarised below: •Undertake thorough inspection of habitat creation area (a transect in line with access and safety considerations on the green/brown roof) •Route should include a minimum of 10 monitoring plots (more can be utilised for larger sites or those with greater variability)	Years 1-3 and 5; One visit per year Years 6-10: One visit every 2 years Visits to be undertaken between May and September.

Outline LEMP feature	Monitoring to be undertaken	Timing
	•The following should be recorded as a minimum: 1. Species lists at each monitoring point to inform DAFOR score for each species across all plots 2. Comparison of the species lists against the Open Mosaic Habitat on Previously Developed Land UK BAP Definition, Annex 1: Characteristic Species list and species listed in the UKHab definition for Open Mosaic Habitat on Previously Developed land. 3. Assessment of the number of early successional communities present as defined in the Open Mosaic Habitat on Previously Developed Land UK BAP definition. 4. Comments on overall impacts of current management regime (e.g. characteristic species present, undesirable species presence, and threats to achieving target habitat etc.) 5. At least one fixed point photographic monitoring (panoramic or 360 degree capture)	
Other habitat features		
Bats	Post construction surveys of 23 Key Connective Locations. Hedgerow reinstatement monitoring at KCLs by suitability experienced Ecologist to advise on when the temporary fencing can be removed.	A minimum of six crossing surveys (including at least three dusk surveys) will be conducted at each KCL every two years up to ten years post-construction. Hedgerow reinstatement monitoring at KCLs to be undertaken in line with the hedgerow planting monitoring schedule.
Barn owl and swift	Monitoring by suitability experienced Ecologist	To be outlined in the detailed LEMPs.
Hazel dormouse	Monitoring of habitat reinstatement in line with licence issued by Natural England.	This will be undertaken within the timeframes specified in the conditions of the licence. Progress on habitat establishment (required as part of mitigation set out in the final hazel dormouse licence) and any remedial measures undertaken will be recorded in a Report of

Outline LEMP feature	Monitoring to be undertaken	Timing
		Action Taken Under Hazel Dormouse Licence for and provided to NE.
Hazel dormouse	Nest box monitoring in line with licence issued by Natural England.	Following reinstatement. May/ June and Sept/Oct Post-construction monitoring may be undertaken at two locations (to be confirmed), the purpose of which will be to confirm populations of hazel dormouse are still present following construction. Post construction nest box monitoring requirements will be subject to finalisation in the final hazel dormouse licence application. If undertaken, monitoring locations will be selected to ensure representation across the Project, where positive results have been identified in field surveys, and where there is suitable woodland habitat present to install nest boxes. Monitoring will be undertaken using 50 nest boxes at each location and will be carried out at least twice per year (May or June and September or October) for five years post-construction. This monitoring will be undertaken by the named ecologist or accredited agents as detailed in the final hazel dormouse licence documents.
Badger	Artificial badger setts monitoring in line with licence issued by Natural England.	As specified within license issued by Natural England.
Invertebrate	Deadwood habitat piles monitoring by suitability experienced Ecologist	One visit undertaken one year post-construction.
Sites of Importance for Nature Conservation (SINC)	Monitoring in line with the detailed LEMPs produced post-consent.	As specified within the detailed LEMPs, produced post-consent.


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