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Ecological Impact Assessment Report

PRESENTED TO

Marshall Yards Development Company Ltd. for a Proposed Large Scale Residential Development at Ballybin Road, Ratoath, Co. Meath

July 2024

Environmental Consultancy Services

Applicant	Marshall Yards Development Company Ltd.
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The methodology adopted and the sources of information used by Enviroguide in providing its services are outlined in this Report.

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If the scope of work includes subsurface investigation such as boreholes, trial pits and laboratory testing of samples collected from the subsurface or other areas of the Site, and environmental or engineering interpretation of such information, attention is drawn to the fact that special risks occur whenever engineering, environmental and related disciplines are applied to identify subsurface conditions. Even a comprehensive sampling and testing programme implemented in accordance with best practice and a professional standard of care may fail to detect certain conditions. Laboratory testing results are not independently verified by Enviroguide and have been assumed to be accurate. The environmental, ecological, geological, geotechnical, geochemical and hydrogeological conditions that Enviroguide interprets to exist between sampling points may differ from those that actually exist. Passage of time, natural occurrences and activities on and/or near the Site may substantially alter encountered conditions.

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1 INTRODUCTION

Enviroguide Consulting was commissioned by Marshall Yards Development Company Ltd. to undertake an Ecological Impact Assessment (EcIA) in relation to a Proposed Residential Development, located at Ballybin Road, Ballybin, Ratoath, Co. Meath, hereafter referred to as 'Proposed Development' or 'Site' when referring to the site area of the Proposed Development.

An EcIA assesses the potential effects of the Proposed Development on habitats and species; particularly those protected by national and international legislation or considered to be of nature conservation importance on or adjacent to the Site. This report will describe the ecology of the Site, with emphasis on habitats, flora, and fauna, and will assess the potential effects of the Construction and Operational Phases of the Proposed Development on these ecological receptors. The report follows Guidelines for Ecological Impact Assessment in the UK and Ireland, by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2018) and supplemented by the National Roads Authority (now TII) (2009) Guidelines for Assessment of Ecological Impacts of National Road Schemes. The purpose of this EcIA is to:

- Set out the methodologies used to inform the assessment.
- Identify Key Ecological Receptors (KERs) within the Zone of Influence (ZOI).
- Assess the impacts from the Proposed Development on the KERs and the resulting significant effects.
- Set out measures to avoid or mitigate negative impacts.
- Assess the residual effects after the incorporation of agreed avoidance or mitigation measures to ensure legal compliance.
- Set out agreed measures to offset significant residual effects.
- Set out opportunities for ecological enhancement.

1.1 Quality Assurance and Competence

Enviroguide Consulting is a multi-disciplinary consultancy specialising in the areas of the Environment, Waste Management and Planning. All our consultants carry scientific or engineering qualifications and have a wealth of experience having undergone extensive training and continued professional development while working within the Environmental Consultancy sectors.

Enviroguide Consulting as a company remains fully briefed in European and Irish environmental policy and legislation. Enviroguide staff members are highly qualified in their field. Professional memberships include the Chartered Institution of Wastes Management (CIWM), the Irish Environmental Law Association and Chartered Institute of Ecology and Environmental Management (CIEEM). Surveys were conducted by Enviroguide ecologists SC, BMcC, SO'B, KMcC, YM, and NB. This report was authored by SC.

SC is an experienced Ecologist with a B.Sc. (Hons) in Botany from the University of Galway and over two years working in Environmental Consultancy. In this time SC has surveyed habitats, plants, bats, wintering birds, breeding birds, mammals, and

invasive species. SC has authored numerous ecological reports including Appropriate Assessment (AA) Screenings, Natura Impact Statements (NIS), Invasive Species Management Plans (ISMP), Ecological Impact Assessments (EcIA), Constraints Reports, and supporting submissions in Environmental Impact Assessment Report (EIAR) chapters.

BMcC is an Ecologist and experienced Ornithologist with over 12 years of bird survey experience. BMcC is a longstanding and active member of Bird Watch Ireland and has provided Ornithology survey work for ecological consultancies, e.g., vantage points surveys of gulls, terns, raptors, waders, and wildfowl; hinterland surveys of the above as well as riverine species; and breeding waders and country birds. BMcC is highly experienced with all survey methodologies and with surveying all species groups of Irish birds and migrants.

SO'B has a B.A. in Zoology from Trinity College Dublin and a M.Sc. Hons. in Wildlife Conservation and Management from University College Dublin, and has experience in desktop research, report writing, and literature scoping-review, as well as practical field and laboratory experience (Pollinator surveying, sampling and identification, habitat surveying, invasive species surveying, etc.). SOB has prepared Stage I and Stage II Appropriate Assessment (AA) Reports, Invasive Species Surveys, Ecology Statements, EcIAs, and Biodiversity Chapters of EIARs.

YM is an Ecologist with Enviroguide and has a B.Sc. in Botany from Tokyo University of Agriculture and a M.Sc. in Botany from Hokkaido University. Yumi has a total of 7 years of practical field experience and provided flora surveys, rare and protected plant species surveys, phytosociological vegetation surveys, habitat assessments/mapping and invasive species surveys. YM has prepared several reports for AA screening, habitat assessment and Invasive Species Management Plans. YM is also a Qualifying member of the Chartered Institute of Ecology and Environmental Management (CIEEM).

KMcC has been an intern with Enviroguide's Contaminated Land team since January 2024. He is a 3rd year BSc. Environmental Science student in the University of Limerick. His experience to date includes landfill gas/leachate management and sampling in addition to data processing and report compilation. He has also gained experience in bat emergence and transect surveys and Preliminary Ecological Appraisal surveys under the supervision of Enviroguide's ecology team.

NB is an Ecologist with Enviroguide Consulting, with a B. Sc. (Hons) in Microbiology, an M. Sc. (Hons) in Environmental Microbiology from NUI, Galway and an M. Sc. (Hons) in Biodiversity and Conservation from Trinity College, Dublin. Her experience includes coordinating phytoplankton and zooplankton surveys in the Aquaculture Industry and coordinating research in Teagasc Food Research Centre. She has experience in laboratory management and university teaching, having coordinated and delivered material to a master's Microbiology course in University College Dublin. NB has extensive experience completing mammal, habitat, and invasive species surveys, as well as in desktop research, including the production of peer reviewed publications, grant proposals, literature reviews and ecological/environmental reports.

This report was reviewed and approved by SO'D. SO'D holds an honours degree in Zoology from University College Dublin and a Masters in Advanced Wildlife Conservation in Practice from the University of the West of England, Bristol. SO'D has over 8 years' experience in habitat survey and assessment in a range of terrestrial, freshwater, and coastal environments, surveys for protected species including bats, otter, newts, freshwater pearl mussel, crayfish and badger as well as surveys for invasive flora species. In his role as an ecologist, SO'D advises clients and contractors in relation to appropriate mitigation strategies for protected species, such as bats, badger and amphibians and, where required, applies on behalf of the client for necessary derogation licenses. SO'D is also experienced in providing ecological services at the construction phase of development to ensure compliance with relevant planning conditions. Throughout his career as an ecologist, SO'D has been project manager and lead author on a range of projects including tourism, industrial, residential and renewable energy developments as well as multiple large scale, national infrastructure projects.

1.2 Relevant Legislation and Policy Context

An EcIA is a process of identifying, quantifying, and evaluating potential effects of development-related or other actions on habitats, species, and ecosystems (CIEEM, 2018). The Proposed Development is undergoing Screening for an Environmental Impact Assessment (EIA) under the Planning and Development Regulations 2001-2023, as amended.

When an EcIA is undertaken as part of an EIA process it is subject to the EIA Regulations (under the EU Planning and Development Regulations 2001-2023). An EcIA is not a statutory requirement, however it is a best practice evaluation process. This EcIA is provided to assist the Competent Authority with its decision making in respect of the Proposed Development.

There are several pieces of legislation, regulations, and policies specific to ecology which underpin this assessment. These may be applicable at a European, National or Local level. Legislation at the International level relevant to the Proposed Development are listed below:

- *Council Directive 92/43/EEC* on the Conservation of Natural Habitats and of Wild Fauna and Flora; hereafter the 'Habitats Directive'.
- *Directive 2009/147/EEC*, hereafter the 'Birds Directive'.
- *Directive 2011/92/EU*, hereafter the 'EIA Directive'.
- EU Regulation 1143/2014, on Invasive Alien Species.
- *Convention on the Conservation of European Wildlife and Natural Habitats 1982*, hereafter the 'Bern Convention'
- *The Convention on the Conservation of Migratory Species of Wild Animals 1983*, hereafter the 'Bonn Convention'.
- *Ramsar Convention on Wetlands 1971*, hereafter referred to as 'Ramsar'.
- *Water Framework Directive 2000/60/EC*, hereafter the 'WFD'.

National legislation and policy relevant to the Proposed Development are listed below:

- Wildlife Act 1976 (as amended).
- Flora (Protection) Order 2022.
- The Planning and Development Act 2000.
- National Biodiversity Action Plan 2023-2030.
- All Ireland Pollinator Plan (2021-2025).

The Habitats Directive (92/43/EEC) seeks to conserve natural habitats and wild fauna and flora by the designation of Special Areas of Conservation (SACs) and the Birds Directive (79/409/EEC) seeks to protect birds of special importance by the designation of SPAs. It is the responsibility of each member state to designate Special Protection Areas (SPAs) and SACs, both of which will form part of Natura 2000, a network of protected sites throughout the European Community. SACs are selected for the conservation of Annex I habitats (including priority types which are in danger of disappearance) and Annex II species (other than birds). SPAs are selected for the conservation of Annex I birds and other regularly occurring migratory birds and their habitats. The annexed habitats and species for which each site is selected correspond to the qualifying interests of the sites; from these the conservation objectives of the site are derived.

Additionally, Natural Heritage Areas (NHAs) are designations under the Wildlife Acts to protect habitats, species, or geology of national importance. The boundaries of many of the NHAs in Ireland overlap with SAC and/or SPA sites. Although many NHA designations are not yet fully in force under this legislation (referred to as ‘proposed NHAs’ or pNHAs), they are offered protection in the meantime under planning policy which normally requires that planning authorities give recognition to their ecological value.

Other International and National designated Sites were searched for within the ZoI, such as Ramsar Sites, Irish Wetland Bird Survey (I-WeBS) Areas, and Important Bird Areas (IBA’S). All of which are recognised as important areas for the protection of wintering and migratory wildfowl.

Local plans and policies relevant to the Proposed Development are listed below:

- Meath County Development Plan 2021 - 2027.
- Meath Biodiversity Action Plan 2015 – 2020 (current).

Further details on legislation and policy relevant to the Proposed Development are detailed in Appendix I – Legislation and Policy.

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2 DESCRIPTION OF THE PROPOSED DEVELOPMENT

2.1 Site Location

The Site of the Proposed Development comprises agricultural lands, sheds and detached rural dwellings. The Site is generally located within Land Use Zoning consisting of A2 New Residential and A1 Existing Residential zoned land within the Meath County Development Plan 2021 - 2027. The existing site is predominantly a greenfield site with three buildings/structures present: two detached dwellings and an agricultural shed. The Site is bound to the north and west by residential developments, to the east by agricultural lands and the Ballybin Road, and to the south by the R125.

2.2 Proposed Development Description

The Proposed Development is at a site with a total area of 5.48 hectares principally located at Main Street/R125 and Ballybin Road, Ratoath, Co. Meath. The total site contains a proposed residential development site with an area of 3.66 hectares (bisected by a proposed realigned Ballybin Road) and a proposed infrastructural development site with an area of 1.82 hectares (principally for road and related works, water services and open space amalgamation). The Site is generally bound by: Fox Lodge Woods and Fox Lodge Manor to the west and north; existing agricultural lands and residential development to the north and east; existing Ballybin Road and Moulden Bridge to the east; and Main Street/R125 and Jamestown Road/L1016 to the south. The Site also incorporates parts of: the existing Ballybin Road (north and west of Moulden Bridge), Main Street/R125, Jamestown Road/L1016 and green open space in Fox Lodge Manor.

The Proposed Development principally consists of the demolition of 2 No. dwellings (594 square metres gross floor area combined) and 1 No. agricultural shed (988.7 square metres gross floor area) and the construction of 141 No. residential dwellings with a gross floor area of 12,424.6 square metres in buildings of 2 No. and 3 No. storeys. The dwellings include 117 No. houses (57 No. 2-bed, 52 No. 3-bed, 7 No. 4-bed and 1 No. 5-bed) and 24 No. maisonette/duplex units (18 No. 1-bed and 6 No. 3-bed).

The development also proposes a reconfiguration of the road layout at the south (Main Street/R125 and Jamestown Road/L1016) and east (Ballybin Road) of the Site. Specifically, it is proposed to demolish/remove the existing 5-arm roundabout and to replace same with a new 4-arm signalised junction and reconfigured access to the existing Ratoath Childcare site. The new junction arrangement will facilitate a proposed realignment of the southern section of the existing Ballybin Road (approximately 172 metres) as the northern arm of the new signalised junction and a revised entrance for the existing dwelling to the north-east of the site at Ballybin Road (known as ‘Fox Lodge Farm’, Eircode A84 KF97). The proposed road infrastructure works also include: road markings, traffic signals, traffic signage, footpaths and cycle infrastructure.

The development also proposes:

- 2 No. new multi-modal accesses onto the proposed realigned Ballybin Road to serve the bisected residential site;
- 2 No. pedestrian accesses onto Main Street/R125 and 1 No. pedestrian access onto the realigned Ballybin Road;
- Relocation of existing eastbound bus stop at Main Street/R125 approximately 130 metres to the west;
- Repurposing of the closed section of Ballybin Road as a pedestrian/cycle greenway;
- Internal roads and footpaths;
- 228 No. car parking spaces;
- Cycle parking spaces;
- Hard and soft landscaping, including public open space, communal amenity space and private amenity space (as rear gardens and terraces/balconies facing multiple directions);
- Demolition of the wall at the north-west corner of the site interfacing with Fox Lodge Manor and the amalgamation of existing public open in the estate and proposed public open space;
- Boundary treatments;
- Public lighting;
- Rooftop PV panels;
- 2 No. ESB sub-stations; and
- All other associated site and development works above and below ground.

It is important to note for the context of the ecology at the Site, that most planned works will occur within the area to the north of the Site which is bounded by the treelines. The southern arm of the roundabout bridging Ratoath Stream, while being realigned, does not generally require intrusive works and no movement of the bridge is required. The location of the Site is presented in Figure 1 below.

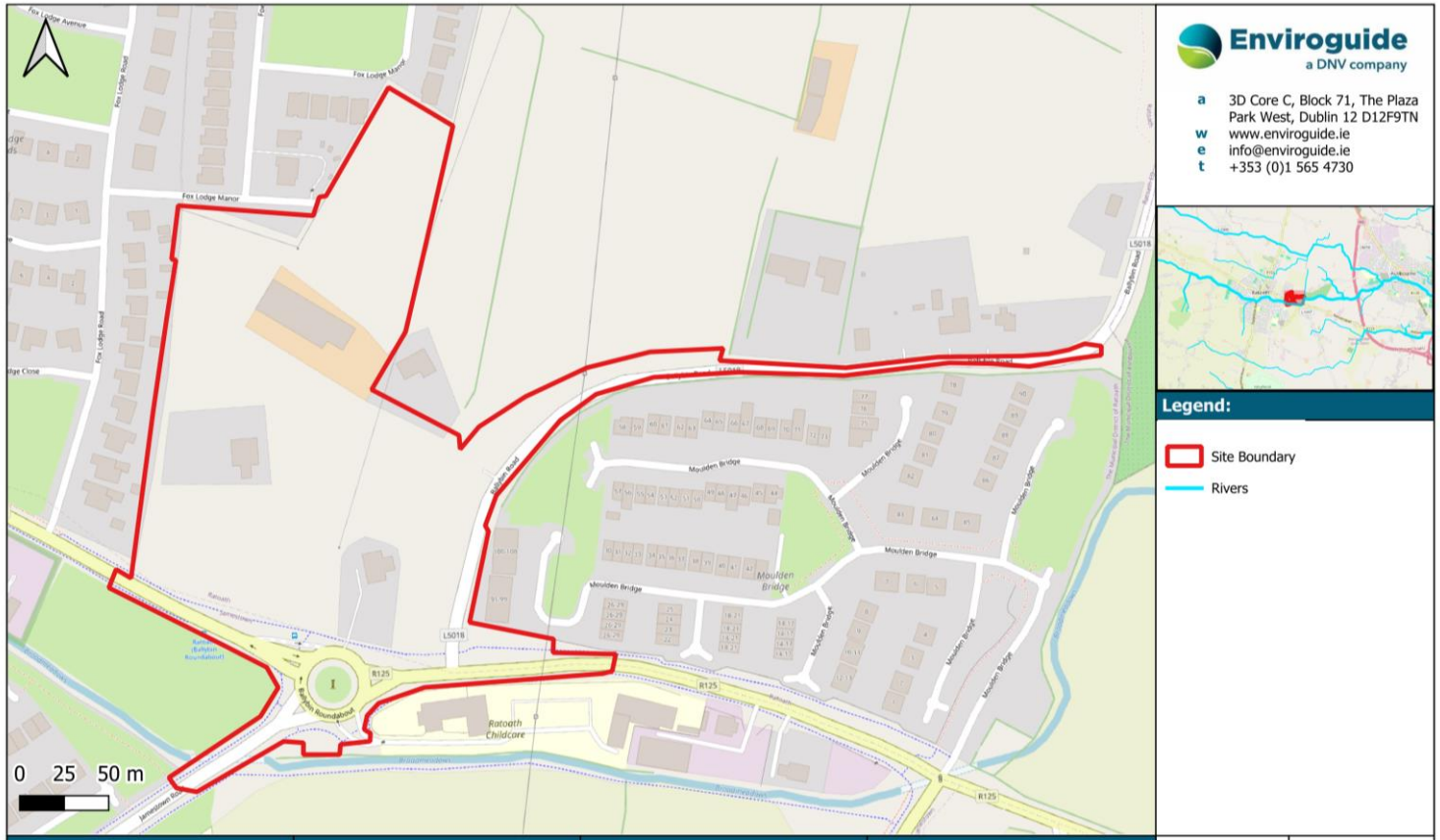

FIGURE 1. SITE LOCATION.

FIGURE 2. PROPOSED SITE LAYOUT (JOHN FLEMING ARCHITECTS, 2024).

2.2.1 Description of the Construction Phase

A Construction Management Plan (CMP) has been prepared as part of the planning application (Donnachadh O'Brien & Associates Consulting Engineers, 2024b) and considered as part of the finalisation of this EcIA.

The Construction Phase will generally comprise the following elements:

- Soil stripping and vegetation clearance.
- Installation of hardstanding areas and construction compounds.
- Groundworks, drainage, and foundation installations.
- Building construction.
- Roadworks and road realignment.

For the duration of the Construction Phase, it is envisaged that the maximum working hours shall be 08:00 to 18:00 Monday to Friday (excluding bank holidays) and 08:00 to 13:00 Saturdays.

No works are proposed on Sundays or Bank Holidays or after the hours noted above, however, it may be necessary to work outside of these hours in exceptional circumstances such as night works or weekend works during certain construction activities.

2.2.1.1 Tree Removals Plan

A number of trees have been proposed for removal at the Site to accommodate the Proposed Development (Figure 3). Full details of the tree retention and removal plans are available in the arboricultural report (Charles McCorkell Arboricultural Consultancy, 2024b).

It is noted that most of the trees scheduled for removal are in low value treelines to the north and west of the Site largely comprising non-native monterey cypress (*Hesperocyparis macrocarpa*), Norway maple (*Acer platanoides*) and ash (*Fraxinus excelsior*) that are showing signs of ash dieback (*Hymenoscyphus fraxineus*). Trees of higher ecological value to the south and southeast are largely being retained. Trees for removal in these treelines are largely low value category C and U sycamore (*Acer pseudoplatanus*) and beech (*Fagus sylvatica*). One category A oak tree (*Quercus robur*) is also scheduled for removal in this treeline to facilitate a road realignment. Mitigation has been implemented as part of the landscaping design strategy (Niall Montgomery & Partners, 2024) to ensure there is no net loss of treeline or hedgerow at the Site. Planting has also been designed strategically to ensure there are no negative effects on commuting bats throughout the Site.

'*A detailed landscape plan has been designed and will form part of the planning application for the development proposal. This design includes the planting of a large number of new high-quality trees and hedgerows. The proposed new planting will mitigate the loss of trees required to facilitate the development and will enhance the tree and hedge cover throughout the site and within the local area. This will have a positive impact on local canopy cover and the character and appearance of development and the surrounding landscape*.' (Charles McCorkell Arboricultural Consultancy, 2024b).

A tree assessment for roosting bats was completed on the 6th of March 2024 and one tree with PRF-M (Potential Roosting Features - Maternity) was recorded: T439. This

tree is being retained and the lighting plan has been designed to ensure it remains dark and that any bats, if present, would not be harmed. Further information on bat surveys is detailed in section 3.4.1.1.3.

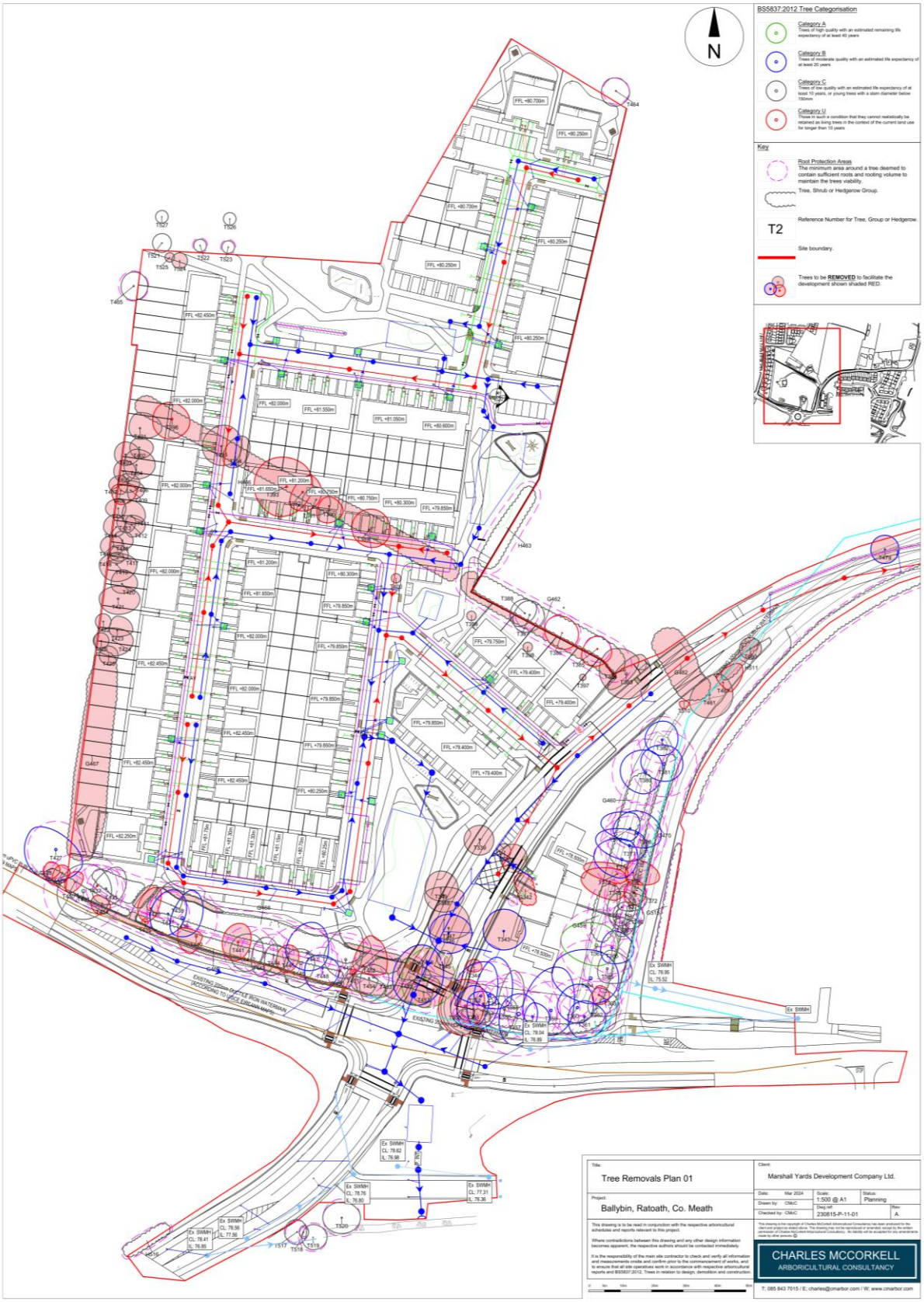

FIGURE 3. PROPOSED TREE REMOVALS PLAN (CHARLES MCCORKELL ARBORICULTURAL CONSULTANCY 2024A).

2.2.2 Description of the Operational Phase

The Operational Phase will comprise of urban residential housing that is consistent with the land use in the surrounding areas.

2.2.2.1 Surface Water

The local topography of the application Site is gently sloping from west to east towards the Ballybin Road. The primary surface water discharge currently on Site is to ground. An existing field boundary drain discharges from west to east within the Site and appears to receive some runoff from the existing agricultural lands and private dwellings prior to discharging to a piped network discharging towards the Ballybin Road.

The design and management of surface water for the Proposed Development will comply with the policies and guidelines outlined in the Meath County Development Plan (2021-2027) and the Construction Industry Research and Information Association (CIRIA) Sustainable Drainage Systems (SuDS) Manual. A 20% climate change factor will be included for the design of the surface water network in accordance with the requirements of Meath County Council.

Surface water drainage from the Proposed Development is to the south via a new 375mm dia. surface water sewer connection to the existing Broadmeadow Stream (Figure 4). The discharge for the surface water drainage associated with the realigned Ballybin Road will discharge to an existing 300mm diameter pipe as per the current Ballybin Road drainage strategy. Full details of the drainage can be found in the Infrastructure Design Report (Donnachadh O'Brien & Associate Consulting Engineers, 2024a).

2.2.2.1.1 Sustainable Drainage Systems (SuDS)

A number of SuDS measures have been included in the Proposed Development with a focus on filtration techniques. These include bioretention areas, tree pits, filter drains, permeable paving, detention basin, a lined underground attenuation tank, and petrol/oil separators. For full details on SuDS measures, please see the Infrastructure Design Report (Donnachadh O'Brien and Associates, 2024a).

2.2.2.2 Foul Water

Wastewater will be collected via a main wastewater drainage network located around the Proposed Development. This will discharge by gravity to an existing 225mm diameter wastewater network located along the Ballybin Road approx. 365m east of the Site (Figure 5). Wastewater is ultimately treated at Ringsend Wastewater Treatment Plant (WwTP) and will be subsequently discharged to the River Liffey.

The estimated peak wastewater loading generated by the Proposed Development's Dry Weather Flow is estimated at 0.66 l/s while the Design Wastewater Flow of 6DWF is 3.97 l/s. For full details on foul water treatment measures can be found in the Infrastructure Design Report (Donnachadh O'Brien and Associates, 2024a).

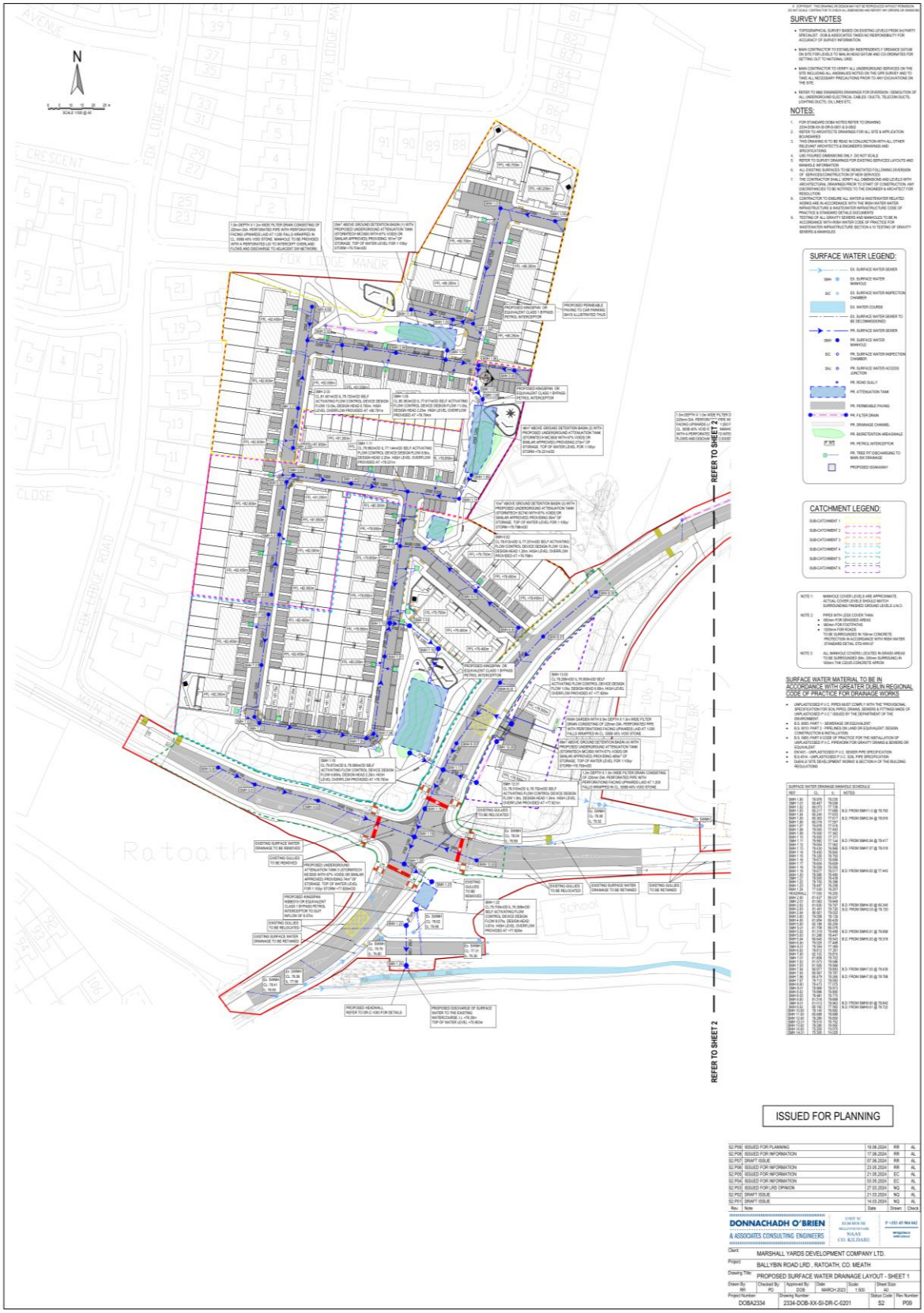

FIGURE 4. PROPOSED SURFACE WATER DRAINAGE FOR THE PROPOSED DEVELOPMENT (DONNACHADH O'BRIEN AND ASSOCIATES, 2024C).

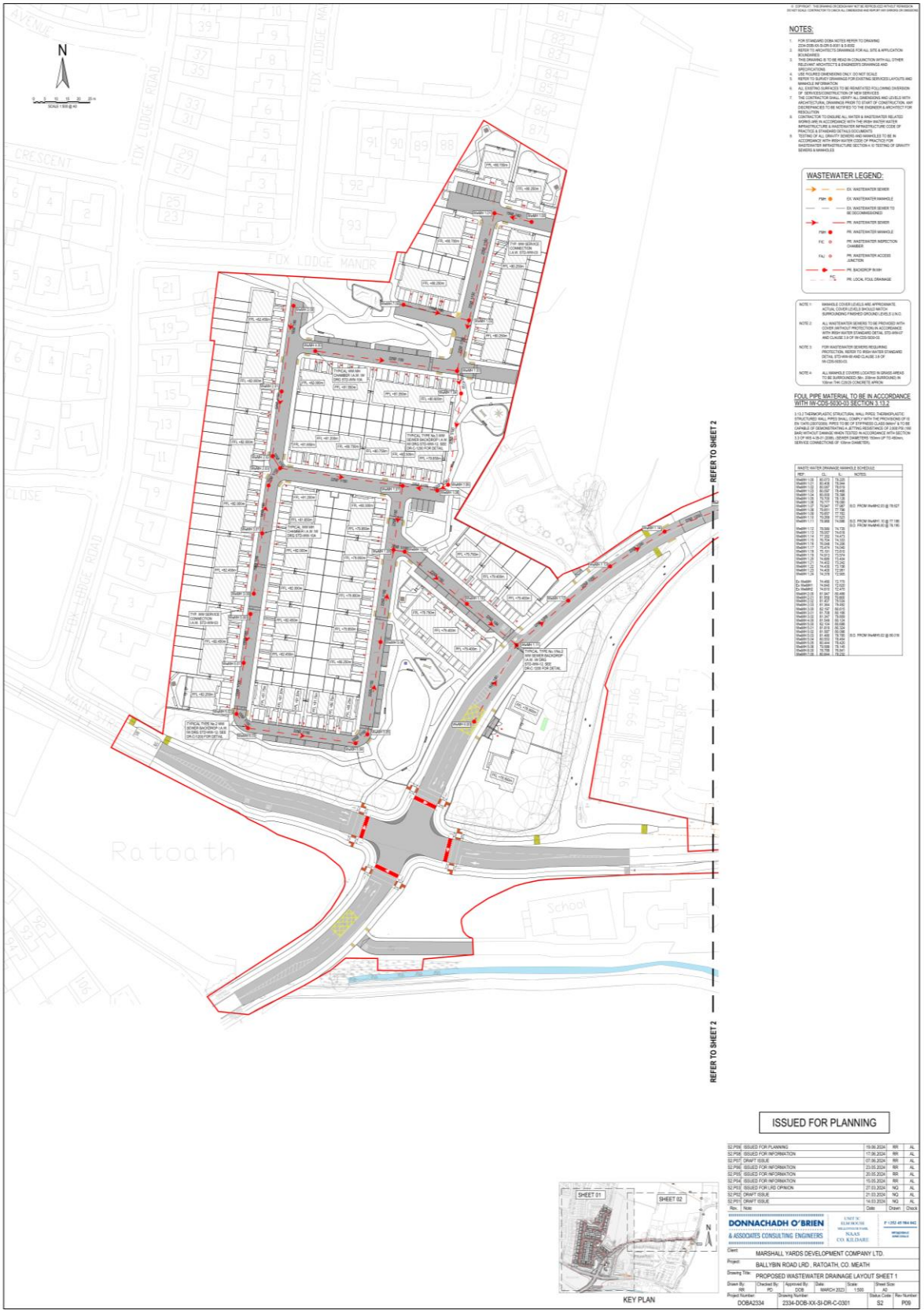

FIGURE 5. PROPOSED FOUL WATER DRAINAGE FOR THE PROPOSED DEVELOPMENT (DONNACHADH O'BRIEN AND ASSOCIATES, 2024E).

2.2.2.3 Landscape Plan

The landscape plan (Figure 6) adapts the existing habitats on Site with a mix of open spaces and new planting throughout the Site. The landscape design statement (Niall Montgomery & Partners, 2024) describes an 'Activity Spine', which will run through the centre of the Proposed Development, linking different areas of the Proposed Development.

The deciduous treeline to the south of the Site will be largely retained except for a small number of trees which will be removed due to their low value, on health and safety grounds, or to facilitate a realigned road. Treelines and hedgerows along the northwest and north of the Site will be removed to facilitate the Proposed Development. A hedgerow appraisal was conducted by Enviroguide ecologists on the 13th of June 2024 to determine the ecological value of these treelines and hedgerows and to ensure they are suitably replaced. Full details of the hedgerow appraisal can be found in the report accompanying this application (Enviroguide, 2024b). The arborist, landscaping, ecology, and lighting teams have consulted to ensure no net loss of treelines or hedgerows arises at the Site and that no long-term negative impacts affect species such as bats, and to ensure replacement planting is equal to or higher quality than those being lost.

'*The masterplan has been envisaged to retain as many of the existing trees as possible of the 133 trees and 12 tree groups surveyed. 27 trees and 1 tree groups were considered to be of poor quality or value and have been identified for removal. Of the remaining trees, 50 trees and 3 tree group have been identified for removal as a result of development. The proposed new trees are intended to enhance the landscape character & aesthetic quality of the site as well as the biodiversity credentials (net gain in biodiversity) and will be located along streets and within public & communal spaces with the intention of mitigating existing tree loss. The new trees will vary in specification of size and species. There will be a majority of trees selected from native tree species, be of deciduous & evergreen nature and varying habit. Clusters of trees rather than formal rows will dominate the landscape expression. There will be a total of 170 new trees planted*.' (Niall Montgomery & Partners, 2024) (Figure 6).

The hedgerow appraisal also found that approximately 348m of hedgerow was proposed for removal. Most of that hedgerow proposed for removal comprises non-native species, and is dominated by sycamore and beech, both of which are scheduled as medium impact invasive species. The findings of the appraisal found that without mitigation, there could be an overall '*permanent, negative and moderate impact at the local scale*'. Following the recommended mitigation; namely planting an equal amount of hedgerow that is similar in structure and ecological significance, that impact would reduce to an overall '*long-term and neutral impact*'. However, the landscaping plan is set to improve on this by planting a total of approximately 450m of hedgerow at the Site, incorporating native species to replace the largely non-native and invasive removals. This should therefore contribute to an overall permanent, positive, moderate impact. Further details regarding the impact on habitats is discussed in section 5.3.1.

Planting throughout the Site will incorporate lawns, public open spaces, a community garden, communal seating, exercise stations, a nature play area, private gardens, and woodland habitat, and a mix of shrub and treeline planting to facilitate the movement of species throughout the Proposed Development, while also promoting a harmonious coexistence between residents and the environment.

The landscape plan has specifically addressed the issue of potential fragmentation for commuting bats, in consultation with the lighting and ecology teams. The Activity Spine that runs through the Site has been planted out more densely to incorporate a mixture of trees and shrubs for foraging bats, while also offering a safe alternative commuting route through the Site to the wider landscape. In combination with the lighting plan, this Activity Spine will form a dark corridor that will only strengthen over time and provide safe passage for bats.

FIGURE 6. PROPOSED LANDSCAPE PLAN (NIALL MONTGOMEREY AND PARTNERS, 2024).

2.2.2.4 Lighting Plan

The lighting and ecology teams have worked closely together to ensure lighting is ecologically friendly throughout the Site, especially in relation to bats. The lighting plan (Morley Walsh, 2024a) (Figure 7) has been designed to minimise light disturbance throughout the Site, with particular attention to the southern and western treelines which are the most frequently utilised bat corridors. The plan has been designed in accordance with Bat Conservation Ireland guidelines; Bat Conservation Ireland (Bats and Lighting: Guidance Notes for Planners, Engineers, Architects and Developers, BCI, 2010) and the Bat Conservation Trust (Guidance Note 08/18 Bats and Artificial Lighting in the UK (BCT, 2018).

The lighting plan incorporates several features to reduce disturbance to bats at the Site; cowls on lights, strategic placing of lights in the centre of the Site to facilitate a new dark corridor for bats, an automatic timing system which will see lights designed to a lighting class of P4 (minimum lux level of 1.0) stepped back to lighting class P5 (minimum lux level of 0.6) after midnight. Lastly, all lamps shall have a narrow spectrum and limited UV component.

Bats have been primarily recorded foraging along the southern treeline and appear to be quite tolerant of light levels currently in place from streetlights on the R125, having been observed foraging along the R125 side of the treeline at dusk. While the lighting lux map (Figure 7) displays this area as over 1 lux, the software used cannot account for the implementation of cowls and so the areas along the top of the canopy where bats have mainly been observed foraging and commuting is much more likely to be closer to 1 lux or less. It is also not possible to reduce these levels to below the current values associated with light spill from the R125, but the lighting plan has been designed to ensure light does not exceed current values (Figure 7).

A new bat commuting corridor has also been proposed through the Site to offset any disturbance from the gap that will be created in the southern treeline by the realigned road. This new commuting corridor has been incorporated into the lighting plan and will merge the southern treeline into an area of <1 lux in the centre of the Site. This area will contain new native tree planting for additional forage and will then merge once more to a hedgerow to the north outside of the redline boundary, allowing bats to move unimpeded through the Site. This corridor is complemented by dense planting in the landscaping plan. One small portion of this corridor is above 1 lux (Figure 7) where an internal road is proposed. This break is buffered from upward light spill by the implementation of cowls and 0-degree tilts. However as previously mentioned, this map does not account for the effect of cowls and so this area is likely to be darker at the height in which bats commute. Trees are also proposed for planting at either end of this gap so that as they grow, the merging of canopies will strengthen this route as a dark corridor above canopy height, while also lessening the gap over which they must commute.

FIGURE 7. PROPOSED LIGHTING PLAN AND LUX LEVELS. BLUE CONTOURS INDICATE AREAS OF 1 LUX OR LESS (MORLEY WALSH, 2024B).

3 METHODOLOGY

This EcIA has been undertaken to support and assess the Proposed Development planning application and the potential impacts that the Proposed Development may have on the ecology of the Site and its environs. Where potential for a risk to the environment is identified, mitigation measures are proposed on the basis that by deploying these mitigation measures the risk is eliminated or reduced to an insignificant level.

This section details the steps and methodologies employed to undertake an ecological impact assessment of the Proposed Development.

3.1 Scope of Assessment

The specific objectives of the study were to:

- Undertake baseline ecological surveys and evaluate the nature conservation importance of the Site.
- Identify and assess the direct, indirect, and cumulative ecological implications or impacts of the Proposed Development during its lifetime.
- Where possible, propose mitigation measures to remove or reduce those impacts at the appropriate stage of the Proposed Development.

3.2 Consultation

The findings of ecology surveys at the Site and their results were presented to the design team throughout the project design process. Species and habitats were protected first and foremost through avoidance measures. Where disturbance to a species or habitat could not be prevented, the design team were consulted to come up with sufficient mitigation such that negative impacts would be reduced to an insignificant level in the long term. Consultation was conducted with several relevant parties throughout the design process including engineers, landscapers, lighting designers, architects, landowners, developers, and the local planning authority.

3.3 Desk Study

A desktop study was carried out to collate and review available information, datasets and documentation sources pertaining to the Site's natural environment. The desk study, completed on the 11th of March 2024, relied on the following sources:

- Information on species records and distributions, obtained from the National Biodiversity Data Centre (NBDC) at *maps.biodiversityireland.ie.*
- Information on waterbodies, catchment areas, and hydrological connections obtained from the Environmental Protection Agency (EPA) at *gis.epa.ie.*
- Information on Fresh Water Pearl Mussel sensitive areas obtained from the National Parks and Wildlife Service (NPWS) at *www.npws.ie*;
- Information on bedrock, groundwater, aquifers, and their statuses, obtained from Geological Survey Ireland (GSI) at *www.gsi.ie.*

- Information on the network designated conservation sites, site boundaries, qualifying interests, and conservation objectives, obtained from the National Parks and Wildlife Service (NPWS) at *www.npws.ie*.
- Information on protected and sensitive habitats such as Ramsar sites, UNESCO sites obtained from *getdata.epa.ie*.
- Satellite imagery and mapping obtained from various sources and dates including Google, Digital Globe, Bing, and Ordnance Survey Ireland.
- Information on the extent, nature, and location of the Proposed Development, provided by the applicant and/or their design team.

3.3.1 Zone of Influence

The Zone of Influence (ZoI) for a project is the area over which ecological features may be affected by changes because of the Proposed Development and associated activities. This is likely to extend beyond the development Site, for example where there are ecological or hydrological links beyond the Site boundaries (CIEEM, 2018). The ZoI will vary with different ecological features, depending on their sensitivities to an environmental change. The ZoI may include European sites within the WFD catchment, groundwater catchment, or those that are hydrologically linked to the Proposed Development.

Furthermore, ZoI in relation to European sites is described as follows in the 'OPR Practice Note PN01 - Appropriate Assessment Screening for Development Management' (OPR, 2021):

> '*The zone of influence of a proposed development is the geographical area over which it could affect the receiving environment in a way that could have significant effects on the Qualifying Interests of a European site. This should be established on a case-by-case basis using the Source-Pathway-Receptor framework and not by arbitrary distances (such as 15 km).*'

3.3.2 Identification of Relevant Designated Sites

To determine the ZoI of the Proposed Development for designated sites, reference was made to the OPR Practice Note PN01 - Appropriate Assessment Screening for Development Management' (OPR, 2021), a practice note produced by the Office of the Planning Regulator, Dublin. This note was published to provide guidance on screening for AA during the planning process, and although it focuses on the approach a planning authority should take in screening for AA, the methodology is also readily applied in the preparation of EcIA reports such as this to identify all relevant designated sites potentially linked to the Proposed Development.

As noted above, the most recent guidance advises against the use of arbitrary distances that serve as precautionary ZoI (e.g., 15km), and instead recommends the application of the Source-Pathway-Receptor (SPR) model in the identification of designated sites, stating that '*This should avoid lengthy descriptions of European sites, regardless of whether they are relevant to the proposed development, and a lack of focus on the relevant European sites and issues of importance*'. Although this statement refers to European sites, it is also applicable to other designated sites.

Thus, the methodology used to identify relevant designated sites comprised the following:

- Identification of potential sources of effects based on the Proposed Development description and details.
- Identification of potential pathways between the Site of the Proposed Development and any designated sites within the ZoI of any of the identified sources of effects.
    - Water catchment data from the EPA (*www.epa.ie*) were used to establish or discount potential hydrological connectivity between the Proposed Development and any designated sites.
    - Groundwater and bedrock information used to establish or discount potential hydrogeological connectivity between the Proposed Development and any designated sites.
    - Air and land connectivity assessed based on Proposed Development details and proximity to designated sites.
    - Consideration of potential indirect pathways, e.g., impacts to flight paths, *ex-situ* habitats, etc.
- Review of Ireland's designated sites to identify those sites which could potentially be affected by the Proposed Development in view of the identified pathways, using the following sources:
    - European sites and nationally designated sites (e.g., NHAs and pNHAs) from the NPWS (*www.npws.ie*);
    - Ramsar sites from the Irish Ramsar Wetland Committee (*https://irishwetlands.ie/irish-sites/*);
    - Other internationally designated sites e.g., UNESCO Biosphere's; and
- Regional development plans to identify any remaining sites or areas designated for nature conservation at a local level.

3.3.3 Bat Landscape Suitability

As part of the desktop study, the Bat Conservation Ireland Landscape Suitability Model (Lundy *et al.*, 2011) was consulted. This provides a habitat suitability index for bat species across Ireland. The model divides the country into 1 km grid squares and ranks the habitat within the squares according to its suitability for various bat species. The scores are divided into five qualitative categories of suitability, namely:

- 0.0000000 - 13.000000: Low.
- 13.000001 - 21.333300: Low – Medium.
- 21.333301 - 28.111099: Medium.
- 28.111100 - 36.444401: Medium – High.
- 36.444402 - 58.555599: High.

A comprehensive list of all the specific documents and information sources consulted in the completion of this report is provided in Section 10, References.

3.4 Field Surveys

A Preliminary Ecological Appraisal (PEA) was conducted by Enviroguide surveyor BMcC on the 28th of September 2023. Further targeted surveys were carried out based on the findings of the PEA, with any incidental sightings of protected species also recorded. Details of surveys conducted are listed in Appendix IV – Survey Information. The PEA comprises a walkover of the entire Site to assess its ecological composition including habitats, flora, amphibians, bats, birds, fish and aquatic invertebrates, non-volant mammals, and reptiles. Details of the methodology for each category are detailed below.

3.4.1 Habitat and Flora Surveys

Habitats were categorised to level 3, according to the Heritage Council's 'A Guide to Habitats in Ireland' (Fossitt, 2000). The habitat mapping exercise had regard to the 'Best Practice Guidance for Habitat Survey and Mapping' (Smith *et al*., 2011) published by the Heritage Council, and the National Roads Association (now known as Transport Infrastructure Ireland (TII)) guidance on 'Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes' (NRA, 2009). Habitats within the surrounding area of the Proposed Development were classified based on views from the Site and satellite imagery where necessary (Google Earth, Digital Globe and OSI). The habitat and flora surveys cover were conducted during the appropriate time of year (April-September) (Smith *et al*., 2010). The surveys also included a search for any rare or protected plant species.

3.4.1.1 Flora

3.4.1.1.1 Invasive Alien Species Surveys

Invasive alien species (IAS) surveys were undertaken at the Site. During the ecological walkovers conducted on the 28th of September 2023, 6th of March 2024, and the 13th of June 2024, the location of invasive species, were they encountered, were documented on a field map or by GPS in the field, along with their extent. The IAS survey primarily focused on plant species that are listed on Schedule III of the European Communities (Birds and Habitats) Regulations and considered to be 'High impact' invasive species e.g., Japanese knotweed (*Reynoutria japonica*). Incidental observations of other terrestrial plant species known to be potentially invasive, such as butterfly bush (*Buddleja davidii),* were also recorded if/where found.

3.4.1.1.2 Rare and/or Protected Plants

A search for rare and protected plant species such as those listed on 'The Red Data List of Irish Plants' by The National Botanic Gardens of Ireland (2018) and 'The Flora Protection Order' (FPO) (2022) were searched for as a part of establishing habitat identifications on Site. Any rare/protected plant species encountered were recorded during the ecological surveys. Particular attention was given to search for any species which may have arisen from the desktop study in the relevant grid squares to the Site.

3.4.1.1.3 Hedgerow Appraisal Survey

A hedgerow appraisal survey was carried out on the 13th of June 2024 by Enviroguide ecologists YM and NB in line with Foulkes *et al.* (2013). A separate hedgerow appraisal report accompanies this application under separate (Enviroguide, 2024b). The hedgerow

appraisal assessed all treelines and hedgerows on Site and scored their ecological value based on two factors: their structural composition, and their ecological significance. This information was then used to ensure that replanting within the landscaping design was sufficient so as to ensure no net loss of quantity or quality of trees and hedgerows at the Site.

3.4.2 Bat Surveys

3.4.2.1 Preliminary Bat Roost Assessment

A daytime inspection of the Site was undertaken on the 28th of September 2023 and a follow up assessment was conducted in line with updated guidance (Collins, 2023) on the 6th of March 2024. The aim of the inspections was to search for any indication or evidence of roosting bats, and to assess the habitat for its ability to support commuting and foraging bats. Buildings and trees on Site were visually assessed with the aid of a torch and binoculars.

The roost inspection comprised a detailed examination of structures and trees on Site. These were subject to exterior and internal inspections (where possible) to search for evidence of bat use. This includes live and dead specimens, droppings, feeding remains, oil staining and noise (Collins, 2023). Buildings were assessed for cracks and crevices, or entry points to the roof that might support roosting bats, while trees were searched for Potential Roosting Features (PRFs) such as hollow trunks, knot holes, peeling bark, splits, cracks, and crevices (Andrews, 2018).

Collins (2023) recommends that structures and trees are assessed for their ability to support roosting bats under separate categorizations using professional judgement.

A structure with roosting potential can be further divided into one of five sub-categories as presented in Table 4.1 (Collins, 2023).

- None – No habitat features on site likely to be used by any roosting bats at any time of the year.
- Negligible – No obvious features observed, however, a small element of uncertainty remains.
- Low – A structure with one or more roost features as used by individual bats opportunistically at any time of year.
- Moderate – A structure with one or more roost features that could be used by bats on a regular basis or by a larger number of bats.
- High – A structure with one or more roost features that are obviously suitable for use by a larger number of bats on a regular basis, and potentially for longer periods of time. These features have the potential to support high conservation status roosts.

Trees are categorized separately according to Table 4.2 of Collins (2023). These classifications are:

- NONE – Either no PRFs in the tree or highly unlikely to be any.
- FAR – Further assessment required to establish if PRFs are present in the tree.
- PRF – A tree with at least one PRF present.

Where a tree contains at least one PRF, each PRF is further assessed according to Table 6.2 (Collins, 2023). PRF's are scored as either:

- PRF-I – PRF is only suitable for individual bats or very small numbers of bats either due to size or lack of suitable surrounding habitats.
- PRF-M – PRF is suitable for multiple bats and may therefore be used by a maternity colony.

As per Table 6.3 of Collins (2023), where low numbers of PRF-I's are identified, no further emergence surveys are required. However, pre-felling endoscope surveys would be recommended and should a roost be identified, a derogation licence would be required. Furthermore, where the number of trees with PRF-I's present increases, further surveys may be required if the trees cannot be retained.

Where a PRF-M tree is identified and requires works or removal, three emergence surveys with night vision aids would be required between May and September with at least two in the period May to August.

3.4.2.2 Preliminary Bat Habitat Suitability Assessment

Bat habitat suitability assessments were carried out in conjunction with the roost assessments on the 28th of September 2023 and 6th of March 2024. These assessments evaluated the habitats present on Site and in the wider area for bat foraging and commuting suitability. Habitat suitability was initially assessed according to Collins (2016) on the 28th of September 2023 and the subsequent survey on the 6th of March 2024 was used to update any assessments in line with Collins (2023). The scorings as per Collins (2023) are as follows:

- None – No habitat features on Site likely to be used by any roosting bats at any time of the year (i.e., a complete absence of crevices/suitable shelter at all ground/underground levels).
- Negligible – No suitable foraging or commuting habitats on Site.
- Low – Suitable but isolated habitats that could be used by small numbers of commuting and/or foraging bats, such as poorly connected gappy hedgerows, lone trees, unvegetated streams, etc.
- Moderate – Suitable continuous habitat connected to the wider landscape that could be used by commuting and/or foraging bats, such as treelines, scrub, grassland, water, etc.
- High – Continuous high-quality habitat that is well-connected to the wider landscape, and is likely used regularly by commuting and/or foraging bats, such as river valleys, broadleaved woodland, woodland edge, grazed parkland, etc.

3.4.2.3 Bat Emergence Surveys

Emergence surveys are carried out to determine if bats are utilising structure(s) on Site for roosting. The number of surveys required is determined according to best practice guidelines (Collins, 2023). Emergence activity surveys should be undertaken in the period from April to October in suitable weather conditions (Collins, 2023). Three buildings were identified on Site as described in detail in section 4.4.4.

Building A was assessed as negligible potential for roosting bats. The building is well sealed up and brightly lit on all sides.

Building B was scored as low potential due to some vents and dark crevices under the eaves. It was subject to one emergence survey on the 8th of May 2024.

Building C was also scored as low potential due to the presence of gaps between the rafters and corrugated roof. It was subject to one emergence survey on the 11th of June 2024. This building was also partially assessed with an endoscope on accessible features during a Site visit on the 6th of March 2024.

3.4.2.4 Bat Activity Surveys

3.4.2.4.1 Walked Transects

Three walked transect activity surveys were conducted at the Site on the 28th of September 2023, 15th of April 2024, and 5th of June 2024 under suitable weather conditions. Walked transects were conducted to record bat foraging and commuting behaviour, and relative areas of activity.

To comply with best practice guidelines, dusk surveys began 15 minutes before sunset and were sustained for a minimum of 1.5 hours after sunset (Collins, 2023). During the activity survey bat echolocation calls were recorded using an Elekon Batlogger. The recordings were subsequently analysed to species level where possible, using BatExplorer analytical software.

3.4.2.4.2 Static Detector Monitoring

Static detector monitoring was conducted for two periods of five nights each to determine the species composition at the Site. A static detector was deployed along the southern treeline for a minimum of 5 nights of good weather on each surveying period. Deployment occurred between the 15th of April and 22nd of April 2024, and the 5th of June to the 12th of June 2024 in line with best practice guidelines (Collins, 2023). Details on survey timings and weather conditions are available in Appendix IV – Survey Information.

3.4.2.5 Data Analysis

Species were identified from recordings using Elekon's BatExplorer software (Version 2.1.11.2). Static detector data was analysed using Kaleidoscope Lite software (Version 5.6.6) and species assigned to each record with reference to species identification guides such as Russ (2012).

Each record i.e., a sequence of bat calls/pulses, is noted as a bat pass and indicates the level of bat activity for each species recorded. It is important to note that bat passes are representative of activity levels and do not necessarily denote individual bats. For example, some bats may continuously fly around a high-quality feeding feature and multiple calls may represent one individual circling an area. Alternatively, Leisler's bats (*Nyctalus leisleri*) recorded early in a survey are likely to be commuting high overhead, and each call may represent a singular bat. Therefore, a bat pass is a measure of activity, and not of the number of bats present.

3.4.3 Bird Surveys

3.4.3.1 Bird Scoping Survey

A scoping bird survey was carried out during the PEA walkover on the 28th of September 2023. The survey methodology employed was based on that recommended in standard literature used by for example the British Trust for Ornithology (BTO) (Gillings *et al.,* 2007; Bibby *et al.,* 1992 and Gilbert *et al.,* 1998), which has subsequently been adapted into guidelines for ecological consultants by the Bird Survey & Assessment Steering Group (2022). During the surveys, the Site was walked slowly, approaching all habitat within and adjacent to the Proposed Development and scanning and listening for birds.

No subsequent breeding or wintering bird surveys were conducted due to a lack of significant suitable habitats for SCI species of any European site that would be adversely affected by the Proposed Development.

3.4.4 Non-Volant Mammals Surveys

Mammal surveys of the Site were carried out in conjunction with the habitat and bird surveys on the 28th of September 2023 and the 6th of March 2024. The Site was searched for tracks and signs of non-volant mammals (i.e., mammals which are incapable of flight). Bat surveys were carried out separately and are described above. The habitat types recorded throughout the survey area were used to assist in identifying the fauna considered likely to utilise the area. During this survey, the Site was searched for any indication of mammals as per Bang and Dahlstrom (2001). These indications include, but are not limited to droppings, fur, prints, trails, and burrows.

All watercourses within 100m of the Site (where accessible) were assessed for the presence of otter (*Lutra lutra*) and for the suitability to support otters. This involved searching for associated field signs, such as spraints, footprints, anal jelly, holts, and couches to best practice guidelines (NRA, 2008). An initial assessment was undertaken by a suitably experienced ecologist on 28th of September 2023, and again on the 6th of March 2024 due to an extended Site boundary.

3.4.5 Other Fauna Surveys

The PEA survey assessed the Site for the presence of fauna other than mammals and birds in conjunction with the habitat surveys undertaken at the Site. The Site was searched for signs of aquatic fauna (incl. amphibians, fish, and invertebrates), reptiles and rare/endangered invertebrates. Habitats on Site were assessed for their potential suitability to support the species groups.

3.5 Ecological Assessment

This EcIA has been undertaken following the methodology set out in Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine (CIEEM, 2018); and with reference to the National Roads Authority 'Guidelines for Assessment of Ecological Impacts of National Road Schemes' (NRA, 2009), the Environmental Protection Agency (EPA) 'Guidelines on the information to be contained in Environmental Impact Assessment Reports' (EPA, 2022), and BS 42020:2013 Biodiversity: Code of practice for planning and development (BSI, 2013).

The evaluation of significant effects should be based on available scientific evidence. Based on the precautionary principle, if the available information is not sufficient, then a significant effect may be assumed likely to occur.

3.5.1 Evaluation of Ecological Features

The value of the ecological features, i.e., the habitats and species present or potentially present, was determined using the ecological evaluation at different geographical scales (NRA, 2009) presented in Appendix II – Value of Ecological Resources.

This evaluation scheme, with values ranging from locally important to internationally important seeks to provide value ratings for habitats and species present that are considered ecological receptors of impacts that may ensue from a proposal. Based on best practice (CIEEM, 2018), any features considered to be less than of local value are not assessed within this EcIA.

3.5.2 Impact Assessment

As per the NRA guidelines, impact assessment is only undertaken on KERs. The assessment of the potential impact of the Proposed Development on the identified KERs was carried out regarding the criteria outlined in the EPA Guideline (EPA, 2022), presented in Appendix III – EPA Impact Assessment Criteria. These guidelines set out several parameters that should be considered when determining which elements of the Proposed Development could constitute impact or sources of impacts, including:

- Positive, neutral, or negative effect.
- Significance.
- Extent.
- Probability.
- Duration.
- Timing.
- Frequency.
- Reversibility.

The impact assessment process considers both direct and indirect impacts: direct ecological impacts are changes that are directly attributable to a defined action, e.g. the physical loss of habitat. Indirect ecological impacts are attributable to an action, but which affect ecological resources through effects on an intermediary ecosystem, process, or feature, e.g., the creation of roads which cause hydrological changes, which, in the absence of mitigation, could lead to an adverse effect of a sensitive habitat.

3.5.3 Assessment of Cumulative Impacts and Effects

Cumulative effects can result from individually insignificant, but collectively significant actions taking place over a period or concentrated in a location. Cumulative effects can occur where a Proposed Development results in individually insignificant impacts that, when considered in combination with impacts of other proposed or permitted plans and projects can result in significant effects.

Relevant plans and policies (see section 1.2) were reviewed to identify any potential for negative cumulative impacts with the Proposed Development. Additionally, existing planning permissions from the past five years within 500 m of the Proposed Development were

reviewed with particular focus on potential cumulative impacts on the identified KERs. Long-term developments were also considered where applicable.

3.5.4 Avoidance, Mitigation, Compensation and Enhancement Measures

Where potentially significant effects have been identified, the mitigation hierarchy has been applied as recommended in the CIEEM guidelines (CIEEM, 2018). The mitigation hierarchy sets out a sequential approach beginning with the avoidance of impacts where possible, the application of mitigation measures to minimise unavoidable impacts and then compensation for any remaining impacts. Once avoidance and mitigation measures have been applied, residual effects are then identified along with any necessary compensation measures, and incorporation of opportunities for enhancement. When seeking mitigation or compensation solutions, efforts should be consistent with the geographical scale at which an effect is significant. For example, mitigation and compensation for effects on a species population significant at a county scale should ensure no net loss of the population at a county scale. The relative geographical scale at which the effect is significant will have a bearing on the required outcome which must be achieved.

It is important for the EcIA to clearly differentiate between avoidance, mitigation, compensation, and enhancement and these terms are defined here as follows:

- Avoidance is used where an impact has been avoided, e.g., through changes in scheme design. In practice, avoidance measures are typically implemented during the design stage via discussions and re-design (e.g., avoiding a sensitive habitat by relocating a building). Avoidance measures are therefore rarely reported within an EcIA, which focuses on assessing the final design.
- Mitigation is used to refer to measures to reduce or remedy a specific negative impact in situ.
- Compensation describes measures taken to offset residual effects, i.e. where mitigation in situ is not possible.
- Enhancement is the provision of new benefits for biodiversity that are additional to those provided as part of mitigation or compensation measures, although they can be complementary.

3.6 Limitations

Every effort has been made to provide a comprehensive description of the Site; however, the following specific limitations apply to this assessment:

- An extensive search of available datasets for records of rare and protected species within proximity of the Proposed Development has been undertaken as part of this assessment. However, the records from these datasets do not constitute a complete species list. The absence of species from these datasets does not necessarily confirm an absence of species in the area.
- The bird scoping survey was carried out outside the optimal breeding bird survey season, however habitats on Site were assessed to determine the bird species likely to utilise the Site. The Site does not provide significant habitat for suitable SCI species of any European sites and so no further surveys were carried out. There will be the loss of some trees and hedges that may lead to habitat loss for locally important species and so breeding birds have been included as a KER and

sufficiently mitigated for. Therefore, this is not a limitation that would prevent robust conclusions being drawn on the effect of the Proposed Development on bird species at the Site.

- A large portion of the Ratoath Stream (also known as the Broadmeadow stream) was inaccessible due to restricted access to survey 100m each way for otter. However, the portion that traverses the Site was observable and surveyed and the precautionary approach was taken to assume that otter utilise the watercourse. Therefore, this was not a limitation that would prevent robust conclusions being drawn as to the presence of otter within the Ratoath Stream.
- A technical/hardware error resulted in the loss of sound recordings from the bat transect survey conducted on the 28th of September 2023. However, most of the relevant information such as species identified in the field, their location, and observable behaviour was recorded as notes during the survey. Therefore, the information that a transect survey primarily seeks to record was captured, and the loss of the digital data was not a limitation that would prevent robust conclusions being drawn as to the nature of bat activity at the Site, on that night.
- During the bat transect on the 15th of April 2024, batteries from the surveyor's torch were fading and so walking along the busy Ballybin road was not safe. This route was not walked during this survey, however it is noted that only one recording was made during both other transects, and this treeline is not being removed as part of the Proposed Development. Furthermore, mitigation has been put in place to protect bats during construction phase activity, and so this is not a limitation that would prevent robust conclusions being drawn as to the nature and impacts on bats at the Site.

4 ECOLOGICAL BASELINE CONDITIONS

This section sets out the baseline conditions for the ecological features within the Site using the findings of the desk study and field surveys.

4.1 Hydrology

The Site has been mapped by the EPA (EPA, 2024) to be within the Nanny-Delvin Catchment (Catchment ID: 08) and the Broadmeadow_SC_010 Sub-Catchment, (Sub-catchment ID: 08_3).

The closest surface water feature to the Site is recorded on the EPA database (EPA, 2024) as the Ratoath Stream (EU Code: IE_EA_08B020400). The Ratoath Stream is known locally and commonly referred to as the Broadmeadow stream but for the purposes of this report, the EPA designated name will be used. The Ratoath Stream is located directly south of the Proposed Development and intersects the redline boundary for approximately 30m on the southern boundary.

The Ratoath Stream flows east before merging with several smaller tributaries to become the Broadmeadow Stream (EPA Code: 08B02) which discharges to Malahide Estuary in Co. Dublin. There is a distance of approximately 16.6 km in a direct line, or approximately 19.1 km of riparian corridor between the Site and this estuary.

4.2 Geology and Hydrogeology

The Soil Information System (SIS) national soil at the Site is '*Straffan'*. The Site sits on subsoils of primarily '*Limestone till (Carboniferous)'* with a small area of '*Alluvium undifferentiated*' to the south of the Site (GSI, 2024).

The Site of the Proposed Development is situated on the Swords groundwater body (EU Code: IE_EA_G_011), which is classified as '*Not at Risk'* of not meeting its WFD objectives (EPA, 2024). The Site sits on an area of 'Poorly productive bedrock' (EPA, 2024). The bedrock units underlying the Site are classified as '*Dinantian Upper Impure Limestones'* (GSI, 2024).

The Site lies within the Swords groundwater body which likely discharges east towards the Irish Sea. The level of groundwater vulnerability from human activity within this groundwater body ranges from '*Low'* across the majority of the Site. A small segment at the south of the Site is rated '*Extreme'*.

4.3 Designated Sites

All European sites potentially linked to the Proposed Development have been identified and fully assessed in the AA Screening Report (Stage 1 AA) accompanying this submission under separate cover (Enviroguide, 2024a). A summary of the AA conclusions is given below.

Other nationally or internationally designated sites potentially linked to the Proposed Development are identified in section 4.3.4 below.

4.3.1 European sites – Appropriate Assessment (AA)

The following conclusion is extracted from the AA accompanying this application under separate cover:

'The Proposed Development at Ballybin Road, Ballybin, Ratoath, Co. Meath has been assessed taking into account:

- *The nature, size and location of the proposed works and possible impacts arising from the construction works.*
- *The QIs and conservation objectives of the European sites*
- *The potential for in-combination effects arising from other plans and projects.*

*In conclusion, upon the examination, analysis and evaluation of the relevant information and applying the precautionary principle, it is concluded by the authors of this report that the possibility **may be excluded** that the Proposed Development will have a significant effect on any of the European sites listed below:*

- *Malahide Estuary SAC (000205)*
- *Malahide Estuary SPA (004025)*
- *Rogerstown Estuary SAC (000208)*
- *Rogerstown Estuary SPA (004015)*
- *Northwest Irish Sea SPA (004236)*
- *South Dublin Bay SAC (000210)*
- *North Dublin Bay SAC (000206)*
- *South Dublin Bay and River Tolka Estuary SPA (004024)*
- *North Bull Island SPA (004006).*

In carrying out this AA screening, mitigation measures specifically put in place to protect European sites have not been taken into account.

*On the basis of the screening exercise carried out above, it can be concluded, on the basis of the best scientific knowledge available and objective information, that the possibility of any significant effects on the above listed European sites, whether arising from the project itself or in combination with other plans and projects, can be excluded in light of the above listed European sites' conversation objectives. Thus, there is no requirement to proceed to Stage 2 of the Appropriate Assessment process; and the preparation of a NIS is **not** required.'*

As such, European sites are not considered further in this report.

4.3.2 National and International Designated Sites

The search determined that one Ramsar sites lies within the ZOI. The Broadmeadow Estuary (Ramsar ID: 833) is downstream of the Proposed Development. National Heritage Areas (NHA) and Proposed National Heritage Areas (pNHA) have been included in Table 1.

4.3.3 Relevant Designated Sites

A designated site will only be at risk from likely significant effects where an SPR link of note exists between the Proposed Development and the designated site. An SPR link of note is one in which the two sites are within such a distance that significant negative effects may arise. For example, two sites may be connected by 100km of river, but due to significant dilution factor, this would not be considered an SPR link of note. All designated sites considered as part of the SPR method are listed in Table 1 and displayed Figure 8.

Those sites with notable SPR links to the Proposed Development are assessed further in this report as KERs of 'National Importance' (pNHAs and NHAs) or 'International Importance' (SACs/SPAs, UNESCO sites, Ramsar sites, etc.).

In conclusion, the desk study determined that there is a total of 5 SACs, 4 SPAs, no NHAs, 3 pNHAs, and 1 I-WeBS, 1 Ramsar, and no UNESCO sites located within the ZOI of the Proposed Development Site and with an SPR link of note.

4.3.4 Other Designated Sites

The AA Screening ruled out all pathways to European sites based on a number of factors. The main SPR connection was a hydrological link between the Proposed Development and downstream European sites of Malahide Estuary SAC (000205) and Malahide Estuary SPA (004025). This pathway was screened out after considering that most of the works on the Proposed Development will be conducted away from the Ratoath Stream and buffered by natural vegetation, coupled with the significant distance and dilution factor that would arise should any sediment or pollutant make its way into the stream.

Several other designated sites considered as part of this assessment and listed in Table 1 overlap with those SACs and SPAs assessed in the AA Screening (Enviroguide, 2024a) and are designated for analogous reasons e.g., the same waterbird species, habitats etc. It is deemed that the AA Screening has therefore assessed the potential impact of the Proposed Development on these other designated sites by proxy. As such, the potential for likely significant effects to occur to these designated sites has been assessed in the AA Screening and they will not be assessed further as part of this report. Any other designated sites that do not overlap with a similar European site that has been addressed in the AA screening, will be addressed further.

TABLE 1. DESIGNATED SITES CONSIDERED WITH THE SOURCE-PATHWAY-RECEPTOR (S-P-R) METHOD TO ESTABLISH NOTABLE LINKS BETWEEN THE SOURCES OF EFFECTS ARISING FROM THE PROPOSED AMENDMENTS, AND ANY RELEVANT DESIGNATED SITES. THOSE SITES WITH NOTABLE S-P-R LINKS THAT ARE FURTHER ASSESSED IN THIS REPORT ARE HIGHLIGHTED IN GREEN (IF ANY).

Site Name & Code (Receptor)	Distance to Site of Proposed Development	Designation Rationale / Site Description	Potential Pathways
Other Internationally Designated Sites			
Broadmeadow Estuary Ramsar Site	> 16 km	This estuary is cut off from the sea by a large sand spit and includes saltmarshes, salt meadows, rocky shores, a well-developed dune ridge and sand mudflats. There are beds of blue mussels and eelgrass and extensive mats of green algae. A railway viaduct built in the 19th century crosses right through the Site, influencing the tidal regime as the estuary does not fully empty at low tide but remains as a permanent lagoon. The estuary is an important wintering site for numerous species of waterbird including the globally threatened common loon (Gavia immer). The Site supports more than one percent of the flyway population of the light-bellied brent goose (Branta bernicla hrota). It regulates water quality and flooding and mitigates the effects of storms. The inner part of the estuary is used for water sports. A section of the outer estuary has been infilled for a marina and housing development and the invasive ascidian (Didemnum vexillum) which is known to occur at the marina could pose a threat to several habitats. Monitoring is implemented and National Parks and Wildlife Service Conservation Rangers regularly inspect the Site.	None – Hydrological pathway assessed by proxy in AA Screening and deemed insignificant due to distance (see AA Screening (Enviroguide, 2024a) for details).
Dublin Bay UNESCO Biosphere	> 16 km	In 1981, UNESCO recognised the importance of Dublin Bay by designating North Bull Island as a Biosphere because of its rare and internationally important habitats and species of wildlife. To support sustainable development, UNESCO's concept of a Biosphere has evolved to include not just areas of ecological value but also the areas around them and the communities that live and work within these areas. There have since been additional international and national	

Site Name & Code (Receptor)	Distance to Site of Proposed Development	Designation Rationale / Site Description	Potential Pathways
		designations, covering much of Dublin Bay, to ensure the protection of its water quality and biodiversity. To fulfil these broader management aims for the ecosystem, the Biosphere was expanded in 2015. The Biosphere now covers Dublin Bay, reflecting its significant environmental, economic, cultural and tourism importance, and extends to over 300km². Over 300,000 people live within the newly enlarged Biosphere.	
Sandymount Strand / Tolka Estuary Ramsar Site (832)		An intertidal system supporting a large bed of eelgrass (*Zostera noltii*) with extensive areas of sandflats. The site is important for various species of waterbirds, supporting internationally important numbers of Brent Geese and large numbers of roosting gulls and terns. Various species of annalids, bivalves and small gastropods occur. Bait-digging is a regular activity on the sandy flats.	
Proposed Natural Heritage Areas			
Malahide Estuary pNHA (000205)	>16 km E	The Conservation Objectives for this pNHA are not specified, and as such the QIs for Malahide Estuary SAC (000205) and Malahide Estuary SPA (004025) are referred to: **As per NPWS (2013a)** **Habitats** 1140 Mudflats and sandflats not covered by seawater at low tide 1310 Salicornia and other annuals colonising mud and sand 1330 Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) 1410 Mediterranean salt meadows (*Juncetalia maritimi*) 2120 Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) 2130 Fixed coastal dunes with herbaceous vegetation (grey dunes)* **As per NPWS (2013d)** **SCI Birds**	None – Any pathways, either direct or indirect such as hydrological or hydrogeological were assessed on impact of the SAC and SPA sites in the AA Screening and deemed insignificant (Enviroguide, 2024a). By proxy and similar reason, this pNHA can also be screened out.

Site Name & Code (Receptor)	Distance to Site of Proposed Development	Designation Rationale / Site Description	Potential Pathways
		A005 Great Crested Grebe (*Podiceps cristatus*) A046 Light-bellied Brent Goose (*Branta bernicla hrota*) A048 Shelduck (*Tadorna tadorna*) A054 Pintail (*Anas acuta*) A067 Goldeneye (*Bucephala clangula*) A069 Red-breasted Merganser (*Mergus serrator*) A130 Oystercatcher (*Haematopus ostralegus*) A140 Golden Plover (*Pluvialis apricaria*) A141 Grey Plover (*Pluvialis squatarola*) A143 Knot (*Calidris canutus*) A149 Dunlin (*Calidris alpina*) A156 Black-tailed Godwit (*Limosa limosa*) A157 Bar-tailed Godwit (*Limosa lapponica*) A162 Redshank (*Tringa totanus*) A999 Wetland and Waterbirds **Additional species as per SDF update (NPWS, 2020a)** A017 Cormorant (*Phalacrocorax carbo*) A052 Teal (*Anas crecca*) A053 Mallard (*Anas platyrhynchos*) A059 Pochard (*Aythya ferina*) A137 Ringed Plover (*Charadrius hiaticula*) A142 Lapwing (*Vanellus vanellus*) A144 Sanderling (*Calidris alba*) A145 Little Stint (*Calidris minuta*) A147 Curlew Sandpiper (*Calidris ferruginea*) A151 Ruff (*Philomachus pugnax*) A160 Curlew (*Numenius arquata*) A164 Greenshank (*Tringa nebularia*) A165 Green Sandpiper (*Tringa ochropus*) A169 Ruddy Turnstone (*Arenaria interpres*) A179 Black-Headed Gull (*Larus ridibundus*) A182 Common Gull (*Larus canus*)	
North Dublin Bay pNHA (000206)	>16 km E	The Conservation Objectives for this pNHA are not specified, and as such the QIs for North Dublin Bay SAC (000206) and North Bull Island SPA (004006) are referred to:	

Site Name & Code (Receptor)	Distance to Site of Proposed Development	Designation Rationale / Site Description	Potential Pathways
		Conservation Objectives Version 1 (NPWS 2013f): **Habitats** 1140 Mudflats and sandflats not covered by seawater at low tide 1210 Annual vegetation of drift lines 1310 Salicornia and other annuals colonising mud and sand 1330 Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) 1410 Mediterranean salt meadows (*Juncetalia maritimi*) 2110 Embryonic shifting dunes 2120 Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) 2130 Fixed coastal dunes with herbaceous vegetation (grey dunes) 2190 Humid dune slacks **Species** 1395 *Petalophyllum ralfsii* (Petalwort) **Conservation Objectives Version 1 (NPWS 2015):** **SCI Birds** A046 Light-bellied Brent Goose (*Branta bernicla hrota*) A048 Shelduck (*Tadorna tadorna*) A052 Teal (*Anas crecca*) A054 Pintail (*Anas acuta*) A056 Shoveler (*Anas clypeata*) A130 Oystercatcher (*Haematopus ostralegus*) A140 Golden Plover (*Pluvialis apricaria*) A141 Grey Plover (*Pluvialis squatarola*) A143 Knot (Calidris *canutus*) A144 Sanderling (*Calidris alba*) A149 Dunlin (*Calidris alpina*) A156 Black-tailed Godwit (*Limosa limosa*) A157 Bar-tailed Godwit (*Limosa lapponica*) A160 Curlew (*Numenius arquata*) A162 Redshank (*Tringa totanus*) A169 Turnstone (*Arenaria interpres*) A179 Black-headed Gull (*Chroicocephalus ridibundus*)	

Site Name & Code (Receptor)	Distance to Site of Proposed Development	Designation Rationale / Site Description	Potential Pathways
		A999 Wetland and Waterbirds **Additional species as per SDF update (2020c)** A050 Wigeon (*Anas penelope*) A053 Mallard (*Anas platyrhynchos*) A069 Red-Breasted Merganser (*Mergus serrator*) A137 Ringed Plover (*Charadrius hiaticula*) A147 Curlew Sandpiper (*Calidris ferruginea*) A151 Ruff (*Philomachus pugnax*) A161 Spotted Redshank (*Tringa erythropus*) A164 Greenshank (*Tringa nebularia*) A182 Common Gull (*Larus canus*) A222 Short-Eared Owl (*Asio flammeus*)	
Dolphins, Dublin Docks pNHA (000201)	12.2km SE	The Conservation Objectives for this pNHA are not specified, and as such the QIs for South Dublin Bay and River Tolka Estuary SPA (004024) are referred to: **Conservation Objectives Version 1 (NPWS 2015a):** **SCI Birds** A046 Light-bellied Brent Goose (*Branta bernicla hrota*) A130 Oystercatcher (*Haematopus ostralegus*) A137 Ringed Plover (*Charadrius hiaticula*) A141 Grey Plover (*Pluvialis squatarola*) A143 Knot (Calidris *canutus*) A144 Sanderling (*Calidris alba*) A149 Dunlin (*Calidris alpina*) A157 Bar-tailed Godwit (*Limosa lapponica*) A162 Redshank (*Tringa totanus*) A179 Black-headed Gull (*Chroicocephalus ridibundus*) A192 Roseate Tern (*Sterna dougallii*) A193 Common Tern (*Sterna hirundo*) A194 Arctic Tern (*Sterna paradisaea*) A999 Wetland and Waterbirds **Additional species as per SDF update (2020b)** A005 Great Crested Grebe (*Podiceps cristatus*) A017 Cormorant (*Phalacrocorax carbo*) A069 Red-Breasted Merganser (*Mergus serrator*)	

Site Name & Code (Receptor)	Distance to Site of Proposed Development	Designation Rationale / Site Description	Potential Pathways
		A160 Curlew (*Numenius arquata*) A169 Ruddy Turnstone (*Arenaria interpres*) A176 Mediterranean Gull (*Larus melanocephalus*)	
South Dublin Bay pNHA (000210)	12.5km SE	The Conservation Objectives for this pNHA are not specified, and as such the QIs for South Dublin Bay SAC (000210) and South Dublin Bay and River Tolka Estuary SPA (004024) are referred to: **Conservation Objectives Version 1 (NPWS 2013a):** **Habitats** 1140 Mudflats and sandflats not covered by seawater at low tide 1210 Annual vegetation of drift lines 1310 Salicornia and other annuals colonising mud and sand 2110 Embryonic shifting dunes **Conservation Objectives Version 1 (NPWS 2015a):** **SCI Birds** A046 Light-bellied Brent Goose (*Branta bernicla hrota*) A130 Oystercatcher (*Haematopus ostralegus*) A137 Ringed Plover (*Charadrius hiaticula*) A141 Grey Plover (*Pluvialis squatarola*) A143 Knot (Calidris *canutus*) A144 Sanderling (*Calidris alba*) A149 Dunlin (*Calidris alpina*) A157 Bar-tailed Godwit (*Limosa lapponica*) A162 Redshank (*Tringa totanus*) A179 Black-headed Gull (*Chroicocephalus ridibundus*) A192 Roseate Tern (*Sterna dougallii*) A193 Common Tern (*Sterna hirundo*) A194 Arctic Tern (*Sterna paradisaea*) A999 Wetland and Waterbirds **Additional species as per SDF update (2020b)** A005 Great Crested Grebe (*Podiceps cristatus*) A017 Cormorant (*Phalacrocorax carbo*)	

Site Name & Code (Receptor)	Distance to Site of Proposed Development	Designation Rationale / Site Description	Potential Pathways
		A069 Red-Breasted Merganser (*Mergus serrator*) A160 Curlew (*Numenius arquata*) A169 Ruddy Turnstone (*Arenaria interpres*) A176 Mediterranean Gull (*Larus melanocephalus*)	
Rogerstown Estuary pNHA (000208)	16.6 km E	The Conservation Objectives for this pNHA are not specified, and as such the QIs for Rogerstown Estuary SAC (000208) are referred to: Estuaries [1130] Mudflats and sandflats not covered by seawater at low tide [1140] Salicornia and other annuals colonising mud and sand [1310] Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330] Mediterranean salt meadows (*Juncetalia maritimi*) [1410] Shifting dunes along the shoreline with Ammophila arenaria (white dunes) [2120] Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]	
Portraine Shore pNHA (001215)	22.2 km E	The Conservation Objectives for this pNHA are not specified.	

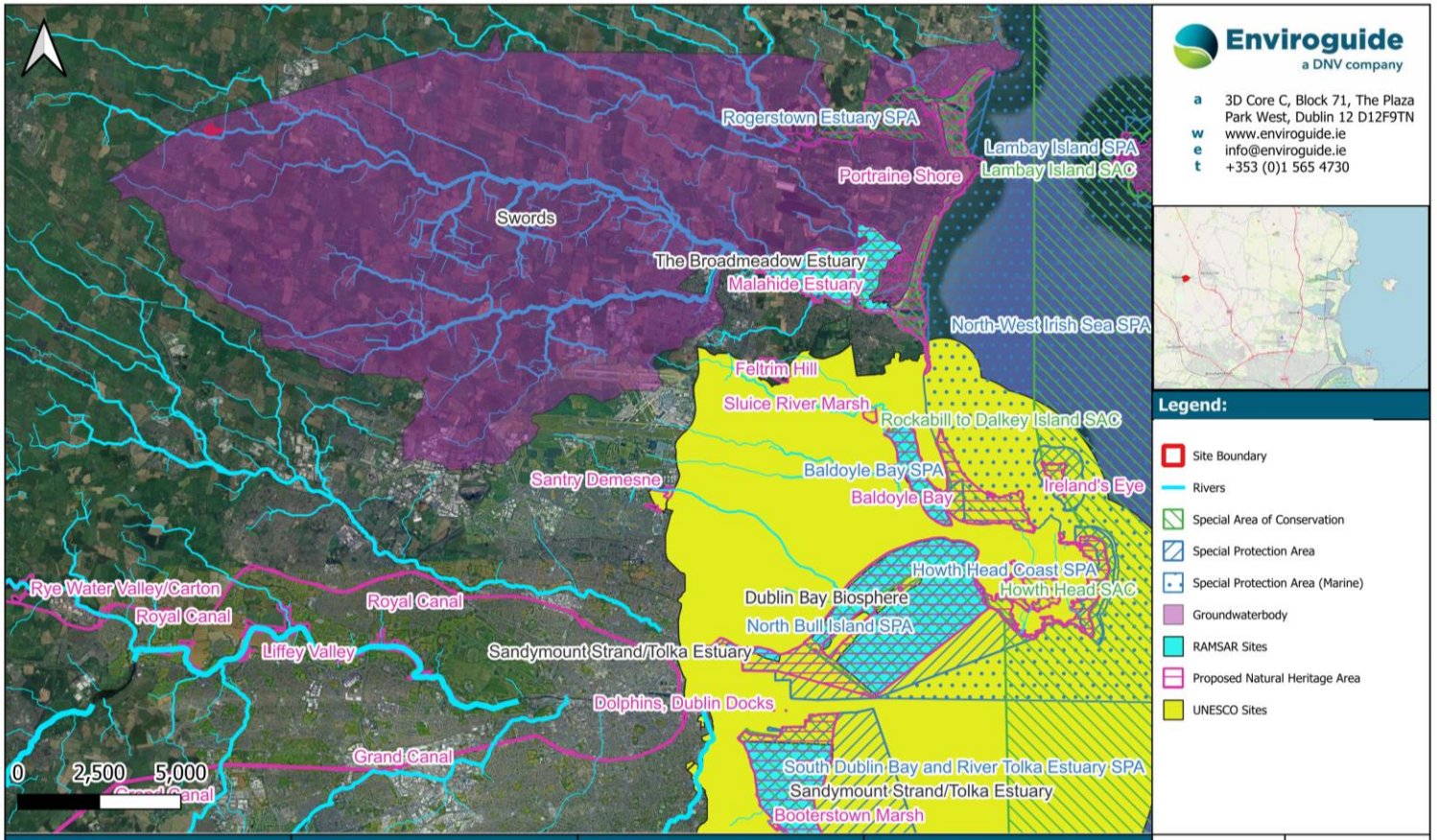

FIGURE 8. ALL DESIGNATED SITES WITHIN THE ZONE OF INFLUENCE OF THE PROPOSED DEVELOPMENT.

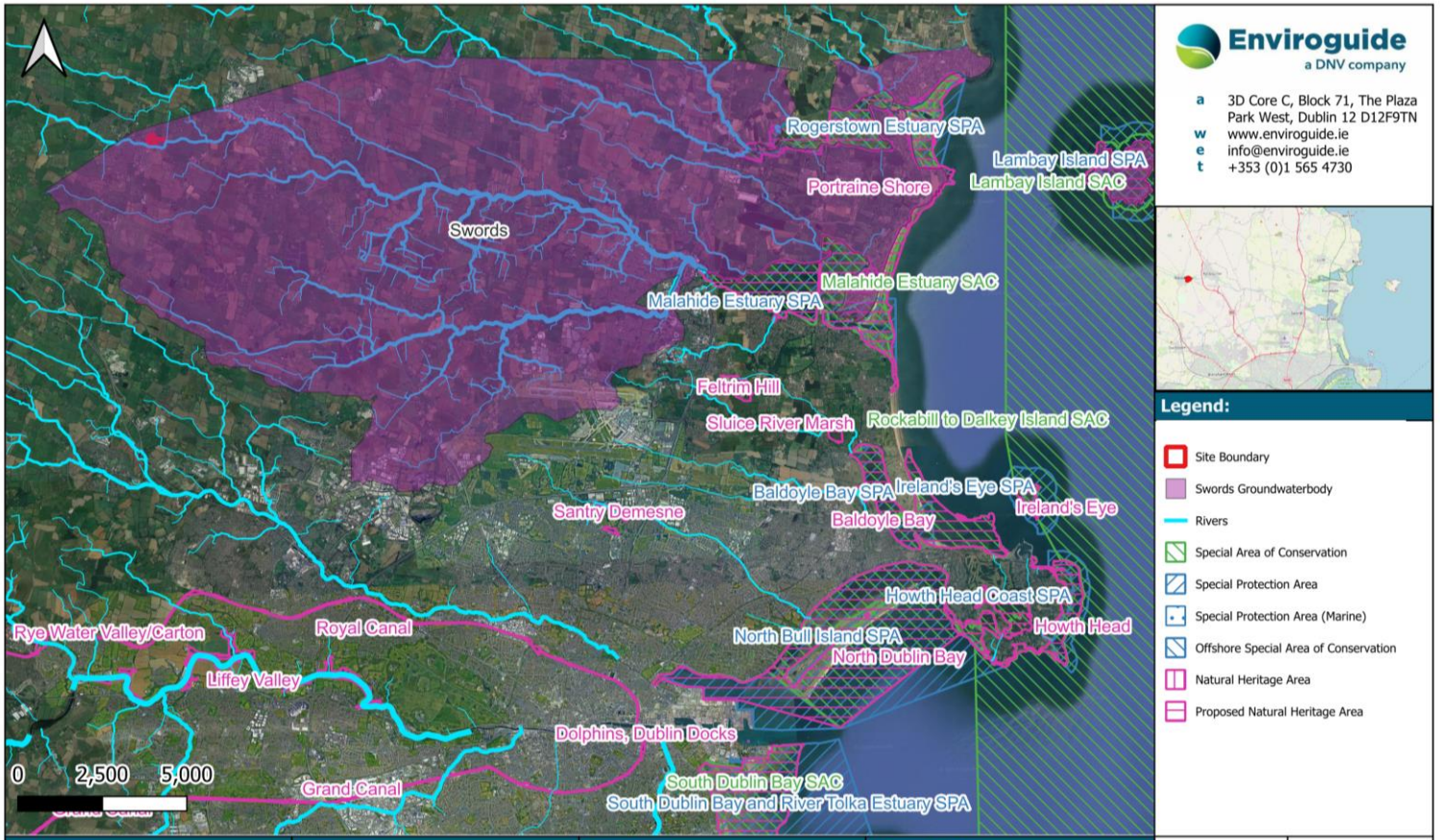

FIGURE 9. EUROPEAN SITES WITHIN THE ZONE OF INFLUENCE OF THE PROPOSED DEVELOPMENT.

4.4 Habitats

The habitats present within the Site, as recorded during field surveys are described in this section and summarised below. Site photographs of these habitats are included after each habitat section and a map of the habitats is presented in Figure 10. Invasive plant species (where present) are mapped in Figure 27.

Habitats recorded on Site were:

- GA1 - Improved agricultural grassland
- BL1 – Stone walls and other stonework
- BL2 - Earth banks
- BL3 - Buildings and artificial surfaces
- ED2 - Spoil and bare ground
- GA2 - Amenity grassland (improved)
- GS2 - Dry meadows and grassy verges
- WD1 - (Mixed) broadleaved woodland
- WL1 - Hedgerows
- WL2 - Treelines
- FW2 - Depositing/lowland rivers
- FW4 - Drainage ditches

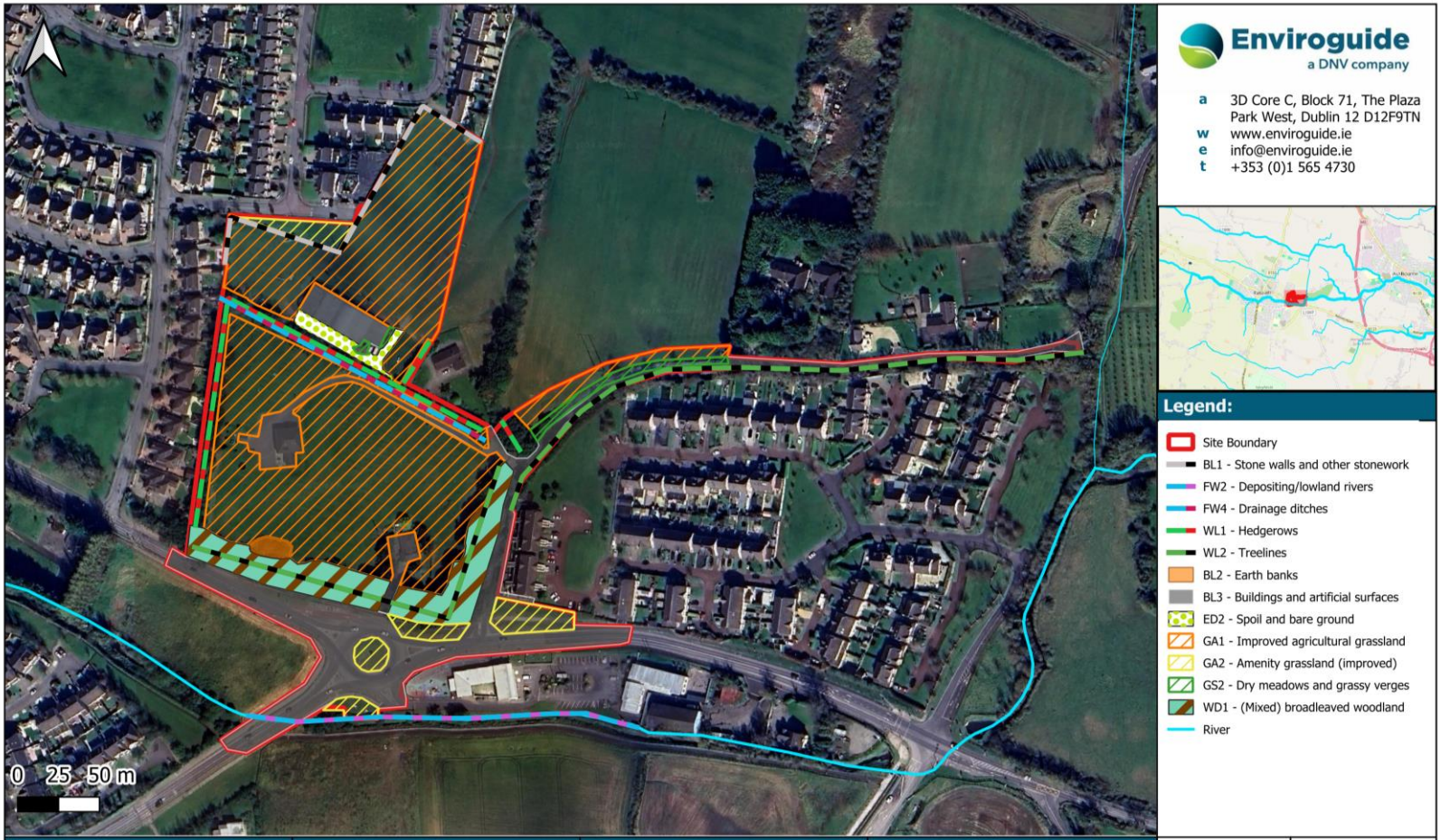

FIGURE 10. HABITAT MAP OF THE PROPOSED DEVELOPMENT SITE.

4.4.1 GA1 - Improved agricultural grassland

This habitat was found across most of the Site (Figure 10 and Figure 11) and was low in species diversity.

Species recorded in this habitat were perennial ryegrass (*Lolium perenne*), ryegrass species (*Lolium spp.*), nettles (*Urtica dioica*), creeping buttercup (*Ranunculus repens*), red clover (*Trifolium pratense*), white clover (*Trifolium repens*), dock (*Rumex spp.*), ribwort plantain (*Plantago lanceolata*), and dandelion (*Taraxacum officinale*).

FIGURE 11. EXAMPLE OF GA1 - IMPROVED AGRICULTURAL GRASSLAND HABITAT AT THE SITE.

4.4.2 BL1 – Old stone walls and other stonework

This habitat was a smooth block wall that separates the Site from a neighbouring development and did not support any flora or faunal species.

FIGURE 12. EXAMPLE OF BL1 – STONE WALL HABITAT AT THE SITE.

4.4.3 BL2 - Earth banks

This habitat was found to the south of the Site (Figure 10 and Figure 13). The habitat had potential to support species such as badgers (*Meles meles*) and burrowing species, but no evidence of any animals was found utilising this habitat. One trail was identified around the earth bank. No prints or evidence of mammals such as burrows were found and it is

suspected the trail may have been formed by the landowners dogs or possibly a commuting fox (*Vulpes vulpes*).

Species recorded in this habitat were perennial ryegrass, common vetch (*Vicia sativa*), ragwort (*Senecio jacobaea*), groundsel (*Senecio vulgaris*), creeping thistle (*Cirsium arvense*), ribwort plantain, dock, nettles, dandelion, creeping buttercup, coltsfoot (*Tussilago farfara*), daisy (*Bellis perennis*), and cow parsley (*Anthriscus sylvestris)*.

FIGURE 13. EXAMPLE OF BL2 - EARTH BANK HABITAT AT THE SITE.

4.4.4 BL3 - Buildings and artificial surfaces

This habitat was found across the Site in the form of buildings, roads, and pavements (Figure 10). Three buildings were present on Site, building A (Figure 15) , B (Figure 16) and C (Figure 17).

Building A is a large two-storey house to the west of the Site. Building B is a small bungalow to the south. Building C is an agricultural shed in the approximate centre of the Site.

Species diversity was very low in this habitat and comprised groundsel, ribwort plantain, dandelion, and daisy.

FIGURE 14. EXAMPLE OF BL3 - BUILDINGS AND ARTIFICIAL SURFACES HABITAT AT THE SITE.

FIGURE 15. BUILDING A.

FIGURE 16. BUILDING B.

FIGURE 17. BUILDING C.

4.4.5 ED2 - Spoil and bare ground

This habitat was found to the south of the shed on Site (Figure 10 and Figure 18). No floral species were recorded in this habitat.

FIGURE 18. EXAMPLE OF ED2 - SPOIL AND BARE GROUND HABITAT AT THE SITE.

4.4.6 GA2 - Amenity grassland (improved)

This habitat was found to the south of the Site along the road network (Figure 10 and Figure 19).

Species diversity was low and comprised perennial ryegrass, daisy, dandelion, white clover and ribwort plantain.

FIGURE 19. EXAMPLE OF GA2 - AMENITY GRASSLAND (IMPROVED) HABITAT AT THE SITE.

4.4.7 GS2 - Dry meadows and grassy verges

This habitat was a border habitat along roadsides to the northeast of the Site (Figure 10 and Figure 20).

Species recorded in this habitat were perennial ryegrass (*Lolium perenne*), ryegrass species (*Lolium spp.*), nettles (*Urtica dioica*), creeping buttercup (*Ranunculus repens*), red clover (*Trifolium pratense*), white clover (*Trifolium repens*), dock (*Rumex spp.*), ribwort plantain (*Plantago lanceolata*), dandelion (*Taraxacum officinale*), cow parsley (*Anthriscus sylvestris*), and cleavers (*Galium aparine*).

FIGURE 20. EXAMPLE OF GS2 - DRY MEADOWS AND GRASSY VERGES HABITAT AT THE SITE.

4.4.8 WD1 - (Mixed) broadleaved woodland

This habitat was found to the southeast and south of the Site (Figure 10 and Figure 21). It was generally two rows of trees deep and provided a border between the Proposed Residential Development area and the road infrastructure to the south.

Species recorded in this habitat were primarily beech (*Fagus sylvatica*) and sycamore (*Acer pseudoplatanus*) with occasional horse chestnut (*Aesculus hippocastanum*), Norway maple (*Acer platanoides*), oak (*Quercus robur.*), larch (*Larix decidua*) and Leyland cypress (*Cupressocyparis leylandii*). A fully detailed list of tree species is available in the arboricultural report (Charles McCorkell Arboricultural Consultancy, 2024b). The understorey comprised of bramble (*Rubus fruticosus*), ivy (*Hedera helix*), primrose (*Primula vulgaris*) and cow parsley (*Anthriscus sylvestris*).

FIGURE 21. EXAMPLE OF WD1 - (MIXED) BROADLEAVED WOODLAND HABITAT AT THE SITE.

4.4.9 WL1 - Hedgerows

Hedgerow habitats occurred throughout the Site (Figure 10 and Figure 22).

Dominant species were beech, sycamore, ivy, and bramble. A comprehensive list of hedgerow species can be found in the hedgerow appraisal under separate cover (Enviroguide, 2024b). One hedgerow on site was bordered by a dry drain.

FIGURE 22. EXAMPLE OF WL1 – HEDGEROWS HABITAT AT THE SITE CONTAINING BEECH AND SYCAMORE.

FIGURE 23. LEYLANDII HEDGEROW ON SITE.

4.4.10 WL2 - Treelines

Treelines on Site vary in their ecological value as assessed in the hedgerow appraisal (Enviroguide, 2024b). Treelines make up the perimeter edges of the small woodland habitats on Site as described in section 4.4.8.

Species in these treelines are primarily beech and sycamore, with occasional oak, horse chestnut and a mix of other ornamentals and non-native species. A second treeline extends from the Site along the Ballybin road. This treeline, referred to as G483 in the arborist report

(Charles McCorkell Arboricultural Consultancy, 2024b) is primarily comprised of sycamore, hawthorn, and ash (Figure 24 and Figure 10). These treelines are being retained. Full details of the species composition of treelines can be found in the arboricultural report (Charles McCorkell Arboricultural Consultancy, 2024b) and the hedgerow appraisal (Enviroguide, 2024b).

FIGURE 24. EXAMPLE OF WL2 – TREELINES HABITAT AT THE SITE.

4.4.11 FW2 - Depositing/Lowland Rivers

The Ratoath Stream borders the very southern extent of the Site and traverses a culvert across the redline boundary for approximately 30m from west to east (Figure 10 and Figure 25). The Ratoath Stream has a consistent flow at the point in which it crosses the redline boundary. It eventually discharges into Malahide Estuary approximately 19.1 km downstream.

FIGURE 25. EXAMPLE OF FW1 - UPLAND EORDING RIVERS HABITAT AT THE SITE.

4.4.12 FW4 - Drainage ditches

One open, dry drain was found traversing the Site from a west to east direction (Figure 26). Water levels were dry at the time of surveying. It was largely overgrown and covered by bramble, ivy and overstorey trees. The drain appears to culvert the Site at its eastern boundary and connect to the wastewater network beneath Ballybin road.

FIGURE 26. EXAMPLE OF OVERGROWN FW4 - DRAINAGE DITCHES HABITAT AT THE SITE.

4.5 Species and Species Groups

4.5.1 Flora

4.5.1.1 Rare and Protected Flora

The Site of the Proposed Development is located within the Ordnance Survey 10km Grid Square (O05) and 2km Grid Square (O05F). These grid squares were searched for rare and/or protected species. This database contained no record(s) of protected flora. No rare or protected floral species were recorded during the Site visits.

4.5.1.2 Invasive Species

4.5.1.2.1 Desk Study Results

There are records for six species of flora considered to be invasive within the grid squares which encompass the Site of the Proposed Development. Details of these records are listed in Table 2 below.

TABLE 2. RECORDS OF INVASIVE SPECIES OF FLOWERING PLANT FOR THE SURROUNDING 10KM (O05) AND 2KM (O05F) GRID SQUARES.

Grid square	Species group	Species name	Record count	Date of last record	Title of dataset	Designation
O05F	flowering plant	**Sycamore** (*Acer pseudoplatanus*)	1	26/09/2013	Irish Vascular Plant Data - Paul Green	Medium Impact Invasive Species
O05F	flowering plant	**Wall Cotoneaster** (*Cotoneaster horizontalis*)	1	26/09/2013	Irish Vascular Plant Data - Paul Green	Medium Impact Invasive Species
O05	flowering plant	**Himalayan Knotweed** (*Persicaria wallichii*)	1	27/09/2013	Irish Vascular Plant Data - Paul Green	Medium Impact Invasive Species Listed on Regulation S.I. 477 (Ireland)
O05	flowering plant	**Indian Balsam** (*Impatiens glandulifera*)	1	26/09/2013	Irish Vascular Plant Data - Paul Green	High Impact Invasive Species Listed on Regulation S.I. 477 (Ireland)
O05	flowering plant	**Japanese Rose** (*Rosa rugosa*)	1	10/05/2020	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	Medium Impact Invasive Species
O05	flowering plant	**Traveler's-joy** (*Clematis vitalba*)	2	26/09/2013	Irish Vascular Plant Data - Paul Green	Medium Impact Invasive Species

Of the six invasive plant species that were recorded, two are listed in Schedule III of the European Communities (Birds and Natural Habitats) Regulations 2011 (SI 477 of 2011),

namely Himalayan knotweed (*Persicaria wallichii*) and Indian balsam (*Impatiens glandulifera*).

4.5.1.2.2 Field Study Results

Five invasive plant species were recorded on or in close proximity to the Site during the Site walkover on the 28th of September 2023 and the hedgerow appraisal on the 13th of June 2024 (Figure 27). These were beech (*Fagus sylvatica*), sycamore (*Acer pseudoplatanus*), cotoneaster sp., butterfly bush (*Buddleia davidii*), and cherry laurel (*Prunus laurocerasus)*.

Sycamore and beech are on the Amber List of invasive plant species and are considered 'Medium' impact species (Invasive Species Ireland, 2013). These are predominant species in the WD1 Mixed broadleaf woodland habitat. While they are considered invasive species, their invasiveness is contextual and is generally only a problem in woodlands where they can out compete native species. In the context of this Site where the surrounding lands are urban and hardscaped or regularly maintained grassland, these species are not considered invasive. Furthermore, where large mature individuals are present as is the case on Site, they tend to have positive ecological functions such as providing nesting and roosting habitat to birds and bats and so have an overall positive effect on the local ecology.

Cotoneaster was identified in hedgerows on Site. The species level could not be identified with certainty, but it was ruled out as being wall cotoneaster which is the only medium impact cotoneaster species and therefore, the species on Site are likely low impact species.

Butterfly bush was identified in a hedgerow to the west of the Site and is classed as a medium impact species.

Cherry laurel was identified along a hedgerow bordering the south of the Site. This hedge is planted on neighbouring lands and not within the redline boundary. This hedgerow will therefore not be disturbed as works in this area of the redline boundary are not intrusive nor do they require disturbance to the cherry laurel.

Considering the above, flora are not considered a KER at the Proposed Development.

FIGURE 27. INVASIVE PLANT SPECIES AT OR NEAR THE SITE.

4.5.2 Bats

4.5.2.1 Desk Study Results

A total of five bat species have been recorded within the 2km (O05F) grid square which encompasses the Site (Table 3).

TABLE 3. RECORDS OF BATS FOR THE SURROUNDING 2KM GRID SQUARES (O05F) ASSOCIATED WITH THE SITE FROM THE NBDC.

Species	Date of last record	Database	Designation
Common Pipistrelle (*Pipistrellus pipistrellus*)	25/07/2018	National Bat Database of Ireland	• EU Habitats Directive - Annex IV • Wildlife Act 1976 (as amended)
Soprano Pipistrelle (*Pipistrellus pygmaeus*)	25/07/2018	National Bat Database of Ireland	• EU Habitats Directive - Annex IV • Wildlife Act 1976 (as amended)
Leisler's Bat (*Nyctalus leisleri*)	12/08/2015	National Bat Database of Ireland	• EU Habitats Directive - Annex IV • Wildlife Act 1976 (as amended)
Brown Long-eared Bat (*Plecotus auritus*)	12/08/2015	National Bat Database of Ireland	• EU Habitats Directive - Annex IV • Wildlife Act 1976 (as amended)
Natterer's bat (*Myotis nattereri*)	18/08/2017	National Bat Database of Ireland	• EU Habitats Directive - Annex IV • Wildlife Act 1976 (as amended)

The Proposed Development Site is located in an area with an overall suitability score of 28.78 (Medium – High) for bats in general (Lundy *et al.,* 2011). Within the Bat Habitat Suitability Index (BHSI) rating, the Lesser Horseshoe bat (*Rhinolophus hipposideros*) had the lowest rating of zero.

Article 17 reports on the status of species protected in Ireland under the Habitats Directive describes the range of this protected species. Lesser Horseshoe bats are currently confined to the west of the country; mainly counties Mayo, Galway, Clare, Limerick, Kerry, and Cork (NPWS, 2019).

TABLE 4. LANDSCAPE SUITABILITY INDEX FOR INDIVIDUAL BAT SPECIES WITHIN THE 2KM GRID SQUARE (SOURCE: NBDC).

Bat Species	Suitability Index
Common Pipistrelle (*Pipistrellus pipistrellus*)	43
Soprano Pipistrelle (*Pipistrellus pygmaeus*)	36
Leisler's Bat (*Nyctalus leisleri*)	40
Brown Long-eared Bat (*Plecotus auritus*)	35
Whiskered Bat (*Myotis mystacinus*)	29

Bat Species	Suitability Index
Daubenton's Bat (*Myotis daubentonii*)	29
Natterer's bat (*Myotis nattereri*)	34
Nathusius' Pipistrelle (*Pipistrellus nathusii*)	13
Lesser Horseshoe Bat (*Rhinolophus hipposideros*)	0
All Bats	28.78

FIGURE 28. BAT LANDSCAPE SUITABILITY MODEL (ALL BATS) SURROUNDING THE PROPOSED DEVELOPMENT SITE (ADAPTED FROM NBDC).

4.5.2.2 Field Survey Results

4.5.2.2.1 Bat Roost Assessment and Emergence Surveys

4.5.2.2.1.1 Buildings

During the Site visit on the 28th of September 2023 and the 6th of March 2024, preliminary bat roost assessments were conducted on all trees and buildings within the Site as per Collins (2023).

The buildings were assessed for their potential to provide suitable roosting habitat for bats. As part of the assessment, each building was inspected externally and internally (where possible) to assess their individual suitability to harbour roosting bats. The results of the building inspections are detailed in Table 5.

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TABLE 5. BAT ROOST SUITABILITY ASSESSMENT RESULTS FOR THE THREE BUILDINGS ON SITE.

Building Ref.	Building Description	Potential Roost Features	Assessment Rating	Further Survey Required
A	Main House	Negligible PRFs present. The house is modern and well-sealed with little to no opportunities for roosting bats.	Negligible	No
B	Smaller bungalow	Some small emergence/re-entry points noted around the roof vents at the house. Otherwise, a well-sealed building.	Low	Yes
C	Sheds	Steel girder and timber frame construction with a corrugated roof. Dark and sheltered in corners between the corrugated roof and timber beams offering some potential for roosting bats.	Low	Yes

Building B was subject to an emergence survey on the 8th of May 2024 with two surveyors. No bats were found emerging from the building and the building is not a roost.

Building C was subject to an emergence survey on the 11th of June 2024 with two surveyors. No bats were found emerging from the building and the building is not a roost. Full details of the survey effort can be found in Appendix IV – Survey Information

4.5.2.2.1.2 Trees

Trees on Site were assessed on the 6th of March 2024 in line with updated guidance (Collins, 2023). Trees were assessed as having either no PRFs, PRF-I or PRF-M features. Tree's that contain PRF-I features (capable of supporting an individual bat) do not require further surveys.

One tree on Site, T469 was found to contain a PRF-M feature (a feature capable of supporting a maternity roost) (Figure 29). This tree is being retained and so therefore did not require emergence surveys. Furthermore, the lighting and landscaping plans have been designed with potential roosts in mind and have mitigated through design to ensure these treelines remain dark and would not be disturbed.

A small number of trees on Site contained visible PRF-I features. These were primarily located in the southern and eastern treelines and are therefore these trees are largely being retained, with occasional removals as outlined in the arborist drawings and report (Charles McCorkell Arboricultural Consultancy, 2024a, 2024b). Sufficient mitigation is detailed in section 6 below to ensure that no bats are harmed during felling and that roosting habitat is not lost on Site.

FIGURE 29. T469 CONTAINING A PRF-M.

4.5.2.2.2 Bat Habitat Assessment and Transect Surveys

Habitats on Site were assessed on the 28th of September 2023 for their potential to support foraging and commuting bats through the provision of suitable forage, and dark, linear features along which bats can commute.

Overall, habitats on Site were scored as *Low* according to Collins (2023) i.e. '*Habitat that could be used by small numbers of bats as flight-paths such as a gappy hedgerow or unvegetated stream, but isolated, i.e. not very well connected to the surrounding landscape by other habitat. Suitable, but isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub*' (Collins, 2023).

The Site does contain some internal commuting and foraging features such as treelines and hedgerows, however considering the context of the Site's location which borders a brightly lit urban centre and which is generally disconnected from the surrounding landscape, it is unlikely to support large numbers of commuting or foraging bats or provide important commuting and foraging corridors in the wider context of the locality.

The required bat activity transect surveys as per Collins (2023) were carried out over each season. These were conducted on the 28th of September 2023, the 15th of April 2024, and the 5th of June 2024. Full survey effort details are provided in Appendix IV – Survey Information

Transect surveys provided insight into commuting and foraging activity at the Site and were used to observe bat behaviour, particularly in areas where commuting and foraging was likely to occur, or in areas that were likely to be disturbed by the Proposed Development.

It is important to note that the activity maps presented below (Figure 30, Figure 31, and Figure 32) depict the location of calls recorded by the Batlogger as surveyors walked during surveys. Most of these calls were emitted from a singular bat that was repeatedly foraging along the same feature, and so these maps are not representative of individual bats or concentrations of bats. For example, the calls emitted along the western treeline were emitted by a singular bat on each survey and were recorded in different locations as the

surveyors walked along the linear feature. Surveyors made attempts to count the number of bats present but this figure cannot be relied on as comprehensive, considering the nature of bats to move rapidly and the onset of dusk during surveys. Nonetheless, an approximation of individual numbers present is provided for context.

Activity was largely confined to the treeline at the south of the Site, and this was where most bats were observed. Only occasional recordings made across the rest of the Site. In respect to the southern treeline, only a small number of bats were observed on any given night with a peak count of six during the third transect on the 5th of June 2024 (Figure 32).

Foraging activity was observed on all three activity surveys. On the 28th of September 2023 (Figure 30), one common pipistrelle was recorded foraging along the western treeline repeatedly in a north to south and vice versa direction. Approximately three other common pipistrelle individuals were observed foraging in the shed, likely due to the presence of bales of hay and relatively high insect numbers, and possibly also for shelter as the wind was gradually picking up.

On the 15th of April 2024 (Figure 31), activity was relatively low, with the highest activity observed along the southern treeline. It was noted that activity was almost exclusively confined to the very top of the treeline.

On the third transect on the 5th of June 2024, activity was noted to be slightly higher across the Site. One bat was initially observed foraging along the southern treeline shortly after sunset and was observable until near total dusk. This bat did not appear phased by either natural light, or the light being emitted from the streetlights and traffic on the R125 as it was recorded emerging from above a tree to the west, before flying past surveyors to the east and disappearing again for several moments. It would then emerge from the same point. This meant the bat had to be crossing the treeline, foraging along the far side along the R125, before circling back into the Proposed Development area once more. This activity was observed approximately four times.

Overall activity at the Site was concentrated to the treeline along the south and this is where most bats were observed. Activity along the western and northern hedgerows was comprised of singular bats foraging repeatedly.

FIGURE 30. BAT DETECTIONS DURING TRANSECT 1 AT THE SITE.

FIGURE 31. BAT DETECTIONS DURING TRANSECT 2 AT THE SITE.

FIGURE 32. BAT DETECTIONS DURING TRANSECT 3 AT THE SITE.

FIGURE 33. TRANSECT 1 WALKED ROUTE.

FIGURE 34. TRANSECT 2 WALKED ROUTE.

FIGURE 35. TRANSECT 3 WALKED ROUTE.

4.5.2.2.3 Static Detector Monitoring

Static detector monitoring was conducted to inform the species composition at the Site. A static detector was deployed along the southern treeline between the 15th of April and 22nd of April 2024, and the 5th of June to the 12th of June 2024 in line with best practice guidelines (Collins, 2023).

During the first deployment, a total of three species were recorded using the Site. These were common pipistrelle (*Pipistrellus pipistrellus*), soprano pipistrelle (*Pipistrellus pygmaeus*), and Leisler's bat (*Nyctalus leisleri*). All three bats were recorded foraging. A total of 2,786 calls were recorded, with 84% coming from common pipistrelle.

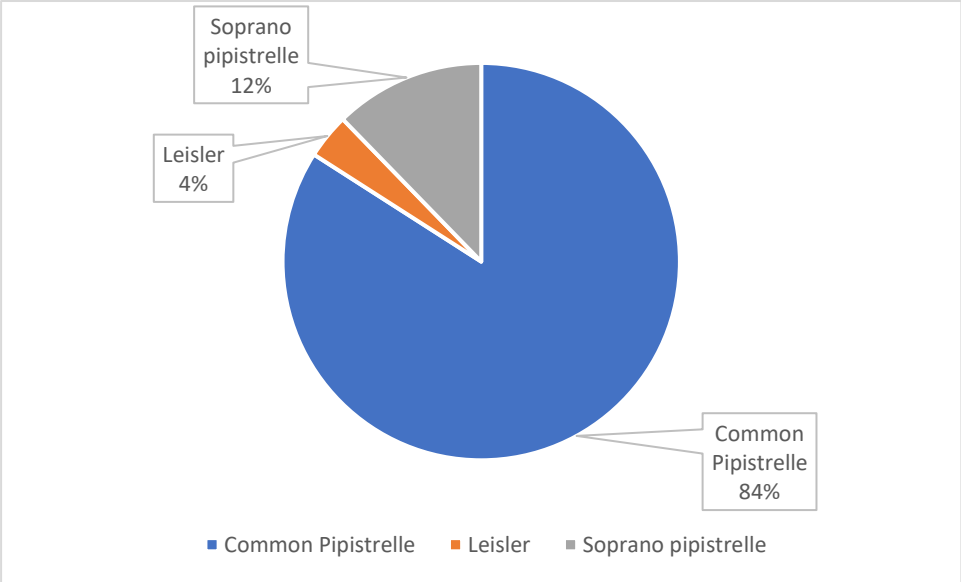

FIGURE 36. SPECIES COMPOSITION RECORDED DURING STATIC DETECTOR MONITORING FROM THE 15TH APRIL - 22ND APRIL 2024.

During the second deployment, a total of four species were recorded using the Site. These were common pipistrelle (*Pipistrellus pipistrellus*), soprano pipistrelle (*Pipistrellus pygmaeus*), Leisler's bat (*Nyctalus leisleri*), and brown long eared bat (*Plecotus auritus*). All four bats were recorded foraging at the Site. A total of 2,786 calls were recorded, with 84% coming from common pipistrelle.

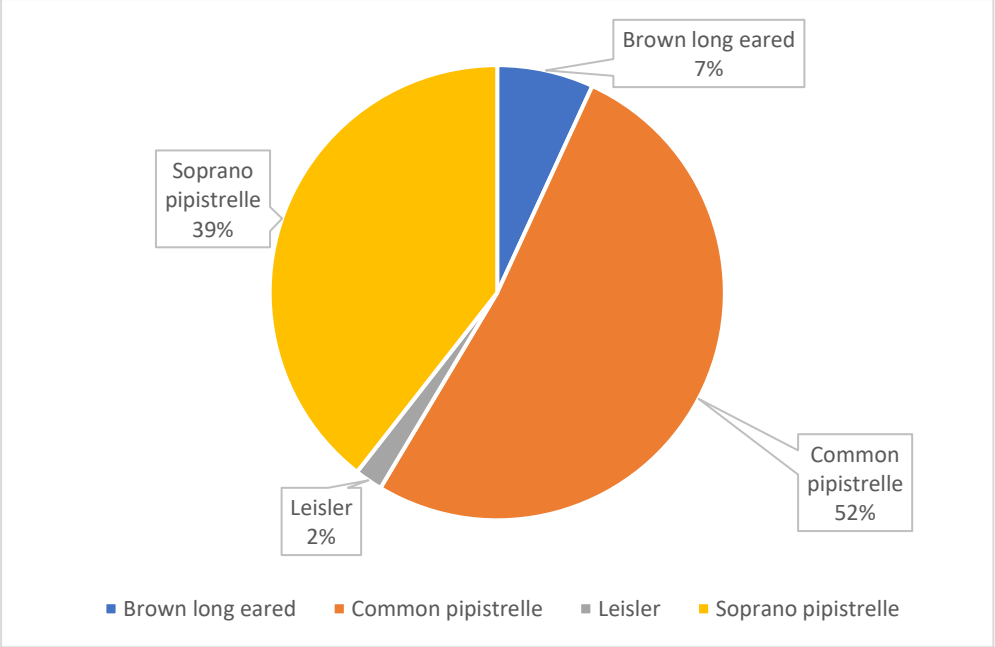

FIGURE 37. SPECIES COMPOSITION RECORDED DURING STATIC DETECTOR MONITORING FROM THE 5TH JUNE – 12TH JUNE 2024.

Species recorded utilising the Site are all common and widespread species, typically associated with woodland areas and treelines. No Annex II bat species, namely Lesser Horseshoe bats were recorded on Site. Bats have been considered to be of local importance (higher value) and will be assessed as a KER.

4.5.3 Birds

4.5.3.1 Desk study Results

A total of 89 bird species have been recorded within the O05 10 km grid square. Of these, 18 No. are amber listed, and 1 No. is red-listed according to Birds of Conservation Concern in Ireland 2020-2026 (Gilbert *et al*., 2021) (Table 6). One green-listed species was also noted as being listed under Annex I of the EU Birds Directive, namely Little Egret (*Egretta garzetta*).

TABLE 6. DETAILS OF AMBER AND RED LISTED BIRD SPECIES WITHIN THE 10KM GRID SQUARE (O05).

Species Name	Date of Last Record	Title of Dataset	BoCCI
Northern Lapwing (*Vanellus vanellus*)	31/12/2011	Bird Atlas 2007 – 2011	Red
Barn Swallow (*Hirundo rustica*)	31/12/2011	Bird Atlas 2007 – 2011	Amber
Common Coot (*Fulica atra*)	31/12/2011	Bird Atlas 2007 – 2011	Amber
Common Kestrel (*Falco tinnunculus*)	19/07/2015	Birds of Ireland	Amber
Common Kingfisher (*Alcedo atthis*)	18/04/2015	Birds of Ireland	Amber

Species Name	Date of Last Record	Title of Dataset	BoCCI
Common Linnet (*Carduelis cannabina*)	31/12/2011	Bird Atlas 2007 – 2011	Amber
Common Snipe (*Gallinago gallinago*)	31/12/2011	Bird Atlas 2007 – 2011	Amber
Common Starling (*Sturnus vulgaris*)	10/02/2023	Birds of Ireland	Amber
Common Swift (*Apus apus*)	31/12/2011	Bird Atlas 2007 – 2011	Amber
Eurasian Tree Sparrow (*Passer montanus*)	31/12/2011	Bird Atlas 2007 – 2011	Amber
Eurasian Woodcock (*Scolopax rusticola*)	31/12/2011	Bird Atlas 2007 – 2011	Amber
House Martin (*Delichon urbicum*)	31/12/2011	Bird Atlas 2007 – 2011	Amber
House Sparrow (*Passer domesticus*)	03/01/2018	Birds of Ireland	Amber
Lesser Black-backed Gull (*Larus fuscus*)	31/12/2011	Bird Atlas 2007 – 2011	Amber
Mew Gull (*Larus canus*)	31/12/2011	Bird Atlas 2007 – 2011	Amber
Northern Wheatear (*Oenanthe oenanthe*)	31/12/2011	Bird Atlas 2007 – 2011	Amber
Red Kite (*Milvus milvus*)	05/08/2019	Birds of Ireland	Amber
Sky Lark (*Alauda arvensis*)	31/12/2011	Bird Atlas 2007 – 2011	Amber
Spotted Flycatcher (*Muscicapa striata*)	31/12/2011	Bird Atlas 2007 – 2011	Amber
Stock Pigeon (*Columba oenas*)	31/12/2011	Bird Atlas 2007 – 2011	Amber

4.5.3.2 Field Survey Results

4.5.3.2.1 Bird Survey Results

During the bird scoping and survey conducted on the 28th of September 2023, a total of 16 species of birds were recorded (Table 7). Of these, none are red-listed, three are amber-listed, and the remaining are green-listed (Gilbert *et al*., 2021).

TABLE 7. BIRD SPECIES RECORDED DURING WALKOVER SURVEYS.

Species	BoCCI Status	Notes
Blackbird (*Turdus merula*)	Green	Present.
Blue Tit (*Cyanistes caeruleus*)	Green	Present.
Chiffchaff (*Phylloscopus collybita*)	Green	Present.
Dunnock (*Prunella modularis*)	Green	Present.

Species	BoCCI Status	Notes
Goldcrest (*Regulus regulus*)	Amber	Present.
Goldfinch (*Carduelis carduelis*)	Green	Present.
Great tit (*Parus major*)	Green	Present.
Greenfinch (*Carduelis chloris*)	Amber	Confirmed breeding - recently fledged young.
Jackdaw (*Corvus monedula*)	Green	Present.
Magpie (*Pica pica*)	Green	Present.
Mistle Thrush (*Turdus viscivorus*)	Green	Present.
Pied Wagtail (*Motacilla alba*)	Green	Present.
Robin (*Erithacus rubecula*)	Green	Present.
Song Thrush (*Turdus philomelos*)	Green	Present.
Starling (*Sturnus vulgaris*)	Amber	Present.
Woodpigeon (*Columba palumbus*)	Green	Present.

Considering the low variety of predominantly green listed bird species recorded, and the largely unsuitable habitat for SCI species of any European sites within the ZoI of the Proposed Development, it is considered that the Site contains resident and regularly occurring, locally important populations of bird species protected under the Wildlife Act. The Site does not provide suitable habitat for wintering birds. Considering the above, breeding birds have been considered to be of local importance (higher value) and will be assessed as a KER within the Site.

4.5.4 Non-volant Mammals

4.5.4.1 Desk Study Results

Records for terrestrial mammals were obtained from the NBDC online database. Table 8 lists these species, their date of last record, and summarises their protected status/designation. A total of six native, and four non-native terrestrial mammals were recorded within the 10km grid square associated with the Site.

Of these, all are afforded legal protection in Ireland under the Wildlife Acts 1976, as amended, except for red fox which is only afforded protection from a variety of hunting and extermination techniques, and from acts of cruelty as per the Animal Health and Welfare Act 2013.

TABLE 8. RECORDS OF TERRESTRIAL MAMMALS (NATIVE AND NON-NATIVE) FOR THE SURROUNDING 10KM (O05) GRID SQUARE ASSOCIATED WITH THE SITE FROM THE NBDC.

Species	Date of last record	Source	Designation
NATIVE SPECIES			
Eurasian Badger (*Meles meles*)	31/12/2012	Mammals of Ireland 2016-2025	• Wildlife Acts 1976, as amended.
European Otter (*Lutra lutra*)	24/05/2016	Mammals of Ireland 2016-2025	• EU Habitats Directive – Annex II species. • Wildlife Acts 1976, as amended.

Species	Date of last record	Source	Designation
Pine Marten (*Martes martes*)	29/03/2021	Atlas of Mammals in Ireland 2010-2015	• EU Habitats Directive – Annex II species. • Wildlife Acts 1976, as amended.
West European Hedgehog (*Erinaceus europaeus*)	19/09/2022	Hedgehogs of Ireland	• Wildlife Acts 1976, as amended.
Irish Hare (*Lepus timidus subsp. Hibernicus*)	07/01/2018	Mammals of Ireland 2016-2025	• Wildlife Acts 1976, as amended.
Red Fox (*Vulpes vulpes*)	04/01/2018	Mammals of Ireland 2016-2025	• Not Legally Protected in Ireland.
NON-NATIVE AND INVASIVE SPECIES			
Bank Vole (*Myodes glareolus*)	09/09/2014	Atlas of Mammals in Ireland 2010-2015	• Medium Impact Invasive Species
Brown Rat (*Rattus norvegicus*)	09/09/2014	Atlas of Mammals in Ireland 2010-2015	• High Impact Invasive Species Regulation S.I. 477 (Ireland)
European Rabbit (*Oryctolagus cuniculus*)	20/04/2014	Atlas of Mammals in Ireland 2010-2015	• Medium Impact Invasive Species
Grey Squirrel (Sciurus carolinensis)	31/12/2012	Irish Squirrel Survey 2012	• High Impact Invasive Species • Regulation S.I. 477 (Ireland)

4.5.4.2 Field Survey Results

During the ecological walkovers, the Site was checked for any evidence of fauna presence/activity on Site. The only evidence of non-volant mammals on Site were some trails around the earth bank to the south which were most likely to be from the landowner's dogs. Some small burrows were present in the woodland habitat indicating the presence of mice and shrews. No evidence of larger mammals such as prints, droppings, or burrows were recorded.

The Ratoath Stream was checked for the presence and signs of otter on the 6th of March 2024. While much of the stream was inaccessible, areas near where works are proposed were easily observed. No sign of otter was recorded, however based on desk study results and applying the precautionary principle, it can be assumed that otter reside downstream of the Site.

Smaller mammals such as hedgehog (*Erinaceous europaeus*) and pygmy shrew (*Sorex minutus*) were not directly observed, although it is considered that the treeline habitat along the Site margins could provide potentially suitable shelter/commuting habitat for these species.

Considering the above, pine marten, hedgehog and otter are of local importance (higher value) and will be assessed as KER mammal species.

4.5.5 Other Fauna

4.5.5.1 Amphibians

Common frog (*Rana temporaria*) was recorded in the 10km (O05) grid square for the Site. No amphibians were observed during the Site walkovers. It can be assumed that common frog is utilising habitat downstream of the Ratoath Stream to the south of the Proposed Development. Considering this, common frog are considered to be of local importance (higher value) and will be assessed as a KER.

4.5.5.2 Reptiles

No records of common lizard (*Zootoca vivipara*) exist for the relevant 10km grid square. There may be some suitable habitat for this species within the Site within the occasional broken boughs and logs in the woodland habitat bordering the Site. Reptiles are therefore considered to be of local importance (lower value) and are not considered as a KER.

4.5.5.3 Fish

No records exist for fish species within the O05 10km hectad (NBDC, 2024). The Site is not within or connected to any freshwater pearl mussel catchments or rivers designated for salmonids. However, the Ratoath Stream and its downstream connections could support protected fish species such as salmonids or lampreys. Fish and aquatic species in the Ratoath Stream are therefore considered to be of local importance (higher value) and are assessed as a KER.

4.5.5.4 Molluscs

No records exist for protected mollusc species within the O05 10km hectad (NBDC, 2024) in the last 20 years. Molluscs are therefore not considered a KER.

4.5.5.5 Invertebrates

There are no NBDC records for protected invertebrates within the 2km (O05F) grid square of the Proposed Development. No rare or protected species of invertebrates were recorded during the Site walkovers. Invertebrates are therefore not considered a KER.

4.5.6 Protected and/or Notable Species Unlikely to Occur at the Site

Other notable and/or rare species and species listed on Annex IV of the Habitats Directive that were considered but that are unlikely to occur at the Site include:

- **Flora**
  - Marsh Saxifrage (*Saxifraga hirculus*) – Known populations only in Co. Mayo.
  - Killarney Fern (*Vandenboschia speciosa*) – Nearest known populations in Co. Kerry.
  - Slender Naiad (*Najas flexilis*) – A clear water, lowland lake species. No suitable habitat available at the Site.
- **Fauna**
  - White-clawed Crayfish (*Austropotamobius pallipes*) – the Ratoath Stream borders the south of the Site. This stream is not connected to any European sites designated for white-clawed crayfish.

- Natterjack Toad (*Epidalea calamita*) – Distribution restricted to few coastal sites. No suitable habitat was present on Site for this species.
- Kerry Slug (*Geomalacus maculosus*) – Distribution restricted to south and west of Ireland. No records for this species exist within the 10km grid square or the grid squares surrounding the Site.

4.6 Evaluation of Ecological Features

Habitats have been evaluated for their conservation importance, based on the NRA evaluation scheme (NRA, 2009b). For something to be selected as a KER, it must be of at least local importance (higher value).

Fauna that have the potential to utilise the Site and immediate area of the Proposed Development, or for which records exist in the wider area have been evaluated for their conservation importance. This evaluation follows the Guidelines for Assessment of Ecological Impacts of National Road Schemes (NRA, 2009b).

The impacts of the Proposed Development on the identified KERs are assessed in Section 5. Table 9 below summarises the evaluation rating assigned to each ecological feature and the rationale behind these evaluations.

TABLE 9. EVALUATION OF DESIGNATED SITES, HABITATS, FLORA AND FAUNA RECORDED WITHIN THE SITE AND THE SURROUNDING AREA. THOSE IDENTIFIED AS KEY ECOLOGICAL RECEPTORS (KERS) ARE HIGHLIGHTED IN GREEN.

Species / Species Group	Evaluation	Rationale	Key Ecological Receptor (KER)
DESIGNATED SITES			
Nationally designated sites (pNHAs, NHAs)	National Importance	These designated sites overlap with those SACs and SPAs assessed in the AA Screening prepared for this application (Enviroguide, 2024a) and are designated for analogous reasons e.g., the same waterbird species, habitats etc. It is deemed that the AA Screening has therefore assessed the potential impact of the Proposed Development on these other designated sites assessed by proxy and no further assessment is required.	**No**
International sites (Ramsar)	International Importance		
HABITATS			
GA1 – Improved Agricultural Grassland	Local Importance (Lower Value)	Highly maintained habitat that's low in species diversity and provides little ecological value. Most of this habitat will be lost to facilitate the Proposed Development.	**No**
BL2 – Earth banks	Local Importance (Lower Value)	A small stockpile of soil with low species diversity. No evidence of use by small mammals. The entirety of this habitat will be lost to facilitate the Proposed Development.	**No**

Species / Species Group	Evaluation	Rationale	Key Ecological Receptor (KER)
BL3 – Buildings and Artificial Surfaces	Local Importance (Lower Value)	Buildings on Site do not provide any significant biodiversity or ecological value at the Site.	**No**
ED2 – Spoil and bare ground	Local Importance (Lower Value)	This is a highly disturbed and often transient habitat with low biodiversity value. The entirety of this habitat will be lost to facilitate the Proposed Development.	**No**
GA2 – Amenity grassland (improved)	Local Importance (Lower Value)	Low floral diversity and highly maintained habitat. Regularly occurring in the local area.	**No**
GS2 – Dry meadows and grassy verges	Local Importance (Lower Value)	Low diversity habitat alongside Ballybin road that is regularly disturbed. This habitat will be lost to facilitate the Proposed Development.	**No**
WD1 Mixed broadleaved woodland and WL2 Treelines	Local Importance (Higher Value)	Narrow woodland habitat and treelines mostly comprised of mature beech, horse chestnut, sycamore, and Monterey cypress. Treelines were generally found to have a structural condition of 'favorable' and an ecological significance of 'slightly significant' during the Hedgerow Appraisal (Enviroguide, 2024b).	**Yes**
WL1 – Hedgerows	Local Importance (Higher Value)	Hedgerows on Site were found to generally comprise a structural condition of 'favorable' and an ecological significance of 'slightly significant' during the Hedgerow Appraisal (Enviroguide, 2024b).	**Yes**
FW4 – Drainage ditch	Local Importance (Lower Value)	One open drain that bisects the Site but is dry and is not linked to any other habitats. Discharges into the local subterranean surface water network.	**No**
FW2 - Depositing/Lowland Rivers	County Importance	The Ratoath Stream is culverted by a bridge along the southern end of the redline boundary and discharges 19km east at Malahide Estuary and is of county importance.	**Yes**
FLORA			

Species / Species Group	Evaluation	Rationale	Key Ecological Receptor (KER)
Rare & Protected Flora	Local Importance (Lower Value)	No rare or protected flora were recorded during the field surveys. Unlikely to be present in notable numbers/densities.	**No**
Invasive Species	Local Importance (Lower Value)	No third schedule species were recorded. Two medium Impact invasive species recorded on Site were sycamore and beech. These are assessed in the treelines habitat above.	**No**
NATIVE FAUNA			
Bat Assemblage	Local Importance (Higher Value)	Foraging and commuting bats were recorded along linear features within the Site of the Proposed Development. Trees on Site are likely to provide some roosting habitat for bats.	**Yes**
Wintering Bird Assemblage	Local Importance (Lower Value)	No suitable habitat present for wintering birds on Site.	**No**
Breeding Bird Assemblage	Local Importance (Higher Value)	A variety of amber and green listed species were recorded at the Site during the scoping survey and are regularly occurring.	**Yes**
Badger	Local Importance (Lower Value)	Limited suitable habitat at the Site for these mammals and unlikely to be regularly present. No evidence of any of these species were recorded on Site.	**No**
Irish Hare			
Fox			
Hedgehog	Local Importance (Higher Value)	No evidence of these species was observed at the Site, but suitable habitats present either on Site, or downstream of the Site.	**Yes**
Otter			
Pine Marten			
Amphibians	Local Importance (Higher Value)	The Ratoath Stream which is culverted to the south of the Site is likely support amphibian species downstream.	**Yes**
Reptiles	Local Importance (Lower Value)	Limited suitable habitat on Site. Occasional logs or broken branches that may offer suitable	**No**

Species / Species Group	Evaluation	Rationale	Key Ecological Receptor (KER)
		habitat but considered unlikely to occur regularly at the Site. No records of reptiles found on Site or during the desk study.	
Fish assemblage	Local Importance (Higher Value)	The Ratoath Stream which is culverted to the south of the Site is likely support fish species. The Ratoath Stream is not a protected salmonid river.	**Yes**
Invertebrates	Local Importance (Lower Value)	No records for protected invertebrates are present within the 10km grid square in which the Site lies and no evidence of same, or important plant species such as Devils bit scabious were recorded at the Site.	**No**
Molluscs	Local Importance (Lower Value)	No records for protected molluscs are present within the 10km grid square in which the Site lies and no evidence of same were recorded at the Site.	**No**

5 ECOLOGICAL IMPACT ASSESSMENT

As per the relevant guidelines, likely effects will be assessed for KERs only, as listed in Table 9. The KERs identified as part of this EcIA are as follows:

- Mixed broadleaf woodland
- Hedgerows
- Treelines
- Lowland depositing river
- Bat assemblage
- Breeding bird assemblage
- Fauna of Ratoath Stream – Fish, amphibians, otter and other aquatic species
- Non-volant Mammals – pine marten, hedgehog, otter (assessed under Fauna of the Ratoath Stream)

The following sections provide an assessment of the impact of the Proposed Development on local ecology. As per CIEEM (2018), where mitigation is fully integrated into the scheme and there is high confidence that it will be implemented the significance of effects of the mitigated project are assessed. Where mitigation has not been integrated into the scheme, for example where it is necessary to include specific measures within a Construction Management Plan (CMP), the potential impacts are assessed in the absence of mitigation. The following is extracted from CIEEM (2018):

'*Presenting the results of the assessment 'with' and 'without' mitigation allows the need for mitigation and/or compensation to be clearly identified. Where mitigation is fully integrated into the scheme and there is high confidence that it will be implemented, it may be appropriate simply to assess the significance of effects of the mitigated project, with this assessment reflecting the likelihood of the incorporated measures being successful. Where there is any uncertainty, then the with/without mitigation approach to assessment described above should be used to ensure transparency*'.

In this instance, mitigation has been integrated into the surface water drainage of the Site (via SUDS), landscape plan and public lighting plan. As such, the impact of these plans is considered when assessing other relevant impacts (e.g., habitat loss).

5.1 Avoidance and Mitigation Embedded in Project Design

The Proposed Development includes several embedded design features that may act to avoid or mitigate negative impacts that would likely occur in the absence of these features. However, as opposed to typical mitigation measures, the implementation of these features is integral to the design and completion of the Proposed Development, and as such the impact assessments are performed with consideration of these features as integrated parts of the Proposed Development. All considered embedded design features that may act to mitigate negative impacts on local ecology and environment are listed in Table 10.

TABLE 10. EMBEDDED DESING FEATURES AND THEIR POTENTIAL TO ACT TO AVOID OR MITIGATE NEGATIVE IMPACTS ON THE LOCAL ECOLOGY AND ENVIRONMENT.

Embedded Design Feature	Avoidance / Mitigation Potential
SUDS: • Bioretention areas	The SUDS features included in the project design will ensure the surface water discharge from the Proposed Development is reduced to greenfield

• Tree pits • Filter drains • Permeable paving • Detention basin • Attenuation tank • Petrol/oil separator	runoff rates. These features will be implemented as part of the surface water drainage design.
Landscape Design: • Ornamental hedges • Ornamental trees • New bat corridor	Slightly offsets the loss of habitats at the Site and provides nesting habitat for birds. Replanting of native species will compensate for the small number of semi mature trees being lost from the northern hedgerow. The dense planting of native tree species through the center of the Site will provide an alternative route for bats in the southern treeline to reach the northern and surrounding landscapes and will mitigate against any potential disturbance or fragmentation caused by the new road.
Lighting Design • Light placement • Light temperature • Cowls • Step back from P4 to P5 after midnight	The lighting plan has been designed in line with best practice guidance for bats. It has also been designed to facilitate the alternative bat corridor through the Site, assisting in creating a dark corridor through the Site.

5.2 Construction Phase

The Proposed Development will see a change in land use from detached one-off housing and agricultural lands bounded by treelines, hedgerows and grassland to a large-scale residential development.

Potential Construction Phase impacts that could arise because of the Proposed Development include, but are not limited to, habitat loss or damage, habitat fragmentation, increases in noise and dust emissions, direct mortality or disturbance of protected species, runoff of sediment or other water borne pollutants into surface waterbodies and designated sites located downstream and light pollution.

It is considered that any negative impacts arising from the Proposed Development can be readily mitigated through avoidance measures, the use of standard best practice construction measures, and biodiversity enhancement measures that will be incorporated into the Proposed Development plan.

5.2.1 Impacts on Habitats

There will be the loss of a total of 83 trees and approximately 348m of hedgerows at the Site as detailed in the arboricultural report (Charles McCorkell Arboricultural Consultancy, 2024b) and the hedgerow appraisal (Enviroguide, 2024b).

The loss of these trees and hedgerows at the Site mostly involves the removal of non-native and invasive species such as beech and sycamore and are not considered to be ecologically significant. The hedgerow appraisal (Enviroguide, 2024b) scored the hedgerows and treelines based on their condition (structure, continuity, and negative indicators) and ecological significance (floral diversity, ground flora, structure, and connectivity). The hedgerows proposed for removal generally scored a condition of ‘favourable’, meaning they contained favourable structure and continuity, while generally scoring ‘slightly significant’ regarding their ecological significance.

It is noted that the vast majority of trees in the woodland belt are being retained with the exception of a section to be removed to facilitate the realigned road. This area already contains an accessway to the Site and will involve the removal of trees either side and in front to expand this access point.

The landscape plan proposes the planting of 170 new trees across the Site (Niall Montgomery & Partners, 2024). In line with the recommendations of the hedgerow appraisal (Enviroguide, 2024b), the proposed planting includes numerous native species such as rowan (*Sorbus aucuparia*) and silver birch (*Betula pendula*) to replace the largely non-natives to be removed. In combination with the new trees, shrub planting proposed in the landscaping design statement will equate to approximately 450m of new hedgerow at the Site.

As these plants and trees establish, the canopy cover will also establish and further enhance the new bat corridor. This will increase year on year as trees become established and reach maturity. The loss of KER hedgerow and tree habitats at the Site is therefore deemed to represent a **short-term, negative, slight** impact **at the local scale** (Enviroguide, 2024b) and will be ameliorated to a **permanent, positive, slight** impact once the landscape and tree planting has been completed and established.

Construction Phase damage could occur to trees and hedgerows in the absence of tree protection measures. The retained vegetation will be protected during the Construction Phase of the Proposed Development with root protection zone buffers, as outlined in the Arboricultural Report (Charles McCorkell Arboricultural Consultancy, 2024b). This represents a potential **short-term, negative, slight** impact at the **local scale**, in the absence of mitigation measures depending on the amount of damage to trees and hedges at the Site. Following the prescribed mitigation, the impact will be an **imperceptible** impact at the local scale.

Five non-native plant species were recorded on or in close proximity to the Site, namely, sycamore, beech, cotoneaster, butterfly-bush and cherry laurel. These species are not listed on the Third Schedule of S.I. 477/2011 (as amended). Cotoneasters are low impact, cherry laurel a high impact species, and the remainder medium impact (Kelly et al., 2013). The cherry laurel is not within the Site boundary and is planted on a neighbouring development. It will therefore not be interfered with. The beech and sycamore in the context of this Site, given their maturity provide overall positive ecological functions and so do not need to be removed entirely as part of a targeted IAS management plan.

Butterfly bush and cotoneaster species will be removed and disposed of appropriately. In the absence of appropriate removal, there is the potential for **short-term, negative, slight impacts** at the **local** scale should these plants be spread off Site in the absence of mitigation. The significance level is deemed to be short-term and slight for these species on the basis that they are widespread in the urban environment, are not considered to cause significant issues where present, and are easily removed where required.

Surface water discharges to the local drainage network and Ratoath Stream associated with the Construction Phase may have the potential to cause impacts on fish species. Therefore, there is potential for a **short-term, negative, moderate** impacts at a **county** level in the absence of suitable mitigation. Standard best practice measures are included as part of the

CMP to protect local surface water networks (Donnachadh O'Brien & Associates Consulting Engineers, 2024b).

5.2.2 Impacts on Native Fauna

5.2.2.1 Bats

Construction works will typically be confined to daylight hours and night-time lighting will therefore not be required during the Construction Phase of the Proposed Development. However, where portable security lighting is required, there is potential for increased levels of lighting during the Construction Phase to deter bats from foraging and commuting within the Site. Considering bats at the Site appear to be accustomed to relatively high levels of lighting already, this has the potential for **short-term, negative, slight** impacts at a **local** scale in the absence of mitigation.

The trees marked for removal have all been assessed and none contain PRF-M features. Some trees for removal contain PRF-I features which are considered low-negligible bat roost potential and do not have the capacity to support roosts of multiple bats (e.g. maternity, hibernation roosts). Nevertheless, should individual bats be present during felling, there is the potential for **permanent, negative, significant** impact on the **local** bat population in the absence of mitigation.

There will be some loss of foraging and commuting habitat for bats at the Site through the removal of the trees and hedgerows, which could fragment bats from the wider landscape. This could have a **permanent, negative, significant** impact on bats in the **local** scale in the absence of mitigation. However, the Proposed Development has been designed with this in mind, and a new alternative commuting and foraging route has been proposed for bats. Therefore, this will be negated to a **permanent, neutral** impact once the planting and lighting plans have been implemented.

5.2.2.2 Breeding Birds

Should any vegetation clearance take place within the breeding bird season (within period March 1st to August 31st, inclusive), there is the potential for harm/mortality to nesting birds and their eggs/young. This would represent a **short term, negative, significant** impact to breeding birds at the **local** scale in the absence of mitigation.

The loss of trees and hedgerows on Site are likely to contain nesting features that occasional breeding birds may utilise. This would represent a **permanent, negative, moderate** impact to breeding birds at the **local** scale in the absence of mitigation.

There will be likely some noise disturbance to local birds at the Site during the construction works, and some minor loss of habitat in the trees and scrub to be removed at the Site. The latter will be more than offset by the tree and shrub planting proposed as part of the landscape plan for the Site (Niall Montgomery & Partners, 2024). As such both of the above will represent **short-term, negative, slight impacts** to breeding birds at the **local** scale.

5.2.2.3 Fauna of Ratoath Stream - Fish, Otter, Amphibians and other aquatic species

There is the potential for surface water runoff from the Construction Phase to enter the local drainage network which discharges into the Ratoath Stream. This could have a **short-term,**

negative, moderate impact on the fish and otter assemblage in the **local** area due to the contamination of this habitat in the absence of mitigation.

There is the potential for noise and dust from the Construction Phase to enter the Ratoath Stream. This could have a **short-term, negative, moderate** impact on the fish and otter assemblage in the **local** area due to the contamination of this habitat in the absence of mitigation.

5.2.2.4 Hedgehog and Pine Marten

Hedgehog and pine marten could utilise the woodland and hedgerow habitats at the Site. The Proposed Development may result in the injury/mortality of these species during the vegetation clearance works if carried out during the hibernation period for hedgehog and breeding period for pine marten. This could result in **short term, negative, significant** impact to hedgehogs and pine marten at the **local** scale, in the absence of mitigation.

Construction sites can pose a source of harm for mammals should they find themselves trapped in an excavation or uncapped pipe, or within construction materials e.g., plastic sheeting or netting. There is therefore a potential for **short-term negative, significant** impacts at the **local** scale in the absence of construction mitigation.

5.3 Operational Phase

5.3.1 Impacts on Habitats and Flora

The Operational Phase has the potential to introduce accidental invasive species to the Proposed Development. This could represent a **negative, long term, moderate** impact at the **local** scale.

The proposed tree, hedgerow, and wildflower/perennial ground flora planting, particularly through the central ‘Activity Spine’ (Niall Montgomery, 2024) of the Proposed Development will connect treelines and green spaces throughout the Site. The overall result, provided long term management of the hedgerows is of the recommended quality, should be a **neutral** impact at the **local** scale after a period of establishment. This will act to offset some of the negative impacts from habitat loss.

5.3.2 Impacts on Native Fauna

5.3.2.1 Bats

Given the presence of lighting in the immediate surrounding environment (i.e. within the active roadways) and street lighting along the surrounding roads including the R125, the local bat population would be expected to be habituated to artificial light spill, especially as the most common species recorded within the Proposed Development Site i.e. Leisler’s bat, soprano pipistrelle, common pipistrelle are some of the least sensitive species to artificial light spill, and are recorded in towns and cities across Ireland. Given the current context of the Site, which is detached housing and agricultural lands, the increase in lighting could have some impact on local bat populations through the loss of dark corridors. The loss of trees in the southern boundary and introduction of a realigned road could act as a barrier for commuting and foraging bats in the absence of mitigation.

The Lighting Report (Morley Walsh, 2024) accompanying this application includes bat-friendly lighting measures in line with Bats and Lighting: Guidance Notes for Planners, Engineers, Architects and Developers (BCI, 2010) and the Bat Conservation Trust (Guidance Note 08/18 Bats and Artificial Lighting in the UK (BCT, 2023). It has accommodated a new dark corridor through the Site in conjunction with the landscaping plan (Niall Montgomery & Partners, 2024). The addition of cowls to lights, low UV and narrow spectrum led lights, and a step back from P4 lighting (a minimum light level of 1 lux) to P5 (a minimum light level of 0.6 lux) after midnight will strengthen this dark corridor as a viable alternative route for bats.

As such, the potential impact to bats within the vicinity of the Proposed Development as a result of the increase in lighting on Site is considered to be **imperceptible** at a local level.

5.3.2.2 Birds

In the absence of mitigation, the loss of trees and hedgerows on Site could result in the loss of breeding habitat for locally important birds. The proposed planting in the landscaping design statement (Niall Montgomery & Partners, 2024) offers increased commuting, foraging, and nesting habitat for local birds, as well as the replacement of many non-native species with native plants that will increase the insect count at the Proposed Development. However this planting will take time to establish and as such, the likely impact is considered **negative, short-term, and slight** at a **local** level in the absence of mitigation.

The Operational Phase is not expected to introduce a collision risk. The Site is bordered on all sides by large mature treelines and building heights will not exceed these heights. Furthermore, the buildings are designed with a mosaic of structures that will be clearly visible to commuting birds. No buildings are comprised of large glass structures that are not clearly visible and so no collision risk, or other negative Operational Phase impacts are expected.

5.3.2.3 Fauna of Ratoath Stream – Fish, otter, and amphibians

No significant effects on fish and aquatic species within local drainage network or the Ratoath Stream are anticipated during the Operational Phase. SuDS measures, including permeable paving, detention basins, interception storage, and fuel interceptors, have been incorporated into the design to treat and minimise surface water run-off from the Site. Therefore, the potential impact on local fish and aquatic species within local drainage network or the Ratoath Stream during the Operational Phase of the Development via water quality deterioration is **imperceptible**.

5.4 Do Nothing Impact

Under the do-nothing scenario, the improved agricultural grassland habitats on Site would continue to be mown and grazed and retain a low biodiversity status. The hedgerows and treeline habitats would continue to serve as biodiversity corridors, providing habitat connectivity throughout the Site and into the wider landscape to the north, along with providing nesting and foraging habitat for birds and mammals.

5.5 Potential for In-Combination Effects

5.5.1 Relevant Plans and Policies

The following plans and policies were reviewed and considered for possible in-combination effects with the Proposed Development.

- Meath County Development Plan 2021-2027
- Meath Biodiversity Action Plan 2015 – 2020
- Ratoath Community Biodiversity Action Plan 2016-2020

No specific projects or plans within the Meath County Development Plan (CDP) 2021-2027 were identified that could act in-combination with the Proposed Development and cause adverse effects on the KERs identified in this report. Additionally, the CDP has directly addressed the protection, enhancement, and incorporation of biodiversity through specific Policies and Objectives, as well as through its Development Management Standards (see Appendix I for details). The Ratoath Community Biodiversity Action Plan 2016-2020 is set out to protect and improve biodiversity in the local area, and as such will not result in negative in-combination effects with the Proposed Development.

Therefore, on examination of the above it is considered that there are no means for the Proposed Development to act in-combination with any plans or projects that would cause any likely significant effects to nearby ecological sensitivities.

5.5.2 Existing Planning Permissions

There are several existing planning permissions on record in the area ranging from small-scale extensions and alterations to existing residential properties to some larger-scale developments. The larger existing developments identified within 2km of the Site within the last 5 years and along the same impact pathways (e.g., the Ratoath Stream) as the Proposed Development are identified below in Table 11 and the potential for possible in-combination effects with the Proposed Development are assessed.

TABLE 11. ASSESSMENT OF POTENTIAL IN-COMBINATION EFFECTS OF THE PROPOSED DEVELOPMENT AND OTHER DEVELOPMENTS PENDING OR GRANTED PERMISSION IN THE LAST 5 YEARS (2019-2024). DEVELOPMENTS ALONG THE SAME IMPACT PATHWAYS AS PROPOSED DEVELOPMENT WERE CONSIDERED WITHIN A 2KM RADIUS.

Planning Reference	Planning Authority	Status	Location
2360296	**Meath County Council**	**Granted 17/11/2023 (Conditional)**	**Traverses a large portion of county Meath (EirGrid Infrastructure)**
Development Description EirGrid PLC, with the consent and approval of the Electricity Supply Board (ESB), intends to apply to Meath County Council for permission for works associated with the proposed uprate of the existing Louth – Woodland 220 kV overhead powerline (OHL) between the existing Louth 220 kV substation in the townland of Monavallet, County Louth and the existing Woodland 220 kV substation in the townland of Woodland, County Meath. The Louth – Woodland 220 kV OHL is approximately 61.5 km long and comprises 207 no. steel lattice tower structures. The existing circuit is located within the functional area of Louth County Council and Meath County Council. Approximately 38.5 km of the existing OHL circuit is located within the functional area of Meath County Council and approximately 23 km is within the functional area of Louth County Council. A separate planning application is being lodged with Louth County Council. The Proposed Development within the functional area of Meath County Council is located in the townlands of Cardrath, Broomfield, Balrenny, Higginstown (Slane Electoral Division), Coalpits, Mooretown (Slane Electoral Division), Cashel, Crewbane, Rossnaree, Fennor (Painestown Electoral Division), Newtown (Painestown Electoral Division), Rathdrinagh, Thurstianstown, Painestown (Painestown Electoral Division), Knockharley, Veldonstown, Kentstown, Danestown, Proudstown			

(Skreen Electoral Division), Macetown (Skreen Electoral Division), Painestown (Macetown Electoral Division), Frankstown, Riggins (Kilbrew Electoral Division), Reask (Kilbrew Electoral Division), Hallstown, Cabinhill, Flemingtown (Ratoath Electoral Division), Twentypark, Lagore Little, Brownstown (Ratoath Electoral Division), Bradystown, Curkeen, Commons (Ratoath Electoral Division), Gormanstown, Wilkinstown (Dunshaughlin Electoral Division), Powderlough, Raynestown, Derrockstown, Mill Land (Dunshaughlin Electoral Division), Parsonstown, Rathregan, Portan (Dunshaughlin Electoral Division), and Woodland. Five (5) temporary construction compounds and associated access routes are located in the townlands of Knockmooney, Slane, Rath, Flemingstown and Tuiterath. The Proposed Development works within the functional area of County Meath will comprise: ? the replacement ("restringing") of the existing overhead line circuit conductor with a new higher capacity conductor; ? the strengthening of up to 25 no. tower foundations; ? the replacement of hardware and fittings, such as insulators, insulator ha.

Potential for In-combination effects
None identified - The permitted development is subject to the mitigation laid out in an NIS. The NIS specifically contains mitigation to prevent pollution under section 7.2, and a CMP under section 7.6 which will prevent pollution to Ratoath Stream. Therefore no in combination effects are expected.

211918	**Meath County Council**	**Granted 17/02/2022 (Conditional)**	**On lands at Ballybin (E.D. Kilbrew), Ashbourne, Co Meath**

Development Description

a Solar PV Energy Development with a total site area of 23.58 ha, to include solar panels mounted on steel support structures, associated cabling and ducting, 5 No. MV Power Stations, 1 No. Client Substation, 1 No. Temporary Construction Compound, access tracks, hardstanding area, boundary security fencing and security gates, CCTV, landscaping and ancillary works. Significant further information/revised plans submitted on this application

Potential for In-combination effects
None identified – The permitted development is accompanied by an AA screening that found no significant impacts would be likely, while also providing protection measures for species such as otter within the acocompanying EcIA. Furthermore, this development has likely been largely completed since February 2022 when planning was granted and so no in combination effects are expected.

RA190890	**Meath County Council**	**Granted 19/08/2019 (Conditional)**	**Townlands Of Jamestown, Ratoath & Tankardstown, Ratoath, Co. Meath**

Development Description

an amendment to the road junction at Moulden Bridge on that portion of the Ratoath Outer Relief Road as approved under planning permission Ref. PL17.247003/RA150993. The amendment as proposed seeks to modify the approved but not yet constructed roundabout to now be a Signalised Cross-Roads Junction, including all associated ancillary site development works together with tie-ins to the Ashbourne Road (R125), the Moulden Estate Road and the Ratoath Outer Relief Road (under construction)

Potential for In-combination effects
None identified – It is understood the permitted development has since been completed and so no in-combination effects are anticipated.

SH305196	**Meath County Council**	**Granted 19/08/2019 (Conditional)**	**Townlands Of Jamestown, Ratoath & Tankardstown, Ratoath, Co. Meath**

Development Description

SUBMISSIONS TO AN BORD PLEANALA - DIRECT APPLICATION TO AN BORD PLEANALA strategic housing development on6.3 hectares,bounded by Ratoath College, agricultural lands and the rear gardens of houses on Glascarn Lane(to the west); Milltree Park (to the north); Broadmeadow Vale(to the east) and the reservation of the Ratoath Outer Relief Road (to the south), all lying within the townland of Jamestown, Ratoath.The development consists of228 No. residential units comprising of 19 No. 1 Bed Units, 68 No. 2 Bed Units, 133 No. 3 Bed Units and 8 No. 4 Bed Units to be provided in a mix of unit types as follows: 88 No. semi-detached houses (2-2.5 storey), 6 No. detached houses (2.5-3 storey), 11 No. terraced houses (2 storey), 9 No. Independent Living Units (2 Storey), 52 No. apartments (in 2 No. 4 and 5 storey apartment buildings with under-croft basement car parking), 32 No. duplex units with 30 No. apartment units above (in 6 No. 3-storey duplex blocks). House Type A1 to have an optional kitchen extension to the rear. A 3 storey childcare facility building (c.

343.17sq.m) with ancillary outdoor play area. Minor amendments to the 'Link Road' and a spur road connecting the 'Link Road' with 'The Way' at Broadmeadow Vale (all approved under RA150993 / PL17.247003) to facilitate integration into the proposed development. Provision of a temporary shared Pedestrian/Bicycle path along the southern boundary of the site within the reservation of the future extension of the Ratoath Outer Relief Road (RORR). All other associated landscaping, boundary treatments, site development and service infrastructure works. Primary vehicular/ bicycle/pedestrian access to be from the Ratoath Outer Relief Road (approved under RA150993 / PL17.247003 and modified under RA190724). Secondary vehicular/ bicycle/pedestrian access via 'The Way' at Broadmeadow Vale (RA150993 / PL17.247003). Pedestrian/Bicycle access (only) via 'The Grove' and 'The Rise' at Milltree Park. The application contains a statement setting out how the proposal will be consistent with the objectives of the Meath CDP 2013-2019 and the Ratoath LAP 2009-2015 & a statement indicating why permission should be granted for the proposed development, having regard to a consideration specified in section 37(2)(b) of the Planning and Development Act, 2000, as amended, notwithstanding that the proposed development materially contravenes a relevant development plan or local area plan other than in relation to the zoning of the land.

Potential for In-combination effects
None identified – The development was granted permission subject to the conditions of ABP which determine the measures in the EcIA must be followed. These include preventative measures for potential impacts to nearby watercourses. The application was also screened for EIA and was it was concluded this was not required. Furthermore, the development is likely to be largely completed since the grant of permission in December 2019 and so no in combination effects are expected.

2460017	Meath County Council	RFI	Ashbourne Road - R125, Ratoath, Co Meath

Development Description
Construction of a road with footpath, bicycle lane, lighting, and, all associated site works, to access and service the lands zoned E2 – General Enterprise and Employment.

Potential for In-combination effects
This application has received a request for further information on surface water attenuation and drainage details. It is not expected this application would be granted without the appropriate surface water management, and so no in combination effects are expected.

It is considered that there is no potential for the Proposed Development to act in-combination with other permitted developments in the vicinity that could cause likely significant effects on any nearby KERs.

6 AVOIDANCE, MITIGATION, COMPENSATION AND ENHANCEMENT MEASURES

6.1 Incorporated Design Mitigation

The incorporated or 'embedded' mitigation included in the Proposed Development from an ecology perspective includes a the suite of SuDS measures detailed in Section 2.2.2.1.1, and the bat friendly public landscaping and lighting plans as discussed in Sections 2.2.2.3 and 2.2.2.4. The landscaping plan will also act to mitigate against the loss of hedgerow on Site.

6.2 Construction Phase

The CMP that accompanies this application under separate cover (Donnachadh O'Brien & Associate Consulting Engineers, 2024b) gives a summary of the best practice development standards and mitigation measures to be implemented during the Construction Phase of the Proposed Development. In addition, to ensure the CMP remains 'fit for purpose' for the

duration of the project it should be reviewed and updated by the Project Manager in consultation with the Contractor's Ecologist during the life of the project to ensure that it remains suitable to facilitate efficient and effective delivery of the project's environmental commitments. The Contractor shall also designate a Site Engineer/Manager/Assistant Manager as the Construction Waste Manager and who will have overall responsibility for the implementation of the Project Waste Management Plan (WMP). This Plan will be prepared upon appointment of the Main Contractor.

Additional mitigation measures required for sufficient protection of the KERs identified in this report are given below.

6.2.1 Protection of Habitats

6.2.1.1 Mitigation 1: Standard Surface Water Protection Measures

These surface water mitigation measures will treat the source (e.g., refuelling of plant to be carried out at designated refuelling station locations on Site) or remove the pathway (e.g., no release of wastewater generated on-site into nearby drains or drainage ditches during the Construction Phase).

The following mitigation measures will protect surface waters during the Construction Phase of the Proposed Development.

All works carried out as part of the Proposed Development will comply with all Statutory Legislation including the Local Government (Water Pollution) Acts, 1977 and 1990 and the contractor will cooperate fully with the Environment Section of Meath County Council in this regard.

Personnel working on the Site will be trained in the implementation of environmental control and emergency procedures. Procedures and relevant documents produced will be formulated in consideration of standard best international practice.

The following standard measures will be implemented by the appointed Contractor (unless otherwise stated) to protect surface water during the Construction Phase of the Proposed Development:

- Run-off from machine service and concrete mixing areas will under no circumstances be allowed to enter the local nearby drainage network or the section of open drainage ditch to the north of the Site.
- Discharge water generated during the placement of concrete will be stored and removed off-site for treatment and disposal.
- There will be no washing out of any concrete trucks on Site.
- Leachate generation from stockpiles or waste receptacles will be prevented by using waterproof covers.
- If contaminated soils are encountered during construction works or if material becomes contaminated by, for example, a fuel spill or hydraulic fluid leak, the contaminated materials will be segregated, placed on an impermeable membrane to prevent contamination of the underlying ground, and covered to prevent contaminants being mobilised by rainwater run-off. The materials will remain covered

until such time as they can be compliantly removed from the site by appropriately authorised waste management contractors.

- A regular review of weather forecasts for heavy rainfall will be conducted, and a contingency plan will be prepared before and after such events to minimise any potential run-off containing silt, sediment, or other pollutants.
- Refuelling of plant during the Construction Phase will only be carried out at designated refuelling station locations on Site. Each station will be fully equipped for spill response and a specially trained and dedicated Environmental and Emergency Spill Response team will be appointed before the commencement of works on Site.
- Robust and appropriate Spill Response Plan and Environmental Emergency Plans will be implemented for the duration of the works.
- A register will be kept of all hazardous substances either used on-site or expected to be present. The register shall be always available and shall include as a minimum: valid safety sheets; Health & Safety, environmental controls to be implemented when storing, handling, using and in the event of spillage of materials; emergency response procedures/precautions for each material; the Personal Protective Equipment (PPE) required when using the material.

Fuel and Chemical Storage

Appropriate storage facilities will be provided on Site. Areas of high risk include:

- Fuel and chemical storage.
- Refuelling Areas.
- Site Compound.
- Waste storage areas.

If required, fuel, oils and chemicals will be stored on an impervious base within a bund, however, it is recommended that all fuel, oil and chemical storage will be off Site.

All tank, container and drum storage areas shall be rendered impervious to the materials stored therein. Bunds shall be designed having regard to Environmental Protection Agency guidelines 'Storage and Transfer of Materials for Scheduled Activities' (2904). All tank and drum storage areas shall, as a minimum, be bunded to a volume not less than the greater of the following:

- 110% of the capacity of the largest tank or drum within the bunded area; or
- 25% of the total volume of substance that could be stored within the bunded area.

Concrete mixer trucks will not be permitted to wash out on Site with the exception of cleaning the chute into a container which will be removed off Site to an authorised facility.

6.2.1.2 Mitigation 2: Silt and Sediment Control

During the Construction Phase, machinery such as diggers have the potential to stir up sediment, especially during rainy periods. This sedimentation has the potential to be transferred to the nearby watercourse in the absence of mitigation measures.

The following mitigation measures will prevent silt and sediment originating at the Site from entering the local drainage system.

- Silt fences will also be installed around any soil mounds / bunds, and along both sides of the bridge culverting the Ratoath Stream to prevent any silt entering the stream from roadworks.
- The outfall point from the internal drain within the Site will be protected from silt while infilling is taking place. This will be done through the placement of a silt dewatering bag on the outflow pipe to capture any silt from construction works.
- An Ecological Clerk of Works (ECoW) will be appointed to ensure best practices and silt traps are in place during any works carried out while infilling the drainage ditch on Site, and prior to any intrusive works beginning with regard to the realigned Ballybin Road.
- Silt traps will be checked weekly and after periods of heavy rainfall to ensure they remain fit for purpose and a record of these checks will be kept and signed off.
- Silt traps will be staggered along relevant watercourses, and not only at the lower reaches towards its outflow.
- Silt trap design can vary, from depressions added to the watercourse bed, to log sections laid lengthways into the drain, to the use of geotextile barriers.

6.2.1.3 Mitigation 3: Reduction of noise related impacts

Noise generated during the Construction Phase of the Proposed Development could cause temporary disturbance to several faunal species associated with the hedgerow, treeline, and agricultural environments within the Site. To mitigate this disturbance, the following measures will be implemented:

- Selection of plant with low inherent potential for generating noise.
- Siting of plant as far away from sensitive receptors as permitted by Site constraints.
- Avoidance of unnecessary revving of engines and switch off plant items when not required.
- Keep plant machinery and vehicles adequately maintained and serviced.
- Proper balancing of plant items with rotating parts.
- Keep internal routes well maintained and avoid steep gradients.
- Minimise drop heights for materials or ensure a resilient material underlies.
- Where noise originates from resonating body panels and cover plates, additional stiffening ribs or materials should be safely applied where appropriate.
- Limiting the hours during which Site activities likely to create high levels of noise are permitted.
- Appointing a Site representative responsible for matters relating to noise.

- Monitoring typical levels of noise during critical periods and at sensitive locations.

6.2.1.4 Mitigation 4: Reduction of dust related impacts

The following general dust control measures will be followed for the duration of the Construction Phase of the Proposed Development and will ensure no significant dust related impacts occur to nearby sensitive receptors including local faunal species.

- Haulage vehicles transporting gravel and other similar materials to Site will be covered by a tarpaulin or similar.
- Access and exit of vehicles will be restricted to certain access/exit points.
- Vehicle speed restrictions of 20km/hr will be in place.
- Bowsers will be available during periods of dry weather throughout the Construction period.
- During dry and windy periods, and when there is a likelihood of dust nuisance, a bowser will operate to ensure moisture content is high enough to increase the stability of the soil thereby reducing the amount of dust.
- Stockpiling of imported materials will be avoided where possible with imported materials ideally placed on Site in their proposed location upon receipt with double handling avoided.
- Stockpiles will be stored in sheltered areas of the Site, covered, and watered regularly or as needed if exposed during dry weather.
- Gravel should be used at Site exit points to remove caked-on dirt from tyre tracks.
- Hard surfaced roads will be wet swept to remove any deposited materials.
- Unsurfaced roads will be restricted to essential traffic only.
- If required to control dust nuisance wheel-washing facilities will be located at the exit from the construction area.
- Dust production because of Site activity will be minimised by regular cleaning of the access roads using vacuum road sweepers and washers. Access roads should be cleaned at least 0.5km on either side of the approach roads to the access points.
- Public roads outside the Site shall be regularly inspected for cleanliness, as a minimum daily, and cleaned as necessary. A road sweeper will be made available to ensure that public roads are kept free of debris.
- The frequency of cleaning will be determined by the Site agent and is weather and activity dependent.
- The height of stockpiles will be kept to a minimum and slopes should be gentle to avoid windblown soil dust.
- The following will be dampened during dry weather:
    - Unpaved areas subject to traffic and wind.

- Stockpiles.
- Areas where there will be loading and unloading of dust-generating materials.

- Under no circumstances will wastewater from equipment, wheel or surface cleaning enter the local drainage network.

6.2.1.5 Mitigation 5: Tree Protection

As outlined in the arboricultural report (Charles McCorkell Arboricultural Consultancy, 2024b) protective tree fencing in compliance with BS 5837:2012 'Trees in relation to design, demolition and construction – Recommendations' will be erected prior to any Construction works being undertaken to prevent damage to the canopy and root protection areas of existing trees to be retained at the Site. The fencing should be signed off by a qualified arborist prior to Construction to ensure it has been properly erected. No ground clearance, earthworks, stock-piling or machinery movement will be undertaken within these areas.

6.2.1.6 Mitigation 6: Biosecurity

The following best practice Site hygiene and biosecurity measures will be in place to avoid the potential introduction of invasive floral species at the Site and offsite via movement of materials/staff:

- All soils/materials being introduced to the Site will be sourced from a certified invasive flora-free source site, to ensure no introduction of invasive plant materials to the Site occurs.
- Personnel working on or between sites will ensure their clothing and footwear are cleaned, ensuring they are visually free from soil and organic debris, in order to prevent inadvertent spread of invasive plant material.
- All vehicles entering or leaving the Site will have been suitably checked and pressure-washed to ensure no introduction of invasive flora to and from the Site. Measures such as a drive through hygiene bath or footbaths will be considered where appropriate.
- Designated wash-down area to be located away from sensitive receptors such as watercourses, ditches, drains etc.
- Material/water left after vehicles have been pressure-washed must be contained, collected and disposed of appropriately (these waters must not under any circumstances be discharged to drains or nearby ditches).

The following management practices will be implemented for the removal of butterfly bush and cotoneaster at the Site.

Butterfly Bush

The following is extracted from TII (2010):

"Buddleia (also known as the Butterfly bush) is a member of the Buddlejaceae family. It is a very fast growing shrub that can reach 2m in its first year, producing flowers and setting seed prolifically. Buddleia is a native of China and is widely planted as an ornamental in gardens, demesnes or parks. Because of its profusion of long, purple and nectar-rich flowers it

also attracts a considerable diversity of butterflies (hence, its other common name – Butterfly bush) and other pollinating insects. It has a widespread distribution throughout Ireland and is particularly frequent in waste ground in urban environments. It colonises bare ground very rapidly and can quickly form monotypic stands. As Buddleia tolerates a broad range of environmental conditions and a wide diversity of soil types, including very poor soils, it is capable of growing on walls, rock outcrops or sub-soils; conditions that are frequently encountered on new road schemes. In particular, it poses a threat where features such as rock cuttings or eskers remain abandoned or are left to re-colonize naturally. In many countries it has established itself as a problem plant along watercourses where, due to its shallow root system, it is frequently washed away, resulting in erosion of the riverbanks and downstream blockages. In Ireland, Buddleia must be considered an invasive species because of the damage it can cause to hard standings and structures, and to native biodiversity. Buddleia produces very large numbers of viable seeds, which are dispersed via wind and water. The seeds are relatively short-lived in the soil, rarely lasting longer than four years. The plant can also readily spread by producing roots, and ultimately new plants, where stem nodes come into contact with the ground. It can also spread by fragmentation of stems or roots.

As Buddleia is a plant that favours disturbed sites, physical removal of plants can provide ideal conditions for the germination of seeds that are present in the soil. For this reason, care needs to be taken to ensure that revegetation of treated areas is undertaken swiftly. The branches of Buddleia are capable of rooting as cuttings, so care should also be taken to ensure material is disposed of in a manner to avoid this risk."

Chemical control

"Recommended practice for the application of herbicides requires cutting back of plants to a basal stump during active growth (late spring to early summer) which is then treated (brushed on) immediately with a systemic weed killer mix (Starr et al., 2003). Foliar application of triclopyr or glyphosate may be adequate for limited infestations of younger plants but should be followed up at 6 monthly intervals. At this point it must be restressed that all Plant Protection Products must be used in accordance with the product label and with Good Plant Protection Practice as prescribed in the European Communities (Authorization, Placing on the Market, Use and Control of Plant Protection Products) Regulations, 2003 (S.I. No. 83 of 2003). Again, it should be noted that it is an offence to use Plant Protection Products in a manner other than that specified on the label. The methods just outlined are not in accordance with the product label and so it will be necessary to discuss the use of such methods with the Pesticides Control Service with a view to seeking approval under the derogation procedures provided under the Plant Protection Regulations. "

Physical control

"Management methods such as digging it out are applicable only to minor infestations at the initial stage of invasion. Hand-picking of young plants is feasible but should be undertaken with care to avoid soil disturbance which can give rise to a flush of new seedling. Grubbing of mature stands as a sole attempt at control is not recommended for the same reason. After uprooting, it is essential to plant the ground in order to prevent a flush of new seedling growth. When it is cut, Buddleia grows back from the stump very vigorously. Mowing of young plants does not provide control as they re-sprout with vigour. Where removal of mature plants is not feasible in the short term, the flower heads should be cut off in June before seed set."

Combined chemical and physical control

Effective control can be achieved by cutting Buddleia plants to a basal stump during active growth (late spring to early summer) and immediately treating the total cut surface with herbicide concentrate. Monitoring will be required and retreatment, as necessary. Do not leave cut stems and branches on the ground as they will re-root and produce new plants."

Recommended Management Plan

Butterfly bush on Site will be removed as part of the treeline and so physical control methods are recommended to remove the infestation. Chemical control as an addition is optional if stumps are not being removed entirely.

1. Flower heads of butterfly bush should first be cut and double bagged before they set seed. This will significantly reduce the chance of a reinfestation as butterfly bush set seed prolifically. This should be carried out in June or early July (TII, 2020a). While mature stands will have likely spread large amounts of viable seed prior to removal, this practice can help reduce the term of potential reinfestation.
2. Stands of butterfly bush may also be cut back to the stump in late spring to early summer, followed by immediate application of an appropriate herbicide.
3. Herbicide application should be carried out by a suitably qualified and registered professional. Professional users of pesticides must be registered pursuant to Regulation 4 of the Sustainable Use of Pesticides Regulations and must have the appropriate training (with associated certificates) required to perform the necessary treatment to suitably manage the targeted IAS. Chemical treatments must always be used in compliance with the product label (TII, 2020a). The treatment programme should also comply to the herbicide manufacturer's instructions.
4. An inert dye should be mixed with the herbicide to ensure that no plants are left untreated.
5. Herbicide should be immediately applied to any cut stumps to prevent the plant forming a protective coating of sap over the stump. This will ensure the herbicide is absorbed by the plant and spread throughout its transport system.
6. This type of treatment is effective all year-round, although it is deemed to be most effective when conducted during the plant's active growth period while transpiration is readily occurring.
7. Herbicide should be brushed onto the remaining stumps with a systemic weed killer mix (Starr *et al*., 2003) (TII, 2010). In sensitive ecological areas such as near watercourses and provided the stump is large enough, herbicide ecoplugs should be used to minimise any potential leaching.
8. Herbicide application should be carried out in dry weather, with a 6 to 24 hour rain free period following the treatment.
9. Physically removed seedlings and cut material should be collected and double bagged before being disposed of via composting, or other suitable disposing methods, adopting the biosecurity measures outlined in TII (2020b).
10. Severed material may be disposed of by composting (if appropriate), burial at a depth of no less than 2m, by incineration (having regard to relevant legislation, including the Waste Management Act, 1996–2011, the Waste Management (Prohibition of Waste Disposal by Burning) Regulations, 2009, and relevant local authority byelaws), or disposal to licensed landfill. Note: Composting should only be employed as a method

of control if it poses no biosecurity risks to the environment. It is essential that the methods used comply with the law and that all necessary licences, permits, consents and permissions are in place (TII, 2020a).

11. Where seed producing plants were evident on Site and where bare soil remains, soil should be mulched (covered with a natural or synthetic barrier, such as wood chip, straw, geo-textile, or other appropriate material) and planted at the earliest opportunity with appropriate native replacement vegetation to stabilize the soil and deter subsequent re-invasion (TII, 2020a).
12. Where seed producing plants are evident on Site, machinery operating within an area of IAS should be treated according to TII (2020b) guidelines before entering and exiting the Site. This should involve designated power washing areas to prevent the spread of seed on machinery. Similarly, PPE and clothing should be removed and changed when exiting the Site.
13. As part of the clearance programme, follow up surveys will be required to ensure that the above control measures are effective.
14. The seeds produced by butterfly bush are very small and numerous, with up to 3 million tiny, winged seeds produced per plant. They can remain viable in the soil for up to four years (TII, 2020a). As such, follow up surveys should be undertaken in Spring the growing season following herbicide treatment for a period of four years. Should the Site be free of butterfly bush after two successive surveys, no further surveys will be required.

Cotoneaster

Cotoneasters represent a large species group of small trees that are evergreen or deciduous, and which produce bright red berries. The majority originate in eastern Asia and have become invasive in Ireland and elsewhere. Seeds are spread over great distances by birds who feed on the berries produced by Cotoneasters, while dumping of garden waste can also lead to infestations (Boer, 2014).

Recommended Management Plan

Although not considered to be a high impact invasive species, these non-native shrubs should be removed and disposed of appropriately at a licensed facility, and every effort made to practise good Site hygiene to ensure no transmission off Site.

As described in Halford *et al*., (2014), repeated cutting (twice a year for 2 years) proved insufficient to deplete and kill *C. horizontalis* bushes, therefore, a combination of physical and chemical control methods are recommended to remove the infestation followed by a period of monitoring. The following control methods are adapted from Boer (2014).

1. Young seedlings can be effectively pulled; however, larger plants may have multiple stems and a large root mass making it difficult to remove the whole plant. In these cases, the root mass can be excavated. Both the stump and the shallow roots should be removed as both can re-sprout (GOERTS 2005).
2. Larger stands of the plant with a trunk diameter of over 2cm should be cut to the base.
3. Once cut, herbicide should be immediately applied to cut stumps.
4. Herbicide application should be carried out by a suitably qualified and registered professional. Professional users of pesticides must be registered pursuant to Regulation

4 of the Sustainable Use of Pesticides Regulations and must have the appropriate training (with associated certificates) required to perform the necessary treatment to suitably manage the targeted IAS. Chemical treatments must always be used in compliance with the product label (TII, 2020a).

5. Herbicide should be applied by painting directly onto stumps.
6. An inert dye should be mixed with the herbicide to ensure that no plants are left untreated.
7. Herbicide application should be carried out in dry weather, with a 6 to 24 hour rain free period following the treatment.
8. It is important that the herbicide has access to the plant's transport system, which is just inside the bark. This type of treatment is most effective in Cotoneaster in September, when the plant is reallocating nutrients to the root system (Halford *et al.,* 2014). This will help the herbicide spread through the plant's transport system.
9. Preventing seed-set is essential as young shrubs (3 years old) can already produce seed. Therefore, smaller bushes (less than 2 cm diameter) also need to be cut to prevent the formation of fruits and seeds. Seeds are present in September so any works carried out during this time should be done so with methods to help ensure viable seed is not spread.
10. These include placing a membrane below the work area to gather any seed that falls loose, and the immediate bagging of cut material to prevent seed dispersal.
11. Where seed producing plants were evident on Site and where bare soil remains, soil should be mulched (covered with a natural or synthetic barrier, such as wood chip, straw, geo-textile, or other appropriate material) and planted at the earliest opportunity with appropriate native replacement vegetation to stabilize the soil and deter subsequent re-invasion by IAS (TII, 2020a).
12. As part of the clearance programme, follow up surveys will be required to ensure that the above control measures are effective. Cotoneaster seed remain viable in soil for up to five years (Pilkington, 2011) and as such these surveys will be undertaken at the end of the growing season following herbicide treatment (i.e., September – October) for a period of five years. Should the Site be free of Cotoneaster after two successive years, no further surveys will be required.
13. Where seed producing plants are evident, soil removal should be done so under the approval of an ECoW and disposed of at a registered and approved waste treatment facility.
14. Machinery operating within an area of IAS should be treated according to TII (2020b) guidelines before entering and exiting the Site. This should involve designated power washing areas to prevent the spread of seed on machinery.
15. The treatment programme will be carried out by a suitably qualified person who has experience of treating invasive species and will be carried out in line with the herbicide manufacturer's instructions.

6.2.1.7 **Mitigation 7: *Construction Phase Lighting on bats***

Any night-time lighting required during the Construction Phase for security etc., will be directed away from the boundary vegetation at the Site (i.e., away from hedgerows and woodland areas), and will not be directed skyward. Lighting will be focused into the centre of the Site and only on equipment and machinery that needs to be illuminated.

The Project Ecologist acting as ECoW for the project will review the Construction Phase lighting with the Contractor regularly during their site visits and make recommendations as required to ensure the lighting is maintained as bat friendly for the duration of the works.

6.2.1.8 Mitigation 8: Timing of Vegetation Clearance

To ensure compliance with the Wildlife Act 1976 as amended, the removal of areas of vegetation will not take place within the nesting bird season (March 1st to August 31st inclusive) to ensure that no significant impacts (i.e., nest/egg destruction, harm to juvenile birds) occur as a result of the Proposed Development. Should nesting birds be found, then the area of habitat in question will be noted and suitably protected until the ecologist confirms the young have fledged.

Table 12 provides guidance for when vegetation clearance is permissible. Information sources include British Hedgehog Preservation Society's *Hedgehogs and Development* and *The Wildlife (Amendment) Act, 2000*.

The preferred period for vegetation clearance is **within the months of September and October**. Vegetation will be removed in sections working in a consistent direction to prevent entrapment of protected fauna potentially present (e.g., hedgehog). Where this seasonal restriction cannot be observed, a check will be carried out immediately prior to any Site clearance by an appropriately qualified ecologist and repeated as required to ensure compliance with legislative requirements.

TABLE 12. SEASONAL RESTRICTIONS ON HABITAT/VEGETATION REMOVAL FOR RELEVANT KER SPECIES. RED BOXES INDICATE PERIODS WHEN CLEARANCE/WORKS ARE NOT PERMISSIBLE

<table>
<tr><th>Ecological Feature</th><th>January</th><th>February</th><th>March</th><th>April</th><th>May</th><th>June</th><th>July</th><th>August</th><th>September</th><th>October</th><th>November</th><th>December</th></tr>
<tr><td>Breeding Birds</td><td colspan="2">Vegetation clearance permissible (Sept - Feb)</td><td colspan="6">Nesting bird season.
No clearance of vegetation unless confirmed to be devoid of nesting birds by an ecologist.
(Mar - Aug)</td><td colspan="3">Vegetation clearance permissible (Sept - Feb)</td></tr>
<tr><td>Hibernating mammals (e.g., Hedgehog)</td><td colspan="3">Mammal hibernation season.
No clearance of vegetation unless confirmed to be devoid of hibernating mammals by an ecologist.
(Jan - Mar)</td><td colspan="7">Vegetation clearance permissible (Apr - Oct)</td><td>Mammal hibernation season.
No clearance of vegetation unless confirmed to be devoid of hibernating mammals by an ecologist.
(Nov - Dec)</td></tr>
</table>

Bats	Tree felling permissible but sub-optimal. If hibernating bats are found, felling must wait until after hiber-nation season.	Tree felling optimal **(Feb-March)**	Tree felling permissible, provided a check is also done for breeding birds prior to felling. Should nests be found, felling must wait until young are fledged.	Tree felling optimal **(Sept - Oct)**	Tree felling permissible but sub-optimal. If hibernating bats are found, felling must wait until after hibernation season.

6.2.1.9 Mitigation 9: Bat and Bird Precautions when Felling Trees

Although all trees on Site set for felling have been assessed and confirmed to be of low-negligible bat roost suitability, harm to individual bats is possible should they be present during the felling process. It is also possible that trees can become damaged in the time between the original PBRA survey and the tree felling taking place, and this can sometimes increase the bat roost suitability of a tree, providing new roost features e.g., cracks, holes etc. Similarly, these features can provide nesting opportunities for small local passerines.

As such, a pre-felling check will be conducted by a suitably qualified Ecologist of **all** trees to be felled at the Site prior to felling taking place. This can be done with either endoscope checks from an articulated hoist, or using climbing equipment such as harnesses provided the ecologist is suitably qualified.

Trees should ideally be felled during the start or end of the hibernation period (so either in September/October or February/March) following a thorough check for bats and nesting birds. The felling of trees during this period will ensure that bats are likely to have entered hibernation or will soon be coming out of it and will reduce the likelihood of them either not having enough energy or a food source if they happen to be disturbed and take flight. It is also outside of the breeding bird season and so unlikely to come across active nests. Felling in this period will further reduce the likelihood of bats having transitioned between roosts overnight, should felling not be carried out immediately following the bat survey. Felling must be carried out no later than 24 hours after the bat survey is complete and once the surveyor can confirm no roosting bats are present.

In the unlikely event that a roosting bat or nesting bird is found, no felling of the tree in question will take place and a derogation licence will be obtained from the NPWS to proceed if the finding is bats, or the nest will be left alone until the young have fledged. The area around the tree will be protected with an appropriate buffer to prevent disturbance of the bat(s)/bird(s).

It is important to note that permission for the Proposed Development can be granted without any reliance on the potential grant of a derogation licence, and that any references to the potential need to obtain a licence are purely precautionary, as detailed above, and therefore not integral to the decision on whether to grant permission.

6.2.1.10 Mitigation 10: Construction Site Management for Mammals

As best-practice, all construction-related rubbish on Site e.g., plastic sheeting, netting etc. will be kept in a designated area and kept off ground level so as to prevent small mammals such as hedgehogs and pine marten from entrapment and death.

Trenches/pits must be either covered at the end of each working day or include a means of escape for any animal falling in e.g., a plank or objects placed in the corner of an excavation (Species such as badgers will continue to use established paths across a site even when construction work has started).

Any temporarily exposed open pipe system will be capped in such a way as to prevent animals gaining access as may happen when contractors are off Site.

6.3 Operational Phase

6.3.1 Mitigation 11: Mammal Habitat Connectivity

By fencing the boundaries of a Site, the land becomes fragmented and largely inaccessible to species such as hedgehog, which like to roam each night in search of food (garden pests e.g., slugs). This can easily be fixed by ensuring that the boundaries and barriers within and surrounding the Site is permeable for hedgehogs. This will allow hedgehogs and small mammals to move between the Site's woodlands and hedgerows.

This will be achieved by:

- Providing 13 x 13 cm gaps at ground level at various locations along any impermeable walls/fences fencing around boundaries (Hedgehog holes). This can be done by omitting bricks, or placing pipes or similar around boundaries.
- Leaving a sufficient gap beneath gates.
- Leaving brick spaces at the base of brick walls.

FIGURE 38. EXAMPLES OF HEDGEHOG HIGHWAYS THAT WILL BE INCORPORATED INTO THE PROPOSED DEVELOPMENT.

6.3.2 Mitigation 12: Bat Boxes

Although the trees containing PRF-I features did not require bat surveys, it is probable that over the coming decades, these trees would become weather damaged and eventually provide roosting features for bats, if not present already. Although suitable alternative landscaping has been proposed, it will likely take decades longer for these features to form on new planting than they would have otherwise.

Therefore, it is recommended that 10 bat boxes are erected throughout the Site at various locations. It is recommended that **3 no. Schwegler 1FF** and **7 no. Schwegler 3FN** models are placed throughout the Site.

It is understood that Schweglers can be particularly difficult to source in Ireland and so suitable alternatives can be used provided the meet the following criteria:

- At least two different models are installed on Site. One model should provide habitat for a small number of bats such as the 3FN, and the another should provide habitat for potentially larger numbers of bats or a colony, such as the 1FF.
- The bat boxes must be made from a durable, and sufficiently insulated material such as woodcrete.
- The bat boxes must be open bottomed, or contain their entrance point near the bottom of the bat box so that a build up of droppings will not prevent the box being used as a long-term roost.

The location of bat boxes will be advised by a suitably qualified ecologist but must meet the following criteria:

- Be placed a minimum of 4m off the ground.
- The bat boxes will not be placed in areas that are subject to lighting. This is particularly important in the case of the larger boxes should bats utilise them for

hibernation. Consideration should be given to the lack of foliage on trees as a light barrier when deciding the placement of bat boxes.

- Bat boxes should ideally face southeast or southwest, provided they are not exposed to light disturbances in doing so.

6.3.3 Mitigation 13: Bird Boxes

As with the bat boxes, trees scheduled for removal likely contain suitable features for local breeding birds and in the absence of mitigation, there would be a loss of breeding habitat for a number of years until newly planted trees form sufficient features. Therefore, it is recommended that 6 no. nest boxes for passerine species are installed throughout the Site. The location of bird boxes will be advised by a suitably qualified ecologist.

6.3.4 Mitigation 14: Biodiversity Hedgerow and Woodland Management

A **Hedgerow and Woodland Management Plan (HWMP)** has been prepared as part of the arboricultural report (Charles McCorkell Arboricultural Consultancy, 2024b). This will be reviewed by a suitably qualified Ecologist once all replanting has been finalised, and signed off by Meath CoCo's Biodiversity Department.

In addition to the arborist's recommendations, the following measures will be adopted by the Management Company tasked with maintaining the Site's landscaping into the future in order to fulfil the recommendations of the Hedgerow Appraisal (Enviroguide, 2024b):

- The hedgerow and woodland areas located along the outer boundaries of the Site will, as much as is practicable, be allowed to link up with each other. The provision of an almost continuous vegetative margin around the Site; through planted native hedgerows and trees, will maintain habitat connectivity with the surrounding environment.
- The understorey areas within the woodland belt that runs along the southern and eastern sides of the Site will be maintained in as wild a state as possible, with minimal intervention, and with areas of dense, scrub habitat allowed to form where landscaping is not proposed. This will recreate the natural habitat conditions present within the existing woodland.
- Hedgerows will be maintained with a minimum **natural meadow strip of 1-2m** at their base wherever possible. Hedges with plenty of naturally occurring flowers and grasses at the base support will provide higher quality habitat for local wildlife using the hedges.
- The 1-2m strip at the base of the hedgerow will be cut on a reduced mowing regime to encourage wildflower growth and maximise the value of the hedgerow for pollinators. A **two-cut management approach** is ideal for suppressing coarse grasses and encouraging wildflowers. Cut the hedgerow basal strip **once during February** (this is before most verge plants flower and it will not disturb ground-nesting birds). Cut the verge **once again during September and October** (this slightly later cutting date allows plants that were cut earlier in the year time to grow and set seed).

  N.B. Raising the cutter bar on the back cut will lower the risk to small mammals.
- Where hedgerow, scrub or woodland understorey trimming needs to occur, delay trimming as late as possible – until **January and February** as the surviving berry crop will provide valuable food for wildlife. The earlier this is cut; the less food will be available to help birds and other wildlife survive through the winter. Any hedgerow/scrub/woodland

trimming will be done outside of the nesting season and due consideration of the Wildlife Act 1976 (as amended) must be taken.

- Where possible, cut these outer boundary hedgerows on a minimum **3-year cycle** (cutting annually stops the hedgerow flowering and fruiting), and cut in rotation rather than all at once - this will ensure some areas of hedgerow will always flower (Blackthorn in March, Hawthorn in May etc.).
- Where they occur naturally, Bramble and Ivy should be allowed grow in hedgerows and along woodland areas, as they provide key nectar and pollen sources in summer and autumn.

Methods to Avoid

Hedgerows and woodland understorey will not be over-managed. Tightly cut hedges and vegetation mean there are fewer flowers and berries, thus reducing available habitats, feeding sources and suitable nesting sites.

Hedgerows and woodland understorey will not be cut between March 1st and August 31st inclusive. It is both prohibited (except under certain exemptions) and very damaging for birds as this is the period they will have vulnerable nests containing eggs and young birds.

Pesticide/ herbicide sprays or fertilisers will not be used near hedgerows or woodland understorey as they can have an extremely negative effect on the variety of plants and animals they support.

6.3.5 Biodiversity Enhancement

6.3.5.1 Biodiversity Enhancement by Design

The landscape plan incorporates native planting throughout the green spaces of the Proposed Development. The planting of native shrubs in the ground layer will provide cover and nesting opportunities for birds and small mammals. While the mixed planting of wildflowers and hedgerow will attract insects which act as food sources for the above species groups and also as pollinators.

The above measures are considered good for promoting pollinators and are considered to provide an overall enhancement of the biodiversity at the Site from the baseline due to the low value and non-native extent of habitats and species that are to be lost to facilitate the Proposed Development. As such, these measures are considered to have a potential positive impact at a local scale.

6.3.5.2 Enhancement 1: Wildflower Meadows

The Landscape Plan includes the planting of ornamental and floral species. It is recommended that wherever possible, the proposed planting of wildflower areas or ornamental non-tree or shrub plants are allowed to regenerate naturally by way of reusing topsoil from the Site to preserve the existing seedbank.

In addition, locally sourced wildflower seeds will be planted on all flowerbeds and along hedgerow margins. At a minimum, it is recommended that all wildflower seeds are Irish Provenance Certified Seed and are purchased from a reputable source such as Design by Nature (Wildflowers.ie). Under no circumstances should seed be purchased from non-Irish

growers, as often this seed may look similar to our native species but will not be adapted sufficiently for our pollinators to detect them. For example, while a flower from Ireland and Hungary may look the same, it is likely that Irish pollinators will not be attracted to things like its scent and therefore render it ineffective as a food source for pollinators. To maximise the biodiversity value of the landscaping at the Site, consideration has been made to the All-Ireland Pollinator Plan planting code (NBDC, 2022).

7 MONITORING

7.1 Construction Phase Monitoring

7.1.1 Ecological Clerk of Works (ECoW)

A suitably qualified ECoW will be employed before commencement and for the duration of the Construction Phase; to provide ecological advice and input to the construction team. The ECoW will carry out the monitoring activities listed below for the duration of the Construction Phase of the Proposed Development.

NOTE: The ECoW will be employed **several weeks before** commencement of works on Site; to allow time for the scope of ECoW works to be reviewed by the ecologist and any necessary pre-construction surveys to be carried out.

- The ECoW will be required to work closely with the Site Manager and Arborist; to arrange to carry out any necessary **pre-clearance surveys** of any vegetation present on Site, such as bat surveys prior to tree felling, or if clearance during the period March 1st – August 1st (i.e., the breeding bird nesting season) is required. It is noted that clearance will be avoided during this period wherever possible through good management of the construction timeline. **Pre-felling checks of trees for bats** will also be conducted by the ECoW.
- As part of the mitigation recommended in relation to mammals e.g., hedgehogs, the ECoW will liaise with the Site Manager to ensure that an adequate level of **site tidiness** is being maintained, i.e., that construction materials such as netting, plastic sheeting etc., are being stored securely and above ground.
- The ECoW will also liaise with the Site Manager to ensure that **mammal escape measures** are in place across the construction site in terms of excavations such as trenches, basements, foundations i.e., that planks or objects are being left in place at a suitable corner of any excavations each night.
- The ECoW will visit the Site and **assess the night-time lighting measures in place for the Construction Phase**; to ensure that they will not cause any impacts to local bats during the night-time. The ECoW will consult this EcIA to understand the priority areas for bat commuting/foraging at the Site and make recommendations where required.

7.1.2 Project Arborist

The project Arborist will be instructed **prior to commencement on Site**; to ensure that appropriate tree protection measures are in place. The southern and eastern boundary woodland will be sufficiently protected for the duration of the Construction Phase to

maximise their ecological value in the final landscape plan. The ECoW will report any issues relating to failure in the tree protection measures on Site to the project Arborist and the Site Manager throughout the Construction Phase to ensure these sections of hedgerow/woodland are protected for the duration of the works.

7.2 Operational Phase Monitoring

7.2.1 Ecologist

The ECoW will visit the Site post-construction to check the following are in place:

- **'Hedgehog highways'** – Gaps placed along southern and western boundary fencing to allow hedgehogs to continue to access the Site from the surrounding lands. A suitable qualified Ecologist will liaise with the Site Manager to ensure that these measures are in place.
- **Bat boxes and bird boxes** – A suitable qualified Ecologist will liaise with the Site Manager to ensure that these measures are in place.
- **Biodiversity Hedgerow and Woodland Management** - A suitable qualified Ecologist will review the Hedgerow and Woodland Management Plan (HWMP) once prepared for the Site and signed off by Meath CoCo's Biodiversity Department. The Ecologist will visit the Site each summer for the first three years post completion to review the management of the hedgerows and woodland areas at the Site, as well as the bat and bird boxes and confirm that the HWMP is being followed by the landscape maintenance company or will clear them themselves after confirming no bats or nests are present.

The following Table summarises the mitigation and monitoring measures recommended for the Proposed Development.

TABLE 13. SUMMARY OF CONSTRUCTION AND OPERATIONAL PHASE MITIGATION AND MONITORING.

Ecological Receptor	Relevant stage of the Proposed Development	Mitigation Measure	Monitoring Type	Details
Hedgerow and Woodland Areas	Construction Phase	Mitigation 5: Tree Protection Measures	ECoW & Arborist	The project Arborist will be instructed prior to commencement on Site; to ensure that appropriate tree protection measures are in place to protect the western and southern boundary hedgerow/woodland habitat being retained on Site. These measures will entail robust fencing around the root protection zones of all trees and hedgerows being retained on Site. An adequate level of signage will also be provided to highlight 'no work zones' and ensure that Site

Ecological Receptor	Relevant stage of the Proposed Development	Mitigation Measure	Monitoring Type	Details
				creep and damage to retained habitats does not occur. The western boundary hedgerow and southern boundary woodland will be sufficiently protected for the duration of the Construction Phase to maximise their ecological value in the final landscape plan. The project Arborist, the project Ecologist and the Site Manager will work together to ensure these sections of hedgerow/woodland are protected for the duration of the works.
Invasive Plant Species	Construction Phase	Mitigation 6 and 8: Pre-clearance invasive species survey by an Ecologist	ECoW	Pre-clearance survey for invasive species by a suitably qualified Ecologist and appropriate removal off Site as per TII (2020).
Birds & Hedgehogs	Construction Phase	Mitigation 8: Timing of Vegetation Clearance	ECoW	The ECoW will be required to work closely with the Site Manager; to arrange to carry out pre-clearance surveys of any vegetation present on Site, especially if clearance during the period March 1st – August 1st (i.e., the breeding bird nesting season) is required. It is noted that clearance will be avoided during this period wherever possible through good management of the construction timeline
Hedgehogs & Pine Marten	Construction Phase	Mitigation 6: Construction Site Management for Mammals	ECoW	Pre-clearance survey for badgers by a suitably qualified Ecologist. The ECoW will also liaise with the Site Manager to ensure that mammal escape measures are in place across the construction site in terms of excavations such as trenches, basements, foundations i.e., that planks or objects are being left in place at a suitable

Ecological Receptor	Relevant stage of the Proposed Development	Mitigation Measure	Monitoring Type	Details
				corner of any excavations each night
Bats	Construction Phase	Mitigation 7: Construction Phase Lighting Mitigation 8: Pre-felling checks for bats of trees.	ECoW	The ECoW will be required to check all trees to be felled for bats prior to felling. In the event that a roosting bat is found, no felling of the tree in question will take place and a derogation licence will be obtained from the NPWS to proceed. The Area around the tree will be protected with an appropriate buffer to prevent disturbance of the bat. The ECoW will assess the lighting measures in place for the Construction Phase; to ensure that they will not cause any impacts to local bats during the night-time. The ECoW will consult this EcIA to understand the priority areas for bat commuting/foraging at the Site and make recommendations where required.
Small mammals	Operational Phase	Mitigation 7: Hedgehog Highways / Mammal Holes	Ecologist	'Hedgehog highways' – Gaps placed along southern and western boundary fencing to allow hedgehogs/ badger to continue to access the Site from the surrounding lands. A suitably qualified Ecologist will liaise with the Site Manager to ensure that these measures are in place.
Bats	Operational Phase	Mitigation 12: Bat Boxes	Ecologist	Bat Boxes – A suitably qualified Ecologist will oversee installation of bat boxes and liaise with the Site Manager to ensure that these enhancement measures are functional.
Hedgerow and Woodland Areas and planting	Operational Phase	Mitigation 14: Biodiversity Hedgerow Management Plan	Ecologist	An ecologist will certify the seed purchased is from a reputable seller and is provenance and certified native Irish stock before any planting commences.

Ecological Receptor	Relevant stage of the Proposed Development	Mitigation Measure	Monitoring Type	Details
		Enhancement 1: Wildflower Meadow And Monitoring: Biodiversity Hedgerow and Woodland Management		Biodiversity Hedgerow and Woodland Management - A suitably qualified Ecologist will review the HWMP once prepared for the Site and signed off by Meath CoCo's Biodiversity Department. The Ecologist will visit the Site each summer for the first three years post completion to review the management of the hedgerows and woodland areas at the Site and confirm that the HWMP is being followed by the landscape maintenance company.

8 RESIDUAL IMPACTS

Residual impacts are impacts that remain once mitigation has been implemented or impacts that cannot be mitigated. Table 14 below provides a summary of the impact assessment for the identified KERs and details the nature of the impacts identified, the mitigation measures proposed, and the classification of any residual impacts.

Both standard Construction Phase control measures, and specific mitigation measures, have been outlined to ensure that the Proposed Development does not impact on any species, habitats or designated sites of conservation importance. It is essential that these measures are complied with, in order to ensure that the Proposed Development complies with National conservation legislation.

Provided all recommended measures are implemented in full and remain effective throughout the lifetime of the Proposed Development, no significant negative residual impacts on the local ecology, or on any designated nature conservation sites, will occur as a result of the Proposed Development.

TABLE 14. SUMMARY OF POTENTIAL IMPACTS ON KER(S), MITIGATION PROPOSED AND RESIDUAL IMPACTS.

Key Ecological Resource	Evaluation	Potential Impact	Impact Without Mitigation				Proposed Mitigation / Mitigating Factors	Proposed Enhancements	Residual Impact
			Quality	Magnitude / Extent	Duration	Significance			
DESIGNATED SITES									
No impacts to any designated sites will occur as a result of the Proposed Development and therefore no mitigation measures are recommended.									
HABITATS									
WD1 Mixed broadleaved woodland, WL2 Treelines and WL1 Hedgerows	Local Importance (Higher Value)	**Construction Phase:** Inadvertent damage/loss of habitat. Loss of trees to facilitate the Proposed Development **Operational Phase:** Increase in tree planting and diversity of habitats across the Site. Potential for the introduction of invasive species.	*Negative* *Negative* *Positive* *Negative*	*Local* *Local* *Local* *Local*	*Short term* *Short term* *Permanent* *Short term*	*Slight* *Slight* *Slight* *Slight*	**Mitigation 5:** Tree protection. **Mitigation 6:** Biosecurity **Mitigation 14:** Biodiversity Hedgerow and Woodland Management **Hedgerow Appraisal Mitigation**: Planting trees and hedgerows in a quantity that at least matches those being lost.	Biodiversity Enhancement by Design through Landscape Plan (Increase in native tree cover at the Site)	*Imperceptible* *Neutral, potentially positive in the long term* *Neutral, potentially positive in the long term* *Neutral*

Key	Evaluation	Potential Impact	Impact Without Mitigation				Proposed	Proposed	Residual
FW2 - Depositing/Lowland Rivers	County Importance	**Construction Phase:** Risk of deterioration of water quality from construction-related pollutants. **Operational Phase:** None identified.	*Negative*	*County*	*Short term*	*Moderate*	**Mitigation 1:** Surface water protection **Mitigation 2:** Silt and sediment control.	Biodiversity Enhancement by Design utilising SUDS	*Imperceptible*
FAUNA									
Bat Assemblage	Local Importance (Higher Value)	**Construction Phase:** Light disturbance during construction phase. Loss of commuting and foraging habitat. Loss of potential	*Negative* *Negative* *Negative*	*Local* *Local* *Local*	*Short term* *Permanent* *Permanent*	*Slight* *Significant* *Significant*	**Mitigation 7**: Construction phase lighting on bats Mitigation by design via new commuting corridor facilitated by lighting and landscape plans. **Mitigation 8**: Timing of vegetation	Enhancement by design with native trees to replace non native species which will increase insect populations and food source at the Site. **Enhancement 1**: Wildflower meadows to improve insect population at the Site and increase food source.	**Imperceptible** **Permanent, neutral** **Permanent, neutral**

Key	Evaluation	Potential Impact	Impact Without Mitigation				Proposed	Proposed	Residual
		roosting habitat. **Operational Phase:** None identified.					clearance. **Mitigation 12:** Installation of bat boxes.		
Potential Breeding Bird Assemblage	Local Importance (Higher Value)	**Construction Phase:** Risk of injury or death during vegetation clearance. Loss of breeding habitat Disturbance from noise, dust and/or lighting. **Operational Phase:** None identified.	*Negative* *Negative* *Negative*	*Local* *Local* *Local*	*Permanent* *Short term* *Short-term*	*Moderate* *Slight* *Slight*	**Mitigation 8:** Timing of Vegetation Clearance **Mitigation 13**: Bird boxes **Mitigation 3:** Reduction of noise impacts Best practice development standards outlined in various sections of the CMP.	Biodiversity Enhancement by Design to replace lost habitat.	**Negative, Local, Short-term, Slight** **Neutral** **Short term, negative, slight**

Key	Evaluation	Potential Impact	Impact Without Mitigation				Proposed	Proposed	Residual
Small Mammals (Hedgehog, Pine marten)	Local Importance (Higher value)	**Construction Phase:** Risk of injury or death during vegetation clearance and / or entrapment in construction-related rubbish. **Operational Phase:** None identified.	*Negative*	*Local*	*Short-term*	*Significant*	**Mitigation 8:** Vegetation Clearance **Mitigation 10:** Waste Management **Mitigation 11:** Mammal habitat connectivity	Enhancement 1: Wildflower meadows will increase the insect population at the Site and therefore small mammal food source.	**Permanent, positive, slight**
Fauna of Ratoath Stream: Fish, Otter and Amphibians	Local Importance (Higher Value)	**Construction Phase:** Risk of deterioration of water quality from construction-related pollutants. **Operational Phase:** None identified.	*Negative*	*Local*	*Short-term*	*Moderate*	**Mitigation 1:** Surface water protection **Mitigation 2:** Silt and sediment control.	Biodiversity Enhancement by Design utilising SUDS	**Imperceptible**

9 CONCLUSION

It is considered that, provided the mitigation measures proposed are carried out in full, there will be no likely significant adverse effects on any valued habitats, designated sites or individual or group of species as a result of the Proposed Development.

The Proposed Development is considered to result in an overall neutral impact to the Site in the long term. This will be achieved by increasing floral biodiversity of the Site via the landscaping plan, which proposes the retention of the majority of existing hedgerows and woodland at the Site and a net increase in total native and non-native trees at the Site through supplementary planting. This will in turn provide additional suitable foraging, commuting and nesting habitat for local populations including birds, bats and small mammals in an otherwise relatively built and urban location and provide connectivity between the Site and the wider area. When all is accounted for, this in combination with the mitigations will offset any negative effects on the ecology of the Site arising from the Proposed Development in line with Meath County Council Development Plan 2021-2027, specifically HER POL 27.

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APPENDIX I – LEGISLATION AND POLICY

International Legislation

EU Birds Directive

The Birds Directive constitutes a level of general protection for all wild birds throughout the European Union. Annex I of the Birds Directive includes a total of 194 bird species that are considered rare, vulnerable to habitat changes or in danger of extinction within the European Union. Article 4 establishes that there should be a sustainable management of hunting of listed species, and that any large scale non-selective killing of birds must be outlawed. The Directive requires the designation of Special Protection Areas (SPAs) for: listed and rare species, regularly occurring migratory species and for wetlands which attract large numbers of birds. There are 25 Annex I species that regularly occur in Ireland.

EU Habitats Directive

The Habitats Directive aims to protect some 220 habitats and approx. 1000 species throughout Europe. The habitats and species are listed in the Directives annexes where Annex I covers habitats and Annex II, IV and V cover species. There are 59 Annex I habitats in Ireland and 33 Annex IV species which require strict protection wherever they occur. The Directive requires the designation of Special Areas of Conservation (SACs) for areas of habitat deemed to be of European interest. The SACs together with the SPAs from the Birds Directive from a network of protected sites called Natura 2000.

Bern and Bonn Convention

The Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention 1982) was enacted to conserve all species and their habitats. The Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention 1979, enacted 1983) was introduced in order to give protection to migratory species across borders in Europe.

Ramsar Convention

The Ramsar Convention on Wetlands is an intergovernmental treaty signed in Ramsar, Iran, in 1971. The treaty is a commitment for national action and international cooperation for the conservation of wetlands and their resources. In Ireland there are currently 45 Ramsar sites which cover a total area of 66,994ha.

Water Framework Directive

The EU Water Framework Directive (WFD) 2000/60/EC is an important piece of environmental legislation which aims to protect and improve water quality. It applies to rivers, lakes, groundwater, estuaries, and coastal waters. The Water Framework Directive was agreed by all individual EU member states in 2000, and its first cycle ran from 2009 – 2015. The Directive runs in 6-year cycles; the second cycle ran from 2016 – 2021, and the current (third) cycle runs from 2022-2027. The aim of the WFD is to prevent any deterioration in the existing status of water quality, including the protection of good and high-water quality status where it exists. The WFD requires member states to manage their water resources on an

integrated basis to achieve at least 'good' ecological status, through River Basin Management Plans (RBMP), by 2027.

National Legislation

Wildlife Act 1976 and amendments

The Wildlife Act 1976 was enacted to provide protection to birds, animals, and plants in Ireland and to control activities which may have an adverse impact on the conservation of wildlife. With regard to the listed species, it is an offence to disturb, injure or damage their breeding or resting place wherever these occur without an appropriate licence from the National Parks and Wildlife Service (NPWS). This list includes all wild birds along with their nests and eggs. Intentional destruction of an active nest from the building stage up until the chicks have fledged is an offence. This includes the cutting of hedgerows from the 1st of March to the 31st of August. The act also provides a mechanism to give statutory protection to Natural Heritage Areas (NHAs). The Wildlife Amendment Act 2000 widened the scope of the Act to include most species, including the majority of fish and aquatic invertebrate species which were excluded from the 1976 Act.

The current list of plant species protected by Section 21 of the Wildlife Act, 1976 (and amendments) is set out in the Flora (Protection) Order, 2022 (S.I. No. 235/2022). The Flora (Protection) Order affords protection to several species of plant in Ireland, including 89 vascular plants, 40 mosses, 25 liverworts, 2 stonewort and 1 lichen. This Act makes it illegal for anyone to uproot, cut or damage any of the listed plant species and it also forbids anyone from altering, interfering, or damaging their habitats. This protection is not confined to within designated conservation sites and applies wherever the plants are found.

EU Habitats Directive 1992 and EC (Birds and Natural Habitats) Regulations 2011

The EU Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (Habitats Directive 1992) provides protection to particular species and habitats throughout Europe. The Habitats Directive has been transposed into Irish law through the EC (Birds and Natural Habitats) Regulations 2011.

Annex IV of the EU Habitats Directive provides protection to a number of listed species, wherever they occur. Under Regulation 23 of the Habitats Directive, any person who, in regard to the listed species, 'Deliberately captures or kills any specimen of these species in the wild, deliberately disturbs these species particularly during the period of breeding, rearing, hibernation and migration, deliberately takes or destroys eggs from the wild or damages or destroys a breeding site or resting place of such an animal shall be guilty of an offence.'

Invasive Species Legislation

Certain plant species and their hybrids are listed as Invasive Alien Plant Species in Part 1 of the Third Schedule of the *European Communities (Birds and Natural Habitats) Regulations* 2011 (SI 477 of 2011, as amended). In addition, soils and other material containing such invasive plant material, are classified in Part 3 of the Third Schedule as vector materials and are subject to the same strict legal controls.

Failure to comply with the legal requirements set down in this legislation can result in either civil or criminal prosecution, or both, with very severe penalties accruing. Convicted parties under the Act can be fined up to €500,000.00, jailed for up to 3 years, or both.

Extracts from the relevant sections of the regulations are reproduced below.

'49(2) Save in accordance with a licence granted [by the Department of Arts, Heritage and the Gaeltacht]*, any person who plants, disperses, allows or causes to disperse, spreads or otherwise causes to grow in anyplace* [a restricted non-native plant]*, shall be guilty of an offence.*

49(3) … it shall be a defence to a charge of committing an offence under paragraph (1) or (2) to prove that the accused took all reasonable steps and exercised all due diligence to avoid committing the offence.

50(1) Save in accordance with a licence, a person shall be guilty of an offence if he or she […] offers or exposes for sale, transportation, distribution, introduction, or release—
(a) an animal or plant listed in Part 1 or Part 2 of the Third Schedule,
(b) anything from which an animal or plant referred to in subparagraph (a) can be reproduced or propagated, or
(c) a vector material listed in the Third Schedule, in any place in the State specified in the third column of the Third Schedule in relation to such an animal, plant or vector material.'

Meath County Development Plan (MCDP) 2021 – 2027

Policies and objectives of the Meath County Development Plan (MCDP) 2021 – 2027 that are of relevance to this EcIA are outlined below:

Overall policies and objectives on Biodiversity:

- HER POL 27: 'To protect, conserve and enhance the County's biodiversity where appropriate.'
- HER POL 28: 'To integrate in the development management process the protection and enhancement of biodiversity and landscape features wherever possible, by minimising adverse impacts on existing habitats (whether designated or not) and by including mitigation and/or compensation measures, as appropriate.'
- HER POL 31: 'To ensure that the ecological impact of all development proposals on habitats and species are appropriately assessed by suitably qualified professional(s) in accordance with best practice guidelines – e.g. the preparation of an Ecological Impact Assessment (EcIA), Screening Statement for Appropriate Assessment, Environmental Impact Assessment, Natura Impact Statement (NIS), species surveys etc. (as appropriate).'
- HER OBJ 30: 'To implement, in partnership with the Department of Culture, Heritage and the Gaeltacht, relevant stakeholders and the community, the objectives and actions of Ireland's National Biodiversity Action Plan 2017 - 2021 which relate to the remit and functions of Meath County Council.'
- HER OBJ 31: 'To implement, in partnership with the Department of Culture, Heritage and the Gaeltacht, relevant stakeholders and the community, the objectives and actions of the County Meath Biodiversity Plan 2015-2020 and any revisions thereof.'

Protecting Biodiversity in Meath – Sites Designated for Nature Conservation

- HER OBJ 32: 'To actively support the implementation of the All Ireland Pollinator Plan 2021-2025 and any revisions thereof.'
- HER POL 32: 'To permit development on or adjacent to designated Special Areas of Conservation, Special Protection Areas, Natural Heritage Areas, Statutory Nature Reserves or those proposed to be designated over the period of the Plan, only where the development has been subject to the outcome of the Appropriate Assessment process and has been carried out to the satisfaction of the Planning Authority, in consultation with National Parks and Wildlife.'
- HER POL 33: 'To have regard to the views and guidance of the National Parks and Wildlife Service in respect of proposed development where there is a possibility that such development may have an impact on a designated European or National site or a site proposed for such designation.'
- HER POL 34: 'To undertake appropriate surveys and collect data to provide an evidence-base to assist the Council in meeting its obligations under Article 6 of the Habitats Directives (92/43/EEC) as transposed into Irish Law, subject to available resources.'
- HER OBJ 33: 'To ensure an Appropriate Assessment in accordance with Article 6(3) and Article 6(4) of the Habitats Directives (92/43/EEC) and in accordance with the Department of Environment, Heritage and Local Government Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities, 2009 and relevant EPA and European Commission guidance documents, is carried out in respect of any plan or project not directly connected with or necessary for the management of the site but likely to have a significant effect on a Natura 2000 site(s), either individually or in-combination with other plans or projects, in view of the site's conservation objectives.'
- HER OBJ 34: 'To protect and conserve the conservation value of candidate Special Areas of Conservation, Special Protection Areas, Natural Heritage Areas and proposed Natural Heritage Areas as identified by the Minister for the Department of Culture, Heritage and the Gaeltacht and any other sites that may be proposed for designation during the lifetime of this Plan in accordance with the provisions of the Habitats and Birds Directives and to permit development in or affecting same only in accordance with the provisions of those Directives as transposed into Irish Law.'

Protecting Biodiversity – Non-designated sites:

- HER POL 35: 'To ensure, where appropriate, the protection and conservation of areas, sites, species and ecological/networks of biodiversity value outside designated sites and to require an appropriate level of ecological assessment by suitably qualified professional(s) to accompany development proposals likely to impact on such areas or species.'

Protected Species:

- HER POL 36: 'To consult with the National Parks and Wildlife Service and take account of their views and any licensing requirements, when undertaking, approving or authorising development which is likely to affect plant, animal or bird species protected by law.'

- HER OBJ 35: 'To ensure that development does not have a significant adverse impact, incapable of satisfactory avoidance or mitigation, on plant, animal or bird species protected by law.'

Woodlands, Hedgerows and Trees:

- HER POL 37: 'To encourage the retention of hedgerows and other distinctive boundary treatments in rural areas and prevent loss and fragmentation, where practically possible. Where removal of a hedgerow, stone wall or other distinctive boundary treatment is unavoidable, mitigation by provision of the same type of boundary will be required.'
- HER POL 38: 'To promote and encourage planting of native hedgerow species in new developments and as part of the Council's own landscaping works.'
- HER POL 39: 'To recognise the archaeological importance of townland boundaries including hedgerows and promote their protection and retention.'
- HER POL 40: 'To protect and encourage the effective management of native and semi-natural woodlands, groups of trees and individual trees and to encourage the retention of mature trees and the use of tree surgery rather than felling, where possible, when undertaking, approving or authorising development.'
- HER POL 41: 'To protect trees the subject of Tree Preservation Orders (see Map 9.3), Champion and Heritage Trees identified on the Tree Register of Ireland and Heritage Tree Database when undertaking, approving, or authorising development.'

Invasive Species:

- HER POL 43: 'To promote best practice in the control of invasive species in the carrying out its functions in association with relevant authorities including TII and the Department of Transport, Tourism and Sport.'
- HER POL 44: 'To require all development proposals to address the presence or absence of invasive alien species on proposed development sites and (if necessary) require applicants to prepare and submit an Invasive Species Management Plan where such a species exists to comply with the provisions of the European Communities (Birds and Natural Habitats) Regulations 2011-2015.'

Green Infrastructure:

- HER POL 55: 'To require that all Land Use Plans protect, manage and provide where possible green infrastructure in an integrated and coherent manner.'
- HER OBJ 60: 'To encourage, pursuant to Article 10 of the Habitats Directive (92/43/EEC), the management of features of the landscape, such as traditional field boundaries, important for the ecological coherence of the Natura 2000 network and essential for the migration, dispersal and genetic exchange of wild species.'

County Meath Biodiversity Action Plan 2015-2020

The main function of the County Meath Biodiversity Action Plan (BAP) 2015-2020 is to provide a framework and series of actions to conserve, enhance and raise awareness of Meath's rich biodiversity and to maximise the contribution that it makes to the social,

economic and environmental wellbeing of the county, taking into account local, national and international, including European priorities.

The County Meath BAP contains four main objectives:

- **Objective 1:** To raise awareness of biodiversity in Meath, its value and the issues facing it.
- **Objective 2:** To better understand the biodiversity of Meath.
- **Objective 3:** To conserve and enhance habitats and species in Meath, taking account of national and local priorities.
- **Objective 4:** To foster active participation to help biodiversity in Meath, encouraging a partnership approach to help our species and habitats.

The BAP includes a total of 28 action items to meet these objectives, ranging from monitoring projects to preparing guidance documents and increasing public awareness.

APPENDIX II – VALUE OF ECOLOGICAL RESOURCES

The criteria outlined in the table below, taken from the *Guidelines for Assessment of Ecological Impacts of National Road Schemes* published by the NRA, were used for assigning value to designated sites, habitats and species within the Site of the Proposed Development and surrounding area.

Table A2.1. Description of values for ecological resources based on geographic hierarchy of importance (NRA, 2009b).

Importance	Criteria

International Importance	- 'European Site' including Special Area of Conservation (SAC), Site of Community Importance (SCI), Special Protection Area (SPA) or proposed Special Area of Conservation.
	- Proposed Special Protection Area (pSPA). - Site that fulfils the criteria for designation as a 'European Site' (see Annex III of the Habitats Directive, as amended).
	- Features essential to maintaining the coherence of the Natura 2000 Network
	- Site containing 'best examples' of the habitat types listed in Annex I of the Habitats Directive.
	- Resident or regularly occurring populations (assessed to be important at the national level) of the following:
	  o Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; and/or
	  o Species of animal and plants listed in Annex II and/or IV of the Habitats Directive
	- Ramsar Site (Convention on Wetlands of International Importance Especially Waterfowl Habitat 1971).
	- World Heritage Site (Convention for the Protection of World Cultural & Natural Heritage, 1972).
	- Biosphere Reserve (UNESCO Man & The Biosphere Programme)
	- Site hosting significant species populations under the Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals, 1979).
	- Site hosting significant populations under the Berne Convention (Convention on the Conservation of European Wildlife and Natural Habitats, 1979).
	- Biogenetic Reserve under the Council of Europe.
	- European Diploma Site under the Council of Europe.
	- Salmonid water designated pursuant to the European Communities (Quality of Salmonid Waters) Regulations, 1988, (S.I. No. 293 of 1988).

National Importance	- Site designated or proposed as a Natural Heritage Area (NHA).
	- Statutory Nature Reserve.
	- Refuge for Fauna and Flora protected under the Wildlife Acts.
	- National Park.
	- Undesignated site fulfilling the criteria for designation as a Natural Heritage Area (NHA); Statutory Nature Reserve; Refuge for Fauna and Flora protected under the Wildlife Act; and/or a National Park.
	- Resident or regularly occurring populations (assessed to be important at the national level) of the following:
	  o Species protected under the Wildlife Acts; and/or
	  o Species listed on the relevant Red Data list.
	  o Site containing 'viable areas' of the habitat types listed in Annex I of the Habitats Directive

County Importance	- Area of Special Amenity. - Area subject to a Tree Preservation Order. - Area of High Amenity, or equivalent, designated under the County Development Plan.

	- Resident or regularly occurring populations (assessed to be important at the County level) of the following:
	  o Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive;
	  o Species of animal and plants listed in Annex II and/or IV of the Habitats Directive;
	  o Species protected under the Wildlife Acts; and/or
	  o Species listed on the relevant Red Data list.
	  o Site containing area or areas of the habitat types listed in Annex I of the Habitats Directive that do not fulfil the criteria for valuation as of International or National importance.
	- County important populations of species; or viable areas of semi-natural habitats; or natural heritage features identified in the National or Local BAP; if this has been prepared.
	- Sites containing semi-natural habitat types with high biodiversity in a county context and a high degree of naturalness, or populations of species that are uncommon within the county.
	- Sites containing habitats and species that are rare or are undergoing a decline in quality or extent at a national level.

Local Importance (higher value)	- Locally important populations of priority species or habitats or natural heritage features identified in the Local BAP, if this has been prepared;
	- Resident or regularly occurring populations (assessed to be important at the Local level) of the following:
	  o Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive;
	  o Species of animal and plants listed in Annex II and/or IV of the Habitats Directive;
	  o Species protected under the Wildlife Acts; and/or o
	  o Species listed on the relevant Red Data list.
	  o Sites containing semi-natural habitat types with high biodiversity in a local context and a high degree of naturalness, or populations of species that are uncommon in the locality;
	- Sites or features containing common or lower value habitats, including naturalised species that are nevertheless essential in maintaining links and ecological corridors between features of higher ecological value.

Local Importance (lower value)	- Sites containing small areas of semi-natural habitat that are of some local importance for wildlife; - Sites or features containing non-native species that is of some importance in maintaining habitat links.

APPENDIX III – EPA IMPACT ASSESSMENT CRITERIA

In line with the draft EPA Guidelines (EPA 2022), the following terms are defined when evaluating and quantifying the quality, significance, extent/context, probability and duration/frequency of effects.

Table A3.1. Definition of quality, significance, extent/context, probability and duration/frequency of effects.

Term	Definition
Quality of Effects	
Positive	A change which improves the quality of the environment (for example, by increasing species diversity, or improving the reproductive capacity of an ecosystem, or by removing nuisances or improving amenities).
Neutral	No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.
Negative/Adverse	A change which reduces the quality of the environment (for example, lessening species diversity or diminishing the reproductive capacity of an ecosystem, or damaging health or property or by causing nuisance).
Significance of Effects	
Imperceptible	An effect capable of measurement but without significant consequences.
Not Significant	An effect which causes noticeable changes in the character of the environment but without significant consequences.
Slight	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
Moderate	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
Significant	An effect which, by its character, magnitude, duration or intensity, alters a sensitive aspect of the environment.
Very Significant	An effect which, by its character, magnitude, duration or intensity, significantly alters most of a sensitive aspect of the environment.
Profound	An effect which obliterates sensitive characteristics. No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.
Extent and Context of Effects	
Extent	Describe the size of the area, the number of sites and the proportion of a population affected by an effect.
Context	Describe whether the extent, duration or frequency will conform or contrast with established (baseline) conditions (is it the biggest, longest effect ever?)
Probability of Effects	

Likely	The effects that can reasonably be expected to occur because of the planned project if all mitigation measures are properly implemented.
Unlikely	The effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented.
Duration and Frequency of Effects	
Momentary	Effects lasting from seconds to minutes.
Brief	Effects lasting less than a day
Temporary	Effects lasting less than a year.
Short-term	Effects lasting one to seven years.
Medium-term Effects	Effects lasting seven to fifteen years.
Long-term	Effects lasting fifteen to sixty years.
Permanent	Effects lasting over sixty years.
Reversible	Effects that can be undone, for example through remediation or restoration.
Frequency	Describe how often the effect will occur (once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually).

APPENDIX IV – SURVEY INFORMATION

Survey Type	Date	Surveyor/(s)
Preliminary Ecological Appraisal	28th of September 2023	BMc
Hedgerow Appraisal	13th of June 2024	YM, NB

Bat Surveys

Survey Type	Date	Surveyor/(s)	Relevant Weather Conditions
Bat Transect Survey	28th September 2023	BMc, SC	Temp (C): 11 Wind (Beaufort): 2 Rain: Mist
Bat Tree Roost Assessment	6th March 2024	SC	n/a
Bat Transect Survey	15th April 2024	SC, EK	Temp (C): 10 Wind (Beaufort): 1 Rain: None
Emergence (Building B)	8th May 2024	SC, KMcC	Temp (C): 15 Wind (Beaufort): 1 Rain: None
Bat Transect Survey	5th June 2024	SC, SOB	Temp (C): 16 Wind (Beaufort): 1 Rain: None
Emergence (Building C)	11th June 2024	BMc, KMcC	Temp (C): 13 Wind (Beaufort): 1 Rain: None
Static Detector Monitoring	15th April 2024 – 23rd April 2024	SC	The survey period captured the minimum of 5 nights of good weather (Collins, 2023)
Static Detector Monitoring	5th June 2024 – 11th June 2024	SC	The survey period captured the minimum of 5 nights of good weather (Collins, 2023)

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