CHAPTER 5

BIODIVERSITY

5.0 BIODIVERSITY

5.1 INTRODUCTION

This Chapter describes the Biodiversity of the Site of the Proposed Development and surrounding environs, with emphasis on habitats, flora and fauna, and details the methodology of assessment used in each case. It provides an assessment of the impacts of the Proposed Development on habitats and species, particularly those protected by national and international legislation, or considered to be of particular Conservation Importance; and proposes measures for the mitigation of these impacts, where appropriate.

The Chapter has been completed having regard to the *Guidelines for Ecological Impact Assessment in the UK and Ireland*, by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2018), together with the guidance outlined in the Environmental Protection Agency documents *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports* (Draft, August 2017), and *Advice Notes for Preparing Environmental Impact Statements* (Draft, September 2015). The value of the ecological resources, the habitats and species present or potentially present, was determined using the ecological evaluation guidance given in the National Roads Authority's (Now Transport Infrastructure Ireland TII) *Ecological Assessment Guidelines* (NRA, 2009). The following best-practise guidelines and information sources were referenced in the preparation of this report:

- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment. August 2018. (Department of Housing, Planning and Local Government, 2018).
- Guidelines for Assessment of Ecological Impacts of National Roads Schemes: Revision 2 (National Roads Authority, 2009).
- Guidelines for Ecological Impact Assessment in the UK and Ireland (CIEEM, 2018).
- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2017).
- Bat Surveys for Professional Ecologists: Good Practice Guidelines (Collins, 2016).
- Bat Mitigation Guidelines for Ireland (Marnell, Kelleher & Mullen, 2022).
- Best Practice Guidelines for the Conservation of Bats in the Planning of National Road Schemes (National Roads Authority, 2006a).
- Bird Monitoring Methods - A Manual of Techniques for Key UK Species (Gilbert et al., 1998).
- Best Practice Guidance for Habitat Survey and Mapping (Smith et al., 2011).
- *Guide to Habitats in Ireland* (Fossitt, 2000).
- *The National Vegetation Database* (Weekes & Fitzpatrick, 2010).
- *British Bryological Society's Mosses and Liverworts of Britain and Ireland: A Field Guide* (Atherton et al., 2010).

5.1.1 Quality Assurance and Competence

Synergy Environmental Ltd., T/A Enviroguide Consulting, is a wholly Irish Owned multi-disciplinary consultancy specialising in the areas of Environment, Waste Management and Planning. All consultants have scientific or technical qualifications and have a wealth of experience working within the Environmental Consultancy sectors, having undergone extensive training and continued professional development.

Professional memberships include the Chartered Institution of Wastes Management (CIWM), and Chartered Institute of Ecology and Environmental Management (CIEEM).

All surveying and reporting have been carried out by qualified and experienced ecologists and environmental consultants. Enviroguide Senior Ecologist Liam Gaffney, the author of this chapter, undertook the surveys for this assessment. Liam Gaffney has a B.Sc. in Zoology (Hons) and a M.Sc. (Hons) in Wildlife Conservation and Management, from University College Dublin, and a wealth of experience in desktop research, literature scoping-

review, and report writing, as well as practical field experience (Habitat surveys, Invasive species surveys, Wintering bird surveys, large mammals, fresh water macro-invertebrates etc.). Liam has extensive experience in compiling Biodiversity Chapters of EIARs, Ecological Impact Assessments (EcIA), Appropriate Assessment (AA) screening and Natura Impact Statements (NIS) reports, and in the overall assessment of potential impacts to ecological receptors from a range of developments. Liam is also a Qualifying member of the Chartered Institute of Ecology and Environmental Management (CIEEM).

5.1.2 Relevant Legislation

5.1.2.1 National Legislation

Wildlife Act 1976 (as amended)

The Wildlife Act 1976 (as amended) was enacted in order to provide protection to birds, animals and plants in Ireland and to control activities which may have an adverse impact on the conservation of wildlife. In regard to the listed species, it is an offence to disturb, injure or damage their breeding or resting place wherever these occur without an appropriate licence from National Parks and Wildlife Service (NPWS). This list includes all birds along with their nests and eggs. Intentional destruction of an active nest from the building stage up until the chicks have fledged is an offence. This includes the cutting of hedgerows from the 1st of March to the 31st of August.

The Act also provides a mechanism to give statutory protection to Natural Heritage Areas (NHAs) from the date they are proposed for designation i.e., at a time they become proposed Heritage Areas (pNHAs). The Wildlife Amendment Act 2000 widened the scope of the Act to include most species, including the majority of fish and aquatic invertebrate species which were excluded from the 1976 Act.

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

The EU Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (Habitats Directive 1992) provides protection to particular species and habitats throughout Europe. The Habitats Directive has been transposed into Irish law through the EC (Birds and Natural Habitats) Regulations 2011 (SI 477 of 2011).

Annex IV of the EU Habitats Directive provides protection to a number of listed species, wherever they occur. Under Regulation 51 of S.I. No.477 of 2011 any person who, in regard to the listed species; "*Deliberately captures or kills any specimen of these species in the wild, deliberately disturbs these species particularly during the period of breeding, rearing, hibernation and migration, deliberately takes or destroys the eggs from the wild, or damages or destroys a breeding site or resting place of such an animal shall be guilty of an offence*."

Flora (Protection) Order, 2015

The Flora (Protection) Order (S.I. No. 356/2015) affords protection to several species of plant in Ireland, including 68 vascular plants, 40 mosses, 25 liverworts, 1 stonewort and 1 lichen. This Act makes it illegal for anyone to uproot, cut or damage any of the listed plant species and it also forbids anyone from altering, interfering, or damaging their habitats. This protection is not confined to within designated conservation sites and applies wherever the plants are found.

Invasive Species Legislation

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

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

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

"49(2) Save in accordance with a licence granted [by the Department of Arts, Heritage and the Gaeltacht]*, any person who plants, disperses, allows or causes to disperse, spreads or otherwise causes to grow in anyplace* [a restricted non-native plant]*, shall be guilty of an offence.*
49(3) … it shall be a defence to a charge of committing an offence under paragraph (1) or (2) to prove that the accused took all reasonable steps and exercised all due diligence to avoid committing the offence.
50(1) Save in accordance with a licence, a person shall be guilty of an offence if he or she […] offers or exposes for sale, transportation, distribution, introduction, or release—
(a) an animal or plant listed in Part 1 or Part 2 of the Third Schedule,
(b) anything from which an animal or plant referred to in subparagraph (a) can be reproduced or propagated, or
(c) a vector material listed in the Third Schedule, in any place in the State specified in the third column of the Third Schedule in relation to such an animal, plant or vector material."

5.1.2.2 International Legislation

EU Birds Directive
The Birds Directive provides a level of general protection for all wild birds throughout the European Union. Annex I of the Birds Directive includes a total of 194 bird species that are considered rare, vulnerable to habitat changes or in danger of extinction within the European Union. Article 4 establishes that there should be a sustainable management of hunting of listed species, and that any large scale non-selective killing of birds must be outlawed. The Directive requires the designation of Special Protection Areas (SPAs) for: listed and rare species, regularly occurring migratory species and for wetlands which attract large numbers of birds. There are 25 Annex I species that regularly occur in Ireland and a total of 154 Special Protection Areas have been designated.

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

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

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

5.2 STUDY METHODOLOGY

This section details the steps and methodology employed to undertake an Ecological Impact Assessment of the Proposed Development.

5.2.1 Scope of the Assessment

The specific objectives of the study were to:

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

5.2.2 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 2022, relied on the following sources:

- Information on species records and distributions, obtained from the National Biodiversity Data Centre (NBDC) at *maps.biodiversityireland.ie*
- Information on waterbodies, catchment areas and hydrological connections obtained from the Environmental Protection Agency (EPA) at *gis.epa.ie*
- Information on bedrock, groundwater, aquifers and their status, 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 Ordinance Survey Ireland
- Information on the existence of permitted development, or developments awaiting decision, in the vicinity of the Proposed Development using sources such as the National Planning Application Map Viewer at *www.myplan.ie.*
- Information on the extent, nature and location of the Proposed Development, provided by the applicant and/or their design team.
- The current conservation status of birds in Ireland taken from Gilbert, Stanbury & Lewis (2021).

A comprehensive list of all the specific documents and information sources consulted in the completion of this report is provided in Section **Error! Reference source not found.**.

5.2.3 Field Surveys

5.2.3.1 Habitat Surveys

The Site of the Proposed Development was visited by Enviroguide Consulting on multiple occasions between the 18th of October 2019 and the 23rd of March 2022. Habitat and botanical surveys of the Site of the Proposed Development were conducted by Enviroguide on the 23rd of March 2022. Habitats were categorised according to the Heritage Council's '*A Guide to Habitats in Ireland'* (Fossitt, 2000) to level 3. The habitat mapping exercise had regard to the 'Best Practice Guidance for Habitat Survey and Mapping' (Smith *et al.*, 2010) published by the Heritage Council. Habitats within the surrounding area of the Proposed Development were classified based on views from the Site and satellite imagery where necessary (Google Earth, Digital Globe and OSI).

5.2.3.2 Invasive Species Surveys

An Invasive flora survey was carried out in tandem with the habitat survey of the Site on the 23rd of March 2022. The survey focused on those high-risk species 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), however, other known lower risk species were also identified and noted where present.

5.2.3.3 Bat Surveys

Potential Bat Roost and Habitat Suitability Survey

The Site of the Proposed Development was inspected for features of bat roosting potential during a site survey carried out during the day time on the 27th of September 2021. There are no buildings located on the Site of the Proposed Development. Trees along the Site boundaries were assessed for Potential Roost Features (PRFs) which were used to determine the potential bat roost (PBR) value of trees as per Collins (2016). Inspections were undertaken visually, from the ground, with the aid of a high-lumen torch.

The Site was also assessed during the daytime survey on 27th of September 2021 for potential bat foraging/commuting habitat. Bat habitat and commuting routes identified were considered in the context of the wider landscape to determine landscape connectivity for local bat populations in the area.

Activity Survey

A dusk activity survey was completed on the evening of the 27th of September 2021, from 19:13 to 21:13 (Sunset: 19:13). A walking transect of the Site was conducted, with surveyors walking along the vegetated boundaries of the Site and across the field covering the Site. Conditions on the night of survey were dry with a cool breeze, with temperatures of 16oC as the survey began. The equipment used for the bat activity survey included a Elekon Bat Logger M2 detector and high-lumen L.E.D. handheld and head torches.

5.2.3.4 Bird Surveys

Winter Waterfowl & Shorebird surveys

A series of monthly vantage point surveys was carried out throughout the winter period of October 2020 to March 2021, to provide a comprehensive summary of the usage of the Site by Species of Conservation Interest (SCI) species for nearby SPAs. A total of 6 days of surveys were completed at the Site over winter 2020/21, as detailed in Table 5.1. A further three visits were conducted between January and March 2022 to confirm conditions at the Site had not changed (27/01/2022, 03/03/2022 & 23/03/2022). No SCI species were recorded utilising the Site during these visits.

Table 5.1 Winter Bird Survey dates at the Site of the Proposed Development over winter 2020/21

Winter Bird survey Dates
October 28th 2020
December 2nd 2020
December 16th 2020
January 12th 2021
February 2nd 2021
March 16th 2021

The survey methodology was as followed:

- Each survey day either commenced at dawn and continued for 6 hours or commenced 6 hours prior to dusk and ended at dusk. These timings were alternated on each survey day to capture any possible temporal trends in the usage of the lands by SCI species.
- Each day, prior to the commencement of the survey, the lands were walked and checked for any obvious evidence of SCI species usage e.g., Light-bellied Brent Goose (LBBG) droppings.
- Each hour the Site was walked and observed for a period of approx. 20 mins with any SCI species activity on, or in flight over the Site recorded.
- All waterfowl and shorebird species that were observed visiting the Site or flying overhead were recorded, as were any other species of note e.g., rare passerines etc.

Breeding Bird Surveys

Breeding bird surveys were conducted at the Site of the Proposed Development on 3rd and 23rd March 2022. The survey methodology followed the British Trust for Ornithology's (BTO) Common Bird Census (CBS) technique (Bibby et al, 1992). The Site was walked with particular focus given to Scrub sections, and hedgerows and treelines that run along the Site's boundaries. All bird species encountered were recorded on field sheets, along with location (on 1:500 field maps), behaviour and numbers.

5.2.3.5 Mammal Surveys

Mammal surveys of the Site were carried out in conjunction with the other field surveys. The Site was searched for tracks and signs of mammals. The habitat types recorded throughout the survey area were used to assist in identifying the fauna considered likely to utilise the area. During this survey, the Site was searched for tracks and signs of mammals as per Bang and Dahlstrom, (2001).

5.2.3.6 Other Fauna

During the course of all surveys at the Site of the Proposed Development, other species of fauna were noted if observed, and these are included in the report where applicable.

On the 23rd of March 2022, a focused amphibian survey was conducted at the Site, with all drainage ditches and areas of pooling surveyed for evidence of breeding amphibians.

5.2.4 Assessment

The value of the ecological resources, i.e., the habitats and species present or potentially present, was determined using the ecological evaluation guidance given in the National Roads Authority's Ecological Assessment Guidelines (NRA, 2009). This evaluation scheme, with values ranging from locally important to internationally important, seeks to provide value ratings for habitats and species present that are considered ecological receptors of impacts that may ensue from a proposal. Any habitats or species evaluated as being of Local Importance (higher value) or greater and considered to be at risk of significant effects as a result of the Proposed Development are selected as potential key ecological receptors (KERs) and thus considered further for assessment.

The assessment of the potential effect or impact of the Proposed Development on the identified key ecological receptors was carried out with regard to the criteria outlined in the draft EPA Guidelines (EPA, 2017). These guidelines set out a number of parameters such as quality, magnitude, extent and duration that should be considered when determining which elements of the Proposed Development could constitute impact or sources of impacts.

5.3 The Existing Receiving Environment (Baseline Situation)

The Site of the Proposed Development is located within the townland of Fosterstown North in Swords, Co. Dublin; *ca.*1.5km north of Dublin airport, and *ca.* 1.2km south of Swords Castle and Swords town centre. The M1 Motorway passes *ca.*1.5km to the east of the Site, while the R132 Swords bypass is located approximately 170m to the north-east. The lands are bounded along their entire eastern edge by the existing R132.There is currently an agricultural access to the lands from the R132.

The Site area measures *ca*.4.6ha and is bordered to the south and west by residential areas, while across the road to the east lies a section of agricultural land which separates the Site from the Airside Retail Park. The Site's northern boundary is abounded by the *Gaybrook stream (North)* (referred to as the Gaybrook Stream in this report) waterway with grass fields located beyond this waterway.

5.3.1 Geology & Hydrogeology

Fosterstown North is located within the Swords groundwater body. The overall status of this waterbody is recorded as Good (EPA, 2022). The groundwater rock units underlying the area are classified as Dinantian Lower Impure Limestones (GSI, 2022), while sub-soil (Quaternary sediments) at the Site is classified as Till derived from limestones to the west and south of the Site; Gravels derived from Limestones to the north-east; and a band of Alluvium running along the northern boundary, tracing the path of the Gaybrook stream (North) waterway (GSI, 2022). The Site is located on a Locally Important Aquifer - Bedrock which is Moderately Productive only in Local Zones with groundwater vulnerability in the area listed as Low (GSI, 2022).

5.3.2 Hydrology

The Site of the Proposed Development is located within the *Broadmeadows_SC_010* sub-catchment and the *Ward_040* sub-basin (EPA, 2022). The closest waterbody to the Site, as mapped by the EPA (EPA, 2022), is the *Swords_Glebe* watercourse (EPA Code: 08S17) which runs *ca.*325m from the Site's northern boundary. This watercourse flows for approximately 665m before linking up with the larger Ward River (EPA Code: 08W01) to the north-east. This watercourse flows another *ca.*2km before joining the *Broadmeadow 08* (EPA Code: 08B02), entering the Malahide estuary to the north a further *ca.*770m downstream. The EPA does not have any operational monitoring stations on the *Swords_Glebe* itself but does have a station *Ward_Br at SW end of Swords (Well rd Br)* (RS08W010500) on the Ward River approximately 885m from the Site's northern boundary. The most recent Q-value recorded at the station was *3*, with a Q-value status of *Poor* (EPA, 2022).

Another waterway, the *Gaybrook Stream (North),* is visible along the Site's northern boundary on the *OpenStreet maps* base-map via the EPA Online map resource (EPA, 2022). Although it is not recognised by EPA surface water feature demarcation in the above online resource, this waterway was confirmed present during site visits. On the aforementioned *OpenStreet maps* base-map the *Gaybrook Stream (North)* can be seen to run *ca.*1.3km to the east before it disappears. Although its full length cannot be traced it is assumed, taking a precautionary approach, that this waterway joins up with the nearby waterbody of the same name the GAYBROOK (EPA code: 08G08); which runs parallel to it, *ca.*250m to the south of the point the *Gaybrook Stream (North)* disappears. The GAYBROOK waterbody then runs a further *ca*.3.3km from this point to where it enters the Malahide Estuary to the north-east, thus providing a potential hydrological connection with the European Sites therein.

5.3.3 Designated Sites

The methodology used to identify relevant designated sites comprised the following:

- Use of up-to-date GIS spatial datasets for European and nationally designated sites and water catchments – downloaded from the NPWS website (www.npws.ie) and the EPA website (www.epa.ie) to identify designated sites which could potentially be affected by the Proposed Development;
- The catchment data were used to establish or discount potential hydrological connectivity between the Project Boundary and any designated sites.
- All designated sites within an initial precautionary zone of influence (European Sites within 15km of the Site of the Proposed Development, and nationally designated sites within 5km) were identified and are presented in Figure 5.1 and Figure 5.2.
- The potential for connectivity with designated sites at distances outside of these precautionary zones was also considered in this initial assessment. In this case, there is no potential connectivity between the Site of the Proposed Development and designated sites located beyond these distances.
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- Table **5.2** below provides details of all relevant designated sites as identified in the preceding steps. The potential for pathways between designated sites and the Site of the Proposed Development was assessed on a case-by-case basis using the Source-Pathway-Receptor framework. Those designated sites where a pathway was identified are highlighted in green. Pathways considered included:
  - Direct pathways e.g., proximity, water bodies, air (for both air and noise emissions).
  - Indirect pathways e.g., disruption to migratory paths, 'Sightlines' where noisy or intrusive activities may result in disturbance to shy species, increased human activity etc.

- The site synopses of these sites, as per the NPWS website (www.npws.ie), were consulted and reviewed at the time of preparing this report.
- The distance to each site listed is taken from the nearest possible point of the Proposed Development Site boundary to the nearest possible point of each European site or pNHA.

5.3.3.1 European Sites

The EU Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (Habitats Directive 1992) provides protection to particular species and habitats throughout Europe. The Habitats Directive has been transposed into Irish law through the EC (Birds and Natural Habitats) Regulations 2011. The Directive requires the designation of Special Areas of Conservation (SACs) for areas of habitat deemed to be of European interest, and the designation of Special Protection Areas (SPAs) for: listed and rare species, regularly occurring migratory species, and for wetlands which attract large numbers of birds. The SACs together with the SPAs form a network of protected sites called Natura 2000.

No European Sites are located within, or directly adjacent to, the Site of the Proposed Development. The nearest European Sites to the Proposed Development are the Malahide Estuary SAC and SPA located ca.2.3km to the east. As detailed in the Appropriate Assessment Screening Report and Natura Impact Statement for this Proposed Development, submitted with this application under separate cover, the Proposed Development maintains potential impact pathways with these Sites via a hydrological connection – the Gaybrook Stream, and via operational foul waters treated at Swords WwTP.

5.3.3.2 Nationally Designated Sites

Natural Heritage Areas (NHAs) are areas considered important at a national level for the habitats present, or which hold species of plants and animals whose habitat needs protection. Proposed NHAs (pNHAs) are areas which were published on a non-statutory basis in 1995 but have not since been statutorily proposed or designated. These sites are deemed to be of significance for wildlife and habitats. Some pNHAs occupy a relatively small area, such as a roosting place for rare bats, while others are relatively large e.g., a woodland or a lake. Under the Wildlife Amendment Act (2000), NHAs are legally protected from damage from the date they are formally proposed for designation.

No NHAs are located within, or directly adjacent to, the Site of the Proposed Development. The nearest pNHA to the Proposed Development is the Feltrim Hill pNHA located ca.2.1km to the southeast. The Proposed Development maintains no potential impact pathway with this pNHA, hydrological or otherwise.

The Proposed Development maintains indirect hydrological impact pathways with the Malahide Estuary pNHA via the Gaybrook Stream, which runs along the Site's northern boundary, and operational foul waters treated at Swords WwTP prior to discharge into the estuary. As a result, this pNHA is included in the precautionary Zone of Influence (ZOI) of the Proposed Development.

No other pNHAs are deemed to maintain potential impact pathways linking them to the Proposed Development. Table 5.2 below summarises the screening in of Sites which maintain potential impact pathways with the Proposed Development. These Sites are assessed further in this report.

Table 5.2 Proposed Natural Heritage Areas located within the precautionary 5km ZOI of the Proposed Development. Sites with identified Source-Pathway-Receptor impact linkage are highlighted in green

Site Name & Code (Receptor)	Distance to Proposed Development	Potential Pathway to receptors
Proposed Natural Heritage Area		
Malahide Estuary pNHA (000205)	2.3 km east	Yes – Hydrological connections exists between the Site and the pNHA via:

Site Name & Code (Receptor)	Distance to Proposed Development	Potential Pathway to receptors
		- The Gaybrook Stream, which runs along the Site's northern boundary and outflows at Malahide Estuary ca.3.4 km east of the Site as the GAYBROOK water course (EPA, 2022) i.e., Construction and Operational Phase surface water discharges. - Operational foul waters will be treated at Swords WwTP (D0024) and discharged into Malahide Estuary.
Feltrim Hill (000205)	2.1km southeast	None – No Impact pathway between the Site and these pNHAs. No hydrological connectivity exists.
Santry Demesne (000178)	4.7km south	

Malahide Estuary pNHA (000205)

Malahide Estuary pNHA does not have a designated NPWS site synopsis, however, it is likely designated for the reasons it is afforded protection as both a SPA and SAC i.e., coastal habitats and bird species. The potential for significant effects to the QIs and SCIs of these European Sites has been assessed and mitigated against as part of the AA Screening Report and Natura Impact Statement prepared for this application. The approach taken in these assessments can, therefore, also be applied to the Malahide Estuary pNHA.

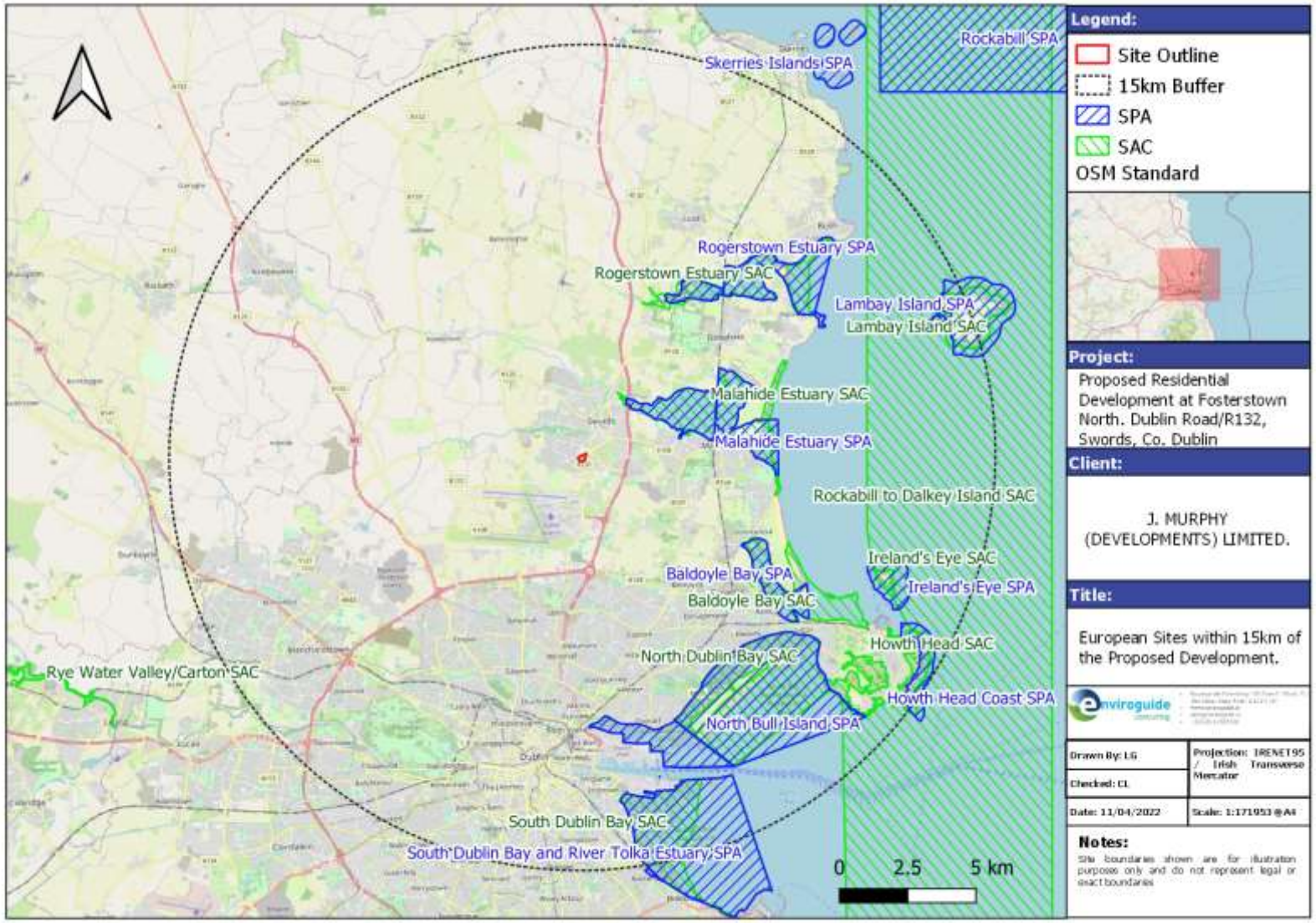

Figure 5.1 European Sites within 15km of the Proposed Development

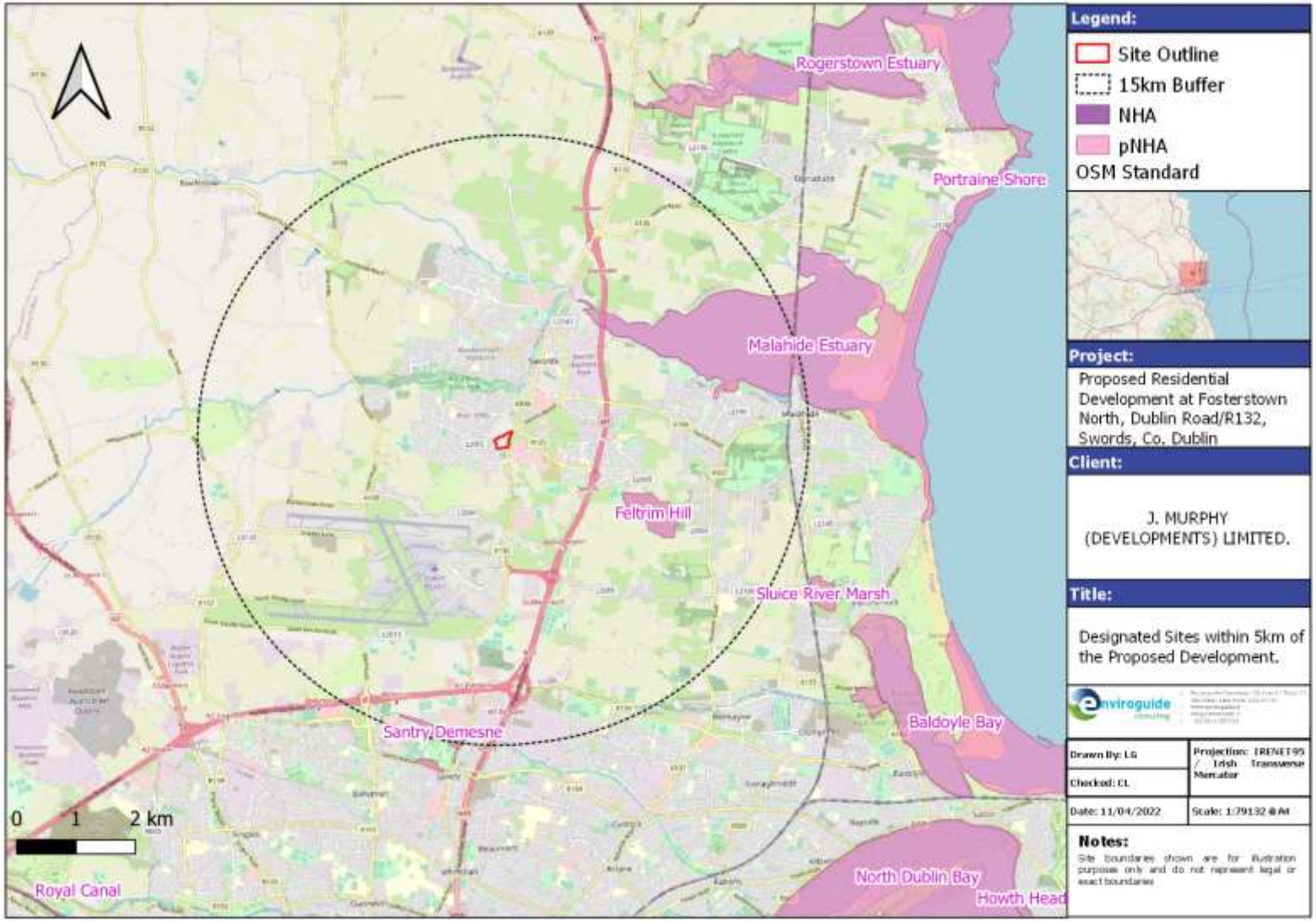

Figure 5.2 Designated Sites within 5km of the Proposed Development

5.3.4 Habitats

The habitats within the Site of the Proposed Development are coded and categorised to level 3 according to Fossitt (2000). The Site comprises an arable stubble field with vegetated margins and an overgrown drainage ditch containing the Gaybrook Stream running along its northern boundary. The following habitats were identified within the redline boundary of the Site:

- Arable Crops (BC1)
- Dry meadows (GS2)
- Scrub (WS1)
- Hedgerows (WL1)
- Treelines (WL2)
- Drainage ditches (FW4)
- Buildings an Artificial Surfaces (BL3)
- Amenity Grassland (GA2)

5.3.4.1 Drainage Ditch (FW4)

The Gaybrook Stream is present running along the Site's northern boundary. On inspection of the watercourse during the surveys of the Site of the Proposed Development, it was classified as *Drainage ditches* (WF4) as per Fossitt (2000). The ditch is located in thick undergrowth classified as *hedgerows* (WL1). The steep ditch was approximately 2m deep with slow moving water at the bottom, no more than 10cm in depth. A hydrocarbon type odour was noted when the sediments were disturbed and there were visible signs of litter/rubbish present in the stream. The only animal prints recorded were a rat species *(Rattus sp.).* This waterway runs along the northern boundary of the Site of the Proposed Development before being culverted under the road to the east of the Site. The route of the stream was followed across the road to where it emerges as a trickle from a culvert into private land, suggesting a possible blockage between the Site of the Proposed Development and this point. Although this habitat is not considered to be of high biodiversity value in its current state, due to its dense overgrowth, steep banks and lack of light penetration, it does provide a potential link to off-site waterbodies including Malahide Estuary and as such is deemed to be of **local importance (higher value).**

5.3.4.2 Arable Crops (BC1)

The most abundant habitat type on-site, the majority of the Site of the Proposed Development are lands currently under agricultural use. Various arable weed species were found throughout and in the grassy verges at the Site. Species recorded in this habitat type included Ribwort plantain (*Plantago lanceolata*) Charlock (*Sinapis arvensis*), Silverweed (*Potentilla anserina*), Common Fumitory (*Fumaria officinalis*), Fool's Parsley (*Aethusa cynapium*), Tufted Vetch (*Vicia cracca*), White Dead Nettle (*Lamium album*), Scutch Grass (*Elymus repens*), Creeping Bent (*Agrostis stolonifera*) and Ragwort (*Senecio jacobeae).* This habitat is deemed to be of **negligible ecological value** due to its limited vegetation cover and its anthropogenic and disturbed nature.

5.3.4.3 Dry Meadows (GS2)

Areas of this habitat type run along the north-east of the Site of the Proposed Development acting as a transitional margin between the arable field and the hedgerow boundary. The north-eastern and north-western corners have particularly prominent areas present. Species recorded in this habitat type include: Creeping Cinquefoil (*Potentilla reptans*); Creeping Buttercup (*Ranunculus repens*), Petty Spurge (*Euphorbia peplus*), Ragwort (*Senecio jacobeae*), Ribwort plantain (*Plantago lanceolata*), Spear Thistle (*Cirsium vulgare*), Creeping Thistle (*Cirsium arvense*), Prickly Sowthistle (*Sonchus asper*), Dandelion (*Taraxacum officinale*), Nettle (*Urtica dioica*), Willowherb (*Chamaenerion angustifolium*), Common Hogweed (*Heracleum sphondylium*), Scutch Grass (*Elymus repens*) and Creeping Bent (*Agrostis stolonifera*). This habitat is deemed to be of **local importance (lower value)** due to its limited presence along the margins of the Site.

5.3.4.4 Scrub (WS1)

Present in the north-eastern corner of the Site of the Proposed Development where the hedgerow habitat breaks down, reducing in height. This habitat blends in with the *Dry meadows and grassy verges (GS2)* and *Hedgerows*

(WL1) habitat types in this section of the Site. Species recorded include Common Hogweed (*Heracleum sphondylium*), Nettle (*Urtica dioica*), Willowherb (*Chamaenerion angustifolium*), Spear Thistle (*Cirsium vulgare*), Bramble (*Rubus fructicosus*), Elder (*Sambucus nigra*), Hedge bindweed (*Calystegia sepium*), Silverweed (*Potentilla anserina*) and Blackthorn (*Prunus spinosa).* This habitat is deemed to be of **local importance (lower value)** due to its limited presence at the Site.

5.3.4.5 Hedgerow (WL1) & Treeline (WL2)

Hedgerow forms the dominant margin habitat, running along the entire boundary of the Site of the Proposed Development to varying degrees. Areas to the east of the Site are particularly thick in nature. Species recorded in this habitat type include Blackthorn (*Prunus spinosa*), Hawthorn (*Crataegus monogyna*), Dog Rose (*Rosa canina*), Bramble (*Rubus fructicosus*), Elder (*Sambucus nigra*), Ash (*Fraxinus excelsior*), Sycamore (*Acer pseudoplatanus*), Honeysuckle (*Lanicera periclymenum*) and Ivy (*Hedera sp*.).

Pockets of this habitat, composed predominantly of Ash (*Fraxinus excelsior*), are present along the northern boundary; intermingled with the hedgerows.

These linear habitats provide habitat connectivity, shelter and foraging to wildlife within an urban landscape and are of deemed to be of **local importance (higher value).**

5.3.4.6 Buildings and Artificial Surfaces (BL3) & Amenity Grassland (GA2)

Sections of these anthropogenic habitats are located along the eastern part of the Site as a section of the R132 road and its mown verge. These habitats are of no ecological value.

Figure 5.3 Habitat Map of the Site of the Proposed Development

5.3.5 Flora

5.3.5.1 Rare and Protected Flora

The Site of the Proposed Development is located within the Ordnance Survey National Grid 10km Square O14. Species records from the National Biodiversity Data Centre (NBDC) online database for the 10km square O14 were studied for the presence of rare or protected flora species.

Table 5.3 Records of rare or protected flora for the surrounding 10km (O14) grid square, from the NBDC. NPWS = Record obtained from NPWS database

Name	Species Group	Date of last record	Database	Designation
Blue Fleabane (*Erigeron acer*)	Flowering plant	22/07/2017	Online Atlas of Vascular Plants 2012-2020	Threatened Species: Endangered
Meadow Barley NPWS (*Hordeum secalinum*)	Flowering plant	1991	Herbarium and Literature Database 19/02/2013	Threatened Species: Endangered
Smooth Brome (*Bromus racemosus*)	Flowering plant	31/07/2014	Online Atlas of Vascular Plants 2012-2020	Threatened Species: Vulnerable
Cornflower NPWS (*Centaurea cyanus*)	Flowering plant	1990	Herbarium and Literature Database 19/02/2013	Threatened Species: Endangered
Hairy St. John's Wort NPWS (*Hypericum hirsutum*)	Flowering plant	1991	NPWS Rare/Threatened Plants Database	S.I. No. 356/2015 - Flora (Protection) Order, 2015

No records of rare flora, e.g., those classified as 'critically endangered', 'endangered', or 'vulnerable' on the *Ireland Red List No. 10: Vascular Plants* (Wyse-Jackson *et al*., 2016) or the *Ireland Red List No. 8: Bryophytes* (Lockhart *et al*., 2012), were identified during surveys of the Site of the Proposed Development. The Site does not contain any species listed on the Flora (Protection) Order 2015.

5.3.5.2 Invasive Plant Species

There are records for 12 species of flora considered to be invasive within the 10km (O14), grid square within which the Site of the Proposed Development is located. Details of these records are listed in

Table ***5.4***.

A number of non-native plants were observed during the habitat survey of the Site of the Proposed Development. Thought mostly to be garden escapes from nearby residences these included invasive species such as: Himalayan Honeysuckle *(Leycesteria formosa)* and Butterfly bush *(Buddleja davidii)* in the northern and western boundary vegetation.

Table 5.4 Records of non-native/ invasive species of plant for the surrounding 10km (O14) grid square, from the NBDC.

Species	Grid square	Date of last record	Source	Designations
Butterfly-bush (*Buddleja davidii*)	**O14**	28/06/2019	Online Atlas of Vascular Plants 2012 Onwards	Medium Impact Invasive Species
Canadian Fleabane (*Conyza canadensis*)	**O14**	09/07/2018	Online Atlas of Vascular Plants 2012-2020	Medium Impact Invasive Species
Cherry Laurel (*Prunus laurocerasus*)	**O14**	11/12/2017	National Invasive Species Database	High Impact Invasive Species
Common Cordgrass (*Spartina anglica*)	**O14**	15/07/2014	Online Atlas of Vascular Plants 2012-2020	Medium Impact Invasive Species
Evergreen Oak *(Quercus ilex)*	**O14**	07/05/2020	Online Atlas of Vascular Plants 2012 Onwards	Medium Impact Invasive Species
Giant Hogweed (*Heracleum mantegazzianum*)	**O14**	06/07/2018	National Invasive Species Database	High Impact Invasive Species Regulation S.I. 477
Himalayan Honeysuckle (*Leycesteria formosa*)	**O14**	11/12/2017	National Invasive Species Database	Medium Impact Invasive Species
Japanese Knotweed (*Fallopia japonica*)	**O14**	20/04/2021	National Invasive Species Database	High Impact Invasive Species Regulation S.I. 477
Russian-vine (*Fallopia baldschuanica*)	**O14**	21/08/2018	Online Atlas of Vascular Plants 2012-2020	Medium Impact Invasive Species
Sycamore (*Acer pseudoplatanus)*	**O14**	29/11/2021	Online Atlas of Vascular Plants 2012-2020	Medium Impact Invasive Species
Three-cornered Garlic (*Allium triquetrum*)	**O14**	11/12/2017	National Invasive Species Database	Medium Impact Invasive Species Regulation S.I. 477
Wild Parsnip *(Pastinaca sativa)*	**O14**	22/06/2020	Online Atlas of Vascular Plants 2012 Onwards	Medium Impact Invasive Species

5.3.6 Non-Volant Mammals

Records for terrestrial mammals recorded in the surrounding 10lm and 2km grid squares were retrieved from the NBDC online database. The following protected species were included in these results:

- Irish Mountain Hare *(Lepus timidus hibernicus)*

- Western European Hedgehog (*Erinaceus europeaus*)
- Eurasian Badger (*Meles meles*)
- Otter (*Lutra lutra*)
- Eurasian Pygmy Shrew (*Sorex minutus*)
- Eurasian Red Squirrel (*Sciurus vulgaris*)
- Pine Marten (*Martes martes*)
- Irish Stoat (*Mustela erminea subsp. hibernica*)

No rare or protected mammal species were directly recorded during site surveys.

The habitats within the Site are of variable value for mammals. The hedgerows provide potential habitat for hedgehog and pygmy shrew while there is limited to no potential habitat for the pine-marten or Irish stoat. Other species such as: mountain hare and red squirrel are not likely to utilise the Site as it is surrounded by urban areas and residential land making it somewhat isolated, along with it supporting little tree cover. Various mammal runs (most likely fox) were noted along the hedgerow/scrub to the north of the Site and this species is most likely present in the area. No badger setts or signs of badger were recorded during the site surveys.

The Gaybrook stream does not offer suitable habitat for otter due to its small size, limited flow/connectivity and over-grown nature. No signs of otter i.e., spraint, prints, holts or lay-ups, were observed during several site inspections of the Site of the Proposed Development and the above waterway.

5.3.7 Bats

In view of their sensitive status across Europe, all species of bat have been listed on Annex IV of the EC 'Habitats and Species Directive' and some, such as the lesser horseshoe bat, are given further protection and listed on Annex II of this Directive. This Directive was transposed into Irish law by the European Communities (Natural Habitats) Regulations, 1997 (which have been replaced by S.I. 477 of 2011), and combined with the Wildlife Acts (1976-2016), ensures that individual bats and their breeding sites and resting places are fully protected. This has important implications for those who own or manage sites where bats occur.

All bat species are protected under the Wildlife Acts which make it an offence to wilfully interfere with or destroy the breeding or resting place of these species; however, the Acts permit limited exemptions for certain kinds of development.

Six species of bat have been recorded within the 2km and 10km grid squares which encompass the Site of the Proposed Development. These species records are listed in Table 5.5.

Table 5.5 Records of Bats for the Surrounding, 2km (O14S) & 10mk (O14) Grid Squares from the NBDC

Species	Grid square	Date of last record	Source	Designation
Brown Long-eared Bat (*Plecotus auritus*)	O14	14/09/2002	National Bat Database of Ireland	EU Habitats Directive - Annex IV Wildlife (Amendment) Act 2000
Daubenton's Bat (*Myotis daubentonii*)	O14	12/08/2009	National Bat Database of Ireland	EU Habitats Directive - Annex IV Wildlife (Amendment) Act 2000
Leisler's Bat (*Nyctalus leisleri*)	O14 O14S	09/08/2012 30/07/2008	National Bat Database of Ireland	EU Habitats Directive - Annex IV Wildlife (Amendment) Act 2000
Natterer's Bat (*Myotis nattereri*)	O14	31/08/2006	National Bat Database of Ireland	EU Habitats Directive - Annex IV Wildlife (Amendment) Act 2000

Common Pipistrelle (*Pipistrellus pipistrellus*)	O14 O14S	09/08/2012 30/07/2008	National Bat Database of Ireland	EU Habitats Directive - Annex IV Wildlife (Amendment) Act 2000
Soprano Pipistrelle (*Pipistrellus pygmaeus*)	O14 O14S	09/08/2012 30/07/2008	National Bat Database of Ireland	EU Habitats Directive - Annex IV Wildlife (Amendment) Act 2000

5.3.7.1 Landscape suitability

The National Biodiversity Data Centre (NBDC) maps landscape suitability bats based on Lundy *et al.* (2011). The maps are a visualisation of the results of the analyses based on a 'habitat suitability' index. The index ranges from 0 to 100 with 0 being least favourable and 100 most favourable for bats. The overall assessment of bat habitat suitability for the lands containing the Site of the Proposed Development is given as 31.22. Table 5.6 gives the suitability of the study area for the bat species found in the study area (based on NBDC) along with their Irish Red List Status (from Marnell *et al.,* 2019).

Table 5.6 Suitability of the area surrounding the Site of the Proposed Development for bats (based on the NBDC data) with Irish Red list status indicated.

Common name	Scientific name	Suitability index	Irish red list status[1]
All bats	-	31.22	Least Concern
Soprano pipistrelle	*Pipistrellus pygmaeus*	45	Least Concern
Brown long-eared bat	*Plecotus auritus*	42	Least Concern
Common pipistrelle	*Pipistrellus pipistrellus*	44	Least Concern
Lesser-horseshoe bat	*Rhinolophus hipposideros*	0	Least Concern
Leisler's bat	*Nyctalus leisleri*	46	Least Concern
Whiskered bat	*Myotis mystacinus*	38	Least Concern
Daubenton's bat	*Myotis daubentonii*	31	Least Concern
Nathusius' pipistrelle	*Pipistrellus nathusii*	1	Least Concern
Natterer's bat	*Myotis nattereri*	34	Least Concern

5.3.7.2 Potential Bat Roost & Habitat Survey

There are no caves, buildings or man-made structures present at the Site of the Proposed Development and it supports little to no suitable bat roosting habitat. The majority of treelines/hedgerows at the Site of the Proposed Development do not provide any roost potential due to a lack of mature trees, major crevices and other suitable features. Several semi-mature Ash along the Site's north-eastern boundary have the potential to support roosting bats (moderate-high potential) based on their maturity and presence of ivy cover. No evidence of any bat roost was observed within the Site.

The hedgerows and treelines at the Site link up with those in the lands to the north, providing suitable commuting and foraging habitat for local bat populations. The majority of existing boundary vegetation at the Site is being retained in the proposed landscape plan. The main body of the Site provides little foraging habitat for local bat species due to its lack of vegetation cover or features of interest.

[1] Marnell, F., Looney, D. & Lawton, C. (2019) Ireland Red List No. 12: Terrestrial Mammals. National Parks and Wildlife Service, Department of the Culture, Heritage and the Gaeltacht, Dublin, Ireland.

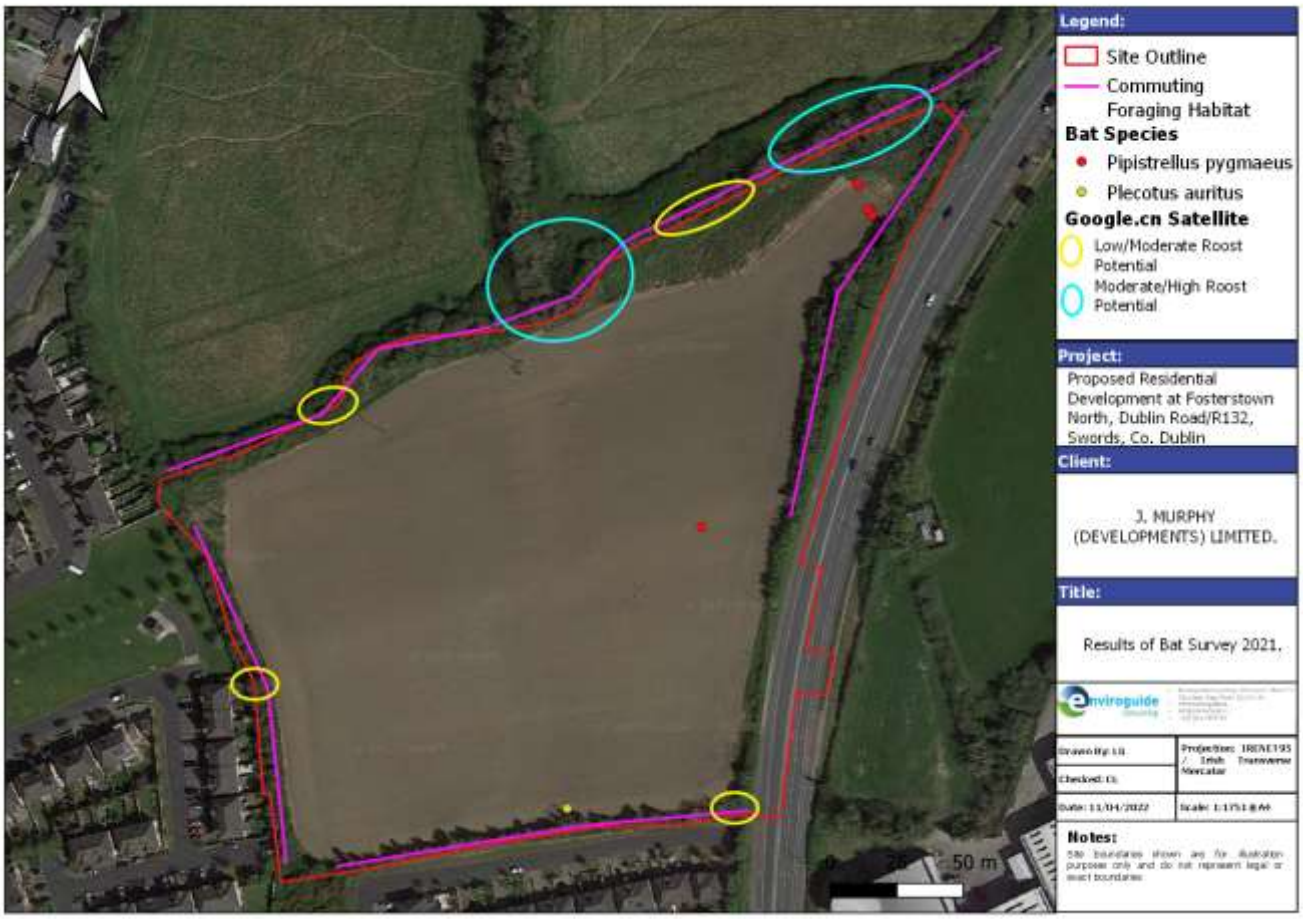

Figure 5.4 Results of the bat activity and habitat assessment surveys carried out at the Site on 27/09/2021.

5.3.7.3 Dusk Activity Survey

A low level of bat activity was recorded at the Site during the dusk activity survey on 27/09/2021. Two bat species were recorded during the activity survey; Soprano Pipistrelle (*Pipistrellus pygmaeus*) and Brown Long-eared Bat (*Plecotus auritus*), with Soprano Pipistrelle the most frequently recorded at the Site. The boundary treeline/ hedgerows in the north-eastern corner of the Site showed low levels of commuting and foraging activity by Soprano Pipistrelle bats. A single record of Brown Long-eared Bat was recorded along the southern field boundary.

Table 5.7 Summary of bat activity recorded at the Site – 27/09/2021

Common Name	Scientific Name	Recordings [#]	Calls [#]
Soprano Pipistrelle	*Pipistrellus pygmaeus*	7	65
Brown Long-eared Bat	*Plecotus auritus*	1	2

5.3.8 Birds

5.3.8.1 Winter Waterfowl and Shorebird Surveys

The results of Winter bird Surveys at the Site of the Proposed Development (6 survey days) comprised of a total of 36 hourly counts between October 2020 and March 2021.

Out of a total of 36 hourly counts: 100% recorded **no SCI waterfowl/shorebird species** utilising the Site of the Proposed Development. As would be expected due to the lack of suitable *ex-situ* feeding habitat no Light-bellied

Brent Geese were recorded utilising the Site of the Proposed Development, nor were any Light-bellied Brent Goose droppings; a distinctive indicator of this species' presence/usage of a site, despite thorough site walkovers carried out each day of the winter surveys.

The Site does not provide any *ex-situ* breeding, roosting, staging or foraging habitats for any of the species listed as Species of Conservation Interest (SCI) for the European Sites in question. The majority of SCI species listed for the SPAs in question are coastal/marine species whose foraging/roosting habitat are confined to these coastal habitats (e.g., divers, ducks, wader species). A further three visits were conducted between January and March 2022 (27/01/2022, 03/03/2022 & 23/03/2022) which confirmed conditions at the Site had not changed in this regard. No SCI species were recorded utilising the Site during these visits.

For species that are known to utilise farmland/arable fields as foraging habitats; such as Black-tailed Godwit, Greylag Goose, Golden Plover, Oystercatcher and Curlew; it is deemed that the Site of the Proposed Development does not represent suitable *ex-situ* feeding/roosting habitat. Considering the abundance of considerably more suitable agricultural lands that surround the Malahide and Rogerstown Estuaries (e.g., those described in Roe & Lovatt, 2009) and that are located within the intervening lands separating the Site of the Proposed Development from the other relevant SPAs within the 15km Zone of Influence (ZOI) i.e., North Bull Island SPA, Baldoyle Bay SPA, South Dublin & River Tolka Estuary SPA and Lambay Island SPA; the Site's urban location and proximity to several busy roads and large residential areas renders it largely unsuitable for the above species.

It is therefore concluded that there will be no loss of any *ex-situ* foraging/roosting habitat, to any of the SCI species listed for the relevant SPAs; as a result of the Proposed Development.

5.3.8.2 Breeding Birds

Results from the breeding bird surveys carried out at the Site of the Proposed Development on the 3rd and 23rd of March 2022 are shown in Table 5.8. A total of 22 species were recorded during these surveys. These were either associated with the treelines and hedgerows that run along the Site boundaries or observed foraging across the Site lands.

Red-listed Bird Species

Three species listed on the BoCCI[2] Red List were recorded at the Site of the Proposed Development during surveys.

- **Yellowhammer** – At least 5 no. birds recorded on the ground and in northern hedgerow.
- **Meadow Pipit** – a minimum of four birds was recorded on site.

Amber-listed Bird Species

Two species which are on the BoCCI Amber List were recorded during surveys.

- **Linnet** – Birds recorded feeding on the ground and in hedgerow in south of Site.
- **Goldcrest** – one bird foraging in western hedgerow.

Table 5.8 Bird species recorded within the vicinity of the Site during the breeding bird surveys of the Site in March 2022

Species	BoCCI Status	EU Designation	Notes
Meadow Pipit *(Anthus pratensis)*	Red	N/A	Birds recorded on the ground and perched on electricity wires.
Yellowhammer *(Emberiza citrinella)*	Red	N/A	At least 5 no. birds recorded on the ground and in northern hedgerow.

[2] Birds of Conservation Concern in Ireland 2020-2026 (Gilbert, Stanbury and Lewis, 2021).

Snipe (*Gallinago gallinago*)	Red	Annex II & III	Single bird flushed in eastern part of field.
Linnet (*Linaria canabina*)	Amber	N/A	Birds recorded feeding on the ground and in hedgerow in south of Site.
Goldcrest (*Regulus regulus*)	Amber	N/A	Recorded foraging along western hedgerow.
Wren (*Troglodytes troglodytes*)	Green	N/A	Singin in east and south of Site.
Robin *(Erithacus rubecula)*	Green	N/A	In song along all hedgerows at Site.
Dunnock (*Prunella modularis*)	Green	N/A	Pair recorded in easter hedgerow.
Blue Tit (*Cyanistes caeruleus*)	Green	N/A	Several foraging in northern trees.
Great Tit (*Parus major*)	Green	N/A	Calling in northern trees.
Long-tailed Tit (*Aegithalos caudatus*)	Green	N/A	Pair foraging in trees along northern boundary.
Chaffinch *(Fringilla coelebs)*	Green	N/A	Male singing along western hedgerow.
Bullfinch (*Pyrrhula pyrrhula*)	Green	N/A	Male foraging along eastern hedgerow.
Goldfinch *(Carduelis carduelis)*	Green	N/A	Calling in south of Site.
Blackbird (*Turdus merula*)	Green	N/A	Singing and calling along all hedgerows at Site.
Magpie *(Pica pica)*	Green	N/A	In northern hedgerow.
Hooded Crow (*Corvus cornix*)	Green	N/A	In flight across Site.
Song Thrush (*Turdus philomelos*)	Green	N/A	Calling in north-eastern corner of Site.
Mistle Thrush (*Turdus viscivorus*)	Green	N/A	Foraging on the ground.
Wood pigeon	Green	N/A	Several birds present in hedgerows and overhead.

(Columba palumbus)			
Reed Bunting (*Emberiza schoeniclus*)	Green	N/A	Single bird present in flock of Linnet and Yellowhammer in eastern hedgerow.
Pheasant (*Phasianus colchicus*)	Green	Annex II & III	Single bird flushed in eastern arable field.

Taking a precautionary approach, it is considered that the Site is of local ecological importance for birds with two Red-listed and two Amber-listed species recorded and possibly nesting on the Site.

5.3.9 Amphibians

Common frog (*Rana temporaria*) is listed in Annex V of the EU Habitats Directive and protected by the Wildlife Acts 1976 and amendments. Smooth newt (*Lissotriton vulgaris*) is also a protected species under the Wildlife Acts.

Common frog are widespread and may to be present at the Site or within the surrounding lands. Limited suitable breeding habitat exists for frog in the form of transient pooling within the field after periods of rainfall. Surveys of the Site during March 2022 recorded no signs of breeding frog despite a thorough check of all areas of pooling on site. No suitable breeding habitat e.g., ponds, exists for Smooth newt at the Site and this species is unlikely to be present.

5.3.10 Fish

European eel (Anguilla Anguilla)

European eel is a red listed species and are currently considered to be the most threatened fish species in Ireland (King et al. 2011). There is a record of European eel within the 10km grid square O14 for the 4th of July 2008. European Eel can inhabit a range of waterway types including lakes, small streams and rivers; migrating from where they live in freshwater habitats to breed out at sea, before returning then as young eel to their freshwater homes (King et al. 2011). The Gaybrook stream waterway located along the northern boundary of the Site has the potential to ultimately link to the Malahide Estuary through a series of waterways to the east. European Eel could potentially utilise these waterways and/or use it as a migratory pathway to the Irish Sea.

5.4 SUMMARY ECOLOGICAL EVALUATION

The habitats present, and species likely to utilise the Site, have been evaluated below in Table 5.9 for their conservation importance based on the NRA evaluation scheme (NRA, 2009b). Those selected as key ecological receptors (KERs) are those which are evaluated to be of at least local importance (higher value) and deemed to be at risk of significant effects resulting from the Proposed Development. The impacts of the Proposed Development on these receptors are assessed in section **Error! Reference source not found.**. The summary in the table below indicates the evaluation rating assigned to each receptor and the rationale behind these evaluations.

Table 5.9 Evaluation of potential ecological sensitivities within the vicinity of Site of the Proposed Development.

Ecological Receptor	Evaluation	Rationale	Key Ecological Receptor (KER)?
Designated Sites			
Malahide Estuary SAC & SPA	International Importance	These European Sites have been assessed in the AA Screening Report and NIS which accompany this application under separate cover.	**Yes**
Malahide Estuary pNHA	National Importance	This site is also an SAC and SPA and as such the assessment and conclusions of the AA Screening Report and NIS can be applied to this pNHA.	**Yes**
Habitats			
Scrub (WS1)	Local Importance (Lower Value)	Limited occurrence on site and fairly common habitat. Scrub is deemed to be important only at the local scale.	No
Arable Crops (BC1) Buildings and Artificial surfaces (BL3)	Negligible Ecological value	Highly managed or disturbed human habitats with negligible ecological value.	No
Dry Meadow (GS2)	Local Importance (Lower Value)	Unmanaged semi-natural grassland habitat providing some value to pollinators. Common habitat where farmland is left unmanaged for a period.	No
Hedgerows (WL1) Treelines (WL2)	Local Importance (Higher Value)	Vegetated boundaries of the Site observed to provide potential commuting foraging habitat for Bats and birds. Part of wider connectivity with surrounding lands.	**Yes**
Drainage Ditch (FW4)	Local Importance (Higher Value)	Gaybrook Stream provides link to downstream sensitivities e.g., Malahide Estuary.	**Yes**
Fauna			
Badger	Local Importance (Lower Value)	No Badger setts or evidence of badger recorded on site. Limited habitat on site for Irish Hare, Pine marten, Irish Stoat and Red squirrel and unlikely to be present. No suitable Otter habitat on site.	No
Irish Hare, Red Squirrel, Pine Marten, Irish stoat.			
Otter			

Ecological Receptor	Evaluation	Rationale	Key Ecological Receptor (KER)?
Hedgehog, Pygmy Shrew	Local Importance (Higher Value)	No evidence of these small mammal at the Site, however, they are ubiquitous species in urban and rural environments and likely to be present. Some sections of existing hedgerows will be removed as part of the Proposed Design.	**Yes**
Bat assemblage	Local Importance (Higher Value)	Two species of bat recorded within the vicinity of the Site of the Proposed Development. Hedgerows and treelines used for commuting/ foraging.	**Yes**
Bird assemblage (Red listed)	Local Importance (Higher Value)	Two red listed and two amber listed species recorded on site. Site provides nesting/foraging habitat in scrub and boundary vegetation.	**Yes**
Bird assemblage (Amber listed)	Local Importance (Higher Value)		
Bird assemblage (Green listed)	Local Importance (Lower Value)		
Common Frog	Local Importance (Lower Value)	Limited to no potential breeding habitat within the Site of the Proposed Development i.e., wet drainage ditches, pooling or ponds.	No
Smooth Newt			
European Eel	Local Importance (Higher Value)	No suitable habitat on site but potential linkage from the Site to larger rivers where Eel have been recorded, and Malahide Estuary via the Gaybrook Stream.	**Yes**

5.5 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The Proposed Development, for which a seven year permission is sought, comprises a Strategic Housing Development of 645 no. residential units (comprising of 208 no. 1 bedroom units, 410 no. 2 bedroom units, and 27 no. 3 bedroom units), in 10 no. apartment buildings, with heights ranging from 4 no. storeys to 10 no. storeys, including undercroft / basement levels (for 6 no. buildings). The proposals include 1 no. community facility in Block 1, 1 no. childcare facility in Block 3, and 5 no. commercial units (for Class 1-Shop, or Class 2- Office / Professional Services or Class 11- Gym or Restaurant / Café use, including ancillary takeaway use) in Blocks 4 and 8. The proposal includes all associated and ancillary development.

Please refer to Chapter 2 of the EIAR for a detailed description of the Proposed Development.

5.5.1 Construction Phase

5.5.1.1 Construction Phase Surface Water

A Construction Environmental Management Plan (CEMP) has been prepared by Waterman Moylan Consulting Engineers Ltd., (WM) which details the surface water management measures that will be in place for the duration of the proposed works. The measures included within the CEMP are consistent with those described in this Biodiversity Chapter and the Natura Impact Statement (NIS) that accompanies this application under sperate cover.

5.5.2 Operational Phase

5.5.2.1 Operational Surface Water

The Site currently drains to the Gaybrook Stream along its northern boundary. According to the Engineering Assessment Report (EAR) prepared by WM, Operational Phase surface water for the Proposed Development will be discharged at a restricted rate to this watercourse mimicking the existing greenfield run-off rates. Attenuation will be provided to restrict surface water runoff from to the equivalent of the existing greenfield runoff rate.

Strict separation of surface water and wastewater will be implemented within the Proposed Development.

The *Engineering Assessment Report* (EAR) completed by Waterman-Moylan Engineering Consultants details the comprehensive Sustainable Urban Drainage System (SuDS) that is to be incorporated into the Proposed Development. These measures will ensure that all surface waters leaving the Site of the Proposed Development during its Operational Phase will be of an acceptable quality and will cause no nuisances to ecological sensitivities located downstream.

These measures will include the following:

- Green/Blue roofing on roofs of proposed apartment blacks and at podium level to provide attenuation and treatment;
- Water Butts/ Rainwater harvesting included in apartment design for sustainable re-use of rainwater;
- Permeable multi-use playing surfaces incorporated into amenity playing pitch design to provide additional attenuation prior to discharge to the stream;
- Filter drains in place along areas of road/footpath for initial surface water run-off treatment from these areas;
- Detention basins with hydrobrakes proposed for three locations, to store and treat surface water prior to controlled outflow to Gaybrook stream at rates sufficient to ensure no increase in surface water flow rates downstream; and
- Petrol interceptors to be installed in basement parking area prior to discharge to foul sewer; and upstream of discharge to porous amenity playing pitch attenuation area.

A stormwater management or treatment train approach has been proposed which assures that run-off quantity and quality is improved, and that surface water generated at different locations on-site undergo various stages of treatment/management prior to final outflow:

- Run-off within the curtilage of the property boundary shall pass through at least one SUDS component prior to discharging to downstream SUDS components within the public realm.
- Run-off from public areas (such as roads, parking bays, hard and soft landscaped areas and footpaths) shall pass through at least two SUDS components prior to discharging to the final downstream detention/retention/polishing SUDS components within the public realm.
- The final SUDS Components located in the public realm shall comprise a detention basin prior to discharge to the Gaybrook Stream. The location of the proposed detention basin is outside the high-end future scenario fluvial flood extents.
- Storage for the 100-year event (as a minimum) including a 20% increase in rainfall intensity for climate change shall be provided for run-off from the public realm, with a maximum discharge rate of 2l/s/ha.

5.5.2.2 Operational Foul Water

An updated Confirmation of Feasibility was received from Irish Water on 17 February 2021 which confirmed that the Proposed Development can be facilitated subject to local sewer infrastructure upgrades which will be delivered by Irish Water. This system will discharge to the Swords Wastewater Treatment Plant (WWTP). The Swords WWTP was recently upgraded to increase treatment capacity from a population equivalent of 60,000 to a population equivalent of 90,000. According to the 2020 Annual Environmental Report (AER) (Irish Water, 2021), the facility

has surplus organic capacity of 11,391 PE remaining and will not be exceeded within the next three years. The upgraded treatment plant will protect and improve quality of receiving waters at the inner Broadmeadow Estuary, using tertiary treatment by filtration, and disinfection using ultra-violet treatment and allow for population growth and economic development.

Figure 5.5 Proposed Site Layout (Adapted from PCOT Drawing PL-21-01, Dated: 03-2022)

5.6 POTENTIAL IMPACT OF THE PROPOSED DEVELOPMENT

This section provides a description of the potential impacts that the Proposed Development may have on ecological receptors in the absence of mitigation. Methodology for determining the significance of an impact has been published by the NRA (NRA, 2009).

5.6.1 Impact on Designated Sites

The Appropriate Assessment Screening Report prepared by Enviroguide Consulting concluded the following:

"In conclusion, upon the examination, analysis, and evaluation of the relevant information, and in applying the precautionary principle; it is concluded by the authors of this report that, on the basis of objective information, the possibility that the Proposed Development will have a significant effect on the following European Sites, noted to be linked by a Source-Pathway-Receptor impact pathway, cannot be excluded; due to the presence of a hydrological connection with the Site of the Proposed Development:

- *Malahide Estuary SAC [000205]*
- *Malahide Estuary SPA [004025]*

As such, a Stage 2 Appropriate Assessment has been carried out of the Proposed Development. A Natura Impact Statement (NIS) has been prepared and accompanies this application under separate cover ".

A Natura Impact Statement has been prepared by Enviroguide which details the measures that will be in place to mitigate/negate any potential impacts to European Sites identified in the Appropriate Assessment Screening Report. The NIS concludes that:

"Where potentially significant adverse impacts were identified, a range of mitigation and avoidance measures have been recommended to offset them. As a result of this Appropriate Assessment, it has been concluded that, with the implementation of the mitigation measures detailed in this report, the Proposed Development at lands at Fosterstown North, Dublin Road / R132, Swords, Co. Dublin, will not adversely affect the integrity of the above European Sites (or any other). "

As detailed in the preceding sections of this report, the only nationally designated site that maintains an indirect impact pathway with the Proposed Development is the Malahide Estuary pNHA. This pNHA is also designated as an SAC and SPA and the potential for significant effects to this Site has been addressed in the NIS prepared for this application. As such, no significant effects will occur at this site as a result of the Proposed Development, as the mitigation measures recommended in the NIS to address any potential impacts to the SAC and SPA, that might arise as a result of its hydrological connection with the Site, are also deemed sufficient to protect the pNHA.

5.6.2 Impacts on the Gaybrook Stream and Aquatic Species

The Proposed Development will involve the re-profiling and replanting of the southern bank of the Gaybrook stream located along the northern boundary of the Site. This will involve some loss of minor sections of hedgerow as the bank is reprofiled and the existing vegetation is thinned to open up the stream channel. It is noted that the majority of hedgerow along the Stream is being retained and incorporated into the proposed landscape design, and that replacement and additional planting will also be utilised to reinforce these existing hedgerows.

The Gaybrook Stream is considered to be of low biodiversity value in its present state due to its overgrown, steep bank profile and lack of light penetration. On further inspection of this waterway during site surveys it was observed to be a slow moving stream no more than 10cm in depth, within a heavily shaded ditch of *ca.* 2.5m in depth. When the stream sediments were disturbed a petrol/fuel odour was emitted and a contaminant sheen could be seen on the surface of the water and sediments, suggesting hydrocarbon contamination of this waterway.

The re-profiling of the Gaybrook Stream does have the potential to have ***negative, short-term, significant*** impacts on this waterway through potential contaminant/sediment mobilisation during these works.

The proposed landscaping of the bank into a more gradual incline, with marginal shelves planted with native tree and shrub species, will also have a ***positive, permanent, significant*** impact through the opening up of the stream; providing new potential foraging habitat for bats.

European Eel

As previously mentioned, European eel have been recorded in the national grid O14 in which the Site of the Proposed Development is located. European eel was recorded by EPA River Biologists in 2008 (NBDC, 2019) in the river networks to the north of the Site of the Proposed Development: the Broadmeadow_08 (EPA Code: 08B02) (segment_code: 08_295) in national 1km grid (O1848); and the Ward waterbody (EPA Code: 08W01) (segment_code: 08_705) in national 1km grid (O1847).

The Gaybrook stream located along the northern boundary of the Site has the potential to ultimately link to the Malahide Estuary through a series of waterways to the east. European Eel could potentially utilise these waterways and/or use it as a migratory pathway to the Irish Sea.

Therefore, in the absence of suitable mitigation the potential for ***negative, short-term, moderate*** impacts to this species cannot be fully ruled out.

5.6.3 Impacts on Hedgerow and Treelines

Hedgerows (WL1) run along the outer margins of the Site of the Proposed Development. These habitats are of higher value, with the potential to support breeding birds, hedgehogs and other small mammal species.

The Proposed Development will involve the replacement of the eastern hedgerow i.e., H1 & H24 in the Arboriculturist Report (Charles McCorkell Arboricultural Consultancy, 2022), at the Site with planted tree species. The majority of hedgerow boundaries at the Site are being retained and incorporated into the proposed landscaping of the Site. The Proposed Development, therefore, has the potential to have a ***negative, short-term, slight*** impact on vegetated boundary habitats that will last until the proposed planting at the Site is completed.

The addition of planted native trees across the Site will also have a ***positive, permanent, significant*** impact; replacing open arable field with a more complex planted environment which will increase habitat connectivity and provide habitat for passerine bird species.

5.6.4 Impacts on Mammals

No mammals of conservation concern were recorded within the Site. The loss of habitats within the Site as a result of the Proposed Development could have a potential ***negative, short-term, moderate*** impact on some species at a local level, such as hedgehog and pygmy shrew, through the removal and thinning of sections of hedgerow and scrub habitat.

Noise generated during the Construction Phase has the potential to cause disturbance to mammals at a local level, representing a ***negative, short-term, moderate,*** impact to these species in the absence of suitable mitigation. Due to the urban surroundings of the Site, local mammals are likely to be accustomed to a certain degree of ambient anthropogenic noise and, as such, Operational Phase noise/disturbance are not considered to represent significant sources of impacts at the Site.

Small mammals have the potential to become entangled in construction materials such as netting and plastic sheeting, as well as other waste materials, causing entrapment and injury/death. This constitutes a ***negative, short-term, moderate*** impact at a local level associated with the Construction Phase of the Proposed Development in the absence of mitigation.

5.6.5 Impacts on Bats

No evidence of roosting bats (e.g., live/dead specimens, droppings, urine splashes and fur-oil stains) were found during the habitat assessment survey at the Site of the Proposed Development. A low level of bat activity was recorded at the Site, with a total of two bat species recorded during the activity survey in September 2021. The Site holds little suitable habitat for bats except for potential commuting/foraging habitat provided by its boundary hedgerows; the majority of which are being retained as part of the landscaping of the Site thus ensuring that habitat connectivity will be maintained with the surrounding lands.

The Proposed Development will result in the physical loss of some minor sections of potential commuting and foraging habitat as a section of hedgerow along the eastern boundary will be removed as part of the works. The loss of habitat will represent a ***negative, permanent, slight*** impact at a local scale, in the absence of mitigation.

Excess light spill from the Proposed Development on to hedgerows and treelines at the Site could render normally dark commuting and foraging routes unsuitable for bats, and negatively impact on their foraging commuting behaviours. However, due to the relatively small number of bats recorded utilising the Site of the Proposed Development, the impact of the Proposed Development on foraging and commuting bats is considered to be ***negative, permanent, moderate*** in nature in the absence of mitigation.

Regarding collisions with proposed structures at the Site, it is noted that bats commute and forage largely using echolocation and as such are capable of navigating buildings unless largely made of smooth reflective metal or glass. In this regard, due to the heterogenous composition of the proposed building façades, collisions are not considered likely to occur.

5.6.6 Impacts on Birds

The majority of species recorded in the vicinity of the Site of the Proposed Development were common hedgerow species either flying overhead or foraging across the Site. The below impacts to these bird species have the potential to occur.

Noise Disturbance

The Construction Phase of the Proposed Development will likely involve elevated noise levels associated with the proposed excavation and construction works. As a result, there is a potential risk of noise disturbance to birds in the vicinity of the Site, representing a ***negative, short-term, moderate*** impact at a ***local*** level in the absence of suitable mitigation. Due to the urban surroundings of the Site, local birds are likely to be accustomed to a certain degree of ambient anthropogenic noise and, as such, Operational Phase noise/disturbance are not considered to represent significant sources of impacts at the Site.

Loss of Habitat

The Proposed Development will result in a loss of potential nesting, foraging habitat at the Site through the clearance of some sections of scrub, hedgerow and treeline habitat. It is noted however, that the proposed landscape plan will entail an increase in native tree cover at the Site, along with native shrub planting. This will help to offset the loss of the existing habitats and as such the loss of habitat represents a ***negative, short-term, slight*** impact at a ***local*** scale.

Injury/mortality during Site Clearance

Should vegetation clearance occur during the nesting season there is the potential for the destruction of nests and eggs, as well as the mortality of young birds prior to fledging. This would represent a ***negative, short-term, significant*** impact at a ***local*** scale in the absence of mitigation.

Collisions with Site structures

The height of buildings, coupled with the use of glass in their design can in some cases have the potential to impact on local birds (both migratory and non-migratory) through collisions. This is a result of birds being unable to distinguish between reflections in glass and the natural environment (resulting in birds flying into windows that appear to be trees or sky), and their inability to perceive clear glass as a solid object (City of Toronto, 2016).

The physical location of buildings and structures can also affect the likelihood of bird collisions. Structures placed on or near areas regularly used by large numbers of feeding, breeding, or roosting birds, or on local flight paths, such as those between foraging and roosting areas can present a higher risk of collision.

The Site itself 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 near any Special Protected Areas (SPAs) designated for wetland bird populations and is in itself not deemed to represent suitable ex-situ feeding/roosting habitat for any such species, as is borne out in the results of the winter bird surveys of the Site (See section 5.3.8.1).
In addition, the Proposed Development entails building heights ranging from four to 10 storeys in height. As such, the risk of migrating birds colliding with the structures due to their height is deemed to be **negligible** [Migrating species tend to commute far above this with Swans and Geese flying up to 2500ft (ca.750m) during migration along Irish Coasts (Irish Aviation Authority, 2020). Birds foraging and/or commuting over or around the Site would fly at lower heights than this but once the buildings are visible to the birds and provide discernible cues as to their existence, birds will simply fly over or around them.

It is also noted that the overall façades of the proposed structures are well broken up; with a varied material composition which breaks up their respective reflective components. 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. This overall visual heterogeneity of the building façades will be sufficient to ensure that the risk of bird collisions as a result of the Proposed Development is **negligible.**

5.7 POTENTIAL CUMULATIVE IMPACTS

5.7.1 Existing Granted Developments

A search of planning applications located within the vicinity of the Site of the Proposed Development was conducted using online planning resources such as the National Planning Application Database (NPAD) (MyPlan.ie). Any planning applications listed as granted or decision pending from within the last five years were assessed for their potential to act in-combination with the Proposed Development and cause likely significant effects on the relevant European Sites. Long-term developments granted outside of this time period were also considered where applicable.

- Ref: ABP 308366-20; MKN Property Group; Fosterstown North and Cremona, Forest Road, Swords, Co. Dublin; Grant Perm. w Conditions: 03/02/2021.

Description: *278 no. residential units (apartments) no. houses, 216 no. apartments, 52 no. duplexes), childcare facility, retail unit and associated site works.* Distance from Proposed Development: *ca*.100m

- Ref: F16A/0324; LIDL Ireland GmbH; Dublin Road, Swords, Co. Dublin; Granted: 18/10/2016 by Fingal County Council.

Description: *Amendments to ABP Ref. PL06F.244562 (and Fingal County Council Ref. F14A/0492) (1) retention permission of works to create and completion of an ESB substation building at the southern boundary of the site which also results in the loss of two parking spaces immediately north of the sub-station; (2) Planning permission for amendments to the permitted development to include: (a) south west elevation - additional glazing and finishes; (b) north west elevation - change to finishes and new car park entrance portico with safety signage; (c) south east*

elevation - additional windows and doors and change of finish materials (d) north east elevation - change of finish materials and inclusion of concrete wall. Adjustments to lift core extends above the level roof at the rear of the store. Reconfiguration of space within the premises offices and storage areas. Replacement of the permitted concrete acoustic wall to the west of the food-store to a timber acoustic fence. All other site development works and any other associated ancillary works. Distance from Proposed Development: *ca*.10m.

- Ref: F19A/0103; Board of Management of Colaiste Choilm; Colaiste Choilm CBS, Dublin Road, Swords, Co. Dublin; Granted: 29/05/2019 by Fingal County Council.

Description: *Alterations to existing school building including removal of the existing roofs, raising walls as necessary and construction of a new roof and associated site works*. Distance from Proposed Development: ca.95m.

- Ref: F08A/1057/E1; Chartered Land Ltd; Pavilions Shopping Centre, Malahide Road And, No's 9, 10 & 11 Dublin Road, Swords, Co Dublin; Granted: 14/01/2016 by Fingal County Council.

Description: *A 7-year permission for development at this site. The Proposed Development comprises the construction of Pavilions Phase 3, a mixed-use town centre development amounting to c.272,637 sq.m. total Gross Floor Area (GFA) and accommodated in buildings ranging in height from 3 to 10 storeys over three levels of enclosed basement car parking, with an associated network of open, sheltered and enclosed streets and spaces.* (Full description at http://planning.fingalcoco.ie/swiftlg/apas/run/WPHAPPDETAIL.DisplayURL?theApnID=F08A/1057/E1). Distance from Proposed Development: *ca.*335m.

- Ref: F18A/0198; MSD International GmbH; Drynam Road, Barrysparks, Commons East, Crowcastle, Swords, Co. Dublin. Granted: 17/07/2018 by Fingal County Council.

Description: *Development at an existing pharmaceutical manufacturing facility (approximately 13.4 hectares). The development consists of the construction of a biopharmaceutical manufacturing campus with a total additional floor area of 12,046 square metres and specifically provides for:- (a) the conversion of an existing warehouse building to a biopharmaceutical manufacturing processes building which will require internal alterations, extension and modifications to the existing elevations; (b) the conversion of an existing manufacturing building to a central utilities and laboratory building requiring internal alterations, extension and modifications to the elevations including the addition of 3 no. flue stacks (to a maximum height of 18.68 metres); (c) construction of a two-storey quality control laboratory and single-storey with mezzanine warehouse building; (d) extension of the existing central spine corridor to provide connectivity to the new laboratory and warehouse buildings, including provision of new staff entrance; (e) demolition of existing utilities plant and buildings comprising 2 no. boiler rooms, compressor room, electrical room, generator compound, water tank and pump house, and 2 no. store buildings; (f) provision of new logistics yard and new ancillary external utilities yard comprising 2 no. electrical switch room buildings, water pump and treatment building, bunded water tank, bunded gas and diesel storage tanks, 3 no. emergency generators and waste water management facility; (g) installation of mechanical plant to the roof of the existing administration, laboratory and canteen building (h) all ancillary site works including diversion and partially reopening of the existing culverted stream within the site; underground services; surface water attenuation tank; modifications to the internal road network, modifications to existing car parking including removal of 212 spaces; 2 no. new bicycle shelters; lighting; CCTV; soft and hard landscaping. An Environmental Impact assessment Report (EIAR, formerly known as and EIS) and Natura Impact Statement (NIS) have been prepared and will be submitted to the Planning Authority with the application. The EIAR and NIS will be available for inspection or purchase at a fee not exceeding the reasonable cost of making a copy during office hours at the offices of the Planning Authority. The Proposed Development is for the purposes of an activity requiring an application to the Environmental Protection Agency for a licence under the Industrial Emissions Directive.* Distance from Proposed Development: *ca.*1.1km

- Ref: F18A/0376; Tesco Ireland Ltd; Tesco Holywell Centre, Junction of the R125 and the Holywell Link Road, Swords, Co. Dublin; Granted: 02/10/2018 by Fingal County Council.

Description: *The development will consist of an extension (458 sq.m gross) to the existing local community and commercial facilities to include a café unit of 173 sq.m. gross and 2 no. retail/retail service units (100 sq.m & 102 sq.m. gross) at ground floor level, a management suite and staff facilities (58 sq.m. gross) at first floor level, circulation areas and screened roof mounted plant provided in a new block to the west of the existing local facilities. Planning permission is also required for all ancillary site services, landscaping and site development works.* Distance from Proposed Development: *ca.*900m*.*

- Ref: F18A/0426; Tesco Ireland Ltd; Tesco Holywell Centre, Junction of the R125 and the Holywell Link Road, Swords, Co. Dublin; Granted: 06/03/2019 by Fingal County Council.

Description: *The provision of an extension of 750 sq.m. gross floor area (500 sq.m. net) to the existing licenced Tesco food store. The development also includes the provision of additional ancillary car parking to the north of the existing car park as well as all site services, landscaping and site development works. Add Info received 21st December 2018.* Distance from Proposed Development: *ca.*900m*.*

- Ref: F17A/0392; October Management Ltd; Holywell, Marshallstown, Swords, Co Dublin; Granted: 01/02/2018 by Fingal County Council.

Description: Permission *for a proposed roundabout and access road to serve proposed commercial development lands including associated services. Add Info rec'd 27th November 2017.* Distance from Proposed Development: *ca.*1km.

- Ref: F18A/0601; Department of Education and Skills; Lands adjacent to Feltrim Road, Drinan, Swords, Co Dublin; Granted: 23/01/2019 by Fingal County Council.

Description: *Permission for the construction of a new three storey post primary school building (Malahide-Portmarnock ET (RN68308L)), associated car parking, access road, construction of external ball courts, landscaping, connection to public services and all associated site works.* Distance from Proposed Development: *ca.* 1.7km.

No developments with the potential to result in likely significant cumulative effects to any designated site or protected species were identified. The majority of applications in the vicinity of the Site are for domestic extensions and revisions to existing private dwellings The Proposed Development will have no significant impacts on its own and will not contribute to any significant cumulative impacts involving other developments in the area. Any combined impacts to the surrounding environment relating to Construction Phase overlap with the adjacent development to the north (Ref: ABP 308366-20) should overlap occur, (e.g., noise, dust) would be minor, short-term and localised in nature and would not have the potential to affect any designated sites due to the intervening distances involved. The ABP 308366-20 application was also accompanied by an AA Screening Report which screened out the likelihood of any significant effects on European Sites.

The Proposed Development, along with other developments, will contribute to an overall reduction in green spaces in the Swords area. However, the habitat being lost is largely agricultural in nature and of low ecological value in its current state (an arable stubble field). Additionally, the majority of the existing mature hedgerows at the Site are being retained and incorporated into the landscape plan, alongside an increase in tree planting across what is currently an open field. As such, it is not considered that the Proposed Development will cause any significant impacts to habitats or wildlife in the area by itself, or in combination with other developments.

5.7.2 Relevant Plans and Projects

In addition, the following Policies and Plans were reviewed and considered for possible in-combination effects with the Proposed Development.

- Fingal Development Plan 2017 - 2023

- Fosterstown Masterplan 2019
- Fingal Heritage Plan 2018 - 2023
- Dublin City Biodiversity Action Plan 2015 - 2020

It is noted that there is potential for proposed plans and projects within the Fingal Development Plan 2017 - 2023 land area, to have cumulative, negative impacts on conditions in Dublin Bay and other coastal areas, via rivers, other surface water features, and foul waters treated at wastewater treatment facilities. However, the core strategy, policies and objectives of the Fingal Development Plan have been developed to anticipate and avoid the need for developments that would be likely to significantly affect the integrity of any European Site. Furthermore, such developments are required to conform to the relevant regulatory provisions for the prevention of pollution, nuisance or other environmental effects likely to significantly affect the integrity of European Sites.

5.7.3 Increased Loading at Swords WwTP

The potential for foul waters generated at the Site of the Proposed Development to reach Malahide Estuary and cause significant effects to designated Sites and protected habitats or species during the Operational Phase is deemed to be negligible due to the following:

- The Swords WwTP was identified by the EPA as being compliant with the Emission Limit Values (ELVs) as set out in its Wastewater Discharge Licence, according to the 2020 Annual Environmental Report (AER) prepared by Irish Water for this facility (Irish Water, 2021).
- The WwTP was upgraded in 2016, increasing its capacity from 60,000 PE to 90,000 PE (Murphygroup.com). According to the 2020 AER (Irish Water, 2021), the facility has surplus organic capacity of 11,391 PE remaining and will not be exceeded within the next three years.

As such, it is not envisaged that the Proposed Development has the potential to act in combination with other developments and lead to overloading at Swords WwTP based on its current treatment capacity.

Therefore, upon examination of the above listed plans and projects within the general vicinity of the Proposed Development it is concluded that there is **no possibility for any significant cumulative effects** on the receiving ecological environment involving the Proposed Development.

5.8 'DO NOTHING' IMPACT

If the Proposed Development were not to go ahead, the Site would likely continue to be utilised as an agricultural arable field. Vegetation cover would continue to be transient across the majority of the land, with pioneer weed species establishing in between periods of cultivation. Were agricultural practises to cease, the land would become gradually more overgrown, with scrub cover increasing as it encroaches from the margins of the Site.

5.9 AVOIDANCE, REMEDIAL & MITIGATION MEASURES

Enhancement Measures

BIO CONST 1: Low Intervention Hedgerow Management

Existing and new hedgerows proposed for the outer margins of the Site will be managed in a way so as to mitigate the loss of existing hedgerows as much as is possible. In this way new hedgerows can be maximised in the ecological value they provide at the Site, with habitat connectivity ensured along the margins of the development; connecting it in with the wider field boundary network in the area. This connectivity is vital for wildlife such as birds, bats, mammals and insect pollinators in a human landscape such as that which will be provided by the Proposed Development. Additionally, by managing hedgerows and treelines in a more natural way, they will provide more in terms of biodiversity; through increased plant diversity, increase provision of food resources and higher quality shelter to wildlife inhabiting and commuting through the area.

The above low intervention approach may not be suitable for hedges included within the more landscaped areas of the Site, which may need to be maintained to a higher degree for health and safety or aesthetic reasons. However, at the very least **native species** will be used wherever possible in these locations; to maximise the biodiversity value of these internal landscaped parts of the Site.

For the hedgerows running along the outer margins of the Site, the following management approach is proposed to maximise their biodiversity value and offset the loss of existing hedgerows at the Site. Should planning be granted, a **Hedgerow Management Plan** will be prepared by a suitably qualified ecologist; for the hedgerows that are proposed for the Site's outer boundaries. This management plan will include the following, with a focus on maintaining these hedges in as natural a state as possible to maximise their ecological value:

- The hedgerows located along the outer boundaries of the Site in the north, west and south will, as much as is practicable, link up with each other and with the hedgerows in the adjacent lands to the north. The provision of an almost continuous vegetative margin around the Site; through planted native hedgerows and trees, will maintain habitat connectivity with the surrounding environment.
- Hedgerows will be maintained with a **natural meadow strip of 1-2m** at their base wherever possible. Hedges with plenty of naturally occurring flowers and grasses at the base support will provide higher quality habitat for local wildlife using the hedges.
- The 1-2m strip at the base of the hedgerow will be cut on a reduced mowing regime to encourage wildflower growth and maximise the value of the hedgerow for pollinators. A **two-cut management approach** is ideal for suppressing coarse grasses and encouraging wild flowers. Cut the hedgerow basal strip **once during February and March** (this is before most verge plants flower and it will not disturb ground-nesting birds). Cut the verge **once again during September and October** (this slightly later cutting date allows plants that were cut earlier in the year time to grow and set seed).N.B. Raising the cutter bar on the back cut will lower the risk to amphibians, reptiles and small mammals.
- Hedgerows, where possible, will be allowed to reach at least 2.5m in height, and should be **trimmed in an A-shape**; maintaining a wider base to compliment the natural meadow strip at their base.
- Where hedgerow trimming needs to occur trimming will be delayed as late as possible – until **January and February;** as the surviving berry crop will provide valuable food for wildlife. The earlier this is cut; the less food will be available to help birds and other wildlife survive through the winter. Any hedgerow cutting will be done outside of the nesting season and due consideration of the **Wildlife Act 1976** (as amended) needs to be taken.
- Where possible, these outer boundary hedgerows will be cut on a minimum **3-year cycle** (cutting annually stops the hedgerow flowering and fruiting), and cut in rotation rather than all at once - this will ensure some areas of hedgerow will always flower (Blackthorn in March, Hawthorn in May).
- Where they occur naturally, Bramble and Ivy will be allowed grow in hedgerows where possible, as they provide key nectar and pollen sources in summer and autumn.

Methods to Avoid

Hedgerows will not be over-managed. Tightly cut hedges mean there are fewer flowers and berries, thus reducing available habitats, feeding sources and suitable nesting sites.
Hedgerows will not be cut between March 1st and August 31st inclusive. It is both prohibited (except under certain exemptions) and very damaging for birds as this is the period they will have vulnerable nests containing eggs and young birds. Red-listed bird species Yellowhammer in particular nest up until the end of August.
Pesticide/ herbicide sprays or fertilisers will NOT BE USED near hedgerows as they can have an extremely negative effect on the variety of plants and animals that live there.

BIO CONST 2: Bat Box Provision
Three (3no.) bat boxes will be erected at suitable locations within the Site to provide new habitat for local bat species during the Operational phase of the Proposed Development. A qualified Ecologist will be consulted with regards the appropriate type and placement/location of these bat boxes. Mature trees located within the northern boundary

hedgerow/treeline that is being retained as part of the Proposed Development may provide suitable locations, as the area along this boundary is being retained in a semi-natural state as a wildlife corridor.

Bird Mitigation

BIO CONST 3: Controlled Vegetation Removal

To ensure compliance with the Wildlife Act 2000 as amended, the removal of areas of vegetation should not take place within the nesting bird season (March 1st to August 31st inclusive) to ensure that no significant impacts (i.e., nest/egg destruction, harm to juvenile birds) occur as a result of the Proposed Development. Where any removal of vegetation within this period is deemed unavoidable, a qualified Ecologist will be instructed to survey the vegetation prior to any removal taking place. Should nesting birds be found, then the area of habitat in question will be noted and suitably protected until the Ecologist confirms the young have fledged, or a derogation licence is obtained from the NPWS.

Timing of vegetation clearance and instream works

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

Table 5.10 Seasonal restrictions on vegetation removal. Red boxes indicate periods when clearance should not be carried out.

Ecological Feature	January	February	March	April	May	June	July	August	September	October	November	December
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, excluding bats)	Mammal hibernation season No clearance of vegetation or works to relevant structures permitted unless confirmed to be devoid of hibernating mammals by an ecologist.				Vegetation clearance permissible						Mammal hibernation season No clearance of vegetation or works to relevant structures permitted unless confirmed to be devoid of hibernating mammals by an ecologist.	
Bats	Tree felling to be avoided								Preferred period for tree-felling		Tree felling to be avoided	

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

BIO CONST 4: Yellowhammer Habitat Provision

Red-listed species Yellowhammer were recorded along the hedgerows of the Site, both during the winter and breeding season. The maintenance of low-intervention native hedgerows along the outer boundaries of the Site will

contribute maintaining nesting/foraging habitat at the Site for this species. Yellowhammer nests on or near the ground and so hedgerows and the unmanaged meadow verge habitat at their bases are important habitats for them. In addition, the long grasses and wildflower species that grow at the base of hedgerows e.g., nettle and dock, along with the insects they support, provide a valuable feeding resource for this species.

The maintenance of the outer hedgerows at the Site in a semi-natural form with a reduced cutting regime, along with the provision of a 1-2m **unmanaged** meadow margin along their bases; will ensure that suitable Yellowhammer habitats is provided at the Site into the future.

BIO CONST 5: Noise Control

A number of measures will be included in the contractor's CEMP as set out in *BS 5228-1: A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 1: Noise,* that will be put in place during the Construction Phase of the Proposed Development. These will ensure that the level of noise caused by the proposed works will be controlled/reduced where possible so as to minimise the potential disturbance impact on local bird species.

These measures will include but are not limited to:

- Selection of plant with low inherent potential for generating noise.
- Avoid 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 becomes a source of 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 local birds or any other fauna species in the vicinity of the Site of the Proposed Development will be reduced to a minimum.

Gaybrook Stream Protection

A Construction Environmental Management Plan (CEMP) has been produced by Waterman-Moylan Engineering Consultants and will be implemented by the contractor during the Construction Phase of the Proposed Development. The CEMP details the suitable precautions to be followed to ensure the prevention of any potential pollution of watercourses as a result of construction activities, and will include the following:

BIO CONST 6: General Surface Water Mitigation

- The contractor will appoint a suitably qualified person to act as Ecological Clerk of Works (ECoW) to oversee the implementation of measures for the prevention of pollution to the receiving surface water environment.
- Measures such as silt fencing, straw bales and trenches will be inspected regularly by the ECoW to ensure they are effective and in good repair. Should any measures be damaged or ineffective, they will be repaired or replaced as per the instruction of the ECoW.
- Temporary cut off trenches will be excavated along the north of the Site in advance of stripping topsoil; to intercept sediment laden surface water flows prior to their reaching the Gaybrook Stream.
- These cut off trenches will be connected to a temporary settlement pond. Straw bales will be placed within the cut off trenches at strategic locations and at the outfall from the settlement pond.

- Stilling ponds to be installed where necessary with a diffuse outflow to mitigate any increase in run-off, along with any other erosion control and retention facilities (e.g., a three stage treatment train: swale – stilling pond – diffuse outflow); to reduce risk of downstream flooding.
- Location of stilling ponds will take into account groundwater vulnerability at the Site and will be located in suitable areas.
- As detailed in the CEMP, regular testing of surface water discharges will be undertaken at the outfall from the subject lands. The location will be agreed between the project ecologist and the Site foreman at the commencement of works. Trigger levels for halting works and re-examining protection measures will be pH >9.0 or pH <6.0; and/or suspended solids >25 mg/l. These trigger levels are based on those outlined within 'Guidelines on Protection of Fisheries During Works in and Adjacent to Waters (IFI, 2016)'.
- Where silt control measures are noted to be failing or not working adequately, works will cease in the relevant area. The project ecologist/ ECoW will review and agree alternative pollution control measures, such as deepening or redirecting trenches as appropriate, before works may recommence.
- 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 located at least 10m away from any surface water features/drainage ditches etc.; and will be surrounded with silt fencing to filter out any suspended solids from surface water arising from these materials.
- Pouring of cementitious materials will be carried out in the dry. A designated wash down area within the Contractor's compound will be used for cleaning of any equipment or plant, with the safe containment and disposal of any cementitious water. No such waters will be allowed to reach the drainage ditches and streams at the Site.
- Where possible the permanent connection to the public foul sewer will be used temporarily for construction vehicle wash down. Such waters will discharge directly, via suitable pollution control and attenuation, to the foul sewer system.
- Refuelling of plant during Construction Phase will only be carried out at designated refuelling station locations on site. Each station will be fully equipped for spill response and a specially trained and dedicated Environmental and Emergency Spill Response team will be appointed before the commencement of works on site.
- 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 the vehicle are contained and removed off site.
- All personnel working on site 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.
- Any other diesel, fuel or hydraulic oils stored on site will be stored in bunded storage tanks- the bunded area will have a volume of at least 110% of the volume of the stored materials as per best practise guidelines (Enterprise Ireland, BPGCS005).
- Adequate security will be provided during the Construction Phase to prevent any incidents as a result of vandalism.
- 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 licenced waste disposal contractor.

BIO CONST 7: Stream Re-profiling Works

- A suitably qualified ECoW will be present during the stream reprofiling works to ensure measures to minimise sedimentation of the Gaybrook Stream are followed.
- Re-profiling to take part in dry weather as far as is possible, using suitable materials, to minimise any disturbances to any waters that may flow through this ditch.

- A 10m buffer zone will be enforced around the stretch of the waterway located along the northern boundary of the Site of the Proposed Development; wherein no works will take place other than those associated with the re-profiling of the stream itself.
- No heavy plant machinery will be allowed enter this buffer zone, nor will materials be stored in this area.
- Operation of machinery in-stream will be kept to a minimum, and all machinery must be mechanically sound to avoid oil/fuel leakage to stream waters.
- Oil/fuel storage and refilling area will be located at least 10m from the stream and minimum 50m from any boreholes/wells, in an area surrounded by a raised bund as per best practise guidelines (Enterprise Ireland, BPGCS005).
- Any flows present in the existing stream during re-profiling works to be diverted via overland temporary pipes around areas where active works are taking place.
- Stream re-profiling to be carried out in small stages starting upstream and working downstream.
- The re-profiled stream channel bed will be constructed using suitable stone material to protected imported material from erosion.
- Erosion control matting (e.g., Jute matting) and other measures will be used to protect banks from erosion while planted vegetation establishes.

Bat Mitigation

BIO CONST 8: Pre-felling Bat survey and Tree removal

Should any tree felling be required, a pre-felling bat survey will be conducted by a suitably qualified bat ecologist of any trees noted to have some bat roost potential at the Site (highlighted in Figure 5.4). This will be carried out the night/morning before felling is proposed to commence and will determine whether a derogation is needed from the NPWS. When felling bat roost potential trees, the following measures will be followed:

- Tree-felling will be undertaken in the months of September and October. During this period bats are capable of flight and are more likely to avoid risks associated with tree-felling, while this approach will also avoid the nesting bird season.
- Felling during the winter months should be avoided as this creates the additional risk that bats may be in hibernation and thus unable to escape from a tree that is being felled. Additionally, disturbance during winter may reduce the likelihood of survival as bat body temperature is too low and they may have to consume too much body fat to survive.
- Tree-felling should be undertaken using heavy plant and chainsaw. There is a wide range of machinery available with the weight and stability to safely fell a tree. Normally trees are pushed over, with a need to excavate and sever roots in some cases. In order to ensure the optimum warning for any roosting bats that may still be present, an affected tree will be pushed lightly two to three times, with a pause of approximately 30 seconds between each nudge to allow bats to become active. Any affected trees should then be pushed to the ground slowly and **should remain in place for a period of at least 24 hours**, and preferably 48 hours to allow bats to escape.
- Should any bats be found to be roosting in trees marked for felling, a derogation licence from the National Parks and Wildlife Services (NPWS) will be required.

BIO OPER 1: Bat-friendly Night-time lighting

The impact of increased night-time lighting as a result of the Proposed Development will be mitigated through the incorporation of bat-friendly lighting measures into the project design and associated lighting plan.

In order to minimise disturbance to bats commuting/foraging in the vicinity of the Site, lighting has been designed to minimise light-spill onto the Gaybrook Stream and boundary vegetation at the Site.

This is achieved by ensuring that the design of lighting adheres to the guidelines presented in the Bat Conservation Trust & Institute of Lighting Engineers *'Bats and Lighting in the UK - Bats and Built Environment Series',* (ILP, 2018)

the Bat Conservation Trust *'Artificial Lighting and Wildlife Interim Guidance'* and the Bat Conservation Trust *'Statement on the impact and design of artificial light on bats'*.

Dark buffer zones can be effectively used to separate important habitats or features from lighting by forming a dark perimeter around them (ILP, 2018). Buffer zones rely on ensuring light levels within a certain distance of a feature do not exceed certain defined limits. The buffer zone can be further subdivided in to zones of increasing illuminance limit radiating away from the feature. Examples of this application can be seen in Figure 5.6. The riparian zone of the Gaybrook Stream is being maintained as a dark corridor for local wildlife including commuting and foraging bats.

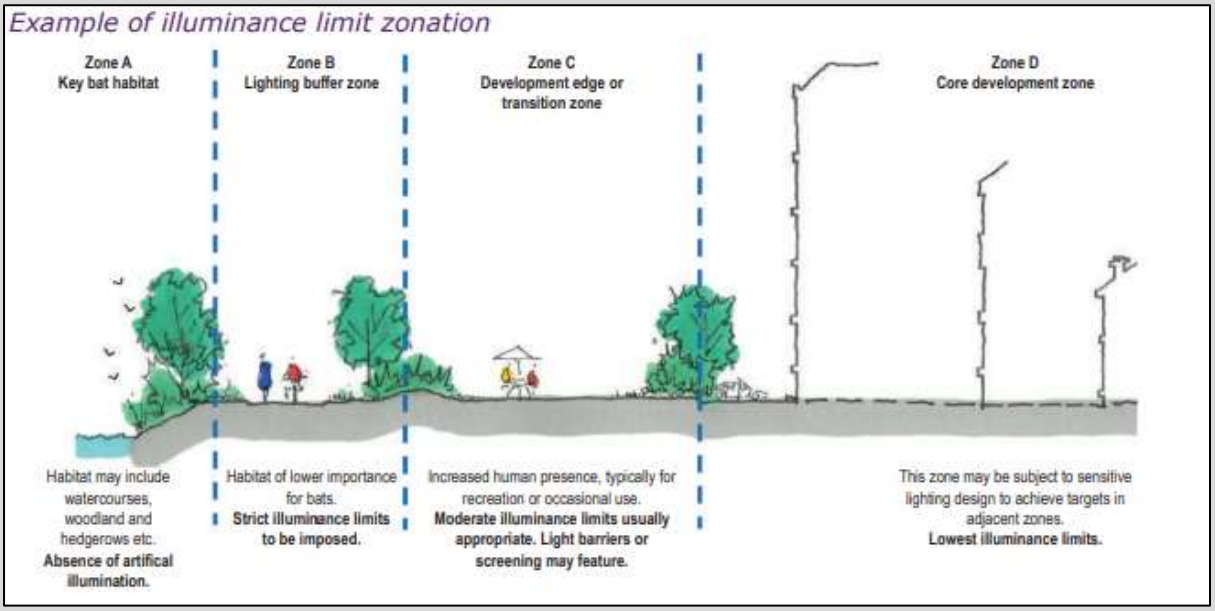

Figure 5.6 External Lighting Zonation Diagram adapted from ILP (2018).

The following lighting measures will be agreed with the project Lighting consultant, and will be incorporated into the lighting plan for the Proposed Development, subject to agreement with Fingal CoCo:

- The minimisation of night-time lighting emitted during both the Construction and Operational Phases of the Proposed Development (once health and safety requirements are met).
- The avoidance of direct lighting of existing or proposed treelines and hedgerows at the Site, as well as areas of planting.
- LED luminaires will be used as they have low UV output, sharp cut-off, lower intensity, good colour rendition and dimming capability.
- Luminaires will be mounted horizontally, ensuring minimal/no up-light.
- Where possible luminaires will be mounted on poles less than 8m (preferably 6m and less).
- Where possible the LEDs used will be <2700K.
- Motion sensor lighting will be considered for the private pathways where possible and safe to do so. The usage and application of motion sensor lighting at the Site will be subject to Fingal CoCo public lighting approval and health and safety requirements.
- Glare shields will be utilized where required in order to minimise any unnecessary light spill onto potential bat routes along the boundaries of the Site.

Incorporation of the appropriate luminaire specifications as advised by a lighting professional can have a considerable input in mitigating the potential impact of night-time lighting on local bats.
Night-time lighting across the Site of the Proposed Development will be kept to a minimum during both the Construction and Operational Phases of the Proposed Development through the reduction of light spill from the

building interior via windows/entrances, and the reduction of spill/glare from outdoor lighting in place on the building exterior and throughout the Site (see Figure 5.7).

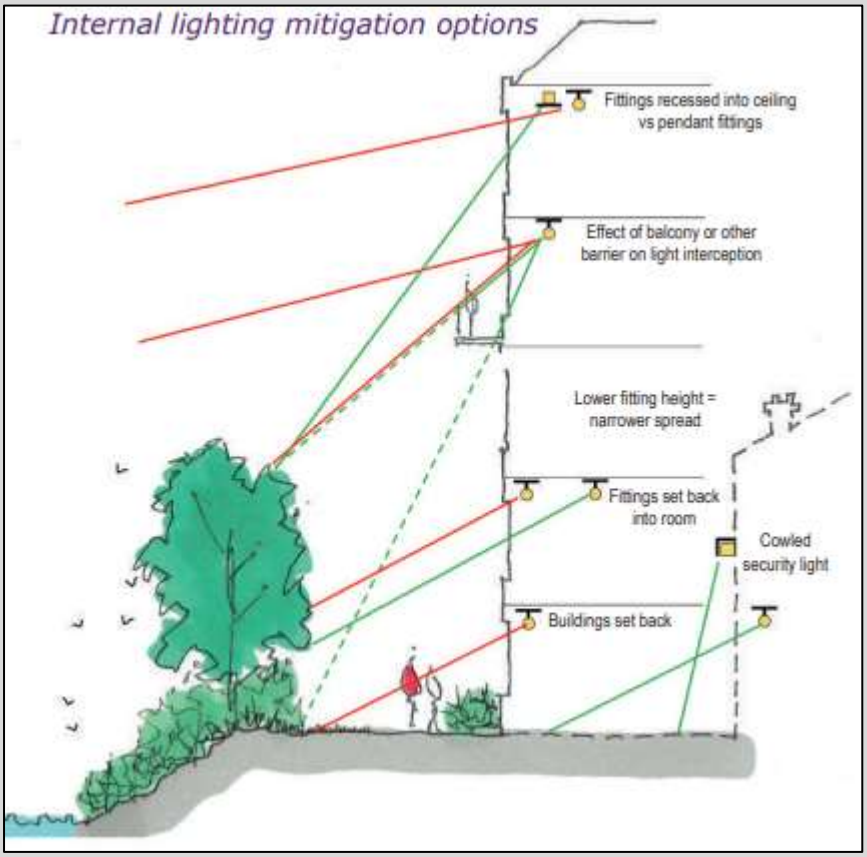

Figure 5.7 Internal Lighting Guidance Diagram adapted from ILP (2018); red line indicates non-mitigated light spill; green line indicates mitigated light spill showing favourable outcomes.

Small Mammals Mitigation

BIO CONST 9: Construction Waste Hygiene

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

BIO CONST 10: Hedgehog Habitat during Construction Phase

During the Construction Phase of the development hedgehogs in particular have the potential to be significantly impacted through the loss of suitable hibernation and nest sites in the form of piles of dead wood, vegetation and leaves on site.

This can be mitigated through the careful removal of dead wood/leaves to another part/corner of the Site where they will not be affected. Woody debris from the proposed management of hedgerow/treeline areas on site can also be left in this out-of-the way area as compensatory hedgehog habitat during the Construction Phase. Hedgehogs also frequent long grass for foraging and daytime nesting sites so caution when strimming/ mowing these areas of the Site is advised. Work likely to cause disturbance during hibernation – for example removal of hibernation habitats such as log piles and dense scrub – **shouldn't take place during November to March** (See Table 5.10).

5.10 PREDICTED IMPACTS OF THE PROPOSED DEVELOPMENT

Impacts that remain once mitigation has been implemented or impacts that cannot be mitigated are known as residual impacts. Table 5.11 below provides a summary of the impact assessment for the identified Key Ecological

Resources (KERs) and details the nature of the impacts identified, mitigation proposed and the classification of any residual impacts.

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

Provided all mitigation measures are implemented in full and remain effective throughout the lifetime of the Proposed Development, no significant negative residual impacts on the local ecology or on any designated nature conservation sites, are expected from the Proposed Works.

Table 5.11 Summary of potential impacts on the identified Key Ecological Receptors KER(s) associated with the Proposed Development, mitigation proposed, and residual impacts.

Key Ecological Resource	Level of Significance	Potential Impact	Impact Without Mitigation				Proposed Mitigation/ Mitigating Factors/ Enhancement	Residual Impact
			Quality	Magnitude / Extent	Duration	Significance		
Designated Sites								
Proposed Natural Heritage Areas	Addressed by proxy in AA screening and NIS that accompanies this application under separate cover. No significant effects envisaged once recommended mitigation is in place.							
Habitats and Flora								
Gaybook Stream (Drainage ditch)	Local Importance (Higher Value)	Sedimentation as a result of proposed works to stream channel.	Negative	Local (stretch of stream within the Site & immediately downstream)	Short-term	Significant	Suite of measures recommended to minimise sedimentation of the stream during works. CEMP will be in place to address the stream works and their potential impacts.	**Negative, short-term, slight**
		Reprofiling of the stream channel to open it up and increase the ecological value of the stream.	Positive	Local	Permanent	Significant	N/A	**Positive, permanent, significant.**
Hedgerows and Treelines	Local Importance (Higher Value)	Reduction in some sections of habitat at the Site.	Negative	Local	Short-term	Slight	Majority of existing hedgerows/treelines being retained. Hedgerows to be maintained using a low-intervention	**Negative, short-term, slight.**

							approach to maximise their ecological value. Increase in tree cover through proposed native and ornamental tree planting across Site.	
		Increased tree planting at the Site as part of the proposed landscaping at the Site.	Positive	Local	Permanent	Significant	N/A	**Positive, permanent, Significant.**
Mammals								
Small mammals (Hedgehog and Pygmy shrew)	Local Importance (Higher Level)	Possible harm/mortality due to construction waste.	Negative	Local	Short-term	Moderate	Good practise construction waste management to be followed.	**Imperceptible**
		Noise disturbance during the Construction Phase.	Negative	Local	Short-term	Moderate	Noise control measures to be in place as per CEMP.	**Imperceptible**
		Loss of habitat.	Negative	Local	Short-term	Moderate	Majority of existing hedgerows/treelines being retained. Hedgerows to be maintained using a low-intervention approach to maximise their ecological value, including a 1-2m meadow margin.	**Short-term, negative, slight.**
Bat assemblage	Local Importance (Higher Level)	Reduction in foraging/ commuting habitat due to increased night-time lighting as a result of the Proposed Development.	Negative	Local	Permanent	Moderate	Incorporation of Bat friendly lighting measures, as laid out in Mitigation section, into the final Project Design.	**Permanent, negative, slight.**

		Physical loss of minor sections of potential foraging commuting habitat.	Negative	Local	Permanent	Slight	Hedgerows to be maintained using a low-intervention approach to maximise their ecological value including a 1-2m meadow margin. Tree planting including native species is proposed across the Site and its landscaped areas. Pre-felling bat survey and 'Soft-felling' approach to be followed when felling roost potential trees, as detailed in Mitigation section. **Habitat enhancement:** Provision of new roosting habitat in the form of 3 bat boxes to be suitably located as part of the Proposed Development.	**Permanent, negative, slight.**
Birds								
Bird assemblage (Red and amber listed)	Local Importance (Higher Level)	Disturbance due to noise during Construction Phase.	Negative	Local	Short-term	moderate	Construction related noise control/minimisation measures to be included in CEMP.	**Negative, Short-term, Slight.**

		Mortality during vegetation clearance.	Negative	Local	Short-term	Significant	Avoidance of vegetation clearance during the nesting season March 1st – August 31st. Pre-clearance surveys by suitably qualified ecologist where required.	**Imperceptible.**
		Loss of habitat.	Negative	Local	Short-term	Slight	Hedgerows to be maintained using a low-intervention approach to maximise their ecological value including a 1-2m meadow margin. Tree planting including native species is proposed across the Site and its landscaped areas.	**Negative, Short-term, Slight.**
Fish								

European Eel	Local Importance (Higher Level)	Surface water run-off containing silt / pollutants into nearby waterbodies adjacent to Site during Construction Phase, which has potential to eventually link with Malahide Estuary.	Negative	Stream Catchment scale	Short-term	Moderate	Suite of measures recommended to minimise sedimentation of the stream during works. CEMP will be in place to address the stream works and their potential impacts.	**Imperceptible**

5.11 MONITORING

Vegetation Clearance

Should any removal of vegetation within the nesting season be unavoidable, a qualified Ecologist will be instructed to survey the vegetation in question prior to any removal taking place. Should nesting birds be found, then the area of habitat in question will be noted and suitably protected until the Ecologist confirms the young have fledged.

Surface Water protection

The contractor will appoint a suitably qualified person to act as Ecological Clerk of Works (ECoW) to oversee the implementation and effective maintenance of measures for the prevention of pollution to the receiving surface water environment. Measures such as silt fencing, straw bales and trenches will be inspected regularly by the ECoW to ensure they are effective and in good repair. Should any measures be damaged or ineffective, they will be repaired or replaced as per the instruction of the ECoW.

As detailed in the CEMP, regular testing of surface water discharges will be undertaken at the outfall from the subject lands. The location will be agreed between the project ecologist and the Site foreman at the commencement of works. Trigger levels for halting works and re-examining protection measures will be pH >9.0 or pH <6.0; and/or suspended solids >25 mg/l. These trigger levels are based on those outlined within 'Guidelines on Protection of Fisheries During Works in and Adjacent to Waters (IFI, 2016)'.

Where silt control measures are noted to be failing or not working adequately, works will cease in the relevant area. The project ecologist / ECoW will review and agree alternative pollution control measures, such as deepening or redirecting trenches as appropriate, before works may recommence.

5.12 REINSTATEMENT

No reinstatement works are required as part of the Proposed Development.

5.13 INTERACTIONS

There are interactions between this Biodiversity Chapter and those of Water (chapter 8), Land and Soils (Chapter 7) and Landscape and Visual (chapter 6).

In terms of Land and Soils, there is overlap with the biodiversity chapter in that the potential impacts of the construction works, through excavation, construction etc., have the potential to adversely affect the receiving environment; both geological and ecological. The mitigation measures in both chapters overlap somewhat as they deal with protecting the receiving environment from the construction works e.g., protecting waterbodies from pollution and sedimentation.

Likewise with Hydrology, the Gaybrook Stream potentially links to the Malahide Estuary and so potential impacts to ecological receptors downstream of the Site are considered. Again, the potential for the Construction Phase to impact on receiving waterbodies and ecology in the vicinity of the Site is addressed via the mitigation measures proposed in these chapters.

In terms of Landscape and Visual, the proposed landscaping of the Site interacts with its biodiversity and ecology; through the changes that will occur to the existing habitats and flora at the Site. The landscaping proposals will entail losses and contributions in terms of vegetation at the Site, which in turn will affect the ecology of the Site. The Site in its current condition is not of high ecological value, and the proposed landscaping will not result in significant adverse effects in this regard.

5.14 DIFFICULTIES ENCOUNTERED IN COMPILING

No difficulties were encountered during the preparation of this Biodiversity Chapter.

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