Appendix 7A

NLG Ecology Ltd (2021) Preliminary Ecological Appraisal Report

Headbolt Lane, Kirkby

Preliminary Ecological Appraisal Report

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SUMMARY

NLG Ecology Ltd (NLG) was commissioned by Buckingham Group to undertake a Preliminary Ecological Appraisal in relation to the proposed construction of a new rail station 'Headbolt Lane' along with associated works to create a second track between Kirby Station and Headbolt Lane, the demolition of the Northern Rail platform at Kirkby station, and the construction of a proposed sub-station and supply bulk point. The survey area is centred at OS Grid Reference SJ 41325 99798, with its nearest postcode being L33 1WD; the site location is shown on Figure 1, along with any recorded habitats and features of ecological interest which are shown on Figure 2, Appendix 1 and in Photographs 1 to 23 in Appendix 3.

The appraisal was required to inform proposals to construct a new station at Headbolt Lane, and associated engineering works at Kirkby Station and the adjacent track. In general, and facilitated by the Preliminary Ecological Appraisal report, for all rail projects that may affect any plants and/or animals, biodiversity risks and opportunities must be identified and managed in accordance with the 'Biodiversity Mitigation Hierarchy'. This comprises sequential steps to avoid, minimise, rehabilitate/restore and offset any negative impacts on biodiversity, aiming ultimately to achieve a net gain in biodiversity.

The Preliminary Ecological Appraisal of the site has comprised of an open-source and local records centre search to 2km radius, an Extended Phase 1 Habitat Survey in accordance with Joint Nature Conservation Committee (JNCC) guidelines (2010) and an evaluation of the key ecological constraints to the project. The data collected have been used to form a baseline for the site and to inform any necessary recommendations for further surveys, mitigation and enhancement measures. In addition, Defra's Biodiversity Metric v2.0 Toolkit has been used to assess the baseline biodiversity of the survey area, the comparative ecological value of the various features recorded and the level of habitat loss to the project.

The appraisal, including the Extended Phase 1 Habitat Survey completed on 13th and 14th July 2020, has been undertaken by Rowena Tylden-Pattenson (Assistant Ecologist at NLG, Graduate CIEEM member), with an update survey of the full area undertaken by Sally Conyers (Ecologist at NLG, ACIEEM) on the 21st and 28th March 2021.

The site baseline habitat area for the proposed new station construction area of Headbolt Lane is 43,500m², the works to the platform at Kirkby station and track widening works between Kirkby Station and Headbolt Lane equate to 33,986m². Within these areas, habitat loss will be significant, which includes areas of notable semi-natural habitat including; woodland, scrub and neutral grassland.

The total study area surveyed for this Preliminary Ecological Appraisal Report is 11.41ha / 114,100m², which equates to 69.74 habitat units; of this, habitat areas are included outside of the red line boundary which may be suitable for off-site compensation and enhancement to mitigate for the habitat loss within the works area.

A calculation of the site baseline habitat areas with descriptions of the location within the scheme, the condition and ecological connectivity of each habitat is attached within a second document titled "Biodiversity Metric 2.0 Calculation Tool Headbolt Lane July 2021" which will be updated following completion of the landscaping plan which will allow for final input of the areas of habitat to be retained, enhanced, proposed succession and lost (within the development footprint).

Recommendations are made with respect to bats, amphibians including great crested newt, nesting birds, rabbit, fox, riparian mammals, reptiles, invasive non-native plant species, and small mammals. All recommendations are located in Section 4.4.

The data contained within this report are considered to be valid for a period of 18 months from the date of the last survey on site (i.e. until 28/09/2022).

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1 INTRODUCTION

1.1 Background

1.1.1 NLG Ecology Ltd (NLG) was commissioned by Buckingham Group to undertake a Preliminary Ecological Appraisal of a site subject to works pertaining to the construction of a new station located at Headbolt Lane, Kirkby. The survey area is centred at OS Grid Reference SJ 41325 99798, with its nearest postcode being L33 1WD; the site location is shown on Figure 1, along with any recorded habitats and features of ecological interest are shown on Figure 2, Appendix 1 and in Photographs 1 to 35 in Appendix 3.

1.1.2 The appraisal was required to inform proposals to construct a new station at Headbolt Lane, and associated engineering works at Kirkby Station and the adjacent track. In general, and facilitated by the Preliminary Ecological Appraisal report, for all rail projects that may affect any plants and/or animals, biodiversity risks and opportunities must be identified and managed in accordance with the 'Biodiversity Mitigation Hierarchy'. This comprises sequential steps to avoid, minimise, rehabilitate/restore and offset any negative impacts on biodiversity, aiming ultimately to achieve a net gain in biodiversity.

1.1.3 The Preliminary Ecological Appraisal has mainly comprised of an open-source desk study to 2km radius, an Extended Phase 1 Habitat Survey and an evaluation of the key ecological constraints to the project. In order to identify ecological opportunities and constraints in respect of the proposals, this report collates the data gathered and seeks to fulfil the following objectives:

- To establish an ecological baseline for the site;
- To assess the potential for, or to confirm actual presence of, protected and notable species;
- To make recommendations for further appraisal and ecological survey where required; and
- To make recommendations for habitat retention and enhancement, so as to ensure opportunities for biodiversity gain are considered in line with the Defra 2.0 Biodiversity Calculator where applicable, along with national and local planning policy and strategies for nature conservation (e.g. the UK Post-2010 Biodiversity Framework, the NERC Act 2006 (Section 41) and the National Planning Policy Framework 2018).

1.1.4 The Extended Phase 1 Habitat Survey of the Headbolt Lane Station site was completed on 13th and 14th July 2020, by Rowena Tylden-Pattenson (Assistant Ecologist at NLG, Graduate CIEEM member), along with Versions 1 and 2 of this appraisal report. A further update walkover survey of the entire study area was undertaken by Sally Conyers (Ecologist at NLG, Associate CIEEM member) on the 21st and 28th March 2021, to gather additional data for the final version (Version 3) of the Preliminary Ecological Assessment.

1.2 Relevant Legislation

1.2.1 Legislation that is applicable to the site is listed below, which covers the UK and Wales only. For a more definitive statement of law it is recommend that the full legislative acts are sighted.

- ***The Conservation of Habitats and Species Regulations 2017*** (the 'Habitats Regulations'): These Regulations consolidate and update the Conservation (Natural Habitats, &c.) Regulations 2010, and previously Regulations 1994 ("the 2010 Regulations" and "the 1994 Regulations"). The Habitats Regulations, which are made under section 2(2) of the European Communities Act 1972, are the principal means by which Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (the "Habitats Directive") is transposed for England and Wales and territorial seas.

- ***The Wildlife and Countryside Act 1981 (as amended)*** gives general protection measures for wildlife and special measures for species included on Schedules of the Act. Schedule 1 lists birds that are afforded special protection, Schedules 4-6 protects various wild animal species from injury, killing or disturbance, and Schedule 8 confers protection to certain plant species. Section 14 prohibits the establishment of non-native invasive plant species (as listed within Schedule 9) to grow in the wild. This includes the moving of contaminated soil or plant cuttings. The statutory designation of Sites of Special Scientific Interest (SSSI) is the main site protection measure in the UK established under the WCA.

- ***The Countryside and Rights of Way Act (CROW Act) 2000*** amended the Wildlife and Countryside Act 1981 to also make it an offence to intentionally or recklessly damage, destroy or obstruct a place that a species, listed on Schedules of the Wildlife and Countryside Act, uses for shelter or protection. The repealed Section 74 of the CROW Act listed habitats and species important to biological diversity in England, in accordance with the 1992 UN Convention on Biodiversity (Habitats and Species Action Plans under The UK Biodiversity Action Plan is the means by which the government complied with its duty under Section 74).

- ***Section 41 of the Natural Environment and Rural Communities Act (2006)*** replaces Section 74 of the Countryside and Rights of Way Act, 2000 and refers to the list of organisms and habitats of principal importance published under the repealed Section 74 of the CROW Act 2000. The Secretary of State must take such steps to further the conservation of the living organisms and types of habitat included in the list and promote the taking by others of such steps.

- **The National Planning Policy Framework (NPPF) (Department of Housing Communities and Local Government, 2019)**: sets out the UK Government's planning policies for England and provides guidance on how these policies are expected to be applied. The NPPF includes a chapter on biodiversity, Chapter 15 – Conserving and Enhancing the Natural Environment. In addition to being concerned with the protection of statutorily designated sites, the Chapter outlines ways in which the planning system is required to contribute to and enhance the natural and local environment and sets out guidance for local authorities in respect of the consideration of biodiversity and green infrastructure. The NPPF is a material planning consideration.

- **The 'UK Post-2010 Biodiversity Framework**': succeeded the UK Biodiversity Action Plan (UKBAP) in July 2012. The post-2010 framework is underpinned by the biodiversity and environment strategies of the four countries of the UK and sets out their common purpose and shared priorities. The UKBAP list of priority species remains as a reference source and has been used to help draw up statutory lists of priorities.

- **Biodiversity 2020**: is a strategy for England's wildlife and ecosystem services. Published in 2011, it is the most recent biodiversity strategy for England, and has as its mission to halt overall biodiversity loss, support healthy well-functioning ecosystems, and establish coherent ecological networks, with more and better places for nature for the benefit of wildlife and people.

- ***Bats***. Receive full protection under the Wildlife and Countryside Act 1981 (as amended). They are also protected under the Conservation of Habitats and Species Regulations 2017. The legislation makes it an offence to intentionally kill, injure or take a wild bat uses for shelter or protection whether present or not, and to intentionally disturb any wild bat while it is occupying a structure or place that it uses for shelter or protection.

- ***The Protection of Badgers Act (1992)*** relates to protecting badgers from activities that result in disturbing or interfering with a badger's sett.

- ***Nesting Birds.*** Under the Wildlife and Countryside Act 1982 (as amended) all wild birds, their nests and eggs are protected by law and it is an offence to internationally kill, injure and wild bird, to intentionally take, damage or destroy the nest of any wild bird while it is in use or being built, and to intentionally take or destroy the egg of any wild bird.

- ***Great Crested Newt*** is a European Protected Species (EPS), receiving full protection under the 1981 Wildlife and Countryside Act (as amended), the 2017 Conservation and Species Regulations and the Countryside and Rights of Way Act (CROW) 2000.

- ***Reptiles.*** All UK reptile species are protected under the Wildlife and Countryside Act 1981 (as amended), making it illegal to intentionally kill or injure a common reptile. Rare reptiles (smooth snake and sand lizard) are also protected under the Conservation of Habitats and Species Regulations 2010. This makes it an offence to deliberately injure, kill, capture or disturb a rare reptile, or to damage or obstruct any place used by the species for shelter or protection.

    - ***Hedgehogs*** are protected in England under Schedule 6 of the Wildlife and Countryside Act (1981) and are also listed under Section 41 of the Natural Environment and Rural Communities (NERC) Act (2006). This lists English species that were formerly identified as requiring action under the UK Biodiversity Action Plans and which continue to be regarded as conservation priorities under many Local Biodiversity Action Plans (LBAP) and the current UK Post-2010 Biodiversity Framework.

    - ***Otter*** are protected under the Conservation of Habitats and Species Regulations 2017 and the Wildlife and Countryside Act 1981 (as amended). This makes it an offence to: intentionally or recklessly disturb an individual while it is occupying a structure or place which it uses for shelter or protection (S9:4b) and to intentionally or recklessly obstruct access to any structure or place used for shelter or protection by an individual (S9:4c). It is also an offence to deliberately capture, injure or kill an otter or to impair their ability to survive or reproduce.

    - ***Rabbit (and Fox).*** The Wild Mammals Protection Act (1996) makes it an offence to crush or asphyxiate any wild mammal. This may apply during site clearance works, particularly where burrowing mammals such as rabbit and fox are present, as such animals could be crushed or asphyxiated in their burrows by heavy machinery.

    - ***Water Vole*** are protected under Schedule 5 of the Wildlife and Countryside Act (1981 as amended), which makes it an offence to: intentionally capture, kill or injure water voles, damage, destroy or block access to their places of shelter or protection (on purpose or by not taking enough care) or to disturb them in a place of shelter or protection (on purpose or by not taking enough care).

2 METHODOLOGY

2.1 Project and Survey Scope

2.1.1 A brief description of the works, as described within the document "Multidisciplinary Survey Requirements for AiP" (Iss. 1.0, 06/03/2020), along with updated figures and proposals provided by ARUP in March 2021, including the Environmental Constraints Plan as part of the GRIP 4 planning stage, is as follows:

- Construction of a substation for Kirkby station;
- Northern platform and walkway of Kirkby station to be demolished;
- Second track to be built from Kirkby station to the proposed Headbolt Lane station; and
- Construction of supply bulk point, substation for Headbolt Lane, two platform station, walkway and associated non-rail transport infrastructure at proposed Headbolt Lane site.

2.1.2 The aim of the Preliminary Ecological Appraisal, including the desk study, is to inform the scheme in recording the ecological baseline for the site and/or identifying key features. Where possible, the ecological value of the features present on site is assessed in accordance with guidelines issued by the Chartered Institute of Ecology and Environmental Management (CIEEM 2016), although the values are usually provisional upon data obtained from further survey effort where required.

2.2 Desk Study

2.2.1 A desk study provides background information on the ecological context of a site and complements data collected in the field. The search area extended up to 2km and incorporated the following resources:

- Defra's Multi-Agency Geographic Information for the Countryside (MAGIC) www.magic.gov.uk was searched for European and National Statutory designated sites, including Special Protected Areas (SPAs), Special Areas of Conservation (SACs), Sites of Special Scientific Interest (SSSI) and Local Nature Reserves (LNRs). The site was also searched for records of nearby granted European Protected Species (EPS) mitigation licences;
- MAGIC also provided a basis for highlighting the location of nearby UK BAP (Biodiversity Action Plan – now covered by the UK Post-2010 Biodiversity Framework) priority habitats;
- The National Biodiversity Network (NBN) Atlas (https://records.nbnatlas.org) was consulted with reference to relevant and notable species records on, or within 1km of, the site; and
- Aerial imagery from Google Maps (www.google.co.uk/maps), and Ordnance Survey mapping from Bing (https://www.bing.com/maps/), was reviewed to help determine terrestrial and hydrological connectivity with the wider landscape. This particularly related to the presence of ponds within 250m of the proposal site. Where potential water bodies are identified, further ground investigation of their presence and suitability for great crested newt (*Triturus cristatus*) is recommended.

2.2.2 An updated desk study was undertaken in October 2020, with information requested from Merseyside Biobank for records of non-statutory designated sites and protected, notable and invasive species records.

2.3 Extended Phase 1 Habitat Survey

2.3.1 The Phase 1 Habitat Survey broadly followed the standard methodology as detailed in the JNCC (2010) *Handbook for Phase 1 Habitat Survey - A technique for environmental audit*, and further developed in Guidance for Baseline Ecological Assessment (Institute of Environmental Assessment, 1995). This involved mapping and describing the broad habitats and compiling a general plant species list to reflect the floristic assemblage of each habitat type. All botanical names follow the nomenclature of Stace (2010).

2.3.2 Target notes (TN) were used to illustrate key features of interest (i.e. over mature trees / dead standing wood) or to draw attention to areas considered too small to map or for the purpose of highlighting the location of an invasive plant species.

2.3.3 The survey was 'extended' in accordance with the Institute of Environmental Assessment, (1995) to assess faunal potential through, and adjacent to, the survey area. The level of scoping does not necessarily constitute full survey effort, although reasonable effort is made to provide informed conclusions for the potential requirement of further survey.

2.4 Biodiversity Calculations – DEFRA 2.0

2.4.1 Biodiversity calculations were undertaken via the "Biodiversity Metric 2.0 Calculation Tool Beta Test - December 2019 Update" tool.

1.1.1 Habitat areas were calculated from the Phase 1 Habitat Plan (Figure 1, Appendix 1), using polygon sizes per habitat parcel calculated, using MapInfo Pro V17, utilising habitat notes gathered from site survey data and satellite imagery.

2.4.2 Condition assessments were undertaken utilising the Biodiversity metric 2.0 Technical supplement – JP029 (BETA).

2.5 Constraints

2.5.1 Some areas of dense scrub were impenetrable and therefore could not be fully surveyed for evidence of mammal burrows. However, during the walkover carried out in March 2021 only rabbit burrows were notable, and although the entire slope was not accessed, the embankment was viewed from trackside and vegetation was considered sparse enough to identify badger setts and paths, if present.

2.5.2 Whilst desk study records can help to inform and complement survey effort, they should not be treated as a comprehensive list of species present within the search area. Many species are under-recorded and a lack of records can reflect a lack of survey effort in certain areas rather than confirming absence of a species.

3 FINDINGS

3.1 Desk Study

Designations and Notable Habitats

3.1.1 Headbolt Lane is located north of Kirkby, Knowsley, Merseyside. The surrounding habitats are suburban, with rural agricultural land in close proximity. Mill Brook and Simonswood Dell woodland, run beneath the railway track to the west of the proposed station location, the woodland is located within Millbrook Park which extends to the south of the track adjacent to the site.

3.1.2 Habitats recorded by MAGIC within 2km of the site include deciduous woodland, which is considered to be of 'priority' conservation status in accordance with the UK Post-2010 Biodiversity Framework.

3.1.3 Connectivity from the proposed development is moderate, with linear features present in the form of watercourses including Simonswood Brook, Simonswood dell and Millbrook Park which run north to south under the rail line and Kirkby Brook which runs within the station development area east to west, and other linear features including the railway track and areas of open grassland connecting to the wider rural landscape.

Protected, Notable and Invasive Species Records

3.1.4 No European Protected Species (EPS) mitigation licence records were returned within 1km of the main works proposals. Three EPS mitigation licence records for common pipistrelle (*Pipistrellus pipistrellus*) were returned within 2km of the site: EPSM2013-5715 1.56km away; 2017-30556-EPS-MIT 1.58km away and 2015-7259-EPS-MIT 1.67km away.

3.1.5 The NBN Atlas was used to search for records of protected or notable species within 2km of the Headbolt Lane Station development from the past 10 years. These records are summarised as follows:

- Mammals: Four hedgehog (*Erinaceus europaeus*), four brown hare (*Lepus europaeus*), four water vole (*Arvicola amphibius*), four common pipistrelle (*Pipistrellus pipistrellus*) nine red squirrel (*Sciurus vulgaris*) and two red fox (*Vulpes vulpes*).

- Birds (Schedule 1 birds within the Wildlife and Countryside Act 1981, as amended): seven fieldfare (*Turdus pilaris*), one peregrine (*Falco peregrinus*) and 15 redwing (*Turdus iliacus*). 116 bird species were recorded within 2km of the site.

- Plants: Two bluebell (*Hyacinthoides non-scripta*).

- Key invasive non-native plant species: ten records of Himalayan balsam (*Impatiens glandulifera*), and three records of Japanese knotweed (*Fallopia japonica*).

3.1.6 During the search, no reptile or amphibian records were returned.

3.1.7 Desk study data from Merseyside Biobank was received on the 5th October 2020, this was further updated to cover the entire red line boundary in March 2021 to include the troughing works area, within a 1km search radius of the site. This data is included within Appendix 6 and further summarised below. Merseyside Biobank provided information for non-statutory designations. These include:

- *Simonswood Brook:* a site north-west of Headbolt Lane that supports neutral grassland, notable bird species and a population of water vole. The brook runs south towards the railway line and therefore has habitat connections to the proposal site via the brook water and adjacent riparian habitats. Located 650m north of the proposed track extension at SD 405001.

- *Mill Brook, Westvale:* a site south of Headbolt Lane that supports neutral grassland, notable invertebrate species, and a population of water vole. The brook runs south from the railway line and therefore has habitat connections to the proposal site via the brook water and adjacent riparian habitats. Located 800m south at SJ 405988.

- *Kirkby Brook, including Mill Brook:* a site south of Headbolt Lane that supports neutral grassland, woodland and ponds, common amphibian species, notable invertebrate species, and a population of water vole. The brook runs south under the rail line (Bridge 56) and therefore has habitat connections to the proposal site via the brook water and adjacent riparian habitats. Located 200m of the proposed rail track extension at SJ 407990.

- *Northwood Forest Hills:* a site that supports woodland and neutral grassland, and notable plant species. Located south east of the Headbolt Lane Station development at SJ 425998.

- *River Alt and M57 Corridor:* a nature improvement area along the Alt valley and M57 corridor which is dominated by woodland –to the south west of Kirkby station at SJ 394987.

- *Kirkby Brook, Northwood:* Open watercourse with habitat suitable for water voles. Located to the east of Headbolt Lane development at SJ 427992.

- *Meadow, Kirkby (Mill) Brook, South of Old Hall Lane:* A meadow within a wet flush on the banks of Kirkby Brook. Sandstone exposures on the banks add to the diversity. Located 700m south of the proposed rail track extension at SJ 407988.

- *Kirkby Brook Waterfall:* geographical site (not ecology) for bedrock of Kirkby Brook – located within Headbolt Lane Station development site.

3.1.8 Merseyside Biobank also provided information on protected or notable species and habitats within 1km from the past 10 years. These records are summarized as follows:

- Amphibians: 1 great crested newt from 2011 situated within Mill Brook Park (200m south of the works);

- Mammals: 5 common pipistrelle (*Pipistrellus pipistrellus*) / unspecified pipistrelle *(Pipistrellus* sp.) species from 2010 - 2016, 11 red squirrel from 2010 to 2013, 12 water vole between 2010 and 2017, 1 badger (*Meles meles*) record from 2010, 4 hedgehog (*Erinaceus europeaus*) between 2015 and 2020 and 1 brown hare (*Lepus europaeus*) from 2011;

- Key invasive plant species: Records of Himalayan balsam between 2010 and 2016 and Japanese knotweed in 2017; and

- Habitats: Lowland acid grassland, lowland meadow, neutral grassland, ponds and broadleaved deciduous woodland are present along the Simonswood and Kirkby Brook corridors, based on ecological network mapping 2016 – these are considered locally valuable habitats

3.2 Extended Phase 1 Habitat Survey

3.2.1 The habitat survey findings are illustrated on Figures 2.1 – 2.4 (Appendix 1) and are described further below, with target notes (TN) tabulated in Appendix 2 and cross referenced within the text below. Photographic plates are presented in Appendix 3.

Habitats

Grassland communities

Neutral grassland – Tall ruderal

3.2.2 Tall ruderal grassland (TN3, photograph 3) with ragwort (*Jacobaea vulgaris*), red campion (*Silene dioica*), immature silver birch (*Betula pendula*), immature oak (*Quercus sp*), common nettle (*Urtica dioica*), Himalayan balsam (*Impatiens glandulifera)*, rosebay willowherb (*Chamaenerion angustifolium*), cow parsley (*Anthriscus sylvestris*), common hogweed (*Heracleum spondylium*) and rapeseed (*Brassica napus*).

Neutral grassland - Semi-improved neutral grassland

3.2.3 Semi-improved neutral grassland (TN4, photographs 5 and 6), with lesser stitchwort (*Stellaria graminea*), great willowherb (*Epilobium hirsutum*), ragwort, common sorrel (*Rumex acetosa*), creeping thistle (*Cirsium arvense*), common nettle, yarrow (*Achillea millefolium*), sweet vernal grass (*Anthoxanthum odoratum*), cocksfoot (*Dactylis glomerata*), ribwort plantain (*Plantago lanceolata*), dandelion (*Taraxacum* sp.), hogweed (*Heracleum spondylium*), creeping buttercup (*Ranunculus repens*), cleavers (*Galium aparine*), bindweed (*Convolvulus arvensis*), dock (*Rumex* sp.), rosebay willowherb, white dead-nettle (*Lamium album*), hawkbit (*Leontodon* sp.), borage (*Borago officinalis*) and garlic mustard (*Alliaria petiolata*), with two ash (*Fraxinus excelsior*) trees.

3.2.4 A small cluster of immature trees (TN5, photograph 6) within semi-improved neutral grassland, including sycamore (*Acer pseudoplatanus*), beech (*Fagus sylvatica*) and elm (*Ulmus procera*), with an understorey of Yorkshire fog (*Holcus lanatus*), meadow cranesbill (*Geranium pratense*), nettle, ragwort, ribwort plantain, mallow (*Malva sylvestris*), herb Robert (*Geranium robertianum*) and hawkbit.

3.2.5 Unmown areas of semi-improved neutral grassland (TN7, photograph 6), with hawkbit, sweet vernal grass, common sorrel, white clover, Yorkshire fog, thistle, dock, ribwort plantain, creeping buttercup, ragwort, weld (*Reseda luteola*), yarrow, bird's foot trefoil (*Lotus corniculatus*) and selfheal (*Prunella vulgaris*).

3.2.6 Semi-improved neutral grassland sloping down to embankment (TN11, photograph 9). Species include garlic mustard, creeping thistle, feverfew (*Tanacetum parthenium*), rosebay willowherb, dock, sweet vernal grass, chickweed (*Stellaria media*), horsetail (*Equisetum* sp.), poppy (*Papaver somniferum*), great willowherb, bramble (*Rubus fruticosus*), ribwort plantain, hawkbit, common vetch (*Vicia sativa*), bindweed, red fescue (*Festuca rubra*), pineappleweed (*Matricaria discoidea*) and creeping buttercup.

Neutral grassland – Poor semi-improved

3.2.7 Mown grassland (TN6, photograph 6) with white clover (*Trifolium repens*), ragwort, ribwort plantain, dandelion, Yorkshire fog, creeping buttercup, black medick (*Medicago lupulina*) and shining cranesbill (*Geranium lucidum*).

3.2.8 Mown grassland (TN12, photograph 9), with infrequent thistle, ribwort plantain, Yorkshire fog, garlic mustard, feverfew, horsetail, white clover, greater plantain (*Plantago major*) and areas of bare ground.

Urban – Amenity grassland

3.2.9 Mown grassland (TN1, photograph 1) with cocksfoot, perennial rye grass and broadleaved dock. Lombardy poplars (*Populus nigra 'Italica'*), one with a broken knot hole (photograph 2) with low bat roosting potential.

3.2.10 Additional small areas of amenity grassland are present on road sides and within housing estates, dominated by perennial rye grass and frequently mown.

Scrub communities

Heathland and Shrub - Mixed Scrub

3.2.11 Mixed scrub which is very dense is present along the railway boundary (TN10, photograph 8). Species include hawthorn (*Crataegus monogyna*), cherry (*Prunus* sp.), elder (*Sambucus nigra*), ash, field rose (*Rosa arvensis*) and oak, with an understory of bird's foot trefoil, bindweed, bramble, nettle, creeping buttercup, cocksfoot, rosebay willowherb, raspberry (*Rubus idaeus*), hogweed, ragwort, and dock.

3.2.12 Railway embankment scrub vegetation east of Kirkby station (TN15, photographs 11 and 12), with species including oak, goat willow (*Salix caprea*), sycamore, silver birch, elder, common lime (*Tilia x europaea*), Lombardy poplar, field maple (*Acer campestre*), cherry, privet (*Ligustrum vulgare*), field rose, hawthorn, gooseberry (*Ribes uva-crispa*), cotoneaster (*Cotoneaster horizontalis*) and Leyland cypress (*Cupressus × leylandii*). Behind the northern platform, trees include laburnum (*Laburnum anagyroides*), sycamore, elder and laurel (*Laurus nobilis*). Ground flora includes horsetail, bramble, ragwort, cocksfoot, red fescue, rosebay willowherb, bindweed, nettle, cleavers, old man's beard (*Clematis vitalba*), bracken (*Pteridium aquilinum*), thistle, hawkbit, ivy (*Hedera helix*), yellow flag iris (*Iris pseudacorus*), goldenrod (*Solidago virgaurea*), raspberry, yarrow, variegated yellow archangel (*Lamiastrum galeobdolon* subsp. *argentatum*), foxglove (*Digitalis purpurea*), common vetch, buddleija (*Buddleja davidii*), groundsel (*Senecio vulgaris*) and herb Robert.

3.2.13 Railway embankment scrub vegetation opposite the Merseyrail Kirkby station platform (TN14); includes bramble, hawthorn, cleavers, rosebay willowherb, buddleja, elder, ragwort, bracken, nettle, raspberry, dogwood (*Cornus sanguinea*) and ash. The platform comprises a mixture of planted and seeded species, including hart's tongue fern (*Asplenium scolopendrium*), ribwort plantain, nettle, ivy, sycamore, hawthorn, dogwood, laurel, field rose, horsetail, St John's wort (*Hypericum perforatum*), dandelion and cotoneaster.

3.2.14 Along the railway embankment from Millbrook Bridge (TN16), species include ash, sycamore, hawthorn, oak, osier (*Salix viminalis*), ivy, cherry species, elder, field rose, Himalayan balsam, ragwort, rosebay willowherb, bracken, bramble, horsetail, nettle, greater willowherb and common toadflax (*Linaria vulgaris*), the last found above County Road Bridge WKL2 55.

3.2.15 Railway embankment species adjacent to Headbolt Lane (TN17) include goat willow, bracken, tormentil (*Potentilla erecta*), yarrow, hawkbit, bindweed, sage (*Salvia officinalis*), common vetch, cherry species, apple species (*Malus* sp.), and wood forget-me-not (*Myosotis sylvatica*). A large mammal run was observed partway down the track on the southern embankment (photograph 13).

Heathland and Shrub – Bramble Scrub

3.2.16 Dense scrub dominated by bramble (TN9), with Himalayan balsam, nettle and coarse grasses including sweet vernal grass at edge of track. A fly tipped shed underneath an English elm may provide suitable refuge for amphibians.

3.2.17 Dense bramble scrub dominates the northern embankment to the north east of the proposed Headbolt Lane development with willowherb and rank grasses of cock's-foot, fescue species (*Festuca* sp.) and false oat grass.

3.2.18 Bramble scrub is present connecting the rail embankment to Kirkby brook within the Headbolt Lane development area.

Woodland communities

Woodland: Lowland mixed deciduous woodland

3.2.19 Semi-natural broadleaved woodland is present within a small area to the south of Mill brook over-bridge predominantly off-network either side of the brook and public walkway. The canopy is dominated by mature sycamore, with oak and an occasional elder scrub layer and an under storey of bramble, hogweed and nettle. This area is a priority habitat on Defra's Magic mapping.

Woodland: Other woodland; broad-leaved

3.2.20 Semi-mature plantation broadleaved woodland is present along the north and south rail embankments to the south west of Kirkby station, which are dominated by oak and sycamore with occasional hawthorn.

3.2.21 A small section of plantation broadleaved woodland is present to the east of Mill brook crossing, and the southern rail embankment on the network, which is dominated by sycamore with rare ash and occasional oak species.

3.2.22 Scattered semi-mature broadleaved trees are present within dense scrub between Kirkby Station and Headbolt Lane.

Running water

3.2.23 The confluence of Mill Brook and Kirkby Brook is located between Mill Lane and the rail bridge over Mill brook (labelled Simonswood Brook further north on OS mapping) (TN2, photograph 3) which emerge from two culverts – Millbrook flows in a southern direction from the North under Mill Lane and Kirkby Brook flows in a westerly direction and is culverted into Mill brook between Mill Lane and the rail bridge, it then flows south through Mill brook Park. Mill brook at the time of the survey had a depth of up to 50cm and a width of 1.5m with a relatively slow flow. Some glossy film was observed on the water's surface, and large pieces of litter were observed on the bed. Bankside vegetation included rosebay willowherb, Himalayan balsam, thistle, nettle, horsetail, cleavers, bindweed, Yorkshire fog, bramble, cow parsley and common reed (*Phragmites australis*), with immature oak.

3.2.24 Kirkby Brook is a generally slow-flowing stream (TN8, photograph 7), at a width of 1m or more, and a depth of 30cm. Some shallower sections have a faster current. The bed is silty, with banks varying in height between 20cm to 1m, and heavily vegetated. Some undercutting of the embankments from current and fluctuations in water depth is notable within natural meanders. No mammal or crayfish holes were visible at the time of the survey. Bankside vegetation includes Himalayan balsam, rosebay willowherb, ragwort, thistle, nettle, common reed, yarrow, sorrel, cocksfoot and creeping buttercup, with areas of bare ground.

Urban environment

Bare ground

3.2.25 An area of bare ground (TN13, photograph 10), with buddleja, bramble, broadleaved dock, rosebay willowherb, hop (*Humulus lupulus*) and Japanese knotweed present adjacent to the security fence alongside track. Trees include field rose, sycamore, silver birch, hawthorn and cherry.

Urban built environment

3.2.26 Built up infrastructure is present within the rail network which includes un-vegetated permeable ballast stone and associated trackway, bridge structures, watercourse crossing points and tarmac pedestrian walkways throughout the proposed Headbolt Lane station area.

Invasive non-native plant communities

3.2.27 Himalayan balsam was identified along the banks of the stream running through Headbolt Lane (TN2, TN8). Japanese knotweed was identified near Kirkby station, just north east of the platform (TN15) on the southern embankment within scrub / woodland vegetation and also to the north of the rail boundary (TN13, photograph 10), in an area of bare ground proposed to be developed for a new substation.

Faunal Species

3.2.28 The survey has identified potential for, or the confirmed presence of, the following protected species within the survey area.

Breeding Birds

3.2.29 Opportunities for nesting birds are prevalent throughout the vegetation within the survey area, including railway embankments and bridges, where trees, scrub and tall ruderal vegetation are present. The dense bramble scrub within the proposed development is of notable value for nesting long tailed tit (*Aegithalos caudatus*), blackbird (*Turdus merula*) and dunnock (*Prunella modularis*).

3.2.30 Old bird's nests (photograph 17) identified as being from prior to the 2020 nesting season were observed underneath the steel crossbeams of a metal footbridge adjacent to Glovers Brow Bridge (SJ 40249 99256).

Rabbit or fox

3.2.31 A cluster of shallow mammal holes were identified along the railway embankment at SJ 41369 99759 (photograph 14). Two mammal pathways, likely used by foxes or domestic cat, were identified at the opposite side of the railway track at SJ 41275 99709 (photograph 13) and at SJ 40753 99478 through thick scrub vegetation. As the vegetation is dense along the railway embankment and in some area of the proposed development area at Headbolt Lane, it is possible that other evidence of badger, rabbit or fox including mammal holes may have been missed. Therefore, as a precaution, recommendations for badger, rabbit and fox are included within the Conclusion and Recommendations section, below.

Amphibians

3.2.32 Two waterbodies are present within 250m of the proposed development between Kirkby Station and Headbolt Lane station. Of these, one comprises a large fishing pond with a population of Canada geese (*Branta Canadensis*) and mallard ducks (*Anas platyrhynchos*) present, situated 100m to the north of bridge 56 at OSGR SJ 40759 99646 within an amenity area. This pond has both inflows and outflows into Simonswood Brook. The pond has a small wooded island within the center of the pond, and a small area of ephemeral vegetation of yellow flag iris (*Iris pseudacorus*) and bulrush (*Typha latifolia*) are present within the northern corner, otherwise no other notable macrophytes were noted within the pond. The entire pond has man-made wooden banking throughout the perimeter. A second pond is present 90m south of the rail line within Millbrook Park at OSGR SJ 40883 99372. This pond has dense common reed around the perimeter, with a relatively small open water area within the center; aquatic mint (*Mentha aquatica*), willowherb, bulrush and yellow flag iris are present frequently within an ephemeral area of the pond.

Reptiles

3.2.33 South facing rail embankments and cuttings with a mosaic of scrub, woodland and open grassland habitat are present within the scheme area with suitable connecting habitat of semi-improved grassland. Although no records of reptile are present within the locality, suitable habitat is present for common reptile species within the survey area. Due to the highly disturbed nature of the area within the proposed Headbolt Lane station development, it is considered unlikely that reptiles would be present in this area, as they are likely to be predated and there is a lack of suitable refugia opportunities.

Bats

Proposed Headbolt Lane station site and railway embankments

3.2.34 The area within the proposed Headbolt Lane station site offers suitable and ecologically well-connected habitat for foraging and commuting bat species, predominantly due to the presence Kirkby Brook and of areas of diverse grassland which are suitable for invertebrates.

3.2.35 A Preliminary Ground Level Roost Assessment was carried out for the trees within the survey area, in accordance with best practice guidance (Collins, 2016). This included any trees along the railway embankments where track works are proposed.

3.2.36 A mature Lombardy poplar is present adjacent to Headbolt Lane at SJ 41536 99849. The tree has a knot hole approximately 2.5m high, facing east (photograph 2). The extent of the knot hole could not be fully observed during the preliminary ground-level roost appraisal. Due to the potential of the features to support roosting bats and the suitable surrounding habitat, the tree has been assessed to hold a **moderate** bat roosting potential.

3.2.37 All other trees within the Headbolt Lane station site were assessed as offering **negligible** potential for roosting bats based on their age and/or a lack of suitable roosting features.

3.2.38 Along the railway embankments, multiple trees including mature sycamore and oak have ivy growth along the length of the trunks. This ivy growth conceals a number of trunks from being directly observed, therefore, due to the maturity of some trees along the embankments, it is considered likely that this ivy may have concealed potential bat roosting features. Due to the maturity of some trees along the railway embankments and highly suitable foraging habitat for foraging bat species, all mature trees have collectively been assessed to hold a **low** bat roosting potential.

County Road Bridge A502 UB WKL2 55

3.2.39 County Road Bridge is a reinforced steel and stone structure (photograph 18), with no signs of weathering or colonisation by plant species. There are no gaps or cracks present that

could provide potential spaces for roosting bats. No evidence of bat use, in the form of droppings, prey remains, staining on crevices by fur oils or urine, or bats themselves were identified across the bridge.

3.2.40 Therefore, County Road Bridge was assessed as having **negligible** potential for roosting bats due to a lack of evidence of bat use and the absence of any suitable roosting features.

Millbrook Bridge UB WKL2 56

3.2.41 Millbrook Bridge is a stone structure with some vegetation growth present on the elevations and underside.

3.2.42 Gaps are present above the arch ring (photograph 19), on the north-west elevation, under the river arch on the western side (photograph 21) and under the arch of the bridge deck (photograph 20); the depth of these gaps are unknown, and therefore may provide suitable roosting opportunities for bats. It is possible that the presence of ivy growing across the wing walls and above the arch rings may have obscured potential bat roosting features; however, the presence of this vegetation is likely to lessen the likelihood of bats roosting in this particular location due to the decrease in available space and the overly cluttered nature of the vegetation which is thought to obstruct a direct flight path. No evidence of bat use, in the form of droppings, prey remains, staining on crevices by fur oils or urine, or bats themselves were identified across the bridge.

3.2.43 Millbrook Bridge was assessed as having **moderate** potential for roosting bats due to presence of multiple small features, however no evidence of bat use was observed.

Glovers Brow Bridge OB WKL2 57

3.2.44 Glovers Brow Bridge is of solid concrete and sandstone construction, with a section of metal plating underneath the arch. Gaps are present between the concrete arch and metal plating (photograph 16) that may provide suitable roosting opportunities for bats, although cobwebs present suggest that these spaces have not been used recently. Some small pockmarks and cracks were present in the eastern sandstone elevation (photograph 15). No evidence of bat use, in the form of droppings, prey remains, staining on crevices by fur oils or urine, or bats themselves were identified across the bridge.

3.2.45 Glovers Brow Bridge was assessed as having **low** potential for roosting bats due to a lack of evidence of bat use, and the presence of only minor superficial roosting features.

Riparian mammals

3.2.46 Kirkby Brook which runs through the proposed site for Headbolt Lane Station appears sub-optimal for otter as the watercourse appears too shallow and narrow with limited refuge opportunities and is isolated from larger watercourses and waterbodies by an extensive pipe culvert and multiple unsuitable crossing points over major roads, with bridges having no suitable mammal passes.

3.2.47 No evidence of water vole was recorded during the survey; however, the banks of the brook are densely vegetated predominantly by tall herb and ruderal species, therefore evidence may have been concealed. The embankments are considered to be of a suitable substrate and gradient for the construction of burrows by this species. Overall, it is considered that Kirkby Brook has some potential to support water vole.

3.2.48 Simonswood / Mill Brook bisects the scheme, with proposed works to the bridge being over the water course. The Brook is generally slow flowing and within the proposed works area is culverted and heavily shaded offering negligible potential for water vole, however within

250m upstream and down-stream of the works suitable habitat is present to support water vole.

Other

3.2.49 The scrub habitats on site offer refuge opportunities to small mammals, such as hedgehogs.

3.3 Biodiversity Value of Habitats within Development Site

3.3.1 Land within the proposed Headbolt Lane development site supports semi-natural habitats comprising a mosaic of semi-improved neutral grassland, tall ruderal, dense bramble scrub, running water and linear built features amounting to approximately 6.72Ha (67,200m²), of which 4.35ha will be lost within the development footprint. The habitats within the footprint of the development range from poor to moderate condition and of low to high habitat distinctiveness with low ecological connectivity to the wider area and of medium strategic significance in Knowsley.

3.3.2 The proposed work at Kirkby station to remove the platform is relatively confined to within current built urban features which are of negligible ecological value. The track extension works between Kirkby Station and Headbolt lane totals an area of 33,986m², habitats present within the proposed works include broadleaved woodland, plantation broadleaved woodland, dense scrub and scattered broadleaved trees. Vegetation clearance required to facilitate the works will be approximately 14m either side of the cess – which is an approximate loss of 14,000m² of bankside vegetation.

3.3.3 An assessment of the habitat loss will be carried out utilising the DEFRA Biodiversity Metric, following completion of the design and finalised landscaping plans to allow for an accurate calculation of biodiversity units lost through the development. At present, the baseline habitats present are set out in a separate document – ""Biodiversity Metric 2.0 Calculation Tool Headbolt Lane July 2021"

3.3.4 Table 1 below details the habitat types and areas that will be impacted by the proposed development.

Table 1: Habitats within the study area and the calculated biodiversity units

Habitat type	Description, species and TN Habitat Condition & Distinctiveness	Estimated Area of habitat / distance of linear feature	
		Hectares (ha) / Metres (m)	Biodiversity units
Neutral grassland: Tall ruderal	Tall ruderal with ragwort, rosebay willowherb, Himalayan balsam and immature trees. The habitat is considered to be in poor condition and of medium distinctiveness with moderate connectivity. Habitat within Headbolt Lane development area.	0.45ha	3.27
Neutral grassland: Semi-improved neutral grassland	Mixed grassland species, including wildflowers but excluding sedges, undesirable species such as ragwort, hogweed and bramble on the embankments of Kirkby brook within the Headbolt Lane development area, regularly mown. The habitat is considered to be in moderate condition and of medium distinctiveness.	2.70ha	26.14
Neutral grassland: Poor semi improved neutral grassland	Poorer species composition with more extensive broadleaved dock, perennial rye grass and cocksfoot (rank grassland) than the semi-improved neutral surrounding which is more frequently mown. The habitat is considered to be in fairly poor condition and of medium distinctiveness. Habitat within Headbolt Lane development area.	2.21ha	10.70
Urban amenity grassland	Areas of mown grassland, with stress-tolerant species. The habitat is considered to be in moderate condition and of low distinctiveness.	0.11ha	0.36
Mixed scrub	Areas of dense or very dense scrub characterized by a mosaic of bramble, birch, willow, introduced shrubs with Himalayan balsam, nettle, thistle and un-grazed tall herb edges. The habitat is considered to be in fairly poor condition and of medium distinctiveness.	1.79ha	11.81
Bramble Scrub	Dense areas of bramble scrub on the rail network, dominate sections of the embankments, also notable bramble scrub areas are present within the Headbolt Lane development area along Kirkby Brook. The habitat is considered fairly poor due to	1.37ha	9.95

	low species diversity and medium distinctiveness.		
Lowland mixed deciduous woodland	A small area of broadleaved deciduous trees, all of similar ages, with a developed ground flora to the south of rail line (outside of the rail boundary) either side of Mill brook. The habitat is considered to be in moderate condition and of high distinctiveness.	0.23ha	2.28
Other woodland: broad-leaved	Semi-mature broadleaved plantation woodland, well-established along the rail embankment. The habitat is considered to be in fairly poor condition and of moderate distinctiveness. Habitat is frequent throughout the entire study area.	0.5ha	3.30
Other woodland: broad-leaved (Scattered mature trees)	Dominated by mature sycamore with occasional semi-mature oak, predominantly notable on the northern embankment between Kirkby Station and Headbolt Lane around the Mill Brook crossing. The habitat is considered to be in moderate condition and of moderate distinctiveness.	0.2ha	1.94
Planted shrub	Not included in biodiversity metric due to small size.		
Bare ground	Not included in biodiversity metric due to small size.		
Running water	Three watercourses are present within the scheme area, of these Kirkby Brook is to be impacted by the proposed development of the Headbolt Lane Station via additional road crossings, however the brook is to remain in place and, where possible, bankside vegetation retained and enhanced. Mill Brook over bridge is to have work carried out to dual the trackway. The watercourses are to be included within the separate metrics and Kirkby Brook within a separate River MoRPH survey report.	Kirkby Brook – 445m in length within headbolt lane area	4.14
Urban Habitat: Built environment	Linear built features include; the rail, road and pathway infrastructure throughout the survey area. Developed land; sealed surface represents buildings and the platforms at Kirkby station All urban built environment is considered to be of very low distinctiveness and the condition is not attainable.	Rail: 1.71ha Roads: 0.1 Buildings: 0.02ha	0

4 CONCLUSIONS AND RECOMMENDATIONS

4.1 Habitats

4.1.1 The habitats recorded on site within the footprint of the development proposal are relatively common and widespread and support commonly occurring botanical species. However, within the context of the urban environment, they are of relatively high ecological value in the local context. When assessed under the criteria of the DEFRA Biodiversity Metric 2.0, the mosaic of semi-improved neutral grassland, tall ruderal, scrub, woodland and bare ground habitats that will be lost to the development range from poor to moderate condition; and from low to moderate habitat distinctiveness.

4.1.2 High distinctiveness broadleaved woodland, which is a priority habitat, is present to the south of the rail line within close proximity to Mill Brook – this habitat should be retained and works within this area avoided unless for the purpose of enhancement to improve the condition of the woodland.

4.1.3 Grassland present within the Kirkby Brook valley was identified in 2016 as being lowland meadow and acid grassland BAP habitat, however during the phase 1 habitat survey of the area, neither of these criterias were met. The bankside (up to 10m) vegetation along Kirkby Brook within the Headbolt Lane development area, previously been identified as 'lowland meadow' BAP habitat, had extensive Himalayan balsam, nettle, hogweed with limited species diversity, the predominant grass species is cocksfoot, in general this is indicative of tall ruderal and rank grassland with presence of an invasive species. Areas previously assigned as 'lowland acid grassland' BAP habitat have been assessed as semi-improved neutral grassland due to a lack of indicator species for acid grassland with likely nitrification from use of the area by dogs with species such as broad-leaved dock, nettle and hogweed recorded. Areas of the grassland that are unmanaged and have become rank with low species diversity are mapped as poor semi-improved grassland.

4.1.4 These habitats provide valuable places of refuge, shelter and foraging opportunities for common amphibian and reptile species, small mammals and birds. Any trees should be retained and incorporated into the landscaping design if possible; any necessary de-vegetation should be undertaken in accordance with the advice given for nesting birds, common amphibian species and small mammals. It is generally recommended that the amount of de-vegetation is restricted to the minimum required to facilitate the proposals and that any bounding vegetation or habitats remain protected and unaffected by the works.

4.2 Invasive Species

4.2.1 The survey has confirmed the presence of two small and localised stands of Japanese knotweed on site. To prevent further spread the works will be carried out in accordance with a site-specific Japanese knotweed management plan to include strict biosecurity measures to prevent the spread of this highly invasive plant along the railway embankments and other locations. There is potential that the stand present within 20m of the Kirkby station platform will require removal prior to the works.

4.2.2 Site operatives should be made aware of the presence of Himalayan Balsam within the proposed working area; an identification guide has been included in Appendix 4. Control measures will be required prior to the works to prevent the spread of this species. Control of this species entails manual hand pulling or strimming (below the first node) of any Himalayan balsam plants within any work areas. This management should be undertaken outside the seeding period (July to October, inclusive), accompanied by the burying or composting (in a designated, contained area) of plant fragments; arisings must not be removed from site. Biosecurity measures would be integral to the plan, including cleaning of plant, tools and footwear used within any contaminated areas.

4.3 Water Pollution Control Measures

4.3.1 All works will be conducted in line with Network Rail Environment Contract Requirements (NR/SP/ENV/015) and all industry standard best practice. This will avoid the risk of polluting the watercourse through chemical contamination or substrate run off.

- Any chemicals (if required) will be stored in designated places and bunded to prevent leakages.
- Spill kits will be on site to deal with any leakage of fuel, wet concrete or chemicals.
- Vehicles will be inspected regularly to identify leaks, fuelling will be carried out off site.
- On completion of the works, the working area will be reinstated on a like-for-like basis.

4.4 Protected Species

4.4.1 The survey has confirmed the potential for or actual presence of nesting birds, bats, small mammals, reptiles, riparian mammals and amphibian species on site. The following is therefore recommended in respect of these species:

Nesting Birds

4.4.2 Nesting opportunities for a range of common bird species exist across the site, including within the proposed development area in grassland, tall ruderal, scrub, under bridges and within trees.

4.4.3 It is recommended that all de-vegetation works are undertaken outside the main nesting bird season (March to August inclusive), and maintained occasionally to deter any uptake prior to the commencement of works. If this timing is not possible and dense scrub or mature trees need to be removed during the main nesting bird season, checks of the affected areas will need to be undertaken by an ecologist no more than 48 hours prior to removal/management. If any active nests are identified, a buffer of at least 5m in all directions would be required, to protect the nest from disturbance until any chicks have fledged.

Bats

Structures

4.4.4 Bridge 56 – the Mill brook overbridge has been assessed as having **moderate** potential to support roosting bats with significant disturbance likely due to the proposed works. The bridge will require further assessment prior to works via aerial inspection and/or with an endoscope by a suitably qualified ecologist or through further survey effort in the form of bat emergence and return survey, in-line with best practice guidelines (Collins, 2016). Should bats be confirmed to be present at this stage, a Natural England mitigation licence would be required for bridge covering the works likely to cause significant disturbance.

4.4.5 County Road road-over-rail bridge situated at Kirkby station has been assessed as having **low** potential to support roosting bats, with significant disturbance likely due to the proposed works. The bridge will require further assessment prior to the proposed works via aerial inspection and/or with an endoscope by a suitably qualified ecologist or through further survey effort in the form of a single bat emergence or return survey, in-line with best practice guidelines (Collins, 2016). Should bats be confirmed to be present at this stage, a Natural England mitigation licence would be required for bridge covering the works likely to cause significant disturbance.

4.4.6

Trees

4.4.7 A single mature Lombardy poplar tree within the red line boundary was assessed as holding **moderate** bat roosting potential which is likely to require removal to facilitate the works. The poplar, and any further trees identified during pre-construction walkovers prior to the works being carried out which were assessed as holding a **moderate** bat roosting potential that are to be impacted by the works, should be assessed via aerial inspection and/or with an endoscope by a suitably qualified ecologist to confirm the assessment of bat roosting potential and to check for bat occupation. If bat roosting potential is confirmed to be moderate or higher, further survey effort in the form of bat emergence surveys (at least one dusk and one dawn emergence survey) would be required to determine if the roosting features are being utilised by bats, in-line with best practice guidelines (Collins, 2016). Should bats be confirmed to be present at this stage, a Natural England mitigation licence would be required for any trees with confirmed bat roosts, to be removed to facilitate the works.

4.4.8 Numerous trees were recorded as holding **low** bat roosting potential within the rail network. Trees assessed as holding low bat roosting potential can be de-vegetated adhering to an ecological precautionary working method statement in regards roosting bats, which will be included within the PWMS / CEMP for the site works.

4.4.9 A bat survey report will be produced detailing the methods of further survey and results of the two structures (Bridge 56 and County Road bridge) and the single poplar tree. In addition, the report will present the locations of any trees or structures which will require precautionary working methods if there is likely to be any impacts or significant disturbance due to the works directly to or within close proximity, will require precautionary working methods to ensure legislation with regards to bats is upheld during the works.

Badgers, foxes and rabbits

4.4.10 Whilst no evidence of badger was recorded during the survey, burrows within the proposed troughing route belonging to rabbit were notable in areas within close proximity to Kirkby Municipal golf course and to the west of Kirkby Station, however these burrows are unlikely to be impacted by the works. Signs of rabbit (foraging, small scrapes and droppings) were also notable between Kirkby Station and the proposed Headbolt Lane development, however no burrows were recorded. A couple of fox scat were noted along the line within the scheme but no large burrows were recorded.

4.4.11 As a precaution, if any holes suspected to be badger sett entrances are unexpectedly discovered during any future works, work in that area must cease and an ecologist must be contacted for advice on how to proceed, a site visit may be required to assess the hole(s). Badger sett entrances are typically in the shape of a capital 'D' with the flat side down, measuring on average 25-35cm in width and maintaining a wide tunnel within. Fresh spoil is often present outside regularly used entrances.

4.4.12 With regards to rabbit and fox, these species are protected under the Wild Mammals Protection Act (1996) from asphyxiation and crushing. It is recommended that if any mammal holes are identified then these holes should be avoided – this includes trampling, obstruction, machinery and temporary storage of materials. If avoidance is not possible, an ecologist should be contacted so that the species to which the hole belongs to can be identified. This information will then be used to provide further advice (a site visit may be required to assess the hole(s)).

Reptiles

4.4.13 The site is considered suitable for commonly occurring reptile species. It is recommended that during de-vegetation works, should a suspected reptile be observed on site, that works cease and that a 10m exclusion zone be demarcated around the reptile and that the reptile be left to disperse on its own accord. A competent ecologist should also be notified immediately. The ecologist will then attend site, assess the situation and establish any required mitigation measures.

Riparian Mammals

4.4.14 Kirkby Brook and Mill Brook watercourses within the site are been considered to offer limited potential for otter and is of sub-optimal potential for water vole. However, there may be more suitable habitat within the wider surrounding area and further survey is recommended due to historic records of water vole on both Kirkby and Mill Brook. As a precaution, during any pre-construction works such as ground investigations, if an otter or water vole is sighted at any point, works should cease in that area until the animal(s) has dispersed of its own accord. In addition, as a precaution throughout the proposed works, the watercourse should remain open to wildlife passage; i.e. in-channel scaffolding or machinery, if required, should not fully block access for wildlife to pass through. No overnight lighting should be used.

Amphibian Species

4.4.15 Any ponds within 250m of the proposed scheme should be subject to a pond habitat suitability index assessment to inform requirements for further survey for great crested newt (within the main working area).

4.4.16 Ponds identified with potential to support amphibian species, following a pond habitat suitability index assessment, within 250m of the main works (Headbolt Lane, Kirkby Station platform demolition and track extension) should be subject to a presence / absence survey for great crested newt, either through traditional survey or use of environmental DNA (eDNA).

Other

4.4.17 The scrub habitats present on site offer refuge opportunities to small mammals such as hedgehog.

4.4.18 Any dense scrub on site, if removal is required, should be carefully cut back in stages by hand in accordance with previous recommendations, taking care to look for hedgehogs in particular. If any hedgehogs are found, these should be safely relocated to a nearby, suitably dense/well-vegetated area or brash pile that will remain undisturbed by the works.

4.4.19 If there is any doubt over translocating the hedgehog to a different part of the site, or if the hedgehog appears to be harmed or underweight, an ecologist will take the hedgehog into care and will contact a local wildlife hospital for advice.

4.4.20 As part of the site's landscaping, enhancement opportunities for wildlife could be considered, including: the installation of bird boxes on nearby mature trees; the planting of pollen rich species of benefit to insects; the planting of a small number of fruit trees; and the addition of shrubs to provide a variable vegetative structure.

4.4.21 Provision of artificial or natural hedgehog boxes could also be considered for quiet undisturbed areas on site with ground covering vegetation, preferably against a wall or fence. For example, three or four logs may be arranged to leave an appropriately sized hole for a hedgehog to nest in, and covered with masses of twigs and leaves. Retaining wood piles attracts invertebrates and fungi, providing a good local food source for hedgehogs and other species, and possible nesting sites (materials from site works could be used for this purpose).

4.5 Suggested Ecological Enhancement

4.5.1 In line with Defra's 'Biodiversity Metric v2.0 Toolkit' and Network Rail's commitment to the 'Mitigation Hierarchy', which comprises sequential steps to avoid, minimise, rehabilitate/restore and offset any negative impacts on biodiversity, calculations of the project's baseline biodiversity units before the works have been made – see relevant pages in the separate document, titled 'Biodiversity Metric 2.0 Calculation Tool Headbolt Lane May 2021'. Calculations were made using the 'Beta Test - December 2019 Update' version of the Biodiversity Metric 2.0 Calculation Tool.

4.5.2 The study area baseline habitat size is 11.31ha, this area includes habitat parcels accessed within the red line boundary and buffer zones/off-site areas which have potential for enhancement around the proposed site boundaries. The ecological baseline within the study area comprises a total of 69.74habitat units.

4.5.3 The site baseline habitat for the proposed new station construction area at Headbolt Lane comprises a total area of 43,500m², which includes the works to the platform at Kirkby station and track widening works between Kirkby Station and Headbolt lane which equates

to 33,986m. Within these areas, habitat loss is to be significant, which includes notable semi-natural habitats including; woodland, scrub and neutral grassland.

4.5.4 The calculations for habitats to be retained, enhanced, proposed succession and lost will be completed as part of the Environmental Impact Assessment following the finalisation of the landscaping plan and agreement for off-site mitigation which will be required due to the extensive loss of semi-natural habitat within the Headbolt Lane Station development and track widening scheme.

4.5.5 It should be noted that calculations that support this report have been carried out with the December 2019 BETA biodiversity calculator, the most recent release at the time of this report. All further updated calculation should take place with this version to ensure comparability to the calculations above. Future versions of the calculator may yield differing results.

4.5.6 The railway embankments offer value to wildlife, as they act as a habitat corridor for wildlife foraging and commuting within the wider landscape. Therefore, it is suggested that de-vegetation within the proposed working areas is kept to a minimum and that any vegetation removed is reinstated, and enhanced, where possible.

4.5.7 Dependent upon an on-site habitat management plan that would ensure the quality and diversity of habitats generated post-works, off-site mitigation is anticipated to be required for the site to achieve a net-gain in biodiversity.

4.5.8 It is recommended that any wood or brash arising from the proposed de-vegetation should be used to create habitat piles in nearby suitable undisturbed locations along the railway embankments/rail corridor or within the compound area where appropriate. This may provide suitable habitat for sheltering and hibernating hedgehogs and provide refuge to other small mammals. The habitat piles should be created by lining up logs or brash horizontally (each layer in alternating directions) in layered, compact piles. Soil and any stones can also be added. Large diameter pieces of wood are the most valuable. The location of the habitat piles should be where feasible to install, but ideally within areas which are unlikely to be disturbed and remain ecologically well-connected to other habitats.

4.5.9 To best achieve a net gain in biodiversity, the following interventions should be implemented on site:

- Any vegetation cleared will be allowed to naturally re-colonise; opening up small areas of vegetation will increase opportunities for successional plants to take hold; and
- Any areas of scrub and tall ruderal vegetation cleared as part of the works should be allowed to naturally re-colonise. Removal of small areas will diversify the structure of the scrub with open areas, providing disturbance features and an opportunity for other successional plants to grow.
- A landscape plan should be developed to include habitat creation post-development of the works area, subject to temporary construction impacts.

5 REFERENCES

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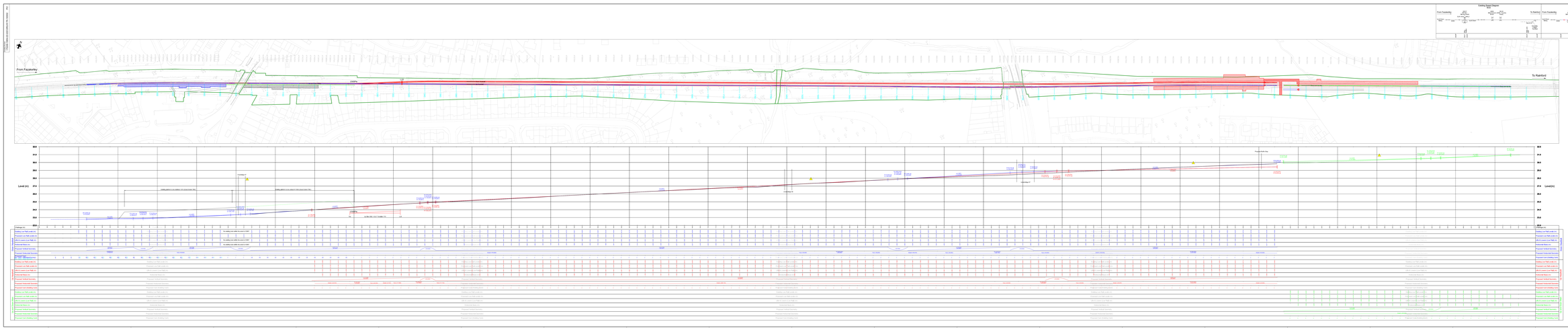
APPENDIX 1: FIGURES

Figure 1: Location of proposed Headbolt Lane station and engineering works, showing extent of the proposed works areas


Existing Gauge Diagram
From Paddingtonby
To Reading
Proposed Gauge Diagram
From Paddingtonby
To Reading
From Paddington
To Reading
Level (m)
Chainage (m)
Existing Line Rail Level (m)
Proposed Line Rail Level (m)
Existing Line Rail Gradient (m)
Proposed Line Rail Gradient (m)
Existing Vertical Sections
Proposed Vertical Sections
Proposed Vertical Gauge
Existing Line Rail Curvature (m)
Proposed Line Rail Curvature (m)
Existing Line Rail Alignment (m)
Proposed Line Rail Alignment (m)
Existing Line Rail Cant (mm)
Proposed Line Rail Cant (mm)
Existing Line Rail Cant Gradient (mm/m)
Proposed Line Rail Cant Gradient (mm/m)
Existing Line Rail Cant Deficiency (mm)
Proposed Line Rail Cant Deficiency (mm)
Existing Line Rail Speed (km/h)
Proposed Line Rail Speed (km/h)
Existing Line Rail Radius (m)
Proposed Line Rail Radius