6.1 Biodiversity

6.2 Introduction

This Biodiversity Chapter 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 particular 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 assesses 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, 2024) and supplemented by the National Roads Authority (2009) guidelines for Assessment of Ecological Impacts of National Road Schemes. The purpose of this Chapter 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.

6.2.1 Quality Assurance and Competency of Experts

All surveying and reporting have been carried out by qualified and experienced ecologists and environmental consultants. Charith Rakesh Kumar (CRK), Ecologist with DNV authored and undertook the field surveys for this report. Abbie Doyle (AD), Caitlin Markey (CK), and Caoimhin Rohu (CR) Ecologist Interns with DNV (formerly known as Enviroguide), Kelly Macken (KM), Graduate Ecologist with DNV, and Bryan Thompson (BT), Ecologist with DNV carried out the bat surveys for the Site. Brian McCloskey (BM), Ecologist with DNV, undertook the breeding bird surveys for the Site.

CRK is an Ecologist with a M.Sc. in Biodiversity and Conservation from Trinity College Dublin. CRK's experience as an ecologist is broad both variety of ecological reports and literature, and field surveys conducted. CRK has experience in surveying habitats, birds, plants, bats, mammals and invasive species, with some experience in assessing welfare conditions of animals using behavioural repertoires as indicators. CRK's experience in ecological report writing extends from Research associated reporting to Appropriate Assessment (AA) Screening reports, Natura 200 Impact (NIS) reports, Preliminary Environmental Assessment (PEA) reports, and Ecological Impact Assessment (EcIA) reports.

BM is an Ecologist and experienced Ornithologist with 12 years of bird survey experience. BM 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. BM is highly experienced with all survey methodologies and with surveying all species groups of Irish birds and migrants.

KM is a Graduate Ecologist with DNV and has a B.Sc (Hons) in Environmental Biology from University College Dublin. KM has a range of fieldwork experience including mammal, bird, and amphibian surveys in addition to freshwater ecology research. KM has extensive experience in data collection and ecological report writing, including but not limited to appropriate assessment screening reports.

AD is an Intern Ecologist with a B.Sc. (Hons) in Geoscience from Trinity College Dublin, and a MSc in Applied Environmental Science from University College Dublin. AD's experience includes both geological and ecological field and laboratory work, molecular biomarker analysis and ecological

report preparation. AD is also a student member of the Chartered Institute of Ecology and Environmental Management (CIEEM).

CM is an Intern Ecologist with DNV and has a B.Sc (Hons) in Zoology from University College Dublin. CM has experience in data collection, ecological modelling, report writing, animal handling, and field surveying, including invasive species sampling, animal behaviour monitoring, species identification, and habitat sampling. CM has partaken in projects across marine, freshwater and terrestrial systems, focusing on ecological impacts and invasive species, and has contributed to relevant reports and academic research.

6.2.2 Relevant Legislation and Policy Context

There are a number of 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 in 2000.
- Flora (Protection) Order 2022.
- The Planning and Development Act 2024 as amended.
- National Biodiversity Plan 2023 - 2030.

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 Special Areas of Conservation (SAC) and/or Special Protection Area (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.

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

- Fingal Development Plan 2023-2029
- Fingal Biodiversity Action Plan 2023-2030

6.2.3 Assessment Methodology

This Biodiversity Chapter has been undertaken to support and assess the Proposed Development planning application and assesses 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 methodology employed to undertake an ecological impact assessment of the Proposed Development.

6.2.4 Nature Conservation Importance

Determining 'importance' of ecological features relies on professional judgement and includes consideration of factors such as size, conservation status and quality, as well as the policy and legal significance. 'Importance' is measured against published selection criteria where available and with reference to published lists (e.g. CIEEM Guidelines for Ecological Impact Assessment). 'Importance' should take into account potential for future restoration of habitats, species populations or ecosystems, which are currently in unfavourable or sub-optimal condition. It should also take into account the importance of the feature to other important features (e.g. a low quality habitat that will allow migration of an adjacent high quality habitat as a consequence of climate change, stepping stone habitats for migratory species or species dispersal).

It should be noted that some species are subject to legal protection that varies through the year (e.g. birds have special protection during the breeding season), or that does not relate to conservation status (e.g. badgers which are subject to protection primarily on animal welfare grounds). Where protected species are present and there is potential for a breach of the legislation, those features are considered as 'important' features. Legally controlled species, e.g. species listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended), are also considered to ensure that land-use changes do not result in contravention of legislation.

The CIEEM Guidelines for Ecological Impact Assessment recommend that the importance of each ecological feature is described in terms of its geographic frame of reference. To achieve no net loss of biodiversity and maintenance of healthy ecosystems this impact assessment will consider impacts at all scales.

Table 6.1 below provides the definitions used for various Ecological Receptors as per their associated value or importance across different levels.

Table 6.1: Evaluation of Ecological Receptor

Value/ Importance	Criteria
International (European)	- '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 (Ireland)	- 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. - Site containing 'viable areas' of the habitat types listed in Annex I of the Habitats Directive
Regional (County Dublin)	- 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.
Authority Area (Fingal County Council)	- 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 (immediate Area)	- Locally important populations of priority species or habitats or natural heritage features identified in the Local BAP, if this has been prepared; - 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. - 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. - 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.

Full justification is provided in the assessment for those ecological features that have been recorded in the study area but have been identified as being not 'important'. Those features are scoped out and not assessed further in the EcIA.

6.2.5 Assessment of Effects

The assessment of the potential effects of the proposed scheme considers both on-site effects and those that may occur to adjacent and more distant nature conservation receptors. Impacts on nature conservation receptors have been characterised, including consideration of:

- Positive or negative (e.g. adverse/beneficial);
- Duration (e.g. permanent/temporary);
- Reversibility (e.g. irreversible/reversible)
- Extent/magnitude;
- Frequency and timing.

Impacts can occur during construction and/or operation, can be permanent or temporary and can include:

- Direct loss of habitats (including temporary loss);
- Fragmentation and isolation of habitats;
- Disturbance to species from noise, light or other visual stimuli;

- Changes to key habitat features;
- Changes to the local hydrology, water quality and/or air quality; and
- Direct mortality or injury to wildlife through construction activities and/or operation.

The significance of effect on an ecological receptor is assessed by considering the environmental sensitivity or value of the receptor and the magnitude of impact. However, effects on conservation status have only been assessed in detail for ecological receptors of local value for biodiversity or greater, and which could be affected by the proposed scheme. Effects on receptors of Less than Local value for biodiversity have been scoped out of further assessment.

The level of impact on biodiversity resources has been assigned as outlined within Table 6.2. Where more than one significance outcome is possible, professional judgement has been used to determine which is most appropriate, on a case by case basis, and ensuring regard to the precautionary principle.

Table 6.2: Impact Magnitude and Character for Ecological Features

Level of Impact (Change)	Impact Characteristics	
Major	Adverse	1) Permanent/ irreversible damage to a biodiversity resource; and 2) The extent, magnitude, frequency, and/or timing of an impact negatively affects the integrity or key characteristics of the resource.
	Beneficial	1) Permanent addition of, improvement to, or restoration of a biodiversity resource; and 2) The extent, magnitude, frequency, and/or timing of an impact positively affects the integrity or key characteristics of the resource
Moderate	Adverse	1) Temporary/reversible damage to a biodiversity resource; and 2) The extent, magnitude, frequency, and/or timing of an impact negatively affects the integrity or key characteristics of the resource.
	Beneficial	1) Temporary addition of, improvement to, or restoration of a biodiversity resource; and 2) The extent, magnitude, frequency, and/or timing of an impact positively affects the integrity or key characteristics of the resource.
Minor	Adverse	1) Permanent and irreversible damage to a biodiversity resource; and 2) The extent, magnitude, frequency, and/or timing of an impact does not

		affect the integrity or key characteristics of the resource.
	Beneficial	1) Permanent addition of, improvement to, or restoration of a biodiversity resource; and 2) The extent, magnitude, frequency, and/or timing of an impact does not affect the integrity or key characteristics of the resource.
Negligible	Adverse	1) Temporary and reversible damage to a biodiversity resource; and 2) The extent, magnitude, frequency, and/or timing of an impact does not affect the integrity or key characteristics of the resource.
	Beneficial	1) Temporary addition of, improvement to, or restoration of a biodiversity resource; and 2) The extent, magnitude, frequency, and/or timing of an impact does not affect the integrity or key characteristics of the resource.
No Change	No observable impact, either positive or negative	

6.2.6 Significance of Effects

When determining the significance of an effect, consideration is given to whether:

- any processes or key characteristics will be removed or changed;
- there will be an effect on the nature, extent, structure and function of component habitats; and
- there is an effect on the average population size and viability of component species.

Functions and processes acting outside the formal boundary of a designated site have also been considered, particularly where a site falls within a wider ecosystem, or where areas of land are functionally linked to the designated sites (for example, habitats used occasionally for grazing by notable bird species but aren't included within the designated site boundary).

Some habitats and ecosystems can tolerate a degree of minor change, such as localised or temporary disturbance or changes in physical conditions, without such changes harming their function or value. Ecological effects have considered information available about the capacity of ecosystems to accommodate change.

The conservation status of undesignated habitats and species within a defined geographical area has been used to determine whether the effects of the proposals are likely to be significant:

- For habitats, conservation status is determined by the sum of the influences acting on the habitat that may affect its extent, structure and functions as well as its distribution and its typical species within a given geographical area; and
- For species, conservation status is determined by the sum of influences acting on the species concerned that may affect its abundance and distribution within a given geographical area.

The principles of the mitigation hierarchy have been applied when considering impacts and subsequent effects on nature conservation receptors within the ZoI. The principles state that in order of preference, impacts on biodiversity should be avoided, reduced, then remediated. If there are significant residual adverse effects that cannot be mitigated, then compensation will be required. Enhancement measures are also identified to provide benefits for biodiversity above the requirements for avoidance, mitigation or compensation.

Taking mitigation into account, the significance of residual effects on nature conservation receptors has been identified using professional judgement. The significance of residual effects is defined in Table 6..

Table 6.3: Significance of residual effects

	Level of Impact					
Resource Importance		No Change	Negligible	Minor	Moderate	Major
	International or European importance	Neutral	Slight	Moderate or large	Large or very large	Very large
	UK or national importance	Neutral	Slight	Slight or moderate	Moderate or large	Large of very large
	Regional importance	Neutral	Neutral or slight	Slight	Moderate	Moderate or large
	County or equivalent authority importance	Neutral	Neutral or slight	Neutral or slight	Slight	Slight or moderate
	Local importance	Neutral	Neutral or slight	Neutral or slight	Neutral or slight	Slight

6.2.7 Mitigation Hierarchy and Delivery

The approach to mitigation for impacts on natural conservation resources is to adhere to the mitigation hierarchy, as follows:

- Avoid – impacts are avoided through measures incorporated into the design and good working practices;
- Mitigate – impacts are reduced where possible to a level that the effect on the nature conservation resource is not significant through measures implemented through the design, construction and operation phases;
- Compensate – impacts that are unavoidable and where mitigation does not reduce the effect to a level that is not significant are compensated for through creation or provision of new resources, such as habitat or places of shelter for animals.

6.2.8 Baseline Conditions and Importance

The following sections describe those features of ecological value relevant to the study area that have been identified through the data collection processes.

For each feature of interest, the following factors have been considered:

- Current condition / status of the habitat or species within the study area;
- Factors upon which the conservation status or integrity of the feature depends; and,

- Value of the feature, including the consideration of its significance on different geographical scales.

6.2.9 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; and
- Where possible, propose mitigation measures to remove or reduce those impacts at the appropriate stage of the Proposed Development.

6.2.10 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 in April 2025, 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 Floral Protection Order (FPO) Bryophytes database at *dahg.maps.arcgis.com*;
- Information on waterbodies, catchment areas and hydrological connections obtained from the Environmental Protection Agency (EPA) at *gis.epa.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;*
- Satellite imagery and mapping obtained from various sources and dates including Google, Digital Globe, Bing and Ordnance Survey Ireland;
- Information on the existence of permitted development, or developments awaiting decision, in the vicinity of the Proposed Development from the National Planning Application Database available at: *https://housinggovie.maps.arcgis.com/apps/webappviewer/index.html?id=9cf2a09799d74d8e9316a3d3a4d3a8de; and*
- Information on the extent, nature and location of the Proposed Development, provided by the applicant and/or their design team.

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

6.2.10.1 Bats

The Bat Conservation Ireland Landscape Suitability Model (Lundy *et al*., 2011) provides a habitat suitability index for bat species across Ireland. The model divides the country into 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

Additionally, the NBDC website (www.nbdc.ie) was also interrogated for historical records of bats within the O03 10km grid square encompassing the Site of the Proposed Development. According to Collins (2023), Irish bats typically have a Core Sustenance Zone (CSZ) of under 5km. A CSZ is defined as "*the area surrounding a communal bat roost within which habitat availability and quality will have a significant influence on the resilience and conservation status of the colony using the roost*". A study by Sheil *et al.,* (1999) found Leisler's bats (*Nyctalus leisleri*) had a maximum foraging range of 13.4km. A similar study by Waters *et al.*, (1999) found Leisler's bats

flew a mean maximum distance of 4.2km from the roost. The NBDC database offers a maximum search range of 10km. Therefore, this distance was chosen as the most suitable range to assess the likely impacts on bat foraging and commuting.

6.2.10.2 Zone of Influence

The ZOI for a project is the area over which ecological features may be affected by changes as a result 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.

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).*"

6.2.10.3 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 (S-P-R) 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., United Nations Educational, Scientific and Cultural Organization (UNESCO) Biospheres; and

- Regional development plans to identify any remaining sites or areas designated for nature conservation at a local level.

6.3 Receiving Environment

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

6.3.1 Proposed Development

6.3.1.1 Geology, Hydrogeology, and Geology

The Proposed Development (St. Mochta's LRD) is located within the Liffey_SC_100 sub catchment within the Liffey and Dublin Bay catchment. The nearest mapped watercourse to the Site, namely Royal Canal Main Line (Liffey and Dublin Bay) (IE_09_AWB_RCMLE) stream is located approximately 25m to the north (EPA, 2025). This watercourse is classified as being of 'Good' qualify for the survey period 2016 – 2021. There are no Q-values available for along the length of this watercourse. The Royal Canal Main Line (Liffey and Dublin Bay) flows east then southeast for approximately 10.2km from the Proposed Development, before discharging into the Tolka Estaury (IE_EA_090_0200) transitional waterbody. This then ultimately flows into the Dublin Bay (IE_EA_090_0000) coastal waterbody, which is located 16.4km downstream of the Proposed Project. The Rusk Stream (IE_EA_09L012350) is located approximately 1km southwest of the Site and flows southward to join the River Liffey (IE_EA_09L012350) approx. 1.3 kilometres (km) south of the Site. The River Liffey continues via the Liffey Estuary upper (IE_EA_090_0400) (approx. 7.1km southeast) and the Liffey estuary lower (IE_EA_090_0300) (10.9km east) before draining into the Dublin Bay approximately 18.1km downstream of the Site.

The groundwater body underlying the Site is the Dublin (IE_EA_G_008), which is classed as being of 'Good' water quality for the 2016 – 2021 survey period. The bedrock aquifer identified beneath the Site is mapped as "*Locally Important Aquifer - Bedrock which is Moderately Productive only in Local Zones*" (Ll), with a small section at the southwest section of the Site classed as "*Poor Aquifer - Bedrock which is Generally Unproductive except for Local Zones*" (Pl). The Groundwater Vulnerability Rating assigned to groundwater beneath the Site is mapped as "*Extreme*" (E) for the predominant area, and "*Rock at or near Surface or Karst*" (X) for a small section along the southwest boundary of the Site (GSI, 2025).

The soil beneath the Site comprises "*Fine loamy drift with limestones".* The quaternary sediments beneath the Site are mapped as "*Till derived from limestones"* (TLs) while the subsoils beneath the Site are mapped as "*Limestone till (Carboniferous)"* (TLs) for the predominat area, with a small section along the eastern boundary of the Site classed as "*Bedrock at surface*" (RcK) (GSI, 2025)

The Environmental Protection Agency (EPA) water quality monitoring data for the stations on the River Liffey located closest to the Site is summarised in Table 6.4. The reported Q-value results indicate that water quality in the River Liffey upstream of the Site is moderate (2022) and in the River Liffey downstream of the Site is poor (2005). The EPA data indicates that there is a downward trend in Total Ammonia and an upward trend for Ortho-phosphate (as P) for the water course for the period 2013-2018 (EPA, 2025).

Table 6.4: WFD Risk and Waterbody Status

EPA Monitoring Station name	Station Code	Location from Site	Distance from Site	Assigned Q value
Lucan Br	RS09L012100	Southwest upstream	3.23km	3-4 "Moderate"

Liffey - 1km u/s Chapelizod Br (Glenaulin Park)	RS09L012330	Southeast downstream	4.51km	3 "Poor"

The Waterbody Status for river, groundwater, transitional and coastal water bodies relevant to the Site as recorded by the EPA (2025) in accordance with European Communities (Water Policy) Regulations 2003 (SI no. 722/2003) are provided in Table 6.5.

Table 6.5: WFD Risk and Waterbody Status

Waterbody Name	Water body; EU code	Distance from Site (km)	WFD water body status (2016-2021)	WFD 3rd cycle Risk Status	Hydraulic Connection to the Site
Surface Water Bodies					
Royal Canal Main Line (Liffey and Dublin Bay)	IE_09_AWB_RCMLE	0.03 N	Good	Review	None
Rusk Stream	IE_EA_09L012350	1.09 SW	Poor	At risk	1.09km southwest of Site
River Liffey	IE_EA_09L012350	1.26 S	Poor	At risk	Downstream of Rusk Stream
Transitional Water Bodies					
Liffey Estuary Lower	IE_EA_090_0300	12km SE	Moderate	At Risk	Downstream
Liffey Estuary Upper	IE_EA_090_0400	6.83 SE	Good	Review	Downstream of River Liffey
Tolka Estuary	IE_EA_090_0200	10.2 E	Poor	At Risk	Downstream of Royal Canal
Coastal Water Bodies					
Dublin Bay	IE_EA_090_0000	16.4km E	Good	Not at Risk	Downstream
Groundwater Bodies					
Dublin	IE_EA_G_008	N/A	Good	Review	Underlying groundwater-body

6.3.1.2 Designated Sites

Designated Sites such as European sites- Special Areas of Conservation (SAC), and Special Protection Area (SPA), proposed Natural Heritage Areas (pNHAs), Ramsar Sites, and United Nations Educational, Scientific and Cultural Organization (UNESCO) Sites potentially linked to the Site of the Proposed Development are discussed in this section.

6.3.1.2.1 European Sites

The following conclusion is extracted from the AA Screening Report accompanying this application under separate cover (DNV, 2025), and is as follows:

"*The Proposed Development at St. Mochtas LRD has been assessed considering:*

- *The nature, size and location of the Proposed Development and possible impacts arising from the construction and/or operational phase.*
- *The SCI/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:*

- *South Dublin Bay SAC (000210),*
- *South Dublin Bay and River Tolka Estuary SPA (004024)*
- *North Dublin Bay SAC (000206)*
- *North Bull Island SPA (004006)*
- *North-West Irish Sea SPA (004326)*
- *Rye Water Valley/Carton SAC (001398)*

In carrying out this AA Screening, any targeted ecological mitigation measures and/or measures intended or included for the purposes of avoiding adverse effects arising as a result of the Proposed Development on any European site 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' conservation objectives. Thus, there is ***no*** *requirement to proceed to Stage 2 of the AA process; and the preparation of a NIS is not required*."

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

6.3.1.2.2 Proposed Natural Heritage Areas (pNHA)

The *Royal Canal (002103)* pNHA is of **national importance** and is the closest pNHA to the Site of the Proposed Development, located approximately 17m away from the Site. This is significant enough a distance that impact pathways via land but not air pathways are deemed insignificant. However, there are no water courses present on Site that connect to the Royal Canal Main Line watercourse that flows in this pNHA, and the existing train line north of the Site will act as a buffer to surface water flow between the Site and the pNHA. While there is a hydrogeological pathway to this pNHA from the Site of the Proposed Development, the embedded mitigations for the Construction Phase of the Proposed Project will negate any impacts via this pathway. Furthermore, impacts via air pathways such as noise disturbances will not impact QIs of *Royal Canal* pNHA such as otters (*Lutra lutra)* due to their acclimatisation with high levels of noise generated from the existing carriageway along the eastern boundary of the Site, and the train line beyond the northern boundary.

Impacts via air pathways such as dust may have a significant impact on the water quality of the Royal Canal pNHA located 17m from the Site. While there is a significant vegetation buffer of mature hedgerow of approximately 6m wide along approximately 200m of the northern boundary, and vegetation buffer of 10m along the banks of the Royal Canal extending to 16m in parts, these factors along with the embedded mitigations in the CEMP for the control of dust emission may not significantly negate impacts via this pathway for the Construction Phase of the Proposed Development.

Impacts via air pathways such as dust may have significant impacts on the QIs of the Royal Canal pNHA such as protected floral species and otters *(Lutra lutra)* given the close proximity of the pNHA to the Site in the absence of embedded mitigation measures for dust control during the Construction Phase but not the Operational Phase.

Therefore, it is concluded that impact pathways via dust emission between the Proposed Development and *Royal Canal* pNHA is considered to potentially be significant, with **minor** level of impact, which at a national level would identify as **slight** impact levels to the pNHA.

6.3.1.2.3 Ramsar Sites

The *Sandymount Strand/ Tolka Estuary (832)* Ramsar site is of **international importance** and is the closest Ramsar site to the Site of the Proposed Development, located approximately 12.3km southeast of the Site. The Royal Canal Main Line stream north of the Site flows into this Ramar Site. However, given the lack of hydrological connections between the Site and the stream, the embedded mitigation measures for the Construction Phase of the Proposed Project for hydrogeological pathways to the stream, the dilution effect of the intervening river distance up to the point of discharge into the transitional waterbodies, the tidal nature of the waters near *Sandymount Strand/ Tolka Estuary* Ramsar site, and the presence of the train line that will act as a buffer to surface water flows from the Site, it can be concluded that impact pathways between the Proposed Development and this Ramsar site is considered to be insignificant, with **no change** in the level of impact, which at an international level identifies as **neutral** level of impacts to *Sandymount Strand/ Tolka Estuary (832).*

6.3.1.2.4 UNESCO Sites

The *Dublin Bay Biosphere* UNESCO site is of **international importance** and is the closest UNESCO site to the Site of the Proposed Development, located approximately 9.7km east of the Site. The Royal Canal Main Line watercourse north of the Site discharges into the UNESCO site. However, given the lack of hydrological connections between the Site and the watercourse, the embedded mitigation measures for the Construction Phase of the Proposed Project for hydrogeological pathways to the watercourse, the dilution effect of the intervening river distance up to the point of discharge into this site, and the presence the train line that will act as a buffer to surface water flows from the Site, it can be concluded that impact pathways between the Proposed Development and this UNESCO site is considered to be insignificant. Therefore, **no change** in the level of impacts to this UNESCO site is foreseen, which at an international level translates to **neutral** level of impacts to *Dublin Bay Biosphere.*

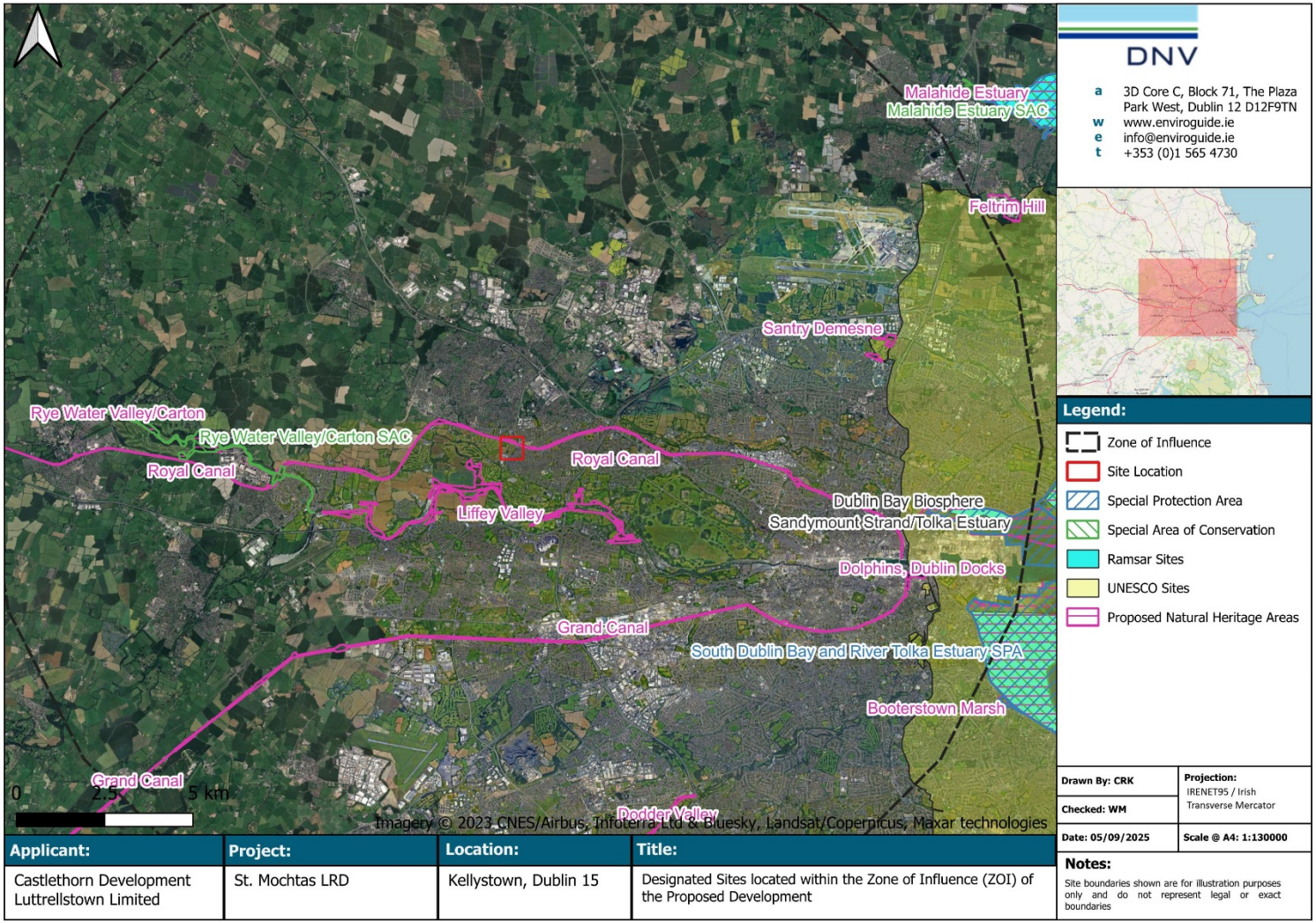

FIGURE 1: DESIGNATED SITES LOCATED WITHIN THE ZONE OF INFLUENCE (ZOI) OF THE SITE

Figure 2: Designated Sites located in proximity to the Site

6.3.1.3 Habitats

The habitats present within the Site, as recorded in the survey area during the field survey conducted on 27th March 2025, are described in this section and summarised below. Site Photographs of these habitats are included in Appendix II and a map of the habitats is presented in Figure 3.

This Site consists of the following habitats:

- BL3 – Buildings and artificial surfaces
- WL1 – Hedgerow
- BC4 – Flower beds and borders
- WL2 – Treeline
- GS2 – Dry meadows and grassy verges
- MWD1 – (Mixed) broadleaved woodlands
- GA2 – Amenity grassland
- ED2 – Spoil and bare ground
- ED3 – Recolonising bare ground

6.3.1.3.1 Buildings and artificial surfaces (BL3)

The buildings and artificial surfaces (BL3) habitats were recorded at the western access gate of the Site of the Proposed Development. This habitat was devoid of any floral species, which was identified due to the presence of buildings at the western boundary of the Site, and the concrete paved surfaces around these structures. Therefore, the buildings and artificial surfaces habitat for this Site has been assigned **less than local importance** in terms of ecological importance.

6.3.1.3.2 Amenity Grassland (GA2)

The amenity grassland (GA2) habitat was the most dominant habitat recorded at the Site of the Proposed Development. This habitat was dominated by perennial ryegrass (*Lolium perenne*) and was used for recreational activities such as soccer pitches. The presence of short grasses in this habitat indicated regular mowing regimes and maintenance.

There were no floral species recorded within this habitat, however, species such as cleavers (*Galium aparine)*, and dandelions (*Taraxacum vulgaria*) were observed along the peripheral extents of the habitat where the grasslands were less managed. Therefore, the amenity grassland habitat for this Site has been assigned **less than local importance**.

6.3.1.3.3 Hedgerow (WL1)

Three areas of the hedgerow (WL1) habitat were recorded at the Site of the Proposed Development. Along the western boundary, hedgerows consisted of elder (*Sambucus nigra)*, bramble (*Rubus fructicosus s*), and common ivy (*Hedera helix)*, with some large elder trees located along the hedgerow. Along the northern boundary of the Site, floral species such as elder, bramble and common ivy were recorded. Invasive butterfly-bush (*Buddleja davidii)* were also recorded along this hedgerow, where their abundances increased exponentially at the eastern extent of the habitat. The final stretch of hedgerow was recorded east of the GA2 habitat, where floral species such as elder, blackthorn (*Prunus spinosa)*, bramble, birch (*Betula sp.)* and yulan magnolia (*Magnolia denudata*) were recorded. Along this stretch of hedgerows, elder and birch were not cut and were allowed to take their arborescent forms, which were identified as large trees along the hedgerows.

At the base of the hedgerows, the amenity grasslands (GA2) and recolonising bare ground (ED3) habitats transitioned to winter heliotrope (*Petasites pyrenaicus*), mad woman's milk (*Euphorbia helioscopia*), bramble, cleavers, nettle (*Urtica dioica*), dandelion, and common ivy among other common ruderal and scrub species

typically found at field margins and hedgerow based. Therefore, the hedgerows habitat for this Site has been identified as of **local importance**.

6.3.1.3.4 Flower beds and borders (BC4)

The flower beds and borders is a small habitat that was recorded at the western access gate to the Site of the Proposed Development. This habitat was restricted in its extent and comprised of ornamental floral species such as *Veronica sp.*, Japanese skimmia (*Skimmia japonica*), Indian cluster berry (*Lonicera ligustrina* Wall), kohuhu (*Pittosporum tenuifolium*), amongst other common species such as daffodil (*Narcissus pseudonarcissus L.*), dandelion, and winter heliotrope. Therefore, the flower beds and border habitat for this Site has been assigned as **less than local importance**.

6.3.1.3.5 Treeline (WL2)

A small treeline (WL2) was recorded adjacent to the BC4 habitat, where four trees of yulan magnolia were present. Three of the four trees were covered by epiphytic common ivy, and the base of the trees were covered by ruderal species typically found at the base of treelines, as well as ornamental planting at the base of one tree. Therefore, the treeline habitat for this Site has been assigned as **less than local importance**.

6.3.1.3.6 Dry meadows and grassy verges (GS2)

The extent of the dry meadows and grassy verges (GS2) habitat is restricted to the southern boundary of the Site of the Proposed Development. These habitats were dominated by floral species such as perennial ryegrass, nettle, dandelion, coltsfoot (*Tussilago farfara*), spear thistle (*Cirsium vulgare),* hybrid dock (*Rumex sp),* and creeping buttercup (*Ranunculus repens).* Scattered populations of cleavers, common ragwort (*Jacobaea vulgaris*), broad-leaved dock (*Rumex obtusifolius*), goat willow (*Salix caprea),* dogwood (*Cornus sanguinea*), and cotoneaster (*Cotoneaster frigidus*) were recorded.

While no rare or protected floral species were observed in this habitat, invasive butterfly bush and cotoneaster were recorded in scattered distribution across the extent of this habitat. Therefore, the dry meadows and grassy verges habitat for this Site has been assigned as **less than local importance**.

6.3.1.3.7 (Mixed) broadleaved woodlands (MWD1)

The (mixed) broadleaved woodlands habitat was recorded along a small stretch of the eastern boundary of the Site, where the woodlands appear to have been planned as roadside trees for the existing carriageway that runs above the eastern section of the Site. This habitat consisted of a mixture of semi-mature and mature trees of common alder (*Alnus glutinosa*), horse chestnut (*Aesculus hippocastanum*), and sour cherry (*Prunus cerasus*). Therefore, the (mixed) broadleaved woodlands habitat for this Site has been identified as of **local importance**.

6.3.1.3.8 Spoil and bare ground (ED2)

The BL3 habitat recorded along the western section of the Site transitions into the spoil and bare ground habitats along the northern section of the Site of the Development. This habitat was identified due to lack of floral biodiversity due to recurring disturbance, in the absence of which can be colonised by the bordering floral species. Therefore, the spoil and bare ground habitat for this Site has been assigned **less than local importance** in terms of ecological importance.

6.3.1.3.9 Recolonising bare ground (ED3)

The ED3 habitat has been recorded along the northern and eastern section of the Site of the Proposed Development, where floral species such as perennial ryegrass, spear thistle, dandelion, winter heliotrope, broad leaved dock, cleavers and young bramble were observed. Invasive butterfly bush was also recorded in this habitat along its northern extent.

A small section at the northern extent of this habitat along the eastern section of the Site had standing water in it. This small area of the habitat was distinct from other areas of the habitat due to the presence of common cattail (*Typha latifolia)* in areas of standing water*,* and hard rush (*Juncus inflexus*) along the perimeter of the standing water. The absence of water courses on Site and the relatively undisturbed nature of the soil indicated that this area of standing water is transient in nature, only showing water during rainfall events.

Some floral species, namely common ragwort, nettle, saplings of orange ball (*Buddleja globosa*), subterranean clover (*Trifolium subterraneum*), horseweed (*Conyza canadensis*), coltsfoot, juvenile goat willow and saplings of alder were recorded only along the eastern section of this habitat. Therefore, the recolonising bare ground habitat for this Site has been assigned as **less than local importance**.

Figure 3: Existing habitats recorded at the Site as assessed during the Site survey conducted on 27th March 2025

6.3.1.4 Species and Species Groups

6.3.1.4.1 Flora

6.3.1.4.1.1 Rare and Protected Flora

Species records available from the National Biodiversity Data Centre (NBDC) online database for the 10 km grid square (O03), 2km grid squares (O03T) and the 1km grid squares (O0637) were studied for the presence of rare or protected flora species. The NBDC datasets for the (O0637) 1km grid square yielded no records. This database contained no records of protected flora within the last 20 years, however, several regionally extinct or vulnerable plant species occurred within the 2km grid squares (O03T), and 10km grid square (O03) are shown in Table 6.6 blow.

Table 6.6: Records of Rare or Protected Flora For the Surrounding 10km (O03) and 2km (O03T) grid squares Associated with the Site from the NBDC

Species	NBDC Grid Square	Date of Last Record	Database	Conservation Status
Common Gromwell (*Lithospermum officinale)*	O03 (10km)	18/07/2020	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	Threatened Species: Near threatened
Cornflower (*Centaurea cyanus*)	O03 (10km) O03T (2km)	26/08/2020	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	Threatened Species: Waiting list
Fragrant Agrimony (*Agrimonia procera*)	O03 (10km)	04/07/2019	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	Threatened Species: Near threatened
Greater Knapweed (*Centaurea scabiosa*)	O03 (10km)	26/03/2022	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	Threatened Species: Near threatened
Green Figwort (*Scrophularia umbrosa*)	O03 (10km)	10/07/2020	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	Threatened Species: Endangered
Hairy St John's-wort (*Hypericum hirsutum*)	O03 (10km)	22/05/2023	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	Protected Species: Flora Protection Order. Threatened Species: Endangered
Meadow Crane's-bill (*Geranium pratense*)	O03 (10km)	08/08/2021	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	Threatened Species: Vulnerable
Pale Flax (*Linum bienne*)	O03 (10km)	14/07/2021	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	Threatened Species: Near threatened

Spring Vetch (*Vicia lathyroides*)	O03 (10km)	18/05/2012	Ireland's BioBlitz	Threatened Species: Least concern
Strawberry-tree (*Arbutus unedo*)	O03 (10km)	26/02/2023	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	Threatened Species: Near threatened
Yellow Archangel (*Lamiastrum galeobdolon*)	O03 (10km)	12/05/2018	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	Threatened Species: Least concern
Yellow Horned-poppy (*Glaucium flavum*)	O03 (10km)	21/06/2020	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	Threatened Species: Near threatened

None of the aforementioned protected or rare floral species were recorded on Site during the Site survey conducted on 27th March 2025. Therefore, these species are of **less than local importance** in terms of ecological importance and are not considered further in this report for this Site.

6.3.1.4.1.2 Invasive Species

No invasive floral species were recorded in the (O0637) 1km grid square, and the (O03T) 2km grid squares encompassing the Site of the Proposed Development. However, one medium impact and one high impact invasive species were recorded within the 10km (O03) grid square. The details of these species have been listed in Table 6.7 below.

Table 6.7: Records of Invasive Flora for the Surrounding 10km (O03) Grid square Associated with the Site from the NBDC

Species	NBDC Grid Square	Date of Last Record	Database	Legal Status
Butterfly-bush (*Buddleja davidii*)	O03	26/02/2023	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	Medium Impact Invasive Species
Nuttall's Waterweed (*Elodea nuttallii*)	O03	18/07/2020	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	High Impact Invasive Species Regulation S.I. 477 (Ireland)

Invasive Butterfly-bush was recorded along the eastern extent of the northern hedgerow (WI1), and the recolonising bare ground (ED3) habitats at the Site of the Proposed Development, as recorded on 27th March 2025 during the Site survey. Therefore, these species are of **less than local importance** in terms of ecological importance and are not considered further in this report for this Site.

6.3.1.4.2 Bats

6.3.1.4.2.1 Desk Study Results

Six bat species were recorded in the 2km (O03T), and 1km (O0537) grid squares encompassing the Site. These species have been listed in Table 6. below. Two additional bat species, Natterer's bat (*Myotis nattereri),* and whiskered bat (*Myotis mystacinus*) were recorded in the 10km (O03) grid square encompassing the Site.

Table 6.8: Records of Bat Species for the Surrounding grid squares Associated with the Site from the NBDC

Species	NBDC Grid Square	Date of Last Record	Database	Legal Status
Common Pipistrelle (*Pipistrellus pipistrellus sensu stricto*)	O0637 (1km)	02/05/2022	National Bat Database of Ireland	EU Habitats Directive - Annex IV Wildlife Act 1976 (as amended)
	O03T (2km)			
	O03 (10km)	15/08/2023		
Daubenton's Bat (*Myotis daubentonii*)	O0637 (1km)	02/05/2022	National Bat Database of Ireland	EU Habitats Directive - Annex IV Wildlife Act 1976 (as amended)
	O03T (2km)			
	O03 (10km)	03/05/2022		
Lesser Noctule (*Nyctalus leisleri*)	O0637 (1km)	15/08/2008	National Bat Database of Ireland	EU Habitats Directive - Annex IV Wildlife Act 1976 (as amended)
	O03T (2km)	02/05/2022		
	O03 (10km)	15/08/2023		
Soprano Pipistrelle (*Pipistrellus pygmaeus*)	O0637 (1km)	02/05/2022	National Bat Database of Ireland	EU Habitats Directive - Annex IV Wildlife Act 1976 (as amended)
	O03T (2km)			
	O03 (10km)	15/08/2023		
Brown Long-eared Bat (*Plecotus auritus*)	O03T (2km)	02/05/2022	National Bat Database of Ireland	EU Habitats Directive - Annex IV Wildlife Act 1976 (as amended)
	O03 (10km)			
Nathusius's Pipistrelle (*Pipistrellus nathusii*)	O03T (2km)	02/05/2022	National Bat Database of Ireland	EU Habitats Directive - Annex IV Wildlife Act 1976 (as amended)
	O03 (10km)			
Natterer's Bat (*Myotis nattereri*)	O03 (10km)	30/09/2008	National Bat Database of Ireland	EU Habitats Directive - Annex IV Wildlife Act 1976 (as amended)
Whiskered Bat (*Myotis mystacinus*)	O03 (10km)	03/09/2005	National Bat Database of Ireland	EU Habitats Directive - Annex IV Wildlife Act 1976 (as amended)

The Proposed Development (indicated in the black box in Figure 4 below) is located in an area with an overall medium - high (35.44) suitability for bats in general. The suitability index for specific bat species is presented in Table 6.. The landscape suitability index is high for five species of bats, namely soprano Pipistrelle (*Pipistrellus pygmaeus*), brown long-eared bat (*Plecotus auritus*), common pipistrelle (*Pipistrellus pipistrellus*), Leisler's bat (*Nyctalus leislerii*), and natterer's bat *(Myotis nattereri)*. The landscape suitability index is medium – high for two species of bat, namely whiskered bat (*Myotis mystacinus),* and Daubenton's bat *(Myotis daubentonii).*

Table 6.9: Landscape Suitability Index for Individual Bat Species within the 2km grid square (NBDC, 2025). Those species that have been recorded in the NBDC Database within the O03 10km grid square are highlighted in green

Bat Species	Suitability Index (2km Grid Square)
Soprano pipistrelle *(Pipistrellus pygmaeus)*	43 (High)
Brown Longed-eared bat *(Plecotus auritus)*	50 (High)
Common pipistrelle *(Pipistrellus pipistrellus)*	50 (High)
Lesser horseshoe bat *(Rhinolophus hipposideros)*	0 (Low)
Leisler's bat *(Nyctalus leisleri)*	51 (High)
Whiskered bat *(Myotis mystacinus)*	33 (Medium - High)
Daubenton's bat *(Myotis daubentonii)*	33 (Medium - High)
Nathusius' pipistrelle (*Pipistrellus nathusii*)	18 (Low - Medium)
Natterer's bat *(Myotis nattereri)*	41 (High)

Figure 4: Bat landscape suitability model (all bats) surrounding the Site indicated by the black box (NBDC, 2025)

6.3.1.4.2.2 Field Survey Results

6.3.1.4.2.2.1 Bat Roost Assessment and Habitat Suitability

During the Site visit on 27th March 2025, a preliminary bat roost assessment was conducted on all trees within the Site. The preliminary bat roost assessment found that the buildings at the western access point of the Site of the Proposed Development fall under the BCT categories of NONE or PRF-I (negligible roosting suitability), whereas the trees along the access gate, trees in the (mixed) broadleaved woodland (MWD1), and hedgerows (WL1) also fall under the BCT categories of NONE or PRF-I (negligible roosting suitability). Therefore, the Site holds limited potential to support singular opportunistic bat roosts.

The linear hedgerows feature along the western, northern and eastern sections of the Site were assessed as providing 'Moderate' habitat suitability for foraging and commuting bats.

The Site of the Proposed Development is exposed to high light levels given the presence of sport floodlights at the Site. In the vicinity of the Site, the trainline to the north, and residential buildings to the east of the Site expose the Site to very low ambient light level along areas of the Site that are not illuminated by the floodlights. Agricultural fields to the west, and construction works to the south of the Site expose the Site to very low ambient light levels along these areas. However, the majority of the Site is likely to be undisturbed by artificial lighting and is well connected to the surrounding landscape, which consists of linear green corridors along the trainline to the north and existing carriageway along the eastern boundary of the Site. Therefore, the Site is of **less than local importance** for roosting bats but is of **local importance** to commuting and foraging bats.

6.3.1.4.2.2.2 Bat Activity Transect Survey

The Site was assessed by an experienced ecologist in relation to the potential bat foraging habitat and commuting routes. The surveys were undertaken to best practice guidance (Collins, 2023 and Marnell et al., 2022) during times of suitable weather conditions, as detailed below. The surveyor was equipped with a Elekon Batlogger M2 detector and powerful L.E.D. torch and head torches. Surveys started at sunset and continued for about 2 hours, along a predesigned transect route with regular point counts as shown in Figure 5 below.

Table 6.10: Weather Conditions Recorded During Bat Transect Survey

Date	Sunset	Survey Start & End	Weather at Start	Weather at End
20/08/2025	20:44	20:41 – 22:38	14°C, dry, light air, cloud cover 100%, vis 4/4, wind 7km/h (NNE)	13°C, dry, light air, cloud cover 100%, vis ¼, wind 3km/h (NNE)
01/09/2025	20:14	20:14 – 22:22	16°C, dry, light breeze, cloud cover 50%, vis 4/4, wind 20km/h (WSW)	14°C, dry, calm, cloud cover 30%, vis 2/4, wind 18km/h (SW)

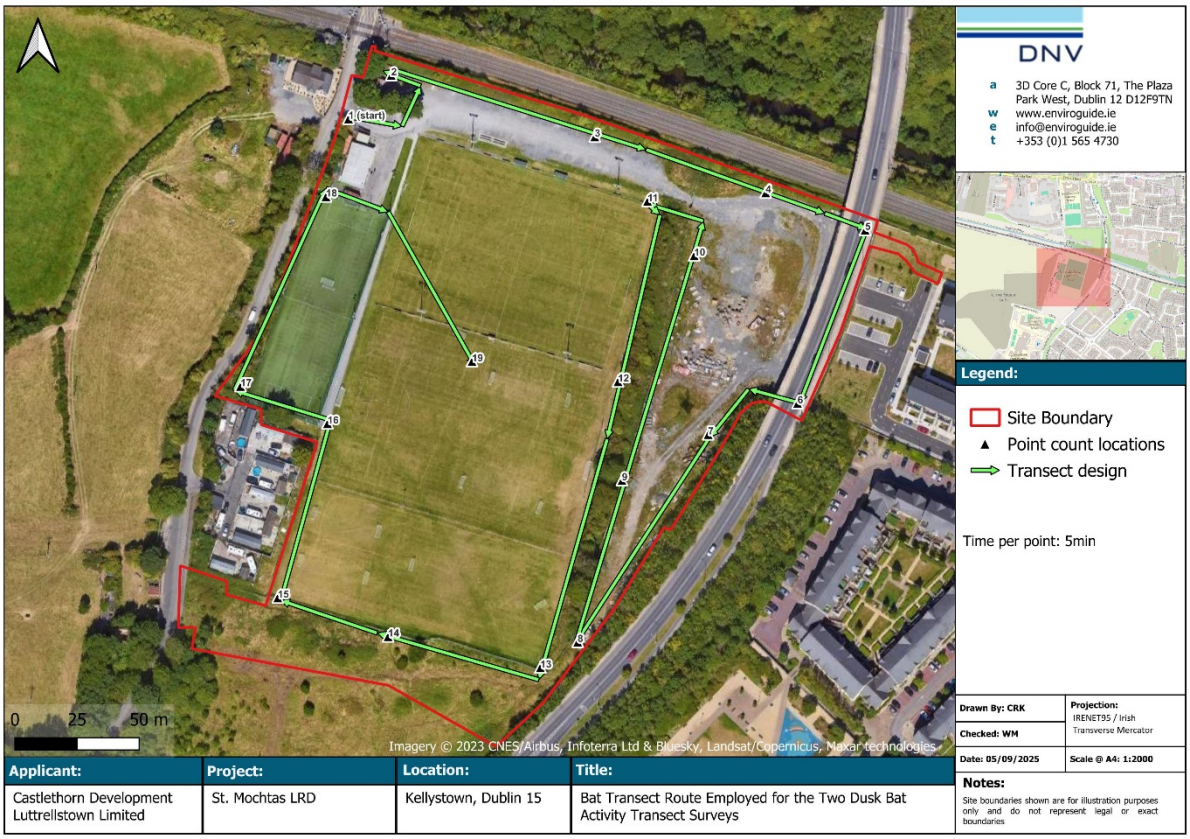

FIGURE 5: BAT TRANSECT ROUTE FOLLOWED FOR THE BAT ACTIVITY TRANSECT SURVEYS

6.3.1.4.2.2.3 Data Analysis

Two dusk activity surveys were conducted at the Site on 20th August 2025 and 1st September 2025. Weather conditions were suitable for these surveys according to the guidance outlines in Collins (2023).

During the bat activity surveys, three species of bats were recorded. These include the common pipistrelle (*Pipistrellus pipistrellus*), soprano pipistrelle (*Pipistrellus pygmaeus*) and Leisler's Bat (*Nyctalus leisleri*). All three species were primarily recorded along the central hedgerow, and woodlands along the eastern boundary of the Site, with a few individuals recorded along the central hedgerow of the Site.

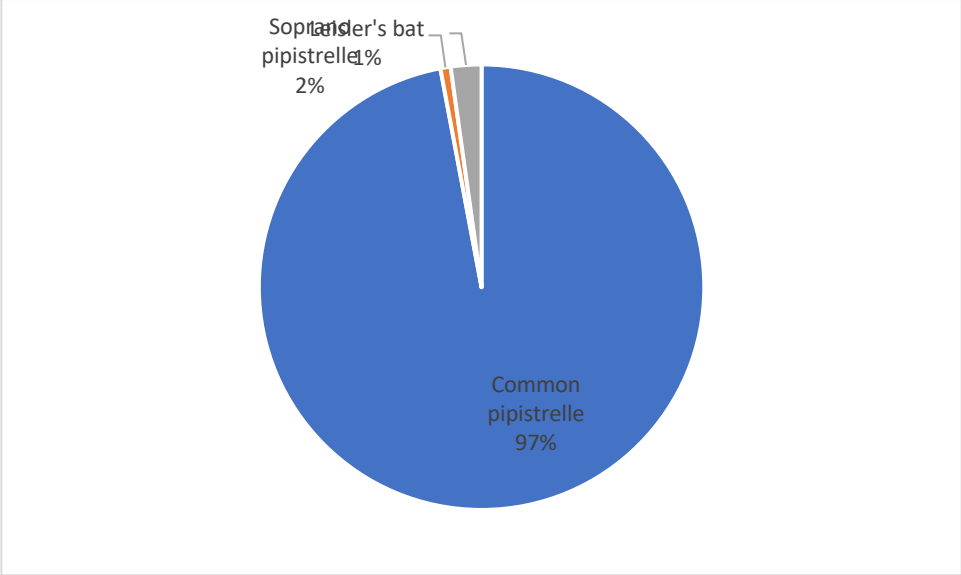

FIGURE 6: SPECIES COMPOSITION FROM BOTH BAT ACTIVITY SURVEYS CONDUCTED AT THE SITE

6.3.1.4.2.3 Evaluation

The two rounds of transect surveys revealed valuable information in relation to bat usage of the Site (see Figure 6). Only a low number of bats were recorded using the Site for commuting / foraging, specifically near the hedgerow habitats and woodland habitats of the Site, where most commonly occurring species in Ireland namely, common pipistrelle, soprano pipistrelle and Leisler's bat, were recorded. Given that common pipistrelle, soprano pipistrelle and Leisler's bat were also recorded within the 10km grid square encompassing the Site, it is presumed that the Site may support locally important populations of these common bat species for commuting and foraging, and of no importance to roosting populations of bat species in the local area. For these reasons, the Site of the Proposed Project has been assigned **local level of importance** for commuting and foraging bats, and **less than local importance** for roosting bats.

6.3.1.4.3 Birds

6.3.1.4.3.1 Desk Study Results

A total of 104 bird species have been recorded within the (O03) 10km grid square, (O03T) 2km grid square, and (O0637) 1km grid squares. Of these, 17 are red listed bird species, 32 are amber listed bird species, and the remaining are green listed bird species (and some bird species with no classification) as identified on the Birds of Conservational Concern in Ireland (BoCCI) (Gilbert er al. 2021). Details of amber and red listed species are detailed in Table 6.6 in Appendix 1.

6.3.1.4.3.2 Field Survey Results

6.3.1.4.3.2.1 Bird Scoping Survey

A total of seven bird species were observed at the Site during the walkover survey on 27th March 2025, where one of the species recorded was an amber listed species as per the Birds of Conservation Concern in Ireland 2020-2026 (Gilbert et al., 2021), namely European Herring Gull (*Larus argentatus*), All of the remaining bird species recorded are green listed species and have been listed in Table 6.2 below. Therefore, the Site is of **local importance** to bird species.

Table 6.2: Bird Species recorded during the walkover survey on 27th March 2025

Species	BoCCI Status
Robin (*Erithacus rubecula*)	**Green**
Magpie (*Pica pica*)	**Green**
Hooded Crow (*Corvus corone*)	**Green**

Wood pigeon (*Columba palumbus*)	**Green**
Great Black-backed Gull (*Larus marinus*)	**Green**
Great Tit (*Parus major*)	**Green**
European Herring Gull (*Larus argentatus*)	**Amber**

In addition to the list of bird species observed at the Site, no disused or new nests were found across the Site. However, given the diverse habitats recorded on Site, there is potential for breeding birds to nest at the Site, the scope of which will be assessed in the breeding bird survey.

6.3.1.4.3.2.2 Breeding Bird Surveys

The three rounds of breeding bird surveys conducted for the Site reaved valuable information in relation to breeding bird usage of the Site. A total of 21 species of birds were recorded during the breeding bird surveys, of which four species are amber listed, and one species is red listed on the most recent 'Birds of Conservation Concern Ireland' (BoCCI) (Gilbert et al. 2021). The remaining bird species are green listed species.

Table 6.3: Bird Species recorded during the Breeding Bird surveys on 14th August 2025, 20th August 2025, and 27th August 2025.

Species	Scientific name	BoCCI Status	Dates recorded	Notes
Blackbird	*Turdus merula*	Green	14th Aug 2025 20th Aug 2025 27th Aug 2025	Common on the Site on all dates.
Blue Tit	*Cyanistes caeruleus*	Green	14th Aug 2025 20th Aug 2025 27th Aug 2025	Common on the Site on all dates.
Bullfinch	*Pyrrhula pyrrhula*	Green	27th Aug 2025	Female present on one date.
Buzzard	*Buteo buteo*	Green	27th Aug 2025	A pair circling over the Site.
Chaffinch	*Fringilla coelebs*	Green	14th Aug 2025 27th Aug 2025	Common in the treeline on two dates.
Dunnock	*Prunella modularis*	Green	14th Aug 2025	One vocal adult in the hedgerows.
Feral Pigeon	*Columba livia domestica*	Unclassified	14th Aug 2025 20th Aug 2025 27th Aug 2025	Flyovers only.
Goldcrest	*Regulus regulus*	**Amber**	14th Aug 2025	In the treeline. Several birds calling. Possibly breeding locally or on Site.

Goldfinch	*Carduelis carduelis*	Green	14th Aug 2025 20th Aug 2025 27th Aug 2025	Present in the hedgerows on all dates.
Hooded Crow	*Corvus cornix*	Green	14th Aug 2025 20th Aug 2025 27th Aug 2025	Feeding on the pitch and in the hedgerows/trees.
House Martin	*Delichon urbicum*	**Amber**	14th Aug 2025	Feeding over the Site
Jackdaw	*Corvus monedula*	Green	14th Aug 2025 20th Aug 2025 27th Aug 2025	Feeding on the pitch
Magpie	*Pica pica*	Green	14th Aug 2025 20th Aug 2025 27th Aug 2025	Feeding on the pitch
Robin	*Erithacus rubecula*	Green	14th Aug 2025 20th Aug 2025 27th Aug 2025	Common on the site
Rook	*Corvus frugilegus*	Green	14th Aug 2025 27th Aug 2025	Feeding on the pitch
Song Thrush	*Turdus philomelos*	Green	14th Aug 2025	Vocal adult on one date
Starling	*Sturnus vulgaris*	**Amber**	20th Aug 2025	Flyovers only
Stock Dove	*Columba oenas*	Red	14th Aug 2025 27th Aug 2025	Two flew over together on two separate dates.
Swallow	*Hirundo rustica*	**Amber**	14th Aug 2025 20th Aug 2025 27th Aug 2025	Feeding over the Site.
Woodpigeon	*Columba palumbus*	Green	14th Aug 2025 20th Aug 2025 27th Aug 2025	Mainly flyovers although regularly feeding on elder berries on the Site.
Wren	*Troglodytes troglodytes*	Green	14th Aug 2025 20th Aug 2025	Common on the Site.

			27th Aug 2025	

6.3.1.4.3.3 Evaluation

Considering the variety of bird species recorded both in the historical records and during the scoping and breeding bird surveys, it is considered that the Site contains resident and regularly occurring, locally important populations of bird species protected under the Wildlife Act, where the habitats on Site may provide suitable breeding habitats for these species. While red and amber listed bird species were recorded on Site, these species were not observed nesting or breeding at the Site itself. For these reasons, the Site of the Proposed Project has been assigned **local level of importance** for bird species.

6.3.1.4.4 Mammals (excl. bats)

6.3.1.4.4.1 Desk Study Results

A total of 19 mammals were recorded within the 10km (O03), 2km (O03T), and 1km (O0637) grid squares. Of these, eleven species are native terrestrial mammals, with seven of these species afforded legal protection under the Wildlife (Amendment) Act, 2000, namely badger (*Meles meles*), otter (*Lutra lutra*), pine marten (*Martes martes*), red deer (*Cervus elaphus*), hedgehog (*Erinaceus europaeus*), red squirrel (*Sciurus vulgaris*), and Eurasian pygmy shrew (*Sorex minutus*)

The remaining eight species are considered invasive and/or non-native, namely brown rat (*Rattus norvegicus*), rabbit (*Oryctolagus cuniculus*), American mink (*Mustela vison*), eastern grey squirrel (*Sciurus carolinensis*), fallow deer (*Dama dama), house mouse (Mus musculus),* Siberian chipmunk (*Tamias sibiricus),* and sika deer (*Cervus nippon).* These species have been recorded across the 10km (O03) grid square encompassing the Site of the Proposed Development.

Table 6.4: Records of mammal species (excl. bats) for the surrounding grid squares associated with the Site from the NBDC

Species	Grid Square	Date of Last Record	Database	Designation
Native Species				
Eurasian Badger (*Meles meles*)	O03 (10km)	08/04/2023	Mammals of Ireland 2016-2025	Wildlife (Amendment) Act 2000 Berne Convention Appendix III
Eurasian Pygmy Shrew (*Sorex minutus*)	O03 (10km)	03/10/2015	Atlas of Mammals in Ireland 2010-2015	Wildlife (Amendment) Act 2000
Eurasian Red Squirrel (*Sciurus vulgaris*)	O03 (10km)	24/01/2015	Atlas of Mammals in Ireland 2010-2015	Wildlife (Amendment) Act 2000
European Otter (*Lutra lutra*)	O03 (10km)	06/12/2018	Mammals of Ireland 2016-2025	Wildlife (Amendment) Act 2000
	O03T (2km)	20/08/2014	Atlas of Mammals in Ireland 2010-2015	
Irish Hare (*Lepus timidus subsp. hibernicus*)	O03 (10km)	23/02/2020	Mammals of Ireland 2016-2025	N/A

Irish Stoat (*Mustela erminea subsp. hibernica*)	O03 (10km)	14/04/2024	Irish Stoats of Ireland	N/A
Pine Marten (*Martes martes*)	O03 (10km)	21/05/2021	Mammals of Ireland 2016-2025	Wildlife (Amendment) Act 2000
	O03T (2km)	17/08/2019		
Red Deer (*Cervus elaphus*)	O03 (10km)	31/12/2008	Deer of Ireland Database	Wildlife (Amendment) Act 2000
Red Fox (*Vulpes vulpes*)	O03 (10km)	21/01/2023	Mammals of Ireland 2016-2025	N/A
	O03T (2km)	28/07/2012	Atlas of Mammals in Ireland 2010-2015	
West European Hedgehog (*Erinaceus europaeus*)	O03 (10km)	07/12/2023	Hedgehogs of Ireland	Wildlife (Amendment) Act 2000
	O03T (2km)	12/05/2021		
	O0637 (1km)	05/05/2021		
Wood Mouse (*Apodemus sylvaticus*)	O03 (10km)	20/05/2011	Ireland's BioBlitz	N/A
Non-native and Invasive Species				
American Mink (*Mustela vison*)	O03 (10km)	02/08/2018	Mammals of Ireland 2016-2025	High Impact Invasive Species Regulation S.I. 477 (Ireland)
Brown Rat (*Rattus norvegicus*)	O03 (10km)	20/11/2015	Atlas of Mammals in Ireland 2010-2015	High Impact Invasive Species Regulation S.I. 477 (Ireland)
	O03T (2km)	27/09/2014	Atlas of Mammals in Ireland 2010-2015	
Eastern Grey Squirrel (*Sciurus carolinensis*)	O03 (10km)	17/11/2022	Mammals of Ireland 2016-2025	High Impact Invasive Species Regulation S.I. 477 (Ireland)
	O03T (2km)	23/06/2022	Mammals of Ireland 2016-2025	
	O0637 (1km)	25/05/2008	Road Kill Survey	
European Rabbit (*Oryctolagus cuniculus*)	O03 (10km)	31/03/2023	Mammals of Ireland 2016-2025	Medium Impact Invasive Species
	O03T (2km)	21/01/2023	Mammals of Ireland 2016-2025	
Fallow Deer (*Dama dama*)	O03 (10km)	19/07/2018	Mammals of Ireland 2016-2025	High Impact Invasive Species

				Regulation S.I. 477 (Ireland)
House Mouse (*Mus musculus*)	O03 (10km)	01/11/2012	Atlas of Mammals in Ireland 2010-2015	High Impact Invasive Species
Siberian Chipmunk (*Tamias sibiricus*)	O03 (10km)	15/07/2011	National Invasive Species Database	High Impact Invasive Species Regulation S.I. 477 (Ireland)
Sika Deer (*Cervus nippon*)	O03 (10km)	31/12/2008	Deer of Ireland Database	High Impact Invasive Species Regulation S.I. 477 (Ireland)

6.3.1.4.4.2 Field Survey Results

6.3.1.4.4.2.1 Large Mammals

During the site walkover survey conducted on 27th March 2025, no signs of large mammal species at the Site of the Proposed Development were recorded.

Badger

No direct sightings, badger setts, footprints, latrines, hairs, feeding activity, snuffle holes or badger scat was recorded at the Site of the Proposed Development. This indicated that badgers do not regularly utilise the Site. Furthermore, there are no notable green corridors connecting the Site to the greater area. The only existing corridor is located along the eastern boundary of the Site, where the roadside tree planting associated with the existing carriageway at the eastern boundary of the Site offered limited connectivity to the south. However, this is considered to be sub-optimal and unlikely to be used by commuting badgers. Given the absence of field signs at the Site of the Proposed Development, it can be concluded that the Site is not used by badgers for foraging, commuting or sett establishment. Therefore, the Site is unlikely to be of significant importance to badger population in the greater area and is of **lesser than local importance**.

Otter

No signs of otter activity, such as direct sightings, spraints, holts, couches, footprints or feeding remains were recorded at the Site of the Proposed Development. This indicated that otters are not currently using the Site for activities such as foraging, commuting, or resting. There are no watercourses at the Site of the Proposed Development, and no water courses connecting the Site with the nearby Royal Canal where otters have been listed as QI. Given the lack of connectivity to the Royal Canal watercourse flowing north of the Site, and absence of watercourses at the Site, it is considered that the Site of the Proposed Development is unlikely to be of significant importance to otter populations in the greater area and is of **lesser than local importance**.

Red Deer

During the Site survey, no tracks, droppings, feeding signs, or sightings was recorded at the Site of the Proposed Development. This indicated that red deer do not regularly utilise the Site. Furthermore, there are no significant green corridors connecting the Site to suitable habitats of red deer within the surrounding landscape. Therefore, given the lack of field signs and lack of green corridors, it is considered that the Site of the Proposed Development is unlikely to be of significant importance to red deer populations in the greater area and is of **lesser than local importance**.

Fox

No evidence of fox activity, such as tracks, scat, dens or remains of prey were recorded at the Site of the Proposed Development. Although foxes are common and widespread across Ireland, the absence of field signs

suggested that the Site is not of significant importance to local fox populations in the greater area, and the Site itself is of **less than local importance** to this species.

Other mammals

Due to the limited number of large trees with tree hollows or crevices, lack of wooded habitat and lack of ecological corridors for larger mammal species, it is unlikely pine marten, or red squirrel would utilise the Site. Therefore, the Site of the Proposed Development is of **less than local importance** for these species.

6.3.1.4.4.2.2 Smaller Mammals

Suitable habitats for smaller mammal species, such as hedgehogs, hare, wood mouse, and pygmy shrew was recorded along the hedgerows bordering the Site, along with the grassland habitat on Site. The western field parcel, just outside the Site boundary contains a scattered piles of logs and branches, which are suitable hibernacula/refuge for small mammals. However, burrows were not recorded across the Site for some of the aforementioned species, indicating the absence of the aforementioned species during the survey.

Although no direct evidence of hedgehogs, hare, wood mouse and pygmy shrew was recorded during the Site walkover, the range of habitats present within the Site, including the hedgerows and grassland habitats are considered to be suitable habitat for these species. Given the timid, nocturnal or cryptic behaviour of some of the aforementioned species, it can be considered that these species may utilise the Site in the future. Therefore, it can be concluded that the Site has the potential to provide suitable commuting, foraging and resting habitats for smaller mammals, which can be significantly impacted during the Construction and/or Operational Phases of the Proposed Development in the absence of mitigation. For these reasons, the Site of the Proposed Project has been assigned **local level of importance**.

6.3.1.4.5 Amphibians

Both common frog (*Rana temporaria*) and smooth newt have (*Lissotriton vulgaris)* been recorded in the 10km (O03) and 2km (O03T) grid squares encompassing the Site of the Proposed Development.

Table 6.14: Records of amphibians for the surrounding grid squares associated with the Site from NBDC

Species	Grid Square	Date of Last Record	Database	Designation
Common Frog (*Rana temporaria*)	O03T (2km)	25/02/2023	Amphibians and reptiles of Ireland	Wildlife (Amendment) Act 2000
	003 (10km)	25/02/2023		
Smooth Newt (*Lissotriton vulgaris*)	003 (10km)	05/04/2023	Amphibians and reptiles of Ireland	Wildlife (Amendment) Act 2000

During the walkover survey on 27th March 2025, habitats on Site were checked for signs of amphibians. No ponds were recorded at the Site, however, a section of the ED3 habitat at the eastern section of the Site consisted of a small area of standing water. No frogs, newts or spawns of these species were recorded in this area during the walkover survey, and the standing water appeared to be transient in nature, only stagnating with water during rainfall events. For these reasons, the Site of the Proposed Development has been assigned **less than local level of importance**.

6.3.1.4.6 Reptiles

No records of common lizard (*Zootoca vivipara*) exist for the relevant 10km (O03), 2km (O03T), and 1km (O0637) grid squares encompassing the Site of the Proposed Development. However, there are some suitable habitats for this species within the Site of the Proposed Development along the hedgerow habitats, as well as waste material (e.g.; concrete blocks) that were located in the ED3 habitat bordering the MWD1 habitat at the eastern section of the Site. As no targeted surveys for common lizard were carried out, it is assumed under the precautionary principle that a locally important population of this species may be present at the Site. Therefore, the Site of the Proposed Development has been identified as **local importance** for common lizards.
Within the 10km (O03), 2km (003T), and 1km (O0637) grid squares, two invasive reptile species have been listed, namely red-eared terrapin (*Trachemys scripta*), and yellow-bellied slider (*Trachemys scripta scripta*). While there

are suitable habitats for these species on the Site of the Proposed Development, these species were not recorded during the walkover survey.

6.3.1.4.7 Fish and other Aquatic Species

While protected species such as European eel (*Anguilla anguilla*), and grey seals (*Halichoerus grypus*) have been recorded within the 10km (O03) grid square encompassing the Site of the Proposed Development, there are no waterbodies within the Site of the Proposed Development that could support notable fish or aquatic species.

The Site drainage network during the Operational Phase of the Development does not connect to the Royal Canal stream that flows north of the Site. Therefore, fish and other aquatic species are not a consideration during this phase of the Proposed Development, and the Site is identified as **less than local importance** for fish and other aquatic species.

6.3.1.4.8 Marsh Fritillary

The marsh fritillary (*Euphydryas aurinia*) butterfly is the only insect in Ireland that is listed on Annex II of the Habitats Directive, which makes it the only insect protected by law in Ireland. There are no records of marsh fritillary from the last five years within the 10km (O030) grid square which encompass the Proposed Development. No individuals of this species or it's associated food plant; devil's bit scabious (*Succisa pratensis*), were recorded during the walkover survey on 27th March 2025. It should be noted that devil's bit scabious is an autumn flowering plant and as such may have been missed during the surveys. Additionally, the recommended survey period for marsh fritillary is in September and October when the caterpillars can be found within silken webs on the leaves of the foodplant. The majority of the Site is amenity grassland which is not considered likely to support devil's bit scabious or the marsh fritillary. Therefore, the Site of the Proposed Development is identified as **less than local importance** for marsh fritillary.

6.3.1.4.9 Other Invertebrates

6.3.1.4.9.1 Desk Study Results

Twelve invertebrate species were recorded within the 10km (O03), 2km (O03T), and 1km (O0637) encompassing the Site of the Proposed Development. These species are not protected, however are listed as 'Endangered', 'Near Threatened', 'Vulnerable' or 'Data deficient' Conservation status in Ireland.

Table 6.15: Records of rare and invasive invertebrates for the surrounding grid squares associated with the Site from the NBDC

Species	Grid Square	Date of Last Record	Database	Conservation Status
Rare Species				
Andrena (*Andrena) fucata*	O03 (10km)	31/05/2008	Bees of Ireland	Threatened Species: Near threatened
Andrena (*Leucandrena) barbilabris*	O03 (10km)	26/04/2022	Bees of Ireland	Threatened Species: Near threatened
Andrena (*Melandrena) nigroaenea*	O03 (10km)	02/04/2021	Bees of Ireland	Threatened Species: Vulnerable
Andrena (*Taeniandrena) wilkella*	O03 (10km)	31/05/2008	Bees of Ireland	Threatened Species: Data deficient
Gipsy Cuckoo Bee (*Bombus*	O03 (10km)	29/05/2023	Bees of Ireland	Threatened Species: Near threatened

(Psithyrus) bohemicus)				
Gooden's Nomad Bee (*Nomada goodeniana*)	O03 (10km) O03T (2km) O0637 (1km)	08/05/2023	Bees of Ireland	Threatened Species: Endangered
Halictus (*Seladonia) tumulorum*	O03 (10km)	30/07/2008	Bees of Ireland	Threatened Species: Near threatened
Large Red Tailed Bumble Bee (*Bombus (Melanobombus) lapidarius)*	O03 (10km) O03T (2km) O0637 (1km)	16/05/2024 17/04/2023 27/07/2012	Bees of Ireland	Threatened Species: Near threatened
Megachile (*Delomegachile) willughbiella*	O03 (10km)	17/07/2021	Bees of Ireland	Threatened Species: Near threatened
Megachile (*Megachile) centuncularis*	O03 (10km)	22/06/2021	Bees of Ireland	Threatened Species: Near threatened
Moss Carder-bee (*Bombus (Thoracombus) muscorum))*	O03 (10km)	06/05/2021	Bees of Ireland	Threatened Species: Near threatened
Invasive Species				
Harlequin Ladybird (*Harmonia axyridis*)	O0637 (1km) O03T (2km) O03N (2km)	02/09/2024 15/08/2024	Ladybirds of Ireland	High Impact Invasive Species Regulation S.I. 477 (Ireland)

6.3.1.4.9.2 Field Survey Results

During the walkover survey conducted on 27th March 2025, none of the aforementioned rare invertebrate species were recorded. Therefore, the Site of the Proposed Development is identified as **less than local importance** to invertebrate species.

6.3.1.4.10 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 have been included in Table 6. below. The Site of the Proposed Development for these species has been identifies as **less than local importance** for these species.

Table 6.16: Protected and/or notable species unlikely to occur at the Site and the reason for exclusion from assessment

Species	Reason for exclusion from assessment
Flora	
Marsh Saxifrage (*Saxifraga hirculus*)	Known populations only in Co. Mayo.

Killarney Fern (*Vandenboschia speciosa*)	Nearest known populations in Co. Wicklow, not recorded at the Site, no suitably sheltered and moist habitats available.
Slender Naiad (*Najas flexilis*)	A clear water, lowland lake species. No suitable habitat available at the Site.
Fauna	
White-clawed Crayfish (*Austropotamobius pallipes*)	Not present in the Liffey, adjacent ditches and streams not considered suitable for this species due to low quality.
Freshwater Pearl Mussel (*Margaritifera margaritifera*)	Nearest known records from the Barrow catchment to the west of the Site, no hydrological connection to this catchment. Liffey is not listed as a *M. margaritifera* sensitive area.
Natterjack Toad (*Epidalea calamita*)	Distribution restricted to few coastal sites.
Kerry Slug (*Geomalacus maculosus*)	Distribution restricted to south and west of Ireland

6.3.2 Cumulative

The application site forms part of a larger landholding in the townlands of Kellystown, Porterstown and Diswellstown, Clonsilla, Dublin 15, which has been subject to a number of recent planning permissions, summarised below.

The consented Kellystown SHD scheme ABP-312318-21 was granted (with 27no. conditions) on 2 March 2023, under section 9(4) of the Planning and Development (Housing) and Residential Tenancies Act 2016 for a Strategic Housing Development. The consented scheme includes 346no. dwellings (123no. houses and 3no. apartment buildings accommodating 223no. apartment units)1 , 1no. childcare facility (c. 528 sq m) and 1no. retail unit (c. 236 sq m), in buildings ranging from 2 to 8-storeys, and associated site works and 2.1ha public park amenity. The overall gross site area of the entire consented scheme amounts to c. 9.73 ha, at land zoned 'RS' residential, in Eastern Development Area 1 and land zoned 'OS' open space to the south of permitted Kellystown Link Road. The site is otherwise generally bounded by the existing Kellystown Link Road and schools to the south; the Old Porterstown Road and existing St Mochta's FC grounds to the east; Dr Troy Bridge/L3036 Porterstown Link Road also to the east; the Dublin Maynooth rail line and Grand Canal to the north and undeveloped (Luttrellstown Gate) lands to the west.

Amendments to the consented SHD scheme ABP-312318-21 was granted on 21 August 2024 under Reg. Ref. LRD0034-S3 for development comprising of the reconfiguration of Block A, located in the eastern corner of the site, to accommodate 193no. dwellings in total (an increase of 28no. dwellings) in buildings ranging between 2 and 8 storeys in height, with the following residential unit mix: 82no. 1- bed apartment units, 108no. 2-bed apartment units, and 3no. 2-bed duplex units. Associated reconfiguration of internal floor plans to accommodate an increase from 31no. to 34no. apartment units per floor. Reduced floor area of the internal residential amenity area (from c.405.7 sq m to c.120.9 sqm). Reduced floor area of the retail unit (from c.236 sq m to c.200.6 sq m). And all associated and ancillary site development, infrastructural, hard and soft landscaping and boundary treatment works.

A live planning application, currently at Further Information Stage under FW25A/0033E seeks the relocation of St. Mochta's Football Club grounds, to 'OS' zoned lands to the south of Kellystown Link Road and north of the Cemetery lands and Luttrellstown Road, within the new emergent residential neighbourhood of Kellystown, Dublin 15. This is in accordance with Key Objective DA 1.1 for the Eastern Development Area of the Kellystown Local Area Plan.

In November 2020, Fingal County Council published proposals for the development of a link road through the Kellystown lands for public consultation, under the Part 8 development process. Note that the consented Kellystown SHD scheme ABP-312318-21 includes the extension of the 'Kellystown Link Road' west from its existing section serving the school campus and cemetery lands. A single new vehicular access point to residential

development in the Kellystown Eastern Development Area extends north from the 'Kellystown Link Road', under SHD ABP-312318-21. Upgrade works to the existing segment of the 'Kellystown Link Road' and its junctions with Porterstown Road and Diswellstown Road/Overbridge are also included in the Kellystown SHD permission.

Potential for in-combination Effects:

The aforementioned planning application shares a direct hydrological and hydrogeological pathway with the Proposed Development via the Royal Canal Stream.

This planning application and its subsequent supporting applications were supported by an AA Screening report prepared by DNV (formerly known as Enviroguide), that concluded that this planning application either alone or in combination with other planning applications in the vicinity does not have the capacity to cause significant impacts on European sites or other Designated sites via the Royal Canal. Therefore, the combination of surface water inputs to the Royal Canal stream from this development and the Proposed Development is not envisaged to cause significant impacts on the downstream European sites and that an NIS will not be required.

In the wider surrounding area, the following developments are subject of live planning permissions:

- ABP Reg. Ref. 320886-24 (FCC Reg. Ref. LRD0021/S3E) (north of the Dublin-Maynooth Railway Line) issued with a Grant of Permission on 21 January 2025 for the construction of 170 residential units, a café, and a childcare facility, and all associated development works including the demolition of structures, site clearance, and ground levelling.
- ABP Reg. Ref. 315707-23 (FCC Reg. Ref. FW22A/0152) (north of the Dublin-Maynooth Railway Line) issued with a Grant of Permission on 19 December 2023 comprises the construction of a mixed use retail and residential development comprising 1no. food store (2,500sqm GFA), 3 no. retail units (611.8sqm GFA) and 67 no. residential units.2

Potential for in-combination Effects:

The aforementioned planning applications shares a direct hydrological and hydrogeological pathway with the Proposed Development via the Royal Canal Stream.

These planning applications were supported by AA Screening reports that concluded that these planning applications either alone or in combination with other planning applications in the vicinity do not have the capacity to cause significant impacts on European sites or other Designated Sites via the Royal Canal. Therefore, the combination of surface water inputs to the Royal Canal watercourse from these developments and the Proposed Development is not envisaged to cause significant impacts on the downstream European sites and that an NIS will not be required for either of the applications.

6.4 Characteristics of the Proposed Development

6.4.1 Site Location

The application site is currently in use as football pitches for St. Mochta's Football Club, however, an application from the applicant has recently been lodged comprising of the relocation of St. Mochta's Football Club grounds within the new emergent residential neighbourhood of Kellystown, Dublin 15, in accordance with Key Objective DA 1.1 for the Eastern Development Area of the Kellystown Local Area Plan. The Site is located to the north of the Kellystown Link Road under construction as part of the adjacent residential development (ABP-312318-21), west of Diswellstown Road, north of Luttrellstown Road and Block A of the Kellystown LAP (which is currently under construction under Reg. Ref. LRD0034/S3).

6.4.2 Proposed Development Description

Castlethorn Developments Luttrellstown Limited intends to apply for Permission for a development at a site (c. 4.38ha) at lands in the Townland of Porterstown.

The Proposed Development comprises 302no. residential units in a mix of houses, duplex and apartment units consisting of 62no. 2 storey, 3-bedroom houses and 35no. 3 storey, 4-bedroom houses; 205no. Duplex / Apartment Units (98no. 1-bed, 88no. 2-bed and 19no. 3-bed) across 4no. blocks comprising: Block D ranging in height from 5-7 storeys accommodating 57no. apartment units; Block E ranging in height from 5-7 storeys accommodating 77no. apartment units; Block F ranging in height from 4-5 storeys accommodating 39no.

apartment and duplex units; Duplex Blocks G1, G2, G3 & G4 3 storeys in height accommodating 32no. apartment units; and all associated and ancillary site development and infrastructural works, hard and soft landscaping and boundary treatment works, including public open space; public lighting; surface car parking spaces; bicycle parking spaces/stores for mid-terrace units; bin stores. Vehicular access to the Proposed Development is provided by the road network permitted under Reg. Ref. ABP-312318-21, as amended by Reg. Ref. LRD0034-S3.

The Demolition Phase of the Proposed Development will include the demolition and removal of the existing vacant house and agriculture buildings (including very poor-quality sheds or shipping containers). The total volume of the buildings to be demolished are 863m^3.

It is estimated by the Main Contractor that the Construction Phase of the Proposed Development will involve the excavation of 5000m^3 of soil for the construction of building foundations, drainage and other infrastructure to depths up to approximately 2m meters below ground level (mbGL) for the Site. It is anticipated that all surplus soil arising from groundworks will require off-site removal for reuse or recovery in accordance with appropriate statutory consents and approvals.

The Construction Phase of the Proposed Development will also require the importation of aggregate fill materials (e.g., granular material beneath road pavement, under floor slabs and for drainage and utility bedding / surrounds etc.).

6.4.3 Drainage and Water Supply

The following surface water and foul drainage information is extracted from the Engineering Assessment Report by Waterman Moylan (Waterman, 2025).

As the Site is currently greenfield, it is proposed that new separate surface and foul drainage systems are to be installed at the Site to serve the Proposed Development.

6.4.4 Surface water Drainage

As per the Engineering Assessment Report (Waterman, 2025), a new surface water drainage has been proposed for the Site, such that surface water at the Site will drain via a series of drains and sewers, ultimately discharging to the spur at the south-east corner of the subject development associated with the adjacent Strategic Housing Development under construction under ABP-312318-21. The surface water will drain into Block A (Reg. Ref. LRD0034/S3) drainage (currently under construction) which in turn drains to Kellystown SHD Phase 1. The drainage through this adjacent space has been constructed by the Applicant under ABP-312318-21, with spurs left to serve the Site of the Proposed Development.

The rate of discharge of surface water will be restricted by a hyrdrobrake or similarly approved flow control device to ensure that the discharge rate is equivalent to the greenfield runoff rate. In the event that the surface water run off rate exceed the greenfield runoff rate, the excess water will be attenuated. The attenuation has been designed to accommodate runoff volumes up to 1-in-100-year storm, accounting for a 20% increase due to climate change.

For the purpose of attenuation, the Site of the Proposed Development has been divided into 2 sub-catchments, such as

- Catchment 1: This includes Block D, and houses/duplexes in the northern part of the Site.
- Catchment 2: This includes Block E, F, G1, G2, and G3, and houses/duplexes in the southern part of the Site.

In addition, surface water sewers will be laid strictly in accordance with Fingal County Council requirements for taking in charge and will generally consist of PVC (to IS 123) or concrete socket and spigot pipes (to IS 6). All private outfall manholes will be built in accordance with the Greater Dublin Regional Code of Practice for Drainage Works, and no private drainage will be located within public areas.

6.4.4.1 Sustainable Drainage System

As part of the Proposed Development, a number of different Sustainable Drainage Systems (SuDS) measures are proposed to minimise the impact on water quality and water quantity of the runoff and maximise the amenity and biodiversity opportunities within the site.

The usage of various SuDS techniques has allowed for the incorporation of a Storm Water Management Plan, which will enable treatment and minimization of surface water runoffs from the Site. The methodology involved in developing a Storm Water Management Plan for the subject site is based on recommendations set out in the Greater Dublin Strategic Drainage Study (GDSDS) and in the SuDS Manual (Ciria C753). Based on three key elements – Water Quantity, Water Quality and Amenity – the targets of the SuDS train concept have been implemented in the design, providing SuDS devices for Source Control, Site Control and Regional Control.

It is proposed to provide the following SuDS measures:

- Green roofs will be installed on the roofs of Blocks D, E, F, G1, G2, and G3, covering approximately 1797m^2 or a minimum of 60% of roof area.
- Permeable paving in all private driveways and car parking spaces throughout the Proposed Development. Downpipes from the buildings will drain into filter drains beneath the permeable paving to facilitate maximum infiltration of surface water from roof areas.
- Filter Drains consisting of perforated pipes surrounded by filter stone will be installed around the perimeter of the buildings and beneath the permeable paving parking space. These perforated pipes will connect to the proposed surface water sewer network.
- Tree pits and planting areas will be introduced at the car parking areas on the Site of the Proposed Development. Surface water runoff from the roads will drain to the tree pits, where a high level gully will allow any excess water to discharge below-ground surface water network in the event that the tree pits and/or landscaped areas become inundated.
- Petrol Interceptor: A Class 1 petrol interceptor will be installed before the surface water outfall, and will function to remove light pollutants, and some hydrocarbons, such as petroleum and diesel (hydrocarbons with less density than water), and in turn protecting the natural watercourse from any contaminated waters.

6.4.5 Foul drainage

The adjacent Kellystown Strategic Housing Development, under construction by the Applicant under ABP-312318-21 has provided a new foul drain under the new Kellystown Link Road with a spur left to serve the Site of the Proposed Development. This foul sewer drains to a new pumping station, also permitted and under construction under ABP-312318-21. This pumping station has been designed to cater to lands within the entire Local Area Plan(LAP), including the Site, and is due to become operational in 2025.

As per the Engineering Assessment Report (Waterman, 2025), all wastewater/ foul water from the Site of the Proposed Development will drain by gravity, via the foul water drainage network, into the existing spur located west of the Site, which has been constructed to facilitate the Site. All foul water from the Site will drain through a separate 300Ø mm upsized pipe on the adjacent phase 1 lands, which will consequently drain to the 450Ø mm pipe immediately north of the foul water pumping station (which is currently under construction). This foul water pumping station has been designed to cater to the Site and includes storage of foul water for 24-hours.

The foul water sewers at the Site will be constructed strictly in accordance with Uisce Éireann requirements, and no private drainage will be located within public areas.

6.4.6 Landscape Plan

The proposed landscaping of the Site has been prepared by Doyle & O'Troithigh Landscape Architecture Ltd. (Doyle, 2025) (see Figure 7). The landscaping at the Site includes additional planting and augmentation of the boundary hedgerows, particularly the western and northern hedgerows.

The linear park to the Eastern boundary of the site development lands has been designed as the primary area of public open space. The design of this linear park consists of a series of four pocket open space lawn areas, where each of the individual pocket lawns will be surrounded by woodland planting. Two of the four lawn pockets will be sunken to accommodate surface water attenuation.

While discontinuous green spaces have been proposed along the perimeter of each block and along roads within the Site, large continuous green spaces are proposed along the eastern, northern and western boundaries of

the Site, mixed woodland, street trees, hedgerows and shrubs have been proposed to be planted to act as a buffer.

Figure 7: Proposed Landscape plan for the Site (Doyle, 2025)

6.4.7 Lighting Plan

The lighting plan for the Site of the Proposed Development has been prepared by Sabre Electrical Services Ltd. The following information has been extracted from Sabre Electrical Services Ltd. Outdoor Lighting Report (Sabre 2025):

The lighting design will provide adequate illuminance for vehicular and pedestrian access, and communal open spaces using low energy LED lighting to minimise both energy consumption and lighting pollution to surrounding area.

6.4.8 Description of the Construction Phase

A draft Construction Environmental Management Plan (CEMP) has been prepared by DNV (DNV, 2025) with details of the Construction Phase for the Site.

It is anticipated that the construction of the Proposed Development will commence in Q3 of 2026 and will be completed by Q2 of 2029. The programme duration and proposed sequence of construction will be finalized by the Main Contractor (once appointed) in advance of construction works commencing onsite and will be agreed with the Client. The project programme, which may be amended over the course of the project, will be included in the live CEMP.

Except where otherwise agreed with Fingal County Council, working hours will be 08:00 – 18:00 from Monday to Friday (excluding bank holidays), and 08:00 – 13:00 on Saturday. No works are envisaged to be carried out on Sundays or Bank Holidays. However, should there be a need to work on Sundays, Bank Holidays or outside the specified normal working hours, a written submission, with compelling reasons for the proposed deviation, seeking authorisation will be made by the Main Contractor (once appointed) to Fingal County Council.

In advance of the commencement for construction the following will be implemented:

- Pre-construction surveys.
- The contractor will secure the Site.
- Establishment of accommodation and welfare facilities for workers.

During construction the following will be implemented:

- Dust, noise and vibrations control measures will be implemented to protect the surrounding residential areas and environment.
- Acceptable excavation material will be reused, while unacceptable material will be transported off site to a licensed waste disposal facility.
- Excavation and construction works will be carefully managed to ensure no contamination of watercourses as a result of the construction work.
- Adherence to best practice in respect of protection of the watercourses during all stages of construction.
- Suitable surface water management. Any surface water encountered during this phase will be pumped to the foul sewerage network during periods of low flow in agreement with the relevant authorities or pumped to tankers and removed from site. In the event of an unexpected underground stream being encountered, this will be diverted in consultation with relevant agencies before excavation works continue.
- Protection of existing buildings in the vicinity of the Site.
- Focussed and controlled lighting during construction.

6.4.9 Description of the Operational Phase

The Operational Phase of the Proposed Development will comprise of the occupancy of the completed residential development.

6.5 Potential Impact of the Proposed Development

6.5.1 Avoidance and Mitigation Embedded in the 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 part of the overall design 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 6. below.

Table 6.17: Embedded design features and their potential to act to avoid or mitigate negative impacts on the local ecology and environment

Embedded Design Features	Avoidance / Mitigation Potential
<u>SUDS:</u> Green roofs Permeable paving Filter drain Tree pits Attenuation Petrol interceptor	The SUDS features included in the Project Design will ensure the surface water discharge from the Proposed Development is reduced to greenfield runoff rates. These features will be implemented as part of the surface water drainage design.
<u>Landscape Design:</u> Hedgerow, shrub, woodland/street tree, and wildflower grass meadows	This will provide habitat for the biodiversity that currently exists on Site, and act to offset potential habitat loss due to vegetation removal.

Park with four lawn pockets and surrounding woodland plantation	
Lighting Design: Public lighting will adhere to best practice guidance. Light spill controlled through a combination of directional lighting and luminaire optics design. No floodlighting will be used on the scheme.	The lighting design will reduce light spill into adjacent habitats to maintain dark corridors along the boundaries at the Site and reduce overall artificial lighting impacts to any nocturnal wildlife active within or adjacent to the Site during peak active times at night.

6.5.2 Construction Stage Impact Assessment

The impacts of the Construction Phase of the Proposed Development on the identified KERs have been assessed, and Table 6. below summaries the evaluation rating assigned to each ecological feature and the rationale behind these evaluations is also provided.

Table 6.18: Evaluation of designated sites, habitats, flora and fauna recorded within the Site for the Construction Phase of the Site. Those identified as Key Ecological Receptors (KERs) are highlighted in green

Species / Species Group	Evaluation	Rationale	Key Ecological Receptor (KER)
Designated Sites			
European Sites	International Importance (No impact)	No significant S-P-R pathways to European Sites. Mitigations have been included in this EIA report to rule out any potential significant effects on any European sites because of the Proposed Development.	No
Nationally designated sites (pNHAs, NHAs)	National Importance (Potential Slight impact)	Significant air pathways to Royal Canal pNHA via dust deposition from the Construction Phase of the Project. Therefore, this pNHA can be directly affected by the Proposed Development through dust deposition	Yes
International Sites (Ramsar, UNESCO)	International Importance (No impact)	No significant S-P-R pathways to designated sites. Mitigations have been included in this EIA report to rule out any potential significant effects on any designated sites because of the Proposed Development	No

Habitats and Flora			
Hedgerows (WL1)	Local importance	Comprises native hedgerow species and provides suitable nesting and foraging habitat for a range of species. Sections of the hedgerow along northern and western extents of this habitat will be retained. However, this habitat may be indirectly affected by the Proposed Development through dust deposition or root damage.	Yes
Flower beds and borders (BC4)	Less than local importance	This habitat is man-made and comprises of ornamental floral planting and is restricted in extent to a small insignificant area on the Site. The loss of this low value habitat will not be of significance.	No
Treeline (WL2)	Less than local importance	The treeline is comprised of non-native species and is restricted in extent to a small insignificant area on the Site. The loss of this low value habitat will not be significant.	No
Buildings and artificial surfaces (BL3)	Less than local importance	This habitat is man-man and of little to no value.	No
Dry Meadows and grassy verges	Less than local importance	The loss of this low value habitat will not be of significance. This habitat type is also abundant in the wider area.	No
(Mixed) broadleaved woodland (MWD1)	Local Importance	Comprises of native tree species and provides suitable nesting and foraging habitat for a range of species. This stretch of the habitat will be retained as these trees have been plated as roadside trees for the existing carriageway that runs above the eastern	Yes

		section of the Site. Therefore, this habitat can be indirectly affected by the Proposed Development through dust deposition or root damage.	
Amenity grassland (GA2)	Less than local importance	The loss of this low value habitat will not be significant.	No
Spoil and bare ground (ED2)	Less than local importance	The loss of this species deficient habitat will not be significant.	No
Recolonising bare ground (ED3)	Less than local importance	This habitat is species poor and is also abundant in the wider area. Therefore, the loss of this low value habitat will not be significant.	No
Invasive species	Less than local importance	The loss of these low value invasive species is not considered to be significant.	No
Fauna			
Bats	Roosting: Less than local importance	PRF-I potential for trees and No potential for buildings for roosting bats, and moderate suitability for commuting and foraging bats. Details of abundance and species diversity of bats for the site will be confirmed after the required bat surveys to be conducted for the Site are complete. Bat species utilising the Site have the potential to be significantly affected by the Proposed Development in the absence of mitigation.	Yes
	Commuting and foraging: Local importance		
Birds	Local importance	Five amber listed, one red listed and several green listed bird species were recorded at the Site with suitable	Yes

		breeding habitats for a few notable species. Bird species utilising the Site have the potential to be significantly affected by the Proposed Development in the absence of mitigation.	
Large Mammals	Less than local importance	No resting sites, foraging or commuting habitats for mammals such as badger or otter were identified at the Site. Therefore, it is presumed that the Site is not of importance to these species	No
Small Mammals (excl. bats)	Local Importance	Suitable habitats present for some of the small native mammals, such as hedgehog, pygmy shrew, and wood mouse at the Site, which may be more timid and less likely to be recorded during surveys. Hedgehog specifically hibernate and may be susceptible to injury during vegetation clearance during hibernation in the absence of mitigation.	Yes
Common Lizard	Local Importance	Some suitable habitats in the form of existing waste material such as concrete blocks, and hedgerows, woodlands, trees and grassland habitats at the Site may provide basking and refugia spots. No desk study records but this species is widespread throughout Ireland and thus presumed present.	Yes
Fish, amphibian and other aquatic species	Less than local importance	No watercourses or waterbodies are located at the Site of the Proposed Development. Therefore, there are no suitable habitats for fish,	No

		amphibians, and other aquatic species at the Site and the impacts to these species will negligible.	

6.5.3 Operational Stage

The impacts of the Operational Phase of the Proposed Development on the identified KERs have been assessed, and Table 6. below summaries the evaluation rating assigned to each ecological feature and the rationale behind these evaluations is also provided.

Table 6.19: Evaluation of designated sites, habitats, flora and fauna recorded within the Site for the Operational Phase of the Site. Those identified as Key Ecological Receptors (KERs) are highlighted in green

Species / Species Group	Evaluation	Rationale	Key Ecological Receptor (KER)
Habitats and Flora			
Hedgerows (WL1)	Local importance	Sections of the native hedgerows along the western and northern boundaries of the Site will be retained. While this habitat provides suitable nesting and foraging habitats for a range of bird species, and commuting bat species, the hedgerows along the Site will be enhanced via tree planting as per the landscape design for the Operational Phase of the Proposed Development. Therefore, the positive impact will act to offset some of the negative impacts from the loss of this habitat.	Yes
Flower beds and borders (BC4)	Less than local importance	The loss of this low value habitat will not be significant given the wildflower meadows proposed for the Operational Phase of the Proposed Development per the landscape design.	No
Treeline (WL2)	Less than local importance	The loss of this low value habitat will not be significant given the woodland and street	No

		tree plantation proposed for the Operational Phase of the Proposed Development as per the landscape design.	
Buildings and artificial surfaces (BL3)	Less than local importance	The loss of this habitat will not be significant given the woodland and street tree plantation proposed for the Operational Phase of the Proposed Development as per the landscape design..	No
Dry meadow and grassy verges (GS2)	Less than local importance	The loss of this low value habitat will not be significant given the hedgerow, street tree, woodland, scrub and wildflower meadows that is proposed for the Operational Phase of the Proposed Development as per the landscape design.	No
(Mixed) broadleaved woodland (MWD1)	Local Importance	This habitat is connected to the Site along the eastern boundary. Although it is to be retained, it may be affected by the Proposed Development through direct damage	Yes
Spoil and bare ground (ED2)	Less than local importance	The loss of this habitat will not be significant and will be further enhanced by the proposed biodiverse green spaces for the Operational Phase of the Proposed Development.	No
Recolonising bare ground (ED3)	Less than local importance	The loss of this low value habitat will not be significant and will be further enhanced by the proposed biodiverse green spaces for the Operational Phase of the Proposed Development.	No
Amenity grassland (GA2)	Less than local importance	The loss of this low value habitat will not be	No

		significant and will be further enhanced by the proposed biodiverse green spaces for the Operational Phase of the Proposed Development.	
Fauna			
Bats	Roosting: Less than local importance	Given the current relatively urban context of the Site, an increase in lighting during the Operational Phase of the Proposed Development will have a negative impact on local bat populations through the loss of dark foraging and commuting corridors. However, the bat friendly lighting measures in line with the Bat Conservation Trust guidelines on artificial lighting and bats has been incorporated into the lighting design plan. Furthermore, the additional green spaces proposed for the Site will positively impact and offset some of the negative impacts from the loss of habitats for bats.	Yes
	Commuting and foraging: Local importance		
Birds	Local Importance	Although negative impacts are envisaged due to the loss of suitable breeding habitats for bird species, the planting of street trees, woodlands, scrub and enhancement of hedgerows for the Operational Phase of the Proposed Development will provide a positive impact on bird species. <u>Likelihood of Collision Impacts</u> While the physical location of buildings and structures can influence	Yes

		the likelihood of bird collisions, the Site itself is located within a combination of urban and agricultural lands and is not deemed to be located in a sensitive area in terms of bird flight paths i.e., it is not located along the coast, or adjacent to any SPAs designated for wetland bird populations. <u>Building Height</u> The Proposed Development entails the construction of low-level residential buildings and as such, the risk of migrating birds colliding with the structure due to its height is deemed to be negligible <u>Building Appearance</u> The overall façades of the proposed buildings are well broken up, with a varied material composition interspersing any reflective areas. These architectural design features provide important visible cues as to the presence and extent of the proposed structures to any commuting/foraging bird species should they be in the vicinity of the Site.	
Large Mammals	Less than local importance	No resting sites, foraging or commuting habitats for mammals such as badger or otter were identified at the Site. Therefore, it is deemed that the Site will have negligible impact on the habitats of large mammals during the Operational Phase of the Proposed Development.	No

Small Mammals (excl. bats)	Local Importance	Noise, increase in light, and potential physical disturbance due to increased human presence associated with the Operational Phase has the potential to cause a negative, permanent, moderate impact to small mammals in the absence of suitable mitigation. The Proposed Development will also result in a loss of foraging and commuting habitat for small mammals, however due to the extent of the surrounding suitable habitat in the vicinity of the Site, and considering the new green spaces proposed for installation at the Site, these factors have the potential to cause a positive, permanent, slight impact to small mammals.	Yes
Common Lizard	Local Importance	No significant impacts on lizards are anticipated during the Operational Phase. The proposed planting at the Site has the potential to provide a positive, permanent, slight impact. Further consideration of this will be provided once the final planting plans are prepared.	Yes
Fish, amphibian and other aquatic species	Less than local importance	Impacts on fishes, amphibians and other aquatic species is not envisaged due to the lack of water courses at the Site and the proposed SuDS measures that have been incorporated into the landscape design for the Operation Phase of	No

		the Proposed Development	

6.5.4 Do-Nothing Impact

Under the do-nothing scenario, most of the habitats at the Site of the Proposed Development would continue to undergo succession. The construction works for the Strategic Housing Development (ABP-312318-21) adjacent to the Site has already commenced and will significantly impact the dry meadows habitats (GS2) habitat along the southern section of the Site. The construction of the aforementioned development will not result in a change in habitat connectivity south of the Site due to the lack of green corridors in these areas.

The other remaining hedgerows would continue to serve as biodiversity corridors, providing habitat connectivity, along with nesting/roosting and foraging habitat for birds and mammals. The grassland would also continue to provide foraging and commuting habitat for local wildlife and pollinators, with potential for scrub species along the hedgerow to further encroach into the grassland area. The floral composition of recolonising bare ground habitats will continue to increase in the absence of disturbance, further encroaching into the neighbouring bare ground habitats. In the absence of regular maintenance and/or management, the amenity grasslands have the potential to support tall swathes of grasses, as well as floral species found at the bases of the adjacent hedgerow and recolonising grounds.

6.6 Mitigation Measures (Ameliorative, Remedial or Reductive Measures)

Mitigation measures for the Construction Phase and Operational Phase of the Proposed Development have been listed below.

6.6.1.1 Construction Stage

6.6.1.1.1 Protection of Habitats and Designated Sites

6.6.1.1.1.1 Mitigation 1: Tree Protection

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 at the Site. The fencing will be signed off by a qualified arborist prior to Construction to ensure it has been properly erected. No ground clearance, earthworks, stockpiling or machinery movement will be undertaken within these areas.

6.6.1.1.1.2 Mitigation 2: Standard Surface water and ground water protection measures

6.6.1.1.1.2.1 Control of Fuel and Chemical Storage

The storage and use of fuel and oils will be kept to a minimum at the Site.

If small quantities of oils and chemicals oils are required at the Site, the use of these will be strictly controlled in accordance with procedures outlined in the CEMP and storage will be avoided where possible. All tank, container and drum storage areas shall be rendered impervious to the materials stored therein. Bunds and storage areas shall be designed having regard to Environmental Protection Agency guidelines 'Storage and Transfer of Materials for Scheduled Activities' (EPA, 2004) and Enterprise Ireland Best Practice Guidelines (BPGCS005). 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.

Any fuels retained on drip trays, mobile bunds, etc., will be emptied into a secure bunded waste oil drum to await appropriate disposal offsite.

Refueling of plant during the Construction Phase will be carried out in accordance with standard best practice. Refueling will only be carried out at the designated, impermeable refueling station location onsite with appropriate containment in place. This 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 at the Proposed Development Site.

Where possible any oil and lubricant changes and maintenance will take place offsite. Only emergency breakdown maintenance will be carried out on Site. Drip trays and spill kits will be available on Site to ensure that any spills from vehicles are contained and removed offsite.

All personnel working onsite will be trained in pollution incident control response. Emergency silt control & spillage response procedures contained within the CEMP will ensure that appropriate information will be available on site outlining the spillage response procedures and a contingency plan to contain silt during an incident.

Provided that these requirements are adhered to, and site crew are trained in the appropriate refueling techniques, it is not expected that there will be any fuel/oil wastage at the Site.

6.6.1.1.1.2.2 Control of Emissions to Surface water and Drainage

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.

Silt traps, and silt fences will be provided by the contractor where necessary to prevent silts and soils being washed away by heavy rains during the course of the Construction Phase. Surface water runoff and water pumped from the excavation works will be discharged via a silt trap / settlement pond to the existing foul drainage network.

In addition, the following general measures will be undertaken:

- Where required, designated impermeable cement washout areas will be provided.
- Run-off from the working site or any areas of exposed soil will be channeled and intercepted at regular intervals for discharge to silt-traps or lagoons with over-flows directed to land rather than to a drain.
- Silty water generated on Site will be treated using silt traps/settlement ponds and temporary interceptors and traps will be installed until such time as permanent facilities are constructed.
- Storm drain inlets which could receive stormwater from the project will be protected throughout the Construction Phase.
- A regular review of weather forecasts of heavy rainfall will be conducted, and a contingency plan will be prepared for before and after such events to minimise any potential nuisances. As the risk of the break-out of silt laden run-off is higher during these weather conditions, no work will be carried out during such periods where possible.
- Any imported materials will, as much as possible, be placed on Site in their proposed location and double handling will be avoided. Where this is not possible designated temporary material storage areas will be used.
- These temporary storage areas will be surrounded with silt fencing to filter out any suspended solids from surface water arising from these materials.
- Temporary hydrocarbon interceptor facilities will be installed and maintained where Site works involve the discharge of drainage waters to nearby drains.
- All containment and treatment facilities will be regularly inspected and maintained.
- All personnel working on site will be trained in pollution incident control response.
- If portaloos and/ or containerised toilets and welfare units will be used to provide facilities for site personnel, all associated waste will be removed from site by a licensed waste disposal contractor.

Under no circumstances will any untreated wastewater generated onsite (from equipment washing, road sweeping etc.) be released into nearby drains.

6.6.1.1.1.2.3 Control of Emissions to Soil and Groundwater

Measures set out in the previous section also serve to protect soil and groundwater. In addition, the following measures will also be undertaken:

- No direct untreated point discharge of construction runoff to groundwater will be permitted.
- Where a pollution incident is detected, construction works will be stopped until the source of the construction pollution has been identified and remedied.
- Groundwater may be encountered during the construction works. Where water must be pumped from the excavations, water will be managed in accordance with best practice standards (i.e., CIRIA – C750) and regulatory consents.

- Any excavated and potentially contaminated stockpiled soils will be constructed/ located/ sheeted in a manner that ensures water is contained within the Site boundary.

6.6.1.1.1.3 Mitigation 3: 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 such as the Royal Canal located north of the Site of the Proposed Development.

- 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 as a result 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 drainage ditches along the boundaries of the Site.

6.6.1.1.1.4 Mitigation 4: Invasive Species Removal

It is recommended that non-native/invasive flora species recorded at the Site are controlled/removed as per the appropriate best-practice guidelines. Removal and disposal should be carried out in accordance with appropriate guidelines such as TII (formerly NRA) *The Management of Invasive Alien Plant Species on National Roads* (2020), with consideration given to the prevention of spread of these plants.

Recommended Management: Physical removal and off-site disposal of butterfly-bush is recommended where it occurs within the survey area.

6.6.1.1.2 Protection of Fauna

6.6.1.1.2.1 Mitigation 5: Reduction of Noise Related Impacts

Noise generated during the Construction Phase of the Proposed Development could cause temporary disturbance to a number of faunal species in the vicinity of 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.
- Use of alternative reversing alarm systems on plant machinery.
- 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.

These measures will ensure that any noise disturbance to nesting birds or any other fauna species in the vicinity of the Site will be reduced to a minimum.

6.6.1.1.2.2 Mitigation 6: Construction Phase Lighting

The following mitigation measures are more general and not specific to the bat activity present at the Site and may change following completion of the bat transect surveys.

As a precautionary measure, no overnight lighting will be directed to the natural habitats bounding the Site. Where overnight lighting cannot be avoided in these areas due to health and safety concerns, the lighting within the Proposed Development will be designed and installed to minimise the impact on local wildlife as agreed with the Ecologist and in accordance with the Bat Conservation Trust guidelines on artificial lighting and bats (Collins, 2023)

- There will be no light spill to the boundary habitats.
- All luminaires used will lack UV/IR elements to reduce impact.
- LED luminaires will be used due to the fact that they are highly directional, lower intensity, good colour rendition and dimming capability.
- A warm white spectrum (3000 Kelvins will be used to reduce the blue light component of the LED spectrum).
- Luminaires will feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats.
- Column heights should be carefully considered to minimise light spill. The shortest column height allowed should be used where possible.
- Only luminaires with an upward light ratio of 0% and with good optical control will be used.
- Luminaires will be mounted on the horizontal, i.e., with no upward tilt.
- Any external security lighting will be set on motion-sensors and short (1min) timers.
- As a last resort, accessories such as baffles, hoods or louvres will be used to reduce light spill and direct it only to where it is needed.

6.6.1.1.2.3 Mitigation 7: Vegetation Clearance

Vegetation clearance of the hedgerow, treeline, grassland and woodland habitats for the Site will need to be cognisant of any potentially present fauna. Table 6.5 provides guidance for when vegetation clearance is permissible in relation to wintering, hibernating and breeding fauna. 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 to avoid the main breeding bird season and bat maternity and roosting season as well as mammal hibernation.

Where this seasonal restriction cannot be observed, a check for active nests, will be carried out immediately prior to any Site clearance by an Ecological Clerk of Works (ECoW) and repeated as required to ensure compliance with legislative requirements. Where a breeding bird and an active nest is found, the nest will be protected, and no further works will take place in the vicinity of the nest until the young have fledged.

Table 6.5: Seasonal restriction on vegetation removal. Red boxes indicate periods when clearance/works are not advised

Ecological Features	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec

Breeding birds	Vegetation clearance permissible	Nesting bird season No clearance of vegetation or works to relevant structures permitted unless confirmed to be devoid of nesting birds by an ecologist	Vegetation clearance permissible	
Hibernating mammals (namely hedgehog)	Mammal hibernation season No clearance of vegetation or works to relevant structures permitted unless confirmed to be devoid of hibernating mammals by an ecologist	Vegetatio clearance permissible		season No clearance of vegetation or works to relevant structures permitted unless confirmed to be devoid of hibernating mammals by an ecologist
Common lizard	Lizard hibernation season No habitat clearance permissible	Active period Habitat (scrub, tall sward grass) clearance permissible		Lizard hibernation season No habitat clearance permissible

Additionally, all vegetation clearance will be carried out in sections working in a consistent direction to prevent entrapment of protected fauna potentially present (e.g., hedgehog, pygmy shrew). Logs and branches from this vegetation will be utilised for the creation of hibernacula on Site, see section 6.6.2.5 below. A phased cutting approach under the supervision of a suitably qualified ECoW will be used to allow wildlife (small mammals, reptiles and amphibians) to move away from any suitable habitat that will be removed:

- Phase 1 – Cutting vegetation to 150-200 mm and removing the arisings;
- Phase 2 – After a minimum of one hour, hand-searching the cut areas (conducted by an ECoW) and removing any sheltering habitat (e.g. logs or debris) then cutting vegetation to ground level and removing the arisings; and
- Phase 3 – Soil scrape.

Should any suitable refugia or day nesting habitats need to be removed, this will be carried out outside the most vulnerable breeding periods for hedgehogs wherever practicable (main hedgehog birthing months June and July) and will be supervised by the ECoW.

6.6.1.1.2.4 Mitigation 8: Waste Management

As best-practice, all construction-related rubbish on-site e.g., plastic sheeting, netting etc. should be kept in a designated area on-site and kept off ground level so as to protect small fauna (such as small mammals, amphibians and reptiles) from entrapment and death**.**

6.6.1.1.2.5 Mitigation 9: Avoidance of accidental trapping of fauna

In order to avoid accidental harm/injury or mortality to mammals during construction all excavations shall have a wooden plank, sloping edge or other means of escape to avoid accidental trapping of mammals. All pipes shall be covered at night.

6.6.1.2 Operational Stage

6.6.1.2.1 Habitats and Flora

6.6.1.2.1.1 Mitigation 10: Invasive Species Management

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.

As such, it is recommended that any newly landscaped areas, particularly where infill materials and soils have been imported for soft landscaping, are assessed during the Operational Phase within the next botanical season for the presence of any inadvertently introduced invasive species, with particular focus on those listed on Schedule III of SI 477 of 2011. If invasive species are detected, an Invasive Species Management Plan will be prepared, agreed with the Local Authority and implemented at the earliest possibility to limit the potential for further spread.

6.6.1.2.1.2 Mitigation 11: Bats

In accordance with the best practise bat-friendly lighting guidelines (ILP, 2023), the below measures will be incorporated as part of the Lighting Design of the Proposed Development:

- All luminaires should lack UV elements when manufactured. Metal halide, compact fluorescent sources should not be used.
- LED luminaires should be used where possible due to their sharp cut-off, lower intensity, good colour rendition and dimming capability.
- A warm white light source (3000 Kelvin or lower) should be adopted to reduce blue light component.
- Light sources should feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats.
- Internal luminaires can be recessed where installed in proximity to windows to reduce glare and light spill.
- Column heights should be carefully considered to minimise light spill and glare visibility. This should be balanced with the potential for increased numbers of columns and upward light reflectance as with bollards.
- Only luminaires with a negligible or zero Upward Light Ratio, and with good optical control, should be considered.
- Luminaires should always be mounted horizontally, with no light output above 90° and/or no upward tilt.
- Where appropriate, external security lighting should be set on motion sensors and set to as short a possible a timer as the risk assessment will allow. For most general residential purposes, a 1 or 2 minute timer is likely to be appropriate.
- Only if all other options have been explored, accessories such as baffles, hoods or louvres can be used to reduce light spill and direct it only to where it is needed. However, due to the lensing and fine cut-off control of the beam inherent in modern LED luminaires, the effect of cowls and baffles is often far less than anticipated and so should not be relied upon solely.

6.6.2 Biodiversity Enhancement Measures

6.6.2.1 Biodiversity Enhancement by Design

The Landscape Plans for the Site of the Proposed Development incorporates native planting throughout the open green spaces of the Proposed Development. This will take the form of street tree planting, mixed woodland planting, hedgerows, scrub beds, and wildflower grass meadows. The planting schedule will be informed prior to the commencement of the construction phase and will be agreed with inputs by a qualified ecologist. A more general planting plan has been included in the Landscape Plans for the Site, which detail the specifications for plant material, the requirements of the Landscape contractor, and proposals for monitoring establishment of green spaces across the Site. The proposed Landscape Plan for the Site has been designed to enhance biodiversity by introducing a greater variety of habitats than those that are currently present on Site.

6.6.2.2 Enhancement 1: Hedgehog Highways

By creating a number of separate private dwellings and gardens at 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 i.e., garden fencing, railings and gates, are permeable for hedgehogs, as seen in Figure 8. This can be achieved by:

- The use of fence panels with 13 x 13 cm holes at ground level (Hedgehog holes);
- Leaving a sufficient gap beneath gates, and;
- Leaving brick spaces at the base of brick walls.

Figure 8: Examples of Hedgehog highways' that can maintain habitat connectivity for hedgehogs in residential developments

The inclusion of hedgehog highways is recommended as part of the landscape design of the Site, specifically along the public open spaces proposed along the Site boundaries. A variety of fence suppliers' stock specific hedgehog-friendly fencing options, which can be easily incorporated at little or no additional cost. These simple measures will provide habitat connectivity at the Site for hedgehogs and reduce the impact of the land-use change on this species.

Including details of hedgehog-friendly features in the new homeowner's welcome pack will raise awareness and prevent homeowners from reversing these features, for instance blocking fence holes.

6.6.2.3 Enhancement 2: Pollinator Habitat

Pollinator/'insect habitat, as seen in Figure 9, will be created on the Site by:

- Creating an earth bank.
- Scraping back some bare earth.
- Leaving some areas to grow wild, and/or
- By drilling holes 10cm deep in unvarnished wood for solitary bees.

Figure 9: Example of solitary bee habitat. Extracted from How-To-Guide: Creating Wild Pollinator Nesting Habitat (NBDC, 2016)

Large bee or insect hotels will not be installed. Guidance from the All -Ireland Pollinator Plan states "*Don't install a large bee or insect hotel. Large bee hotels are attractive to humans, but not great for pollinators. They can encourage the spread of disease and attract predators. Avoid anything bigger than an average-sized bird box. There are many other ways to provide nesting habitats for pollinators, such as providing wild areas of undisturbed long grass, and scraping back some bare earth. If you want to make a bee hotel, make sure it is small, and position it away from bird feeders so the insects aren't easy targets*." A link to a "How-to-guide Creating wild pollinator nesting habitat" is provided for the development management company to put these habitats in place: Pollinator-Nesting-How-to-Guide-2022-WEB.pdf (pollinators.ie). An appointed ecologist will oversee the creation of these habitats.

6.6.2.4 Enchantment 3: Bat Boxes

Four summer bat boxes (e.g., Woodcrete 1FF design) will be erected on the Site of the Proposed Development. The number of boxes may increase should the activity surveys find evidence of roosting on Site to mitigate any loss of roost habitat. The boxes will be installed as part of the landscaping works, so as to not delay their deployment and potential positive impacts.

Bat boxes will be sited carefully, and this will be undertaken by a bat specialist. The bat ecologist will denote the locations, orientation and height of the bat boxes to be erected with assistance from the contractor. Some general points that will be followed include:

- Bat boxes will be erected on trees (or telegraph poles) with no crowding branches or other obstructions for at least 1 metre above and below the bat box.
- The diameter of the tree should be wide and strong enough to hold the required number of boxes.
- Locate bat boxes in areas where bats are known to forage or adjacent to suitable foraging areas. Locations will be sheltered from prevailing winds.
- Bat boxes will be erected at a height of 4-5 metres to reduce the potential for vandalism and predation of roosting bats.
- The recommended Woodcrete 1FF design is open at the bottom, allowing the droppings to fall out, and so does not need cleaning.

6.6.2.5 Enhancement 4: Hibernacula

It is recommended to enhance the landscaped areas for small mammals, amphibians and reptiles by providing hibernacula in the form of log and brush piles within the Site of the Proposed Development. It is recommended that 2-3 areas of hibernacula are provided at areas furthest removed from likely human activity.

For this Proposed Development the public open spaces along the eastern boundary, but away from the pedestrian and cycle lane, will be suitable areas for hibernacula installation.

Hibernacula for hedgehogs, amphibians and reptiles is relatively easy to create from logs and soil, all of which can likely be sourced from the Site during works. Wood in various sizes should be piled either in a shallow depression or on the slope of the attenuation pond in a disorganised way to create nooks and crevices. Larger tree trunks or rocks should be placed so that they will protrude through the final mound to provide open entrances to the mound. This pile should then be covered in soil to allow the inner crevices to maintain a stable temperature through the winter and allow for hibernation.

6.6.2.6 Enhancement 5: Swift Boxes/Bricks

The installation of swift bricks/boxes is recommended for the Site of the Proposed Development. Swifts (*Apus apus)* are an endangered species of bird that migrate to Ireland from South Africa each summer and traditionally nest in crevices or the eaves of buildings. The swift bricks in particular are discrete hollow bricks designed to building regulation standards that can be matched to the design of the façade.

Swifts are a "clean" bird species which remove their own wastes from their nests periodically. As such, Swift bricks do not require any cleaning by the management company.

The incorporation of Swift Boxes or Bricks will help recover the declining swift population, which are now Red Listed in Ireland (Gilbert et al., 2021). The following recommendations are extracted from "Saving Swifts" by Birdwatch Ireland (BirdWatch Ireland, 2023).

Swift Bricks/boxes:

- should be constructed of long-lasting material and securely fixed in position.
- should be erected at least five metres above ground level.
- should be erected in sheltered cool areas out of the sun, or under an overhang and /or under the eaves. Bricks can be placed at any aspect, however, as they tend not to overheat the way that externally fitted boxes can.
- should have a clear airspace in front for access.
- should be grouped (side by side in rows) as swifts are colony nesters.
- should avoid sites which can be accessed by predators- cats, squirrels, magpies, rats.
- should avoid sites near plate glass windows because they are a known collision hazard for birds.
- should not be placed directly above ledges or other obstructions. Swifts drop before taking flight and can collide with obstacles below the nest entrance.
- should not be one above the other.
- should not be near spotlights or later fit spotlights near them

6.6.2.7 Enhancement 6: Long Term Management of Hedgerows

For the long term management of hedgerows during the Operational Phase of the Proposed Development, relevant guidance has been sourced from Hedgerows Ireland (HE, 2025), and (LAHO, 2016), to inform best practice and optimal enhancement of hedgerows at the Site.

As per the guidance provided in Hedgerows Ireland (HE,2025), it is recommended that cutting/flailing of hedgerows is not undertaken annually. This is because annual cutting has been associated with reducing local biodiversity benefits that the hedgerows may offer to flowering species within the hedgerow itself, as well as the pollinators that rely on these floral species. Furthermore, the annual cutting of hedgerows can also diminish food resources in the form of berries or fruits for birds thereby depleting resources that the bird species may rely on. Cutting can also directly impact the nesting behaviour of birds in the locality, therefore, all cutting mush take place outside of the breeding bird season (March to August).

Additionally, as per (LAHO, 2016), it is recommended that proper maintenance of hedgerows should be established to encourage flowering, fruiting and growth to boost wildlife potential in hedgerows. This is to be accomplished by ensuring that mature hedgerows are in good condition and must be allowed to grow naturally, and maintenance is confided to essential practices such as stockproofing, inplanting, and the control of invasive species. Weak hedgerows, which have lost their vigour, will require more intervention such as laying or coppicing. Any established hedgerows will need cutting every two to three years, and the maintenance is to be done on a rotational basis around the Site to ensure that there is growth at all stages.

6.7 Residual Impact of the Proposed Development

Residual impacts are defined as '*effects that are predicted to remain after all assessments and mitigation measures*'. They are the remaining 'environmental costs' of a project and are the final or intended effects of a development after mitigation measures have been applied to avoid or reduce adverse impacts. Potential residual impacts from the proposed development were considered as part of this environmental assessment. Table 6. below provides a summary of the impact assessment for the identified KERs and details the nature of the impacts identified, mitigation proposed and the classification of any residual impacts.

All mitigation measures detailed in this Chapter will be implemented in full and will remain effective throughout the lifetime of the facility. Therefore, no significant negative residual impacts on the local ecology or on any designated nature conservation sites will result from the Proposed Development.

Table 6.21: Summary of potential impacts on KER(s), mitigation measure/mitigating factors and residual impacts for the Site of the Proposed Development.

Key Ecological Resources	Level of Significance	Potential Impact	Impact without mitigation				Proposed mitigation / mitigation factors	Proposed enhancements (if any)	Residual impact
			Quality	Magnitude /Extent	Duration	Significance			
Designated Sites									
Royal Canal pNHA (002103)	National Importance	**Construction Phase:** Weak potential for deterioration of water quality and resources due to dust emission.	Negative	National	Short-term	Minor (slight or moderate)	Mitigation 2: Standard surface water and ground water protection measures Mitigation 3: Reduction of Dust Related Impacts	None	Imperceptible
		Operational Phase: None Envisaged	None	None	None	None	None		Imperceptible
Habitats									

Key Ecological Resources	Level of Significance	Potential Impact	Impact without mitigation				Proposed mitigation / mitigation factors	Proposed enhancements (if any)	Residual impact
			Quality	Magnitude /Extent	Duration	Significance			
(Hedgerows (WL1), and (mixed) broadleaved woodland (MWD1).	Local importance	**Construction Phase:** Loss of habitat	Negative	Local	Permanent	Minor (neutral or slight)	Mitigation 1: Tree Protection Mitigation 7: Vegetation Clearance	Recommend planting of native hedgerow, shrub, woodland species within the Site	Negative, Local, Permanent, Neutral or Slight
		Operational Phase: None identified	None	None	None	None			
Invasive Species	Less than local importance	**Construction Phase:** Spread of invasive species.	Negative	Local	Short-term	Minor (neutral or slight)	Mitigation 4: Invasive Species Removal	None	Imperceptible
		Operational Phase: Spread of invasive species.	Negative	Local	Short-term	Minor (neutral or slight)	Mitigation 10: Invasive species management		
Fauna									
Bat Assemblage	Local Importance	**Construction Phase:** Loss of habitat due to felling of the	Negative	Local	Permanent	Moderate (neutral or slight)	Mitigation 6: Construction Phase Lighting	Enhancement 3: Bat boxes	Positive, Local, Permanent, Neutral or Slight

Key Ecological Resources	Level of Significance	Potential Impact	Impact without mitigation				Proposed mitigation / mitigation factors	Proposed enhancements (if any)	Residual impact
			Quality	Magnitude /Extent	Duration	Significance			
		sections of hedgerows. Increase in lighting during construction works.	Negative	Local	Short-term	Moderate (neutral or slight)	Mitigation 5: Reduction of Noise Related Impacts		
		Operational Phase: Increase lighting. Additional foraging/commuting routes as a result of the Proposed Landscaping	Negative	Local	Permanent	Moderate (neutral or slight)	Mitigation 11: Bats		
			Positive	Local	Permanent	Moderate (neutral or slight)			
Bird Assemblages	Local Importance	**Construction Phase:** Habitat loss. Disturbance from noise, dust and/or lighting. Risk of injury or death during	Negative	Local	Permanent	Moderate (neutral or slight)	Mitigation 3: Reduction of Dust Related Impacts Mitigation 5: Reduction of Noise Related Impacts	None	Positive, Local, Permanent, Neutral or Slight
			Negative	Local	Short-term	Moderate			

Key Ecological Resources	Level of Significance	Potential Impact	Impact without mitigation				Proposed mitigation / mitigation factors	Proposed enhancements (if any)	Residual impact
			Quality	Magnitude /Extent	Duration	Significance			
		vegetation clearance				(neutral or slight)	Mitigation 7: Vegetation Clearance		
			Negative	Local	Short-term	Moderate (neutral or slight)			
		Operational Phase: Additional habitat as a result of the proposed planting on Site.	Positive	Local	Permanent	Moderate (neutral or slight)			
Small Mammals excl. bats (Irish Hare, Hedgehog, Wood Mouse, Pygmy Shrew)	Local Importance	**Construction Phase:** Habitat loss. Risk of injury or death during vegetation clearance and / or entrapment in construction-related rubbish and excavations. Disturbance from noise, dust and/or lighting.	Negative	Local	Permanent	Moderate (neutral or slight)	Mitigation 3: Reduction of dust related impacts. Mitigation 5: Reduction of noise related impacts. Mitigation 7: Vegetation Clearance. Mitigation 8: Waste Management. Mitigation 9: Avoidance of	Enhancement 4: Hibernacula	Negative, Local, Permanent, Neutral or Slight
			Negative	Local	Short-term	Moderate (neutral or slight)			
			Negative	Local	Short-term	Moderate (neutral or slight)			

Key Ecological Resources	Level of Significance	Potential Impact	Impact without mitigation				Proposed mitigation / mitigation factors	Proposed enhancements (if any)	Residual impact
			Quality	Magnitude /Extent	Duration	Significance			
							accidental trapping of fauna.		
		Operational Phase: Disturbance due to human activity. Additional habitats as a result of the proposed planting at the Site	Negative	Local	Permanent	Moderate (neutral or slight)	Mitigation 9: Avoidance of Accidental Trapping of Mammals		
			Positive	Local	Permanent	Moderate (neutral or slight)			
Common Lizard	Local Importance	**Construction Phase:** Loss of habitat Risk of injury or death during vegetation clearance and / or entrapment in construction-related rubbish	Negative	Local	Permanent	Moderate (neutral or slight)	Mitigation 7: Vegetation Clearance	Enhancement 4: Hibernacula	Negative, Local. Permanent, Not Significant
			Negative	Local	Short-term	Moderate (neutral or slight)	Mitigation 8: Waste Management		
		Operational Phase:	Positive	Local	Permanent	Negligible			

Key Ecological Resources	Level of Significance	Potential Impact	Impact without mitigation				Proposed mitigation / mitigation factors	Proposed enhancements (if any)	Residual impact
			Quality	Magnitude /Extent	Duration	Significance			
		No potential impacts identified				(neutral or slight)			

6.8 Monitoring

Table 6. below provides a summary of the required monitoring and pre-works inspections during the Construction Phase, as well as any surveys that should be completed during the Operational Phase. The monitoring, inspections and surveys will ensure that the identified mitigation measures are implemented and maintained efficiently and have the desired effect of protecting the local ecology from adverse impacts.

Table 6.22: Monitoring and pre-works inspection for the identified mitigation measures during the Construction Phase of the Proposed Development to be carried out by a suitably qualifies ecologist or ecological clerk of works (highlighted in green) or by development contractor (no highlight)

Measure	Monitoring
Mitigation 1: Tree Protection	To be monitored by contractor or arborist.
Mitigation 2: Standard Surface Water and Ground Water Protection Measures	To be monitored by contractor.
Mitigation 3: Reduction of Dust Related Impacts	To be monitored by contractor.
Mitigation 4: Invasive Species Removal	To be monitored by contractor.
Mitigation 5: Reduction of Noise Related Impacts	To be monitored by contractor.
Mitigation 6: Construction Phase Lighting	To be monitored by contractor.
Mitigation 7: Vegetation Clearance	Any Site vegetation clearance is subject to supervision by an Ecologist and a phased approach.
Mitigation 8: Waste Management	To be monitored by contractor.
Mitigation 9: Avoidance of Accidental Trapping of Fauna	To be monitored by contractor.
Mitigation 10: Invasive Species management	An Invasive Species Survey will be carried out by a qualified Ecologist during the next botanical season after soft landscaping has been completed.
Mitigation 11: Bats	To be monitored by contractor and/or suitably qualified ecologist.
Enhancement 1: Hedgehog Highways	The placement and construction of these structures should be carried out under the supervision of an Ecologist to ensure they are fit for purpose.
Enhancement 2: Pollinator Habitat	The placement and construction of these structures should be carried out under the supervision of an Ecologist to ensure they are fit for purpose.
Enhancement 3: Bat Boxes	The placement and construction of these structures should be carried out under the supervision of an Ecologist to ensure they are fit for purpose.
Enhancement 4: Hibernacula	The placement and construction of these structures should be carried out under the supervision of an Ecologist to ensure they are fit for purpose. Should any damage occur, the Ecologist will be contacted, and appropriate repairs or replacements will be made.

Enhancement 5: Swift Boxes/Bricks	The placement of these structures should be carried out by a qualified Ecologist. Land contractor will be responsible for the installation as per the advice of the Ecologist.
Enhancement 6: Long term Management of Hedgerows	To be monitored by contractor, qualified arborist and/or suitably qualified ecologist.

6.9 Interactions

There are interactions between this biodiversity chapter and the hydrology, and hydrogeology chapters due to the assessment impacts to designated sites and aquatic environments via hydrological and hydrogeological pathways. The groundwater and surface water impacts discussed in these chapters are considered applicable to this chapter with regard to S-P-R pathways. Any mitigation or considerations of the ground and surface water impacts contained within those chapters are relevant to the biodiversity assessment with regard to the aquatic environment.

6.10 Difficulties Encountered

Every effort has been made to provide a comprehensive description of both Sites (Sub 100 Scheme and LRD Scheme) of the Proposed Development. 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.

6.11 References

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Appendix I Desk study results for the Site as recorded within the grid squares as per NBDC.

Table 6.6: Details of Bird species within the 10km (O03) grid squares encompassing the Site of the Proposed Development

Species	NBDC Grid Square	Date of record	BoCCI Status
Barn Owl (*Tyto alba*)	O03 (10km)	07/07/2019	Red
Barn Swallow (*Hirundo rustica*)	O03 (10km)		Amber
Black-headed Gull (*Larus ridibundus*)	O03 (10km)	05/05/2023	Amber
Brambling (*Fringilla montifringilla*)	O03 (10km)	18/03/2018	Amber
Brent Goose (*Branta bernicla*)	O03 (10km)	02/02/2023	Amber
Common Coot (*Fulica atra*)	O03 (10km)	05/03/2023	Amber
Common Kestrel (*Falco tinnunculus*)	O03 (10km)	16/04/2020	Red
Common Kingfisher (*Alcedo atthis*)	O03T (2km)	08/06/2019	Amber
	O03 (10km)	23/02/2023	
Common Linnet (*Carduelis cannabina*)	O03 (10km)	25/04/2023	Amber
Common Pochard (*Aythya ferina*)	O03 (10km)	05/03/2023	Red
Common Snipe (*Gallinago gallinago*)	O03 (10km)	21/09/2021	Red
Common Redshank (*Tringa totanus*)	O03 (10km)	31/12/2011	Red
Common Sandpiper (*Actitis hypoleucos*)	O03 (10km)	04/09/2021	Amber
Common Starling (*Sturnus vulgaris*)	O03T (2km)	08/05/2023	Amber
	O03 (10km)	24/05/2023	
Common Swift (*Apus apus*)	O03T (2km)	17/07/2023	Red
	O03 (10km)	31/05/2024	
Common Tern (*Sterna hirundo*)	O03 (10km)	22/10/2020	Amber
European Greenfinch (*Carduelis chloris*)	O03T (2km)	31/12/2011	Amber
	O03 (10km)	21/05/2023	
Eurasian Teal (*Anas crecca*)	O03 (10km)	22/03/2023	Amber
Eurasian Tree Sparrow (*Passer montanus*)	O03 (10km)	31/12/2011	Amber
Eurasian Wigeon (*Anas penelope*)	O03 (10km)	31/12/2011	Amber

European Golden Plover (*Pluvialis apricaria*)	O03 (10km)	31/12/2011	**Red**
European Turtle Dove (*Streptopelia turtur*)	O03 (10km)	15/03/2021	**Red**
Gadwall (*Anas strepera*)	O03 (10km)	31/12/2011	**Amber**
Goldcrest (*Regulus regulus*)	O03T (2km)	31/12/2011	**Amber**
	O03 (10km)	16/04/2023	
Goosander (*Mergus merganser*)	O03 (10km)	31/12/2011	**Amber**
Great Cormorant (*Phalacrocorax carbo*)	O03 (10km)	11/01/2023	**Amber**
Grey Wagtail (*Motacilla cinerea*)	O03 (10km)	22/05/2023	**Red**
Herring Gull (*Larus argentatus*)	O03 (10km)	21/04/2023	**Amber**
House Martin (*Delichon urbicum)*	O03 (10km)	08/06/2018	**Amber**
House Sparrow (*Passer domesticus*)	O03T (2km)	08/05/2023	**Amber**
	O03 (10km)		
Lesser Black-backed Gull (*Larus fuscus)*	O03 (10km)	05/03/2023	**Amber**
Mallard (*Anas platyrhynchos*)	O03T (2km)	08/06/2019	**Amber**
	O03 (10km)	21/04/2023	
Meadow Pipit (*Anthus pratensis*)	O03 (10km)	25/04/2023	**Red**
Mute Swan (*Cygnus olor*)	O03 (10km)	21/04/2023	**Amber**
Northern Lapwing (*Vanellus vanellus*)	O03 (10km)	02/04/2019	**Red**
Northern Pintail (*Anas acuta*)	O03 (10km)	31/12/2011	**Amber**
Northern Shoveler (*Anas clypeata*)	O03 (10km)	27/02/2023	**Red**
Red Grouse (*Lagopus lagopus*)	O03 (10km)	31/12/2011	**Red**
Red Kite (*Milvus milvus*)	O03 (10km)	09/11/2023	**Red**
Redwing (*Turdus iliacus*)	O03T (2km)	22/02/2023	**Red**
	O03 (10km)		
Ringed Plover (*Charadrius hiaticula*)	O03 (10km)	25/07/2019	**Amber**
Sand Martin (*Riparia riparia*)	O03 (10km)	09/05/2020	**Amber**
Sky Lark (*Alauda arvensis*)	O03 (10km)	24/06/2021	**Amber**
Spotted Flycatcher (*Muscicapa striata*)	O03 (10km)	31/12/2011	**Amber**

Stock Pigeon (*Columba oenas*)	O03 (10km)	24/05/2022	**Red**
Tufted Duck (*Aythya fuligula*)	O03 (10km)	05/03/2023	**Amber**
Whooper Swan (*Cygnus cygnus*)	O03 (10km)	31/12/2011	**Amber**
Willow Warbler (*Phylloscopus trochilus*)	O03 (10km)	04/04/2023	**Amber**
Yellowhammer (*Emberiza citrinella*)	O03 (10km)	31/12/2011	**Red**

Appendix II

Site Photographs

Figure 10: *BL3 habitat at access point of the Site*

Figure 11: *BC4 and WL2 habitat adjacent to the access point of the Site*

Figure 12: *WL1 habitat along the northern boundary of the Site.*

Figure 13: *ED2 habitat along the northern section of the Site.*

Figure 14: *ED3 habitat adjacent to the ED2 habitat along the northern boundary of the Site*

Figure 15: *ED3 habitat along the eastern section of the Site, and existing overhead carriageway.*

Figure 16: *MWD1 habitat at the southeast section of the Site. Concrete blocks providing suitable reptilian habitat.*

Figure 17: *WL1 habitat adjacent to the GA2 habitat at the Site.*

Figure 18: *GA2 habitat in the Site*

Figure 19: *Fencing along the southern boundary of the Site, and GS2 habitat beyond the fencing within southern boundary.*