FEHILY TIMONEY

CONSULTANTS IN ENGINEERING, ENVIRONMENTAL SCIENCE & PLANNING

ENVIRONMENTAL IMPACT ASSESSMENT REPORT FOR THE EXPANSION OF A MATERIALS RECOVERY FACILITY AT CAPPOGUE AND DUNSINK, BALLYCOOLIN ROAD, DUBLIN 11.

Volume 2 – Main Body of the EIAR
Chapter 8 – Biodiversity Chapter

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8. CHAPTER 8 - BIODIVERSITY

8.1. Introduction

This chapter assesses the impacts on ecology associated with the proposed development. The proposed development is defined in Chapter 1: Introduction and a detailed description of the proposed development is set out in Chapter 4: Description of the Existing and Proposed Development.

The purpose of this evaluation was to:

- Undertake a desktop review of available ecological data for both the receiving environment and greater area, including a review of European sites within Zone of Influence (ZoI) of the project (as part of a separate Appropriate Assessment Screening) and nationally designated sites within the ZoI;
- Undertake ecological field surveys of the receiving environment;
- Identify flora and fauna present within the footprint of all elements of the project;
- Evaluate the ecological significance of the receiving environment;
- Appraise the potential impacts of the project on the ecology of the receiving environment;
- Consider measures to mitigate the potential negative impact(s) of the project on the ecology of the receiving environment.

8.1.1. Statement of Competency

This chapter of the EIAR was completed by David Daly and Jon Kearney.

David is a Project Ecologist working as part of the Energy and Planning Team at Fehily Timoney and Company (FTCO). He holds a Bachelor of Science (BSc) in Ecology from University College Cork, obtained in 2017, and a Master of Science (MSc) in Species Identification and Survey Skills from University of Reading, obtained in 2019. David has carried out numerous habitat surveys, including surveys of woodland, grassland, and riverine habitats, and also qualitative assessments and mapping of the same. He has also carried out numerous mammal surveys including bat, badger, otter, and general mammal surveys. He has completed ecological impact assessments for a wide range of development projects. David was responsible for completing the surveys which informed this chapter and assisted with the production of the chapter itself.

Jon is a Principal Ecologist with FTCO and has 16 years' experience in the field of ecological assessment. He holds a BSc (Hons) in Applied Ecology from University College Cork and MSc in Ecological Management and Biological Conservation from Queens University Belfast. In his time as an ecological consultant in both the UK and Ireland, he has worked on a broad diversity of projects including NIS's for numerous waste management facilities, several offshore renewable energy projects, circa. 50 wind farms projects, solar farms, road schemes and commercial developments. Jon as the lead ecologist has been the lead expert witness for biodiversity and Appropriate Assessment at several An Bord Pleanála Oral Hearings. Jon was responsible for the completion of the ecological impact assessment in this case, and for the production of this chapter.

8.1.2. Study Area

The development site encompasses the Applicant's existing waste facility situated at Cappogue Industrial Park, Dublin 11, together with lands to the south of this facility situated in the townlands of Cappogue and Dunsink. The surrounding landscape is peri-urban in nature, industrial, commercial and residential lands surrounding the site. The M50 also passes along the sites southern boundary. There are agricultural lands in the surrounding area, as well as a disused landfill and golf course. The land use classifications for the surrounding area as defined by the 2018 CORINE landcover dataset are: 243 Land principally occupied by agriculture with significant areas of natural vegetation. Within the wider landscape are: 121 Industrial and commercial units, 211 Non-irrigated arable land, 122 Road and rail network, 231 Pastures, 142 Sport and leisure facilities and 112 Discontinuous urban fabric.

The site is underlain by the Tober Colleen Formation, which comprises dark-grey, calcareous, commonly bioturbated mudstones and subordinate thin micritic limestones.
The EPA mapviewer indicates that the:

- Site is located within the Tolka_SC_020 Sub-catchment within the Liffey and Dublin Bay Catchment.
- A drainage ditch within the boundary of the proposed development site flows overground in a south-eastern until it reaches a point adjacent to the M50 where it is culverted once again. It then passes under the M50 before rising to the surface again where it flows in an eastward direction a short distance and enters the Dunsink Landfill. Drainage from this ditch is then directed by a stormwater drain to the attenuation pond serving this landfill. This attenuation pond drains to a northern tributary of the Scribblestown stream traversing the landfill site in a north-western to south eastern direction, which in turn drains to the Scribblestown stream south east of the landfill site. The Scribblestown stream then enters the River Tolka which in turn drains to the River Tolka Estuary, before entering Dublin Bay. There is an instream distance of c10km between the proposed development site and the closest hydrologically linked European site, South Dublin Bay and River Tolka Estuary. North Bull Island SPA and North Dublin Bay SAC are an additional 3km, direct distance, beyond the River Tolka Estuary within Dublin Bay.
- There are three EPA water monitoring stations along the River Tolka, downstream of the proposed development site and between the proposed development and the SPA. Two of these have a Q value of 3, while the remaining station has a Q value of 2-3. All stations had a water quality status of 'Poor'. The receiving surface waters are not classed as protected under the EU Freshwater Fish Directive (2006/44/EC).
- Site is located within the Groundwater Subcatchment 09, within Extreme and High Vulnerability areas.

8.2. Methodology

8.2.1. Relevant Guidance

The methodology for this appraisal has been devised in consideration of the following relevant guidance published by the Environmental Protection Agency (EPA) including '*Guidelines on the information to be contained in Environmental Impact Statements* (2022) and '*Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment*' (DoECLG, 2013)

Additional guidance available from the EU such as '*Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment*' (2013) has also been considered.

The appraisal also takes account of '*Guidelines for Ecological Impact Assessment in the United Kingdom*' (2006), CIEEM (2018) *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal*, 2nd edition. Chartered Institute of Ecology and Environmental Management, Winchester both published by the Chartered Institute of Ecology and Environmental Management (CIEEM). The Heritage Council publication '*Best Practice Guidance for Habitat Survey & Mapping*' (Smith et al., 2011) is also referenced.

Documentation and guidance available from Fingal County Council (FCC) including the 'Fingal County Development Plan 2017-2023'.

Relevant guidance published by the National Roads Authority (NRA), and applicable to assessing watercourses in Ireland, was also followed, including '*Guidelines for the Assessment of Ecological Impacts of National Road Schemes – Revision 2*' (NRA 2009a), '*Ecological surveying techniques for protected flora and fauna during the planning of National Road Schemes – Version 2*' (NRA 2009b), '*Environmental Impact Assessment of National Road Schemes – A practical guide*' (NRA 2008a) and '*Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes*' (NRA 2008).

8.2.2. Legislative Context

A diversity of flora and fauna, rare at a national level, are protected under the provisions of the Wildlife Act 1976, as amended, and the orders and regulations made thereunder, such as the Flora Protection Order (2022. The Habitats Directive 1992 has been transposed into Irish law, for the purposes of this application for permission by Part XAB of the Planning and Development Act 2000, as inserted. In addition, certain other obligations of the Habitat Directive have been transposed by the European Communities (Birds and Natural Habitats) Regulations 2011-2021, as amended.

Section 171 of the Fisheries (Consolidation) Act 1959 creates the offence of throwing, emptying, permitting or causing to fall onto any waters deleterious matter. Deleterious matter is defined as not only as any substance that is liable to injure fish but is also liable to damage their spawning grounds or the food of any fish or to injure fish in their value as human food or to impair the usefulness of the bed and soil of any waters as spawning grounds or other capacity to produce the food of fish.

Under Section 3 of the Local Government (Water Pollution) Act, 1977 (as amended by Sections 3 and 24 of the 1990 Act) it is an offence to cause or permit any polluting matter to enter waters. Suspended solids would be a key parameter here. Likewise, any visual evidence of oil/fuel in the river would constitute an offence.

8.2.3. Consultation

The scope for this assessment has been informed by consultation with prescribed bodies, bodies with environmental responsibility and other interested parties as summarised in Chapter 6 Scoping and Consultation in Volume 2 of the EIAR. The following consultation responses were considered in the preparation of this chapter:

- Stakeholder engagement responses from Inland Fisheries Ireland dated the 4th of April and the 8th of April 2022.
- Stakeholder engagement response from the Department of Housing, Local Government and Heritage Development Applications Unit dated 22nd of April 2022.

Both these consultation responses informed the type of baseline ecological surveying which was undertaken at the development site. Both responses highlighted potential impacts on aquatic ecology and protected Natura 2000 sites hydrologically connected to the development site. These issues were addressed during the completion of this ecological impact assessment.

8.2.4. Zone of Influence

CIEEM (2018) defines the Zone of Influence (ZoI) as "… the area over which ecological features may be affected by biophysical changes as a result of the proposed project and associated activities." Each ecological feature will have a different Zones of Influence, depending on its ecological characteristics (CIEEM, 2018); best practice guidance and professional judgement were used to define the Zone of Influence for each ecological feature.

Given the scale and nature of the proposed development, the Zone of Influence defined for most ecological features was the footprint and immediate surroundings. To determine the zone of influence for designated sites, an initial buffer of 15km was first examined using Geographic Information System (GIS) Mapping and the conservation interests of these designated sites were examined in order to ascertain whether there could be potential physical or ecological connectivity to the project and the associated likely project impacts. Additionally, any European sites beyond the initial 15km radius with hydrological connectivity were also identified for further examination.

The 'Source-Pathway-Receptor' model was used to determine impacts on European designated sites, aided by the EPA's Appropriate Assessment tool to determine hydrological pathways (https://gis.epa.ie/EPAMaps/AAGeoTool).

8.2.5. Desktop Study

A desk study was carried out to collate and review available information, datasets and documentation sources pertaining to the site's natural environment. These sources included:

- OSI Aerial photography and 1:50000 mapping
- National Parks and Wildlife Service (NPWS);
- The Ireland Red List No. 10: Vascular Plants (Wyse et al. 2016);
- Teagasc Soil area maps
- The EPA Geotool (EPA Maps)
- Bat Conservation Ireland (BCI)
- Geological Survey Ireland (GSI) area maps
- Environmental Protection Agency (EPA) water quality data
- Fingal Development Plan 2023-2029 Draft

8.2.5.1. Designated Nature Conservation Sites

Natural Heritage Areas (NHAs) and proposed Natural Heritage Areas (pNHAs) within 10km of the proposed site were identified as part of this ecological appraisal using in-house GIS systems to interrogate datasets obtained from the NPWS at www.npws.ie. These designated sites are described in Table 8-8 of this document.

European (Natura 2000) sites within 15 km of this project, such as candidate Special Areas of Conservation (SACs) and Special Protection Areas for birds (SPAs) were also identified as part of this ecological appraisal. A separate Appropriate Assessment (AA) screening report was prepared to inform the Competent Authorities Screening for AA.

8.2.5.2. Flora and Fauna

A desktop study was undertaken to locate any records of rare or protected flora and fauna that have previously been recorded for the site and surrounding area.

Records available on the NPWS and the National Biodiversity Data Centre websites were reviewed. Other data sources include:

- Ireland's Wetlands and their Waterbirds: Status and Distribution (Crowe 2005),
- Bird Atlas 2007-11: the breeding and wintering birds of Britain and Ireland (Balmer et al., 2013),
- Birds of Conservation Concern in Ireland 2020-2026 (Gilbert et al., 2021).

Botanical species were assessed in accordance with their occurrence on the Flora Protection Order (2022) and The Ireland Red List No. 10: Vascular Plants (Wyse et al. 2016).

8.3. Field Assessment

An ecological site walkover was carried out over the 12th May and 17th June 2022 by FT Project Ecologist David Daly.

8.3.1. Habitats

The habitats within the site of the proposed development were identified and classified according to 'A Guide to Habitats in Ireland' (Fossitt, 2000) during the walkover. The dominant plant species present in each habitat type was recorded.

Habitats were appraised and evaluated according to their occurrence as protected habitats under Annex I of the EU Habitats Directive (92/43/EEC) and for their capacity to support rare, threatened and endangered species. The methodology used in this report to assess the impact on habitats is based on NRA (2009) and CIEEM (2018) guidelines.

The habitat mapping exercise had regard to the 'Best Practice Guidance for Habitat Survey and Mapping' (Smith et al., 2011) published by the Heritage Council. Scientific and common names for plants follow Parnell et al. (2012) and Blamey et al. (2003), respectively. In addition to habitat identification, each habitat was assessed for its ecological significance, based on the National Roads Authority (NRA) Site Evaluation Scheme (NRA, 2009).

8.3.2. Mammals

Mammal observations or signs were recorded during site walkover. Field boundaries were walked to search for potential badger setts. Riparian areas and watercourses were investigated for spraints and/or holts.

Evidence of bat roosts was searched for and information on all potential roosts was recorded according to roost identification guidelines 'Bat Survey Guidelines: Traditional Farm Buildings Scheme', Aughney, T., Kelleher, C. & Mullen, D. (2008).

The conservation status of mammals within Ireland and Europe is assessed using one or more of the following documents: Wildlife Acts, the Red List of Terrestrial Mammals (Marnell et al., 2019) and NPWS (2019) The Status of EU Protected Habitats and Species in Ireland.

8.3.3. Avifauna

For breeding bird surveys, the method utilised was based on the existing British Trust for Ornithology (BTO) Breeding Bird Survey (BBS or CBS; Bibby et al, 2000). The study area for this survey comprised a total of two no. c. 500m transects which were selected and centred on different habitats present within the subject site (see Figure 8-1 for the location of transects). Birds were counted over two visits, each timed to coincide with the early part of the breeding season (April to mid-May) and later part of the season (mid-May to late June), with visits at least four weeks apart (transect order and direction were reversed between surveys to avoid bias in transect order and direction with time of day). Surveyors recorded all birds seen or heard as they walked methodically along the transect routes.

Birds were recorded in four distance categories, measured at right angles to the transect line (within 25 m, between 25 m - 100 m and over 100 m from the transect line/ and those seen in flight only). Recording birds in distance bands gives a measure of bird detectability and allows relative population densities to be estimated if required (BTO, 2018).

The breeding bird transect schedule is available in Table 8-1.

Table 8-1: Breeding Bird Transect Survey Details

Date	Transect	Time	Weather Conditions
12/05/2022	T1 and T2	06:45 – 07:45	Dry; wind F1 N; cloud 3/8 oktas
17/06/2022	T1 and T2	06:30 – 07:30	Dry; wind F2 NE, cloud 6/8 oktas

8.3.4. Other Fauna

During the ecological survey at the proposed site, species from other groups of fauna were noted and included in the report.

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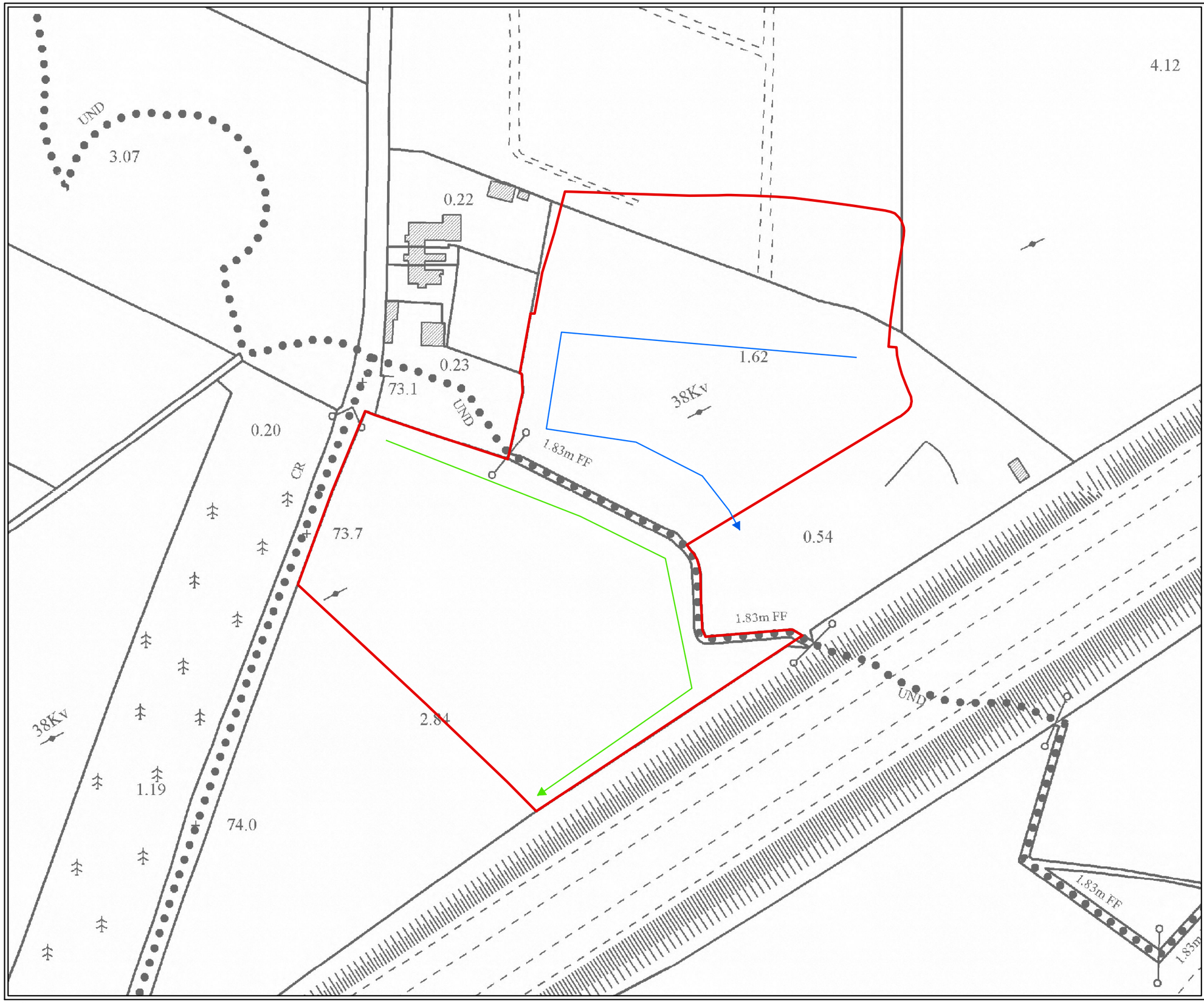

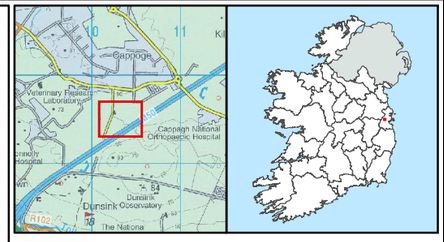

Proposed Site Boundary

Breeding Bird Transects

1

2

Meters
0 25 50 100

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PROJECT:	SID Application, EIAR and IE Licence Application for Thorntons		
FIGURE NO:	8-1		
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8.4. Evaluation and Impact Assessment

The value of the ecological resources and features or receptors was determined using the ecological evaluation guidance given in the National Roads Authority (NRA) Ecological Assessment Guidelines as outlined in Appendix 8.1 (NRA, 2009). This evaluation scheme seeks to provide value ratings for ecological receptors, with values ranging from internationally to locally important. Internationally important receptors would include candidate Special Areas of Conservation (cSAC) or Special Protected Areas (SPA) while those of national importance would include Natural Heritage Areas (NHA).

This evaluation scheme is aimed at assessing the value of sites. It has been adapted here to assess the value of habitats and fauna within one site. The value of habitats is assessed based on its condition, size, rarity, conservation and legal status. The value of fauna is assessed on its biodiversity value, legal status and conservation status. Biodiversity value is based on its national distribution, abundance or rarity, and associated trends.

All Irish bat species are protected under the Wildlife (Amendment) Act 2000 and the EU Habitats Directive. Some of the habitats and species identified were selected as key ecological receptors. The CIEEM (CIEEM, 2018) refer to key ecological receptors as those ecological features which are evaluated as Local Importance or higher and are likely to be impacted significantly by the proposed development. The features that were evaluated as being of Local Importance (and higher in this study were selected as key ecological features and the impact significance on each of these features was assessed.

8.4.1. Ecological Resource Evaluation

Ecological resources are evaluated using the criteria outlined in Appendix 8.1.

8.4.2. Assessing Impact Significance

Once the value of the identified ecological receptors (features and resources) was determined, the next step was to assess the potential effect or impact of the proposed development on the identified key ecological receptors. This was carried out with regard to the criteria outlined in various impact assessment guidelines (NRA, 2009; CIEEM, 2018 and revisions). The impacts were assessed under a number of parameters such as magnitude, extent, duration and reversibility.

Table 8-2 to Table 8-7 outline the EPA (2022) evaluation criteria utilised in this appraisal of the Environmental Factor, Biodiversity. These criteria are included in the Guidelines on the Information to be contained in Environmental Impact Assessment Reports (EPA, 2022).

Table 8-2: Probability of Effects (EPA, 2022)

Likely Effects	Unlikely Effects
The effects that can reasonably be expected to occur because of the planned project if all mitigation measures are properly implemented.	The effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented.

Table 8-3: Quality of Effects (EPA, 2022)

Quality of Effect	Description
Positive Effect	A change which improves the quality of the environment (for example, by increasing species diversity; or the improving reproductive capacity of an ecosystem, or removing nuisances or improving amenities)
Neutral Effect	No effects or effects that are imperceptible, within the normal bounds of variation or within the margin of forecasting error.
Negative/Adverse Effect	A change which reduces the quality of the environment (for example, lessening species diversity or diminishing the reproductive capacity of an ecosystem; or damaging health or property or by causing nuisance).

Table 8-4: Significance of Effects (EPA, 2022)

Significance of Effect	Description
Imperceptible	An effect capable of measurement but without significant consequences
Not Significant	An effect which causes noticeable changes in the character of the environment but without significant consequences
Slight	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities
Moderate	An effect that alters the character of the environment in a manner that is consistent with existing and emerging trends
Significant	An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment
Very Significant	An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment
Profound	An effect which obliterates sensitive characteristics

Table 8-5: Duration of Effects (EPA, 2022)

Duration of Effect	Description
Momentary Effects	Effects lasting from seconds to minutes
Brief Effects	Effects lasting less than a day
Temporary Effects	Effects lasting less than a year
Short-term Effects	Effects lasting one to seven years
Medium-term Effects	Effects lasting seven to fifteen years
Long-term Effects	Effects lasting fifteen to sixty years
Permanent Effects	Effects lasting over sixty years

Table 8-6: Types of Effects (EPA, 2022)

Type of Effect	Description
Effect/Impact	A change resulting from the implementation of a project
Likely Effects	The effects that are specifically predicted to take place – based on an understanding of the interaction of the proposed project and the receiving environment.
Indirect Effects (a.k.a. secondary effects)	Effects on the environment, which are not a direct result of the project, often produced away from the project site or because of a complex pathway
Cumulative Effects	The addition of many minor or significant effects, including effects of other projects, to create larger, more significant effects.
'Do Nothing' Effects	The environment as it would be in the future should the subject project not be carried out.
'Worst Case' Effects	The effects arising from a project in the case where mitigation measures substantially fail
Indeterminable Effects	When the full consequences of a change in the environment cannot be described.
Irreversible Effects	When the character, distinctiveness, diversity or reproductive capacity of an environment is permanently lost.
Reversible Effects	Effects that can be undone, for example through remediation or restoration
Residual Effects	The degree of environmental change that will occur after the proposed mitigation measures have taken effect
Synergistic Effects	Where the resultant effect is of greater significance than the sum of its constituents (e.g. combination of SOx and NOx to produce smog).

Table 8-7: Definition of Terms - Source, Pathway, Receptor (EPA, 2022)

Term	Description
Source	The activity or place from which an effect originates
Pathway	The route by which an effect is conveyed between a source and a receptor.
Receptor	Any element in the environment which is subject to effects.
Effect/Impact	A change resulting from the implementation of a project

Where impacts are assessed to be significant, mitigation measures have been incorporated into the project design to remove or reduce these impacts. The residual impacts after mitigation were then assessed.

The cumulative impact of the development was also assessed by discussing the impact of the proposed development in terms of other developments that have planning permission, that are under construction or are in existence in the area. The cumulative impact of neighbouring developments, and agriculture in the greater area are also considered.

8.5. Existing Environment

8.5.1. Sites of International and National Importance

An Appropriate Assessment Screening Report was prepared to examine the potential for likely significant effects to European Sites (SACs and SPAs) that might arise from the proposed development (either alone or in combination with other plans or projects). This was done in accordance with Article 6(3) of the 'Habitats' Directive (92/43/EEC) and is presented along with the Environmental Report.

8.5.1.1. Special Areas of Conservation (SACs)

Special Areas of Conservation (SACs) are protected under the European Union (EU) 'Habitats Directive' (92/43/EEC), as implemented in Ireland by the European Communities (Natural Habitats) Regulations, 1997. There are five SACs within 15 km of the proposed development (see Figure 8-2).

8.5.1.2. Special Protection Areas (SPAs)

Special Protection Areas (SPAs) were initially designated under Directive 79/409/EEC, The Directive on the Conservation of Wild Birds ('The Birds Directive') and are now protected as Natura 2000 Sites under the EU 'Habitats Directive'. There are four SPAs within 15 km of the proposed development (see Figure 8-2).

8.5.1.3. Natural Heritage Areas and proposed Natural Heritage Areas (NHAs and pNHAs)

Sites of National Importance in the Republic of Ireland are termed, Natural Heritage Areas (NHAs) and proposed Natural Heritage Areas (pNHAs). While the Wildlife (Amendment) Act 2000 has been passed into law, pNHAs will not have legal protection until the consultative process with landowners has been completed; this process is currently ongoing. However, they have been treated as fully designated sites for the purposes of this assessment. A total of five pNHAs are present within 10 km of the Study Area (Figure 8-3). There are no NHAs within 10 km of the Study Area.

Table 8-8: European Conservation Sites within 15km and National Conservation Sites within 10km of the proposed development

Site Name	Site Code	Summary Details	Distance from Proposed Project (km)
pNHAs			
Royal Canal pNHA	002103	The Royal Canal is a man-made waterway, with this site comprising the canal channel and the banks on either side of it. Several different habitats are found within the canal boundaries - hedgerow, tall herbs, calcareous grassland, reed fringe, open water, scrub and woodland. Otter spraints are found along the towpath, particularly where the canal passes over a river or stream. Aquatic species Opposite-leaved Pondweed and Tassel Stonewort are also present in Dublin.	1.5 S
Liffey Valley pNHA	000128	This site is an important Salmon river in Ireland. The terrestrial habitats include deciduous woodland, wet marsh ad rough grassland. The threatened Green Figwort and Yellow archangel, along with the rare and protected Hairy St. John's-wort are found in this site.	3.6 S
Santry Demesne pNHA	000178	This site is comprised of a Beech dominated woodland with the rare and protected Hairy St. John's-wort.	5.7 E
Grand Canal pNHA	002104	The Grand Canal is a man-made waterway, with this site comprising the canal channel and the banks on either side of it. Several different habitats are found within the canal boundaries - hedgerow, tall herbs, calcareous grassland, reed fringe, open water, scrub and woodland. Otter spraints are found along the towpath, particularly where the canal passes over a river or stream.	6.6 S
North Dublin Bay pNHA	000206	See North Dublin Bay SAC below.	8.2 SE
European Sites			
South Dublin Bay and River Tolka Estuary SPA	004024	This site includes intertidal mudflats, saltmarshes, grasslands and sandy beach habitats. It is designated for its wetlands. It is of conservation interest for the following species: Light-bellied Brent Goose, Oystercatcher, Ringed Plover, Grey Plover, Knot, Sanderling, Dunlin, Bar-tailed Godwit, Redshank, Black-headed Gull, Roseate Tern, Common Tern and Arctic Tern.	8.4 SE

Site Name	Site Code	Summary Details	Distance from Proposed Project (km)
Rye Water Valley/ Carton SAC	001398	The site is composed of a series of lakes with some reed fringes as well as deciduous and coniferous woodland. It is of importance for aquatic species such as trout salmon and white-clawed crayfish. It is designated for petrifying springs, narrow-mouthed whorl snail and Desmoulin's whorl snail.	10.1 W
South Dublin Bay SAC	000210	This site consists of intertidal sand and mudflats habitats. It is designated for Tidal mudflats and sandflats, Annual vegetation of drift lines, Salicronia and other annuals colonizing mud and sand, and Embryonic shifting dunes.	10.7 SE
North Bull Island SPA	004006	This site includes sandspit, saltmarsh, intertidal lagoon habitats. It is designated for its wetlands. It is of conservation interest for the following species: Light-bellied Brent Goose, Shelduck, Teal, Pintail, Shoveler, Oystercatcher, Golden Plover, Grey Plover, Knot, Sanderling, Dunlin, Black-tailed Godwit, Bar-tailed Godwit, Curlew, Redshank, Turnstone and Black-headed Gull.	11.2 E
North Dublin Bay SAC	000206	This site consists of sandspit, dune, grassland, saltmarsh and lagoon habitats. It is designated for several habitats: Tidal mudflats and sandflats, Annual vegetation of drift lines, *Salicornia* mud, Atlantic salt meadows, Mediterranean salt meadows, Embryonic shifting dunes, Marram dunes, Fixed dunes, and Humid dune slacks. It is also designated for the rare liverwort, Petalwort	11.2 E
Malahide Estuary SPA	004025	This site includes estuary, saltmarsh and shallow subtidal habitats. It is designated for its wetlands. It is of conservation interest for the following species: Great Crested Grebe, Light-bellied Brent Goose, Shelduck, Pintail, Goldeneye, Red-breasted Merganser, Oystercatcher, Golden Plover, Grey Plover, Knot, Dunlin, Black-tailed Godwit, Bar-tailed Godwit and Redshank.	11.9 NE
Malahide Estuary SAC	000205	This site consists of estuary, sandspit, sand and mudflat, dune, and salt meadow habitats. It is designated for several habitats: Tidal mudflats and sandflats, *Salicornia* mud, Atlantic salt meadows, Mediterranean salt meadows, Marram dunes and Fixed dunes.	11.9 NE
Baldoyle Bay SAC	000199	This site consists of estuary, dune, saltmarsh and river habitats. It is designated for several habitats: Tidal mudflats and sandflats, *Salicornia* mud, Atlantic salt meadows and Mediterranean salt meadows.	13.2 E
Baldoyle Bay SPA	004016	This site includes intertidal flats, estuary and river habitats. It is designated for its wetlands. It is of conservation interest for the following species: Light-bellied Brent Goose, Shelduck, Ringed Plover, Golden Plover, Grey Plover and Bar-tailed Godwit.	13.4 E

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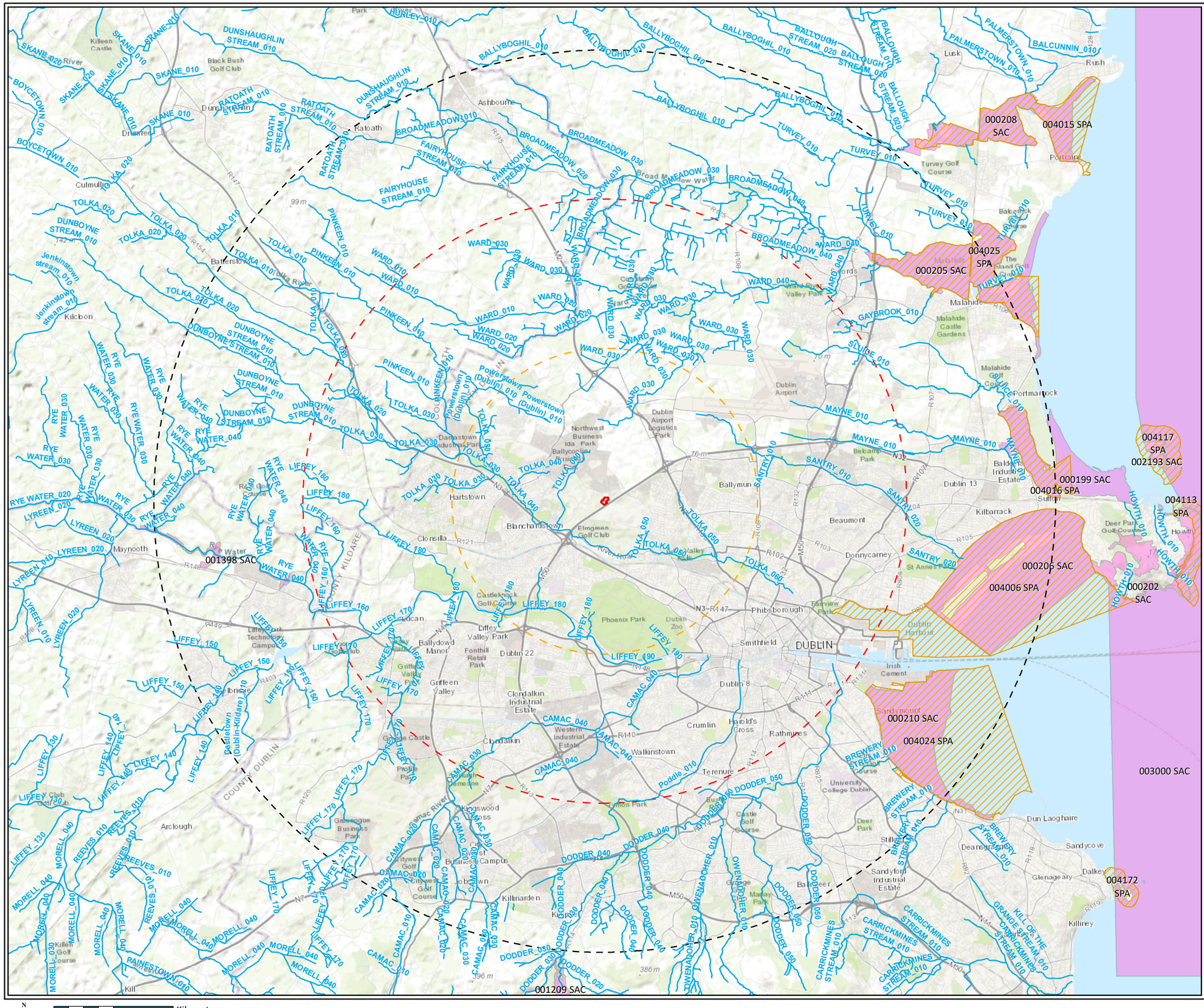

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PAGE SIZE:	A3

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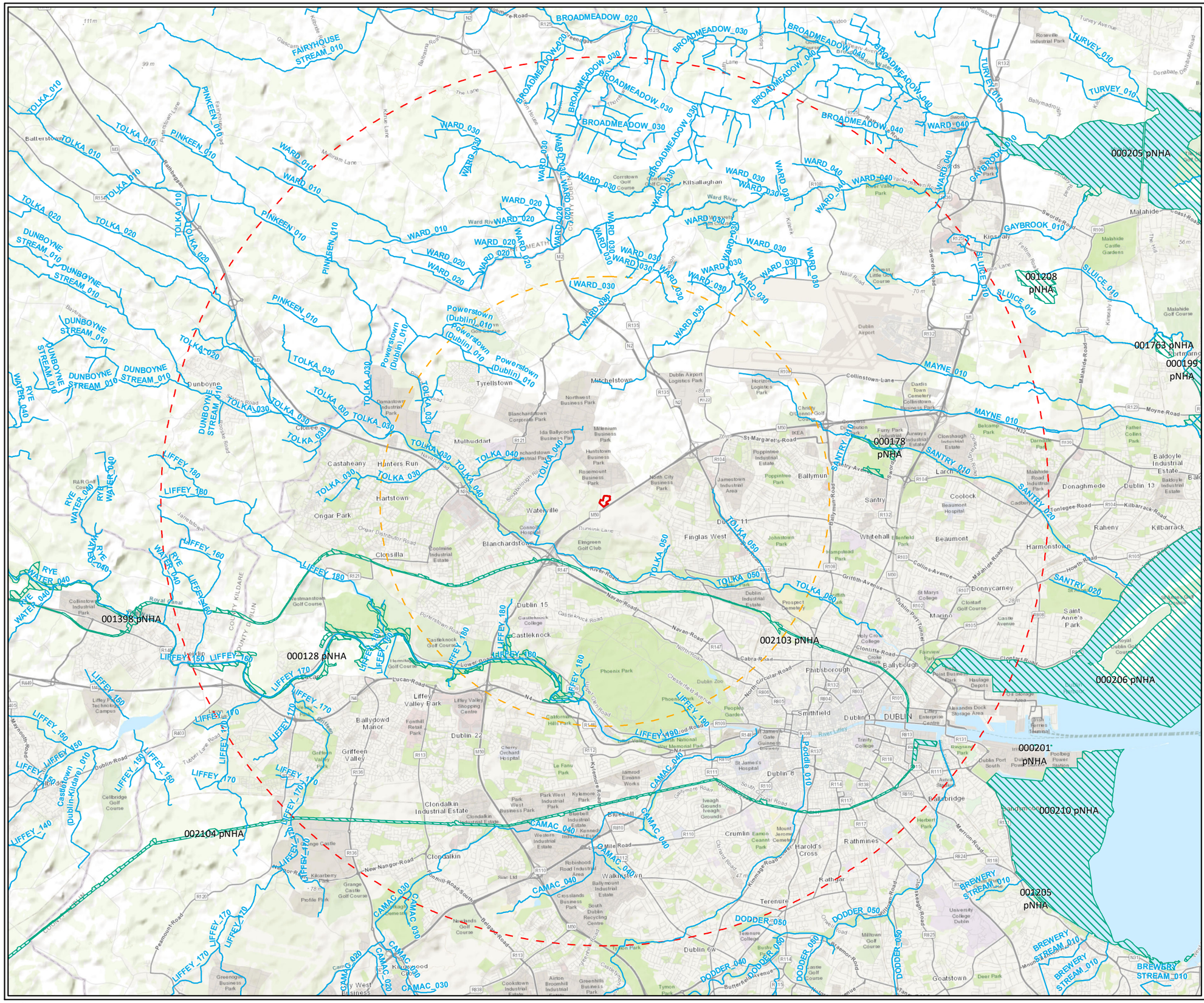

Proposed Site Boundary

10km Distance from Site Boundary

5km Distance from Site Boundary

Proposed Natural Heritage Area (pNHA)

WFD River Water Bodies

TITLE:	pNHA's within Zone of Interest
PROJECT:	SID Application, EIAR and IE Licence Application for Thorntons
FIGURE NO:	8-3
CLIENT:	Thorntons Recycling
SCALE:	1:85000
REVISION:	0
DATE:	14/09/2022
PAGE SIZE:	A3

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8.5.2. Habitats

There are no habitats within the study area that conform to those listed under Annex I of the EU Habitats Directive. The dominant habitats within the site boundary are Improved agricultural grassland/ dry meadows & grassy verges mosaic (GA1/GS2), recolonising bare ground (ED3), scrub (WS1) buildings and artificial surfaces (BL3). Treelines (WL2), and a drainage ditch (FW4) run through the centre of the site and spoil and bare ground (ED2) form some of the boundaries of these fields within the site, Figure 8-4.

8.5.2.1. Habitats within and adjacent to the Proposed Development Site

Improved agricultural grassland/ dry meadows & grassy verges GA1/ GS2 mosaic

Improved agricultural grassland (GA1), dominated by perennial rye grass *Lolium perenne* and other grasses such as annual meadow *Poa annua*, Yorkshire fog *Holcus lanatus*, meadow foxtail *Alopecurus pratensis* and cocksfoot *Dactylis glomerata*, covers most of the northern field in the proposed development site. However, this habitat type grades into dry meadows and grassy verges (GS2) habitat in parts of the field. Overall, there is a high forb cover in this field, with the flowering species attracting a notable array of insects, particularly bumblebees during the walkover surveys. While grasses are well established across this field, there are large patches red and white clover *Trifolium pratense* and *repens*, meadow buttercup *Ranunculus acris* and chickweed *Stellaria media*, as well of stands of taller species such as broad-leaved dock *Rumex obtusifolius*, common comfrey *Symphytum officinale*, spear thistle *Cirsium vulgare*, mustard *Hirschfeldia incana* and bush vetch *Vicia sepium*.

Plate 8-1: Improved agricultural grassland/ dry meadows & grassy verges GA1/ GS2 mosaic

Recolonising bare ground ED3

The southern field has less grass cover, with more bare ground. Similar grasses to GA1/GS2 are present. Similar forb species are also present, along with pioneer species in the barer areas, such as nettle *Urtica dioca*, common poppy *Papaver rhoeas*, opium poppy *Papaver somniferum*, silverweed *Potentilla anserina*, lesser swinecress *Coronopus didymus*, fumitory *Fumaria officinalis* and birds-foot trefoil *Lotus corniculatus*. It was noted that the flowering species in this habitat also attracted a large number of bumblebees during the walkover survey.

Plate 8-2: Recolonising Bare Ground ED3

Scrub WS1

Scrub is present along the treeline to the north of the drainage ditch. It is dominated by nettles and bramble *Rubus fruticosus*. Other less frequent species present include cocksfoot, dock spp., cleavers *Galium aparine,* cow parsley *Anthriscus sylvestris*, lords and ladies *Arum maculatum* and Yarrow *Achillea millefolium*. There are some shrubby species like elder *Sambucus nigra* and red-osier dogwood *Cornus sericea* throughout.

Plate 8-3: Scrub WS1

Spoil and bare ground ED3

This habitat is present along the periphery of the fields in the form of spoil mounds. It is largely bare soil with exposed stones and gravel. Some colonising species are starting to grow such as common poppy and field mustard.

Plate 8-4: Spoil and Bare Ground ED2

Buildings and artificial surfaces BL3

This habitat consists of the concrete and metal cladded industrial building and the truck loading yard onsite.

Plate 8-5: Buildings and artificial surfaces BL3

Treelines WL2

A treeline runs along the northwest site boundary and intersects the middle of the site, where it runs on either side of the drainage ditch. The treeline is dominated by elder, with hawthorn *Crataegus monogyna*, ash *Fraxinus excelsior*, alder *Alnus glutinosa* and goat willow *Salix caprea* also present. There ground cover is mostly bare, with some bramble and ivy *Hedera helix*.

Another treeline runs between the sites south-eastern boundary and the M50. This treeline is dominated by alder, with hawthorn, white poplar *Populus alba*, willow, birch *Betula pendula* and red-osier dogwood also present.

Plate 8-6: Treeline WL2

Drainage ditches FW4

A drainage ditches runs along the northwest site boundary and intersects the middle of the site. It is in poor condition with low water levels and rubbish instream at time of the survey. It is fully shaded by trees with no vegetation growing within. Ivy grows along the steep banks.

Plate 8-7: Drainage ditch FW4

The evaluation of these habitats with regards to biodiversity informs whether these habitats are ecological receptors of the proposed development, see Table 8-9 below.

Table 8-9: Evaluation of habitats within the study area (NRA, 2009)

Habitat	Evaluation	Rationale	Selection as key ecological receptor
Improved grassland/ dry meadows and grassy verges GA1/GS2 Mosaic	Local	Semi-natural habitat; habitat loss due to development.	Yes
Recolonising Bare Ground ED3	Local	Highly modified habitat, but important for pollinator species; habitat loss due to development.	Yes
Scrub WS1	Local	Semi-natural habitat; habitat loss due to development.	Yes
Spoil and Bare Ground ED2	Site	Intensively managed grassland - highly modified habitat	No
Buildings and artificial surfaces BL3	Site	Artificial habitats of no value to local wildlife.	No
Treelines WL2	Local	Semi-natural habitat; nesting birds and commuting/ foraging mammals; habitat loss due to development.	Yes
Drainage Ditches FW4	Local	Intensively modified habitat – value to local commuting wildlife	Yes

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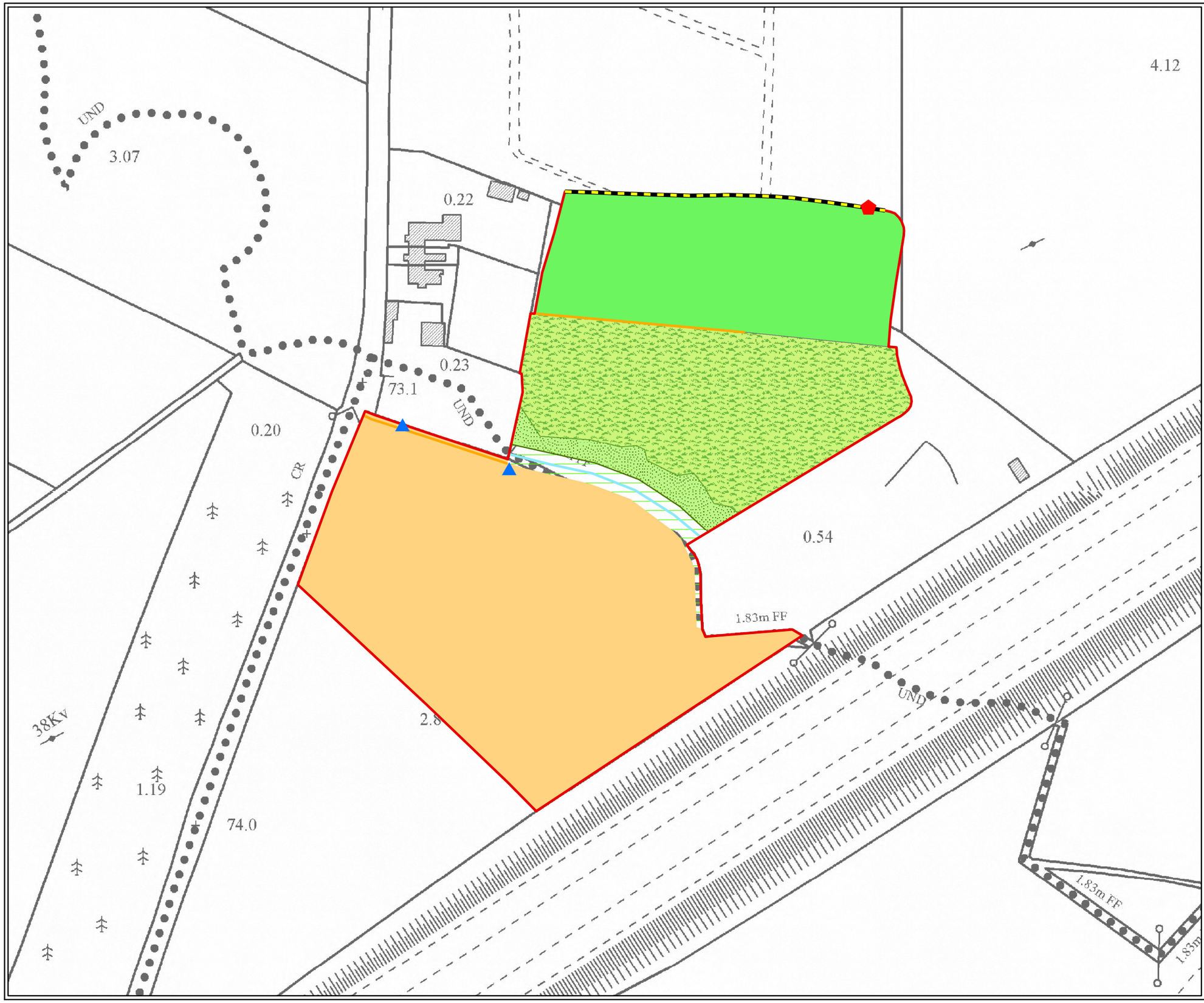

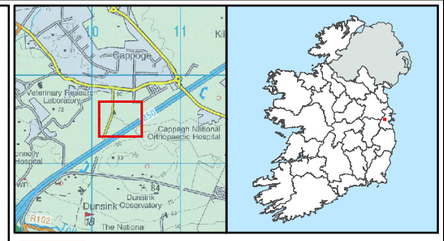

Proposed Site Boundary

Invasive Species

- Buddleja
- Rhododendron
- Cherry Laurel

Habitat Classification

- ED2 - Spoil and bare ground
- FW4 - Drainage ditches
- GA1/GS2 - Improved grassland/ dry meadows Mosaic
- BL3 - Buildings and artificial surfaces
- ED3 - Recolonising bare ground
- WL2 - Treelines
- WS1 - Scrub

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TITLE:	Habitat Map		
PROJECT:	SID Application, EIAR and IE Licence Application for Thorntons		
FIGURE NO:	8-4		
CLIENT:	Thorntons Recycling		
SCALE:	1:1500	**REVISION:**	0
DATE:	14/09/2022	**PAGE SIZE:**	A3

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8.5.3. Flora

8.5.3.1. Protected or Rare Flora

No rare or protected flora species protected under the Flora Protection Order (2022), listed in Annex II and IV of the EU Habitats Directive (92/43/ECC), or listed in the Irish Red Data were recorded during the surveys.

The protected plant species listed in Table 8-10 have been returned by a search of records for rare or protected species within a 5km radius of the proposed development site provided on request by the NPWS and the NPWS FPO Bryophyte Sites Mapviewer:

(http://dahg.maps.arcgis.com/apps/webappviewer/index.html?id=71f8df33693f48edbb70369d7fb26b7e). Accessed 22nd August 2022.

No protected plant species are recorded within the O13 (10km grid) dataset obtained from the NBDC.

Table 8-10: Historical Records of Rare and Protected Flora within 10km of the Proposed Development (Source: NPWS and National Biodiversity Data Centre)

Common Name	Scientific Name	Flora Protection Order (2022)	Irish Red Data Book (Vascular Plants/ Bryophytes)	Record Date
Betony	*Stachys officinalis*	Yes	Endangered	18/05/2012
Blue Fleabane	*Erigeron acer*	No	Endangered	29/07/2016
Cornflower	*Centaurea cyanus*	No	Regionally Extinct	06/06/2018
Great Burnet	*Sanguisorba officinalis*	Yes	Endangered	30/09/2016
Hairy St John's-wort	*Hypericum hirsutum*	Yes	Endangered	23/07/2020
Hairy Violet	*Viola hirta*	Yes	Endangered	18/05/2012
N/A	*Lamiastrum galeobdolon subsp. montanum*	No	Vulnerable	20/04/2020
Meadow Barley	*Hordeum secalinum*	Yes	Endangered	31/12/2007
Nettle-leaved Bellflower	*Campanula trachelium*	No	Endangered	04/07/2020
Opposite-leaved Pondweed	*Groenlandia densa*	Yes	Endangered	31/12/1999
Purple Spurge	*Euphorbia peplis*	No	Regionally Extinct	30/0/2016

Common Name	Scientific Name	Flora Protection Order (2022)	Irish Red Data Book (Vascular Plants/ Bryophytes)	Record Date
Round-leaved Crane's-bill	*Geranium rotundifolium*	No	Endangered	12/03/2019
Small Cudweed	*Filago minima*	No	Vulnerable	12/07/2012
Spring Vetch	*Vicia lathyroides*	No	Vulnerable	18/05/2012
Water-violet	*Hottonia palustris*	No	Vulnerable	31/12/1993
Showy Feather-moss	*Eurhynchium speciosum*	No	Near threatened	21/12/1993

8.5.3.2. Invasive Non-Native Flora

Butterfly-bush *Buddleja davidii* was recorded onsite in two locations, see Figure 8-4. A row of Cherry laurel *Prunus laurocerasus* hedge runs offsite along the northern site boundary, with a single young rhododendron *Rhododendron ponticum* sapling within.

Further non-native invasive plant species listed below in Table 8-11 below are recorded within the 10km grid square (O13) overlapping the site.

Table 8-11: Historic Records of Invasive Non-native Flora within 10km of the Proposed Development

Common Name	Scientific Name	Invasive Impact	Record Date
Water Fern	*Azolla filiculoides*	Medium	31/12/1999
American Skunk-cabbage	*Lysichiton americanus*	Medium	29/03/2019
Brazilian Giant-rhubarb	*Gunnera manicata*	Medium	29/03/2019
Canadian Fleabane	*Conyza canadensis*	Medium	26/10/2020
Canadian Waterweed	*Elodea canadensis*	High	08/07/2020
Common Broomrape	*Orobanche minor*	Medium	26/06/2021
Curly Waterweed	*Lagarosiphon major*	High	21/12/1999
Evergreen Oak	*Quercus ilex*	Medium	28/08/2020

Common Name	Scientific Name	Invasive Impact	Record Date
Bohemian knotweed	*Fallopia japonica x sachalinensis = F. bohemica*	High	17/06/2020
False-acacia	*Robinia pseudoacacia*	Medium	26/04/2012
Giant Hogweed	*Heracleum mantegazzianum*	High	19/07/2021
Giant Knotweed	*Fallopia sachalinensis*	High	03/08/2017
Giant-rhubarb	*Gunnera tinctoria*	High	28/06/2020
Himalayan Honeysuckle	*Leycesteria Formosa*	Medium	26/11/2021
Indian Balsam	*Impatiens glandulifera*	High	24/10/2021
Japanese Knotweed	*Fallopia japonica*	High	29/11/2021
Japanese Rose	*Rosa rugosa*	Medium	19/05/2018
Least Duckweed	*Lemna minuta*	Medium	31/12/1993
Narrow-leaved Ragwort	*Senecio inaequidens*	Medium	18/07/2021
New Zealand Pigmyweed	*Crassula helmsii*	High	31/07/2009
Nuttall's Waterweed	*Elodea nuttallii*	High	22/07/2019
Pampas-grass	*Cortaderia selloana*	Medium	15/01/2019
Parrot's-feather	*Myriophyllum aquaticum*	High	31/07/2009
Sea-buckthorn	*Hippophae rhamnoides*	Medium	29/11/2021
Spanish Bluebell	*Hyacinthoides hispanica*	High	30/03/2021
Sycamore	*Acer pseudoplatanus*	Medium	21/07/2021
Three-cornered Garlic	*Allium triquetrum*	Medium	08/03/2022
Traveller's-joy	*Clematis vitalba*	Medium	06/09/2021
Tree-of-heaven	*Ailanthus altissima*	Medium	25/10/2009

Common Name	Scientific Name	Invasive Impact	Record Date
Turkey Oak	*Quercus cerris*	Medium	09/05/2019
Wild Parsnip	*Pastinaca sativa*	Medium	03/08/202

8.5.4. Fauna

8.5.4.1. Avifauna

Birds Species Within 2km of Site (Desktop Study)

The desktop review using the National Biodiversity Data Centre's Bird Atlas 2007-2011 and Birds of Ireland datasets, highlighted that within 2km of the site a total of 30 (additional to those species recorded during the site visits) species have been recorded (see Table 8-12 below) within the two 2km squares (O04V, O14A, O03Z, & O13E) overlapping the proposed development site.

Four red-listed species were recorded, grey wagtail, kestrel, lapwing and swift. Potential nesting habitat for Kestrel is present on site in the dense treelines onsite, however Kestrel, or signs of nesting Kestrel, were not noted during either site visit. The site does not contain any suitable breeding habitat for grey wagtail, lapwing, or swift.

Nine amber-listed species was recorded, black-headed gull, house martin, kingfisher, mallard, mute swan, pintail, sand martin, spotted flycatcher and willow warbler. Potential nesting habitat for spotted flycatcher and willow warbler is present on site in the dense treelines onsite. The site does not contain any suitable breeding habitat for black-headed gull, house martin, kingfisher, mallard, mute swan, pintail or sand martin.

A total of 17 green-listed species were also recorded, see Table 8-12. Potential nesting habitat is present on site, in the dense treelines, for chaffinch, chiffchaff, coal tit, dunnock, heron, long-tailed tit, mistle thrush, raven, rook and sparrowhawk. The site does not contain any suitable breeding habitat for the other green-listed species.

Table 8-12: Bird Records within 5km of site

Common Name	Scientific Name	Grid Square
Black-headed Gull	*Larus ridibundus*	O03Z
Chaffinch	*Fringilla coelebs*	O13E, O03Z
Chiffchaff	*Phylloscopus collybita*	O03Z
Coal Tit	*Periparus ater*	O03Z
Dipper	*Cinclus cinclus*	O03Z

Common Name	Scientific Name	Grid Square
Dunnock	*Prunella modularis*	O03Z
Grey Heron	*Ardea cinerea*	O03Z, O04V
Grey Wagtail	*Motacilla cinerea*	O03Z
House Martin	*Delichon urbicum*	O13E
Kestrel	*Falco tinnunculus*	O13E
Kingfisher	*Alcedo atthis*	O03Z
Lapwing	*Vanellus vanellus*	O04V
Long-tailed Tit	*Aegithalos caudatus*	O03Z
Mallard	*Anas platyrhynchos*	O03Z
Mandarin Duck	*Aix galericulata*	O03Z
Mistle Thrush	*Turdus viscivorus*	O03Z
Moorhen	*Gallinula chloropus*	O03Z
Mute Swan	*Cygnus olor*	O03Z
Peregrine Falcon	*Falco peregrinus*	O03Z, O14A
Pheasant	*Phasianus colchicus*	O03Z, O14A
Pintail	*Anas acuta*	O03Z
Raven	*Corvus corax*	O03Z
Rock Pigeon	*Columba livia*	013E, 0O3Z
Rook	*Corvus frugilegus*	013E, 0O3Z, 0O4V
Sand Martin	*Riparia riparia*	013E
Sparrowhawk	*Accipiter nisus*	0O3Z

Common Name	Scientific Name	Grid Square
Spotted Flycatcher	*Muscicapa striata*	O13E
Swift	*Apus apus*	O13E, O03Z
Waxwing	*Bombycilla garrulus*	O03Z
Willow Warbler	*Phylloscopus trochilus*	O03Z

Birds Recorded During Transect Surveys

A total of 19 bird species were noted during the CBS transect surveys on the 12th May and 17th June 2022. These species are presented in Table 8-13 below. No Red-listed Species were recorded. Species highlighted in orange represent species that are of European Conservation Concern. They are Amber-listed because of their unfavourable conservation status. The remaining species are Green-listed, species of favourable conservation status (Gilbert et al, 2021). No Annex I species were recorded.

Three amber-listed species was recorded, namely greenfinch, starling and swallow. Single individuals were observed along the treeline that runs through the centre of the site. Potential nesting habitat is present on site in the dense treelines onsite. Starlings were recorded in small flocks of two to four birds, perched on the building onsite or metal railings offsite. Potential nesting habitat may be present on site in the treelines. Two swallows were recorded flying over the southern field (ED3). This species could potentially use the fields within site to forage; these habitats are common in the wider area, however.

A total of 16 green-listed species were recorded, namely blackbird, blackcap, blue tit, bullfinch, buzzard, collard dove, feral pigeon, goldfinch, great tit, hooded crow, jackdaw, magpie, robin, rook, song thrush, woodpigeon and wren.

The treelines within and adjacent to the site could potentially be used by all of the green-listed species recorded both for foraging and nesting. These birds may also forage within the fields themselves. A hooded crow's nest was observed in the treeline that runs through the centre of the site on both visits, with adults on or near the nest. The building onsite is not suitable for nesting birds.

Table 8-13: Bird species recorded within the study area during site walkover

Common Name	Scientific Name	Notes
Blackbird	*Turdus merula*	Resident breeder – found along treelines onsite
Blackcap	*Sylvia atricapilla*	Resident breeder – found along treelines onsite
Blue Tit	*Parus caeruleus*	Resident breeder – found along treelines onsite
Bullfinch	*Pyrrhula*	Resident breeder – found along treelines onsite

Common Name	Scientific Name	Notes
Buzzard	*Buteo buteo*	Resident breeder – observed soaring above ED3 onsite and offsite
Collard Dove	*Streptopelia decaocto*	Resident breeder – found along treelines onsite
Feral Pigeon	*Columba livia f. domestica*	Resident breeder – flying across site
Goldfinch	*Carduelis carduelis*	Resident breeder – found along treelines onsite
Great Tit	*Parus major*	Resident breeder – found along treelines onsite
Greenfinch	*Chloris chloris*	Resident breeder – found along treelines onsite
Hooded Crow	*Cavus cornix*	Resident breeder – found nesting in treeline onsite
Jackdaw	*Corvus monedula*	Resident breeder – flying across site
Magpie	*Pica pica*	Resident breeder – flying across site
Robin	*Erithacus rubecula*	Resident breeder – found along treelines onsite
Song Thrush	*Turdus philomelos*	Resident breeder – found along treelines onsite
Starling	*Sturnus vulgaris*	Resident breeder – observed perched on BL3 onsite and offsite
Swallow	*Hirundo rustica*	Resident breeder – flying across site
Woodpigeon	*Columba palumbus*	Resident breeder – found along treelines onsite
Wren	*Troglodytes troglodytes*	Resident breeder – found along treelines onsite

8.5.4.2. Non-volant Mammals

Hedgehog, hare, and red fox have been recorded within the area and could potentially be present within treelines of the site, Table 8-14.

While pine marten have been recorded within the area, no signs of activity for this species was recorded within the site. The treelines onsite and adjacent could provide foraging habitat.

The high-impact invasive mammal American mink, grey squirrel and house mouse have been recorded historically within two 5km of the proposed development site, Table 8-15.

Table 8-14: Non-volant Mammals (records within 5km)

Common Name	Scientific Name	Irish Red List	EU Habitat Directive Annex Listing	Wildlife Act
Eurasian Badger	*Meles meles*	Least Concern	N/A	√
Eurasian Otter	*Lutra lutra*	Least Concern	II & IV	√
European Hedgehog	*Erinaceus europaeus*	Least Concern	N/A	√
Irish Hare	*Lepus timidus subsp. hibernicus*	Least Concern	V	√
Pine Marten	*Martes martes*	Least Concern	V	√
Red Fox	*Vulpes vulpes*	Least Concern	N/A	X

Table 8-15: Invasive Mammal Species (records within 5km)

Common Name	Species Name	Invasive Impact	Latest Record Date
American Mink	*Mustela vison*	High	21/12/1962
European Rabbit	*Oryctolagus cuniculus*	Medium	16/11/2017
Grey Squirrel	*Sciurus carolinesis*	High	30/07/2017
House Mouse	*Mus musculus*	High	01/11/2012

Rabbit *Oryctolagus cuniculus* (medium-impact invasive species) droppings were recorded throughout the site. No other mammal sightings or signs were recorded during the survey.

While badger have been recorded within the surrounding area, no signs of Badger activity was recorded within the site. The open grasslands may be used by foraging badger populations in the greater area.

While otter have been recorded within the surrounding area and may use the drainage ditch within the site to commute, the ditch is of negligible foraging value to the species. No signs of otter activity were recorded in the ditch. No holts were observed in this area, and the ditch are considered unlikely to contain suitable holt sites due to steep open banks, and lack of instream and bank vegetation cover.

8.5.4.3. Bats

There is one building onsite, consisting of concrete base with steel cladded walls and roofs. The internal roof space is open with metal beams. No potential roosting features were identified, and the building has negligible bat roosting potential. Additionally, the building and surrounding yard is heavily lit during hours of darkness with artificial security lighting. The grassland fields and treelines distant from the existing building are not directly lit.

No trees onsite had potential bat roosting features and are of negligible potential for roosting bats. The site's hedgerows provide suitable foraging habitat for bats. The open areas of grassland are considered to be of lower suitability for bats which favour linear features for both commuting and foraging.

Eight bat species (and unidentified species) have been recorded within 10km (grid square 013) of the site (Table 8-16 below).

The National Biodiversity Data Centre's 'Bat Landscapes' map layer indicates that the site itself is situated in an area of moderate value for bats in general; and of high value for Common Pipistrelle and Leisler's; moderate-high value for Soprano Pipistrelle; low-moderate value for Brown Long-eared Bat; and low-moderate value for Whiskered Bat, Daubenton's Bat, Natterer's Bat, and Nathusius Pipistrelle .There is no potential for Lesser Horseshoe Bat as it is outside of its known geographical range.

The hedgerows, treelines, woodlands, and drainage ditches within and bounding the site offer potential foraging habitat for bats. Similar habitats are present in the wider landscape.

Table 8-16: Bat Species recorded within 10km of Site

Common Name	Scientific Name	Irish Red List	EU Habitat Directive Annex Listing	Wildlife Act
Brown Long-eared Bat	*Plecotus auratus*	Least Concern	IV	√
Leisler's Bat	*Nyctalus leisleri*	Least Concern	IV	√
Common Pipistrelle	*Pipistrellus pipistrellus*	Least Concern	IV	√
Soprano Pipistrelle	*Pipistrellus pygmaeus*	Least Concern	IV	√
Nathusius's Pipistrelle	*Pipistrellus nathusii*	Least Concern	IV	√
Daubenton's Bat	*Myotis daubentonii*	Least Concern	IV	√
Natterer's Bat	*Myotis nattereri*	Least Concern	IV	√
Whiskered Bat	*Myotis mystacinus*	Least Concern	IV	√
Whiskered/ Brandt's Bat	*Myotis mystacinus/ brandtii*	Least Concern	IV	√

8.5.4.4. Other Fauna

Additional protected species recorded historically within 5km of the site are outlined in Table 8-17.

Table 8-17: Other Protected and Rare Fauna Recorded within 5km of Site

Common Name	Scientific Name	Irish Red List	EU Habitat Directive Annex Listing	Wildlife Act
Common Frog	*Rana temporaria*	Least Concern	V	√
Smooth Newt	*Lissotriton vulgaris*	Least Concern	N/A	√
Northern White-tailed bumblebees	*Bombus (Bombus) magnus*	Threatened Species: Data deficient	N/A	N/A

The drainage ditches may be suitable for frog spawn deposition due to their lack of flow. However, the ditch has no vegetation associated with it and has rubbish dumped within, likely polluting the water.

Several bumblebee bee species were observed foraging amongst the flowering species onsite during the site walkovers, see Table 8-18.

Table 8-18: Other Protected and Rare Fauna Recorded within the study area during site walkover

Common Name	Scientific Name	Irish Red List	EU Habitat Directive Annex Listing	Wildlife Act
White-tailed bumblebee	*Bombus lucorum*	Least Concern	N/A	N/A
Garden bumblebee	*Bombus hortorum*	Least Concern	N/A	N/A
Red-tailed bumblebee	*Bombus lapidarius*	Near Threatened	N/A	N/A

8.5.4.5. Biodiversity Evaluation

The basis of evaluation assessment should be a determination of which ecological resources within the zone of influence of the proposed development are of sufficient value to be material in decision making and therefore, included in the assessment (CIEEM 2018 and revisions).

Table 8-19 outlines the key avifauna receptors selected for assessment and their rationale:

Table 8-19: Avifauna Evaluation

Common Name	Conservation Status	Evaluation	Rationale	Key Ecological Receptor
Black-headed Gull	Amber Listed	Local	Historical records within the 5km grid encompassing the site.	No
Greenfinch	Amber Listed	Local	Observed within treelines in the centre of the site.	Yes
Grey Wagtail	Red-listed	Local	Historical records within the 5km grid encompassing the site. Not observed within the proposed development site.	No
House Martin	Amber Listed	Local	Historical records within the 5km grid encompassing the site. Not observed within the proposed development site.	No
Kestrel	Red Listed	County	Historical records within the 5km grid encompassing the site. Not observed within the proposed development site.	No
Kingfisher	Amber Listed	Local	Historical records within the 5km grid encompassing the site. Not observed within the proposed development site.	No
Lapwing	Amber Listed	Local	Historical records within the 5km grid encompassing the site. Not observed within the proposed development site.	No
Mallard	Amber Listed	Local	Historical records within the 5km grid encompassing the site. Not observed within the proposed development site.	No
Mute Swan	Amber Listed	Local	Historical records within the 5km grid encompassing the site. Not observed within the proposed development site.	No
Pintail	Amber Listed	Local	Historical records within the 5km grid encompassing the site. Not observed within the proposed development site.	No
Sand Martin	Amber Listed	Local	Historical records within the 5km grid encompassing the site. Not observed within the proposed development site.	No
Spotted Flycatcher	Amber Listed	Local	Historical records within the 5km grid encompassing the site. Not observed within the proposed development site.	No

Common Name	Conservation Status	Evaluation	Rationale	Key Ecological Receptor
Swallow	Amber Listed	Local	Observed foraging over the grassland onsite and adjacent to the site. Unlikely to solely be reliant on grassland onsite, as this habitat is abundant in the surrounding environment.	No
Swift	Red Listed	National	Historical records within the 5km grid encompassing the site. Not observed within the proposed development site.	No
Starling	Amber Listed	Local	Observed on fencing and buildings onsite. Buildings not suitable for nesting and not associated with the treelines during CBS transects, so unlikely nesting onsite. May forage in treelines and grassland onsite.	Yes
Willow Warbler	Amber Listed	Local	Historical records within the 5km grid encompassing the site. Not observed within the proposed development site.	No
All other species recorded historically and during site visits	Green Listed	Site	These species are of low conservation value.	No

Table 8-20 outlines the key receptors selected for fauna selected for assessment and their rationale:

Table 8-20: Summary of Fauna Evaluations and Selection as Key Ecological Receptors

Species Name	Conservation Status	Evaluation	Rationale	Key Ecological Receptor
Terrestrial Mammals				
Badger	Wildlife Act 1976 (as amended), Least Concern	Site Value	Likely present in habitats surrounding the proposed development site.	No

Species Name	Conservation Status	Evaluation	Rationale	Key Ecological Receptor
Hedgehog	Wildlife Act 1976 (as amended), Least Concern	Site Value	Likely present in habitats surrounding the proposed development site.	No
Irish Hare	Wildlife Act 1976 (as amended), Least Concern	Site Value	Likely present in habitats surrounding the proposed development site.	No
Otter	Wildlife Act 1976 (as amended), Annex II & IV EU Habitats Directive, Near Threatened	National	Species likely to occur in surrounding landscape. Potential indirect effects via hydrological pathways.	Yes
Pine Marten	Wildlife Act 1976 (as amended), Annex V EU Habitats Directive, Least Concern	National	Likely present in habitats surrounding the proposed development site.	No
Invasive Mammals				
American Mink	None	None	Invasive species of High Impact. Not found within site.	No
Grey Squirrel	None	None	Invasive Species of High Impact. Not found within site.	No
Rabbit	Least Concern	Local	Invasive Species of Medium Impact. Not found within site.	No
House Mouse	None	None	Invasive species of High Impact. Not found within site.	No
Bats				
Leisler's Bat	Wildlife Act 1976 (as amended), Annex IV EU Habitats Directive, Least Concern	National	Not recorded within the site and no suitable roosting habitat present	No
Daubenton's Bat	Wildlife Act 1976 (as amended), Annex IV EU Habitats Directive, Least Concern	National	Not recorded within the site and no suitable roosting habitat present	No

Species Name	Conservation Status	Evaluation	Rationale	Key Ecological Receptor
Natterer's Bat	Wildlife Act 1976 (as amended), Annex IV EU Habitats Directive, Least Concern	National	Not recorded within the site and no suitable roosting habitat present	No
Whiskered Bat	Wildlife Act 1976 (as amended), Annex IV EU Habitats Directive, Least Concern	National	Not recorded within the site and no suitable roosting habitat present	No
Common Pipistrelle	Wildlife Act 1976 (as amended), Annex IV EU Habitats Directive, Least Concern	National	Not recorded within the site and no suitable roosting habitat present	No
Soprano Pipistrelle	Wildlife Act 1976 (as amended), Annex IV EU Habitats Directive, Least Concern	National	Not recorded within the site and no suitable roosting habitat present	No
Nathusis's Pipistrelle	Wildlife Act 1976 (as amended), Annex IV EU Habitats Directive, Least Concern	National	Not recorded within the site and no suitable roosting habitat present	No
Other Fauna				
Common Frog	Annex V EU - Habitats Directive (92/43/EEC) & Wildlife Act 1976, (as amended);	National	Species recorded in historical records. Potentially present in surrounding habitats including the drainage ditch	Yes
Smooth Newt	Annex V EU - Habitats Directive (92/43/EEC) & Wildlife Act 1976, (as amended);	National	Species recorded in historical records. Potentially present in surrounding habitats including the drainage ditch	Yes
Bumblebees	N/A	Site	Several species onsite associated with flowering species in grassland.	Yes

8.6. Potential Impacts

8.6.1. Impacts During Construction

8.6.1.1. Designated Sites

The proposed development site is not within the boundary of any designated conservation areas and does not require any resources from designated areas. European designated sites within 15km of the proposed development site, which are both SACs and SPAs, are considered under their higher European designation within the accompanying Appropriate Assessment Screening Report. This report concluded that no pathways for likely significant effects on any European sites were identified. Thus, it can be concluded beyond reasonable scientific doubt, in view of best scientific knowledge and on the basis of objective information and in light of the conservation objectives of the relevant European sites, that the proposed project individually or in combination with other plans and projects, would not be likely to have significant effect on any European sites.

Details of the NHAs and pNHAs assessed within this Ecological Appraisal are discussed below:

- Royal Canal pNHA (002103) located c. 1.5km south of the proposed development site is comprised of the canal channel, as well as the associated habitats along the banks. Otter is associated with the waterway. There is no hydrological connectivity between the proposed development and the site.
- Liffey Valley pNHA (000128) located c. 3.6km south of the proposed development site comprises river, woodland marsh and grassland habitat, as well as rare and protected plant species. There is no hydrological connectivity between the proposed development and the site.
- Santry Demesne pNHA (000178) located c. 5.7km east of the proposed development site comprises woodland habitat with rare and protected plant species. There is no hydrological connectivity between the proposed development and the site.
- Grand Canal pNHA (002104) located c. 6.6km south of the proposed development site is comprised of the canal channel, as well as the associated habitats along the banks. Otter is associated with the waterway. There is no hydrological connectivity between the proposed development and the site.
- North Dublin Bay pNHA (000206) located c. 8.2 southeast of the proposed development site overlaps North Dublin Bay SAC, with a weak indirect hydrological connection, which has been ruled out for significant effects as a result of the proposed development in the associated AA Screening Report.

Given the lack of a hydrological link between the development site and these pNHA's, and the fact that they are designated primarily for habitats, flora, and fauna occurring within their boundaries, and will not be subject to habitat loss, disturbance and/or displacement during the construction phase of the development, no impact is envisaged to these pNHA's.

8.6.1.2. Habitats and Flora

Habitats within the development zone

There are no Annex I habitats within the site boundary. Five habitat types were identified as key ecological receptors (See Table 8-9) within the study area of the proposed development, namely Improved grassland/ dry meadows and grassy verges GA1/GS2 mosaic, recolonising bare ground ED3, scrub WS1, treelines WL2 and drainage ditches FW4.

Improved grassland/ dry meadows (GA1/ GS2) mosaic, totalling c. 0.8 Ha, and recolonising bare ground (ED3), totalling c. 1.6 Ha in area, lies within the development footprint. These areas will be lost within the development footprint, resulting in habitat destruction. As such, an irreversible, permanent slight negative Impact in a local context to this habitat type is envisaged.

The treelines running through the centre of the site (WL2) will be removed, totalling c. 180m, resulting in an irreversible, long term slight negative impact in a local context to this habitat type.

The Drainage Ditch (FW4), with a length of c 80m, will be culverted, with a precast concrete culvert. This will lead to an irreversible, permanent slight negative impact in a local context to this habitat type.

Small areas of scrub (WS1) (maximum of 0.1 Ha) within the site boundary will be impacted by construction works. As such, an irreversible, permanent slight negative impact in a local context to this habitat type is envisaged.

Habitats adjacent to the development zone

No Annex I habitats are present in the areas abutting the development zone, and any impacts will be limited to within the development zone.

Protected or Rare Flora

No rare or protected flora were recorded within the study area.

Invasive Non-native Flora

The high-level *Rhododendron ponticum* and Cherry Laurel were recorded adjacent to the proposed development site during surveys, shown in Figure 8-4. These areas lie outside the site boundary and will not interact with construction activities, however measures to ensure this are required.

Butterfly-bush *Buddleja davidii* is present at two locations, both along the spoil mounds associated with the site boundaries (see Figure 8-4). There is potential for interaction with construction activities; as such, mitigation measures to prevent the spread of this species are required.

8.6.1.3. Avifauna

The Amber-listed species identified during field surveys and during the desktop study fall into a number of general groups which are likely to use the habitats within the proposed development site in a particular way.

The passerine species, including the amber-listed greenfinch, may breed and/or forage within treelines within the site, and Starling may also forage within grassland fields within the site. Since short sections of hedgerow are proposed to be removed, there may be a loss of bird nesting habitat onsite; as such, in the absence of mitigation measures, the impact to this species is envisaged to be negative, reversible, long-term, significant in a local context.

The proposed development is located in an active industrial zone with regular periods of human activity associated with ongoing commercial and industrial operations. Residential settlements are also along the western site boundary. There is the potential for some localised disturbance or avoidance, but this would be considered temporary with species highly likely to return once construction has been completed. The increase in noise and human activity during the construction phase for all key species is considered to be a negative, reversible, temporary slight impact in a local context.

Since short sections of hedgerow are proposed to be removed, if construction were to take place during the breeding season, disturbance to this species could be significant; as such, in the absence of mitigation measures, the impact to this species is envisaged to be negative, reversible, long-term, significant in a local context.

8.6.1.4. Non-volant Mammals

No signs of badger were observed throughout the site. However, badger may commute and forage within the proposed development site. Construction activities will be limited to daylight hours, reducing the likelihood of commuting/ foraging badger avoiding the area due to disturbance.

While otter may commute using the drainage ditch running through the proposed development site, the drainage ditch is of negligible value as foraging grounds for this species. In addition, no holts were observed, and the drainage ditches running through and bounding the site are steep sided and are not fringed by vegetation. Construction activities will occur during to daylight hours, reducing the likelihood of commuting otter avoiding the area due to disturbance. Impacts are likely to be limited to potential reductions in water quality due to pollution or contamination in the absence of mitigation measures. As such, in the absence of mitigation measures, the potential impact to this species is envisaged to be negative, reversible, short-term and slight in a local context.

Hedgerows and treelines have been identified as the most valuable habitats for hedgehog, Irish hare and red fox within the proposed development site. Since it is proposed to remove sections of treeline within the site, the resultant impact on these species is deemed to be a negative, reversible, short-term slight impact in a local context.

8.6.1.5. Bats

The site's treelines provide potential foraging habitat for bats; as such, the loss of c. 180m of treelines resulting in interruptions to these linear foraging habitats may result in a reduction in foraging habitat quality for bats, impacts to bats are envisaged to be a negative, reversible, long-term and slight.

8.6.1.6. Other Fauna

Frogs may breed in other stagnant stretches of drainage ditch within the site. As such, potential impacts are limited to declines in water quality. Considering these factors, impacts to frogs are envisaged to be a negative, reversible short-term and slight.

The removal of the grassland habitats will lead to a reduction in flowering species onsite, therefore a reduction in the availability of food sources for bumblebees. Considering this, impacts to bumblebees are envisaged to be a negative, reversible long-term and slight.

8.6.2. Impacts During Operation

8.6.2.1. Designated Sites

The Appropriate Assessment Screening Report has concluded that no pathways for likely significant effects on any European sites were identified.

Given the lack of a hydrological link between the development site and the surrounding pNHA's, and the fact that these sites are designated primarily for habitats, flora, and fauna occurring within their boundaries, and will not be subject to habitat loss, disturbance and/or displacement during the operational phase of the development, no impact is envisaged to these sites.

No further excavation works shall be required during the operational phase of the proposed development. There shall be occasional maintenance works required but these shall be minimal without the need for large scale construction; risks to water quality are not envisaged.

Having regard to findings from other chapters of this EIAR which address emissions from the proposed facility (e.g., dust, odour, noise, aqueous discharges), it is concluded that there will be no emissions of significance from the proposed facility during operations. The facility will operate under an Industrial Emission (IE) licence enforced by the EPA which will regulate emissions associated with the proposed facility, and prevent the discharge of emissions of significance from the facility.

No impacts are therefore envisaged to designated areas during the operational phase of the proposed development.

8.6.2.2. Habitats and Flora

As no further excavation or construction works shall be required during the operational phase of the proposed development, no further impacts to habitats are envisaged.

There shall be some human and plant activity within the site as part of general operations. However, this shall not differ markedly with the current level of human activity associated with industrial and residential practices within and adjacent to the site.

There will be no emissions of significance from the proposed facility during operations. The facility will operate under an Industrial Emission (IE) licence enforced by the EPA.
No impacts are envisaged to habitats or flora during the operational phase of the proposed development.

8.6.2.3. Avifauna

As no further excavation or construction works shall be required during the operational phase of the proposed development, no further impacts to avifauna are envisaged.

There shall be some human and plant activity within the site as part of general operations. However, this shall not differ markedly with the current level of human activity associated with industrial and residential practices within and adjacent to the site.

There will be no emissions of significance from the proposed facility during operations. The facility will operate under an Industrial Emission (IE) licence enforced by the EPA.

No impacts are therefore envisaged to avifauna mammals during the operational phase of the proposed development.

8.6.2.4. Non-volant Mammals

As no further excavation or construction works shall be required during the operational phase of the proposed development, no further impacts to habitats are envisaged.

There shall be some human and plant activity within the site as part of general operations. However, this shall not differ markedly with the current level of human activity associated with industrial and residential practices within and adjacent to the site.

There will be no emissions of significance from the proposed facility during operations. The facility will operate under an Industrial Emission (IE) licence enforced by the EPA.

No impacts are therefore envisaged to non-volant mammals during the operational phase of the proposed development.

8.6.2.5. Bats

Increased artificial lighting during hours of darkness would decrease the potential foraging habitat for bats onsite. Therefore, impacts to bats are envisaged during the operational phase to be negative, reversible, long-term slight in a local context.

8.6.2.6. Other Fauna

For the same reasons as outlined above, no further impacts are envisaged to other species of fauna during the operational phase of the proposed development.

8.6.3. Impacts During Decommissioning

If the facility is no longer to be used for waste processing, it will be decommissioned in accordance with a Decommissioning Plan for the facility (which will be prepared as a condition of the IE Licence).

All buildings present on-site will be left in-situ. As such, there will be no demolition or excavation during decommissioning.

All residual materials, wastes and washwaters will be contained on-site and dispatched from the site for off-site management. There will be no emissions of significance from the proposed facility during operations. The facility will operate under an Industrial Emission (IE) licence enforced by the EPA.
No impacts are envisaged to designated sites, habitats and flora, avifauna, non-volant mammals, bats or other fauna during the decommissioning phase of the proposed development.

8.6.4. Cumulative Impact

Cumulative impacts will depend on species present, number and frequency of occurrence of fauna observed at the proposed site and at adjacent proposed and existing developments. The timing of the construction phase can also have a bearing on the magnitude of the impact. It is also dependent on distance from the proposed development in to other existing and proposed developments and the habitats present between same or their linkage to the proposed development site.

A cumulative impact arises from incremental changes caused by other past, present or reasonably foreseeable actions together with the proposed development. The surrounding environment is dominated by and industrial, agricultural land uses which may have such an 'in combination' impact with the proposed development

Industrial activities in the wider area may potentially result in the discharge or release of emission to the environment, which may combine with proposed development related activities and result in a cumulative impact on ecological receptors.

Agriculture is widespread within the greater area. Arable farming appears to be the dominant agricultural practices in the surrounding area, followed by pastureland. Potential impacts include an increase in nutrient levels of local watercourses; habitat loss due to land reclamation and drainage; and well as the loss of treelines

Other development taking place in the wider area may combine with proposed development related activities and result in a cumulative impact on ecological receptors.

To identify other committed development in the area, a planning search was carried out using the online planning enquiry system.[1] This search considered townlands at the development site and abutting the same. The results of this search are contained in Appendix 1.2 of Volume 3 of this EIAR.

A small number of records for residential-scale development applications such as a new dwelling house, detached garage, and single storey extension were returned. Due to the scale and/or type of these developments they will not act cumulatively with the proposed development.

Permission was granted on 07th July 2022 for development comprising: (i) construction of 5 no. industrial / warehouse / logistics units contained within 3 no. blocks and creation of vehicular access point (Planning reference: FW22A/0061), c.150m east of the proposed development.

Permission was granted on 26th May 2022 for the construction of a security hit, 2 no. warehouse/ light industrial units, warehouse/ logistic unit and associated site works (Planning reference: FW21A/0149), c.200m northeast of the proposed waste facility.

Permission was granted on 01st June 2022 for the construction of 4 no. industrial units consisting of offices, workshops and accessories (Planning reference: FW21A/0190), c.400m northeast of the proposed waste facility.

There may be limited potential for cumulative impacts in conjunction with these developments; these would be likely to be limited to small increases in sediment and dust creation during construction activities. While these developments are within 500m of the proposed development, there is no hydrological link between these sites and the proposed development or to any European site.

[1] https://mapzone.dublincity.ie/MapZonePlanning/MapZone/,https://fingalcoco.maps.arcgis.com/apps/webappviewer/

Mitigation measures have been defined in this EIAR for to prevent the generation of silt laden surface water run-off and dust during construction of the proposed development however (See Chapter 10 Hydrology and Surface Water, and Chapter 11 Air and Climate, respectively).

8.7. Mitigation Measures

The following sections outlines appropriate mitigation measures to avoid or reduce the potential impact of the proposed development on receiving ecology, during both the construction and operational phases of the proposed development.

8.7.1. Construction Environmental Management Plan

A Construction Environmental Management Plan (CEMP) has been prepared for the proposed development and is included in Volume 3, Appendix 4.2. The CEMP defines the work practices, environmental management procedures and management responsibilities relating to the construction phase of the proposed development. The CEMP describes how the Contractor for the main construction works will implement a site Environmental Management System (EMS) to meet the specified contractual, regulatory and statutory requirements including the requirements identified as part of the environmental impact assessment process.

The CEMP will be updated prior to construction to take account of any amendments arising during the consenting process and relevant conditions attached to the planning permission and will be implemented for the duration of the construction phase of the project. The CEMP will be a live document and will be reviewed and updated as required.

The CEMP defines the following construction phase control measures in relation to surface water management.

8.7.2. Water Quality related Mitigation Measures

Water quality related mitigation measures will be adopted and implemented to ensure the prevention of aquatic ecology during the construction and operational phased of the proposed development. These measures are comprehensively detailed in Section 10.6 of Chapter 10 – Hydrology and Surface Water Quality, of this EIAR.

8.7.3. Mitigation Measures for Habitats and Flora

No disturbance to habitats or flora outside the proposed development area will occur. All works and temporary storage of material will be restricted to the immediate footprint of the development, which will be wholly within the development site boundary. Designated access points will be established within the site and all construction traffic will be restricted to these locations.

To counteract the loss of habitat associated with the development footprint (e.g., 180m of treeline), and further enhance biodiversity at the development site, a total of 651m (linear length) of new hedgerows will be created along the sites boundary and will screen the development from the surrounding area. These hedgerows will be created using native species, of similar composition to the existing treelines onsite that will be removed. The hedgerows will be dominated by hawthorn and elder with willow and alder frequently used.

Additional species such as hazel, holly and guelder rose should be planted also to ensure a diverse mix of species that will provide food and shelter for birds, mammals, and invertebrates at different times of the year. These hedgerows will serve to provide a suitable habitat for bird species using the site for the long-term.

These hedgerows will need to be maintained in a manner that promotes biodiversity insofar as possible. Tightly cut hedgerows with flat tops provide little benefit to wildlife, taller and bulky hedgerows are recommended as this provide more shelter for wildlife. When the hedgerows are maintained, stems will be cut a little above the last cut (see Figure 8-5) as cutting back to the exact same point depletes the energy of the hedgerow, forms a build-up of scar tissue which discourages new growth. Light annual cutting of hedgerows is not good for wildlife as it limits the production of flowers and fruit. The sites hedgerows will be cut every three to four years in rotation as this will leave areas of undisturbed hedgerows. Cutting equipment used will be sharp so as not to shatter or fray the hedge. Shattering and fraying allows for disease to enter plants and can lead to decay and weaken the vigour of the hedgerow. A finger-bar cutter is recommended as the most appropriate tool to minimise fraying and smashing of branches (Heritage Council, 2017). A flail-type hedge cutter is unsuitable for hedge trimming in situations where hedgerow health is a priority.

Where practical, gaps in the hedgerow will be filled via laying which is a method of rejuvenating hedgerows. Laying involves cutting hedgerow stems partly through near ground level and bending the stem to the required position to fill a gap. New growth then is produced from the cut which thickens the hedge base and rejuvenates it.

Where gaps are too large and to enhance the diversity of the hedgerow, native whips will be planted. Hedgerow maintenance will not be carried out between the 1st of March and 31st of August as this is the nesting period for birds and any maintenance at this time will disturb breeding; this is in keeping with the Wildlife Act 1976 (as amended).

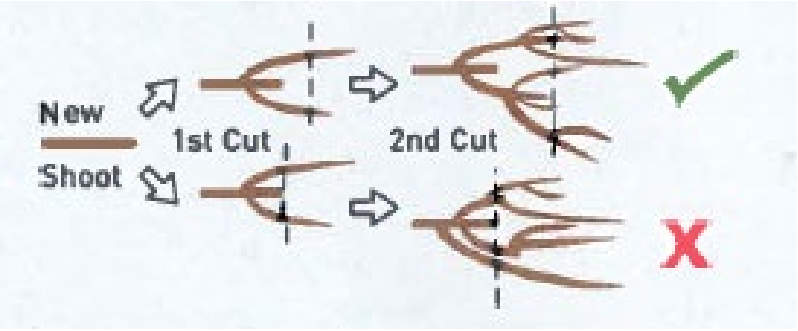

Figure 8-5: Hedgerow level of cut (Teagasc)

A site-specific Invasive Species Management Plan will also be implemented pre-construction to manage invasive species present on-site (e.g., *Buddleja davidii*), see Appendix 8.2. An additional pre-construction invasive plant species survey will be completed in advance of construction works commencing, to ensure no additional invasive species has spread into the site since the initial ecology walkover survey.

8.7.4. Birds

The removal of trees and hedgerow trimming will be undertaken outside of the bird breeding season (March 1st to August 31st inclusive). This will help protect nesting birds. The proposed hedgerows along the site boundary) will serve to provide a suitable habitat for bird species using the site for the long-term.

8.7.5. Terrestrial Mammals

Construction operations within the proposed development site will take place during the hours of daylight where possible to minimise disturbances to faunal species at night.

The water quality mitigation measures outlined in this EIAR will ensure otter are not negatively impacted by declines in water quality.

8.7.6. Bats

As part of best practice construction measures a preconstruction bat survey shall be carried out within the site prior to construction to reconfirm the findings of preplanning surveys. If any new roosts are found during these surveys a relevant bat derogation licence shall be sought prior to construction works commencing and works will be carried out under the terms of the relevant derogation licence this shall include any felling works being undertaken, and works will be timed and conducted in a manner to ensure that no bats are harmed as a result of felling. Relevant guidance including the NRA (2006) guidelines for the treatment of bats during the construction of national road schemes.

Construction operations within the proposed development site will take place during the hours of daylight where possible to minimise disturbances to bat species at night. Lighting shall not be left switched on overnight within the site. The use of lighting within the site can discourage bats from utilising the site during construction.

Where overnight artificial lighting is required for security purposes, an ecologist will be consulted during the detailed lighting design. The lighting design should follow BCT and ILP 2018 best practice guidance:

- Incorporate specialist bollard or low-level downward directional luminaries;
- Where low-level downward directional luminaries are not appropriates, installation of luminaries with warm spectrum LEDs (<2700 Kelvin) to reduce blue light, with peak wavelengths higher than 550nm;
- Mounted luminaires should not tilt upward, with an upward light ration of 0% and with good optical control;
- External security lighting should be set on motion-sensors and short (1 min) timers;
- Incorporate cowls to lighting throughout the proposed development site to spill away from the site boundaries;

Maximise the separation distance between light mast locations and vegetated features, such as surrounding treelines and the adjacent green fields, where possible.

8.7.7. Other Taxa

A pre-construction amphibian survey of the drainage ditch within the proposed development footprint will be undertaken during late winter/early spring to reconfirm the existing environment as described in the ecological appraisal forming part of this assessment, and to check for signs of breeding frog.

If frogspawn is observed in these areas, an appropriate response will be formulated in order to prevent negative impacts to this species, in many cases it is best to attempt to retain at least part of the populations (frog and newt) on site, this obviates the uncertainties often associated with translocation.

Where the population cannot be retained on site, a suitable receptor site will be located in consultation with NPWS. A suitable receptor site will ideally:

- be located as close as possible to the donor site (at least within the same county, and the same geology and habitat type);
- not currently support a population of the species to be translocated;
- not be subject to planning or other threats in the foreseeable future;
- be subject to a pre and post-translocation management plan;
- be subject to a pre and post-translocation monitoring programme.

8.8. Residual Impact

Following the full implementation of all the mitigation measures described above, the residual negative impacts on the biodiversity due to the proposed development will vary from ***Imperceptible*** to ***Not Significant***. The construction, operational, and decommissioning phases of the proposed development will not have any significant adverse impact on the receiving ecological receptors.

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