

ElAR Volume 5: Onshore Infrastructure Chapter 2: Biodiversity

Kish Offshore Wind Ltd

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Dublin Array Offshore Wind Farm

Environmental Impact Assessment Report

Volume 5, Chapter 2: Biodiversity

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Glossary

Term	Definition
Adaptive Management	A systematic process for continually improving management policies and practices by learning from the outcomes of previously implemented management strategies.
An Bord Pleanála (ABP)	Competent authority as defined by the Planning Acts to determine the application for development consent for Dublin Array and carry out the EIA and AA of the proposed development.
Anthropogenic	Resulting from the influence of human beings on nature.
Applicant	Kish Offshore Wind Limited. Kish Offshore Wind Limited is making the application on behalf of and/or with the consent of the joint holders of the MACs for the maritime area to which the proposed development relates: Kish Offshore Wind Limited, Bray Offshore Wind Limited and Dún Laoghaire-Rathdown County Council.
Application for development consent	The planning application to An Bord Pleanála for the construction, operation and decommissioning of Dublin Array under Section 291 of the Planning Act.
Aquatic ecology	The study of the relationships between aquatic organisms and their environment.
Buffer zone	An area designated to separate and protect a specific area from external impacts.
Benthic	Related to the bottom of a water body, including the sediment surface and sub-surface layers.
Biotic	Pertaining to living organisms.
Cumulative Effects Assessment (CEA)	The assessment of potential cumulative effects that may arise when effects arising from Dublin Array act cumulatively with impacts from other projects considered in the assessment.
Connectivity	A measure of the functional availability of the habitats needed for a particular species to move through a given area e.g. the flight lines used by bats to travel between roosts.
Dublin Array	Dublin Array Offshore Wind Farm. Where the context so provides within the EIAR, references to Dublin Array refer to all geographical areas of the proposed development, i.e. both offshore, onshore and including the proposed O&M Base.
Degradation (of habitat)	The process by which a habitat becomes less able to support its native species and ecological functions. This can result from various factors such as pollution, invasive species, land use changes, and climate change.
Ecosystem Services	The benefits people obtain from ecosystems, including provisioning, regulating, cultural, and supporting services.

Term	Definition
Environmental Impact Assessment (EIA)	Assessment of the likely significant effects of a proposed project on the environment. The EIA will be carried out by An Bord Pleanála in this instance.
EIA Report (EIAR)	As defined in the Planning and Development Act 2000, as amended: 'environmental impact assessment report' means a report of the effects, if any, which proposed development, if carried out, would have on the environment and shall include the information specified in Annex IV of the Environmental Impact Assessment Directive.
Fauna	The animals of a particular region, habitat, or geological period.
Flora	The plants of a particular region, habitat, or geological period.
Fragmentation	The process by which habitats are broken into smaller, isolated patches, often due to human activities.
Green infrastructure	A network of natural and semi-natural areas that provide environmental, economic, and social benefits.
Habitat connectivity	The degree to which different habitats are connected, allowing for the movement and interaction of species.
Invasive alien species	A non-native species that has been introduced, either intentionally or unintentionally, and poses a significant threat to native wildlife, ecosystems, or human activities.
Irish Transverse Mercator (ITM)	A coordinate system used for mapping in Ireland.
Landfall Site	The location where the Offshore Export Cable Corridors come ashore adjacent to the Shanganagh Waste Water Treatment Plant (WWTP).
Natural Capital	The world's stocks of natural assets, including geology, soil, air, water, and all living organisms.
Natura Impact Statement (NIS)	A document that assesses the potential impacts of a project on Natura 2000 sites, which are protected areas in the EU.
Offshore infrastructure	Wind turbine generators, offshore substation platform, inter array cables, and offshore export cables.
Onshore Electrical System (OES)	Collective term for all onshore infrastructure from the landfall/TJB to the grid connection point which is likely to be necessary to connect the project to the national grid.
Onshore infrastructure	The Onshore Electrical System and the O&M Base.
Onshore substation	Part of the OES, the substation is required to facilitate the connection to the existing national electricity transmission system.
Operations & Maintenance Base	Part of the onshore infrastructure, located within the administrative boundary of Dún Laoghaire-Rathdown County Council, which will be used to support the management of the construction of the offshore wind farm.

Term	Definition
Planning Acts	Planning and Development Act 2000, as amended, and where the context so admits, including also the Planning Regulations 2001 as amended.
Precautionary Principle	A principle that advocates for preventive action in the face of uncertainty to avoid harm to the environment.
Qualifying Interest (QI)	The habitats and species for which each European site is selected are the QI for SACs and special conservation interests (SCI) for SPAs of each site. These are collectively referred to as qualifying interests (QI) in this report.
Receiving environment	The baseline environment.
Riparian Zone	The interface between land and a river or stream, often characterized by unique vegetation and ecological processes.
Transition Joint Bay (TJB)	The proposed infrastructure at the Landfall location where the offshore and onshore cables connect.
Valued Ecosystem Component (VEC)	An element of the environment that is considered important based on scientific, social, cultural, or economic values.
Water Quality	The chemical, physical, and biological characteristics of water, typically measured to assess its suitability for various uses.
Wetland	An area of land that is saturated with water, either permanently or seasonally, and supports distinct plant and animal communities.

Acronyms

Term	Definition
ARC	Amphibian and Reptile Conservation
BAP	Biological Action Plan
BCT	Bat Conservation Trust
CBD	Convention on Biological Diversity
CEMP	Construction Environmental Management Plan
CIEEM	Chartered Institute of Ecology and Environmental Management
CIRIA	Construction Industry Research and Information Association
CMS	Construction Method Statement
DBB	Dublin Bay Biosphere
DCC	Dublin City Council
DCCAE	Department of Communications, Climate Action and Environment
DLRCC	Dún Laoghaire–Rathdown County Council
DPM	Direct Pipe Method
EC	European Commission
EclA	Ecological Impact Assessment
ECoW	Ecological Clerk of Works
ECRIPP	East Coast Railway Infrastructure Protection Project
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EMRA	Eastern and Midland Regional Assembly
EPA	Environmental Protection Agency
GIB	Green Infrastructure Strategy
HDA	Habitats Directive Assessment
HDD	Horizontal Directional Drilling
HGV	Heavy Goods Vehicle
IASMP	Invasive Alien Species Management Plan
IEF	Important Ecological Feature
IFI	Inland Fisheries Ireland
ILP	Institute of Lighting Professionals

Term	Definition
IAS	Invasive Alien Species
ISB	Irish Statute Book
ITM	Irish Transverse Mercator
JB	Joint Bay
JNCC	Joint Nature Conservation Committee
LIBS	Locally Important Biodiversity Site
LSE	Likely Significant Effect
MDS	Maximum Design Scenario
MI	Marine Institute
NBDC	National Biodiversity Data Centre
NHA	Natural heritage Area
NI	Northern Ireland
NIS	Natura Impact Statement
NPWS	National Parks and Wildlife Service
NRA	National Roads Authority (now TII)
O&M Base	Operations and Maintenance Base
OSS	Onshore Substation
Onshore ECR	Onshore Export Cable Route
PRA	Preliminary Roost Assessment
(p)NHA	(Proposed) Natural Heritage Areas
PRF	Potential Roost Features
QI	Quantifying Interest
RPA	Roost Protection Area
RSES	Regional Spatial and Economic Strategy
RSPB	Royal Society for the Protection of Birds
SAC	Special Area of Conservation
SDZ	Strategic Development Zone
SCI	Special Qualifying Interest
SISAA	Supporting Information for Screening for Appropriate Assessment
SPA	Special Protection Areas
TII	Transport Infrastructure Ireland

Term	Definition
TJB	Transition Joint Bay
UN	United Nations
VEC	Valued Ecosystem Component
VP	Vantage Point
WWTP	Wastewater Treatment Plant
ZoI	Zone of Influence

2 Biodiversity

2.1 Introduction

- 2.1.1 This chapter of the Environmental Impact Assessment Report (EIAR) presents the results of the Environmental Impact Assessment (EIA) for the potential impacts of the construction, operation and decommissioning phases of the onshore infrastructure of the proposed Dublin Array Offshore Wind Farm (Dublin Array) upon the onshore biodiversity (including intertidal birds). The onshore infrastructure includes the proposed Operations and Maintenance (O&M) Base at Dún Laoghaire Harbour and the Onshore Electrical System (OES) from the Landfall Site at Shanganagh Cliffs, the onshore export cable route (ECR) and onshore substation (OSS) at Ballyogan and associated temporary construction compounds (TCCs). Both the O&M Base and OES are described in full in Volume 2, Chapter 6: Project Description.
- 2.1.2 Specifically, this chapter considers impacts on receptors above the High Water Mark (HWM).
- 2.1.3 The chapter describes the scope and baseline conditions existing at the O&M Base and OES sites and their surroundings. It considers any potential significant environmental effects the proposed development could have on the baseline environment; the mitigation measures required to prevent, reduce or offset any significant adverse effects; and the likely residual effects after these measures have been employed. Cumulative effects with other proposed developments that may also have an impact on the sensitive receptors close to the Dublin Array are also considered.
- 2.1.4 For clarity, ‘the Site’, as referred to in this chapter, is the boundary of the onshore infrastructure (i.e. Landfall Site, Onshore ECR, OSS and grid connection and O&M Base as defined in the planning application).
- 2.1.5 This EIAR chapter should be read in conjunction with the following documents:
- ▲ Volume 6 (Onshore Technical Appendices), Appendix 6.5.2-1: Technical Baseline Appendix for Onshore Biodiversity (hereafter referred to as the Onshore Biodiversity Technical Baseline Report), including the aquatic ecology baseline report included within that baseline report);
 - ▲ Volume 6, Appendix 6.5.2-2, O&M Base Intertidal Bird Surveys Report;
 - ▲ Volume 4, Appendix 4.3.6-8: Intertidal Bird Surveys at two potential grid connection cable Landfall locations – Winter 2019/20 and Autumn 2020 (hereafter referred to as the ‘2020 Intertidal Bird Survey Report’) and updated in 2024 (Volume 4, Appendix 4.3.6-9, hereafter referred to as the ‘2024 Intertidal Bird Surveys Report’);
 - ▲ Volume 7, Appendix 8: Invasive Species Management Plan (part of CEMP);
 - ▲ Volume 6, Appendix 6.5.7-2: Tree Survey Report; and

- ▲ Habitats Directive Assessments: Supporting Information for Screening for Appropriate Assessment (SISAA) and Natura Impact Statement (NIS).

2.1.6 Note that the likely significant effects for ecology in the marine environment are described in the Offshore Infrastructure volume of the EIAR, which can be found in the following chapters of Volume 3 (Offshore Assessment Chapters) and the technical baseline appendices that support these chapters:

- ▲ Chapter 3: Benthic Subtidal and Intertidal Ecology;
- ▲ Chapter 4: Fish and Shellfish Ecology;
- ▲ Chapter 5: Marine Mammals;
- ▲ Chapter 6: Offshore and Intertidal Ornithology;
- ▲ Chapter 7: Bats in the Offshore Environment; and
- ▲ Chapter 8: Nature Conservation.

2.1.7 Construction impacts in relation to hydrology, noise and vibration and air quality have been assessed in Volume 5 and are summarised below in respect of ecological receptors:

- ▲ The Onshore Water (Hydrology, Hydrogeology and Flood Risk) chapter (Volume 5, Chapter 4) provides a description of the hydrological setting of water courses within the relevant study area and includes the relevant project design measures and other avoidance and preventative measures to reduce potential impacts to receiving waters;
- ▲ The Noise and Vibration chapter (Volume 5, Chapter 5) considers the impacts related to noise and vibration as a result of the proposed development; and
- ▲ The Air Quality chapter (Volume 5, Chapter 10) considers impacts during construction to sensitive ecological receptors as a result of dust and increased road traffic.

2.1.8 The purpose of this chapter is to:

- ▲ Identify, describe and assess (any) likely significant effects, any indirect, secondary, cumulative, transboundary, short-term, medium-term, and long-term, permanent and temporary, positive and negative effects of the Dublin Array onshore infrastructure which result from the proposed works during construction, operation and decommissioning; and
- ▲ Describe mitigation measures envisaged to avoid, prevent or reduce any identified significant adverse effects on biodiversity; and explain the extent, to which significant adverse effects on the environment are avoided, prevented, or reduced.

2.1.9 This chapter will address the terrestrial and freshwater habitats and species, with particular attention to species, as provided in Nelson et al. (2019) 'Checklist of protected and threatened species in Ireland', and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC, and those protected on a national level.

2.1.10 Statements of authority for authors of this chapter are included in Volume 2, Chapter 1: Introduction.

2.2 Regulatory background

2.2.1 The assessment of potential impacts upon onshore biodiversity has been made with specific reference to the applicable legislation and guidance, including:

International legislation and policy

- ▲ United Nations (UN) Convention on Biological Diversity (CBD); and
- ▲ The Ramsar Convention on Wetlands of International Importance.

European legislation

- ▲ EU Habitats Directive on the conservation of natural habitats and of wild fauna and flora (92/43/EEC) (the Habitats Directive);
- ▲ EU Birds Directive on the conservation of wild birds (2009/147/EC);
- ▲ The Bern Convention on the Conservation of European Wildlife and Natural Habitats;
- ▲ The Bonn Convention on the Conservation of Migratory Species of Wild Animals;
- ▲ EU Water Framework Directive establishing a framework for Community action in the field of water policy (2000/60/EC) (as amended);
- ▲ EU Environmental Liability Directive (2004/35/EC);
- ▲ EU EIA Directive on the assessment of the effects of certain public and private projects on the environment (2011/92/EU) (as revised by Directive 2014/52/EU);
- ▲ Regulation (EU) No 1143/2014 of the European Parliament and of the Council of 22 October 2014 on the prevention and management of the introduction and spread of invasive alien species, as amended, together with Commission Implementing Regulation (EU) 2016/1141 and Implementing Regulation (EU) 2019/1262; and
- ▲ EU Nature Restoration Law 2023 2022/0195(COD).

National legislation

- ▲ The Wildlife Act 1976;
- ▲ The Wildlife (Amendment) Act 2000;
- ▲ The Wildlife (Amendment) Act 2010;
- ▲ The Wildlife (Amendment) Act 2012;
- ▲ The Wildlife (Amendment) Act 2023;
- ▲ S.I. No. 477 of 2011 – Part 6 of European Communities (Birds and Natural Habitats) Regulations (as amended);
- ▲ S.I. No. 272 of 2009 – European Communities Environmental Objectives (Surface Waters) Regulations, as amended;
- ▲ S.I. No. 722 of 2003 – European Communities (Water policy) Regulations, 2003, as amended;
- ▲ S.I. No. 293 of 1988 – European Communities (Quality of Salmonid Waters) Regulations;
- ▲ S.I. No. 269 of 2009 – European Union Environmental Objectives (Freshwater Pearl Mussel) (Amendment) Regulations 2009 to 2018 (as amended);
- ▲ S.I. No. 235 of 2022 - The Flora (Protection) Order 2022;
- ▲ S.I. No. 374 of 2024 – European Union (Invasive Alien Species) Regulations 2024;
- ▲ The Heritage Act, 2018);
- ▲ Planning and Development Act, 2000 (as amended); and
- ▲ S.I. No. 600 of 2001 – Planning and Development Regulations, 2001 (as amended).

EU and National policy

- ▲ EU Biodiversity Strategy 2020;
- ▲ Project Ireland 2040;
- ▲ National Heritage Plan 2030;
- ▲ Ireland's 4th National Biodiversity Action Plan 2023 - 2030.

Local policy

2.2.2 The relevant component of chapters from Dún Laoghaire–Rathdown County Council (DLRCC) County Development Plans (see Annex 1 of the Onshore Biodiversity Technical Baseline Report) have also been considered including:

- ▲ DLRCC County Development Plan 2022-2028;
- ▲ DLRCC Biodiversity Action Plan 2021-2025; and
- ▲ Regional Spatial and Economic Strategy (RSES) for the Eastern and Midland Region Assembly (EMRA 2019).

Guidance

2.2.3 The relevant guidance has been followed:

- ▲ Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022);
- ▲ Guidelines for Assessment of Ecological Impacts of National roads Schemes (National Roads Authority (NRA, 2009a.);
- ▲ Ecological Surveying Techniques for Protecting Flora and Fauna during the Planning of National Road Schemes (NRA, n.d.);
- ▲ Guidance on the Strict Protection of Certain Animal and Plant Species under the Habitats Directive in Ireland (NPWS, 2021);
- ▲ Guidelines for the Treatment of Badgers Prior to the Construction of National Road Schemes (NRA, 2009b);
- ▲ Surveying Badgers (Harris et al., 1989);
- ▲ Guidelines for Ecological Impact Assessment in the UK and Ireland (Chartered Institute of Ecology and Environmental Management (CIEEM), 2018);
- ▲ Guidance Note 08/23: Bats and Artificial Lighting at Night (Institute of Lighting Professionals (ILP) and Bat Conservation Trust (BCT), (2023);
- ▲ Bat Surveys for Professional Ecologists – Good Practice Guidelines (Collins 2016; and Collins, 2023);
- ▲ A Guide to Habitats in Ireland (Fossitt, 2000);
- ▲ The Status of Ireland’s Breeding Seabirds: Birds Directive Article 12 Reporting 2013 – 2018 (Cummins et al., 2019);

- ▲ The Status of EU Protected Habitats and Species in Ireland (National Parks and Wildlife Service (NPWS), 2019);
- ▲ Common Standards Monitoring Guidance for Reptiles and Amphibians (Joint Nature Conservation Committee (JNCC), 2004);
- ▲ UK BAP Mammals: Interim Guidance for Survey Methodologies, Impact Assessment and Mitigation (Cresswell et al, 2012); and
- ▲ New Atlas of the British and Irish Flora: An Atlas of the Vascular Plants of Britain, Ireland, The Isle of Man and the Channel Islands (Preston et al., 2002).

2.2.4 Where appropriate guidance is not available for Ireland, alternative guidance documents from jurisdictions/countries where comprehensive guidance has been developed have been used. The principal guidance documents for this assessment are:

- ▲ ‘Guidance on EIS and NIS Preparation for Offshore Renewable Energy Projects’ (Barnes, 2017);
- ▲ ‘Guidance on Marine Baseline Ecological Assessments & Monitoring Activities for Offshore Renewable Energy Projects’ (Sally et al., 2018);
- ▲ ‘Ecological Monitoring and Mitigation Policies and Practices at Offshore Wind Installations in the United States and Europe’ (Allen, 2020);
- ▲ ‘Summary Report: Best Management Practices Workshop for Atlantic Offshore Wind Facilities and Marine Protected Species’ (Bureau of Ocean Energy Management (BOEM), 2018); and
- ▲ ‘Assessing Significance of Impacts from Onshore Wind Farms Outwith Designated Areas’ (Scottish Natural Heritage, 2006).

2.3 Consultation

2.3.1 As part of the EIA for Dublin Array, consultation has been undertaken with various statutory and non-statutory authorities and stakeholders for the EIA process as well as for the NIS. A Scoping report was made publicly available and issued to statutory consultees in October 2020.

2.3.2 Following the recommendation outlined in the Department of Communications, Climate Action and Environment (DCCA) guidelines, the Applicant has sought to consult with BirdWatch Ireland, NPWS, Inland Fisheries Ireland (IFI), Marine Institute (MI), and DLRC for onshore biodiversity.

- 2.3.3 To date, consultation with regards to the scope of the EIAR has taken place via the Scoping Report. In addition, the Dublin Array project website has been created to inform the public about all aspects of the proposed development, with public consultations conducted in January to March 2023. The website is used to notify members of the public of project updates, project timelines, upcoming public consultation and any changes in the design and layout as a consequence of consultations, environmental assessment, and engineering. It also provides information for the public on how to contact Dublin Array directly.
- 2.3.4 Table 1 provides a summary of the relevant stakeholders that have been consulted with during the EIAR process relevant to this chapter.

Table 1 Summary of consultation undertaken for onshore biodiversity¹

Date	Consultation type	Consultation and key issues raised	Section where provision is addressed
Informal consultation			
18/09/2023	BirdWatch Ireland informal communication	Birdwatch Ireland provided information that roosting terns have been noted at Sandycove/Scotsman’s Bay in 2017 and 2018.	This data was provided to SLR to contribute to the assessment and is detailed in the Intertidal Bird Surveys Reports.
Various dates	Informal consultation with DLRCC	Various meetings held with DLRCC to provide update on routing of onshore ECR and OSS. Feedback provided on routing and sensitive receptors along proposed corridors.	Onshore Biodiversity Technical Baseline Report
Scoping responses			
30/11/2020	MI	The MI questioned in their response whether the full set of environmental conservation designations was listed, e.g. Dublin Bay is a UNESCO biosphere reserve?	A baseline of all designated conservation sites within this EIAR chapter, including the biosphere reserve. This is provided in the Onshore Biodiversity Technical Baseline Report and is assessed in Sections 2.10 to 2.14.
30/11/2020	MI	The MI stated in their response that iWeBs data is for high tide (roosting) sites only and stated that given the development traverse intertidal areas there is a need for some low tide intertidal bird surveys to predict any potential disturbance effect.	Intertidal bird surveys were conducted at the Landfall location and are detailed further in the Intertidal Bird Surveys Reports. Findings have been summarised in Section 2.5.
10/11/2020	NPWS – Dublin Array Project Update	The NPWS noted in their response that proposed Onshore ECR should avoid Natura 2000 sites and sensitive habitats wherever possible.	Detailed in Section 2.5. Also refer to the Onshore Biodiversity Technical Baseline Report.

¹ Note that only consultation responses relating to onshore biodiversity have been included here.

Date	Consultation type	Consultation and key issues raised	Section where provision is addressed
10/11/2020	NPWS – Dublin Array Project Update	The NPWS stated in their response that habitats along the proposed Onshore ECR should be mapped using Fossitt habitat classification system.	Detailed in the Onshore Biodiversity Technical Baseline Report.
10/11/2020	NPWS – Dublin Array Project Update	The NPWS stated in their response that the assessment approach should be based on CIEEM 2018 EclA guidelines.	As noted in Section 2.4.
10/11/2020	NPWS – Dublin Array Project Update	The NPWS stated in their response that the Shanganagh Cliffs provide breeding habitat for sand martins.	The assessment of impacts and effects to birds is provided in Sections 00 to 2.14. The Onshore Biodiversity Technical Baseline Report also considers sand martin.
10/11/2020	NPWS – Dublin Array Project Update	The NPWS stated in their response that a potential otter holt may be present in Kill-o-the-Grange (Deansgrange) stream, located north of the proposed Landfall. Additionally, Loughlinstown River is noted for having potential otter habitat.	<p>Otters were considered in the Onshore Biodiversity Technical Baseline Report and the aquatic ecology surveys are provided in Annex 3 of Onshore Biodiversity Technical Baseline Report. This report provides further details on potential otter holts and suitable habitat across the onshore ECR.</p> <p>An otter holt was identified in the Shanganagh River, adjacent to the Shanganagh Wastewater Treatment Plant (WWTP). This along with otters in general have been considered in Sections 2.10 to 2.14.</p> <p>Potential impacts to otters have been considered in Sections 2.10 to 2.14.</p>

Date	Consultation type	Consultation and key issues raised	Section where provision is addressed
10/11/2020	NPWS – Dublin Array Project Update	A botanical survey recorded bee orchids <i>Ophrys apifera</i> on Shanganagh Cliffs.	The Onshore Biodiversity Technical Baseline Report provides an assessment on flora across the onshore ECR, including bee orchid. This is also considered in Section 2.10.
19/11/2020	DLRCC	DLRCC suggest that reference should be made to ‘Dublin Bay Biosphere, a UNESCO designation’ for all concerning environmental designations.	Dublin Bay Biosphere is included in the Onshore Biodiversity Technical Baseline Report and Section 2.5.
23/11/2020	IFI	Potential impacts should include loss of and disturbance to habitat due to cable installation.	Potential impacts to riparian habitats are considered in Sections 2.10 to 2.14.
		IFI suggest that the trenchless technique is the preferred option for cable installation at all locations, Landfall, watercourses and the intertidal area. IFI also suggest that in order to protect the fisheries resource, instream works in inland fisheries waters should only take place during the period July to September to avoid interference with the spawning migration and spawning process and to protect juvenile fish emerging from the gravels. It is essential that watercourse crossings where instream works are proposed are scheduled so that all works are completed before 30 th September in any year. It is preferable that all crossings of watercourses including drainage ditches be completed by trenchless techniques. The timing constraints do not apply to trenchless techniques which may take place at any time of year subject to agreement with IFI on a method statement and location of the crossing points. The CEMP should include a frack-out contingency plan to eliminate any adverse effects from the trenchless procedure.	This was assessed and presented within Sections 2.10 to 2.14

Date	Consultation type	Consultation and key issues raised	Section where provision is addressed
		<p>Additional Watercourses includes the River Dargle, which is an EU Designated Salmonid River which holds populations of Atlantic Salmon, Sea Trout and Brown Trout.</p> <p>IFI also recommend that all fish species that live in or transition through the study area should be included in potential impact of underwater noise.</p>	<p>This is presented within the aquatic baseline report (Annex 3 of the Onshore Biodiversity Technical Baseline Report) and underwater noise is assessed in Sections 2.10 to 2.14.</p>
03/10/2023	NPWS – Dublin Array Project Update	<p>Extensive data (5 years) for bats for the corridor between Carrickmines and Shanganagh will be used.</p>	<p>The Onshore Biodiversity Technical Baseline Report provides a desk study for bats including data within this timeframe.</p>

2.4 Methodology

Zone of influence, study area, and baseline data

Zone of influence

- 2.4.1 The Zone of Influence (Zoi) of the proposed development is the area over which ecological features may be subject to significant effects as a result of its construction, operation, decommissioning and/or associated activities. The Zoi can extend beyond the boundary of the site, for example where there are hydrological links beyond the site.
- 2.4.2 The Zoi will vary for different ecological features depending on their sensitivity to an environmental change. It is, therefore, appropriate to identify different Zoi for different ecological features, including designated sites, habitats, and species.
- 2.4.3 As recommended by CIEEM guidance (CIEEM, 2018), professionally accredited or published studies, where available, and professional judgement were used to determine the likely Zoi. Initial Zois were updated where necessary based on the results of the desk study and field surveys. Where information was limited, the precautionary principle was applied and a Zoi was established on that basis. The overall study area, which is described in the following section, was then finalised ensuring that each Zoi was included.

Designated sites

- 2.4.4 An initial search area of 15 km was adopted, following which the source-pathway-receptor model was used to identify any additional sites with hydrological and/or ecological connectivity beyond this initial search area. Information on designated sites within a minimum of 15 km of the onshore infrastructure, as well as any designated sites with a hydrological and/or ecological connection were obtained using NPWS data and EPA map viewer².
- 2.4.5 The potential for connectivity with the onshore infrastructure was assessed using the available datasets and professional judgement. The 15 km buffer from the proposed development was used as an arbitrary distance within which the initial desktop search was undertaken. This 15 km distance is considered sufficient given the location, nature and scale of the onshore proposed infrastructure of Dublin Array. Beyond this 15 km buffer, only European sites with hydrological and/or ecological connectivity with the OES and O&M Base have been considered.

² <https://gis.epa.ie/EPAMaps/>

European designated sites

2.4.6 Designated sites are sites of national and international nature conservation importance that are afforded protection as set out in this section. Special Areas of Conservation (SAC) are designated under the Habitats Directive, which provides for the protection of certain habitats (listed on Annex I of the Directive) and/or species (listed on Annex II of the Directive) within SACs. Special Protection Areas (SPA) are designated under the Birds Directive, which allows for the protection of bird species listed on Annex I of the Directive, regularly occurring populations of migratory species, and important wetland habitats for birds, including within SPAs, Ramsar sites and the Dublin Bay UNESCO Biosphere.

Nationally designated sites

2.4.7 National Heritage Areas (NHA) are designated under the Wildlife Acts to protect habitats, species or geology of national importance. Many of the NHAs in Ireland overlap with European sites. Numerous NHAs are not yet fully designated under this legislation. These are referred to in the meantime as ‘proposed NHAs’ (pNHA). pNHAs are protected from damage from the date they are proposed for designation, under section 19 of the Wildlife Amendment Act, 2000, as amended, are additionally protected through local planning policies, and are sites of importance for wildlife and habitats.

2.4.8 NHAs and pNHAs within the Zols were identified as part of the desktop search. This is considered a suitable distance due to the potential impacts that are anticipated to occur from the Onshore ECR, Landfall, OSS, and TCC areas. This distance also included all NHAs that are potentially hydrologically and/or ecologically connected to the various onshore elements of the project.

Locally Important Biodiversity Sites

2.4.9 Locally Important Biodiversity Sites (LIBS), are non-designated sites where action is being taken to promote biodiversity. They have no formal protection but serve to highlight sites which may be worthy of protection or enhancement and provides additional benefits to, or supports, the protected area network. They do not overlap with protected sites but may be adjacent to them.

Overall study area

2.4.10 The overall study area for onshore biodiversity comprises the following areas:

- ▲ The proposed OES which comprises the proposed Landfall Site (including temporary construction compound), the onshore ECR (Sectors 1 – 7 and 50 m buffer either side) the proposed OSS, the onshore grid connection route between the proposed OSS and the existing Carrickmines 220 kV substation and Temporary Construction Compounds (TCCs) at Clifton Park and Leopardstown. A 50 m buffer was deemed reasonable for a detailed habitat survey due to the limited nature of the likely impacts from the construction works and operation from an onshore export cable and substation.

- ▲ The proposed O&M Base, that will be located adjacent to, and on St. Michael’s Pier in Dún Laoghaire Harbour, which includes a new pontoon fixed to the existing harbour wall. This area includes the proposed site of the O&M Base on Dún Laoghaire Harbour, plus the pontoon adjacent to the harbour wall. Given the nature of the proposed development of the O&M Base a 500 m buffer was considered reasonable for a detailed habitat survey. This is greater than the buffer used for the study area due to the increased sensitivity of seabird species to disturbance from construction activities.

2.4.11 Additional study areas relating to onshore biodiversity included several survey locations across the various watercourses that run close to the OES (refer to the Aquatic Ecology Report, provided in the Onshore Biodiversity Technical Baseline Report). Some of these locations were slightly outside of the overall study area but were chosen to describe baseline conditions downstream of the proposed OES, thus providing a fuller picture of aquatic ecology within the ZOI for aquatic ecological features.

2.4.12 The stream and river names used in this chapter are the ones used by the EPA under the WFD. For clarity the EPA WFD naming structure has been used for the watercourses. The water courses are also known locally as:

- ▲ Kill-o-the-Grange Stream is often referred to as the Deansgrange Stream;
- ▲ Shanganagh River is often referred to as the Loughlinstown River; and
- ▲ Carrickmines Stream (which is a tributary of the Shanganagh River) is often referred to as the Ballyogan Stream or Barnacullia Stream further upstream.

2.4.13 The EPA WFD naming structure considers the following smaller streams, located within the study area, to comprise the Carrickmines Stream:

- ▲ Laughlanstown Stream (south of Cherrywood in Sector 4);
- ▲ Cabinteely Stream (draining north from the Carrickmines Stream at Cherrywood in Sector 5); and
- ▲ Jamestown 10 and Glenamuck North streams, which are located south of Carrickmines Retail Park in Sector 7).

Baseline data

2.4.14 Baseline data was gathered through the combination of a desk study and ecological surveys of the various areas of the onshore infrastructure (detailed above – Section 2.4.10). The desk study used the following data sources:

- ▲ National Parks and Wildlife Service (NPWS) online resources were accessed for information on sites with a statutory designation for nature conservation, specifically European sites (including SACs and SPAs), Ramsar sites and NHAs, and other sites such as pNHAs that are not legally designated but are identified as being of conservation interest, and protected habitats and species as defined under the NPWS 'Checklist of Protected and Threatened Species in Ireland' (Nelson et al., 2019);
- ▲ National Biodiversity Data Centre (NBDC) (NBDC, n.d.) online resource was accessed for information on protected habitats and species (Nelson et al., 2019);
- ▲ Records of Annex I habitats, and Annex II and IV species of the Habitats Directive (92/43/EEC) using Article 12 and Article 17 reports;
- ▲ Habitats listed under the DLRCC County Development Plan;
- ▲ Records of Annex I birds from the Birds Directive (2009/147/EC);
- ▲ Environmental Protection Agency (EPA) Maps (EPA Maps, 2023) were accessed for environmental information, such as surface water features, relevant to the assessment of likely significant effects;
- ▲ The BirdWatch Ireland website (BirdWatch Ireland, n.d.) was accessed for information on birds of conservation concern. Birds of Conservation Concern in Ireland (BoCCI), published by BirdWatch Ireland and the Royal Society for the Protection of Birds (RSPB) Northern Ireland (NI), is a list of priority bird species for conservation action on the island of Ireland. The BoCCI lists birds which breed and/or winter in Ireland and classifies them into three separate lists; Red, Amber and Green; based on the conservation status of the bird and hence their conservation priority. Birds on the Red List are those of highest conservation concern, Amber List are of medium conservation concern and Green List are not considered threatened;
- ▲ The protection of mammals is evaluated using one or more of the following documents; Wildlife Acts 1976 – 2018 (ISB, n.d.), the Red List of Terrestrial Mammals (Marnell et al., 2019), and Annexes of the EU Habitats Directive 92/43/EEC12 (European Commission, n.d.); and
- ▲ Where available and relevant, ecology reports prepared for other projects within the overall study area were reviewed. These included the Cherrywood Strategic Development Zone (SDZ) <https://www.dlrcoco.ie/planning/cherrywood-sdz>: Biodiversity Plan and Cherrywood SDZ Development Area 5 Ecological Appraisal were reviewed as part of this exercise (DLRCC, 2023).

2.4.15 NBDC biological records of species within the overall study area were obtained from relevant grid squares in which the various areas of the project were located. These are detailed in Table 2.

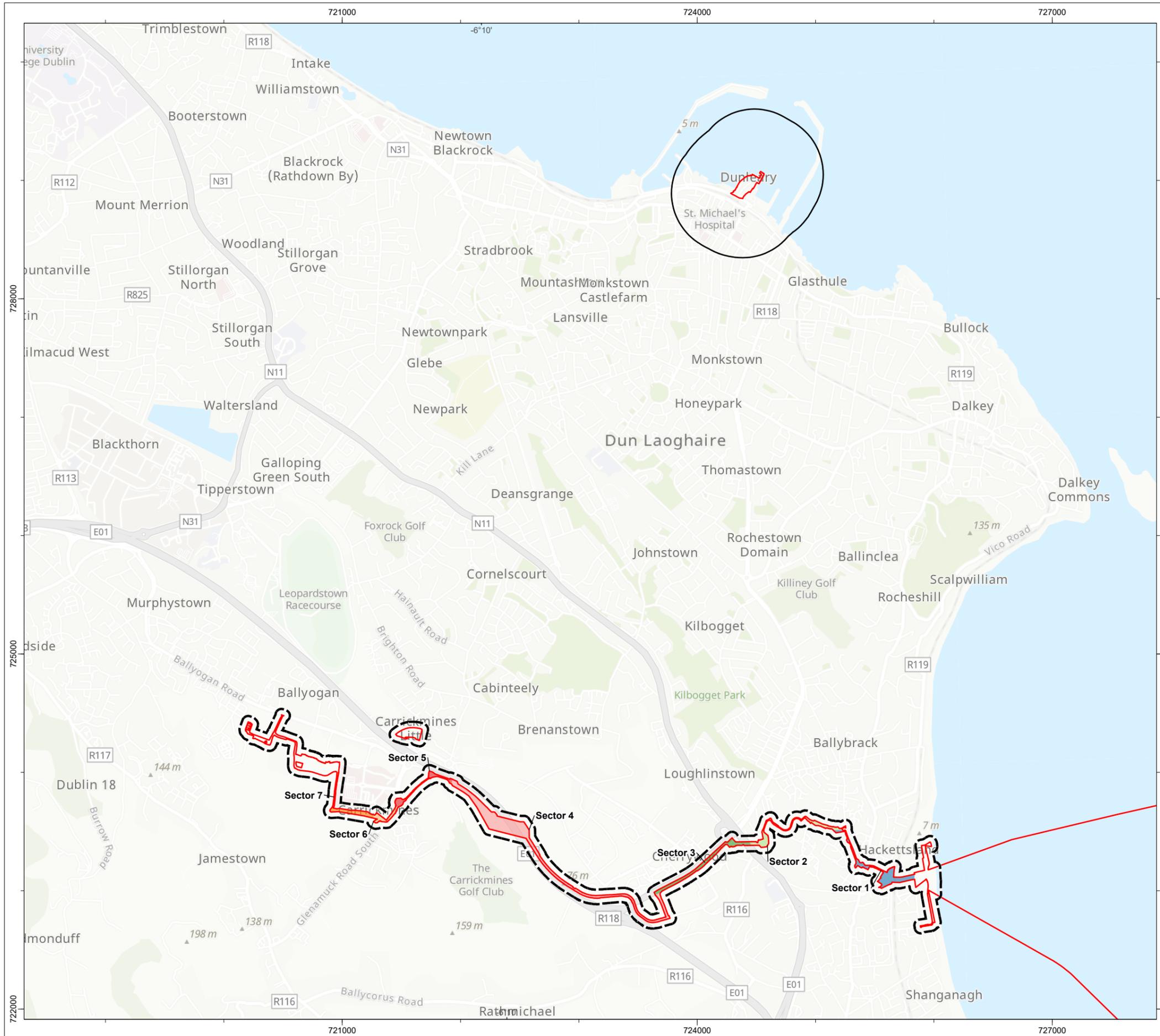
Table 2 Desk study grid squares

Date of data collection	Relevant area of the project	Grid square reference	Grid square size (km ²)
07/11/2023	Onshore ECR including the Landfall Site and the OSS	O2023, O2024, O2123, O2124, O2222, O2223, O2224, O2322, O2323, O2423, O2522, O2523, O2622, O2623	1
07/11/2023	O&M Base	O22J & O22P	2

Field surveys

- 2.4.16 Field surveys were carried out within the overall study area to establish the baseline ecology. The dates and details of the surveys are provided in the survey metadata, which is provided in the Onshore Biodiversity Technical Baseline Report.
- 2.4.17 The approach to the field surveys was based on accepted standard practice and methods. Habitats within the overall study area were classified after ‘A Guide to Habitats in Ireland’ (Fossitt, 2000) and Annex I habitats as defined by European Commission (EC) (2013) ‘Interpretation Manual of European Union Habitats’. The dominant plant species present, survey type and habitat type were recorded during the field surveys, and this is considered sufficient to allow accurate classification of the habitats present.
- 2.4.18 The overall study area was also appraised for its suitability to support species listed on Annex I of the Birds Directive, species listed on Annex II and Annex IV of the Habitats Directive, other protected species such as amphibians, common lizard, badgers, and bats, and other threatened species (as defined by Nelson et al., 2019). Incidental sightings of birds, mammals and amphibians were recorded during the habitat survey. The overall study area was also appraised for its suitability to support birds listed on Annex I of the Birds Directive and Birds of Conservation Concern in Ireland (BoCCI).
- 2.4.19 Trees or structures suitable for bat roosts and potential suitable bat foraging were noted where they occurred within the overall study area. Trees or structures within the onshore ECR were visually inspected from the ground level for Potential Roost Features (PRF) where it was considered likely that they may be suitable for use by roosting bats. Potential roosts/roost features and bat foraging habitat were evaluated using the criteria set out in the BCT guidelines.
- 2.4.20 All trees identified with PRFs or FAR for roosting bats noted within the search area that were considered likely to be impacted by the proposed development underwent bat presence/absence surveys. These surveys were conducted following the 2016 BCT guidance (Collins 2016; updated 2023). The surveys started no later than 15 minutes prior to sunset and ended no later than 1 hour 30 minutes after sunset with surveyors holding Anabat swift or Elekon Batlogger M bat detectors whilst visibly monitoring Potential Roosting Features (PRFs) on the tree.

- 2.4.21 Invasive species were noted where present. For the purposes of this report ‘invasive species’ are those which are listed in Part 1 and Part 2 of the Third Schedule within the Habitats Directive.
- 2.4.22 Watercourses were assessed for the potential to support protected and threatened species including otter *Lutra lutra*, white-clawed crayfish *Austropotamobius pallipes*, lampreys, European eel and Atlantic salmon *Salmo salar*. A range of survey techniques were undertaken including eDNA, Q-sampling, and otter surveys. The methodology of the aquatic ecology surveys is detailed fully in the Aquatic Ecology Report (provided in the Onshore Biodiversity Technical Baseline Report). A total of 14 survey sampling locations were undertaken (detailed in Table 3).



- Application Site Boundary
 - Onshore Electrical System (OES) 50 m Study Area
 - Operations and Maintenance Base (O&M Base) 500 m Study Area
- Export Cable Route (ECR) Sector**
- Sector 1
 - Sector 2
 - Sector 3
 - Sector 4
 - Sector 5
 - Sector 6
 - Sector 7

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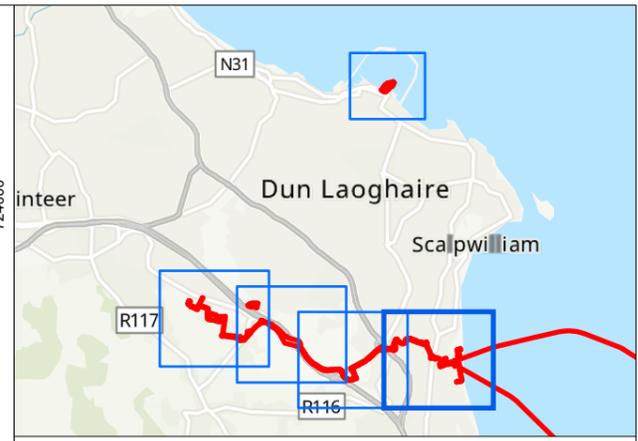
PROJECT TITLE
Dublin Array

DRAWING TITLE
Biodiversity: Study Area

DRAWING NUMBER: **1** PAGE NUMBER: **1 of 1**

VER	DATE	REMARKS	DRAW	CHEK	APRD
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02	2025-02-17	PUBLIC	JK	SW	AE





Application Site Boundary

Onshore Electrical System (OES) 50 m Buffer

Onshore Electrical System (OES) Design

- TJB
- Temporary Trenchless Crossing Compound
- Underground Joint Bay
- Onshore Export Cable Route (Trenchless)
- Onshore Export Cable Route (Trenched)
- Temporary Construction Compound (TCC)
- Landfall TJB Area

Export Cable Route (ECR) Sector

- Sector 1
- Sector 2
- Sector 3

Tree Roost Potential

- High
- Moderate
- Low

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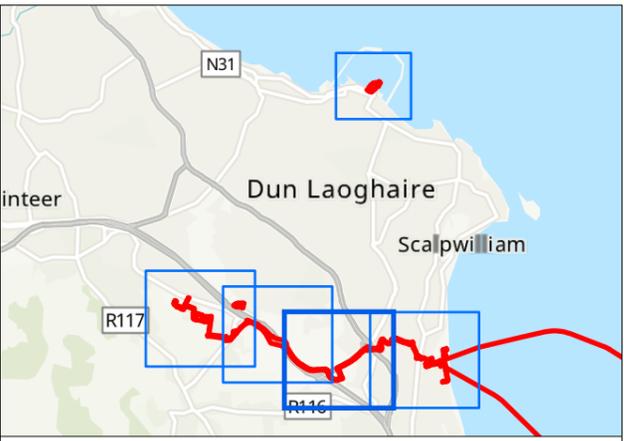
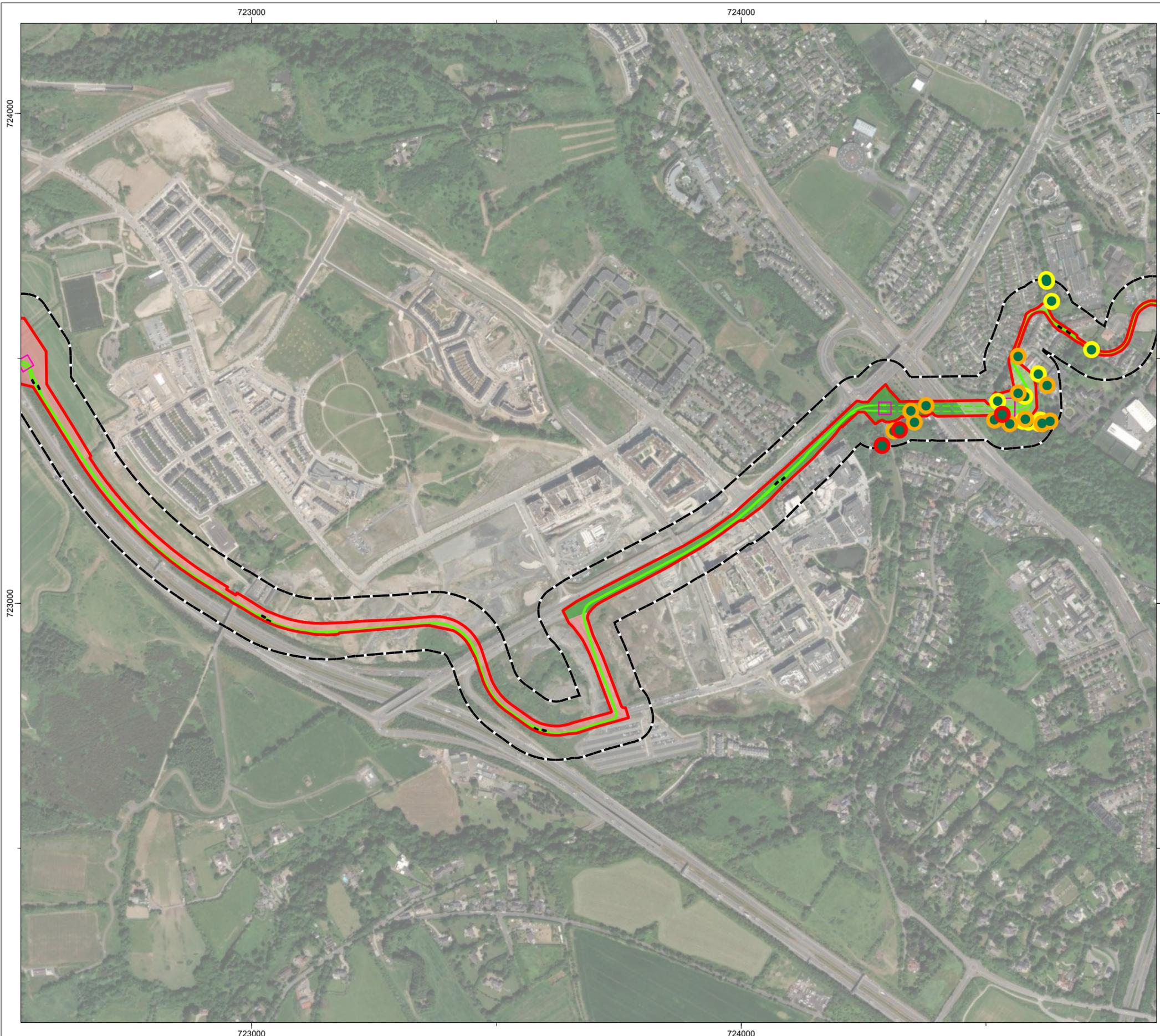
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DRAWING TITLE **Biodiversity: Trees and Bat Roosting Potential**

DRAWING NUMBER: **Figure 2** PAGE NUMBER: **1 of 1**

VER	DATE	REMARKS	DRAW	CHEK	APRD
01	2025-02-12	DRAFT	JK	SW	AE
02	2025-02-06	PUBLIC	JK	CM	AM





Application Site Boundary

Onshore Electrical System (OES) 50 m Buffer

Onshore Electrical System (OES) Design

- Temporary Trenchless Crossing Compound
- Underground Joint Bay
- Onshore Export Cable Route (Trenchless)
- Onshore Export Cable Route (Trenched)

Export Cable Route (ECR) Sector

- Sector 2
- Sector 3
- Sector 4

Tree Roost Potential

- High
- Moderate
- Low

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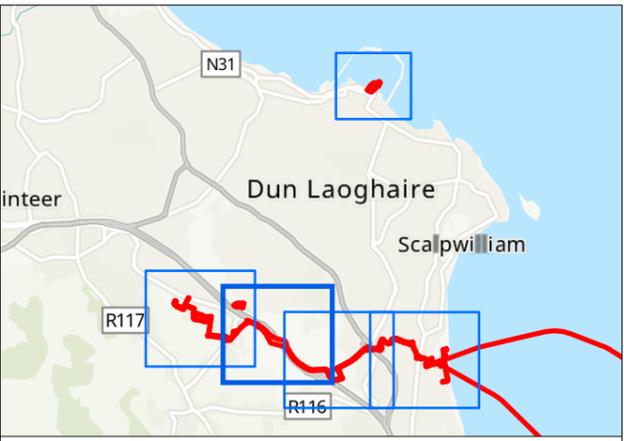
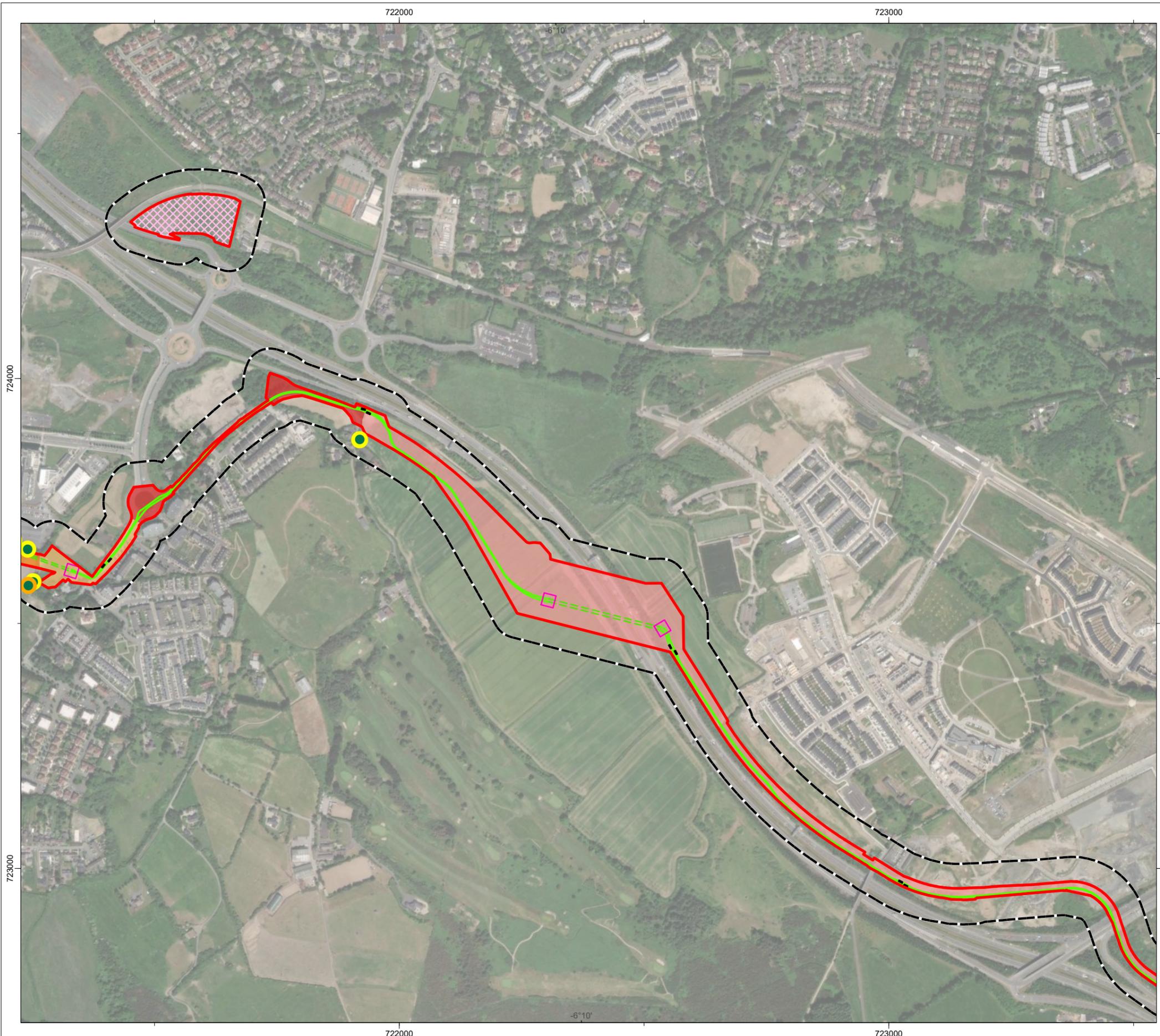
PROJECT TITLE **Dublin Array**

DRAWING TITLE **Biodiversity: Trees and Bat Roosting Potential**

DRAWING NUMBER: **Figure 3** PAGE NUMBER: **1 of 1**

VER	DATE	REMARKS	DRAW	CHEK	APRD
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02	2025-02-06	PUBLIC	JK	CM	AM





Application Site Boundary

Onshore Electrical System (OES) 50 m Buffer

Onshore Electrical System (OES) Design

- Temporary Trenchless Crossing Compound
- Underground Joint Bay
- Onshore Export Cable Route (Trenchless)
- Onshore Export Cable Route (Trenched)
- Temporary Construction Compound (TCC)

Export Cable Route (ECR) Sector

- Sector 4
- Sector 5
- Sector 6
- Sector 7

Tree Roost Potential

- Moderate
- Low

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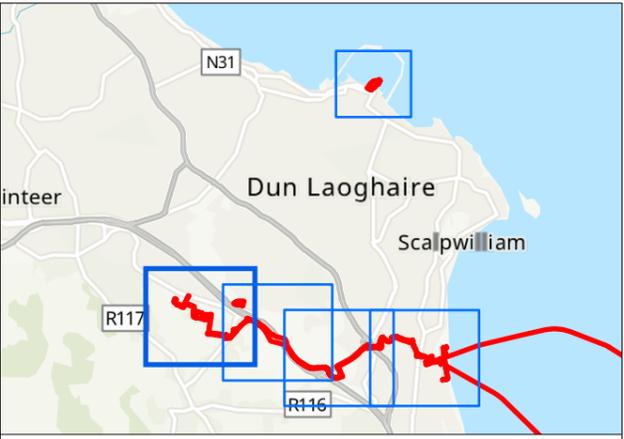
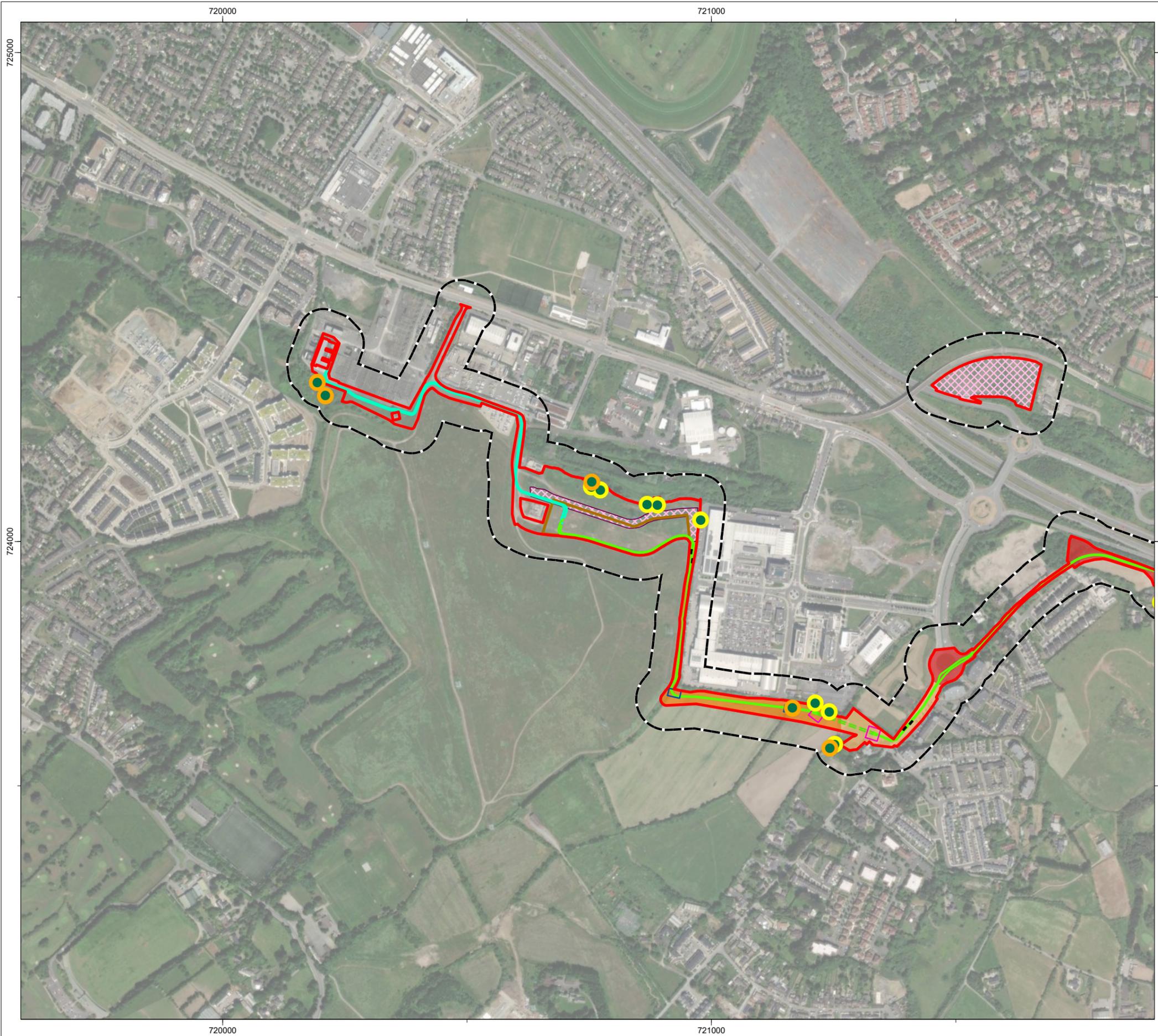
PROJECT TITLE **Dublin Array**

DRAWING TITLE **Biodiversity: Trees and Bat Roosting Potential**

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VER	DATE	REMARKS	DRAW	CHEK	APRD
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02	2025-02-06	PUBLIC	JK	CM	AM





- Application Site Boundary
- Onshore Electrical System (OES) 50 m Buffer
- Onshore Electrical System (OES) Design**
- Onshore ECR Watercourse Crossing (trenched)
- Temporary Trenchless Crossing Compound
- Underground Joint Bay
- Onshore Export Cable Route (Trenchless)
- Onshore Export Cable Route (Trenched)
- Grid Connection Cable
- Onshore Substation (OSS) Boundary
- Temporary Construction Compound (TCC)
- Export Cable Route (ECR) Sector**
- Sector 5
- Sector 6
- Sector 7
- Tree Roost Potential**
- Moderate
- Low

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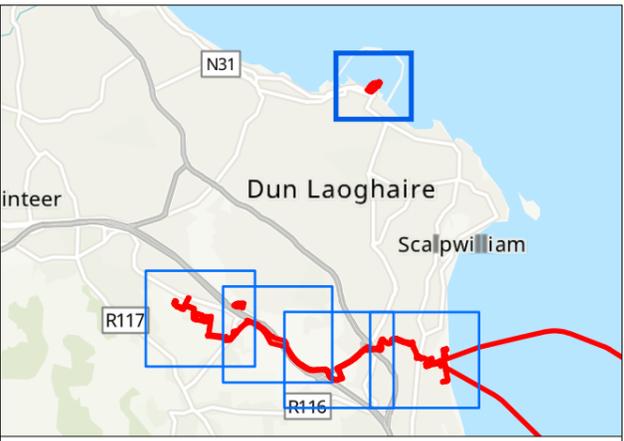
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DRAWING TITLE **Biodiversity: Trees and Bat Roosting Potential**

DRAWING NUMBER: **Figure 5** PAGE NUMBER: **1 of 1**

VER	DATE	REMARKS	DRAW	CHEK	APRD
01	2025-02-12	DRAFT	JK	SW	AE
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- Application Site Boundary
- Operations and Maintenance Base (O&M Base) 500 m Buffer

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PROJECT TITLE **Dublin Array**

DRAWING TITLE **Biodiversity:
 Trees and Bat Roosting Potential**

DRAWING NUMBER: **Figure 6** PAGE NUMBER: **1 of 1**

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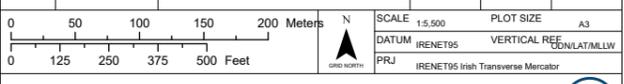


Table 3 Aquatic survey sites

Site no.	Watercourse	EPA code	Location	Alternative name	X (ITM)	Y (ITM)
A1	Unnamed stream	n/a	Jamestown	n/a	720615	724202
A2	Barnacullia Stream	10899	Jamestown	Ballyogan Stream	720891	724089
A3	Jamestown Stream	10J01	Carrickmines Great	n/a	720922	723686
A4	Glenamuck North Stream	10G19	Carrickmines Great	Golf Stream	721167	723658
A5	Unnamed stream	n/a	Carrickmines Great	n/a	721259	723629
A6*	Carrickmines Stream	10C04	Carrickmines Little	n/a	721772	724212
A6b	Carrickmines Stream	10C04	Carrickmines Park & Ride	n/a	722200	724024
A7	Laughanstown Stream	10L07	Carrickmines Great	n/a	722386	723149
A7b	Laughanstown Stream	10L07	Carrickmines Great	n/a	722481	723921
A8*	Carrickmines Stream	10C04	Cherrywood Park	Loughlinstown River North	724338	723387
A9*	Shanganagh River	10S01	Shanganagh Wood	n/a	725587	723085
B1	Kill-O-The-Grange Stream	10K02	R118 road culvert	Deansgrange Stream	724617	723919
B2	Kill-O-The-Grange Stream	10K02	Glencar Lawn	Deansgrange Stream	724998	723617
B3*	Kill-O-The-Grange Stream	10K02	Achill Road	Deansgrange Stream	725167	723512

Note: For further detail see Aquatic Ecology Report (provided in Annex 3 of the Onshore Biodiversity Technical Baseline Report).

*eDNA sampling for Atlantic salmon, brown/sea trout, European eel *Anguilla anguilla* & lamprey *Lamptetra* sp.

Assessment methodology

- 2.4.23 The ecological evaluation and assessment within this chapter has been undertaken with reference to relevant parts of the 2018 Guidelines for Ecological Impact Assessment in the UK and Ireland developed by Chartered Institute of Ecology and Environmental Management (CIEEM) ‘Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine’ (CIEEM, 2018 updated 2022) (henceforth referred to as the CIEEM guidelines).
- 2.4.24 Although this is recognised as current good practice for ecological assessment, the guidance itself recognises that it is not a prescription about exactly how to undertake an ecological impact assessment (EclA); rather, they *‘provide guidance to practitioners for refining their own methodologies’*.
- 2.4.25 The CIEEM guidelines are widely regarded as industry best practice. It is noted that this differs in places from the Dublin Array EIA methodology set out in Volume 2, Chapter 3: ‘EIA Methodology’ which follows the approach set out in the EPA ‘Guidelines on the information to be contained in Environmental Impact Assessment Reports’ (EPA, 2022). The approach is explained below.

Important ecological features

- 2.4.26 In accordance with the CIEEM guidelines, only ecological receptors (habitats, species, ecosystems and their functions/processes) which are considered to be important and potentially affected by a proposed development should be subject to detailed assessment. As stated in the CIEEM guidelines: *‘it is not necessary to carry out detailed assessment of receptors that are sufficiently widespread, unthreatened and resilient to impacts from the proposed development and will remain viable and sustainable’*. For this assessment effects have therefore been assessed for receptors of Local value or greater, plus any additional receptors subject to legal protection.
- 2.4.27 Important Ecological Features (IEFs) comprise the following:
- ▲ Designated sites, including European, nationally, and locally designated sites;
 - ▲ Habitats listed on Annex I of the Habitat Directive;
 - ▲ Populations of bird species listed on Annex I of the Birds Directive;
 - ▲ Populations of protected and threatened species as defined by Nelson et al. (2019);
 - ▲ Match descriptions of habitats listed on Annex I of the Habitats Directive;
 - ▲ Match descriptions of habitats listed on local biodiversity plans or are provided protection through policies listed under the county development plans; or
 - ▲ Comprise a significant habitat resource for an important species.

Determining value

2.4.28 All IEFs (sites, habitat areas, species populations, veteran trees, etc.) were assigned a level of value based upon the published guidelines for ecological impact assessment (CIEEM, 2018). The levels of value available for use in the assessment are:

- ▲ International;
- ▲ National (i.e. Ireland);
- ▲ Regional (i.e. Leinster);
- ▲ County (i.e. Dublin);
- ▲ Local; and
- ▲ Negligible.

2.4.29 The level of value is determined by reference to standard criteria from the CIEEM (2018) guidelines. All features of Local value and higher are considered in the assessment if they are likely to be significantly affected. Other features are also considered in the assessment if they are protected by law or policy, or otherwise require consideration in the development process. All features of negligible value have been reasonably discounted from the assessment.

Assessment criteria

2.4.30 The impact assessment process involves the following steps:

- ▲ Identifying and characterising potential impacts;
- ▲ Incorporating measures to avoid and mitigate (reduce) these impacts;
- ▲ Assessing the significance of any residual effects after mitigation;
- ▲ Identifying appropriate compensation measures to offset significant residual effects (if required); and
- ▲ Identifying opportunities for ecological enhancement.

2.4.31 In accordance with CIEEM guidelines, when describing ecological impacts reference has been made to the following characteristics, as appropriate.

- ▲ Positive or negative;
- ▲ Extent;
- ▲ Magnitude;

- ▲ Duration³;
- ▲ Timing;
- ▲ Frequency; and
- ▲ Reversibility.

2.4.32 The impact assessment process considers both direct and indirect impacts: direct ecological impacts are changes that are directly attributable to a defined action, e.g. the physical loss of habitat occupied by a species during the construction process. Indirect ecological impacts are attributable to an action, but which affect ecological resources through effects on an intermediary ecosystem, process, or feature (e.g. the creation of roads which cause hydrological changes, which, in the absence of mitigation, could lead to the drying out of wet grassland).

Assessment of significance

2.4.33 In accordance with CIEEM guidelines, a significant effect, for the purposes of Ecological Impact Assessment (EIA), is defined as an effect that either supports or undermines biodiversity conservation objectives for ‘important ecological receptors’ or for biodiversity in general. Conservation objectives may be specific (e.g. for a designated site) or broad (e.g. national/local nature conservation policy) or more wide-ranging (enhancement of biodiversity). It is one that is sufficiently important to require assessment and reporting so that the decision-maker is adequately informed as to the environmental consequences of permitting the project.

2.4.34 Effects can be considered significant at a wide range of scales from international to local (paragraph 2.4.28). For example, a significant effect on a NHA or pNHA is likely to be of national significance whilst a significant effect on a regionally important population of a species is likely to be of regional significance. In some circumstances the scale of significance of an effect may also differ from the geographic context in which the feature is considered important.

2.4.35 The nature of the identified effects on each assessed feature is characterised. This is considered using available research and professional judgement against the sensitivity of the feature affected, and how the impact is likely to affect the feature. Where it is concluded that an effect would be likely to reduce the importance of an assessed feature, it is described as significant. The degree of significance of the effect takes into account the geographic context of the feature’s importance and the degree to which its interest is judged to be affected.

³ Duration of effects follows the EPA guidance where: momentary (seconds to minutes), brief (less than 1 day), temporary (less than 1 year) short-term (effects lasting 1 to 7 years), medium-term (7 to 15 years), long-term (15 to sixty years), permanent (>60 years).

2.4.36 In summary:

- ▲ For designated sites – effects may be significant if they are likely to undermine the conservation objectives of the site; or positively or negatively affect the conservation status of the species or habitats for which the site is designated; or may affect the condition of the site or its qualifying interest(s).
- ▲ For ecosystems – effects may be significant if the project is likely to result in a change in ecosystem structure and function. Consideration should be given as to whether any processes or key characteristics will be removed or changed, including effects to the extent, structure, and function of habitats or if there is an effect on the average population size and viability of component species.

Cumulative effects

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

2.4.38 Other projects that are be considered when establishing cumulative effects are:

- ▲ proposals for which consent has been applied but which are awaiting determination;
- ▲ projects which have been granted consent, but which have not yet been started or which have been started but are not yet completed (i.e. under construction);
- ▲ proposals which have been refused permission, but which are subject to appeal, and the appeal is undetermined; or
- ▲ developments specifically referenced in a county development plan.

Avoidance, mitigation, compensation and enhancement

2.4.39 The purpose of avoidance, mitigation, and compensation measures is to reduce the extent or magnitude of project impacts. The aim of these measures is to reduce the project’s adverse impacts such that there is no net loss⁴ of biodiversity as a result of the project. Within EclA, mitigation measures should be described clearly, and their likely success assessed.

2.4.40 When seeking mitigation or compensation solutions, the CIEEM guidelines state that efforts should be consistent with the geographical scale at which an effect is significant. For example, mitigation and compensation for effects on a species population that is significant at a county scale should ensure, where possible, there are no adverse effects upon the population status at a county scale.

⁴ 4th National Biodiversity Action Plan, Action Number 3C1: ‘All Public Authorities and private sector bodies move towards no net loss of biodiversity through strategies, planning, mitigation measures, appropriate offsetting and/or investment in Blue-Green infrastructure’.

- 2.4.41 Where potentially significant effects have been identified, the mitigation hierarchy has been applied, as recommended in the CIEEM guidelines. The mitigation hierarchy sets out a sequential approach beginning with the avoidance of impacts where possible. Where avoidance of impacts is not possible, the application of mitigation measures to minimise unavoidable impacts; and then compensation for any remaining impacts. Once avoidance and mitigation measures have been applied, residual effects are then identified along with any necessary compensation measures, and incorporation of opportunities for enhancement.
- 2.4.42 Many of the avoidance measures have been implemented in the design scheme as project design features and other avoidance and preventative measures, which is detailed in Section 2.9.

2.5 Receiving environment

- 2.5.1 The Onshore Biodiversity Technical Baseline Report provides a detailed characterisation of the receiving baseline in terms of biodiversity and ecological features. A summary of the ecological features that have been scoped into the assessment from the findings of this report has been summarised in Table 4. This section is not intended to repeat or to carry out any additional assessment of impacts within the Onshore Biodiversity Technical Baseline Report.

Table 4 Summary of baseline ecological features with distance from the OES

Ecological feature		Relevant sector(s)/Distance from closest point from the OES	Study area	Assessment of importance	Details
OES					
Internationally designated sites	Dublin Bay Biosphere	Associated with: <ul style="list-style-type: none"> ▪ North Dublin Bay SAC; ▪ Rockabill to Dalkey Island SAC; ▪ Howth Head SAC and SPA; ▪ North Bull Island SPA; ▪ South Dublin Bay and River Tolka Estuary SPA. 	Located within 15 km or downstream where hydrologically connected.	International	UNESCO designation recognised for its biodiversity of the area. DLRCC policy protection: GIB10 and DCC policy protection GIB137 and GIB139.
	Sandymount Strand/Tolka Estuary Ramsar site	4.7 km from OES	Located within 15 km of the project	International	The Site supports an excellent diversity of wintering waterfowl, regularly supporting in excess of 20 000 waterbirds. Sandymount Strand/Tolka Estuary is designated as a EU Natura 2000 Site (Special Protection Area) due to the presence of nationally and internationally important populations of species listed on Annex I/II of E.U. Birds Directive. Under this designation the wetland habitat is also protected as a

Ecological feature	Relevant sector(s)/Distance from closest point from the OES	Study area	Assessment of importance	Details	
				<p>resource for the regularly-occurring migratory waterbirds that utilise it. An internationally important population of light-bellied brent goose, black tailed godwit and bar-tailed godwit occur at the site; and a further 19 species occur at nationally important numbers. South Dublin Bay is the premier site in Ireland for the Mediterranean gull and is a regular autumn roosting ground for significant numbers of terns. A number of these bird species are listed on Annex I of the Birds Directive.</p> <p>Sandymount Strand/Tolka Estuary occurs within the UNESCO Dublin Bay Biosphere and the Dublin Bay Important Bird Area⁵.</p>	
European designated sites	Rockabill to Dalkey Island SAC [003000]	1.5 km from OES	Located within 15 km of the project or downstream where hydrologically connected.	International	<p>Policy protection: GIB22. The Habitats Directive.</p> <p>Qualifying Interests include:</p> <ul style="list-style-type: none"> ▪ 1170 Reefs ▪ 1351 Harbour Porpoise <i>Phocoena phocoena</i>
	Ballyman Glen SAC [000713]	3.9 km from OES			<p>Policy protection: GIB22. The Habitats Directive.</p> <p>Qualifying Interests include:</p>

⁵ Further information can be found at https://rsis.ramsar.org/RISapp/files/RISrep/IE832RIS_2303_en.pdf

Ecological feature	Relevant sector(s)/Distance from closest point from the OES	Study area	Assessment of importance	Details
				<ul style="list-style-type: none"> ▪ 7220 Petrifying springs with tufa formation Cratoneurion* ▪ 7230 Alkaline fens
	Knocksink Wood SAC [000725]	4.4 km from OES		<p>Policy protection: GIB22. The Habitats Directive.</p> <p>Qualifying Interests include:</p> <ul style="list-style-type: none"> ▪ 7220 Petrifying springs with tufa formation Cratoneurion* ▪ 91A0 Old sessile oak woods with Ilex and Blechnum in the British Isles ▪ 91E0 Alluvial forests with Alnus glutinosa and Fraxinus excelsior Alno-Padion, Alnion incanae, Salicion albae*
	South Dublin Bay SAC [000210]	4.7 km from OES		<p>Policy protection: GIB22. The Habitats Directive.</p> <p>Qualifying Interests include:</p> <ul style="list-style-type: none"> ▪ 1140 Mudflats and sandflats not covered by seawater at low tide ▪ 1210 Annual vegetation of drift lines ▪ 1310 Salicornia and other annuals colonising mud and sand ▪ 2110 Embryonic shifting dunes

Ecological feature		Relevant sector(s)/Distance from closest point from the OES	Study area	Assessment of importance	Details
	Bray Head SAC [000714]	5.1 km from OES			<p>Policy protection: GIB22. The Habitats Directive.</p> <p>Qualifying Interests include:</p> <ul style="list-style-type: none"> ▪ 1230 Vegetated sea cliffs of the Atlantic and Baltic coasts ▪ 4030 European dry heaths
	Wicklow Mountains SAC [002122]	5.6 km from OES			<p>Policy protection: GIB22. The Habitats Directive.</p> <p>Qualifying Interests include:</p> <ul style="list-style-type: none"> ▪ 3110 Oligotrophic waters containing very few minerals of sandy plains <i>Littorelletalia uniflorae</i> ▪ 3160 Natural dystrophic lakes and ponds ▪ 4010 Northern Atlantic wet heaths with <i>Erica tetralix</i> ▪ 4030 European dry heaths ▪ 4060 Alpine and Boreal heaths ▪ 6130 Calaminarian grasslands of the <i>Violetalia calaminariae</i> ▪ 6230 Species-rich <i>Nardus</i> grasslands, on siliceous substrates in mountain areas (and submountain areas, in Continental Europe)* ▪ 7130 Blanket bogs (* if active bog)

Ecological feature		Relevant sector(s)/Distance from closest point from the OES	Study area	Assessment of importance	Details
					<ul style="list-style-type: none"> ▪ 8110 Siliceous scree of the montane to snow levels (<i>Androsacetalia alpinae</i> and <i>Galeopsietalia ladani</i>) ▪ 8210 Calcareous rocky slopes with chasmophytic vegetation ▪ 8220 Siliceous rocky slopes with chasmophytic vegetation ▪ 91A0 Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles ▪ 1355 Otter <i>Lutra lutra</i>
	North Dublin Bay SAC [000206]	10.0 km from OES			<p>Policy protection: GIB22. The Habitats Directive.</p> <p>Qualifying Interests include:</p> <ul style="list-style-type: none"> ▪ 1140 Mudflats and sandflats not covered by seawater at low tide ▪ 1210 Annual vegetation of drift lines ▪ 1310 <i>Salicornia</i> and other annuals colonising mud and sand ▪ 1330 Atlantic salt meadows <i>Glaucopuccinellietalia maritima</i> ▪ 1410 Mediterranean salt meadows (<i>Juncetalia maritimi</i>) ▪ 2110 Embryonic shifting dunes

Ecological feature	Relevant sector(s)/Distance from closest point from the OES	Study area	Assessment of importance	Details
				<ul style="list-style-type: none"> 2120 Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) 2130 Fixed coastal dunes with herbaceous vegetation (grey dunes)* 2190 Humid dune slacks <p>Species</p> <ul style="list-style-type: none"> 1395 Petalwort <i>Petalophyllum ralfsii</i>
	Glenasmole Valley SAC [001209]	10.5 km from OES		<p>Policy protection: GIB22. The Habitats Directive.</p> <p>Qualifying Interests include:</p> <ul style="list-style-type: none"> 6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates <i>Festuco-Brometalia</i> (* important orchid sites) 6410 <i>Molinia</i> meadows on calcareous, peaty or clayey-silt-laden soils <i>Molinion caeruleae</i> 7220 Petrifying springs with tufa formation <i>Cratoneurion</i>*
	Glen of the Downs SAC [000719]	10.9 km from OES		<p>Policy protection: GIB22. The Habitats Directive.</p> <p>Qualifying Interests include:</p> <ul style="list-style-type: none"> 91A0 Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles

Ecological feature		Relevant sector(s)/Distance from closest point from the OES	Study area	Assessment of importance	Details
	Howth Head SAC [000202]	13.0 km from OES			<p>Policy protection: GIB22. The Habitats Directive.</p> <p>Qualifying Interests include:</p> <ul style="list-style-type: none"> 1230 Vegetated sea cliffs of the Atlantic and Baltic coasts 4030 European dry heaths
	The Murrough SAC [002249]	14.9 km from the OES			<p>Policy protection: GIB22. The Habitats Directive.</p> <p>Qualifying Interests include:</p> <ul style="list-style-type: none"> 1210 Annual vegetation of drift lines 1220 Perennial vegetation of stony banks 1330 Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>) 1410 Mediterranean salt meadows (<i>Juncetalia maritimi</i>) 7210 Calcareous fens with <i>Cladium mariscus</i> and species of the <i>Caricion davallianae</i> 7230 Alkaline fens
	Dalkey Islands SPA [004172]	3.2 km from OES			<p>Policy protection: GIB22. The Habitats Directive.</p> <p>Qualifying Interests include:</p> <ul style="list-style-type: none"> A192 Roseate Tern <i>Sterna dougallii</i>

Ecological feature	Relevant sector(s)/Distance from closest point from the OES	Study area	Assessment of importance	Details
	South Dublin Bay and River Tolka Estuary SPA [004024]	4.7 km from OES		<ul style="list-style-type: none"> ▪ A193 Common Tern <i>Sterna hirundo</i> ▪ A194 Arctic Tern <i>Sterna paradisaea</i> <p>Policy protection: GIB22. The Habitats Directive. Qualifying Interests include:</p> <ul style="list-style-type: none"> ▪ A046 Light-bellied Brent Goose <i>Branta bernicla hrota</i> ▪ A130 Oystercatcher <i>Haematopus ostralegus</i> ▪ A137 Ringed Plover <i>Charadrius hiaticula</i> ▪ A141 Grey Plover <i>Pluvialis squatarola</i> ▪ A143 Knot <i>Calidris canutus</i> ▪ A144 Sanderling <i>Calidris alba</i> ▪ A149 Dunlin <i>Calidris alpina</i> ▪ A157 Bar-tailed Godwit <i>Limosa lapponica</i> ▪ A162 Redshank <i>Tringa totanus</i> ▪ A179 Black-headed Gull <i>Chroicocephalus ridibundus</i> ▪ A192 Roseate Tern <i>Sterna dougallii</i> ▪ A193 Common Tern <i>Sterna hirundo</i> ▪ A194 Arctic Tern <i>Sterna paradisaea</i> ▪ Wetlands

Ecological feature	Relevant sector(s)/Distance from closest point from the OES	Study area	Assessment of importance	Details
Wicklow Mountains SPA [004040]	5.9 km from OES			Policy protection: GIB22. The Habitats Directive. Qualifying Interests include: <ul style="list-style-type: none"> ▪ A098 Merlin <i>Falco columbarius</i> ▪ A103 Peregrine <i>Falco peregrinus</i>
North Bull Island SPA [004006]	10.0 km from OES			Policy protection: GIB22. The Habitats Directive. Qualifying Interest include: <ul style="list-style-type: none"> ▪ A046 Light-bellied Brent Goose <i>Branta bernicla hrota</i> ▪ A048 Shelduck <i>Tadorna tadorna</i> ▪ A052 Teal <i>Anas crecca</i> ▪ A054 Pintail <i>Anas acuta</i> ▪ A056 Shoveler <i>Anas clypeata</i> ▪ A130 Oystercatcher <i>Haematopus ostralegus</i> ▪ A140 Golden Plover <i>Pluvialis apricaria</i> ▪ A141 Grey Plover <i>Pluvialis squatarola</i> ▪ A143 Knot <i>Calidris canutus</i> ▪ A144 Sanderling <i>Calidris alba</i> ▪ A149 Dunlin <i>Calidris alpina</i> ▪ A156 Black-tailed Godwit <i>Limosa limosa</i> ▪ A157 Bar-tailed Godwit <i>Limosa lapponica</i>

Ecological feature	Relevant sector(s)/Distance from closest point from the OES	Study area	Assessment of importance	Details
				<ul style="list-style-type: none"> ▪ A160 Curlew <i>Numenius arquata</i> ▪ A162 Redshank <i>Tringa totanus</i> ▪ A169 Turnstone <i>Arenaria interpres</i> ▪ A179 Black-headed Gull <i>Chroicocephalus ridibundus</i> ▪ Wetlands
	Howth Head Coast SPA [004113]			<p>Policy protection: GIB22. The Habitats Directive.</p> <p>Qualifying Interests include:</p> <ul style="list-style-type: none"> ▪ A188 Kittiwake <i>Rissa tridactyla</i>
	The Murrough SPA [004186]			<p>Policy protection: GIB22. The Habitats Directive.</p> <p>Qualifying Interests include:</p> <ul style="list-style-type: none"> ▪ Red-throated Diver (<i>Gavia stellata</i>) [A001] ▪ Greylag Goose (<i>Anser anser</i>) [A043] ▪ Light-bellied Brent Goose (<i>Branta bernicla hrota</i>) [A046] ▪ Wigeon (<i>Anas penelope</i>) [A050] ▪ Teal (<i>Anas crecca</i>) [A052] ▪ Black-headed Gull (<i>Chroicocephalus ridibundus</i>) [A179] ▪ Herring Gull (<i>Larus argentatus</i>) [A184]

Ecological feature	Relevant sector(s)/Distance from closest point from the OES	Study area	Assessment of importance	Details
Nationally designated sites	Dalkey Coastal Zone and Killiney Hill pNHA [001206]	0.01 km from the OES	Located within 2 km or downstream where hydrologically connected	<ul style="list-style-type: none"> ▪ Little Tern (<i>Sterna albifrons</i>) [A195] ▪ Wetland and Waterbirds [A999]
	Loughlinstown Woods pNHA [001211]	6 m from the OES		<ul style="list-style-type: none"> ▪ Policy protection: GIB18, GIB21, and GIB22.
	Dingle Glen pNHA [001207]	0.76 km from OES		
	Fitzsimon's Wood pNHA [001753]	2.43 km from OES		
	Ballybetagh Bog pNHA [001202]	2.87 km from OES		
	Ballyman Glen pNHA [000713]	3.85 km from OES		
	South Dublin Bay pNHA [000210]	4.72 km from the OES		

Ecological feature	Relevant sector(s)/Distance from closest point from the OES	Study area	Assessment of importance	Details
Knocksink Wood pNHA [000725]	4.97 km from the OES			
Bray Head pNHA [000714]	4.98 km from OES			
Powerscourt Woodland pNHA [001768]	5.75 km from OES			
Boosterstown Marsh pNHA [001205]	5.80 km from OES			
Dargle River Valley pNHA [001754]	5.82 km from OES			
Great Sugar Loaf pNHA [001769]	7.00 km from OES			
Kilmacanoge Marsh pNHA [000724]	8.25 km from OES			
Glencree Valley pNHA [001755]	8.50 km from OES			
Grand Canal pNHA [002104]	9.13 km from OES			

Ecological feature	Relevant sector(s)/Distance from closest point from the OES	Study area	Assessment of importance	Details
Powerscourt Waterfall pNHA [001767]	9.83 km from OES			
North Dublin Bay pNHA [000206]	10.11 km from OES			
Royal Canal pNHA [002103]	10.52 km from OES			
Glenasmole Valley pNHA [001209]	10.53 km from OES			
Glen of the Downs pNHA [000719]	10.89 km from OES			
Howth head pNHA [000202]	13.33 km from OES			
Lugmore Glen [001212]	13.91 km from OES			
The Murrough pNHA [000730]	14.79 km from OES			
Liffey Valley pNHA [000128]	14.88 km from OES			

Ecological feature		Relevant sector(s)/Distance from closest point from the OES	Study area	Assessment of importance	Details
LIBS	Shanganagh River and Cliff [LIBS04]	Within Landfall Site/Sector 1	A minimum 50 m buffer (note that this buffer was extended where areas of potentially high ecological value were noted) ⁶ .	Local	DLRCC policy protection GIB18. DCC policy protection 136 and 139.
Habitats	Amenity grassland (GA2)	Landfall Site, Sectors 1, 2, 3, 6.		Negligible	Does not comprise Annex I habitat.
	Arable crops (BC1)	Sector 4		Negligible	Does not comprise Annex I habitat.
	Buildings and artificial surfaces (BL3)	Landfall Site, Sectors 1, 2, 3, 4, 5, 6 OSS, grid connection.		Negligible	Does not comprise Annex I habitat.
	Depositing river (FW2)	Landfall Site, sectors 1, 2, 3, 4, 6, 7 OSS, grid connection.		Local	Policy protection: GIB22. Does comprise Annex I habitat: Floating river vegetation (3260).
	Drainage ditch (FW4)	Sector 4		Local	Does not comprise Annex I habitat.
	Dry calcareous grassland (GS1)	Landfall Site		Local	Policy protection: GIB22. Does not comprise Annex I habitat ⁷ .
	Dry meadow and grassy verges (GS2)	Sectors 4, 5, 6, 7 OSS		Local	Does not comprise Annex I habitat.
Hedgerow (WL1)	Sectors 1, 2, 3, 4	County	Policy protection: GIB22, GIB25.		

⁶ SEPA Guidance note 31 (n.d.)

⁷ Due to the lack of orchids present.

Ecological feature	Relevant sector(s)/Distance from closest point from the OES	Study area	Assessment of importance	Details
	OSS			Does not comprise Annex I habitat.
Horticultural land (BS2)	Landfall Site		Negligible	Does not comprise Annex I habitat.
Immature woodland (WS2)	Sectors 3, 4 Leopardstown TCC		Local	Does not comprise Annex I habitat.
Improved agricultural grassland (GA1)	Sector 7		Negligible	Does not comprise Annex I habitat.
Mixed broadleaved woodland (WD1)	Sector 5		County	Policy protection: GIB22, GIB23. Does not comprise Annex I habitat.
Ornamental non-native shrub (WS3)	Sector 6		Negligible	Does not comprise Annex I habitat.
Other artificial lakes and ponds (FL8)	OSS		Local	Does not comprise Annex I habitat.
Recolonizing bare ground (ED3)	Sectors 3, 4		Local	Does not comprise Annex I habitat.
Riparian woodland (WN5)	Sectors 1, 7		County	Policy protection: GIB22. Does comprise Annex I habitat: Alluvial forests (91E0).

Ecological feature		Relevant sector(s)/Distance from closest point from the OES	Study area	Assessment of importance	Details
	Scattered trees and parkland (WD5)	Sector 2		County	Policy protection: GIB22. Does not comprise Annex I habitat.
	Scrub (Ws1)	Landfall Site Sectors 4, 5 Leopardstown TCC		Local	Does not comprise Annex I habitat.
	Sedimentary sea cliffs (CS3)	Landfall Site		International	Policy protection: GIB22. Does comprise Annex I habitat: vegetated sea cliffs of the Atlantic and Baltic Coasts' (code 1230).
	Shingle and gravel shores (LS1)	Landfall Site		County	Policy protection: GIB22. Does comprise Annex I habitat: Perennial vegetation of stoney banks (1220).
	Spoil and bare ground (ED2)	Sector 3		Negligible	Does not comprise Annex I habitat.
	Tilled land (BC3)	Sector 4		Negligible	Does not comprise Annex I habitat.
	Treelines (WL2)	Landfall Site Sectors 1, 2, 3, 4, 7		Local	Policy protection: GIB25. Does not comprise Annex I habitat.
Flora and fauna	Amphibians – common frog	All OES	1 km ⁸	Local	Policy protection: GIB22. Listed on Annex V of the Habitats Directive.

⁸ Based on the upper migration distance in Baker et al. (2011).

Ecological feature	Relevant sector(s)/Distance from closest point from the OES	Study area	Assessment of importance	Details
				Protected under the Schedule Wildlife Act 1976 (and subsequent amendments). Suitable terrestrial habitat along Onshore ECR. Cannot be discounted as present along the Onshore ECR.
Amphibians – smooth newt	All OES	500 m ¹⁴	Local	Policy protection: GIB22. Protected under the Wildlife Act 1976 (and subsequent amendments). Suitable terrestrial habitat along Onshore ECR. Cannot be discounted as present along the Onshore ECR.
Bird assemblage - general	All OES	For Special Protection Area (SPA) qualifying species, core foraging ranges were used ⁹ . For other species, the study area is limited to 1	Local	Policy protection: GIB22. All birds are protected under the Wildlife Act 1976 (and subsequent amendments) during the breeding bird season (i.e. 1st March to 31st August). Nesting birds considered present within vegetated habitats. Birds of prey and ground-nesting birds likely present. Likely notable red and amber-listed species present.

⁹ SNH guidance (2016).

Ecological feature	Relevant sector(s)/Distance from closest point from the OES	Study area	Assessment of importance	Details
			km due to high mobility.	
	Bat assemblage	All OES	2 km when considering potential effects for commuting and foraging bats and considering high mobility and Core Sustenance Zones (CSZ). ¹⁰	County Policy protection: GIB22. All bats considered likely present are listed on Annex IV of the Habitats Directive and are protected under the Wildlife Act 1976 (and subsequent amendments). Bats likely to use the Site for foraging and commuting. Roosting bats unconfirmed but likely present along the Onshore ECR.
	Badger	All OES	1 km due to the extensive home ranges	County Policy protection: GIB22. Protected under the Wildlife Act 1976 and subsequent amendments. Badgers confirmed present along the Onshore ECR, with disused setts identified.
	Hedgehog	All OES	750 m ¹¹	Local Policy protection: GIB22. Protected under the Wildlife Act 1976 and subsequent amendments.

¹⁰ Bat Mitigation Guidelines Ireland (2022)

¹¹ Haigh, A. J. (2011)

Ecological feature	Relevant sector(s)/Distance from closest point from the OES	Study area	Assessment of importance	Details
				Likely present along Onshore ECR.
Otter	All aquatic and riparian habitats across the project	2 km due to the extensive home ranges	County	Policy protection: GIB22. Protected under the Wildlife Act 1976 and subsequent amendments. Listed on Annex II and IV of the Habitats Directive.
Other mammals (pygmy shrew, Irish hare, Irish stoat, red squirrel)	All OES	Pygmy shrew: 700 m ¹² Irish hare: 700 m ¹³ Pine marten: 250 m ¹⁴ Red squirrel: 50 m ¹⁵	Local	Policy protection: GIB22. Protected under the Wildlife Act 1976 (and subsequent amendments). Cannot be discounted.
Fish – Brown trout	Aquatic survey sites A6, A8, A9, and B3	River catchment and estuaries	Local	Protected against unlicensed /unregistered fishing. No legal protection under the legislation cited.
Fish - Lamprey	Aquatic survey site A9		County	Policy protection: GIB22.

¹² Mammal society (2024)

¹³ McGowan et al. (2019)

¹⁴ Nature Scot (2020a)

¹⁵ Nature Scot (2020b)

Ecological feature	Relevant sector(s)/Distance from closest point from the OES	Study area	Assessment of importance	Details
				Three lamprey species listed on Annex II of the Habitats Directive; river lamprey is listed on Annex V of the Habitats Directive.
	Fish – European eel	Aquatic survey sites A6, A8, A9, and B3		County Protected under the European Eel Regulation 1100/2007 Policy protection: GIB22. Red-listed species.
	Invertebrates	All OES	Invertebrates considered within the initial 50 m buffer search area	Local Policy protection: GIB22. Notable invertebrates are protected under the Wildlife (Amendment) Act, 2000. Notable species considered present, with valuable woodland and aquatic habitats located along OES.
	Invasive alien species	Landfall Site Sectors 1, 7	Within the initial 50 m buffer search area as well as upstream and downstream riparian habitats of associated watercourses.	N/A Covered under Policy Objective GIB28. Risk of spreading invasive species across the local area.

Table 5 Summary of baseline ecological features with distance from the O&M Base

Ecological feature		Relevant sector(s)/Distance from closest point from the OES =	Study area	Assessment of importance	Details
O&M Base					
Internationally designated sites	Dublin Bay Biosphere	Associated with: <ul style="list-style-type: none"> ▪ North Dublin Bay SAC; ▪ Rockabill to Dalkey Island SAC; ▪ Howth Head SAC and SPA; ▪ North Bull Island SPA; ▪ South Dublin Bay and River Tolka Estuary SPA; ▪ Ireland’s Eye SAC and SPA 	Located within 15 km or downstream where hydrologically connected	International	DLRCC policy protection: GIB10.
European designated sites	South Dublin Bay SAC [000210]	1.4 km from O&M Base	Within 15 km of O&M Base	International	Policy protection GIB22. Habitats Directive. Qualifying Interests include the following: <ul style="list-style-type: none"> ▪ 1140 Mudflats and sandflats not covered by seawater at low tide

Ecological feature	Relevant sector(s)/Distance from closest point from the OES =	Study area	Assessment of importance	Details
				<ul style="list-style-type: none"> ▪ 1210 Annual vegetation of drift lines ▪ 1310 Salicornia and other annuals colonising mud and sand ▪ 2110 Embryonic shifting dunes
Rockabill to Dalkey Island SAC [003000]	2.7 km from O&M Base			<ul style="list-style-type: none"> ▪ Policy protection GIB22. ▪ Habitats Directive. ▪ Qualifying Interests include the following: <ul style="list-style-type: none"> ▪ 1170 Reefs ▪ 1351 Harbour Porpoise <i>Phocoena phocoena</i>
North Dublin Bay SAC [000206]	5.5 km from O&M Base			<p>Policy protection GIB22. Habitats Directive. Qualifying Interests include the following:</p> <ul style="list-style-type: none"> ▪ 1140 Mudflats and sandflats not covered by seawater at low tide ▪ 1210 Annual vegetation of drift lines ▪ 1310 Salicornia and other annuals colonising mud and sand ▪ 1330 Atlantic salt meadows <i>Glauco-Puccinellietalia maritima</i> ▪ 1410 Mediterranean salt meadows (<i>Juncetalia maritimi</i>) ▪ 2110 Embryonic shifting dunes

Ecological feature	Relevant sector(s)/Distance from closest point from the OES =	Study area	Assessment of importance	Details
				<ul style="list-style-type: none"> ▪ 2120 Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) ▪ 2130 Fixed coastal dunes with herbaceous vegetation (grey dunes)* ▪ 2190 Humid dune slacks ▪ 1395 Petalwort <i>Petalophyllum ralfsii</i>
	Howth Head SAC [000202]	7.8 km from O&M Base		<p>Policy protection GIB22. Habitats Directive.</p> <p>Qualifying Interests include the following:</p> <ul style="list-style-type: none"> ▪ 1230 Vegetated sea cliffs of the Atlantic and Baltic coasts ▪ 4030 European dry heaths
	Ballyman Glen SAC [000713]	10.2 km from O&M Base		<p>Policy protection GIB22. Habitats Directive.</p> <p>Qualifying Interests include the following:</p> <ul style="list-style-type: none"> ▪ 7220 Petrifying springs with tufa formation <i>Cratoneurion</i>* ▪ 7230 Alkaline fens
	Knocksink Wood SAC [000725]	10.6 km from O&M Base		<p>Policy protection GIB22. Habitats Directive.</p> <p>Qualifying Interest include the following:</p>

Ecological feature	Relevant sector(s)/Distance from closest point from the OES =	Study area	Assessment of importance	Details
				<ul style="list-style-type: none"> ▪ 7220 Petrifying springs with tufa formation <i>Cratoneurion</i>* ▪ 91A0 Old sessile oak woods with Ilex and Blechnum in the British Isles ▪ 91E0 Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> <i>Alno-Padion</i>, <i>Alnion incanae</i>, <i>Salicion albae</i>*
Baldoye Bay SAC [000199]	10.6 km from O&M Base			<p>Policy protection GIB22. Habitats Directive. Qualifying Interest include the following:</p> <ul style="list-style-type: none"> ▪ 1140 Mudflats and sandflats not covered by seawater at low tide ▪ 1310 Salicornia and other annuals colonising mud and sand ▪ 1330 Atlantic salt meadows <i>Glaucopuccinellietalia maritima</i> ▪ 1410 Mediterranean salt meadows <i>Juncetalia maritimi</i>
Bray Head SAC [000714]	11.5 km from O&M Base			<p>Policy protection GIB22. Habitats Directive. Qualifying Interest include the following:</p> <ul style="list-style-type: none"> ▪ 1230 Vegetated sea cliffs of the Atlantic and Baltic coasts

Ecological feature	Relevant sector(s)/Distance from closest point from the OES =	Study area	Assessment of importance	Details
	Wicklow Mountains SAC [002122]	11.8 km from O&M Base		<ul style="list-style-type: none"> ▪ 4030 European dry heaths <p>Policy protection GIB22. Habitats Directive. Qualifying Interest include the following:</p> <ul style="list-style-type: none"> ▪ 3110 Oligotrophic waters containing very few minerals of sandy plains <i>Littorelletalia uniflorae</i> ▪ 3160 Natural dystrophic lakes and ponds ▪ 4010 Northern Atlantic wet heaths with <i>Erica tetralix</i> ▪ 4030 European dry heaths ▪ 4060 Alpine and Boreal heaths ▪ 6130 Calaminarian grasslands of the <i>Violetalia calaminariae</i> ▪ 6230 Species-rich <i>Nardus</i> grasslands, on siliceous substrates in mountain areas (and submountain areas, in Continental Europe)* ▪ 7130 Blanket bog ▪ (* if active bog) ▪ 8110 Siliceous scree of the montane to snow levels (<i>Androsacetalia alpinae</i> and <i>Galeopsietalia ladani</i>)

Ecological feature	Relevant sector(s)/Distance from closest point from the OES =	Study area	Assessment of importance	Details
				<ul style="list-style-type: none"> ▪ 8210 Calcareous rocky slopes with chasmophytic vegetation ▪ 8220 Siliceous rocky slopes with chasmophytic vegetation ▪ 91A0 Old sessile oak woods with Ilex and Blechnum in the British Isles ▪ 1355 Otter <i>Lutra lutra</i>
	Ireland's Eye SAC [002193]	12.3 km from O&M Base		<p>Policy protection GIB22. Habitats Directive.</p> <p>Qualifying Interests include the following:</p> <ul style="list-style-type: none"> ▪ 1220 Perennial vegetation of stony banks ▪ 1230 Vegetated sea cliffs of the Atlantic and Baltic coasts
	South Dublin Bay and River Tolka Estuary SPA (004024)	0.7 km from O&M Base		<p>Policy protection GIB22. Habitats Directive.</p> <p>Qualifying Interests include the following:</p> <ul style="list-style-type: none"> ▪ A046 Light-bellied Brent Goose <i>Branta bernicla hrota</i> ▪ A130 Oystercatcher <i>Haematopus ostralegus</i> ▪ A137 Ringed Plover <i>Charadrius hiaticula</i> ▪ A141 Grey Plover <i>Pluvialis squatarola</i> ▪ A143 Knot <i>Calidris canutus</i> ▪ A144 Sanderling <i>Calidris alba</i>

Ecological feature	Relevant sector(s)/Distance from closest point from the OES =	Study area	Assessment of importance	Details
	North Bull Island SPA [004006]	5.4 km from O&M Base		<ul style="list-style-type: none"> ▪ A149 Dunlin <i>Calidris alpina</i> ▪ A157 Bar-tailed Godwit <i>Limosa lapponica</i> ▪ A162 Redshank <i>Tringa totanus</i> ▪ A179 Black-headed Gull <i>Chroicocephalus ridibundus</i> ▪ A192 Roseate Tern <i>Sterna dougallii</i> ▪ A193 Common Tern <i>Sterna hirundo</i> ▪ A194 Arctic Tern <i>Sterna paradisaea</i> ▪ Wetlands <p>Policy protection GIB22. Habitats Directive. Qualifying Interests include the following:</p> <ul style="list-style-type: none"> ▪ A046 Light-bellied Brent Goose <i>Branta bernicla hrota</i> ▪ A048 Shelduck <i>Tadorna tadorna</i> ▪ A052 Teal <i>Anas crecca</i> ▪ A054 Pintail <i>Anas acuta</i> ▪ A056 Shoveler <i>Anas clypeata</i> ▪ A130 Oystercatcher <i>Haematopus ostralegus</i> ▪ A140 Golden Plover <i>Pluvialis apricaria</i> ▪ A141 Grey Plover <i>Pluvialis squatarola</i> ▪ A143 Knot <i>Calidris canutus</i>

Ecological feature	Relevant sector(s)/Distance from closest point from the OES =	Study area	Assessment of importance	Details
				<ul style="list-style-type: none"> ▪ A144 Sanderling <i>Calidris alba</i> ▪ A149 Dunlin <i>Calidris alpina</i> ▪ A156 Black-tailed Godwit <i>Limosa limosa</i> ▪ A157 Bar-tailed Godwit <i>Limosa lapponica</i> ▪ A160 Curlew <i>Numenius arquata</i> ▪ A162 Redshank <i>Tringa totanus</i> ▪ A169 Turnstone <i>Arenaria interpres</i> ▪ A179 Black-headed Gull <i>Chroicocephalus ridibundus</i> ▪ Wetlands
	Howth Head Coast SPA [004113]	8.8 km from O&M Base		<p>Policy protection GIB22. Habitats Directive. Qualifying Interests include the following:</p> <ul style="list-style-type: none"> ▪ A188 Kittiwake (<i>Rissa tridactyla</i>)
	Baldoyle Bay SPA [004016]	10.6 km from O&M Base		<p>Policy protection GIB22. Habitats Directive. Qualifying Interests include the following:</p> <ul style="list-style-type: none"> ▪ A046 Light-bellied Brent Goose (<i>Branta bernicla hrota</i>) ▪ A048 Shelduck <i>Tadorna tadorna</i> ▪ A137 Ringed Plover <i>Charadrius hiaticula</i> ▪ A140 Golden Plover <i>Pluvialis apricaria</i>

Ecological feature	Relevant sector(s)/Distance from closest point from the OES =	Study area	Assessment of importance	Details	
				<ul style="list-style-type: none"> A141 Grey Plover <i>Pluvialis squatarola</i> A157 Bar-tailed Godwit <i>Limosa lapponica</i> Wetlands 	
	Ireland's Eye SPA [004117]	11.9 km from O&M Base		Policy protection GIB22. Habitats Directive. Qualifying Interests include the following: <ul style="list-style-type: none"> A017 Cormorant <i>Phalacrocorax carbo</i> A184 Herring Gull <i>Larus argentatus</i> A188 Kittiwake <i>Rissa tridactyla</i> A199 Guillemot <i>Uria aalge</i> A200 Razorbill <i>Alca torda</i> 	
	Wicklow Mountains SPA [004040]	12.2 km from O&M Base		Policy protection GIB22. Habitats Directive. Qualifying Interests include the following: <ul style="list-style-type: none"> A098 Merlin <i>Falco columbarius</i> A103 Peregrine <i>Falco peregrinus</i> 	
Nationally designated sites	Dalkey Coastal Zone and Killiney Hill pNHA [002106]	0.44 km from O&M Base	Within 2 km of O&M Base	National	Policy protection: GIB18, GIB 21, and GIB22.

Ecological feature	Relevant sector(s)/Distance from closest point from the OES =	Study area	Assessment of importance	Details
South Dublin Bay pNHA [000210]	0.86 km from O&M Base			
Booterstown Marsh pNHA [001205]	4.33 km from O&M Base			
Loughlinstown Woods pNHA [001211]	5.48 km from O&M Base			
North Dublin Bay pNHA [000206]	5.49 km from O&M Base			
Dingle Glen pNHA [001207]	6.76 km from O&M Base			
Fitzsimon's Wood pNHA [001753]	7.04 km from O&M Base			
Howth Head pNHA [000202]	7.90 km from O&M Base			
Grand Canal pNHA [002104]	8.34 km from O&M Base			

Ecological feature		Relevant sector(s)/Distance from closest point from the OES =	Study area	Assessment of importance	Details
	Royal Canal pNHA [002103]	8.98 km from O&M Base			
	Ballybetagh Bog pNHA [001202]	9.10 km from O&M Base			
	Ballyman Glen pNHA [000713]	9.95 km from O&M Base			
	Knocksink Wood pNHA [000725]	10.39 km from O&M Base			
	Baldoyle Bay pNHA [000199]	10.90 km from O&M Base			
	Powerscourt Woodland pNHA [001768]	11.93 km from O&M Base			
	Bray head pNHA [000714]	11.40 km from O&M Base			
	Dargle River Valley pNHA [001754]	11.89 km from O&M Base			
	Great Sugar Loaf pNHA [001769]	13.11 km from O&M Base			
	Dodder Valley pNHA [000991]	13.17 km from O&M Base			

Ecological feature		Relevant sector(s)/Distance from closest point from the OES =	Study area	Assessment of importance	Details
	Santry Demesne pNHA [000178]	13.63 km from O&M Base			
	Kilmacanogue Marsh pNHA [000724]	14.30 km from O&M Base			
	Glencree valley [001755]	14.99 km from O&M Base			
Habitats	Amenity grassland (GA2)	O&M Base	500 m initial buffer zone	Negligible	<ul style="list-style-type: none"> Does not comprise Annex I habitat.
	Buildings and artificial surfaces (BL3)	O&M Base		Negligible	<ul style="list-style-type: none"> Does not comprise Annex I habitat.
	Open marine water (MW1)	O&M Base		National	Policy protection: GIB22. <ul style="list-style-type: none"> Does comprise Annex I habitat: Large shallow inlets and bays (1160).
	Ornamental non-native shrub (WS3)	O&M Base		Negligible	<ul style="list-style-type: none"> Does not comprise Annex I habitat.
	Sea inlets and bays (MW2)	O&M Base		National	Policy protection: GIB22. <ul style="list-style-type: none"> Does comprise Annex I habitat: Large shallow inlets and bays (1160).

Ecological feature	Relevant sector(s)/Distance from closest point from the OES =	Study area	Assessment of importance	Details
	Sea walls, piers and jetties (CC1)	O&M Base		County <ul style="list-style-type: none"> Does not comprise Annex I habitat.
Flora and fauna	Bird assemblage – SPA qualifying interest	O&M Base	For Special Protection Area (SPA) qualifying species, core foraging ranges were used ¹⁶ .	International <p>Policy protection: GIB22. SPA qualifying species present within the search area. Likely use the surrounding marine habitats for foraging. EU Directive - Annex I listed species.</p>
	Bird assemblage – amber-listed birds	O&M Base	1 km due to high mobility.	County <p>Amber-listed black guillemots considered likely nesting within search area.</p>
	Marine mammals – dolphins/ porpoise	O&M Base	Refer to Volume 3, Chapter 5 – Marine Mammal Ecology	International <p>Policy protection: GIB22. Populations of European protected marine mammals cannot be discounted from the search area. Protected under EU Habitats Directive. Covered in the offshore chapters.</p>

¹⁶ Scottish Natural Heritage (SNH) guidance (2016)

Ecological feature		Relevant sector(s)/Distance from closest point from the OES =	Study area	Assessment of importance	Details
	Marine mammals – seals	O&M Base	Refer to Volume 3, Chapter 5 – Marine Mammal Ecology	National	Policy protection: GIB22. Protected under EU Habitats Directive. Covered in the offshore chapters.

Designated sites

- 2.5.2 European designated sites are protected under the Habitats and Birds Directives. Moreover, the DLRCC County Development Plan includes Policy Objectives GIB18 and GIB19, which aim to protect European designated sites. Additional local policy protections apply to the internationally designated site Dublin Bay Biosphere (DBB), which is afforded policy protections under the DLRCC County Development Plan (GIB10). Figures 7-9 of the Onshore Biodiversity Technical Baseline Report show the statutory and non-statutory designated sites in relation to the OES.
- 2.5.3 All European designated sites located within 15 km of the OES and the O&M Base, and all designated sites that have hydrological and/or ecological connectivity beyond this, to the OES have been included in the baseline assessment. 15 km has been chosen as a reasonable distance for consideration. European designated sites beyond this buffer are considered unlikely to be impacted by the onshore infrastructure of the project due to the sufficient distance and lack of Source-Pathway-Receptor connectivity. However, European designated sites located beyond 15 km where there is hydrological and/or ecological connectivity to the project or where there is a clear Source-Pathway-Receptor link (OPR, 2021) have also been included in the assessment.

Internationally designated sites of nature conservation

Onshore Electrical System (OES)

- 2.5.4 The Onshore Biodiversity Technical Baseline Report found that a total of 17 Natura 2000 sites were located within 15 km of the OES or were hydrologically connected to OES. Table 6 summarises the European sites identified within 15 km to the closest point of the proposed OES.

Table 6 Designated European sites within zone of influence of the OES

Site name	Site code	Distance to the closest point of the OES (km)	Qualifying interests	Ecological or hydrological connectivity with the onshore development area
SACs				
Rockabill to Dalkey Island SAC	003000	1.5	Habitats 1170 Reefs Species 1351 Harbour Porpoise <i>Phocoena phocoena</i>	Yes. Hydrological connectivity via the marine habitat and the Landfall Site. There is no terrestrial connectivity.
Ballyman Glen SAC	000713	3.9	Habitats 7220 Petrifying springs with tufa formation <i>Cratoneurion</i> * 7230 Alkaline fens	No. There is no hydrological or ecological connectivity. This SAC is located upgradient of the site with no hydrological connectivity with the OES.
Knocksink Wood SAC	000725	4.4	Habitats 7220 Petrifying springs with tufa formation <i>Cratoneurion</i> * 91A0 Old sessile oak woods with Ilex and Blechnum in the British Isles 91E0 Alluvial forests with <i>Alnus glutinosa</i> and Fraxinus excelsior <i>Alno-Padion, Alnion incanae, Salicion albae</i> *	No. There is no hydrological or ecological connectivity. This SAC is located upgradient of the site with no hydrological connectivity with the OES.
South Dublin Bay SAC	000210	4.7	Habitats 1140 Mudflats and sandflats not covered by seawater at low tide 1210 Annual vegetation of drift lines 1310 Salicornia and other annuals colonising mud and sand 2110 Embryonic shifting dunes	Yes. There is hydrological connectivity between this SAC and the landfall location. However, there is also a significant distance (i.e. 4.7 km) between them.
Bray Head SAC	000714	5.1	Habitats 1230 Vegetated sea cliffs of the Atlantic and Baltic coasts	No. There is hydrological connectivity between this SAC and the landfall

Site name	Site code	Distance to the closest point of the OES (km)	Qualifying interests	Ecological or hydrological connectivity with the onshore development area
			4030 European dry heaths	location. However, it is via the marine habitat which is unlikely to affect the Quantifying Interest (QI) for this SAC.
Wicklow Mountains SAC	002122	5.6	<p>Habitats</p> <p>3110 Oligotrophic waters containing very few minerals of sandy plains <i>Littorelletalia uniflorae</i></p> <p>3160 Natural dystrophic lakes and ponds</p> <p>4010 Northern Atlantic wet heaths with <i>Erica tetralix</i></p> <p>4030 European dry heaths</p> <p>4060 Alpine and Boreal heaths</p> <p>6130 Calaminarian grasslands of the <i>Violetalia calaminariae</i></p> <p>6230 Species-rich <i>Nardus</i> grasslands, on siliceous substrates in mountain areas (and submountain areas, in Continental Europe)*</p> <p>7130 Blanket bogs (* if active bog)</p> <p>8110 Siliceous scree of the montane to snow levels (<i>Androsacetalia alpinae</i> and <i>Galeopsietalia ladani</i>)</p> <p>8210 Calcareous rocky slopes with chasmophytic vegetation</p> <p>8220 Siliceous rocky slopes with chasmophytic vegetation</p> <p>91A0 Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles</p> <p>Species</p> <p>1355 Otter <i>Lutra lutra</i></p>	Yes. There is no hydrological connection as this SAC is located upgradient of the site. However, there is potential that highly mobile QI species otter may reach the Shanganagh River catchment, which is located near the OES. A supporting population of otters to the SAC may be present within the Shanganagh River catchment.

Site name	Site code	Distance to the closest point of the OES (km)	Qualifying interests	Ecological or hydrological connectivity with the onshore development area
North Dublin Bay SAC	000206	10.0	<p>Habitats</p> <p>1140 Mudflats and sandflats not covered by seawater at low tide</p> <p>1210 Annual vegetation of drift lines</p> <p>1310 Salicornia and other annuals colonising mud and sand</p> <p>1330 Atlantic salt meadows <i>Glauco-Puccinellietalia maritimae</i></p> <p>1410 Mediterranean salt meadows (<i>Juncetalia maritimi</i>)</p> <p>2110 Embryonic shifting dunes</p> <p>2120 Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes)</p> <p>2130 Fixed coastal dunes with herbaceous vegetation (grey dunes)*</p> <p>2190 Humid dune slacks</p> <p>Species</p> <p>1395 Petalwort <i>Petalophyllum ralfsii</i></p>	No. There is no hydrological or ecological connectivity between this SAC and the OES.
Glenasmole Valley SAC	001209	10.5	<p>Habitats</p> <p>6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates <i>Festuco-Brometalia</i> (* important orchid sites)</p> <p>6410 <i>Molinia</i> meadows on calcareous, peaty or clayey-silt-laden soils <i>Molinion caeruleae</i></p> <p>7220 Petrifying springs with tufa formation <i>Cratoneurion</i>*</p>	No. There is no hydrological or ecological connectivity between this SAC and the OES.

Site name	Site code	Distance to the closest point of the OES (km)	Qualifying interests	Ecological or hydrological connectivity with the onshore development area
Glen of the Downs SAC	000719	10.9	Habitats 91A0 Old sessile oak woods with Ilex and Blechnum in the British Isles	No. There is no hydrological or ecological connectivity between this SAC and the OES.
Howth Head SAC	000202	13.0	Habitats 1230 Vegetated sea cliffs of the Atlantic and Baltic coasts 4030 European dry heaths	No. There is no hydrological or ecological connectivity between this SAC and the OES.
The Murrough Wetlands SAC	002249	14.9	Habitats 1210 Annual vegetation of drift lines 1220 Perennial vegetation of stony banks 1330 Atlantic salt meadows (<i>Glauco-Puccinellietalia maritima</i>) 1410 Mediterranean salt meadows (<i>Juncetalia maritimi</i>) 7210 Calcareous fens with <i>Cladium mariscus</i> and species of the <i>Caricion davallianae</i> 7230 Alkaline fens	No. There is no hydrological or ecological connectivity between this SAC and the OES.
SPAs				
Dalkey Islands SPA	004172	3.2	Birds A192 Roseate Tern <i>Sterna dougallii</i> A193 Common Tern <i>Sterna hirundo</i> A194 Arctic Tern <i>Sterna paradisaea</i>	Yes. There is hydrological connectivity between this SPA and the OES via the marine habitat.

Site name	Site code	Distance to the closest point of the OES (km)	Qualifying interests	Ecological or hydrological connectivity with the onshore development area
South Dublin Bay and River Tolka Estuary SPA	004024	4.7	Birds A046 Light-bellied Brent Goose <i>Branta bernicla hrota</i> A130 Oystercatcher <i>Haematopus ostralegus</i> A137 Ringed Plover <i>Charadrius hiaticula</i> A141 Grey Plover <i>Pluvialis squatarola</i> A143 Knot <i>Calidris canutus</i> A144 Sanderling <i>Calidris alba</i> A149 Dunlin <i>Calidris alpina</i> A157 Bar-tailed Godwit <i>Limosa lapponica</i> A162 Redshank <i>Tringa totanus</i> A179 Black-headed Gull <i>Chroicocephalus ridibundus</i> A192 Roseate Tern <i>Sterna dougallii</i> A193 Common Tern <i>Sterna hirundo</i> A194 Arctic Tern <i>Sterna paradisaea</i> Habitats Wetlands	Yes. There is no hydrological or ecological connectivity between this SPA and the OES. However, the mobile SCI birds are likely to use the marine habitats located at the landfall of the OES.
Wicklow Mountains SPA	004040	5.9	Birds A098 Merlin <i>Falco columbarius</i> A103 Peregrine <i>Falco peregrinus</i>	No. There is no hydrological or ecological connectivity between this SPA and the OES. The mobile SCI birds are unlikely to use the habitats located across the OES.
North Bull Island SPA	004006	10.0	Birds A046 Light-bellied Brent Goose <i>Branta bernicla hrota</i>	Yes. There is no hydrological or ecological connectivity between this

Site name	Site code	Distance to the closest point of the OES (km)	Qualifying interests	Ecological or hydrological connectivity with the onshore development area
			A048 Shelduck <i>Tadorna tadorna</i> A052 Teal <i>Anas crecca</i> A054 Pintail <i>Anas acuta</i> A056 Shoveler <i>Anas clypeata</i> A130 Oystercatcher <i>Haematopus ostralegus</i> A140 Golden Plover <i>Pluvialis apricaria</i> A141 Grey Plover <i>Pluvialis squatarola</i> A143 Knot <i>Calidris canutus</i> A144 Sanderling <i>Calidris alba</i> A149 Dunlin <i>Calidris alpina</i> A156 Black-tailed Godwit <i>Limosa limosa</i> A157 Bar-tailed Godwit <i>Limosa lapponica</i> A160 Curlew <i>Numenius arquata</i> A162 Redshank <i>Tringa totanus</i> A169 Turnstone <i>Arenaria interpres</i> A179 Black-headed Gull <i>Chroicocephalus ridibundus</i> Habitats Wetlands	SPA and the OES. However, the mobile SCI birds are likely to use the marine habitats located at the landfall of the OES.
Howth Head Coast SPA	004113	13.5	Birds A188 Kittiwake <i>Rissa tridactyla</i>	Yes. There is no hydrological or ecological connectivity between this SPA and the OES. However, the mobile SCI birds are likely to use the marine

Site name	Site code	Distance to the closest point of the OES (km)	Qualifying interests	Ecological or hydrological connectivity with the onshore development area
				habitats located at the Landfall Site of the OES.
The Murrough SPA	004186	14.9	Birds A001 Red throated diver <i>Gavia stellata</i> A043 Greylag goose <i>Anser anser</i> A046 Light-bellied brent goose <i>Brant bernicia hrota</i> A050 Wigeon <i>Anas penelope</i> A052 Teal <i>Anas crecca</i> A179 Black-headed gull <i>Larus argentatus</i> A184 Herring gull <i>Larus argentatus</i> A195 Little tern <i>Sterna albifrons</i> A999 Wetland and waterbirds	Yes. There is no hydrological or ecological connectivity between this SPA and the OES. However, the mobile SCI birds are likely to use the marine habitats located at the Landfall Site of the OES.

2.5.5 Note that several of the sites listed in Table 6 also partially form part of the Dublin Bay Biosphere, which is an internationally recognised designation aiming to conserve biodiversity, restore and enhance ecosystem services and foster the sustainable use of natural resources (DBB Partnership (DBBP), 2022). Designated sites within the DBB include the following:

- ▲ North Dublin Bay SAC;
- ▲ Rockabill to Dalkey Island SAC;
- ▲ Howth Head SAC and SPA;
- ▲ North Bull Island SPA; and
- ▲ South Dublin Bay and River Tolka Estuary SPA.

2.5.6 The Biosphere designation itself brings no new regulations (DBBP, 2022). Development in the DBB is subject to existing legislation and policy framework. The DBB has been integrated into local policy and incorporated into local development plans for DLRCC and DCC.

2.5.7 The DBB is afforded local policy protections under the following:

- ▲ Policy GIB10 of the DLRCC County Development Plan, which states the following:

‘It is a Policy Objective to participate, support and contribute to the management of the biosphere, along with its partners and to aim to raise awareness and education to people living, working and using the biosphere, through an Education Strategy. In furtherance of this Policy Objective, DLR have contributed to the development of an Environmental Code of Practice for those working in the Biosphere, and all partners carry out conservation actions including gathering biodiversity data, and monitoring within the biosphere.’

- ▲ Policies GIB137 and GIB139 of the DCC County Development Plan:

- Policy 137 states the following: *‘To ensure a co-ordinated approach to the protection and management of Dublin Bay with other State and Semi-State agencies through the Dublin Bay UNESCO Biosphere Partnership in line with its management plan for the sustainable development of Dublin Bay and the Lima Action Plan of the UNESCO MAB World Network of Biosphere Reserves.’*
- Policy 139 states the following: *‘To raise awareness of the international importance for nature conservation of Dublin Bay by improving information and interpretation of its biodiversity for recreational users and visitors. To increase public engagement and actions to conserve nature in line with the objectives of the UNESCO Biosphere Reserve.’*

O&M Base

2.5.8 The Onshore Biodiversity Technical Baseline Report identifies a total of 16 European sites located within the study area of the proposed O&M Base. Table 7 provides a summary of these.

Table 7 Designated European sites within zone of influence of the O&M Base

Site name	Site code	Distance to O&M Base (km)	Qualifying interests	Ecological or hydrological connectivity with the onshore development area
SACs				
South Dublin Bay SAC	000210	1.4	Habitats 1140 Mudflats and sandflats not covered by seawater at low tide 1210 Annual vegetation of drift lines 1310 Salicornia and other annuals colonising mud and sand 2110 Embryonic shifting dunes	Yes. There is hydrological connectivity between this SAC and the O&M Base via the marine habitat.
Rockabill to Dalkey Island SAC	003000	2.7	Habitats 1170 Reefs Species 1351 Harbour Porpoise <i>Phocoena phocoena</i>	Yes. There is hydrological connectivity between this SAC and the O&M Base via the marine habitat.
North Dublin Bay SAC	000206	5.5	Habitats 1140 Mudflats and sandflats not covered by seawater at low tide 1210 Annual vegetation of drift lines 1310 Salicornia and other annuals colonising mud and sand 1330 Atlantic salt meadows <i>Glauco-Puccinellietalia maritimae</i> 1410 Mediterranean salt meadows (<i>Juncetalia maritimi</i>) 2110 Embryonic shifting dunes 2120 Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes)	Yes. There is hydrological connectivity between this SAC and the O&M Base via the marine habitat.

Site name	Site code	Distance to O&M Base (km)	Qualifying interests	Ecological or hydrological connectivity with the onshore development area
			2130 Fixed coastal dunes with herbaceous vegetation (grey dunes)* 2190 Humid dune slacks Species 1395 Petalwort <i>Petalophyllum ralfsii</i>	
Howth Head SAC	000202	7.8	Habitats 1230 Vegetated sea cliffs of the Atlantic and Baltic coasts 4030 European dry heaths	No. There is no hydrological connectivity between this SAC and the O&M Base as the marine habitat is unlikely to affect SAC area.
Ballyman Glen SAC	000713	10.2	Habitats 7220 Petrifying springs with tufa formation <i>Cratoneurion</i> * 7230 Alkaline fens	No. There is no hydrological or ecological connectivity between this SAC and the O&M Base.
Knocksink Wood SAC	000725	10.6	Habitats 7220 Petrifying springs with tufa formation <i>Cratoneurion</i> * 91A0 Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles 91E0 Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> <i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i> *	No. There is no hydrological or ecological connectivity between this SAC and the O&M Base.
Baldoyle Bay SAC	000199	10.6	Habitats 1140 Mudflats and sandflats not covered by seawater at low tide 1310 <i>Salicornia</i> and other annuals colonising mud and sand 1330 Atlantic salt meadows <i>Glauco-Puccinellietalia maritimae</i>	No. There is no hydrological or ecological connectivity between this SAC and the O&M Base.

Site name	Site code	Distance to O&M Base (km)	Qualifying interests	Ecological or hydrological connectivity with the onshore development area
			1410 Mediterranean salt meadows <i>Juncetalia maritimi</i>	
Bray Head SAC	000714	11.5	Habitats 1230 Vegetated sea cliffs of the Atlantic and Baltic coasts 4030 European dry heaths	No. There is no hydrological or ecological connectivity between this SAC and the O&M Base.
Wicklow Mountains SAC	002122	11.8	Habitats 3110 Oligotrophic waters containing very few minerals of sandy plains <i>Littorelletalia uniflorae</i> 3160 Natural dystrophic lakes and ponds 4010 Northern Atlantic wet heaths with <i>Erica tetralix</i> 4030 European dry heaths 4060 Alpine and Boreal heaths 6130 Calaminarian grasslands of the <i>Violetalia calaminariae</i> 6230 Species-rich <i>Nardus</i> grasslands, on siliceous substrates in mountain areas (and submountain areas, in Continental Europe)* 7130 Blanket bogs (* if active bog) 8110 Siliceous scree of the montane to snow levels (<i>Androsacetalia alpinae</i> and <i>Galeopsietalia ladani</i>) 8210 Calcareous rocky slopes with chasmophytic vegetation 8220 Siliceous rocky slopes with chasmophytic vegetation 91A0 Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles Species	No. There is no hydrological or ecological connectivity between this SAC and the O&M Base.

Site name	Site code	Distance to O&M Base (km)	Qualifying interests	Ecological or hydrological connectivity with the onshore development area
			1355 Otter <i>Lutra lutra</i>	
Ireland's Eye SAC	002193	12.3	Habitats 1220 Perennial vegetation of stony banks 1230 Vegetated sea cliffs of the Atlantic and Baltic coasts	No. Site lies wholly above MHWM with no pathway of direct or indirect effects from the construction or decommissioning of the O&M base.
SPAs				
South Dublin Bay and River Tolka Estuary SPA	004024	0.7	Birds A046 Light-bellied Brent Goose <i>Branta bernicla hrota</i> A130 Oystercatcher <i>Haematopus ostralegus</i> A137 Ringed Plover <i>Charadrius hiaticula</i> A141 Grey Plover <i>Pluvialis squatarola</i> A143 Knot <i>Calidris canutus</i> A144 Sanderling <i>Calidris alba</i> A149 Dunlin <i>Calidris alpina</i> A157 Bar-tailed Godwit <i>Limosa lapponica</i> A162 Redshank <i>Tringa totanus</i> A179 Black-headed Gull <i>Chroicocephalus ridibundus</i> A192 Roseate Tern <i>Sterna dougallii</i> A193 Common Tern <i>Sterna hirundo</i> A194 Arctic Tern <i>Sterna paradisaea</i> Habitats Wetlands	Yes. There is hydrological connectivity between this SPA and the O&M Base via the marine habitat. In addition, highly mobile SCI birds may use the marine habitat near the O&M Base.

Site name	Site code	Distance to O&M Base (km)	Qualifying interests	Ecological or hydrological connectivity with the onshore development area
North Bull Island SPA	004006	5.4	Birds A046 Light-bellied Brent Goose <i>Branta bernicla hrota</i> A048 Shelduck <i>Tadorna tadorna</i> A052 Teal <i>Anas crecca</i> A054 Pintail <i>Anas acuta</i> A056 Shoveler <i>Anas clypeata</i> A130 Oystercatcher <i>Haematopus ostralegus</i> A140 Golden Plover <i>Pluvialis apricaria</i> A141 Grey Plover <i>Pluvialis squatarola</i> A143 Knot <i>Calidris canutus</i> A144 Sanderling <i>Calidris alba</i> A149 Dunlin <i>Calidris alpina</i> A156 Black-tailed Godwit <i>Limosa limosa</i> A157 Bar-tailed Godwit <i>Limosa lapponica</i> A160 Curlew <i>Numenius arquata</i> A162 Redshank <i>Tringa totanus</i> A169 Turnstone <i>Arenaria interpres</i> A179 Black-headed Gull <i>Chroicocephalus ridibundus</i> Habitats Wetlands	Yes. There is hydrological connectivity between this SPA and the O&M Base via the marine habitat. In addition, highly mobile SCI birds may use the marine habitat near the O&M Base
Howth Head Coast SPA	004113	8.8	Birds A188 Kittiwake (<i>Rissa tridactyla</i>)	Yes. There is hydrological connectivity between this SPA and the O&M Base via the marine habitat. In addition,

Site name	Site code	Distance to O&M Base (km)	Qualifying interests	Ecological or hydrological connectivity with the onshore development area
				highly mobile SCI birds may use the marine habitat near the O&M Base
Baldoyle Bay SPA	004016	10.6	Birds A046 Light-bellied Brent Goose (<i>Branta bernicla hrota</i>) A048 Shelduck <i>Tadorna tadorna</i> A137 Ringed Plover <i>Charadrius hiaticula</i> A140 Golden Plover <i>Pluvialis apricaria</i> A141 Grey Plover <i>Pluvialis squatarola</i> A157 Bar-tailed Godwit <i>Limosa lapponica</i> Habitats Wetlands	Yes. There is hydrological connectivity between this SPA and the O&M Base via the marine habitat. In addition, highly mobile SCI birds may use the marine habitat near the O&M Base
Ireland's Eye SPA	004117	11.9	Birds A017 Cormorant <i>Phalacrocorax carbo</i> A184 Herring Gull <i>Larus argentatus</i> A188 Kittiwake <i>Rissa tridactyla</i> A199 Guillemot <i>Uria aalge</i> A200 Razorbill <i>Alca torda</i>	Yes. There is hydrological connectivity between this SPA and the O&M Base via the marine habitat. In addition, highly mobile SCI birds may use the marine habitat near the O&M Base
Wicklow Mountains SPA	004040	12.2	Birds A098 Merlin <i>Falco columbarius</i> A103 Peregrine <i>Falco peregrinus</i>	No. This SPA is upgradient of the O&M Base. Therefore, there is no hydrological connectivity. There is no ecological connectivity, as there is little motivation for SCI birds to use the O&M Base.

- 2.5.9 Note that Ireland's Eye SAC and SPA also forms part of the DBB.
- 2.5.10 In addition, three Ramsar sites were identified within zone of influence of the O&M Base including the following:
- ▲ Sandymount Strand/Tolka Estuary;
 - ▲ North Bull Island; and
 - ▲ Baldoyle Bay.

Summary

- 2.5.11 A total of 12 European designated sites were identified as having connectivity to the OES study areas. These include Wicklow Mountains SAC, Rockabill to Dalkey Island SAC, North Dublin Bay SAC, Dalkey Islands SPA, South Dublin Bay and River Tolka Estuary SPA, North Bull Island SPA, Howth Head Coast SPA, The Murrrough SPA, South Dublin Bay SAC, Baldoyle Bay SPA and Ireland's Eye SPA. All other European sites have been scoped out of the assessment as no pathways were identified that could lead to Likely Significant Effects (LSE) to the Qualifying Interests (QIs) of the designated sites.
- 2.5.12 In addition, a separate Habitats Directive Assessment (HDA) Supporting Information for Screening for Appropriate Assessment (SISAA) Report and Natura Impact Statement (NIS) has been provided alongside this report (Part 4 Habitats Directive Assessments of the application) assessing the likely significant effects on European sites in relation to the onshore infrastructure of Dublin Array, i.e. the OES and the O&M Base, for the purposes of Article 6(3) of the Habitats Directive and Part XAB of the Planning and Development Act 2000, as amended. The results of the NIS have been taken into consideration in the preparation of this chapter.
- 2.5.13 In summary, only the Wicklow Mountains SAC was found to have a pathway relating to LSE to otter as a species of QI relating to the onshore infrastructure study areas (i.e. the OES and O&M Base). All other Natura 2000 sites were scoped out of further assessment.
- 2.5.14 Potential LSE to otter includes habitat loss/damage/degradation, noise and vibrations, and pollution events causing hydrocarbons and suspended sediments entering the Shanganagh River and tributaries, which may negatively affect their prey. This would impact a supporting population of the QI species otter to the SAC. This was assessed within the NIS resulting in no adverse effect on the integrity of the site or features.

Nationally designated sites of nature conservation

- 2.5.15 Nationally designated sites included Natural Heritage Areas (NHA) or proposed NHA (pNHA). The DL RCC County Development Plan includes Policy Objectives GIB18, GIB21 and GIB22 which affords protection to NHA and pNHA. Section 19 of the Wildlife Amendment Act 2000 prohibits damage to pNHAs as well as NHAs.

OES

2.5.16 Table 8 details the NHA and pNHA within zone of influence of the OES (measured to the closest point of the OES).

Table 8 NHA and pNHA within zone of influence of the OES

Site name	Site code	Distance to closest point of the OES (km)	Ecological or hydrological connectivity with the OES study area
Loughlinstown Woods pNHA	001211	0.005	Yes. Considered to be ecologically connected to the OES as the pNHA almost borders the boundary of the OES.
Dalkey Coastal Zone and Killiney Hill pNHA	001206	0.01	Yes. Considered to be ecologically connected to the OES due to the short distance between the designation and the OES.
Dingle Glen pNHA	001207	0.76	Yes. Considered to be ecologically connected to the OES due to the short distance between the designation and the OES.
Fitzsimon's Wood pNHA	001753	2.43	No. There is no ecological or hydrological connectivity between the OES and this pNHA as the pNHA is located upgradient of the OES.
Ballybetagh Bog pNHA	001202	2.87	No. There is no ecological or hydrological connectivity between the OES and this pNHA as the pNHA is located upgradient of the OES.
Ballyman Glen pNHA	000713	3.85	No. There is no ecological or hydrological connectivity between the OES and this pNHA.
South Dublin Bay pNHA	000210	4.72	No. There is no ecological or hydrological connectivity between the OES and this pNHA as the pNHA is located sufficiently far along the coastline from the OES.
Knocksink Wood pNHA	000725	4.97	No. There is no ecological or hydrological connectivity between the OES and this pNHA as the pNHA is located upgradient of the OES.
Bray Head pNHA	000714	4.98	No. There is no ecological or hydrological connectivity between the OES and this pNHA as the pNHA is located sufficiently far along the coastline from the OES.

Site name	Site code	Distance to closest point of the OES (km)	Ecological or hydrological connectivity with the OES study area
Powerscourt Woodland pNHA	001768	5.75	No. There is no ecological or hydrological connectivity between the OES and this pNHA.
Boosterstown Marsh pNHA	001205	5.80	No. There is no ecological or hydrological connectivity between the OES and this pNHA.
Dargle River Valley pNHA	001754	5.85	No. There is no ecological or hydrological connectivity between the OES and this pNHA.
Great Sugar Loaf pNHA	001769	7.00	No. There is no ecological or hydrological connectivity between the OES and this pNHA.
Kilmacanoge Marsh pNHA	000724	8.25	No. There is no ecological or hydrological connectivity between the OES and this pNHA.
Glenree Valley pNHA	001755	8.50	No. There is no ecological or hydrological connectivity between the OES and this pNHA.
Grand Canal pNHA	002104	9.13	No. There is no ecological or hydrological connectivity between the OES and this pNHA.
Powerscourt Waterfall pNHA	001767	9.83	No. There is no ecological or hydrological connectivity between the OES and this pNHA.
North Dublin Bay pNHA	000206	10.11	No. There is no ecological or hydrological connectivity between the OES and this pNHA.
Royal Canal pNHA	002103	10.52	No. There is no ecological or hydrological connectivity between the OES and this pNHA.
Glenasmole Valley pNHA	001209	10.53	No. There is no ecological or hydrological connectivity between the OES and this pNHA.
Glen of the Downs pNH	000719	10.89	No. There is no ecological or hydrological connectivity between the OES and this pNHA.
Howth head pNHA	000202	13.33	No. There is no ecological or hydrological connectivity between the OES and this pNHA.

Site name	Site code	Distance to closest point of the OES (km)	Ecological or hydrological connectivity with the OES study area
Lugmore Glen	001212	13.91	No. There is no ecological or hydrological connectivity between the OES and this pNHA.
The Murrough pNHA	000730	14.79	No. There is no ecological or hydrological connectivity between the OES and this pNHA.
Liffey Valley pNHA	000128	14.88	No. There is no ecological or hydrological connectivity between the OES and this pNHA.

2.5.17 Potential impacts to those pNHAs that are ecologically or hydrologically connected to the OES cannot be discounted. These include the following:

- ▲ Dalkey Coastal Zone and Killiney Hill pNHA is located approximately 10 m from the proposed beach access ramp within the proposed Landfall Site.
- ▲ Loughlinstown Woods pNHA, located ca. 5 m from the OES (onshore ECR – Sector 2).
- ▲ Dingle Glen pNHA is located approximately 0.76 km from the OES (onshore ECR – Sector 6).

2.5.18 As such, Dalkey Coastal Zone and Killiney Hill pNHA, Loughlinstown Woods pNHA, and Dingle Glen pNHA have been included for assessment. All other pNHA listed in Table 8 are located sufficiently distant or not ecologically or hydrologically connected to the OES. These have been scoped out from further assessment.

O&M Base

2.5.19 Table 9 details the 24 pNHA identified within the zone of influence of the O&M Base.

Table 9 NHA and pNHA within zone of influence of the O&M Base

Site name	Site code	Distance to O&M Base (km)	Ecological or hydrological connectivity with the O&M Base study area
Dalkey Coastal Zone and Killiney Hill pNHA	001206	0.44	Yes. There is hydrological connectivity between this pNHA and the O&M Base.
South Dublin Bay pNHA	000210	0.86	Yes. There is hydrological connectivity between this pNHA and the O&M Base.
Boosterstown Marsh pNHA	001205	4.33	Yes. There is hydrological connectivity between this pNHA and the O&M Base.

Site name	Site code	Distance to O&M Base (km)	Ecological or hydrological connectivity with the O&M Base study area
Loughlinstown Woods pNHA	001211	5.48	No. There is no hydrological or ecological connectivity between this pNHA and the O&M Base
North Dublin Bay pNHA	000206	5.49	Yes. There is hydrological connectivity between this pNHA and the O&M Base.
Dingle Glen pNHA	001207	6.76	No. There is no hydrological or ecological connectivity between this pNHA and the O&M Base
Fitzsimon's Wood pNHA	001753	7.04	No. There is no hydrological or ecological connectivity between this pNHA and the O&M Base
Howth Head pNHA	000202	7.90	No. There is no hydrological or ecological connectivity between this pNHA and the O&M Base
Grand Canal pNHA	002104	8.34	No. There is no hydrological or ecological connectivity between this pNHA and the O&M Base
Royal Canal pNHA	002103	8.98	No. There is no hydrological or ecological connectivity between this pNHA and the O&M Base
Ballybetagh Bog pNHA	001202	9.10	No. There is no hydrological or ecological connectivity between this pNHA and the O&M Base
Ballyman Glen pNHA	000713	9.95	No. There is no hydrological or ecological connectivity between this pNHA and the O&M Base
Knocksink Wood pNHA	000725	10.39	No. There is no hydrological or ecological connectivity between this pNHA and the O&M Base
Baldoyle Bay pNHA	000199	10.90	No. There is no hydrological or ecological connectivity between this pNHA and the O&M Base
Powerscourt Woodland pNHA	001768	11.93	No. There is no hydrological or ecological connectivity between this pNHA and the O&M Base
Bray head pNHA	000714	11.40	No. There is no hydrological or ecological connectivity between this pNHA and the O&M Base

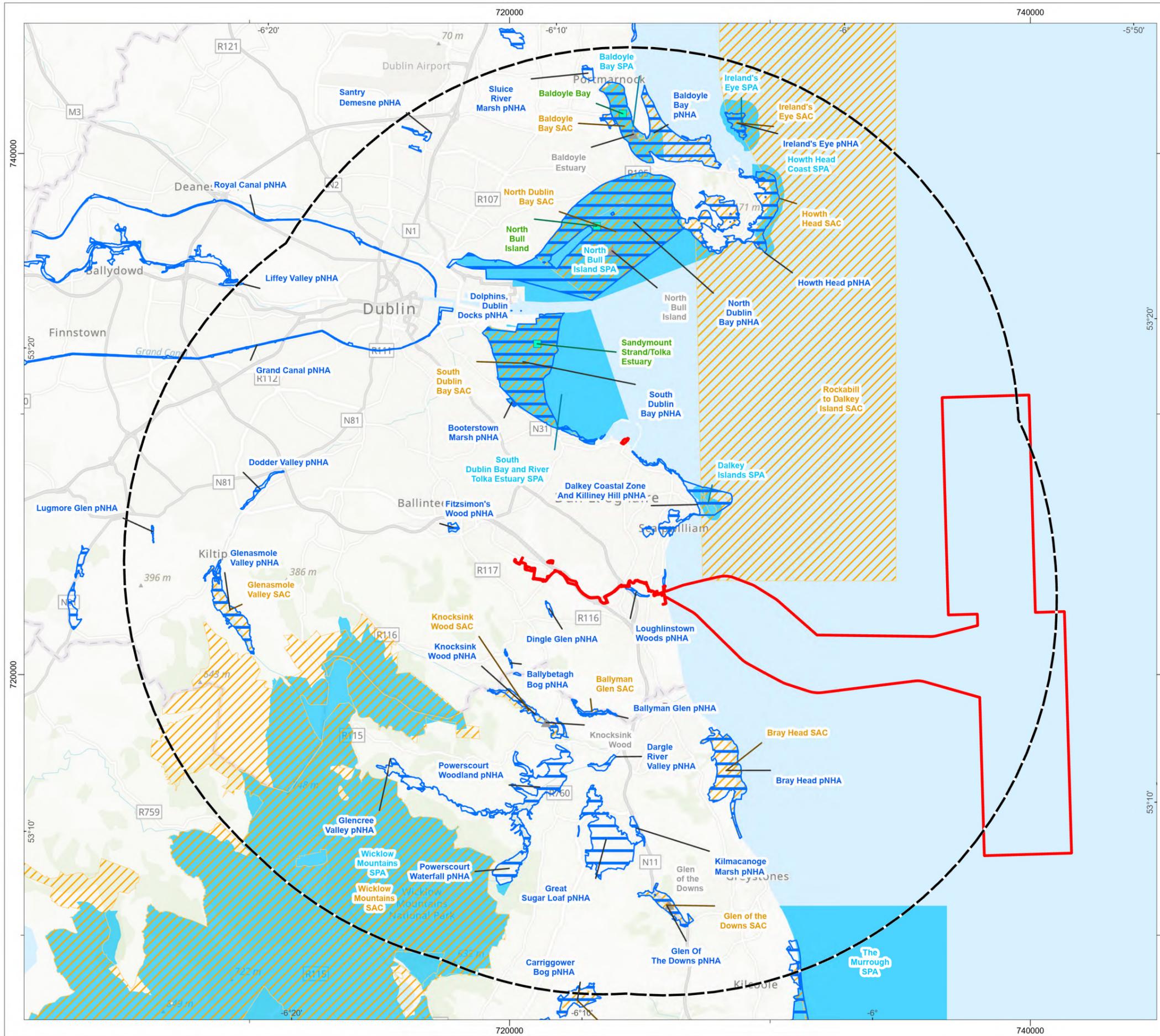
Site name	Site code	Distance to O&M Base (km)	Ecological or hydrological connectivity with the O&M Base study area
Dargle River Valley pNHA	001754	11.89	No. There is no hydrological or ecological connectivity between this pNHA and the O&M Base
Ireland's Eye pNHA	000203	12.33	No. The distance between the pNHA and the O&M Base is considered sufficiently far for there to be no hydrological or ecological connectivity between this pNHA and the O&M Base
Great Sugar Loaf pNHA	001769	13.11	No. There is no hydrological or ecological connectivity between this pNHA and the O&M Base
Dodder Valley pNHA	000991	13.17	No. There is no hydrological or ecological connectivity between this pNHA and the O&M Base
Santry Demesne pNHA	000178	13.63	No. There is no hydrological or ecological connectivity between this pNHA and the O&M Base
Sluice River Marsh pNHA	001763	13.88	No. There is no hydrological or ecological connectivity between this pNHA and the O&M Base
Kilmacanoge Marsh pNHA	000724	14.3	No. There is no hydrological or ecological connectivity between this pNHA and the O&M Base
Glenree valley pNHA	001755	14.99	No. There is no hydrological or ecological connectivity between this pNHA and the O&M Base

2.5.20 Those pNHAs that are ecologically or hydrologically connected to the O&M Base are most likely to suffer impacts from the proposed works there. These include the following:

- ▲ Dalkey Coastal Zone and Killiney Hill pNHA;
- ▲ South Dublin Bay pNHA;
- ▲ North Dublin Bay pNHA; and
- ▲ Booterstown Marsh pNHA.
- ▲ As such, Dalkey Coastal Zone and Killiney Hill pNHA, and South Dublin Bay pNHA, North Dublin Bay pNHA and Booterstown Marsh pNHA have been included for assessment. All other pNHA listed in Table 9 are located sufficiently distant or not ecologically or hydrologically connected to the O&M Base. These have been scoped out from further assessment.

Summary

- 2.5.21 In summary, Dalkey Coastal Zone and Killiney Hill pNHA, Loughlinstown Woods pNHA and Dingle Glen pNHA,
- 2.5.22 have been included for further assessment in relation to the proposed OES works; and Dalkey Coastal Zone and Killiney Hill pNHA, South Dublin Bay pNHA, Booterstown Marsh pNHA and North Dublin Bay pNHA have been included for assessment in relation to the proposed works at the O&M Base. All other pNHAs have been scoped out.



- Application Site Boundary
- Onshore Electrical System (OES) and Operations and Maintenance Base (O&M Base) 15 km Buffer
- Special Protected Area (SPA)
- Special Area Conservation (SAC)
- Proposed Natural Heritage Area (pNHA)
- RAMSAR Wetland Site
- ▲ Nature Reserve

Note: No NHA's within Study Area

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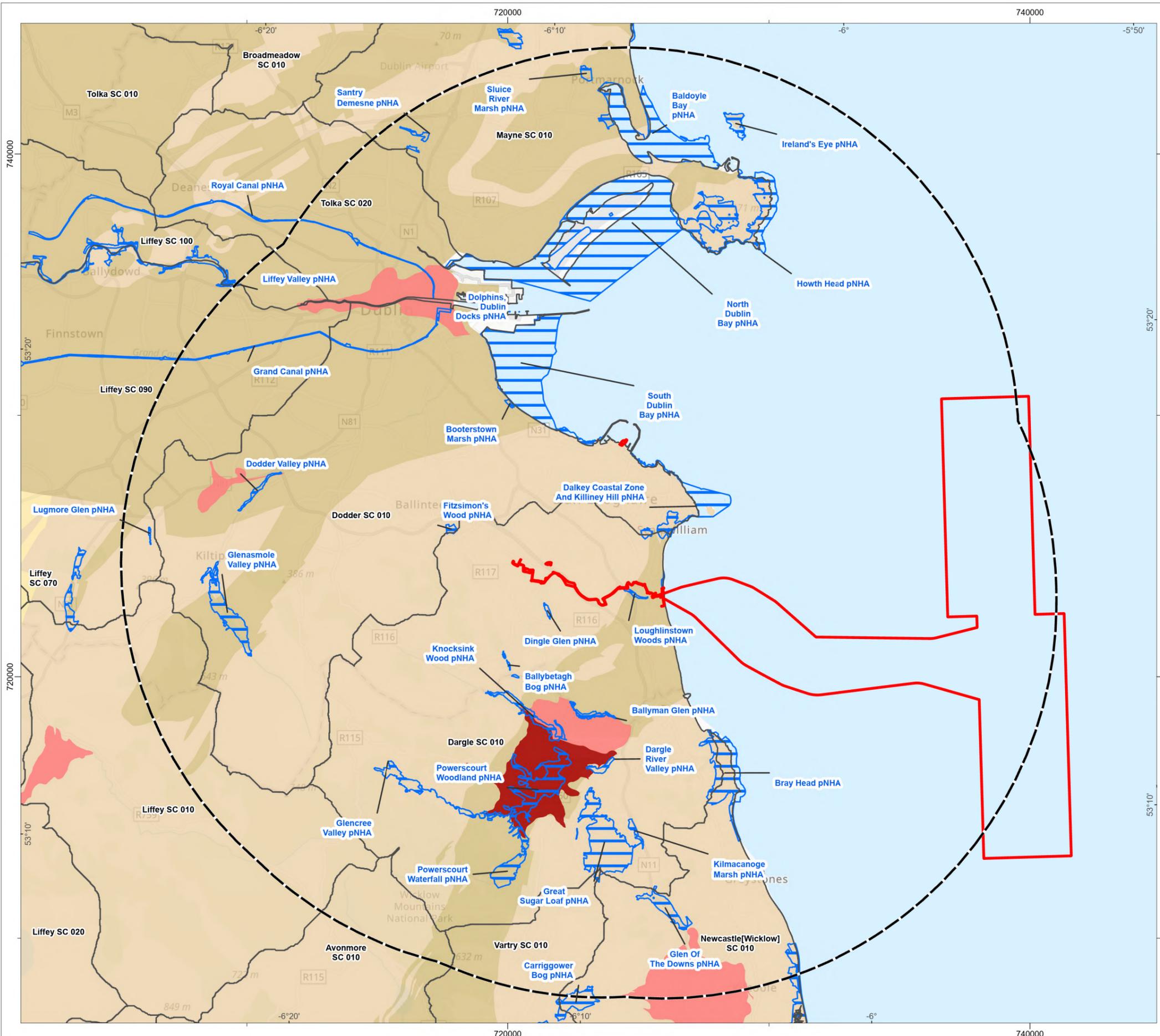
PROJECT TITLE **Dublin Array**

DRAWING TITLE **Biodiversity: Designated Sites**

DRAWING NUMBER: **Figure: 7** PAGE NUMBER: **1 of 1**

VER	DATE	REMARKS	DRAW	CHEK	APRD
01	2025-02-12	DRAFT	JK	SW	AE
02	2025-02-06	PUBLIC	JK	CM	AM





- Application Site Boundary
- Onshore Electrical System (OES) and Operations and Maintenance Base (O&M Base) 15 km Buffer
- Proposed Natural Heritage Area (pNHA)
- Sub-Catchment
- Gravel Aquifer
 - Locally Important Gravel Aquifer
 - Regionally Important Gravel Aquifer
- Bedrock Aquifers
 - LI - Locally Important Aquifer - Bedrock which is Moderately Productive only in Local Zones
 - PI - Poor Aquifer - Bedrock which is Generally Unproductive except for Local Zones
 - Pu - Poor Aquifer - Bedrock which is Generally Unproductive
 - Unclassified

Note: No NHA's within Study Area

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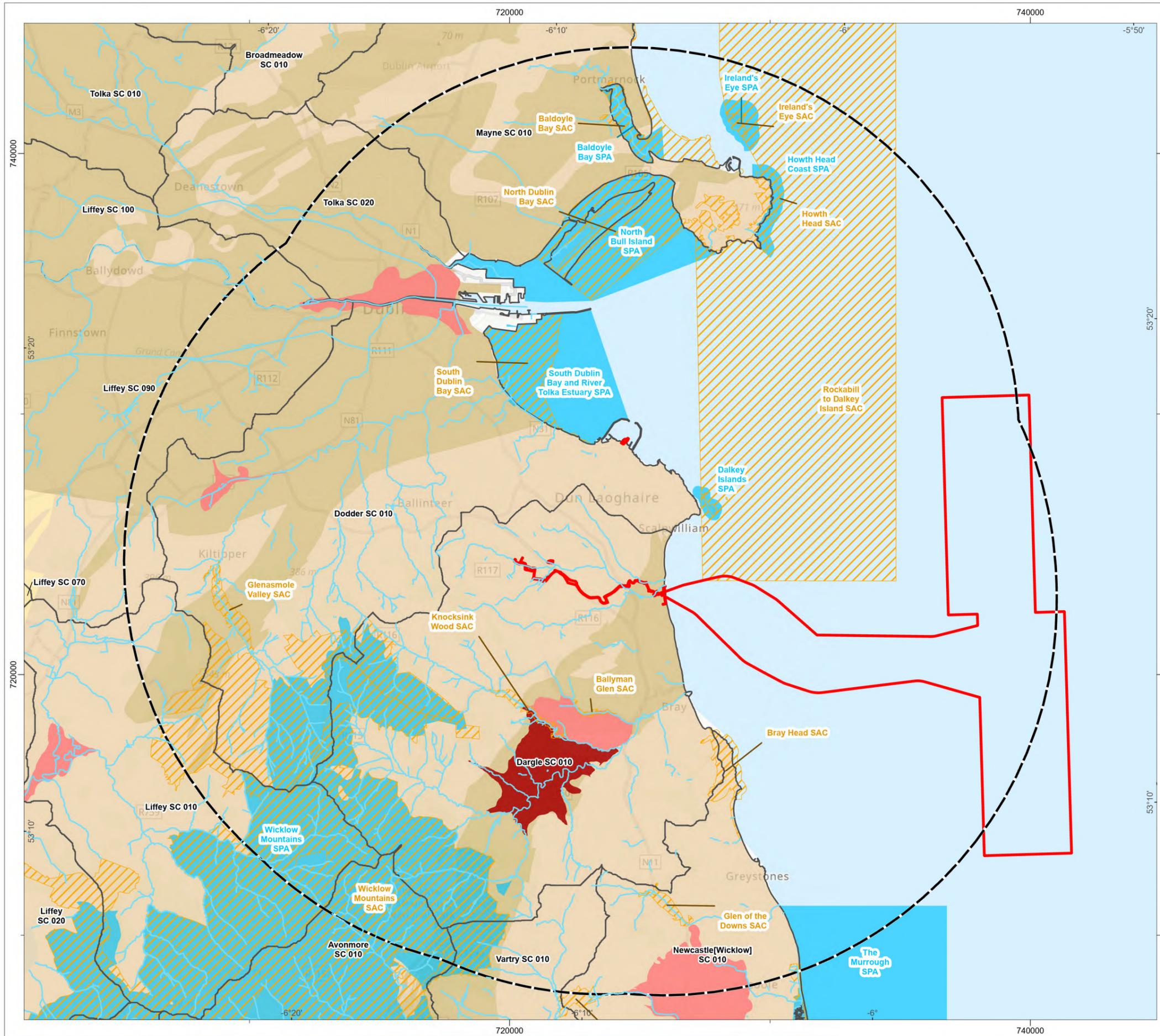
PROJECT TITLE **Dublin Array**

DRAWING TITLE **Biodiversity: NAH and pNHA with Hydrological Connections**

DRAWING NUMBER: **Figure: 8** PAGE NUMBER: **1 of 1**

VER	DATE	REMARKS	DRAW	CHEK	APRD
01	2025-02-12	DRAFT	JK	SW	AE
02	2025-02-06	PUBLIC	JK	CM	AM





Application Site Boundary

Onshore Electrical System (OES) and Operations and Maintenance Base (O&M Base) 15 km Buffer

Special Protected Area (SPA)

Special Area Conservation (SAC)

Sub-Catchment

Watercourse

Gravel Aquifer

- Locally important gravel aquifer
- Regionally important gravel aquifer

Bedrock Aquifer

- LI - Locally Important Aquifer - Bedrock which is Moderately Productive only in Local Zones
- PI - Poor Aquifer - Bedrock which is Generally Unproductive except for Local Zones
- Pu - Poor Aquifer - Bedrock which is Generally Unproductive
- Unclassified

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PROJECT TITLE **Dublin Array**

DRAWING TITLE **Biodiversity: SPA and SAC with Hydrological Connections**

DRAWING NUMBER: **Figure: 9** PAGE NUMBER: **1 of 1**

VER	DATE	REMARKS	DRAW	CHEK	APRD
01	2025-02-12	DRAFT	JK	SW	AE
02	2025-02-06	PUBLIC	JK	CF	AM



Local Important Biodiversity Sites

2.5.23 Locally Important Biodiversity Sites (LIBS), are areas that are outside of protected areas, but which form an integral part of the ecological network across a county and are considered important at a local level and provide a range of ecosystem services to communities. They have no formal designation but are considered sites worthy of protection and enhancement. LIBS may also provide additional benefits to or support, the protected area network (i.e. statutory designated sites such as NHA). They do not overlap with protected sites but may be located adjacent to them or within close proximity to them (DLRCC, 2021).

2.5.24 These areas aim to support pollinating invertebrates, which would have additional benefits for bats and birds. The DLR County Development Plan Policy Objective GIB10 provides local policy protection for them. Full wording for the policy is included in the Onshore Biodiversity Technical Baseline Report.

OES

2.5.25 Annex 9 of the Onshore Biodiversity Technical Baseline Report includes Supplementary Map B1 (Ecological network map) from the DLRCC County Development Plan details the LIBS areas along with other designated sites within DLRCC. In total, 16 LIBS were identified within 5 km of the OES. These are detailed further in Table 10.

Table 10 LIBS within 5 km of the OES

LIBS name ¹⁷	Site code	Distance to OES study area (km)
Shanganagh River and Cliff	LIBS04	Within site
Bride's Glen East	LIBS07	0.16
Heronford Bridge	LIBS08	0.19
Druid's Glen	LIBS06	0.36
Cherrywood Tullyvale Springs	LIBS14	0.53
Ballycorus Road/Ticknick	LIBS09	0.67
Cabinteely Park	LIBS05	0.99
Shanganagh Park and Coastline	LIBS01	1.07
Fernhill Park	LIBS20	1.47
Ballycorus/Kingston grassland	LIBS10	1.54
Carrickgollogan Hill and Ballycorus Leadmine	LIBS02	1.83
Two Rock Mountain and Ballybrack	LIBS17	2.49
Barnaslingan Forest and The Scalp	LIBS03	2.50

¹⁷ Taken from p.80 of the DLRCC Biodiversity Action Plan

LIBS name ¹⁷	Site code	Distance to OES study area (km)
Kilmashogue Mountain	LIBS18	3.91
Glencullen Valley	LIBS16	4.50
Marlay Park	LIBS19	4.57

2.5.26 The Shanganagh River and Cliff LIBS are located within the OES boundary, on the boundary of the Landfall Site and Sector 1 of the ECR. Additionally, Bride’s Glen East LIBS, Heronford Bridge LIBS, and Druid’s Glen LIBS are located within the 50 m buffer for the OES. These are assessed as important on a **local level**.

2.5.27 There are no LIBS located within the boundary of the OES or the 50 m buffer and, therefore, all other LIBS have been reasonably discounted from further assessment.

O&M Base

2.5.28 Annex 9 of the Onshore Biodiversity Technical Baseline Report includes Map B1 from the DLRCC County Development Plan, which details these areas along with other designated sites within DLRCC. Four LIBS were identified within 5 km of the O&M Base. These are detailed further in Table 11.

Table 11 LIBS within 5 km of the O&M Base

LIBS name ¹⁸	Site code	Distance to O&M Base (km)
Blackrock Park	LIBS13	3.11
Cabinteely Park	LIBS05	3.79
Druid’s Glen	LIBS06	4.80
Cherrywood Tullyvale Springs	LIBS14	4.98

2.5.29 No LIBS were located within the boundary of the O&M Base or the 500 m buffer of the O&M Base. The closest LIBS site comprised Blackrock Park, located 3.11 km from the O&M Base. As such, all LIBS have been appropriately discounted from further assessment in relation to the O&M Base.

Summary

2.5.30 Four LIBS were identified: Shanganagh River and Cliff LIBS, Bride’s Glen East LIBS, Heronford Bridge LIBS, and Druid’s Glen LIBS within the OES study area and/or the 50 m buffer. These LIBS site have been evaluated as being important on a **local level**. All other LIBS are located outside the boundary of the OES have been scoped out of the assessment.

2.5.31 No LIBS were located within the boundary or the 500 m buffer of the O&M Base. Therefore, all LIBS have been scoped out of the assessment for the O&M Base.

¹⁸ Taken from p.80 of the DLRCC Biodiversity Action Plan

Habitats

2.5.32 Table 12 provides the extent of habitats present across the OES and O&M Base planning application boundaries. Figure 5 in the Onshore Biodiversity Technical Baseline Report shows the location of these habitats, with further details for each component of the onshore infrastructure being provided in the Onshore Biodiversity Technical Baseline Report. The area of habitats within the boundaries of both the OES and O&M Base are considered to be the upper limit of habitat loss that could be expected throughout the project.

Table 12 Habitats extent across the OES and O&M Base boundary and the study areas

Habitats (Fossitt, 2000)	EU Annex I affiliations	Area/length of habitat within OES boundary	Area/length of habitat within OES study area (i.e. 50 m buffer for OES and 500 m buffer for O&M Base)	Important Ecological Feature? (Yes/no)
OES				
Arable crops BC1	No	1.33 ha	3.57 ha	No
Horticultural land BC2	No	0.65 ha	0.83 ha	No
Tilled land BC3	No	5.36 ha	11.31 ha	No
Buildings and artificial surfaces BL3	No	7.48 ha	51.75 ha	No
Sedimentary sea cliffs CS3	Vegetated sea cliffs of the Atlantic and Baltic coasts (1230)	0.21 km	0.34 km	Yes
Spoil and bare ground ED2	No	1.89 ha	9.72 ha	No
Recolonizing bare ground ED3	No	0.06 ha	0.75 ha	No
Other artificial lakes and ponds FL8	No	0.00 ha	0.34 ha	Yes
Depositing river FW2	Floating river vegetation (3260)	0.65 km	2.15 km	Yes
Drainage ditch FW4	No	0.09 km	0.19 km	Yes
Improved agricultural grassland GA1	No	0.37 ha	0.99 ha	No

Habitats (Fossitt, 2000)	EU Annex I affiliations	Area/length of habitat within OES boundary	Area/length of habitat within OES study area (i.e. 50 m buffer for OES and 500 m buffer for O&M Base)	Important Ecological Feature? (Yes/no)
Amenity grassland GA2	No	4.23 ha	11.16 ha	No
Dry calcareous grassland GS1	No	0.48 ha	1.29 ha	Yes
Dry meadows and grassy verges GS2	No	7.39 ha	21.17 ha	Yes
Shingle and gravel shores LS1	Perennial vegetation of stony banks (1220)	0.62 ha	1.97 ha	Yes
Mixed broadleaved woodland WD1	No	0.09 ha	1.38 ha	Yes
Scattered trees and parkland WD5	No	1.45 ha	4.51 ha	Yes
Hedgerows WL1	No	0.26 km	1.10 km	Yes
Treelines WL2	No	0.49 km	3.61 km	Yes
Riparian woodland WN5	No	0.26 ha	0.78 ha	Yes
Scrub WS1	No	0.62 ha	4.52 ha	Yes
Immature woodland WS2	No	0.56 ha	5.52 ha	Yes
Ornamental non-native shrub WS3	No	0.00 ha	0.04 ha	No
Total area/length		32.88 ha	136.83 ha	
O&M Base				
Sea wall, piers and jetties CC1	No	0.13 ha	4.85 ha	No
Amenity grassland GA2	No	0.09 ha	0.46 ha	No
Open marine water MW1	No	0.00 ha	7.40 ha	Yes

Habitats (Fossitt, 2000)	EU Annex I affiliations	Area/length of habitat within OES boundary	Area/length of habitat within OES study area (i.e. 50 m buffer for OES and 500 m buffer for O&M Base)	Important Ecological Feature? (Yes/no)
Sea inlets and bays MW2	Large shallow inlets and bays (1160)	0.09 ha	60.26 ha	Yes
Buildings and artificial surfaces BL3	No	2.30 ha	46.94	No
Total area:		2.61 ha	119.91 ha	

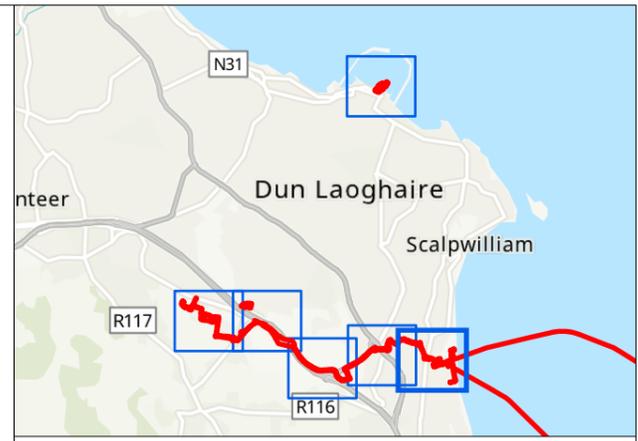
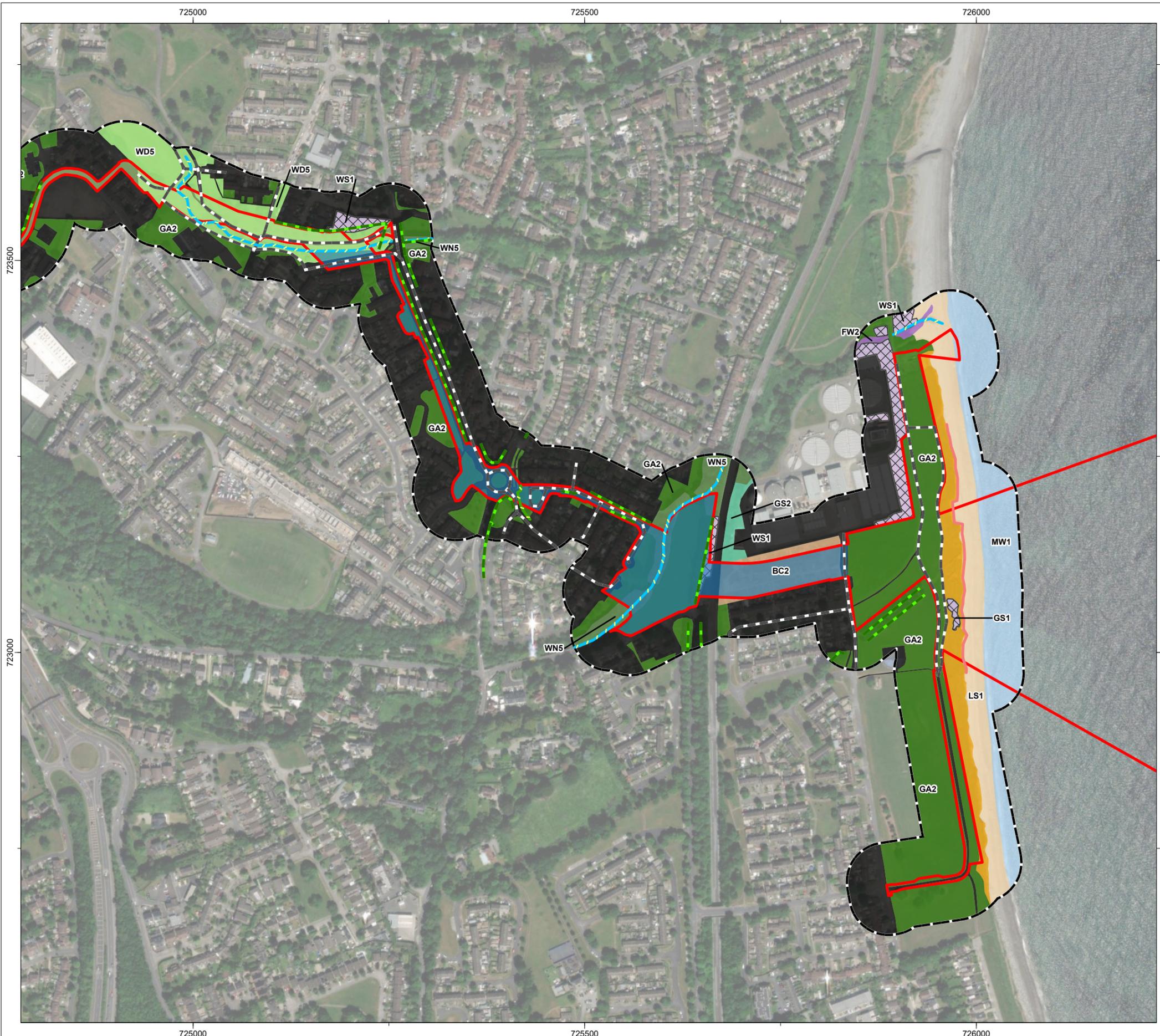
2.5.33 The following Annex I habitats were present across the OES and O&M Base (as detailed in Table 12):

OES

- ▲ Floating river vegetation (3260);
- ▲ Alluvial forests (91E0);
- ▲ Vegetated sea cliffs of the Atlantic and Baltic Coasts (code 1230); and
- ▲ Perennial vegetation of stoney banks (1220).

O&M Base

- ▲ Large shallow inlets and bays (1160).



Application Site Boundary
 Onshore Electrical System (OES) 50 m Study Area

Export Cable Route (ECR) Sector

- Sector 1
- Sector 2

Fossitt Habitat (Linear)

- BL3 - Built Land
- CS3 - Sedimentary Sea Cliff
- FW2 - Depositing River
- WL1 - Hedgerow
- WL2 - Treeline

Fossitt Habitats (Areas)

- BC2 - Horticultural Land
- BL3 - Buildings and Artificial Surfaces
- FW2 - Depositing Lowland Rivers
- GA2 - Amenity Grassland (Improved)
- GS1 - Dry Calcareous and Neutral Grassland
- GS2 - Dry Meadows & Grassy Verges
- LS1 - Shingle Gravel Shore
- MW1 - Open Marine Waters
- WD5 - Scattered Trees and Parkland
- WN5 - Riparian Woodland
- WS1 - Scrub

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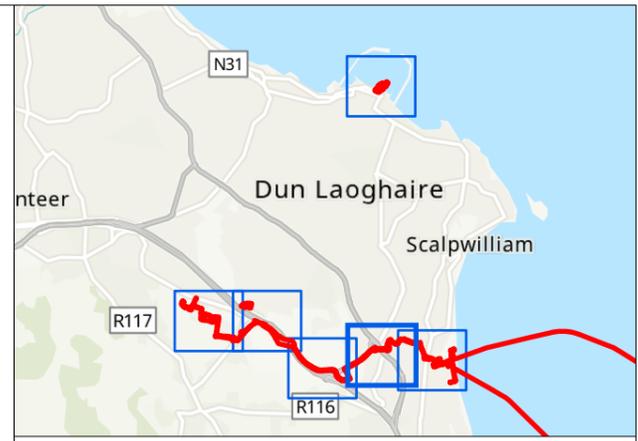
PROJECT TITLE
Dublin Array

DRAWING TITLE
Biodiversity: Fossitt Habitat Survey

DRAWING NUMBER: **10** PAGE NUMBER: **1 of 6**

VER	DATE	REMARKS	DRAW	CHEK	APRD
01	2024-18-12	DRAFT	JK	SW	AE
02	2025-02-17	PUBLIC	JK	SW	AE





Application Site Boundary
Onshore Electrical System (OES) 50 m Study Area

Export Cable Route (ECR) Sector

- Sector 1
- Sector 2
- Sector 3
- Sector 4

Fossitt Habitat (Linear)

- BL3 - Built Land
- FW2 - Depositing River
- WL1 - Hedgerow
- WL2 - Treeline

Fossitt Habitats (Areas)

- BL3 - Buildings and Artificial Surfaces
- ED2 - Spoil and Bare Ground
- ED3 - Recolonising Bare Ground
- GA2 - Amenity Grassland (Improved)
- GS2 - Dry Meadows & Grassy Verges
- WD1 - Mixed Broadleaved Woodland
- WD5 - Scattered Trees and Parkland
- WS1 - Scrub
- WS2 - Immature Woodland

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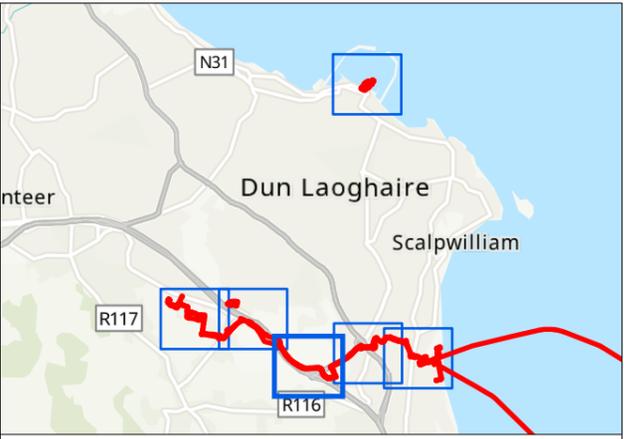
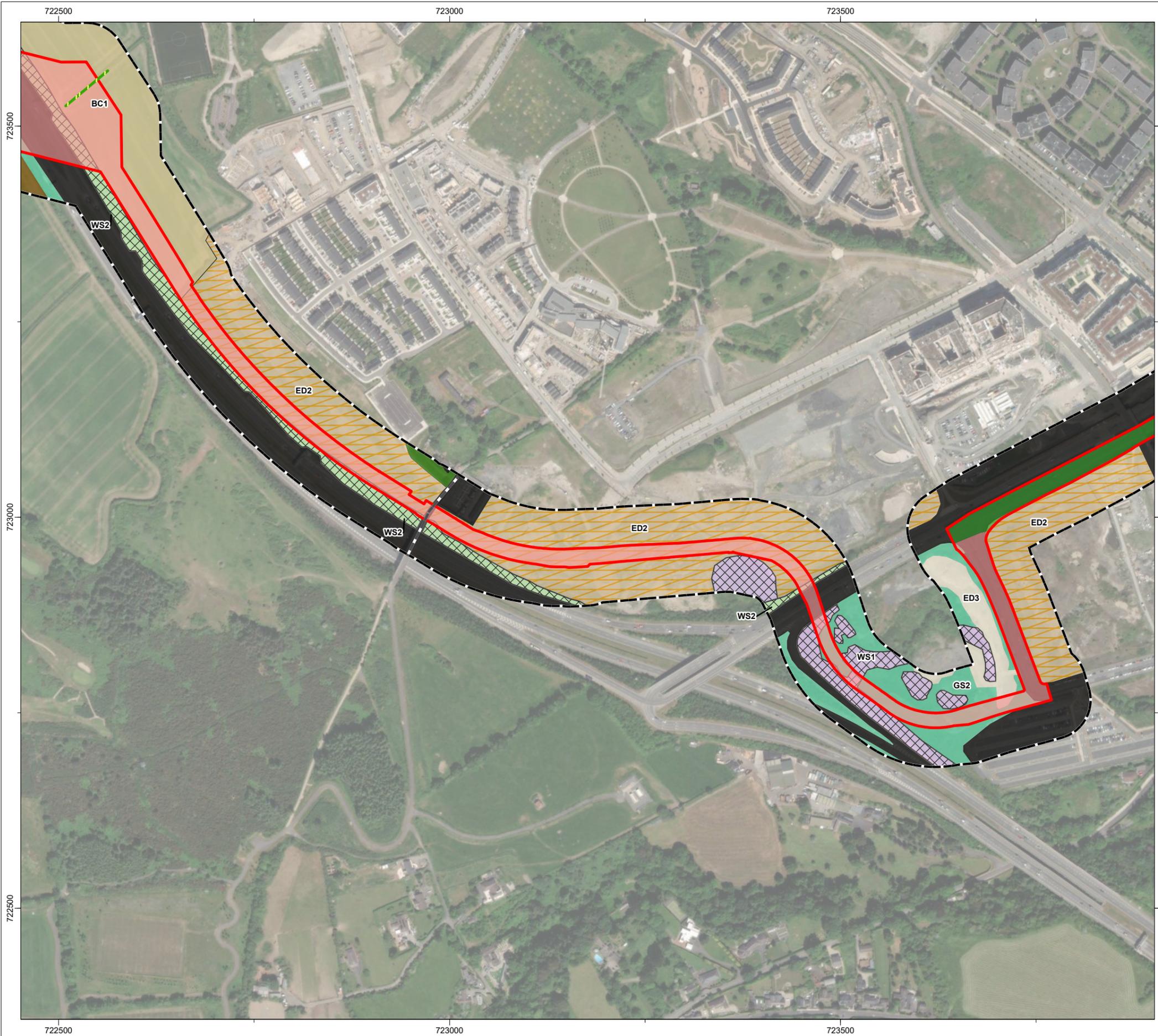
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DRAWING TITLE
Biodiversity: Fossitt Habitat Survey

DRAWING NUMBER: **11** PAGE NUMBER: **2 of 6**

VER	DATE	REMARKS	DRAW	CHEK	APRD
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02	2025-02-17	PUBLIC	JK	SW	AE





Application Site Boundary
Onshore Electrical System (OES) 50 m Study Area

Export Cable Route (ECR) Sector

- Sector 3
- Sector 4

Fossitt Habitat (Linear)

- BL3 - Built Land
- WL1 - Hedgerow

Fossitt Habitats (Areas)

- BC1 - Arable Crops
- BC3 - Tilled Land
- BL3 - Buildings and Artificial Surfaces
- ED2 - Spoil and Bare Ground
- ED3 - Recolonising Bare Ground
- GA2 - Amenity Grassland (Improved)
- GS2 - Dry Meadows & Grassy Verges
- WS1 - Scrub
- WS2 - Immature Woodland

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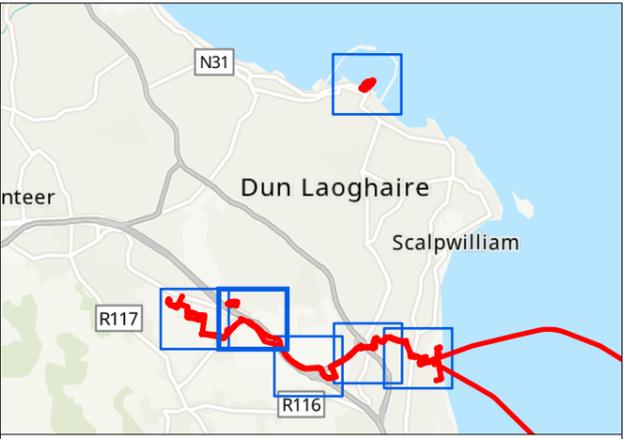
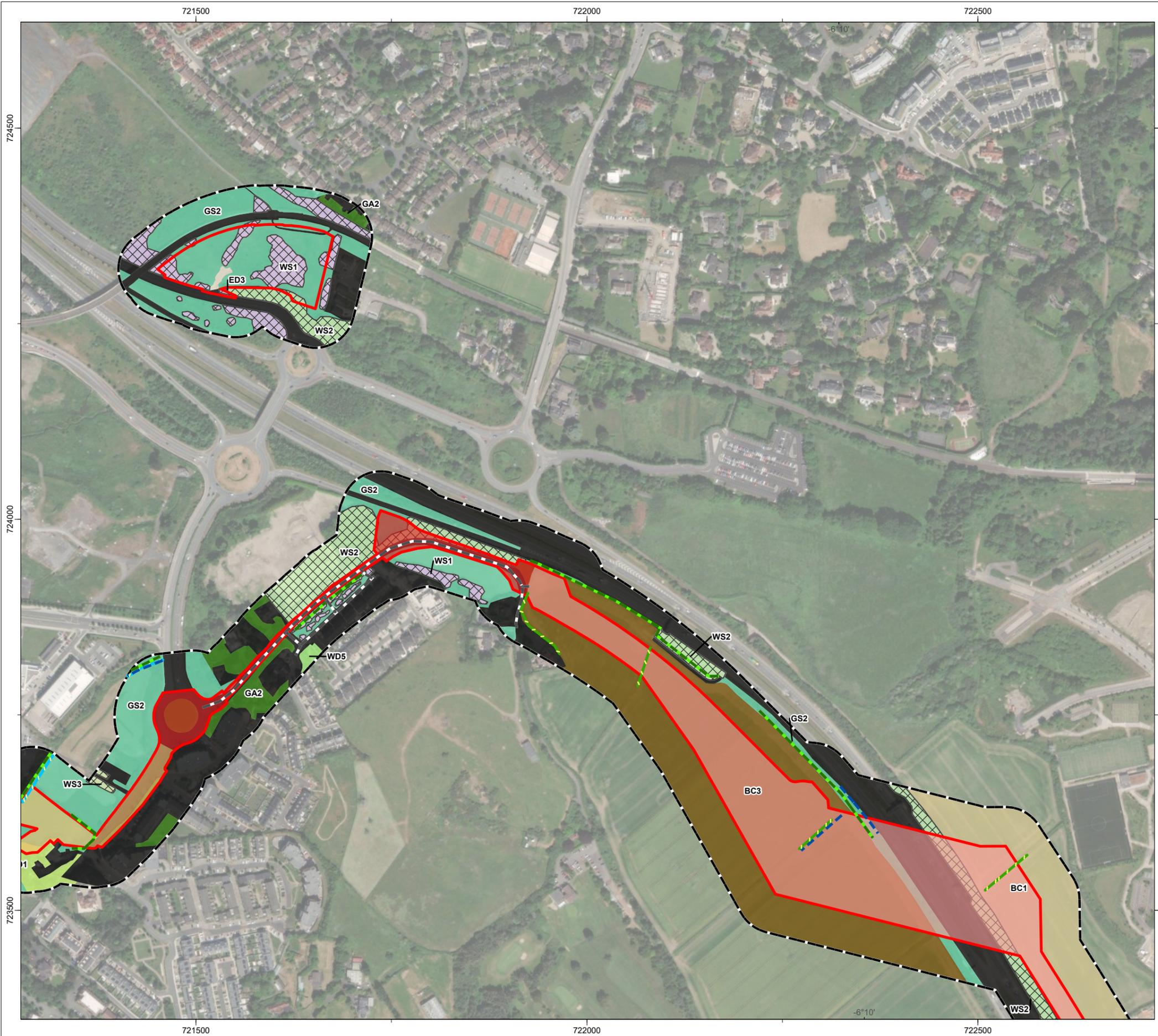
DRAWING TITLE
Biodiversity: Fossitt Habitat Survey

DRAWING NUMBER: 12 **PAGE NUMBER:** 3 of 6

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02	2025-02-17	PUBLIC	JK	SW	AE

0 25 50 75 100 Meters
 0 0.03 0.05 0.08 0.1 Miles

SCALE 1:5,000 PLOT SIZE A3
 DATUM IRENET95 VERTICAL REF ODNLAT/MLLW
 PRJ IRENET95 Irish Transverse Mercator



- Application Site Boundary
- Onshore Electrical System (OES) 50 m Study Area
- Export Cable Route (ECR) Sector**
- Sector 4
- Sector 5
- Sector 6

- Fossitt Habitat (Linear)**
- BL3 - Built Land
- FW2 - Depositing River
- FW4 - Drainage Ditch
- WL1 - Hedgerow
- WL2 - Treeline

- Fossitt Habitats (Areas)**
- BC1 - Arable Crops
- BC3 - Tilled Land
- BL3 - Buildings and Artificial Surfaces
- ED2 - Spoil and Bare Ground
- ED3 - Recolonising Bare Ground
- GA2 - Amenity Grassland (Improved)
- GS2 - Dry Meadows & Grassy Verges
- WD1 - Mixed Broadleaved Woodland
- WD5 - Scattered Trees and Parkland
- WS1 - Scrub
- WS2 - Immature Woodland
- WS3 - Ornamental/Non-Native Shrub

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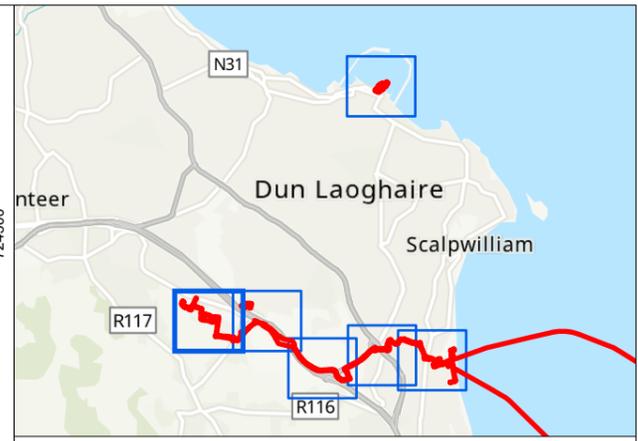
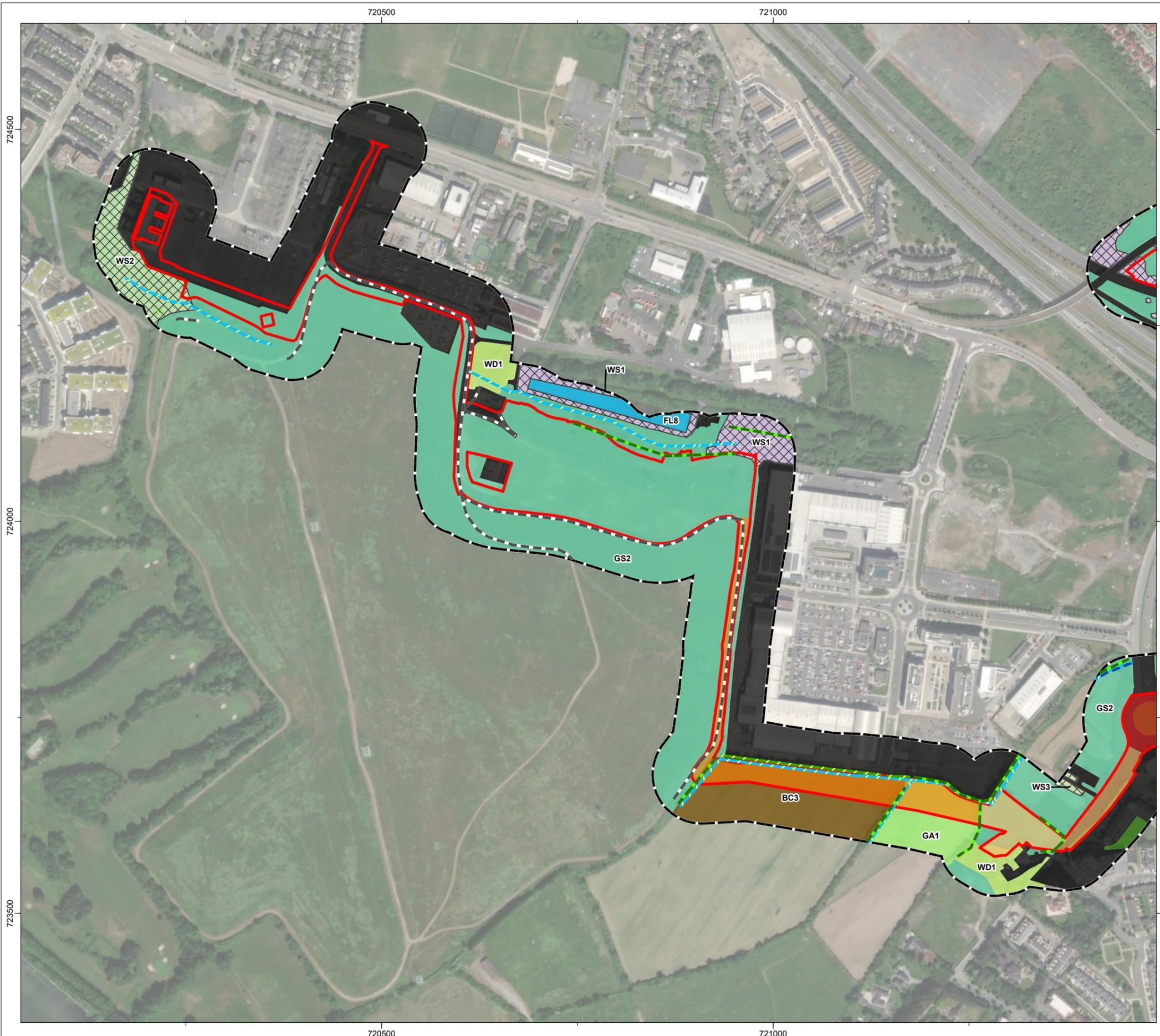
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DRAWING TITLE
Biodiversity: Fossitt Habitat Survey

DRAWING NUMBER: **13** PAGE NUMBER: **4 of 6**

VER	DATE	REMARKS	DRAW	CHEK	APRD
01	2024-18-12	DRAFT	JK	SW	AE
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Application Site Boundary
 Onshore Electrical System (OES) 50 m Study Area

Export Cable Route (ECR) Sector

- Sector 5
- Sector 6
- Sector 7

Fossitt Habitat (Linear)

- BL3 - Built Land
- FW2 - Depositing River
- FW4 - Drainage Ditch
- WL1 - Hedgerow
- WL2 - Treeline

Fossitt Habitats (Areas)

- BC3 - Tilled Land
- BL3 - Buildings and Artificial Surfaces
- FL8 - Other Artificial Lakes and Ponds
- GA1 - Improved Agricultural Grassland
- GA2 - Amenity Grassland (Improved)
- GS2 - Dry Meadows & Grassy Verges
- WD1 - Mixed Broadleaved Woodland
- WS1 - Scrub
- WS2 - Immature Woodland
- WS3 - Ornamental/Non-Native Shrub

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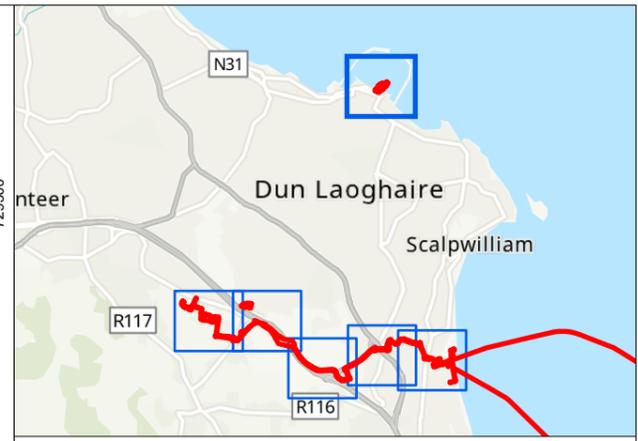
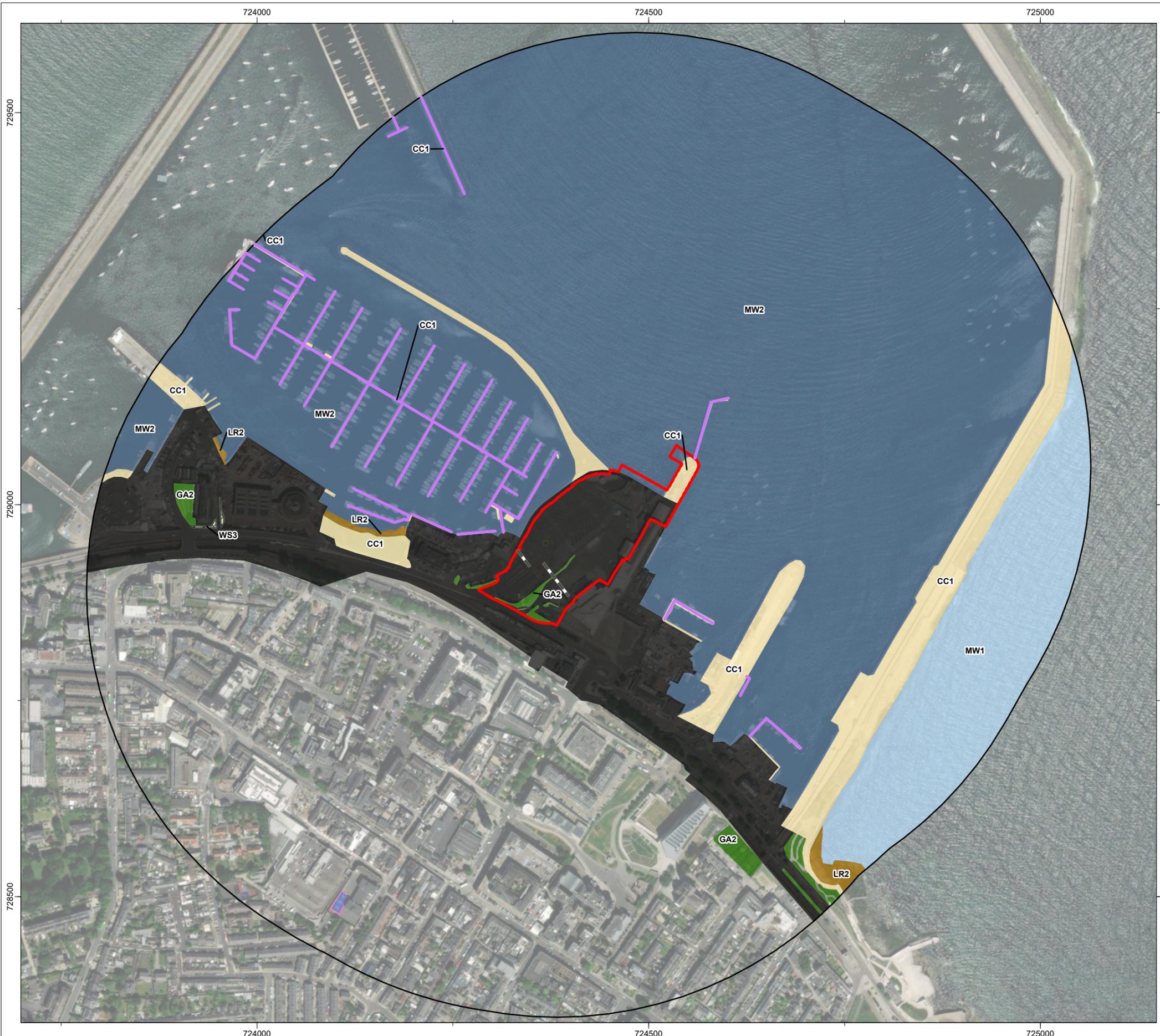
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DRAWING TITLE
Biodiversity: Fossitt Habitat Survey

DRAWING NUMBER: **14** PAGE NUMBER: **5 of 6**

VER	DATE	REMARKS	DRAW	CHEK	APRD
01	2024-18-12	DRAFT	JK	SW	AE
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Application Site Boundary
 Operations and Maintenance Planning Boundary (O&M Base) 500 m Study Area

Fossitt Habitat (Linear)
 - - - BL3 - Built Land
 CC1 - Coastal Constructuins

Fossitt Habitats (Areas)
 BL3 - Buildings and Artificial Surfaces
 CC1 - Coastal Constructuins
 GA2 - Amenity Grassland (Improved)
 LR2 - Moderately Exposed Rocky Shores
 MW1 - Open Marine Waters
 MW2 - Sea inlets and bays
 WS3 - Ornamental/Non-Native Shrub

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Biodiversity: Fossitt Habitat Survey

DRAWING NUMBER: **15** PAGE NUMBER: **6 of 6**

VER	DATE	REMARKS	DRAW	CHEK	APRD
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Flora and fauna

2.5.34 The flora and fauna scoped into the assessment, based on a review of the desk study, including records returned, their distribution (based on Article 17 reports¹⁹ (NPWS, 2019), and field surveys (refer to the Onshore Biodiversity Technical Baseline report) are as follows:

OES

- ▲ Amphibians due to the presence of suitable terrestrial habitat although no suitable breeding ponds were present within the study area.
- ▲ Birds, including:
 - Shorebird assemblage due to the OES proximity to the coast and European sites designated for shorebirds;
 - Raptor assemblage due to the extent of suitable foraging habitat across the study area; and
 - General bird assemblage, including common and widespread birds and red and amber-listed birds (BoCCI) that are present in the study area based on the results of the desk study.
- ▲ Bats due to the presence of suitable commuting and foraging habitat and likely roosting locations within trees and nearby residential buildings. Bat species include the following:
 - Common pipistrelle, soprano pipistrelle & brown-long eared;
 - *Myotis* spp.; and
 - Leisler's bat.
- ▲ Badgers due to the presence of suitable foraging habitat in the study area and the identification of a (disused) sett;
- ▲ Hedgehogs due to the presence of suitable foraging habitat across the study area;
- ▲ Otters due to the identification of a potential holt near the Shanganagh WWTP and Clifton Park in Sector 1 at ITM coordinates 725712, 723223 and suitable habitat within the Shanganagh River and tributaries;

¹⁹ Under Article 11 of the Habitats Directive, each member state is obliged to undertake surveillance of the conservation status of the natural habitats and species in the Annexes and under Article 17, to report to the European Commission every six years on their status and on the implementation of the measures taken under the Directive.

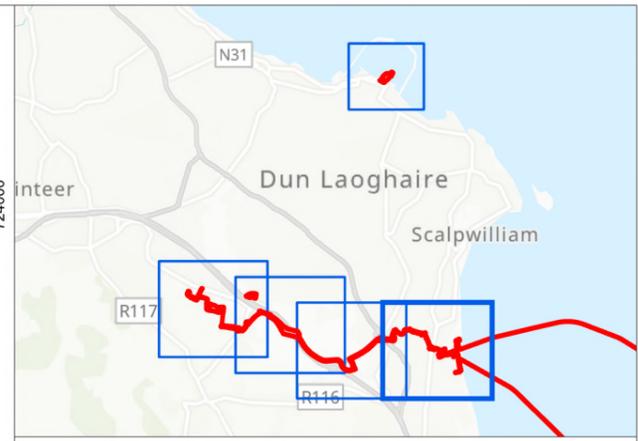
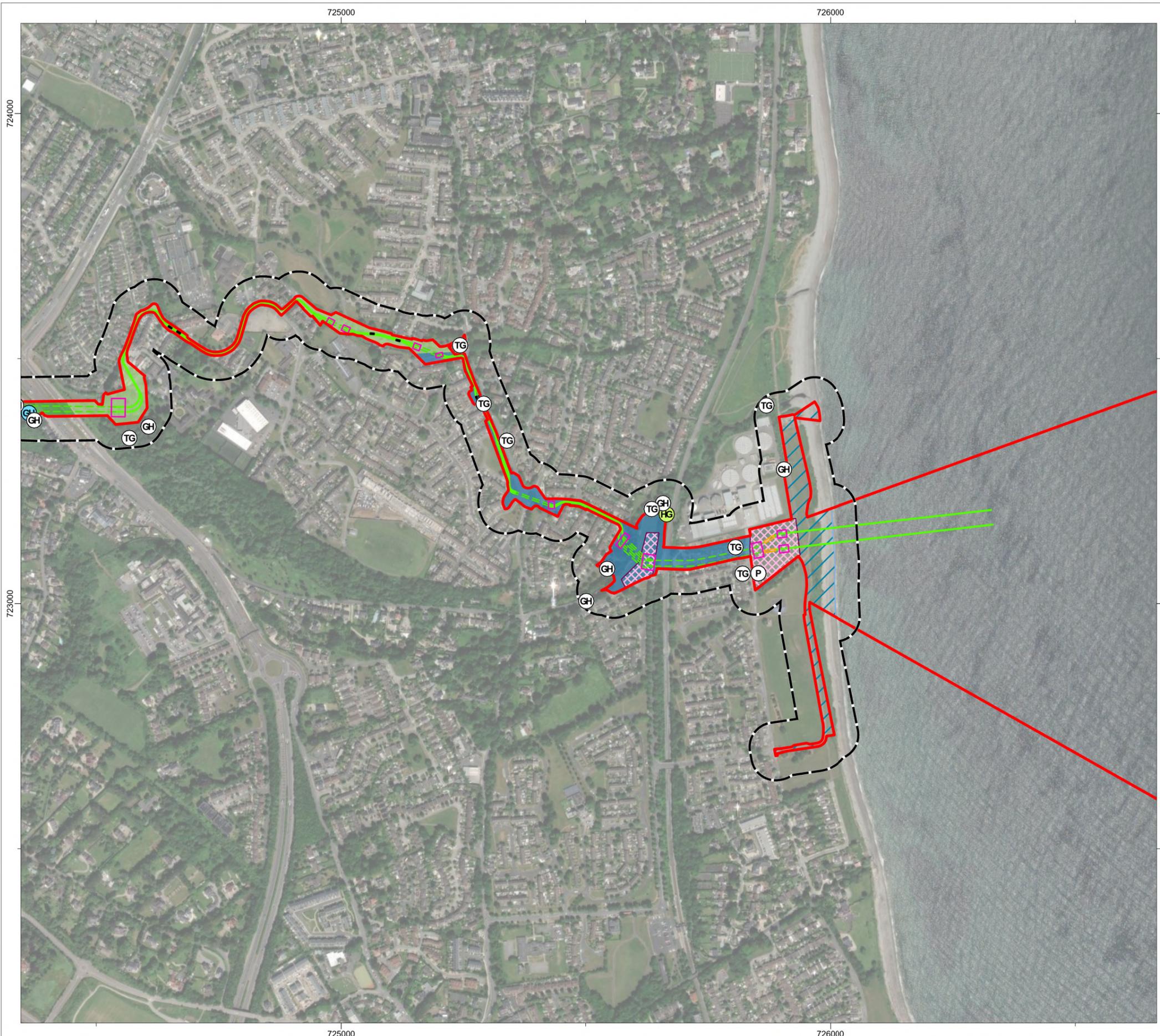
- ▲ Other mammals due to the presence of suitable habitats across the study area, including:
 - Pygmy shrew;
 - Irish hare;
 - Irish stoat; and
 - Red squirrel;
- ▲ Fish based on the aquatic ecology field survey results, including:
 - Brown trout;
 - European eel; and
 - Lamprey spp.;
- ▲ Invertebrates
- ▲ Invasive alien species that were identified during field surveys, for which the following were identified:
 - Giant hogweed *Heracleum mantegazzianum*;
 - Montbretia *Crocsmia x crocosmifolia*;
 - Japanese knotweed *Reynoutria japonica*;
 - Ring-necked parakeet *Psittacula krameri*²⁰; and
 - Three-cornered garlic *Allium triquetrum*.

O&M Base

- ▲ SPA qualifying bird assemblage based on the findings of the intertidal bird surveys; and
- ▲ Amber-listed birds – black guillemot due to their confirmed presence and ‘probable breeding’ under Carlisle Pier within Dún Laoghaire Harbour, based on current British Trust for Ornithology (BTO) breeding codes²¹.

²⁰ Observed in flight near the rail track at the Landfall Site/.

²¹ Which can be found here: <https://www.bto.org/our-science/projects/birdatlas/methods/breeding-evidence> [Accessed: January 2025].



Application Site Boundary

Onshore Electrical System (OES) 50 m Buffer

Onshore Electrical System (OES) Design

- TJB
- Temporary Trenchless Crossing Compound
- Underground Joint Bay
- Onshore Export Cable Route (Trenchless)
- Onshore Export Cable Route (Trenched)
- Temporary Construction Compound (TCC)
- Landfall TJB Area

Electrical Cable Route (ECR) Sector

- Sector 1
- Sector 2
- Sector 3

Invasive Alien Species

- Parakeet
- Giant Hogweed
- Young Giant Hogweed
- Giant Hogweed and Garlic
- Three Cornered Garlic

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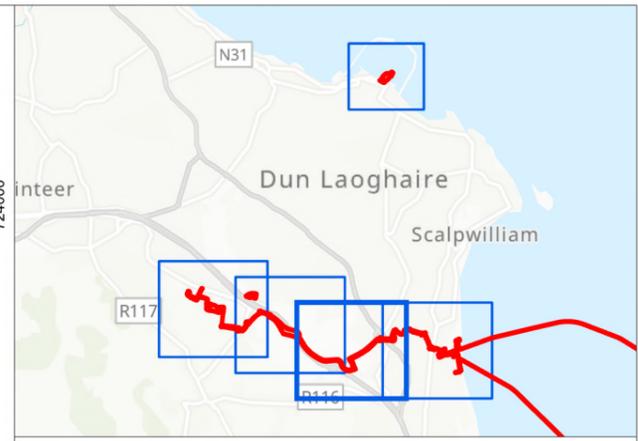
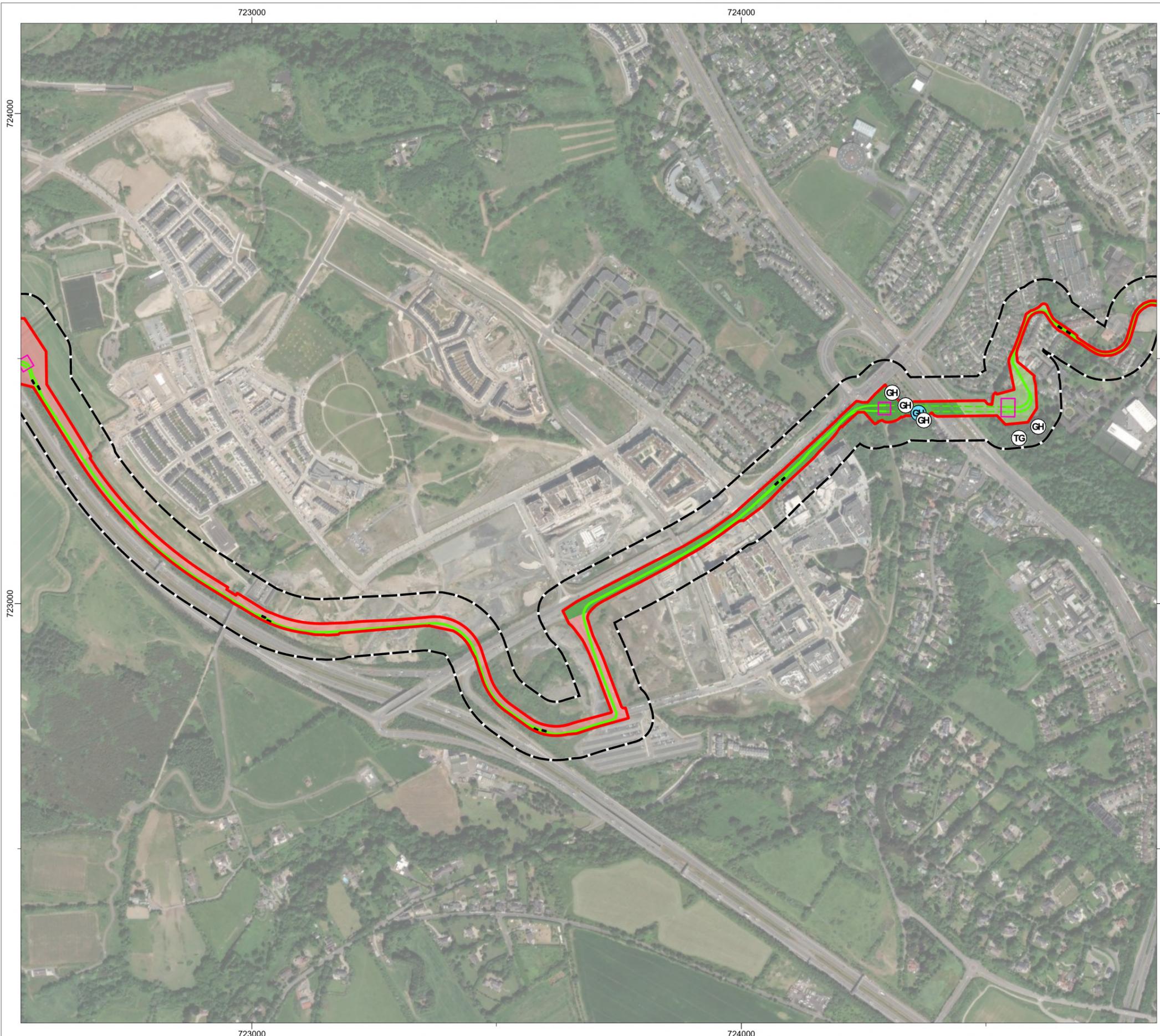
PROJECT TITLE **Dublin Array**

DRAWING TITLE **Biodiversity: Invasive Alien Species**

DRAWING NUMBER: **Figure 16** PAGE NUMBER: **1 of 1**

VER	DATE	REMARKS	DRAW	CHEK	APRD
01	2025-02-18	DRAFT	JK	SW	AE
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Application Site Boundary

Onshore Electrical System (OES) 50 m Buffer

Onshore Electrical System (OES) Design

- Temporary Trenchless Crossing Compound
- Underground Joint Bay
- Onshore Export Cable Route (Trenchless)
- Onshore Export Cable Route (Trenched)

Electrical Cable Route (ECR) Sector

- Sector 2
- Sector 3
- Sector 4

Invasive Alien Species

- GH Giant Hogweed
- YGH Young Giant Hogweed
- TG Three Cornered Garlic

DRAWING STATUS **PUBLIC**

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PROJECT TITLE **Dublin Array**

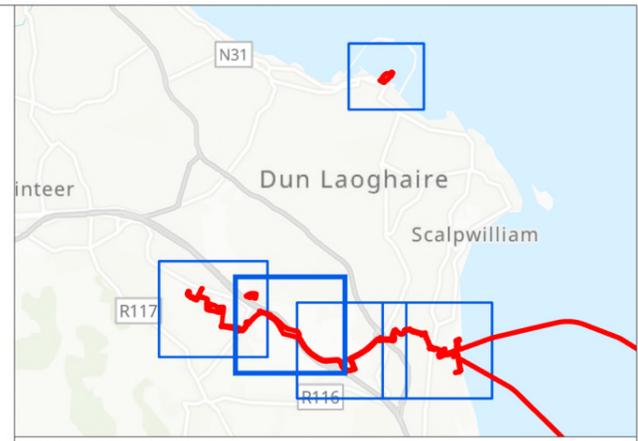
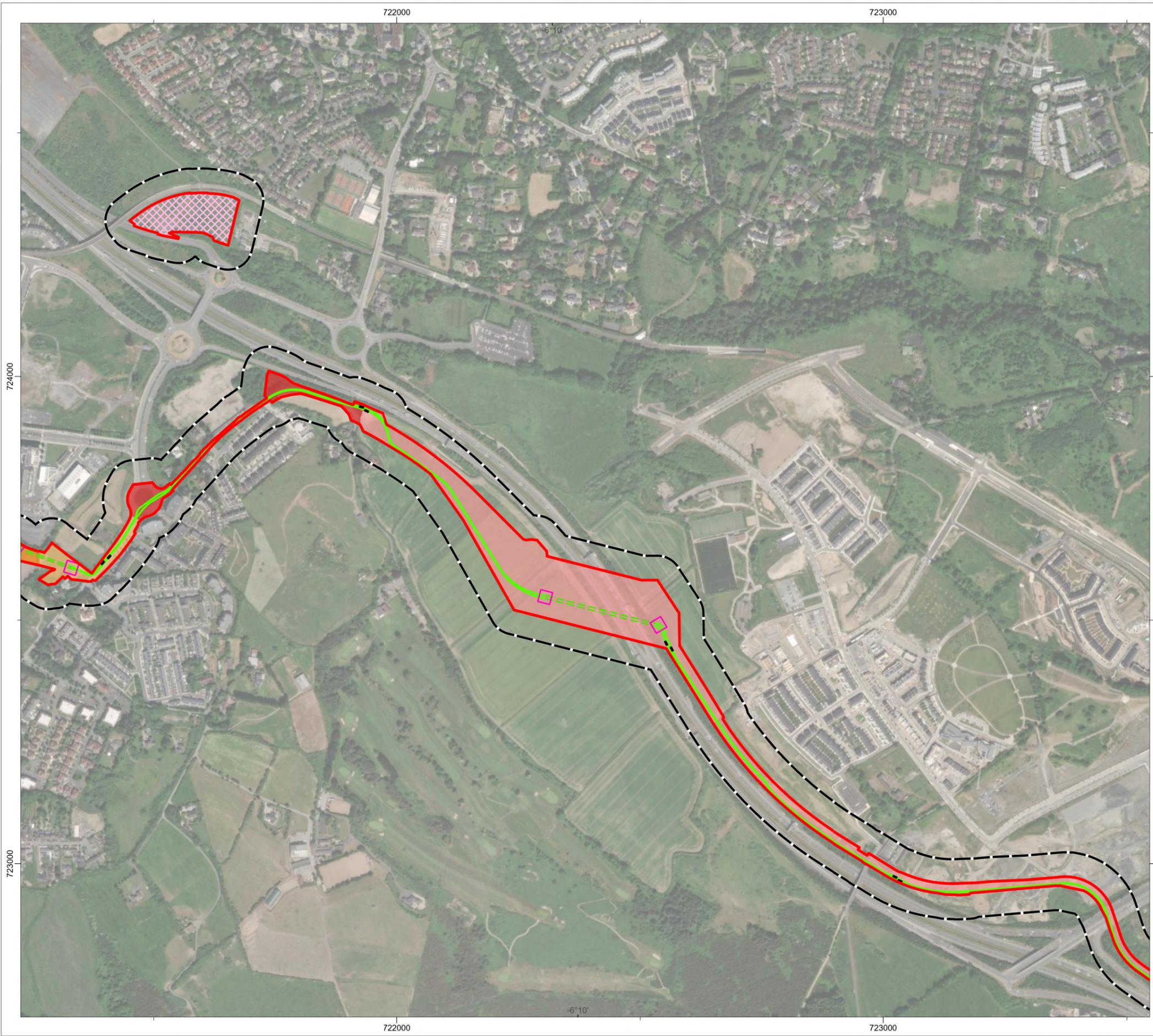
DRAWING TITLE **Biodiversity: Invasive Alien Species**

DRAWING NUMBER: **Figure 17** PAGE NUMBER: **1 of 1**

VER	DATE	REMARKS	DRAW	CHEK	APRD
01	2025-02-18	DRAFT	JK	SW	AE
02	2025-02-11	PUBLIC	JK	SP	CF

0 25 50 75 100 Meters
 0 0.03 0.05 0.08 0.1 Miles

SCALE 1:8,000 PLOT SIZE A3
 DATUM IRENET95 VERTICAL REF. ODN/LAT/MLLW
 PRJ IRENET95 Irish Transverse Mercator



- Application Site Boundary
- Onshore Electrical System (OES) 50 m Buffer
- Onshore Electrical System (OES) Design**
- Temporary Trenchless Crossing Compound
- Underground Joint Bay
- Onshore Export Cable Route (Trenchless)
- Onshore Export Cable Route (Trenched)
- Temporary Construction Compound (TCC)
- Electrical Cable Route (ECR) Sector**
- Sector 4
- Sector 5
- Sector 6
- Sector 7

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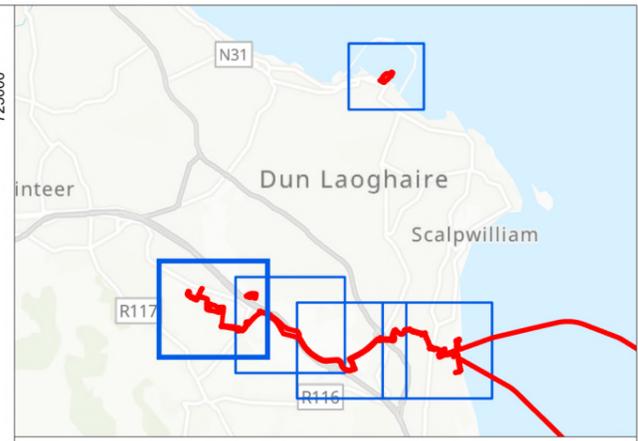
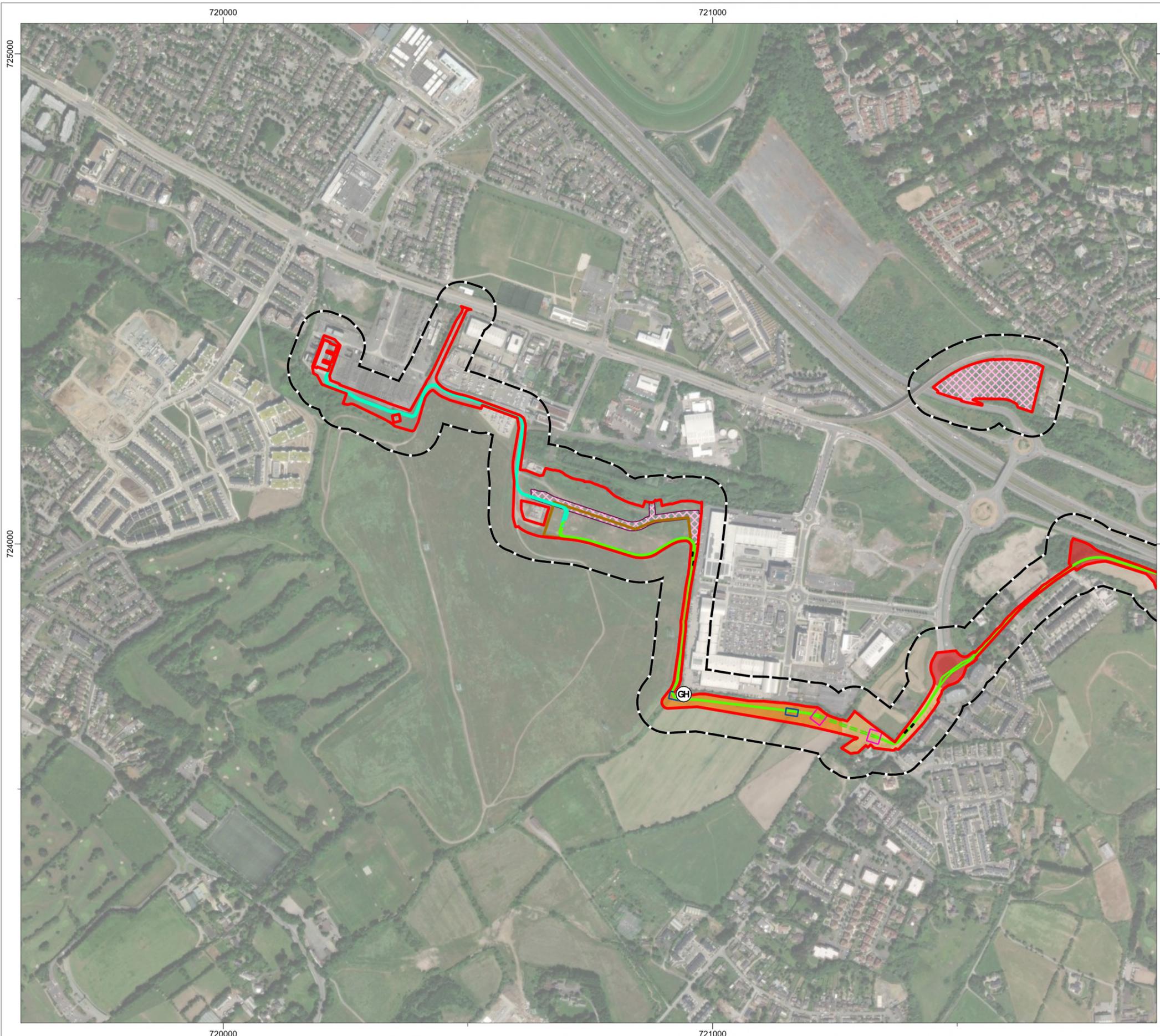
PROJECT TITLE **Dublin Array**

DRAWING TITLE **Biodiversity: Invasive Alien Species**

DRAWING NUMBER: **Figure 18** PAGE NUMBER: **1 of 1**

VER	DATE	REMARKS	DRAW	CHEK	APRD
01	2025-02-18	DRAFT	JK	SW	AE
02	2025-02-11	PUBLIC	JK	SP	CF





- Application Site Boundary
- Onshore Electrical System (OES) 50 m Buffer
- Onshore Electrical System (OES) Design**
- Onshore ECR Watercourse Crossing (trenched)
- Temporary Trenchless Crossing Compound
- Underground Joint Bay
- Onshore Export Cable Route (Trenchless)
- Onshore Export Cable Route (Trenched)
- Grid Connection Cable
- Temporary Construction Compound (TCC)
- Electrical Cable Route (ECR) Sector**
- Sector 5
- Sector 6
- Sector 7
- Onshore Substation (OSS) Boundary
- Invasive Alien Species**
- GH Giant Hogweed

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PROJECT TITLE **Dublin Array**

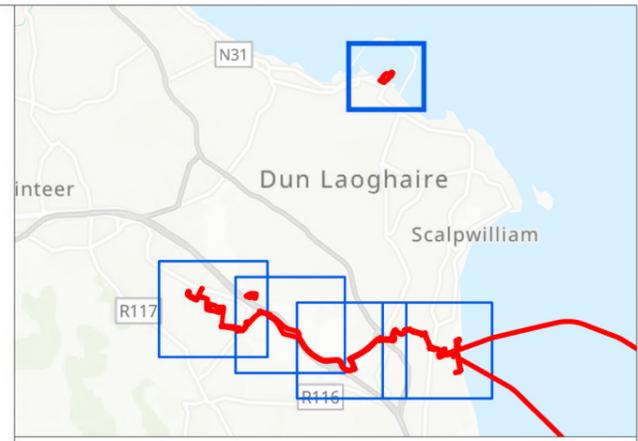
DRAWING TITLE **Biodiversity: Invasive Alien Species**

DRAWING NUMBER: **Figure 19** PAGE NUMBER: **1 of 1**

VER	DATE	REMARKS	DRAW	CHEK	APRD
01	2025-02-18	DRAFT	JK	SW	AE
02	2025-02-11	PUBLIC	JK	SP	CF

0 25 50 75 100 Meters
 0 0.03 0.05 0.08 0.1 Miles

N
 SCALE 1:8,000 PLOT SIZE A3
 DATUM IRENET95 VERTICAL REF. ODNLATMLLW
 PRJ IRENET95 Irish Transverse Mercator



Application Site Boundary
 Operations and Maintenance Base (O&M Base) 500 m Buffer

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PROJECT TITLE **Dublin Array**

DRAWING TITLE **Biodiversity: Invasive Alien Species**

DRAWING NUMBER: **Figure 20** PAGE NUMBER: **1 of 1**

VER	DATE	REMARKS	DRAW	CHEK	APRD
01	2025-02-18	DRAFT	JK	SW	AE
02	2025-02-11	PUBLIC	JK	SP	CF

0 25 50 75 100 Meters
 0 0.03 0.05 0.08 0.1 Miles
 SCALE 1:5,500 PLOT SIZE A3
 DATUM IRENET95 VERTICAL REF. ODNLAT/MLLW
 PRJ IRENET95 Irish Transverse Mercator

Scoped out from further evaluation in this EIAR

2.5.35 Table 13 details the ecological features that have been scoped out from further assessment (refer the Onshore Biodiversity Technical Baseline Report for further information).

Table 13 Ecological features scoped out of the assessment

Ecological feature Sector(s)	Justification for scoping out
OES	
European designated Sites	<p>The SISAA Report and NIS scoped out all impacts to onshore internationally designated sites (i.e. Natura 2000 sites) other than the Wicklow Mountains SAC, and specifically for the QI species otter, relating to potential LSE from the OES works.</p> <p>All Natura 2000 sites other than the Wicklow Mountains SAC have been scoped out from further assessment in this report relating to the OES.</p>
Nationally designated sites	<p>The following pNHAs are sufficiently distant and not hydrologically connected to the OES and have, therefore, been scoped out from further assessment:</p> <ul style="list-style-type: none"> ▪ Fitzsimon's Wood pNHA ▪ Ballybetagh Bog pNHA ▪ Ballyman Glen pNHA ▪ South Dublin Bay pNHA ▪ Knocksink Wood pNHA ▪ Bray Head pNHA ▪ Powerscourt Woodland pNHA ▪ Powerscourt Woodland pNHA ▪ Booterstown Marsh pNHA ▪ Dargle River Valle pNHA ▪ Dargle River Valley pNHA ▪ Great Sugar Loaf pNHA ▪ Kilmacanoge Marsh pNHA ▪ Glencree Valley pNHA ▪ Grand Canal pNHA ▪ Powerscourt Waterfall pNHA ▪ North Dublin Bay pNHA ▪ Royal Canal pNHA ▪ Glenasmole Valley pNHA ▪ Glen of the Downs pNH ▪ Howth head pNHA pNHA ▪ Lugmore Glen ▪ The Murrough pNHA ▪ Liffey Valley pNHA

Ecological feature Sector(s)	Justification for scoping out
LIBS	Four LIBS, comprising Shanganagh River and Cliff LIBS, Bride’s Glen East LIBS, Heronford Bridge LIBS, and Druid’s Glen LIBS were identified within the OES Study Area (i.e. OES and a 50 m buffer). The remaining LIBS are located outside the OES study area have been scoped out from further assessment.
Habitats	<p>All habitats that were not listed as Annex I habitats or afforded legal or policy protection under the DLRCC County Development Plan have been scoped out of the assessment which are the following habitats:</p> <ul style="list-style-type: none"> ▪ Amenity grassland (GA2) ▪ Arable crops (BC1) ▪ Buildings and artificial surfaces (BL3) ▪ Dry meadows and grassy verges (GS2) ▪ Horticultural land (BC2) ▪ Improved agricultural grassland (GA1) ▪ Ornamental non-native shrub (WS3) ▪ Spoil and bare ground (ED2) ▪ Tilled land (BC3)
Atlantic salmon	eDNA analysis at sample points were undertaken at aquatic subsites A6, B3, A8, and A9. Only one positive result of Atlantic Salmon was returned, however this was assessed as being a false positive due to only returning 1/12 positive replicates (refer to the Aquatic Ecology report and the Technical Baseline for Biodiversity for further details). Therefore, this species is likely to be absent from these watercourses.
White-clawed crayfish	No white-clawed crayfish were identified at the survey sites. While there was suitable habitat identified for crayfish in the study area such as boulder and cobble refugia of the Barnacullia Stream, Carrickmines Stream and Shanganagh River. The low alkalinity and igneous geology of the River Dargle sub-catchment made it unsuitable for the species (Demers et al., 2005; Lucey & McGarrigle, 1987), supporting the absence of records in the catchment (based on NPWS data). Therefore, the presence of this species can be reasonably discounted.
O&M Base	
European designated Sites	The HDA SISAA and NIS scoped out all impacts to onshore internationally designated sites (i.e. Natura 2000 sites) other than the Wicklow Mountains SAC, and specifically for the QI species otter, relating to potential LSE from the OES. No impacts were expected relating to onshore ecology from the O&M Base. Therefore, all Natura 2000 sites have been scoped out from further assessment in this report relating to the O&M Base.

Ecological feature Sector(s)	Justification for scoping out
Nationally designated sites	<p>The following pNHAs are sufficiently distant and not hydrologically connected to the O&M Base and have, therefore, been scoped out from further assessment:</p> <ul style="list-style-type: none"> ▪ Loughlinstown Woods pNHA ▪ Dingle Glen pNHA ▪ Fitzsimon's Wood pNHA ▪ Howth Head pNHA ▪ Grand Canal pNHA ▪ Royal Canal pNHA ▪ Ballybetagh Bog pNHA ▪ Ballyman Glen pNHA ▪ Knocksink Wood pNHA ▪ Baldoyle Bay pNHA ▪ Powerscourt Woodland pNHA ▪ Bray Head pNHA ▪ Dargle River Valley pNHA ▪ Ireland's Eye pNHA ▪ Great Sugar Loaf pNHA ▪ Dodder Valley pNHA ▪ Santry Demesne pNHA ▪ Sluice River Marsh pNHA ▪ Kilmacanoge Marsh pNHA ▪ Glencree Valley pNHA
LIBS	All LIBS are outside the boundary and the 500 m buffer for the O&M Base and have been scoped out from further assessment.
Amphibians	No incidental sightings of amphibians were noted at the O&M Base. This area comprises of mostly buildings, artificial surfaces and marine habitats, which are of negligible value for amphibians. Therefore, amphibians are assessed as likely absent from the O&M Base itself.
Reptiles	<p>No incidental sightings of reptiles were recorded during the surveys at the O&M Base. However, common lizards are considered present in the local area, with records of this species being returned associated with Killiney and Dalkey Hill, located c. 3 km south-east of the O&M Base. These include recent records of common lizard (i.e. 2023).</p> <p>However, substantial existing urban environment is present between the location of these records and the O&M Base. This presents an effective barrier to common lizards through buildings and roads. Therefore, it is considered extremely unlikely that common lizards associated with Killiney and Dalkey Hill are able to disperse to the O&M Base.</p> <p>Furthermore, the habitats at the O&M Base are of negligible value for reptiles, offering no foraging opportunities or significant refugia or shelter from predators. The immediate surrounding area is heavily urbanised and</p>

Ecological feature Sector(s)	Justification for scoping out
	has significant human disturbance, that is likely to limit lizards from using the area. As such, this species is considered absent from the O&M Base and have been reasonably discounted from further assessment as a result.
Badger	The habitats at the O&M Base were mostly buildings and artificial surfaces, which are of negligible value for badger, offering no sett creating or foraging opportunities for this species. Therefore, badgers are assessed as absent from the O&M Base and have been scoped out from further assessment.
Hedgehog	The habitats at the O&M Base are considered of negligible value to hedgehog, with limited and isolated foraging and refuge opportunities for them. The area is heavily urbanised with high levels of human disturbance. Therefore, hedgehog are considered likely absent, and they have been scoped out.
Other mammals (pygmy shrew, red squirrel, Irish hare, and Irish stoat)	The urban nature of the O&M Base study area, high levels of human disturbance and the lack of suitable habitats means that this area is unsuitable for these species. Therefore, these species have been scoped out from further assessment.
Marine mammals: dolphins, porpoise and seals	These species are not assessed in this chapter, which is limited to onshore biodiversity and ecology. Rather they are considered in Volume 3, Chapter 5 of the EIAR.

Summary of Important Ecological Features

2.5.36 Table 14 provides a summary of the IEFs that have been included for assessment.

Table 14 IEFs scoped into the assessment for the OES and O&M Base

Feature	Considered IEF (yes/no)	
OES		
Designated sites	Internationally designated sites (SACs/SPAs)	Yes
	Nationally designated sites (NHAs/pNHAs)	Yes
	Locally important sites (LIBS)	Yes
Habitats	Arable crops BC1	No
	Horticultural land BC2	No
	Tilled land BC3	No
	Buildings and artificial surfaces BL3	No
	Sedimentary sea cliffs CS3	Yes
	Spoil and bare ground ED2	No

Feature		Considered IEF (yes/no)
	Recolonizing bare ground ED3	No
	Other artificial lakes and ponds FL8	Yes
	Depositing river FW2	Yes
	Drainage ditch FW4	Yes
	Improved agricultural grassland GA1	No
	Amenity grassland GA2	No
	Dry calcareous grassland GS1	Yes
	Dry meadows and grassy verges GS2	Yes
	Shingle and gravel shores LS1	Yes
	Mixed broadleaved woodland WD1	Yes
	Scattered trees and parkland WD5	Yes
	Hedgerows WL1	Yes
	Treelines WL2	Yes
	Riparian woodland WN5	Yes
	Scrub WS1	Yes
	Immature woodland WS2	Yes
	Ornamental non-native shrub WS3	No
Fauna	Amphibians (Smooth newt & common frog)	Yes
	Common lizard	Yes
	Shorebird assemblage	Yes
	Raptor assemblage	Yes
	General passerine bird assemblage	Yes
	Common pipistrelle and soprano pipistrelle bats	Yes
	Brown long-eared bat	Yes
	Leisler's bat	Yes
	<i>Myotis</i> spp. bat assemblage	Yes
	Badger	Yes
	Hedgehog	Yes
	Otter	Yes

Feature		Considered IEF (yes/no)
	Other mammals including: <ul style="list-style-type: none"> Pygmy shrew Irish hare Irish stoat Red squirrel 	Yes
	Fish including: <ul style="list-style-type: none"> Brown trout European eel Lamprey spp. 	Yes
	Invertebrates	Yes
Invasive Alien Species	<ul style="list-style-type: none"> Giant hogweed Montbretia Japanese knotweed Three-cornered garlic Ring-necked parakeet 	Yes
O&M Base		
Designated sites	<ul style="list-style-type: none"> Internationally designated sites (SACs/SPAs) 	Yes
	<ul style="list-style-type: none"> Nationally designated sites (NHAs/pNHAs) 	Yes
	<ul style="list-style-type: none"> Locally important sites (LIBS) 	Yes
Habitats	<ul style="list-style-type: none"> Sea wall, piers and jetties CC1 	No
	<ul style="list-style-type: none"> Amenity grassland GA2 	No
	<ul style="list-style-type: none"> Open marine water MW1 	Yes
	<ul style="list-style-type: none"> Sea inlets and bays MW2 	Yes
Fauna	<ul style="list-style-type: none"> SPA qualifying bird assemblage 	Yes
	<ul style="list-style-type: none"> Amber-listed birds 	Yes

2.6 Predicted future baseline

2.6.1 The predicted future baseline is the baseline when the proposed development commences construction. It takes into account any changes which may occur between the time when the surveys were completed and the start of the development, which in this case is the commencement of the construction phase.

- 2.6.2 Conditions within the OES and O&M Base study areas are expected to remain as they are now up to the point when the construction phase commences. Whilst species populations (e.g. birds, bats, otter, badger, etc.) are expected to naturally fluctuate, they are expected to overall remain consistent between now and the commencement of the construction phase of the project. The habitats and their conditions within the proposed development site are also not expected to change.
- 2.6.3 Outside the study areas, ongoing planning applications may commence, and habitats located outside the overall study area may experience habitat losses representative of the footprint of their respective proposed development footprints. This will reduce the extent of habitats located within the local area (but outside the proposed development zone) and may have a detrimental impact to the baseline species populations scoped in.

2.7 Uncertainties and technical difficulties encountered

Desktop data

- 2.7.1 The desktop study is has drawn upon existing available desktop information which is in the public domain. This has been used to inform the scope of follow-up surveys.

Land access

- 2.7.2 The majority of the OES is located within publicly accessible locations such as public roads or amenity open space. For the majority of sections which cross private land, access was arranged with the relevant land owner to enable surveys to take place. This included the site of the proposed O&M Base.
- 2.7.3 However, land access to the Shanganagh Community Gardens in Sector 1 and a short section within Sector 4, where the OES follows the alignment of the proposed Beckett Road, was not possible. These areas are shown on Figure 5 in the Onshore Biodiversity Technical Baseline Report. These areas were viewed using binoculars from a distance and assessed using available up to date aerial photography. As such, the lack of land access is not considered to impair the assessment.
- 2.7.4 In addition, trenchless techniques will be used to install the connection between the offshore export cable and the Transition Joint Bay (TJB) underneath the land at Shanganagh Community Gardens at the Landfall Site and within Sector 4 where the onshore ECR will follow the route of the proposed Beckett Road.
- 2.7.5 Similarly, there were a number of areas within the OES 50 m buffer where land access was not possible, as shown in Figure 5 in the Onshore Biodiversity Technical Baseline Report. These mainly comprise private gardens for residential properties or land within the Cherrywood SDZ. These areas were viewed using binoculars from a distance and using available up to date aerial photography. As such, the lack of land access is not considered to impair the assessment.

- 2.7.6 The inability to access to some locations within the overall study area is not considered to be a limitation to providing an accurate biodiversity baseline. This is due to the urban location of the proposed underground onshore ECR within habitats that are commonly occurring and widespread in distribution throughout Ireland.

Bat roost presence/absence surveys

- 2.7.7 Bat roost presence/absence surveys were planned for trees T24 and T25, located within the Eurofound site along the onshore ECR in Sector 2, east of the N11. However, due to restrictions on night-time access to the site after 19:00, only one bat survey within Eurofound was possible in October 2023. As such, the decision was made to delay the survey until later in the year, when sunset was earlier; the potential presence of a maternity or summer roost may have been missed as a result. Furthermore, due to this timeframe restriction, it was not possible to conduct the final 30 minutes of the survey once the 19:00 deadline was reached. Therefore, it is possible that later emerging bats were not recorded.
- 2.7.8 These limitations have been mitigated through the provision of supplementary static detector data in September 2023. This supplementary data provided greater insight into the species of bats in the Eurofound site albeit does not provide data on roosts directly. These limitations may impact the assessment, preventing a full assessment of the site for bats to be concluded.
- 2.7.9 The above limitation was still in place for the repeat bat surveys conducted in summer 2024. As such T24 and T25 only underwent one bat emergence survey, which does not meet the guidance of two surveys for moderate trees and three surveys for high potential trees. As such, it is possible that a bat roost is present in T24 and/or T25. As such, under the precautionary principle, mitigation has been included for T24 and T25 to avoid any unnecessary damage or disturbance to them.

2.8 Key parameters for assessment

- 2.8.1 For each of the impacts ‘Scoped-in’ to the assessment and as described in the preceding (Section 2.9), the relevant design parameter used in assessing the impact are set out in Table 16. For the purpose of environmental assessment, the design parameters that could give rise to the maximum potential adverse impacts, in respect of receptors, have been chosen as the design parameter to assess impact against.
- 2.8.2 An impact is considered to be ecologically significant if it is predicted to affect the integrity or conservation status of an IEF at a specified geographical scale. All potential impacts are described in the absence of mitigation other than project design measures and other avoidance and preventative measures (detailed in Section 2.9).

Construction phase

2.8.3 The onshore ECR between the TJBs and the OSS has been subdivided into seven sectors. At eight points along the onshore ECR the route will cross under significant transport networks and watercourses. Trenchless drilling techniques (HDD or similar) will be utilised at these locations. The eight trenchless crossing locations are identified using TX-01, TX-02...TX-08 references as set out in Table 15.

Table 15 Onshore ECR sector breakdown

Sector No.	TX No.	Key Locations
1	TX-01 TX-02 TX-03 TX-04	<ul style="list-style-type: none"> ▪ Shanganagh Cliffs ▪ Dart/Railway Line ▪ Clifton Park/Shanganagh River ▪ Bayview ▪ Shanganagh Road ▪ Achill Road
2	TX-04 TX-05	<ul style="list-style-type: none"> ▪ Loughlinstown Linear Park ▪ Gleanntan ▪ Loughlinstown Drive (L1067) ▪ DL RCC Parks Depot ▪ Eurofound
3	TX-06	<ul style="list-style-type: none"> ▪ Cherrywood Park ▪ Wyattville Road (R118)
4	TX-06 TX-07	<ul style="list-style-type: none"> ▪ Cherrywood Avenue ▪ Beckett Road ▪ Kilternan Link Road
5	-	<ul style="list-style-type: none"> ▪ Golf Lane
6	TX-08	<ul style="list-style-type: none"> ▪ Glenamuck Road South (R842) ▪ Glenamuck District Distributor Road
7	TX-08	<ul style="list-style-type: none"> ▪ Carrickmines Great ▪ Jamestown

2.8.4 The installation of the OES, excluding surveys and site preparation, is anticipated to take approximately 24 months.

2.8.5 The total O&M Base construction programme is expected to take 126 weeks, including site demolition, construction of new O&M building and commissioning.

2.8.6 Construction of the OSS is likely to start early in the overall construction programme and works will continue until the wind farm and complete OES has been commissioned.

- 2.8.7 Construction of the OES will occur during normal construction working hours (i.e. 07:00 – 19:00) from Monday – Friday and 08:00 – 14:00 Saturday with the exception of works associated with the entry and exit pits at the TJB(s) and trenchless crossings at TX-01 (railway line), TX-06 (N11) and TX-07 (M50) which will typically occur 24 hours per day, seven days per week for defined periods within the construction programme.
- 2.8.8 The largest concentration of construction staff will be at the OSS site, and this will peak at later stages of the construction programme when it is likely that there will be up to approximately 75 staff on site.

Operational phase

- 2.8.9 The OES assets shall be subject to regular local operation, inspection and maintenance intervals in accordance with EirGrid asset management policies.

TJB and Onshore ECR

- 2.8.10 Approximately six to eight visits per month are anticipated, typically involving two personnel. Quarterly inspection site and maintenance visits as required.
- 2.8.11 Unplanned maintenance may involve the repair of onshore ECR faults. As set out in Volume 2, Chapter 6 Project Description this is extremely rare (indicatively 1-2 events per lifetime).
- 2.8.12 The extent or nature of any unplanned corrective maintenance required cannot be predicted at this stage. Therefore, the possible effects in terms of disturbance cannot be assessed. Any unplanned corrective maintenance would be subject to any necessary consents and consultation with the relevant bodies at the time. For unplanned major maintenance, vehicles similar to those used for construction may also be required (e.g. rigid lorries delivering materials, low loaders delivering plants, and individual vehicles for personnel).

OSS

- 2.8.13 The OSS will be unmanned; however, the OSS and associated assets shall be subject to regular local operation, inspection and maintenance intervals in accordance with EirGrid asset management policies.

O&M Base

- 2.8.14 Daily operations at the base will include the delivery of spare parts, materials and supplies to the O&M warehouse. There will not be any heavy engineering or manufacturing processes at the site.
- 2.8.15 Deliveries to the O&M Base will generally consist of small loads delivered by light goods vehicles (on average 2 deliveries per day) with an occasional Heavy Goods Vehicle (HGV) expected on rare occasions. Traffic will access the internal O&M Base via the main harbour gates off Harbour Road.
- 2.8.16 There will be a storage area on site for lubricants and solvents for use in general maintenance operations at the wind farm. The lubricants and solvents will be stored in a lockable, suitably contained/bunded store unit. An area will be designated in the yard for the storage of skips to ensure waste generated by the operations is appropriately segregated.

Decommissioning phase

- 2.8.17 The decommissioning process for the onshore infrastructure is likely to follow a reverse programme of the construction process. The decommissioning process and techniques will adhere to the following requirements:
- ▲ Any decommissioning specific conditions of the Development Consent;
 - ▲ The latest development in technology available for decommissioning work at the time when the work is carried out;

- ▲ Legislative obligations in place at the time of decommissioning regarding method and scope; and
- ▲ Ensuring that the environmental impacts are consistent or less in scale and magnitude to those predicted in the EIAR associated with the Development Consent or subsequent relevant consent.

2.8.18 A decommissioning plan and supporting decommissioning environmental management plan will be prepared prior to commencement of decommissioning and will be subject to its own environmental assessment. The environmental management measures specified in the Onshore CEMP, which are relevant to the decommissioning activities, will be implemented and will reflect the relevant legislation and guidance available at the time of decommissioning.

2.8.19 When it becomes appropriate to decommission the onshore ECR, the cables will be removed but below ground ducting will remain in place. All above ground structures (i.e. access track, marker posts, link) between the TJBs at the Landfall and the OSS will be removed, and the sites will be returned to their previous state. All the remaining underground infrastructure, including the TJBs, should remain in situ.

2.8.20 When the OSS reaches the end of its useful life, it may be either refurbished/repurposed and replaced, or it will be decommissioned. The O&M Base will be re-purposed for an alternative use following the decommissioning of the offshore developments of the project. All buildings and above ground structures will be removed.

Table 16 Overview of impacts and key project design parameters considered for Biodiversity assessmentH

Potential impact	Design parameter and impact assessed	Relevant phase	Rationale
<p>Impact 1: Permanent or temporary loss or damage of designated sites or effects to their Qualifying Interests</p>	<p>a) Impact of habitat loss impact on designated sites or their Qualifying Interests</p> <p>Any designated sites that overlap with the OES or O&M Base are at risk of being lost, degraded, or damaged during the construction and decommissioning phases. This effect would have other knock-on impacts to the flora and fauna that these designated sites may support.</p> <p>Relevant project design parameters</p> <p><i>Landfall:</i> Trenchless techniques (HDD or DPM) will be used to install the connection between the offshore export cable and the TJB.</p> <p><i>HDD crossings:</i> HDD is the preferred option for onshore trenchless crossings TX-01 to TX-08 identified in the Project Description chapter. Temporary HDD compounds will be required at these locations:</p> <p><i>Onshore ECR:</i> The total length of the onshore ECR is 7, 339 m with a working corridor width of 3 m to 4 m. All cable trenches associated with the construction phase will be reinstated. All topsoil will be stored within the construction cable corridor for reinstatement works.</p> <p><i>OSS:</i> The proposed OSS will be situated within a 4-hectare (ha) site, with 1.7 ha dedicated to the OSS itself and the remaining area used for enabling works, temporary storage, and laydown areas during construction. The OSS will also include the provision of landscaping and site drainage.</p> <p><i>O&M Base:</i> The building will be 84.4 m long and 16.1 m wide. The following existing structures are subject to demolition: the RoRo ramp structure and associated concrete towers, the existing harbour maintenance building, covered walkways, storage buildings as well as the partial demolition of existing fender structures.</p>	<p>Construction & decommissioning</p>	<p>The maximum development footprint (temporary and permanent) and maximum duration of works is assumed and therefore, the largest possible area and duration of impact on designated sites or their Qualifying Interests over the construction and decommissioning phases is assessed.</p>

Potential impact	Design parameter and impact assessed	Relevant phase	Rationale
	<p>b) Impact of pollution on designated sites or their Qualifying Interests</p> <p>Fuel or other chemicals spills may occur (e.g. hydrocarbons) particularly during the construction and decommissioning phases. Such events are anticipated to be rare in occurrence and small in scale. However, there is a risk that if such pollution is not appropriately contained and cleaned, surface run-off may cause it to spread into nearby river or marine habitats whereby the pollution may reach nearby designated sites. Pollution accumulation may alter water chemistry within aquatic designated sites, and affect the flora and fauna that they support</p> <p>Relevant project design parameters</p> <p><i>Watercourse crossings:</i> Trenchless (HDD) drilling method will be adopted at the following watercourse crossings:</p> <ul style="list-style-type: none"> ▪ Sector 1(TX-02): Shanganagh River; ▪ Sector 2: (TX-04 and TX-05). Two crossings of Kill-O-The-Grange/Deansgrange Stream; ▪ Sector 3: (TX-06) Carrickmines Stream; and ▪ Sector 4: (TX-07) Laughanstown Stream. <p>In Sector 7, there will be two open cut trench crossings under the Glenamuck North and Jamestown 10 (golf) streams.</p> <p>The grid connection between the proposed OSS and the existing Carrickmines 220 kV substation will cross the Carrickmines Stream within existing infill ground sitting above an existing culvert of the stream.</p> <p><i>Vehicle access routes:</i> The HGV Landfall construction access route has been designed to avoid the use of the northern end of Shanganagh Cliffs. The main access for HGV traffic will follow the existing path from the Shanganagh Cliffs public road via the existing gate opposite the bridge</p>		

Potential impact	Design parameter and impact assessed	Relevant phase	Rationale
	<p>over the DART railway line. This path is proposed to be upgraded and widened to 4 m suitable for the delivery of plant, equipment and construction materials. The main access to the OSS will be via Ballyogan Road, using the existing entrance through the DLR Operations Centre. To facilitate the proposed OSS and associated construction works the access track will be upgraded.</p> <p>TCCs: the following TCCs will be required for the OES:</p> <ul style="list-style-type: none"> ▪ Landfall – a TCC of approximately 9,500 m² will be required throughout the Landfall construction. The TCC will include a temporary access road to facilitate passing bays with a bituminous surface to minimise dust. ▪ Clifton Park – a TCC of approximately 5,500 m² will be required throughout the onshore ECR construction works. Minor earthworks will be necessary to ensure the TCC is on level ground. ▪ Leopardstown -a TCC of approximately 15,000 m² will be required throughout the onshore ECR construction works The TCC will include a temporary access road with a bituminous surface to minimise dust. 		
	<p>c) Impact of dust creation on designated sites or their Qualifying Interests</p> <p>Dust deposition can alter water quality if allowed to accumulate in aquatic habitats. Dust may also deposit on vegetation and inhibit or limit photosynthesis and thus create ecological stress for affected vegetation and plant communities during dry spells in weather (Farmer, 1991; Holman et al., 2014). Such impacts would degrade habitats associated with designated sites and would have likely knock on effects to the fauna that they support.</p>	Construction & decommissioning	The approach to the assessment of air quality impacts is in line with relevant guidance (see Volume 5, Chapter 10: Air Quality for further details).

Potential impact	Design parameter and impact assessed	Relevant phase	Rationale
	<p>Dust creation is anticipated to occur during the construction phase, and to a lesser extent, the decommissioning phase of the project. Large dust particles (greater than 30 µm) will largely deposit within 100 m of sources, with intermediate particles (10 – 30 µm) likely to travel up to 200 – 500 m (IAQM, 2016). Therefore, all designated sites located within 500 m of the project are considered, with those located within 100 m being at greatest risk of this effect.</p> <p>Relevant project design parameters See design parameters for Impact 1 (b).</p>		
	<p>d) Impact of artificial lighting on designated sites or their Qualifying Interests</p> <p>Artificial lighting can cause displacement of species and alter their behaviours. Artificial lighting can adversely impact a range of nocturnal fauna, including badgers and bats. It can also impact diurnal species such as birds.</p> <p>Temporary artificial lighting will likely be required for all aspects of the construction works at the OES and O&M Base. This impact is relevant to construction and operation.</p> <p>Relevant project design parameters</p> <p>Task lighting during night-time hours will be required should drilling activity at the Landfall continue throughout night. Any temporary lighting shall be only to light up work areas. Additionally, 24-hour security lighting has been assumed at the three temporary construction compounds.</p> <p>Lighting during non-daylight hours may be required along the onshore ECR crossings TX-01 (Railway Line Crossing at Shanganagh Cliffs - Clifton</p>	All phases	This is a reasonable worst case assumption of the lighting requirements for the onshore infrastructure to allow an assessment of the likely maximum disturbance impacts of artificial lighting on designated sites or their Qualifying Interests.

Potential impact	Design parameter and impact assessed	Relevant phase	Rationale
	<p>Park), TX-06 (N11/Loughlinstown (Shanganagh) River) and TX-07 (M50 Crossing). Any temporary lighting shall be only to light up work areas. 24-hour security lighting has been assumed at the 3 No. main TCCs.</p> <p>During working hours at the OSS, the area will be lit up using task lighting. The lights would be downward facing. Access routes around the carpark and to the offices would be lit using low level PIR (passive infra red) lighting.</p> <p>It will be necessary to illuminate the operational O&M Base site during the hours of darkness for safety and security reasons. A detailed lighting scheme design will be undertaken as part of the detailed design but may include single or twin head LED bulkhead light on poles, with a maximum height of 12 m in the parking areas and fluorescent lights, either wall mounted, with a maximum height of 8 m, in the warehouse area of the site. Lux level between 20 and 30 is anticipated depending on the use of the area being lit. Motion sensor lights will be used to ensure lighting on site is minimised only to when required. Low level lighting required on the pontoon and gangway. There is no requirement for night-time lighting at the O&M Base during construction, however 24-hour security lighting has been assumed at the TCCs.</p>		
	<p>Impact of spread of invasive alien species (IAS) on designated sites or their Qualifying Interests</p> <p>The spread of IAS may occur during the construction phase of the OES as several IAS were recorded. The construction phase risks the spread of these IAS within the site and beyond, including the potential spread to designated sites, which may reduce overall biodiversity within these areas and have a knock-on effect to any protected flora fauna that they support.</p> <p>Relevant project design parameters</p>	Construction	

Potential impact	Design parameter and impact assessed	Relevant phase	Rationale
	See design parameters for Impact 1 (a).		
Impact 2: Permanent or temporary loss, damage, degradation or fragmentation of habitats	<p>a) Impact of direct habitat loss, damage or degradation on habitats</p> <p>All habitats within the boundaries of the OES and the O&M Base are at risk of being lost, damaged and/or degraded during the construction phase; particularly during trenching and groundworks. Future habitats that have reestablished will face similar risks (although to lesser extent) during the decommissioning phase.</p> <p>The likely extent of habitat loss will comprise the total area within the boundary for the OES, including the onshore ECR, Landfall Site, OSS, all TCCs and the O&M Base. There is also a risk that surrounding habitats, located outside the boundaries for the OES and O&M Base, may be impacted (i.e. the 50 m buffer area) by accidental events during the construction and decommissioning phase. This assessment has included both habitat areas under the precautionary principle. The extent of habitats likely to be damaged or degraded in the event of an unforeseen or unplanned event is unknown; but is likely limited to the OES and O&M Base boundaries and 50 m buffer. Habitats beyond this are unlikely to be affected.</p> <p>Relevant project design parameters See design parameters for Impact 1 (a).</p>	Construction & decommissioning	The maximum development footprint (temporary and permanent) and maximum duration of works is assumed and therefore, the largest possible area and duration of impact on habitats over the construction and decommissioning phases is assessed.
	<p>b) Impact of dust creation on habitats</p> <p>See Impact 1(b) Relevant project design parameters</p>	Construction & decommissioning	The approach to the assessment of air quality impacts is in line with relevant guidance (see Volume 5,

Potential impact	Design parameter and impact assessed	Relevant phase	Rationale
	See design parameters for Impact 1 (b).		Chapter 10: Air Quality for further details).
	<p>c) Impact of pollution on habitats</p> <p>Pollution events such as spillages of hydrocarbons and run-off of suspended sediments may enter nearby aquatic habitats including rivers (for the OES) and the marine environment (for the OES and O&M Base). This impact is anticipated to be rare in occurrence and small in scale. However, there is a risk that if such pollution is not appropriately contained and cleaned, surface run-off may cause it to spread into nearby river or marine habitats whereby the pollution may enter nearby aquatic habitats, such as rivers or the marine environment, that are located in close proximity to the OES and O&M Base. This may affect water quality and chemistry and may have a knock on effect to the flora and fauna that the aquatic habitat supports.</p> <p>Relevant project design parameters See design parameters for Impact 1 (b).</p>	All phases	The maximum development footprint (temporary and permanent) and maximum duration of works is assumed and therefore, the largest possible area and duration of impact on habitats over the construction and decommissioning phases is assessed.
	<p>d) Impact of spread of invasive alien species on habitats</p> <p>The spread of IAS may occur during the construction phase of the OES as several IAS were recorded. The construction phase risks the spread of these IAS within the site and beyond, including the potential spread to nearby habitats, which may reduce overall biodiversity within these areas and have a knock-on effect to any protected flora fauna that they support.</p> <p>Relevant project design parameters See design parameters for Impact 1 (a).</p>	Construction	The maximum development footprint (temporary and permanent) and maximum duration of works is assumed and therefore, the largest possible area and duration of impact on habitats over the construction and decommissioning phases is assessed.

Potential impact	Design parameter and impact assessed	Relevant phase	Rationale
Impact 3: Impacts on protected species or upon their resting or breeding sites	<p>a) Impact of habitat loss on protected species or their resting or breeding sites</p> <p>Direct habitat loss, damage, or degradation (see Impact 2) will potentially affect protected species in various ways, such as decreasing the total supporting habitats area, and/or causing a reduction of habitat quality that may reduce the number of breeding or resting places or suitable foraging area. This effect is most likely to occur during the construction phase of the development. However, this may also occur (to a lesser extent) during the decommissioning phase of habitats that have reestablished at this future time. Overall, the effect may lead to reduced populations and/or range and distributions of protected species.</p> <p>Relevant project design parameters See design parameters for Impact 1 (a).</p>	Construction & decommissioning	The maximum development footprint (temporary and permanent) and maximum duration of works is assumed and therefore, the largest possible area and duration of impact on protected species or upon their resting or breeding sites over the construction and decommissioning phases is assessed.
	<p>b) Impact of artificial lighting on protected species or their resting or breeding sites</p> <p>Artificial lighting can negatively affect a range of species; and especially nocturnal species such as bats. Artificial lighting can affect natural foraging and commuting behaviours. It can also cause bats to become entombed within roosts (ILP & BCT, 2023). Artificial lighting can also impact diurnal species such as birds by affecting their natural behaviours, attracting migrating birds and even entrapping them within bright lights (BTO, 2014).</p> <p>Much of the proposed works for the OES and the O&M Base will occur within existing urban environments that are already subjected to high levels of artificial lighting. However, the Onshore ECR in particular will be</p>	All phases	This is a reasonable worst case assumption of the lighting requirements for the onshore infrastructure to allow an assessment of the likely maximum disturbance impacts of artificial lighting on protected species or upon their resting or breeding sites.

Potential impact	Design parameter and impact assessed	Relevant phase	Rationale
	<p>located close to sensitive habitats that are likely to support IEFs as well as potential breeding sites and resting places for these IEFs.</p> <p>Furthermore, much of the Onshore ECR and other areas of the OES will not require artificial lighting during the construction and decommissioning phases as much of the works will occur during the hours of daylight with the exception of three trenchless crossings along the ECR (TX-01, TX-06 and TX-07). Trenchless crossings will require 24 hours and seven-days per week working hours. These will be limited to the trenchless crossings at TX01 (DART/railway line), TX-06 (N11) and TX-07 (M50).</p> <p>Relevant project design parameters See design parameters for Impact 1 (d).</p>		
	<p>c) Impact of noise and vibration on protected species or their resting or breeding sites</p> <p>The potential exists for protected species to be impacted by construction activities on the OES and the O&M Base. This impact will potentially arise either via permanent or temporary habitat loss or inadvertent injury or death, or from disturbance via light, noise, and human activities or presence.</p> <p>Noise and vibration will cause disturbance and the potential isolation of species that these habitats support, as they are no longer able to reach previously linked habitat.</p> <p>These impacts will occur as a result of the construction phase of the OES and O&M Base. However, the O&M Base will not be as significantly affected by this impact due to the existing high levels of human activity occurring there.</p>	All phases	This is a reasonable worst-case assumption of the noise and vibration levels for the onshore infrastructure to allow an assessment of the likely maximum disturbance impacts of noise and vibration on protected species or upon their resting or breeding sites.

Potential impact	Design parameter and impact assessed	Relevant phase	Rationale
	A list of indicative construction plant noise levels and associated 'on-times' for all each construction activity/phase (i.e. establish access, site preparation, TJB excavation), is presented in Annex B of the Noise and Vibration chapter (Volume 5, Chapter 5). The combined sound power level has been calculated for the construction activity, and includes plant required together with associated on-times, and is detailed in Section 5.11 of the Noise and Vibration chapter (Volume 5, Chapter 5).		
Impact 4: Spread of Invasive Alien Species (IAS)	<p>Impact of IAS on designated sites or effects to their Qualifying Interests, habitats or protected species or upon their resting or breeding sites</p> <p>The spread of IAS may occur during the construction phase of the OES as several IAS were recorded (see Impact 4). The construction phase risks the spread of these IAS within the site and beyond, including the potential spread to designated sites and habitats, which may reduce overall biodiversity within these areas and have a knock-on effect to any protected fauna that they support.</p> <p>There is potential for the spread of confirmed IAS by construction activities, anywhere across the boundary of the OES or even beyond. This impact may also affect designated sites (see Impact 1), habitats (see Impact 2), and may even have knock-on effects to local fauna (see Impact 3).</p>	Construction	The maximum development footprint (temporary and permanent) and maximum duration of works is assumed and therefore, the largest possible area and duration of impact on designated sites or effects to their Qualifying Interests, habitats or protected species or upon their resting or breeding sites over the construction and decommissioning phases is assessed.

Potential impact	Design parameter and impact assessed	Relevant phase	Rationale
	<ul style="list-style-type: none"> ▪ There is no risk of spreading IAS from the O&M Base as no IAS were recorded there. However, IAS may be spread to the O&M Base through the use of plant, equipment and vehicles from elsewhere where effective biosecurity protocols have not been employed. However, this is considered a minor risk due to the lack of vegetated habitats present at the O&M Base. <p>Relevant project design parameters</p> <ul style="list-style-type: none"> ▪ See design parameters for Impact 1 (a). 		

2.9 Project Design Features and Other Avoidance and Preventative Measures

2.9.1 As outlined within the Methodology Chapter (Volume 2: Chapter 3) and in accordance with the EPA Guidelines (2022), this EIAR describes the following:

- ▲ Project Design Features: These are features of the Dublin Array project that were selected as part of the iterative design process, which are demonstrated to avoid and prevent potential adverse effects on the environment. These are presented within Table 17.
- ▲ Other Avoidance and Preventative Measures: These are measures that were identified throughout the early development phase of the Dublin Array project, also to avoid and prevent likely significant effects, which go beyond design features. These measures were incorporated in as constituent elements of the proposed development, they are referenced in the project description chapter of this EIAR, and they form part of the project for which development consent is being sought. These measures are distinct from design features and are found within our suite of management plans. These are also presented within Table 17
- ▲ Additional Mitigation: These are measures that were introduced to the Dublin Array project after a likely significant effect was identified during the EIA assessment process. These measures either mitigate against the identified significant adverse effect or reduce the significance of the residual effect on the environment. The assessment of impacts is presented in Sections 2.10, 2.11, 2.12 and 2.13 of this EIAR chapter. All measures are secured within Volume 8: Chapter 4, Schedule of Measures.

2.9.2 Key project design features in respect of the proposed OES and O&M Base have involved the sensitive siting and design of the onshore infrastructure during site selection to ensure potential impacts are avoided or reduced (refer to Table 17). Where additional mitigation is identified as being required to reduce the significance of the residual effect in EIA terms this is presented in Sections 2.10 to 2.13,

Table 17 Project design features and other avoidance and preventative measures relating to biodiversity

Project design feature/measure	Impact	Where secured
Project design measures		
<p>Other options considered have been included within Volume 2, Chapter 2.5: Consideration of Alternatives. A site selection process has been undertaken for the O&M Base, the OSS and the Landfall Site and an onshore ECR route selection process was undertaken to consider against environmental, socio-economic, economic and technical criteria. A description of the site and route selection process is set out in Volume 6, Appendix 6.5.1-1: Carrickmines Substation Site Selection Report and Appendix 6.5.1.2: Onshore Cable Route Selection Report.</p> <p>Baseline surveys associated with the EIA have been undertaken over several years and have informed the choice of routing, siting and design of the onshore infrastructure. Key decisions have included:</p> <ul style="list-style-type: none"> ▪ Using trenchless technology (Horizontal Directional Drill (HDD) or Direct Pipe Method (DPM)) at the Landfall Site for installation of the offshore cable ducts to avoid impacts to the sedimentary sea cliffs at this location and avoid impacts on the shingle and gravel shoreline. ▪ Using trenchless technology (HDD or similar) to cross rivers along the onshore ECR to reduce impact on the riparian river corridors, with the exception of trenched crossings of the drainage ditches Glenamuck North stream and Jamestown 10 in Sector 7. ▪ Routing of the onshore ECR to avoid sensitive habitats and minimise habitat loss (e.g. trees). Where possible the onshore ECR has followed public roads and areas of amenity ground which is of low ecological value. ▪ Siting of the OSS within an area of low habitat sensitivity. ▪ Location of the O&M Base on previously developed and urban land within an existing harbour environment. The design of the onshore infrastructure prioritises avoidance, minimisation, and restoration. 	Impacts 1-4	Volume 3, Chapter 5: Consideration of Alternatives and Chapter 6: Project Description

Project design feature/measure	Impact	Where secured
<ul style="list-style-type: none"> ▪ The onshore ECR has been routed to minimise the number of water course crossings which are necessary. Where crossings are necessary these will be crossed by trenchless techniques, with the exception of crossings in Sector 7. ▪ For trenchless crossings (TX-02/TX-04/TX-05/TX-06/TX-07), temporary drilling compounds will be established on either side of the watercourse to facilitate the set-up of the necessary plant and equipment. Limited surface excavation works will be required to create the launch and exit pit in the temporary drilling compounds. The excavated drill pit will collect drill mud returns, the pumps will move the fluid from the pit into the recycling plant/tanks. Two open cut trench crossings of the small streams south of the Carrickmines Retail Park (Glenamuck North and Jamestown 10 streams). The water flows will be managed through use of a temporary dam to hold back waters with over pumping of the water downstream to enable the construction of the trenchless crossings. The open cut crossings will be subject to agreement with IFI on a method statement and further details of the crossing points ▪ Construction works will be set back from the river and stream channels, except for the two open-cut trenched crossings at Sector 7, and where it is not possible to maintain an adequate set back, suitable measures to prevent run-off from entering the watercourse (such as temporary interceptor drains) will be used to prevent runoff going to the watercourse. Additional control measures such as silt fences will be deployed. ▪ The grid connection between the proposed OSS and the existing Carrickmines substation will cross the Carrickmines Stream within existing infill ground sitting above an existing culvert of the stream. An open cut trench method will be used for the installation of the cable in this location. ▪ fencing will be erected around the temporary trenchless crossing compound and will not encroach the precautionary zones/RPAs of any of the trees comprising Loughlinstown Woods proposed Natural Heritage Area (pNHA). 		

Project design feature/measure	Impact	Where secured
<p>Breeding birds</p> <p>There will be no demolition of O&M buildings during the nesting bird season (March to September inclusive).</p> <p>Vegetation which could support nesting birds (e.g. trees, scrub or long grass) will be cleared outside the main bird breeding season (March to August inclusive) to avoid damage to, or destruction of nests.</p>	Impact 3	Volume 3, Chapter 6: Project Description
<p>Passerines</p> <p>High value nesting habitats such as woodland, hedgerows, and treelines, will be protected from direct impacts in areas where HDD is proposed rather than trenching, thus avoiding further unnecessary reduction in habitats.</p> <p>The habitats of highest value for birds have been retained through the route design and any habitats that are directly impacted will regenerate naturally or will be reinstated.</p>	Impact 3	Volume 3, Chapter 5: Consideration of Alternatives and Chapter 6: Project Description
<p>Black guillemot</p> <p>The nest site, located underneath Carlisle Pier, which is located ca. 150 m from the proposed O&M Base, will be retained.</p>	Impact 3	Volume 3, Chapter 6: Project Description
<p>Shorebirds</p> <p>The avoidance of these areas in the route selection process for the OES avoids losses of habitat for these species.</p>	Impact 3	Volume 3, Chapter 5: Consideration of Alternatives and Chapter 6: Project Description
<p>Raptors</p> <p>The habitats of highest value for birds have been retained through the Onshore ECR design avoidance. Habitats which will be impacted will be allowed to naturally regenerate or will be replanted.</p> <p>High value nesting habitats such as riparian woodland will be retained by utilising trenchless technology (HDD or similar technology) rather than trenching thus avoiding impacting these habitats.</p>	Impact 3	Volume 3, Chapter 5: Consideration of Alternatives and Chapter 6: Project Description
<p>Bats</p> <p>The habitats of highest value for bats will be retained through the avoidance of these areas as part of site selection and route selection of the OES and any habitats that are lost will be replanted, where possible.</p>	Impact 3	Volume 3, Chapter 5: Consideration of Alternatives

Project design feature/measure	Impact	Where secured
<p>High value nesting habitats such as riparian woodland will be retained by utilising trenchless technology (HDD or similar technology) rather than trenching thus avoiding impacting these habitats.</p> <p>Where possible lighting installations will be directed away from trees, known bat roosts and retained habitats for bats (including trees identified as T14 & T15 in Sector 2 along the onshore ECR).</p>		and Chapter 6: Project Description
<p>Badger, hedgehog, otter, other mammals (pygmy shrew, Irish hare, Irish stoat, red squirrel)</p> <p>The project design has avoided valuable habitats where possible.</p>	Impact 3	Volume 3, Chapter 5: Consideration of Alternatives
<p>Fish</p> <p>Direct impacts on streams and associated riparian habitat will be avoided as cable installation will predominantly use trenchless technology such as HDD.</p> <p>Two streams in Sector 7 will require open-cut trenching. Where in-stream works for the cable installation are required in Sector 7, the method statement will be agreed in consultation with IFI & in-stream works will be limited to July - September as per IFI's guidance</p>	Impact 3	Volume 3, Chapter 6: Project Description
<p>Invertebrates</p> <p>Habitats likely to support significant numbers or notable invertebrates (comprising unmanaged grasslands, hedgerows, scrub, fragmented areas of woodland and the freshwater habitats), and that will be retained, will be appropriately protected throughout the construction phase.</p> <p>Habitats to be reinstated following the completion of the construction phase.</p> <p>Habitats likely to support significant numbers or notable invertebrates (comprising grasslands, hedgerows, scrub, fragmented areas of woodland and the freshwater habitats), and that will be impacted by construction activities, will be allowed to naturally regenerate following the construction phase, where possible. Additional planting using species with known ecological benefits. At the OSS, a Landscaping Plan is proposed which will include tree planting mix covering and a wildflower meadow to the north-east of the site.</p>	Impact 3	Volume 7, Appendix 8: Onshore CEMP
<p>Avoidance and preventative measures</p>		
<p>A planning stage CEMP has been included with the application for development consent and is included in Volume 7, Appendix 8. The purpose of the planning stage CEMP is to set out the measures which will be</p>	Impacts 1-4	Volume 7, Appendix 8: Onshore CEMP

Project design feature/measure	Impact	Where secured
<p>taken to manage the potential environmental impacts of the onshore construction of Dublin Array and limit the disturbance from onshore construction activities such as site preparation, material delivery and removal, works activities and site reinstatement as far as is reasonably practicable.</p> <p>The CEMP is a planning stage document that, by reference to the assessments reported in the EIAR, sets out the key construction stage environmental commitments. The Final Construction Stage CEMP will be sent by the Applicant to the Planning Authority for approval, as a condition of the development consent.</p> <p>Mitigation measures arising from the EIA which are relevant to the environmental management of the construction works are contained in here also.</p> <p>The CEMP sets out environmental management measures to be adopted during the construction phase including the following:</p> <ul style="list-style-type: none"> ▪ Protective fencing will be installed around retained habitats of importance to prevent accidental encroachment, loss or damage to retained habitats during the construction phase. ▪ An ECoW is will be employed to oversee construction at key ecological sensitive locations to minimise risks to IEFs. ▪ Habitats will be reinstated, or allowed to reinstate naturally, following the completion of the construction phase. A pre construction verification survey will be undertaken in advance of tree or vegetation clearance to check for the presence of nesting birds, badger setts, hedgehogs, amphibians, or other protected species will be carried out by suitably qualified Ecologist. Additional reasonable avoidance measures will be implemented, and appropriate NPWS licences will be acquired in advance where necessary. Vegetation which could support nesting birds (e.g. trees, scrub or long grass) will be cleared outside the main bird breeding season (March to August inclusive) to avoid damage to, or destruction of nests. ▪ The Inland Fisheries Ireland (IFI) Guidelines on the Protection of Fisheries during construction works in or adjacent to waters (2016) will be implemented. ▪ Where in-stream works for the cable installation are required in Sector 7, the method statement will be greed in consultation with IFI & in-stream works will be limited to July - September as per IFI's guidance In-stream works will be timed to avoid critical periods to salmonids (1st October to 31st April). 		

Project design feature/measure	Impact	Where secured
<p>Pollution risks to aquatic habitats</p> <p>The CEMP details the following measures to minimise pollution risk to aquatic habitats:</p> <ul style="list-style-type: none"> ▪ Refuelling of plant and equipment will be at a distance of greater than 50 m from a watercourse; ▪ The construction phase management measures will follow the relevant CIRIA guidelines, CIRIA C648, Control of Water Pollution from Linear Construction Projects; ▪ The construction phase management measures will follow the relevant CIRIA guidelines, CIRIA C648, Control of Water Pollution from Linear Construction Projects; ▪ Designated location for plant and vehicle washout will be established with adequate storage capacity; ▪ Washout water will be stored in the washout area before being transported offsite or treated; ▪ Appropriate sediment control measures will be installed; ▪ Surface water ingress into open trenches will be limited through measures such as directing surface water drainage away from excavations; ▪ Fuel and chemical storage will be stored in storage units with 110% bunding storage; and ▪ An environmental emergency control plan will be developed prior to construction. 	<p>Impacts 1-3</p>	<p>Volume 7, Appendix 8: Onshore CEMP</p>
<p>Dust suppression</p> <p>The CEMP details measures for dust suppression, which will minimise the main adverse effects caused during the construction phase. Such measures will include the following:</p> <ul style="list-style-type: none"> ▪ During hot, dry weather a water bowser will be used to control dust arising from access tracks; ▪ Vehicle cleaning – a wheel and body wash would be operated within the site to ensure materials from the construction sites are not transferred onto the highway, and ▪ Road cleaning will take place when required to remove any mud deposits that are carried from the construction locations. All road cleaning activities will remain local to the site access and egress locations. 	<p>Impact 1-3</p>	<p>Volume 7, Appendix 8: Onshore CEMP</p>

Project design feature/measure	Impact	Where secured
<p>Pollution prevention and control measures</p> <p>Planning stage pollution prevention and control measures are included in the CEMP. The construction phase management measures will follow the relevant CIRIA guidelines, CIRIA C648, Control of Water Pollution from Linear Construction Projects.</p>	Impact 1-3	Volume 7, Appendix 8: Onshore CEMP
<p>Badgers</p> <p>Measures in the CEMP to alleviate potential impacts to badgers to include the following:</p> <ul style="list-style-type: none"> ▪ In advance of construction pre-construction faunal surveys will be undertaken to identify the presence of badger sets on the study area; ▪ Excavations will either be covered overnight and a ramp provided to prevent the accidental entrapment of badgers; ▪ Excavations will either be covered overnight and a ramp provided to prevent the accidental entrapment of badgers; ▪ Where possible and safety considerations allow, fell trees away from badger setts and avoid blocking any badger pathways; ▪ Where possible lighting installations will be directed away from any identified badger setts; ▪ Store chemicals where they cannot be accessed by wildlife; and ▪ If required, plant dense native shrubs around setts to provide added protection (e.g. gorse, blackthorn, holly and elder). 	Impact 3	Volume 7, Appendix 8: Onshore CEMP
<p>Hedgehogs</p> <p>Measures in the CEMP to alleviate potential impacts to hedgehog to include the following:</p> <ul style="list-style-type: none"> ▪ Pre-commencement surveys will be undertaken by the Ecological Clerk of Works (ECOW) to identify the presence of hedgehogs where there is planned vegetation removal; ▪ Identified hedgehogs will be moved to a nearby area of similar/suitable retained habitat; ▪ Exposed ducts and pipes stored onsite will have the ends covered to prevent hedgehogs becoming trapped; Excavations will either be covered overnight and a ramp provided to prevent the accidental entrapment of hedgehogs; 	Impact 3	Volume 7, Appendix 8: Onshore CEMP

Project design feature/measure	Impact	Where secured
<ul style="list-style-type: none"> ▪ Maintain high standard of house keeping during the construction operations; ▪ Store chemicals where they cannot be accessed by wildlife. 		
<p>Otter Measures in the CEMP to alleviate potential impacts to otter to include the following:</p> <ul style="list-style-type: none"> ▪ In advance of construction pre-construction faunal surveys will be undertaken to identify the presence of otter holt at suitable habitats in the study area; ▪ If a holt is identified within 150 m of proposed works (NRA, 2008), a NPWS license will be secured to progress with required mitigation measures; ▪ Exposed ducts and pipes stored onsite will have the ends covered to prevent hedgehogs becoming trapped; Excavations will either be covered overnight and a ramp provided to prevent the accidental entrapment of otters; ▪ Maintain high standard of house keeping during the construction operations; ▪ Store chemicals where they cannot be accessed by wildlife; ▪ Where possible lighting installations will be directed away from the water courses and associated riparian habitat. 	Impact 3	Volume 7, Appendix 8: Onshore CEMP
<p>Invasive Species Management A planning stage Invasive Species Management procedure (ISMP) is included in Volume 7, Appendix 8: CEMP. The measures will be undertaken to avoid the uncontrolled spread of IAS that are present within the following areas of the project: (refer to the Onshore Biodiversity Technical Baseline Report for exact locations IAS have been recorded):</p> <ul style="list-style-type: none"> ▪ Landfall Site; ▪ Sector 1; ▪ Sector 2; ▪ Sector 7; and ▪ TCCs. 	Impact 4	Biosecurity and IAS method statement

Project design feature/measure	Impact	Where secured
<p>Measures will be deployed to prevent and apply containment measures. Species-specific treatment measures detailed in the ISMP and include the following:</p> <ul style="list-style-type: none"> ▪ A pre-construction survey will be undertaken to locate the presence and distribution of IAS within the study area. General containment measures during the construction phase: ▪ A pre-construction survey will be undertaken to locate the presence and distribution of IAS within the study area. ▪ An appropriate buffer will be used to cordon off invasive species outside the works footprint. ▪ Species-specific IAS treatment measures during the construction phase are detailed further in Table 28 of the Biodiversity Chapter and will be followed during construction; ▪ Remedial actions during the construction phase will be implemented to ensure that the IAS does not regrow. 		
<p>All construction work will be undertaken in accordance with the CEMP (Volume 7) and relevant good practice guidance, including</p> <ul style="list-style-type: none"> ▪ Construction Industry Research and Information Association (CIRIA) Control of water pollution from construction sites; and ▪ Guidance for consultants and contractors (C532) (CIRIA, 2001). 	Impacts 1-4	Best practice
<p>No discharge to main river watercourses will occur without permission from EPA (Local Authorities Services National Training Group (WSTG), 2011)²².</p>		Volume 7, Appendix 8: Onshore CEMP
<p>Arboricultural works to be undertaken in accordance with BS3998: 2010 Tree work – Recommendations (BS3998) by suitably qualified and insured contractors.</p>		
<p>The services of a suitably qualified arboriculturist will be retained for the duration of construction works where there is potential for trees to be affected, to support the implementation of all recommendations made.</p>		

²² Local Authority Services National Training Group (WSTG) (2011), Discharges to Surface Waters – Guidance to the Applicant (Rev. B).

Project design feature/measure	Impact	Where secured
<p>Prior to the commencement of construction works that could affect trees within a particular location along the ECR, an Arboricultural Method Statement (AMS) will be developed for that location in accordance with BS 5837:2012. Trees in relation to design, demolition and construction – Recommendations.</p> <p>The objective of the AMS will be to inform the construction/ development process and protect retained trees during the construction phase. The AMS will be informed by detailed design and produced by a suitably qualified arboriculturist in liaison with the contractor undertaking the works. The AMS will consider the following key elements as a minimum:</p> <ul style="list-style-type: none"> ▪ Protective Fencing <ul style="list-style-type: none"> ▪ Location and specification of Tree Protection Fencing (in line with BS 5837:2012) ▪ Location and specification of alternative protective fencing, if required ▪ Details of appropriate signage demarcating tree protection areas ▪ Construction Exclusion Zones (CEZ) <ul style="list-style-type: none"> ▪ Location of CEZ including detail of suitable demarcation and restrictions that will be in place within these areas during construction ▪ Temporary Ground Protection <ul style="list-style-type: none"> ▪ Location and detail of temporary ground protection measures to prevent soil compaction around tree roots ▪ New Permanent Surfacing within RPAs <ul style="list-style-type: none"> ▪ Location and detail of any new surfacing within RPAs ▪ Canopy Protection <ul style="list-style-type: none"> ▪ Details of measures to avoid damage to tree canopies including staff awareness and pruning to facilitate access for plant and equipment is required. 		

Project design feature/measure	Impact	Where secured
<ul style="list-style-type: none"> ▪ Use of Hazardous Materials <ul style="list-style-type: none"> ▪ Measures to prevent accidental release of materials hazardous to tree roots within RPAs 		
<ul style="list-style-type: none"> ▪ Key persons and contractors who could be working along the onshore ECR in areas where there is potential for impact on trees to occur, will receive training by the appointed arboriculturist (e.g. via a tool box talk) on commencement of the construction works. This training, as a minimum, will cover how trees are potentially damaged (above ground and below ground) and the specific protection measures confirmed within the AMS. 		
<p>Regular planning by the construction team and the Arboriculturist will be undertaken in advance of scheduled works to review the programme of work and to ensure damage by machinery is avoided to the RPAs the stems and branches of trees to be retained along the ECR.</p>		
<p>The appointed arboriculturist will be present and monitor any excavation works where roots within the precautionary zone/RPA of trees could be affected along the ECR. The monitoring will seek to determine the amount and size of tree roots present and the extent of severance within the area excavated.</p> <p>An assessment will be made of the future viability of any trees that would incur damage to roots. Tree health, viability and stability will be dependent on the volume of root that would be removed, tree species and local context.</p> <p>Depending on the findings the following approaches will be taken:</p> <ul style="list-style-type: none"> ▪ Trees considered unviable in the future: Where a tree’s health/vitality is considered to be severely impacted arising from tree root damage and/or the tree is likely to become a health and safety hazard, due to reduced anchorage, it will be recorded and removed within 4 – 6 weeks of the excavation works taking place. The number of trees requiring removal will be reported to the local authority, prior to the works taking place. Replacement planting will be undertaken, in accordance with the DLRCC Tree Strategy 2024-2030. The number, species and location for replacement trees will be agreed with DLRCC. 		

Project design feature/measure	Impact	Where secured
<p>Trees considered viable in the future: The trees that are considered to be able to withstand the amount of tree roots lost, without significant impact on their health/vitality and / or stability will be retained. A monitoring and management plan for each retained tree will be prepared appropriate to the amount of tree roots lost. Measures included in the plan may include soil improvement to foster regrowth of roots, tree pruning to counter balance the loss of roots and long-term monitoring for signs of declining health or stability.</p>		
<p>Under supervision from the arboriculturist, any severed roots will be pruned back with a clean cut and any exposed roots will be wrapped to prevent them from drying out. The wrapping will stay in place whilst the roots are exposed. Suitable material will be placed around the roots when the trench is back-filled. These works will be undertaken in line with section 7.2 of BS 5837:2012 (Avoiding physical damage to the roots during demolition or construction).</p>		
<p>The layout of the Clifton Park TCC, and the trenchless crossing compounds will be designed in liaison with the appointed arboriculturist. Where feasible, the layout of the TCC will aim to avoid the precautionary zones/RPAs and canopy spread of adjoining trees. The following measures will be applied, as appropriate:</p> <ul style="list-style-type: none"> ▪ Tree Protection Fencing: Where TCCs are located adjacent or in very close proximity to precautionary zones / RPAs, the TCC fencing (including noise barrier fencing), can be used in-lieu of tree protection fencing (as specified in BS5837:2012). Where this is used, appropriate signage identifying an exclusion zone for tree protection purposes will be displayed. Additional fencing may be required, as directed by the appointed arboriculturist. ▪ Ground Protection Measures: Where encroachment into the precautionary zones / RPAs is unavoidable, alternative protection arrangements such as ground protection (sufficient to protect the structure of the soil from compaction) may be required. This will be designed in accordance with the requirements of section 6.2.3 of BS5837:2012. 		

Project design feature/measure	Impact	Where secured
<p>Canopy Protection Measures: Above ground equipment (such as containers, drill rigs and noise attenuation fencing), should be arranged to avoid damage to the canopies of existing trees. Where this is not possible, pruning to facilitate access for plant and equipment may be required as advised by the appointed arboriculturist.</p>		
<p>Clifton Park TCC (Sector 1): The following potential considerations will be addressed by measures in the AMS which will be informed by detailed design:</p> <ul style="list-style-type: none"> ▪ The eastern boundary of the Clifton Park TCC is in close proximity to an established tree line which is located along the DART railway line. The current plan indicates that part of the TCC is likely to be within the precautionary zone / RPA of the trees. The AMS will specify suitable ground protection measures prior to any plant or machinery operating in this area. <p>Any variation in the TCC location will require consideration of the precautionary zone / RPA of the trees along Shanganagh River.</p>		
<p>The TCC surrounding the trenchless crossing entry pit within Eurofound grounds: The TCC at Eurofound which will facilitate the trenchless crossing to undertake the N11 crossing is located in proximity to several large high-quality trees. The following potential considerations will be addressed by measures in the AMS which will be informed by detailed design:</p> <ul style="list-style-type: none"> ▪ Ground compaction from the operation / storage of plant and machinery within the compound and along the access route into it. The AMS will specify suitable ground protection measures prior to any plant or machinery operating in this area ▪ Encroachment into the precautionary zone / RPA of some trees, due to the excavations at the HDD entry pit. The HDD bore itself is unlikely to impact on tree roots, as it will be buried more than 60 cm below ground within a short distance of the entry pit. The AMS will specify suitable root protection measures, should these be required. 		

Project design feature/measure	Impact	Where secured
<p>Above ground impact on the tree canopies, in particular due to the proposed noise attenuation fencing along the northern, western and eastern boundary of this TCC. The fencing can function as a protective barrier around the RPAs of trees if sited carefully). Suitable canopy protection measures will be confirmed within the AMS.</p>		
<p>Replacement planting will be undertaken in line with Table 6-2 of Appendix 6.5.7-2 Tree Survey Report</p>		
<p>Replacement planting will be located in open green space that is under the control of DLRCC and will be agreed with DLRCC in advance of tree removal alongside the quantity, location, tree size and species to be used. The aim will be for planting to be undertaken in the first planting season following the removal of each of the groups of trees upon completion of construction.</p> <p>The same details for tree planting which will be undertaken to replace existing trees at Eurofound and detail of the quantity, location, tree size and species to be used will be agreed with Eurofound in advance of any tree removal.</p> <p>New planting will consider the existing species mix present within the survey area in relation to both arboricultural and ecological considerations. New planting offers an opportunity to increase the species and age class diversity for a given area which can boost the resilience of the local tree stock in relation to pests, disease and climate change as well as providing a greater range of amenity and other benefits.</p> <p>New trees will be planted in accordance with the minimum distances from new structures, services and surfacing set out in Table A.1 of BS 5837:2012. Tree stock selection, planting methods and planned maintenance will follow guidance as set out in BS 8545:2014 Trees: from nursery to independence in the landscape.</p>		

Project design feature/measure	Impact	Where secured
Operation		
<p>Operational practices will incorporate measures to prevent pollution and increased flood risk; including emergency spill response procedures, clean up and control of any potential contaminated surface water runoff.</p> <p>Where unplanned operational or maintenance works are required, appropriate mitigation measures would be developed and agreed with the relevant consultees prior to the works taking place.</p>	<p>Impact 5</p>	<p>General</p>

2.10 Environmental assessment: Construction phase

- 2.10.1 This section addresses the potential impacts (detailed in Table 16) to the important IEFs identified in the Onshore Biodiversity Technical Baseline Report and presented in Section 2.5. This assessment is based on the OES and the O&M Base study areas.
- 2.10.2 The construction programme is described in Volume 2, Chapter 6: Project Description.
- 2.10.3 Where potential impacts on IEFs are described and characterised in this section, it is without the project design measures and other avoidance and preventative measures identified in Table 17 and the appropriate and necessary additional mitigation measures identified in Table 25 to avoid, prevent and reduce effects. The residual effects and their level of significance are then stated following the incorporation of these measures.

Related chapters

- 2.10.4 Potential impacts in relation to air quality, noise and vibration and hydrology have been assessed elsewhere in the EIAR. The results of other assessments have been taken into account in the assessment of effects on Biodiversity under the EIA Directive and are summarised below in respect of ecological receptors:
- ▲ The hydrology chapter (Volume 5, Chapter 4) concludes that there will be no significant residual effects as a result of the proposed development. The assessment of effects on aquatic receptors assumes implementation of the proposed mitigation measures presented in this chapter.
 - ▲ The Noise and Vibration chapter (Volume 5, Chapter 5) concludes that there would be no significant residual effects as a result of the proposed development.
 - ▲ Volume 5, Chapter 10 considers air quality impacts during construction to sensitive ecological receptors as a result of dust and increased road traffic. The assessment concludes that likely sources of dust emissions include earthworks, construction, and trackout. However, the Air Quality chapter also states that the risk of dust emissions on ecological receptors will be negligible (refer to Table 14 of the Air Quality Chapter, Volume 5, Chapter 10). Potential impacts of dust in relation to the source-pathway-impact model are nonetheless discussed in the following sections.

Impact 1: Permanent and temporary loss or damage of designated sites or effects to their Qualifying Interests

- 2.10.5 Ireland's 4th National Biodiversity Action Plan 2023–2030 addresses onshore biodiversity conservation and management needs, including habitat restoration, species protection and ensuring that biodiversity considerations are integrated into planning and development processes. Table 20 details the extent of the potential impacts expected to occur to designated sites.

European designated sites

2.10.6 A total of 12 European designated sites were identified as having connectivity to the onshore development areas, see Table 18 with the connectivity rationale given in Table 6.

Table 18 Scoped in European designated sites for the OES and O&M Base

Site name	Site code	Distance to closest point of the OES (km)
OES		
Dalkey Islands SPA	004172	3.2
South Dublin Bay and River Tolka Estuary SPA	004024	4.7
Wicklow Mountains SAC	002122	5.6
North Bull Island SPA	004006	10.0
Howth Head Coast SPA	004113	13.5
The Murrough SPA	004186	14.9
O&M Base		
South Dublin Bay and River Tolka Estuary SPA	004024	0.7
South Dublin Bay SAC	000210	1.4
Rockabill to Dalkey Island SAC	003000	2.7
North Bull Island SPA	004006	5.4
North Dublin Bay SAC	000206	5.5
Howth Head Coast SPA	004113	8.8
Baldoyle Bay SPA	004016	10.6
Ireland's Eye SPA	004117	11.9

Nationally designated sites

2.10.7 A total of five pNHAs were identified as having connectivity to the onshore development areas, see Table 19.

Table 19 Scoped in hydrologically and/or ecologically connected nationally designated sites for the OES and O&M Base

Site name	Site code	Distance to closest point of the OES or O&M Base
OES		
Loughlinstown Woods pNHA	001211	0.005 km
Dalkey Coastal Zone and Killiney Hill pNHA	001206	0.01 km
Dingle Glen pNHA	001207	0.76 km
O&M Base		
Dalkey Coastal Zone and Killiney Hill pNHA	001206	0.44 km
South Dublin Bay pNHA	000210	0.86 km
Boosterstown Marsh pNHA.	001205	4.33 km
North Dublin Bay pNHA	000206	5.49 km

Locally important biodiversity sites

2.10.8 One LIBS has been scoped in for assessment: Shanganagh River and Cliff LIBS, due to it overlapping the boundary of the OES. All other LIBS have been scoped out as they are outside the study area.

2.10.9 Table 20 details the extent of the potential biodiversity impacts to designated sites expected for the OES and O&M Base, the proposed mitigation and/or reinstatement measures to be implemented and the residual effects expected following these measures is also presented in this table.

Table 20 Potential impacts, likely significant effects, project design measures, other avoidance and preventative measures, proposed additional mitigation and significance of residual effects for designated sites

IEF	Potential impact	Potential effects	Project design measures and other avoidance and preventative measures	Proposed additional mitigation	Significance of residual effects
OES					
European designated sites	Effects relating to direct habitat loss or damage	There is no overlap between the boundaries of the OES and any European designated sites. The closest European designated sites is Dalkey Islands SPA, which is 3.2 km from the closest point of the OES. Therefore, there will be no direct habitat loss or damage to any European designated sites and there will not be a likely significant effect.	As detailed in Table 17, a site selection process has been undertaken for the Landfall, with alternative locations discounted due to a combination of technical, environmental and social considerations, including proximity to the Coastal Zone and Killiney Hill pNHA and Dalkey Islands SPA	There is no additional mitigation required.	There will be no loss of habitats within any European designated sites. As such, there will be no significant residual effects.
	Effects arising from dust creation	Large dust particles (greater than 30 µm) will largely deposit within 100 m of sources, with intermediate particles (10 – 30 µm) likely to travel up to 200 – 500 m (IAQM, 2016). No European designated sites are located within 500 m of the OES. Therefore, there will be no LSE to any European designated sites arising from with dust creation during the construction and to a lesser extent the decommissioning phases for the project. Any dust creation within 500 m of marine and river habitats may cause an accumulation in the marine habitat that may reach hydrologically connected European designated sites. However, dust entering the marine environment is anticipated to be quickly dispersed due to the transient nature of this aquatic habitat so that LSE to hydrologically connected sites are considered unlikely to occur.	Dust suppression measures detailed in the CEMP and Table 17.	No additional mitigation is required	Following the implementation of the proposed mitigation, the risk of LSE arising from dust impacts will be negligible. As such, there will be no significant residual effects.
	Effects relating to pollution events arising from surface run-off	Two European designated are downstream/hydrologically connected to the OES, including: <ul style="list-style-type: none"> Rockabill to Dalkey Island SAC; and Dalkey Islands SPA All other European designated sites are considered sufficiently distant from the source, that any pollutants or suspended sediments will have effectively dispersed so that no significant effects will occur. In addition, the Wicklow Mountains SAC QI otter was scoped in (refer to the NIS) as a supporting population may be present in the Shanganagh River and tributaries and may be affected by this impact. Hydrologically connected European designated sites (Rockabill to Dalkey Island SAC and Dalkey Island SPA) located adjacent or downstream of the OES development area may experience LSE during the construction and decommissioning phases. These effects may arise through any hydrocarbon pollution events or suspended sediments entering the water. Such impacts may result in the degradation of downstream European designated sites and the coastal QI habitats and species that they support. Pollution events may occur through accidental leaks or spillages from machinery or vehicles associated with the construction or	Trenchless techniques (HDD or similar) will be used to cross watercourses along the Onshore ECR so there will be no risk of increased sediments entering any river habitats. The two drainage ditches in Sector 7 in agricultural fields. which will be trenched crossings are the exception to this. Construction works will be set back from the river and stream channel except for the two open-cut trenched crossings at Sector 7, and where it is not possible to maintain an adequate set back to prevent runoff going to the watercourse. Additional control measures such as silt fences will be deployed at these locations. As detailed in the Hydrology, Hydrogeology and Flood Risk chapter (Volume 5, Chapter 4), construction works will be set back from the river and stream channels, except for the two open-cut trenched crossings at Sector 7, and where it is not possible to maintain an adequate set back to prevent runoff going to the watercourse. Additional control measures such as silt fences will be deployed.	No additional mitigation is required.	The project design features and other avoidance and preventative measures will ensure that sediments and pollutants entering watercourses and potentially reaching European designated sites will be minimised. There will be no significant residual effects.

IEF	Potential impact	Potential effects	Project design measures and other avoidance and preventative measures	Proposed additional mitigation	Significance of residual effects
		<p>decommissioning of the OES. However, these are anticipated to be small in scale and rare in occurrence. Furthermore, the natural ground is likely to naturally mitigate most of the potential effects of these incidents (acknowledging that if suspended solids flow into a waterbody they will not be absorbed into the ground).</p> <p>Construction phase groundworks, including open-cut trenching for the two drainage ditches in Sector 7 of the Onshore ECR and trenchless crossings at all other watercourse crossings, risk causing increased suspended sediments entering river habitats through run-off. This sediment will travel downstream and may accumulate and adversely affect the coastal Natura 2000 sites located there. Trenchless techniques (HDD or similar) will be employed (under Table 17), which will avoid the need for trenching through or close to river habitats. This will avoid the risk of sediment from entering river habitats and potentially reaching downstream designated sites.</p> <p>The effects will occur for the duration of the construction works and will be temporary. However, any sediments and pollutants that enter the watercourses will be quickly dispersed in the in transient aquatic habitat so that the effects to the European designated sites are not likely to be significant.</p> <p>Any LSE caused to European designated sites are likely to be significant on an international level.</p> <p>All other European designated sites are considered sufficiently distant from the source, that any pollutants or suspended sediments will have effectively dispersed so that no significant effects will occur.</p> <p>Rockabill to Dalkey Island SAC</p> <p>This SAC includes the dynamic inshore and coastal waters in the western Irish Sea and is designated for its reefs and harbour porpoise. Any pollutants and suspended sediments will be effectively dispersed by the time they reach this designated site and will have no significant effects as a result.</p> <p>Dalkey Island SPA</p> <p>Dalkey Island SPA comprises terrestrial habitat that is of high value for breeding terns and is unlikely to be affected by small-scale pollution events and suspended sediments.</p> <p>Wicklow Mountains SAC</p> <p>Any pollution events that enter the Shanganagh River and tributaries may affect otters by mainly causing a potential reduction in its prey. This could affect a supporting population of otters to the Wicklow Mountains SAC, potentially causing a reduction of the supporting population that might have a knock-on reduction to the SAC population. This would cause LSE for this SAC.</p> <p>In summary, it is likely that effects arising from this impact will have no significant effects.</p>	<p>Measures to minimise pollution risk to aquatic habitats detailed in the CEMP and Table 17</p>		

IEF	Potential impact	Potential effects	Project design measures and other avoidance and preventative measures	Proposed additional mitigation	Significance of residual effects
	Other effects relating to Wicklow Mountains SAC QI (otters)	<p>The OES is located and crosses the Shanganagh River and tributaries at several places (Sector 1, 2...etc), particularly through the onshore ECR. There is a risk that the works will cause disturbance or damage to a potentially supporting population of otter to the Wicklow Mountains SAC. Any harm to the otter population in this catchment may have a knock-on effect to the SAC population if it does form a supporting population (this is unknown).</p> <p>Any LSE caused to European designated sites are likely to be significant on an international level.</p>	<p>As detailed Table 17, a site selection process has been undertaken for the OES which prioritises avoidance, minimisation, and restoration, including:</p> <ul style="list-style-type: none"> ▪ With the exception of trenched crossings of the drainage ditches Glenamuck North stream and Jamestown 10 in Sector 7, use of trenchless technology (HDD or similar) to cross rivers along the onshore ECR to reduce impact on the riparian river corridors ▪ Construction works will be set back from the river and stream channel except for the two open-cut trenched crossings at Sector 7, and where it is not possible to maintain an adequate set back to prevent runoff going to the watercourse. Additional control measures such as silt fences will be deployed at these locations. ▪ Routing of the onshore ECR to avoid sensitive habitats and minimise habitat loss (e.g. trees). Where possible the onshore ECR has followed public roads and areas of amenity ground which is of low ecological value. ▪ Siting of the OSS within an area of low habitat sensitivity. <p>A pre-construction verification survey will aim to identify any changes in otter activity, holt locations, etc., since the original surveys. The pre-construction survey should be conducted no more than 10-12 months in advance of construction commencing. This will ensure that there will be sufficient time to comply with all licensing and additional mitigation requirements (e.g. holt exclusion and/or the creation of artificial holts). Where holts are found to be inactive, they will be destroyed immediately using a mechanical digger, under the supervision of the holder of the relevant NPWS licence.</p> <ul style="list-style-type: none"> ▪ Where holts are found that are likely to be disturbed, their activity level will be assessed to verify whether they are active or inactive. 	No additional mitigation is required.	Following the implementation of the proposed mitigation, the risk of causing a reduction in a potential supporting otter population to the SAC is considered negligible. As such, there will be no significant residual effects.
	Effects relating to IAS	<p>IAS located across areas of the OES may be accidentally spread across the site and beyond (including into nearby European designated sites) by the proposed construction works.</p> <p>Any IAS that become established within European designated and may negatively affect its biodiversity as a result by outcompeting and limiting the natural growth and dispersal of native species. This could cause LSE</p>	Management measures including general prevention measures, general containment measures, and species-specific treatment measures detailed in the ISMP and Table 17	No additional mitigation is required.	Following the implementation of the mitigation measures, the IAS will be controlled and eradicated and their accidental spread into any European designated sites

IEF	Potential impact	Potential effects	Project design measures and other avoidance and preventative measures	Proposed additional mitigation	Significance of residual effects
		<p>to the European designated sites. Those European designated sites located closest to the OES are at greatest risk.</p> <p>Any LSE caused to European designated sites are likely to be significant on an international level.</p>			<p>will be avoided. As such, there will be no significant residual effects.</p>
<p>Nationally designated sites (pNHAs)</p>	<p>Effects relating to direct habitat loss, damage, and/or degradation</p>	<p>There are no nationally designated sites that overlap with the boundaries of the OES. As such Dalkey Coastal Zone and Killiney Hill pNHA and Dingle Glen pNHA will not be affected by this impact.</p> <p>Loughlinstown Woods pNHA is located c. 5 m from the temporary trenchless crossing compound that will be located within the Eurofound site (TX-06). There is a risk that heavy machinery access and materials storage may impact the RPAs of the trees that form the edge of this pNHA during the construction phase through soil compaction. There is the potential to cause the loss or damage of these trees in the long-term and a reduction in the quality of the woodland that forms the pNHA. This impact would cause a significant effect on a county level.</p>	<p>As detailed in Table 17, a site selection process has been undertaken for the OES which prioritises avoidance, minimisation, and restoration, including:</p> <ul style="list-style-type: none"> ▪ Routing of the onshore ECR to avoid sensitive habitats and minimise habitat loss (e.g. trees). Where possible the onshore ECR has followed public roads and areas of amenity ground which is of low ecological value. ▪ Siting of the OSS within an area of low habitat sensitivity. <p>Trees identified as potentially affected by the ECR (see Figure 6) will be monitored throughout the construction phase by a suitably qualified Arboricultural consultant to oversee the implementation of all recommendations made in the Tree Survey Report. This person will advise the construction team on whether the proposed Root Protection Area (RPA) encroachment by the works will damage the trees (refer to Volume 6, Appendix 6.5.7-2: Tree Survey Report).</p> <p>Where encroachment into the precautionary zones/RPAs is unavoidable, alternative protection arrangements such as ground protection in accordance with the requirements of 6.2.3 of BS 5837:2012 (sufficient to protect the structure of the soil from compaction) may be required.</p> <p>Fencing will be erected around the temporary trenchless crossing compound and will not encroach the RPAs of any of the trees comprising Loughlinstown Woods pNHA. This will minimise the risk of accidental access or storage of materials here that may harm these trees.</p>	<p>No additional mitigation is required.</p>	<p>There will be no loss of habitats within any pNHAs. The mitigation provided will protect against accidental damage to the RPA of Loughlinstown Woods pNHA. As such, there will be no significant residual effects</p>
	<p>Effects relating to dust creation and air quality</p>	<p>Dust prevention measures have been included in the CEMP as embedded mitigation to minimise the creation and dispersal of dust during the construction and decommissioning phases. Furthermore, the effects caused by dust will be naturally mitigated by weather conditions, with rain suppressing dust and wind dispersing it to insignificant levels.</p> <p>Therefore, it is unlikely that dust will have any significant impacts on the nationally designated sites.</p>	<p>Dust suppression measures identified in the CEMP and Table 17.</p>	<p>No additional mitigation is required.</p>	<p>Following the implementation of the proposed mitigation, the risk of LSE arising from dust impacts are considered to be negligible. As such, there will be no significant residual effects</p>

IEF	Potential impact	Potential effects	Project design measures and other avoidance and preventative measures	Proposed additional mitigation	Significance of residual effects
	Effects relating to pollution events	<p>For pNHAs located adjacent or downstream of the OES study area, there is potential for indirect impacts to result in LSE on these pNHAs through construction phase impacts.</p> <p>River crossings and near-watercourse works risk causing the potential increase of suspended solids/pollutants in the surface water run-off entering river habitats through run-off. This sediment will travel downstream and may accumulate and adversely affect the coastal pNHAs located there. Those pNHAs located downstream and at risk of LSE arising from this impact include Dalkey Coastal Zone and Killiney Hill pNHA and Loughlinstown Woods pNHA.</p> <p>Trenchless techniques (HDD or similar) will be employed (under Section 2.9), which will avoid the need for trenching through river habitats. This will avoid the risk of sediment from entering river habitats and potentially reaching downstream designated sites.</p> <p>Moreover, pollution events (e.g. fuel spillages and leaks) are expected to occur only rarely and will be small in scale and easily contained. Furthermore, the natural ground is likely to naturally mitigate most of the potential effects of these incidents.</p> <p>Downstream water quality impacts affecting these pNHAs could arise from trenchless crossings involving in-watercourse or near-watercourse works, and the potential increase of suspended solids/pollutants in the surface water run-off. Such impacts may result in the degradation of downstream pNHAs and the habitats that they support, including Dalkey Coastal Zone and Killiney Hill pNHA, South Dublin Bay pNHA, and North Dublin Bay pNHA, Loughlinstown Woods pNHA, and Dingle Glen pNHA. Any LSE caused to nationally designated sites are likely to be significant on a national level.</p>	<p>Trenchless techniques (HDD or similar) will be used to cross watercourses along the Onshore ECR so there will be no risk of increased sediments entering any river habitats. The two drainage ditches in Sector 7 in agricultural fields, which will be trenched crossings are the exception to this. Construction works will be set back from the river and stream channel except for the two open-cut trenched crossings at Sector 7, and where it is not possible to maintain an adequate set back to prevent runoff going to the watercourse. Additional control measures such as silt fences will be deployed at these locations.</p> <p>As detailed in the Hydrology, Hydrogeology and Flood Risk chapter (Volume 5, Chapter 4), construction works will be set back from the river and stream channels, except for the two open-cut trenched crossings at Sector 7, and where it is not possible to maintain an adequate set back to prevent runoff going to the watercourse. Additional control measures such as silt fences will be deployed Measures to minimise pollution risk to aquatic habitats detailed in the CEMP and Table 17.</p>	No additional mitigation is required.	The residual effects are predicted to be minor, adverse, and temporary. There will be no significant residual effects
	Effects relating to IAS	<p>IAS located across areas of the OES may be accidentally spread into this habitat and may negatively affect its biodiversity as a result by outcompeting and limiting the natural growth and dispersal of native species.</p> <p>Any LSE caused to nationally designated sites are likely to be significant on a national level.</p>	Management measures including general prevention measures, general containment measures, and species-specific treatment measures detailed in the ISMP and Table 17.	No additional mitigation is required.	Following the implementation of the mitigation measures, the IAS will be controlled and eradicated and their accidental spread into any pNHAs will be avoided. As such, there will be no significant residual effects
Locally Important Biodiversity Sites	Effects relating to direct habitat loss, damage, and/or degradation	<p>The Onshore ECR will pass through the boundary of the Shanganagh River and Cliff LIBS, putting the habitats at risk of loss or damage. However, HDD installation technique will be implemented and will ensure the Onshore ECR passes underneath the LIBS to avoid any loss or damage to this site.</p> <p>Additionally, a TCC area will be located approximately 12 m away from the boundary of the Shanganagh River and Cliff LIBS and (without appropriate mitigation) there is a small risk of accidental damage to the habitats attributed to the LIBS.</p>	Trenchless techniques (HDD or similar) will be used to cross watercourses along the Onshore ECR so there will be no risk of increased sediments entering any river habitats. The two drainage ditches in Sector 7 in agricultural fields, which will be trenched crossings are the exception to this. Construction works will be set back from the river and stream channel except for the two open-cut trenched crossings at Sector 7, and where it is not possible to maintain an adequate set back to prevent runoff going to the watercourse. Additional	Suitable fencing will be erected between the boundary of the LIBS and the boundary of the nearby TCC with signs stating 'Sensitive Biodiversity Area' to avoid accidental damage or loss of the habitats attributed to the LIBS.	The residual effects are predicted to be minor, adverse, and temporary. There will be no significant residual effects

IEF	Potential impact	Potential effects	Project design measures and other avoidance and preventative measures	Proposed additional mitigation	Significance of residual effects
		<p>No other LIBS site overlaps with the onshore project boundary and therefore there will be no loss or damage of habitat to other LIBS sites. Any LSE caused to LIBS designated sites are likely to be significant on a local level.</p>	<p>control measures such as silt fences will be deployed at these locations.</p> <p>As detailed in the Hydrology, Hydrogeology and Flood Risk chapter (Volume 5, Chapter 4), construction works will be set back from the river and stream channels, except for the two open-cut trenched crossings at Sector 7, and where it is not possible to maintain an adequate set back to prevent runoff going to the watercourse. Additional control measures such as silt fences will be deployed</p> <p>Measures to minimise pollution risk to aquatic habitats detailed in the CEMP and Table 17.</p>		
	<p>Effects relating to dust creation and air quality</p>	<p>The OES application site overlaps with the Shanganagh River and Cliff LIBS. Therefore, there is a significant risk of dust created during groundworks, HDD and trenching depositing on and affecting the habitats and the vegetation within the LIBS.</p> <p>Dust deposition within the river habitat and its associated riparian woodland can have adverse effects to the vegetation as during long dry periods dust can coat plant foliage adversely affecting photosynthesis and other biological functions. Rainfall removes the deposited dust from foliage and can rapidly leach chemicals into the soil (Holman et al., 2014).</p> <p>Any LSE caused to LIBS designated sites are likely to be significant on a local level.</p>	<p>Dust suppression measures identified in the CEMP and Table 17.</p>	<p>No additional mitigation is required</p>	<p>The residual effects are predicted to be minor, adverse, and temporary. There will be no significant residual effects</p>
	<p>Effects relating to pollution events</p>	<p>Pollution caused by accidental spillages as well as sediment run-off may enter the river habitat within the Shanganagh River and Cliff LIBS. This may impact the riparian habitat and river habitat within the LIBS causing a reduction in population or distribution of the flora and fauna and/or a reduction in the extent or quality of the habitats that this LIBS supports.</p> <p>Any LSE caused to LIBS designated sites are likely to be significant on a local level.</p>	<p>Measures to minimise pollution risk to aquatic habitats detailed in the CEMP and Table 17.</p>	<p>No additional mitigation is required.</p>	<p>The residual effects are predicted to be minor, adverse, and temporary. There will be no significant residual effects</p>
	<p>Effects relating to IAS</p>	<p>IAS located across areas of the OES may be accidentally spread into this LIBS. LSE may arise from this impact through IAS negatively affecting its biodiversity as a result of outcompeting and limiting the natural growth and dispersal of native species supporting within the LIBS.</p> <p>Any LSE caused to LIBS designated sites are likely to be significant on a local level.</p>	<p>Management measures including general prevention measures, general containment measures, and species-specific treatment measures detailed in the ISMP and Table 17.</p>	<p>No additional mitigation is required.</p>	<p>Following the implementation of the mitigation measures, the IAS will be controlled and eradicated and their accidental spread into the LIBS will be avoided.</p> <p>As such, there will be no significant residual effects</p>

IEF	Potential impact	Potential effects	Project design measures and other avoidance and preventative measures	Proposed additional mitigation	Significance of residual effects
O&M Base					
European designated sites	Effects relating to direct habitat loss or damage	There is no overlap between the boundaries of the O&M Base and any European designated sites. The closest European designated site to the O&M Base is South Dublin Bay and River Tolka Estuary SPA, which is 0.7 km from the O&M Base. Therefore, there will be no direct habitat loss or damage will not lead to LSE to any European designated sites.	No mitigation is required.		There will be no loss of habitats within any European designated sites. As such, there will be no significant residual effects.
	Effects arising from dust creation	No European designated sites are located within 500 m of the O&M Base. Therefore, there will be no LSE to any European designated sites arising from with dust creation during the construction and to a lesser extent the decommissioning phases for the project. Any dust creation within 500 m of marine and river habitats may cause an accumulation in the marine habitat that may reach hydrologically connected European designated sites. However, dust entering the marine environment is anticipated to be quickly dispersed due to the transient nature of this aquatic habitat so that LSE to hydrologically connected sites are considered unlikely to occur.	Dust suppression measures identified in the CEMP and Table 17.	No additional mitigation is required.	Following the implementation of the proposed mitigation, the risk of LSE arising from dust impacts are considered to be negligible. As such, there will be no significant residual effects.
	Effects relating to pollution events arising from surface run-off	<p>Hydrologically connected European designated sites to the O&M Base development area may suffer LSE during the construction and decommissioning phases impacts. These may arise through any pollution events entering the water. Such impacts may result in the degradation of hydrologically connected European designated sites and the coastal QI habitats and species that they support.</p> <p>Pollution events may occur during all phases through accidental leaks or spillages of machinery or vehicles associated with the construction, operation, or decommissioning of the OES. However, these are anticipated to be small in scale and rare in occurrence. Furthermore, the natural ground is likely to naturally mitigate most of the potential effects of these incidents.</p> <p>It is considered unlikely that there will be a significant risk of suspended sediments entering the water. The O&M Base comprises existing urban environment and there will be no need for significant groundworks to occur and appropriate sediment control measures will be installed. Therefore, the risk of this effect arising is considered unlikely and it has been scoped out.</p> <p>The risk of pollutants reaching watercourses will occur for the duration of the construction works and will be temporary. However, any sediments and pollutants that enter the watercourses will be quickly dispersed in the in transient aquatic habitat so that the effects to the European designated sites are likely to be not significant.</p> <p>Any LSE caused to European designated sites are likely to be significant on an international level.</p> <p>Three European designated are considered to be hydrologically connected to the O&M Base, including:</p> <ul style="list-style-type: none"> ▪ South Dublin Bay and River Tolka Estuary SPA; ▪ South Dublin Bay SAC; and 	Measures to minimise pollution risk to aquatic habitats are detailed in the CEMP and Table 17.	No additional mitigation is required.	The project design measures and other avoidance and preventative measures will ensure that sediments and pollutants entering watercourses and potentially reaching European designated sites will be minimised. There will be no significant residual effects.

IEF	Potential impact	Potential effects	Project design measures and other avoidance and preventative measures	Proposed additional mitigation	Significance of residual effects
		<ul style="list-style-type: none"> Rockabill to Dalkey Island SAC <p>All other European designated sites are considered sufficiently distant from the source, that any pollutants or suspended sediments will have effectively dispersed so that no significant effects will occur.</p> <p>South Dublin Bay and River Tolka Estuary SPA</p> <p>This SPA is designated for supporting a range of notable shorebirds and wintering wildfowl. It is unlikely that rare occurrences of small quantities or pollutants will significantly affect this SPA.</p> <p>South Dublin Bay SAC</p> <p>This SAC is designated for its valuable coastal habitats. It is unlikely that rare occurrences of small quantities or pollutants will significantly affect this SAC.</p> <p>Rockabill to Dalkey Island SAC</p> <p>This SAC includes the dynamic inshore and coastal waters in the western Irish Sea and is designated for its reefs and harbour porpoise. Any pollutants and suspended sediments will be effectively dispersed by the time they reach this designated site and will have no significant effects as a result.</p>			
	Effects relating to IAS	There are no IAS in the O&M Base and therefore, no risk of spreading IAS within this area or beyond into designated sites.	No mitigation is required.		There will be no significant residual effects.
Nationally designated sites	Effects relating to direct habitat loss, damage, and/or degradation	There are no nationally designated sites that overlap with the boundaries of the O&M Base. Therefore, there will be no direct habitat losses as a result of the proposed construction, operation or decommissioning phases. As such none of the pNHAs (Dalkey Coastal Zone and Killiney Hill pNHA, South Dublin Bay pNHA, Booterstown Marsh pNHA or North Dublin Bay pNHA), will be affected by this impact.	As detailed Table 17, a site selection process has been undertaken for the O&M Base which prioritises avoidance, minimisation, and restoration, including Location of the O&M Base on previously developed and urban land within an existing harbour environment.	No additional mitigation is required.	There will be no loss of habitats within any nationally designated sites. As such, there will be no significant residual effects.
	Effects relating to dust creation and air quality	<p>Dust may be created by works associated with the construction and decommissioning phases. Large dust particles (greater than 30 µm) will largely deposit within 100 m of sources, with intermediate particles (10 – 30 µm) likely to travel up to 200 – 500 m (IAQM, 2016). Therefore, all pNHAs located within 100 m of the project are at the greatest risk of LSE arising from dust impacts. These pNHAs includes Dalkey Coastal Zone and Killiney Hill pNHA. All other pNHAs are located >500 m from the O&M Base and are therefore unlikely to suffer LSE from dust impacts.</p> <p>South Dublin Bay pNHA, Booterstown Marsh pNHA and North Dublin Bay pNHA are both located >500 m of the O&M Base and will be unaffected by dust creation.</p> <p>Only Dalkey Coastal Zone and Killiney Hill pNHA is located within 500 m of the O&M Base. It is possible that dust created during the construction and decommissioning phases may reach this pNHA and have adverse effects by altering water chemistry there. However, most dust will settle within 100 m and the marine environments will also naturally disperse any dust so that significant effects are considered unlikely. Furthermore, dust prevention measure are detailed in the CEMP. This will minimise</p>	Dust suppression measures identified in the CEMP and Table 17.	No additional mitigation is required.	Following the implementation of the proposed mitigation, the risk of LSE arising from dust impacts are considered to be negligible. As such, there will be no significant residual effects

IEF	Potential impact	Potential effects	Project design measures and other avoidance and preventative measures	Proposed additional mitigation	Significance of residual effects
	Effects relating to pollution events	<p>the amount of dust that may be able to disperse from the O&M Base and will prevent significant effects from occurring to this pNHA.</p> <p>Hydrologically connected European designated sites to the O&M Base development area may suffer LSE during the construction and decommissioning phases impacts. These may arise through any pollution events entering the water. Such impacts may result in the degradation of hydrologically connected European designated sites and the coastal QI habitats and species that they support.</p> <p>It is considered unlikely that there will be a significant risk of suspended sediments entering the water. The O&M Base comprises existing urban environment and there will be no need for significant groundworks to occur and appropriate sediment control measures will be installed. Therefore, the risk of this effect arising is considered unlikely and it has been scoped out.</p> <p>Pollution events may occur during all phases through accidental leaks or spillages of machinery or vehicles associated with the construction, operation, or decommissioning of the OES. However, these are anticipated to be small in scale and rare in occurrence.</p> <p>In addition, pollution prevention measures have been included as project design measures and other avoidance and preventative measures and detailed in the CEMP. This will minimise the potential risk of pollutants reaching any of the pNHAs (Dalkey Coastal Zone and Killiney Hill pNHA, South Dublin Bay pNHA, Booterstown Marsh pNHA or North Dublin Bay pNHA). Therefore, no significant effects are expected.</p>	Measures to minimise pollution risk to aquatic habitats detailed in the CEMP and Table 17.	No additional mitigation is required.	Following the implementation of the proposed mitigation, the risk of LSE arising from dust impacts are considered to be negligible. As such, there will be no significant residual effects
	Effects relating to IAS	There are no IAS in the O&M Base and therefore, no risk of spreading IAS within this area or beyond into designated sites.	No mitigation is required.		There will be no significant residual effects.

Impact 2: Permanent or temporary loss, damage, degradation or fragmentation of habitats

2.10.10 Ireland's 4th National Biodiversity Action Plan 2023–2030 addresses onshore biodiversity conservation and management needs, including habitat restoration, species protection and ensuring that biodiversity considerations are integrated into planning and development processes. Table 21 details the extent of the potential impacts that could occur without mitigation, i.e. loss, damage, degradation or fragmentation to habitat during the construction phase for the OES and O&M Base, the proposed mitigation measures to avoid, prevent and reduce such impacts, and the extent of potential impacts post-mitigation. The extent of the habitat losses ranges from the boundary (lower limit) and the boundary and buffer (50 m for OES/500 m for O&M Base). Details of the proposed mitigation and/or reinstatement measures to be implemented for each habitat and details of any residual effects expected following these measures is also presented in this table. The main area of permanent habitat loss is limited to the OSS. This assessment should be reviewed in consideration of Volume 6, Appendix 6.5.7-2: Tree Survey Report for a detailed description of the trees which will be impacted on the OES and for the schedule of tree removal.

Table 21 Potential effects, proposed mitigation and residual effects of Impact 2

Habitat	Potential impact	Potential effects	Project design measures and other avoidance and preventative measures	Proposed additional mitigation	Significance of residual effects
OES					
Depositing river (FW2)	Effects relating to direct habitat loss, damage, and/or degradation	Trenchless crossings using HDD or similar will be used, with the exception of trenched crossings of the drainage ditches Glenamuck North stream and Jamestown 10 in Sector 7 (see Section 2.9). Trenchless crossings will avoid damage or loss of this habitat. Therefore, no temporary or permanent loss of river habitats will occur throughout all phases of the development.	As set out in Volume 2, Chapter 6 Project Description, in order to avoid direct impacts with river corridors including FW3 depositing river habitat, Dublin Array is proposing to use trenchless techniques (HDD or similar) to install the onshore ECR at river crossings. As detailed in the Hydrology, Hydrogeology and Flood Risk chapter (Volume 5, Chapter 4), construction works will be set back from the river and stream channels, except for the two open-cut trenched crossings at Sector 7, and where it is not possible to maintain an adequate set back to prevent runoff going to the watercourse. Additional control measures such as silt fences will be deployed.	No additional mitigation is required.	The use of trenchless crossing techniques will avoid any losses or damage to this habitat. As such, there will be no significant residual effects
	Effects relating to dust creation and air quality	Dust creation is anticipated to occur during the construction phase, and to a lesser extent, the decommissioning phase of the project. Large dust particles (greater than 30 µm) will largely deposit within 100 m of sources, with intermediate particles (10 – 30 µm) likely to travel up to 200 – 500 m (IAQM, 2016). Therefore, rivers located within 500 m of the project has been considered, with areas located within 100 m being at greatest risk of this effect. This may cause LSE to this habitat by degrading its ecological quality and affecting the flora and fauna that it supports. Given the transient nature of this habitat, it is likely that any dust that enters it will be quickly dispersed and unable to accumulate in large enough quantities to cause adverse LSE on the habitat or the flora and fauna that it supports. Therefore, LSE arising as a result of this impact are assessed to be not significant.	Dust suppression measures identified in the CEMP and Table 17.	No additional mitigation is required.	With the implementation of the mitigation measures, it is anticipated that the effects on this habitat will be minor, adverse, and temporary. As such, there will be no significant residual effects.

Habitat	Potential impact	Potential effects	Project design measures and other avoidance and preventative measures	Proposed additional mitigation	Significance of residual effects
	Effects relating to pollution events	<p>LSE could arise from trenchless crossings involving near-watercourse works, and the potential increase of suspended solids/pollutants in the surface water run-off may enter this aquatic habitat. This may negatively affect the flora and fauna that this habitat supports, and the effect may become greater in downstream areas, if additional suspended solids/pollutants have accumulated.</p> <p>HDD will be employed (under Section 2.9), which will avoid the need for trenching through river habitats. This will minimise most of the risk of sediment from entering river habitats and potentially causing LSE to this habitat.</p> <p>Pollution events (e.g. fuel spillages) is considered to occur only rarely through an accidental spillage or leakages. Moreover, these would be small in scale and easily containable and the ground will naturally mitigate this impact by filtering for suspended solids. Additionally, the surface water network is transient by nature and therefore pollution is likely to quickly disperse. Therefore, LSE arising as a result of this impact are assessed to be not significant.</p>	<p>Trenchless techniques (HDD or similar) will be used to cross watercourses along the Onshore ECR so there will be no risk of increased sediments entering any river habitats. The two drainage ditches in Sector 7 in agricultural fields, which will be trenched crossings are the exception to this.</p> <p>As detailed in the Hydrology, Hydrogeology and Flood Risk chapter (Volume 5, Chapter 4), construction works will be set back from the river and stream channels, except for the two open-cut trenched crossings at Sector 7, and where it is not possible to maintain an adequate set back to prevent runoff going to the watercourse. Additional control measures such as silt fences will be deployed. Measures to minimise pollution risk to aquatic habitats detailed in the CEMP and Table 17.</p>	No additional mitigation is required.	With the implementation of project design measures and other avoidance and preventative pollution prevention measures detailed in the CEMP, the residual effects arising from this impact will be minor, adverse, and temporary. As such, there will be no significant residual effects.
	Effects relating to IAS	IAS located across areas of the OES may be accidentally spread into this habitat and may negatively affect its biodiversity as a result by outcompeting and limiting the natural growth and dispersal of native species. This habitat is particularly susceptible to IAS due to its aquatic nature allowing IAS to easily spread across its banks. The LSE caused to this habitat by IAS is likely to be significant on a local level.	Management measures including general prevention measures, general containment measures, and species-specific treatment measures detailed in the ISMP and Table 17.	No additional mitigation is required.	With the implementation of project design measures and other avoidance and preventative measures detailed in the ISMP, IAS will be eradicated and effective biosecurity measures will be implemented to ensure that IAS will not be spread. As such, there will be no significant residual effects.
Drainage ditch (FW4)	Effects relating to direct habitat loss, damage, and/or degradation	<p>In total, c. 190 m of drainage ditch was recorded across the OES study area. Trenching will cause the temporary loss or damage to c. 90 m of drainage ditches across Sectors 4 and 7.</p> <p>The ditches will be restored following the completion of the proposed trenching. However, some time will be required for the vegetation to return to its original condition.</p> <p>This habitat can provide ecological connectivity across the local landscape and the works will cause some minor and temporary habitat fragmentation as</p>	<p>The route of the OES has been revised to minimise the potential ecological impact. The length of drainage ditch to be impacted has also been minimised.</p> <p>The drainage ditches will be reinstated following the completion of the trenching works. They will be allowed to naturally revegetate.</p>	No additional mitigation is required.	The loss/damage to the drainage ditches will be adverse to biodiversity. However, the effects of this impact have been minimised and will temporary and recoverable. As such, there will be no significant residual effects.

Habitat	Potential impact	Potential effects	Project design measures and other avoidance and preventative measures	Proposed additional mitigation	Significance of residual effects
		a result. Any LSE caused to this habitat is likely to be significant on a local level.			
	Effects relating to dust creation and air quality	Without appropriate mitigation, dust may accumulate within this semi-aquatic habitat and affect the water chemistry and vegetation that it supports. Given dust prevention measures are included as project design measures and other avoidance and preventative measures, no significant effects are likely to occur as a result of this impact.	Dust suppression measures identified in the CEMP and Table 17.	No additional mitigation is required.	With the implementation of dust control mitigation measures, the residual effects to this habitat are anticipated to be minor, adverse, and temporary and the habitat is likely to be able to recover quickly. As such, there will be no significant residual effects.
	Effects relating to pollution events	Potential pollution events (e.g. construction-related spillages and/or sediments) may enter watercourses across the extent of the OES and may cause temporary damage to this habitat. The impact would lead to a reduction in water quality of the catchment at the point of the pollution event and downstream. It is likely that the ground will act as a natural filter for suspended solids, limiting any potential impact. Additionally, the surface water network is transient by nature and therefore is likely to recover quickly. This impact is considered unlikely to occur and would only occur during an accidental spillage or leakage. This impact would be adverse and temporary as the water flow will carry the pollution downstream and prevent significant build-up from occurring. Given pollution prevention measures are included as part of the project design measures and other avoidance and preventative measures, no significant effects are likely to occur as a result of this impact.	Measures to minimise pollution risk to aquatic habitats detailed in the CEMP and Table 17. Construction works will be set back from the river and stream channels, except for the two open-cut trenched crossings at Sector 7, and where it is not possible to maintain an adequate set back to prevent runoff going to the watercourse. Additional control measures such as silt fences will be deployed	No additional mitigation is required.	With the implementation of the pollution control mitigation measures and the erection of silt fencing to prevent run-off entering the habitat, the residual effects to this habitat are anticipated to be minor, adverse, and temporary and the habitat is likely to be able to recover quickly. As such, there will be no significant residual effects.
	Effects relating to IAS	IAS located across areas of the OES may be accidentally spread into this habitat and may negatively affect its biodiversity as a result by outcompeting and limiting the natural growth and dispersal of native species. This habitat is particularly susceptible to IAS due to its aquatic nature allowing IAS to easily spread across its banks. The LSE caused to this habitat by IAS is likely to be significant on a local level.	Management measures including general prevention measures, general containment measures, and species-specific treatment measures detailed in the ISMP and Table 17.	No additional mitigation is required.	With the implementation of mitigation measures detailed in the ISMP, IAS will be eradicated, and effective biosecurity measures will be implemented to ensure that IAS will not be spread. As such, there will be no significant residual effects.

Habitat	Potential impact	Potential effects	Project design measures and other avoidance and preventative measures	Proposed additional mitigation	Significance of residual effects
Dry calcareous grassland (GS1)	Effects relating to direct habitat loss, damage, and/or degradation	In total 1.29 ha of dry calcareous grassland was recorded in the OES study area. This was limited to the Landfall Site, in the area above the sea cliffs. Consultation scoping identified this area as a potential Annex I habitat due to the presence of bee orchid at this location. However, no bee orchids or other orchids were recorded within the OES study area throughout the surveys and therefore, this habitat was not considered to comprise of Annex I habitat ²³ (NPWS, 2019). Trenchless techniques (HDD or DPM) will be employed at this location, ensuring that none of this habitat will be lost or damaged as a result of construction. However, there is potential of damage to this habitat through the compaction of soils and damage to the flora through trampling through the storage of materials and the use of vehicles and heavy machinery during the construction phase. This will damage or destroy the flora and will degrade the habitat through loss of vegetation, soil compaction or the potential release of nutrients that would degrade the habitat by allowing undesirable competitive flora to grow. It is likely that this habitat would recover from most of these impacts in the short-term (i.e. 1 – 7 years). However, this would be significant on a local level due to the high value and species diversity within this habitat.	As set out in Volume 2, Chapter 6 Project Description in order to avoid direct impacts to the cliffs at the Landfall Site, Dublin Array is proposing to use trenchless techniques to connect the Offshore ECR to the TJBs. Two different installation methods are being considered, HDD and DPM. Both methods will involve installing the cable ducts under the cliffs avoiding the habitat. This mitigation will also benefit the calcareous grassland located on top of the cliffs.	Suitable fencing will be erected around any areas of Dry calcareous grassland (GS1) to prevent the accidental access by heavy machinery or storage of construction materials. Necessary losses or damage (e.g. caused by heavy plant used during the construction phase) will be minimised and retained areas will be protected from incidental damage or nutrient increase. Where damage does occur to this habitat, reinstatement planting through a suitable native wildflower seed mix planting, or seedbank collection, storage and replanting, following the completion of the construction phase.	With the implementation of trenchless techniques (HDD or DPM) through mitigation there will be no direct loss or damage to this habitat. The mitigation measures provided will protect this habitat from potential damage during the construction phase. As such, there will be no significant residual effects.
	Effects relating to dust creation and air quality	Without appropriate mitigation, dust may accumulate within this habitat and affect the vegetation that it supports by inhibiting effective photosynthesis from occurring. The effect of this impact may cause a minor degradation of the habitat. However, the CEMP provides dust control measures, therefore, this is unlikely to cause a significant impact on any level.	Dust suppression measures identified in the CEMP and Table 17.	No additional mitigation is required.	With the implementation of the dust control measures, the residual effects of dust on this habitat are unlikely to be significant. Natural weather conditions are likely to further mitigate the effects of this impact, as dust is naturally washed away from foliage. As such, there will be no significant residual effects.
	Effects relating to pollution events	Pollution events caused from accidental spillages and suspended sediments are unlikely to affect this habitat and cause any significant effects to this terrestrial habitat.	Measures to minimise pollution risk to aquatic habitats detailed in the CEMP and Table 17.	No additional mitigation is required	There will be no significant residual effects.

²³ Note that dry calcareous grassland (GS1) located at the Landfall Site (above the Sedimentary sea cliffs) is not considered Annex I habitat 6210 *semi-natural grassland and scrubland facies on calcareous substrates* due to the lack of orchids present within the habitat. It is only considered an Annex I habitat if it is an important orchid site (NPWS, 2019). None of this habitat is considered present in the tetrad O21/O22, relating to the study area.

Habitat	Potential impact	Potential effects	Project design measures and other avoidance and preventative measures	Proposed additional mitigation	Significance of residual effects
	Effects relating to IAS	IAS located across areas of the OES may be accidentally spread into this habitat and may negatively affect its biodiversity as a result by outcompeting and limiting the natural growth and dispersal of native species. This habitat is particularly susceptible to IAS due to its aquatic nature allowing IAS to easily spread across its banks. The LSE caused to this habitat by IAS is likely to be significant on a local level.	Management measures including general prevention measures, general containment measures, and species-specific treatment measures detailed in the ISMP Table 17.	No additional mitigation is required.	With the implementation of measures detailed in the ISMP, IAS will be eradicated, and effective biosecurity measures will be implemented to ensure that IAS will not be spread. As such, there will be no significant residual effects.
Dry meadow and grassy verges (GS2)	Effects relating to direct habitat loss, damage, and/or degradation	<p>In total 21.17 ha of this habitat was recorded across the OES study area. Trenching and groundworks are expected to cause the temporary loss of c. 0.19 ha of this habitat across the onshore ECR during the construction phase. This will have a temporary (i.e. <1 year) and minor adverse effect, that is certain to occur once. However, following the completion of the construction phase and reinstatement of the land, these areas will be able to naturally recover quickly. In addition, there will be a permanent loss (i.e. >40 years) of c. 1.7 ha of this habitat to facilitate the construction of the OSS.</p> <p>This habitat is common and widespread, and any potential loss is likely to be temporary and will recover relatively quickly (i.e. less than one year) (except for the permanent loss for the OSS). The areas that are temporarily lost will naturally recover in the short to medium term. Therefore, the losses of this habitat will not be significant.</p>	<p>As detailed in Table 17, a site selection process has been undertaken for the OES which prioritises avoidance, minimisation, and restoration, including:</p> <ul style="list-style-type: none"> Routing of the onshore ECR to avoid sensitive habitats and minimise habitat loss (e.g. trees). Where possible the onshore ECR has followed public roads and areas of amenity ground which is of low ecological value. Siting of the OSS within an area of low habitat sensitivity. 	<p>Necessary losses or damage (e.g. caused by heavy plant used during the construction phase) will be minimised and retained areas will be protected from incidental damage or nutrient increase.</p> <p>Areas of this habitat that are to be retained and located adjacent to the proposed development area will be protected through the erection of Heras fencing or equivalent will be used to prevent the accidental encroachment of works activities into the retained habitat.</p> <p>The habitat will be replanted following the completion of the construction phase; however, this would require time to meet the condition of the habitat that is lost/damaged. A suitable seed mix will be used for replanting to avoid the risk of a less biodiverse grassland being created.</p> <p>Reinstatement planting will be created within the lost grassland habitat (as shown on the OSS Landscaping Plan, Drawing 229100714-MMD-00-XX-DR-C-0250), subject to agreement with DLRCC.</p>	With the implementation of the mitigation, it is anticipated that the residual effects will be mostly temporary as most grassland affects will be able to quickly recover other than the permanent loss of grassland for the OSS. Reinstatement planting will have a reduced area than the baseline; however, will comprise more high value habitat. As such, there will be no significant residual effects.
	Effects relating to dust creation and air quality	Without appropriate mitigation, dust may accumulate within this habitat and affect the vegetation that it supports. The effect of this impact may cause a minor degradation of the habitat. However, mitigation measures provided through the CEMP provides dust control measures. Therefore, this is unlikely to cause a significant impact on any level.	Dust suppression measures identified in the CEMP Table 17.	No additional mitigation is required.	With the implementation of the dust control measures as mitigation, the residual effects of dust on this habitat are unlikely to be significant. Natural weather conditions are likely to further mitigate the effects of this impact, as dust is naturally washed away from foliage. As such, there will be no significant residual effects.

Habitat	Potential impact	Potential effects	Project design measures and other avoidance and preventative measures	Proposed additional mitigation	Significance of residual effects
	Effects relating to pollution events	Pollution events caused from accidental spillages and suspended sediments are unlikely to affect this habitat and cause any significant effects to this terrestrial habitat.	No mitigation is required.		There will be no significant residual effects.
	Effects relating to IAS	IAS located across areas of the OES may be accidentally spread into this habitat and may negatively affect its biodiversity as a result by outcompeting and limiting the natural growth and dispersal of native species. This habitat is particularly susceptible to IAS due to its aquatic nature allowing IAS to easily spread across its banks. The LSE caused to this habitat by IAS is likely to be significant on a local level.	Management measures including general prevention measures, general containment measures, and species-specific treatment measures detailed in the ISMP Table 17	No additional mitigation is required.	With the implementation of mitigation measures detailed in the ISMP, IAS will be eradicated, and effective biosecurity measures will be implemented to ensure that IAS will not be spread. As such, there will be no significant residual effects.
Hedgerow (WL1)	Effects relating to direct habitat loss, damage, and/or degradation	<p>Refer to Volume 6, Appendix 6.5.7-2: Tree Survey Report for a detailed description of the trees to be removed in advance of the OES construction including schedule of tree removal.</p> <p>A total of 1.10 km of hedgerow was identified in the OES study area. Much of these will be retained throughout the lifetime of Dublin Array. The construction works are expected to require the removal of c. 10 m of hedgerow habitat. The effect will be disrupting ecological connectivity across the local landscape. Hedgerows will recover in time; however, the effect is anticipated to be short-term (i.e. 1 - 7 years).</p> <p>A total of 298.9 km of hedgerow habitat (excluding those that are likely to have been lost in the past 12 years) have been mapped across the DLRCC (Blackthorn Ecology, 2021). 62.4 km of these were assessed to be of county level importance. The expected loss of hedgerows to facilitate the proposed development represents a negligible proportion of the total mapped hedgerows within the DLRCC county. Therefore, LSE arising from this impact are not expected to be significant.</p>	<p>As detailed in Table 17, a site selection process has been undertaken for the OES which prioritises avoidance and minimisation including designing the onshore ECR to minimise impacts on hedgerows.</p> <p>Hedgerow losses have been minimised throughout the design of the onshore ECR and other elements of the OES and retained hedgerows will be appropriated protected.</p> <p>Reinstatement planting will provide additional hedgerow relative to the baseline, although it would require three to five years for the planting to reach maturity.</p>	<p>Necessary hedgerow losses will be minimised and retained areas will be protected from incidental damage.</p> <p>Retained hedgerows located close to construction activities (e.g. within 10 m) will be appropriately protected during the construction phase through the erection of suitable fencing. This will include their RPA, which will protect potential harm from soil compaction by heavy machinery and materials.</p> <p>The full extent of potential losses will be replanted/reinstated, using suitable native woody species.</p> <p>Dead hedging will be implemented where losses to this habitat are necessary. This will involve putting the cut branches and foliage from necessary hedgerow removal back.</p> <p>New hedgerow will be created surrounding the proposed OSS to reinstate for the loss of c. 10 m hedgerow during the construction phase (refer to the Landscaping Plan shown on Drawing 229100714-MMD-00-XX-DR-C-0250), to be agreed in consultation with DLRCC.</p>	With the implementation of the mitigation, it is anticipated that the residual effects will be not significant.
	Effects relating to dust creation and air quality	Without appropriate mitigation, dust may accumulate within this habitat and affect the vegetation by inhibiting effective photosynthesis from occurring. The effect of this impact may cause a minor degradation of the habitat. However, mitigation provided through the CEMP provides dust	Dust suppression measures identified in the CEMP and Table 17.	No additional mitigation is required.	With the implementation of the dust control measures as project design measures, the residual effects of dust on this habitat are unlikely to be significant. Natural weather conditions are likely to further mitigate the effects of this impact, as dust is naturally

Habitat	Potential impact	Potential effects	Project design measures and other avoidance and preventative measures	Proposed additional mitigation	Significance of residual effects
		control measures. Therefore, this is unlikely to cause a significant impact on any level.			washed away from foliage. As such, there will be no significant residual effects.
	Effects relating to pollution events	Pollution events caused from accidental spillages and suspended sediments are unlikely to affect this habitat and cause any significant effects to this terrestrial habitat.	No mitigation is required.		There will be no significant residual effects.
	Effects relating to IAS	IAS located across areas of the OES may be accidentally spread into this habitat and may negatively affect its biodiversity as a result by outcompeting and limiting the natural growth and dispersal of native species. This habitat is particularly susceptible to IAS due to its aquatic nature allowing IAS to easily spread across its banks. The LSE caused to this habitat by IAS is likely to be significant on a local level.	Management measures including general prevention measures, general containment measures, and species-specific treatment measures detailed in the ISMP and Table 17	No additional mitigation is required.	With the implementation of mitigation measures detailed in the ISMP, IAS will be eradicated and effective biosecurity measures will be implemented to ensure that IAS will not be spread. As such, there will be no significant residual effects.
Immature woodland (WS2)	Effects relating to direct habitat loss, damage, and/or degradation	<p>Refer to Volume 6, Appendix 6.5.7-2: Tree Survey Report for a detailed description of the trees which will be impacted from the construction of the OES and for the schedule of tree removal.</p> <p>A total of c. 5.52 ha of immature woodland (i.e. woodland dominated by saplings trees not yet meeting the 5 m threshold height) was recorded across the OES study area. The proposed trenching and groundworks will cause the loss of c. 0.01 ha of this habitat and a further 0.03 ha will be lost to facilitate the Leopardstown TCC during the construction phase.</p> <p>The effect from the loss of this habitat will be short-term (1 – 7 years) to medium-term (8 – 15 years) and will have minor adverse effect given the relatively small area to be affected. This impact is certain to occur.</p> <p>Habitat loss and fragmentation will potentially disrupt the ecological connectivity across the landscape. There will be c. 0.04 ha impacted in Sectors 4 and 5 as a result of the construction phase. This represents a negligible proportion of this habitat across the OES and additionally so across the local and county areas. Therefore, habitat fragmentation is unlikely to be significant.</p> <p>This habitat is of limited ecological value due to the young age of the trees and is more recoverable than mature woodland as a result. The areas that are temporarily lost will naturally recover in the short to</p>	The onshore ECR has been designed to minimise impacts on immature woodland. Where immature woodland is present near trenchless crossing locations, the habitat will be avoided through the use of HDD or similar technology, minimising the risk of damaging or disturbing this habitat.	Necessary losses will be minimised and retained areas will be protected from incidental damage. The potential losses will be offset through the replanting of similar aged trees, where possible.	Losses to this habitat have been minimised through the design route and young woodland will recover in the medium-term (i.e. 1 – 7 years). As such, it is anticipated that there will be no significant residual effects.

Habitat	Potential impact	Potential effects	Project design measures and other avoidance and preventative measures	Proposed additional mitigation	Significance of residual effects
		medium term, depending on reinstatement planting. Therefore, the losses of this habitat will not be significant.			
	Effects relating to dust creation and air quality	Without appropriate mitigation, dust may accumulate within this habitat and affect the vegetation by inhibiting effective photosynthesis from occurring. The effect of this impact may cause a minor degradation of the habitat. However, mitigation provided through the CEMP provides dust control measures. Therefore, this is unlikely to cause a significant impact on any level.	Dust suppression measures identified in the CEMP and Table 17.	No additional mitigation is required.	With the implementation of the dust control measures as project design measures, the residual effects of dust on this habitat are unlikely to be significant. Natural weather conditions are likely to further mitigate the effects of this impact, as dust is naturally washed away from foliage. As such, there will be no significant residual effects.
	Effects relating to pollution events	Pollution events caused from accidental spillages and suspended sediments are unlikely to affect this habitat and cause any significant effects to this terrestrial habitat.	No mitigation is required		There will be no significant residual effects.
	Effects relating to IAS	IAS located across areas of the OES may be accidentally spread into this habitat and may negatively affect its biodiversity as a result by outcompeting and limiting the natural growth and dispersal of native species. This habitat is particularly susceptible to IAS due to its aquatic nature allowing IAS to easily spread across its banks. The LSE caused to this habitat by IAS is likely to be significant on a local level.	Management measures including general prevention measures, general containment measures, and species-specific treatment measures detailed in the ISMP Table 17.	No additional mitigation is required.	With the implementation of mitigation measures detailed in the ISMP, IAS will be eradicated and effective biosecurity measures will be implemented to ensure that IAS will not be spread. As such, there will be no significant residual effects.
Mixed broadleaved woodland (WD1)	Effects relating to direct habitat loss, damage, and/or degradation	Refer to Volume 6, Appendix 6.5.7-2: Tree Survey Report for a detailed description of the trees which will be impacted from the construction of the OES. A total of 1.38 ha of mixed broadleaved woodland was recorded across the OES study area. There will be no such habitat directly impacted at any phase of the Dublin Array. There will be no part of the habitat removed. However, there is potential for there to be damage to habitat if heavy machinery and materials are stored within their RPAs. This could damage the health of the trees and may lead to their eventual loss. The area most at risk is the woodland comprising the edge of Loughlinstown Woods pNHA at its north-western extent within Eurofound in	The Onshore ECR has been designed to minimise impacts on high-value habitats, such as mixed broadleaved woodland. Tree protection measures, as set out in Table 17 will be employed during construction.	Necessary losses will be minimised and retained areas will be protected from incidental damage. The full extent of potential losses will be replanted/reinstated with tree planting.	With the implementation of the mitigation measures, the risk accidentally accessing or storing materials within the RPAs of the woodland trees and thus potentially damaging them will be highly reduced. As such, it is anticipated that the residual effects will not be significant.

Habitat	Potential impact	Potential effects	Project design measures and other avoidance and preventative measures	Proposed additional mitigation	Significance of residual effects
		<p>Sector 2. At this location there will be a temporary trenchless crossing compound established.</p> <p>This effect arising from this impact is uncertain as the true extent of the RPA of the woodland is unknown. However, the HDD compound will be located outside the Precautionary Zones identified for tree protection²⁴ (4 x tree circumference) and the estimated RPAs of all trees associated with the woodland habitat, which will avoid effects such as soil compaction to the woodland trees. Further detail is provided in the Tree Survey Report.</p> <p>Although the planning application boundary does not overlap with the pNHA boundary there is a degree of uncertainty of the effects to this woodland habitat, as well as its high-value as mature woodland comprising a pNHA, and potential for effects arising as a result of damage to the trees through soil compaction, in the absence of additional mitigation, and on a precautionary basis, effects could be significant at a county level. However, it should be noted that only the very edge of the woodland may be affected and the remainder will be unaffected by the proposed works.</p>			
	Effects relating to dust creation and air quality	Without appropriate mitigation, dust may accumulate within this habitat and affect the vegetation by inhibiting effective photosynthesis from occurring. The effect of this impact may cause a minor degradation of the habitat. However, mitigation provided through the CEMP provides dust control measures. Therefore, this is unlikely to cause a significant impact on any level.	Dust suppression measures identified in the CEMP and Table 17.	No additional mitigation is required.	With the implementation of the dust control measures as mitigation, the residual effects of dust on this habitat are unlikely to be significant. Natural weather conditions are likely to further mitigate the effects of this impact, as dust is naturally washed away from foliage. As such, there will be no significant residual effects.
	Effects relating to pollution events	Pollution events caused from accidental spillages and suspended sediments are unlikely to affect this habitat and cause any significant effects to this terrestrial habitat.	No mitigation is required.		There will be no significant residual effects.
	Effects relating to IAS	IAS located across areas of the OES may be accidentally spread into this habitat and may negatively affect its biodiversity as a result by outcompeting and limiting the natural growth and dispersal of native species. This habitat is particularly	Management measures including general prevention measures, general containment measures, and species-specific treatment measures detailed in the ISMP and Table 17.	No additional mitigation is required.	With the implementation of mitigation measures detailed in the ISMP, IAS will be eradicated and effective biosecurity measures will be implemented

²⁴ Identified in BS 5837:2012 – Trees in relation to design, demolition and construction – Recommendations’ (BSI, 2012). Further to that, the methodology and scope of this report were prepared with reference to Volume 4, NJUG Guidelines for the Planning Installation and Maintenance of Utility Apparatus in proximity to Trees, Issue 2: 16th November 2007 (NJUG Volume 4, 2007).

Habitat	Potential impact	Potential effects	Project design measures and other avoidance and preventative measures	Proposed additional mitigation	Significance of residual effects
		susceptible to IAS due to its aquatic nature allowing IAS to easily spread across its banks. The LSE caused to this habitat by IAS is likely to be significant on a local level.			to ensure that IAS will not be spread. As such, there will be no significant residual effects.
Other artificial lakes and ponds (FL8)	Effects relating to direct habitat loss, damage, and/or degradation	One waterbody comprising this habitat was identified in the OES study area, with a total area of 0.34 ha. FL8 does not comprise Annex I habitat. The Onshore Biodiversity Technical Baseline report assessed this habitat as important on a local level. One FL8 habitat was present across the study area comprising the single settlement waterbody (hereafter referred to as WB1), located 90 m north of the proposed OSS. However, no loss of this habitat will occur nor will any damage occur to this habitat. Therefore, it has been scoped out. No significant impacts are predicted to this habitat.	No mitigation is required.		There will be no significant residual effects.
	Effects relating to dust creation and air quality	Without appropriate mitigation, dust may accumulate within this habitat and affect the vegetation by altering the water chemistry. The effect of this impact may cause a minor degradation of the habitat. However, mitigation provided through the CEMP provides dust control measures. Therefore, this is unlikely to cause a significant impact on any level.	Dust suppression measures identified in the CEMP and Table 17.	No additional mitigation is required.	With the implementation of the dust control measures as mitigation, the residual effects of dust on this habitat are unlikely to be significant. As such, there will be no significant residual effects.
	Effects relating to pollution events	Pollution events caused by accidental spillages and run-off of suspended sediments may affect water quality if they enter this aquatic habitat. However, the only waterbody (WB1) located within the study area of the OES is located c. 90 m north of the proposed OSS and is separated by Ballyogan Stream. It is, therefore, not possible for any potential pollutants to enter this habitat,	No mitigation is required.		No significant residual effects.
	Effects relating to IAS	IAS located across areas of the OES may be accidentally spread into this habitat and may negatively affect its biodiversity as a result by outcompeting and limiting the natural growth and dispersal of native species. This habitat is particularly susceptible to IAS due to its aquatic nature allowing IAS to easily spread across its banks. The LSE caused to this habitat by IAS is likely to be significant on a local level.	Management measures including general prevention measures, general containment measures, and species-specific treatment measures detailed in the ISMP and Table 17.	No additional mitigation is required.	With the implementation of mitigation measures detailed in the ISMP, IAS will be eradicated and effective biosecurity measures will be implemented to ensure that IAS will not be spread. As such, there will be no significant residual effects.
	Effects relating to direct	A total of 0.51 ha of riparian woodland was identified in the OES study area. However, there will be no habitat removal to facilitate the OES works as	As set out in Volume 2, Chapter 6 Project Description in order to avoid direct impacts with river corridors including WN5 Riparian woodland, Dublin Array is proposing to use	No additional mitigation is required.	HDD will avoid any losses or damage to this habitat, as such,

Habitat	Potential impact	Potential effects	Project design measures and other avoidance and preventative measures	Proposed additional mitigation	Significance of residual effects
Riparian woodland (WN5)	habitat loss, damage, and/or degradation	trenchless techniques (such as HDD technology) will be used. As such, there will be no loss, damage, or degradation. Soil compaction and damage to the root systems of the riparian woodland may occur during the construction phase where heavy machinery access or construction materials are stored within the RPAs of the trees. Damage to the root systems may harm the trees and may cause them to be lost in the future, thus causing a reduction in the habitat area and quality.	HDD techniques to install the Onshore ECR at river crossings. The use of this trenchless technique at river crossings will ensure that the WN5 Riparian woodland habitat is avoided. Tree protection measures, as set out in Table 17 will be employed during construction.		there will be no significant residual effects
	Effects relating to dust creation and air quality	Without appropriate mitigation, dust may accumulate within this habitat and affect the vegetation by inhibiting effective photosynthesis from occurring. The effect of this impact may cause a minor degradation of the habitat. However mitigation provided through the CEMP provides dust control measures. Therefore, this is unlikely to cause a significant impact on any level.	Dust suppression measures identified in the CEMP and Table 17.	No additional mitigation is required.	With the implementation of the dust control measures as mitigation, the residual effects of dust on this habitat are unlikely to be significant. Natural weather conditions are likely to further mitigate the effects of this impact, as dust is naturally washed away from foliage. As such, there will be no significant residual effects.
	Effects relating to pollution events	Pollution events caused by accidental spillages and run-off of suspended sediments during the construction phase may enter nearby rivers and affect adjacent riparian habitats by changing the water chemistry. These are likely to be rare in occurrence, however, and small in scale and highly localised to construction areas. Furthermore, mitigation (detailed in the CEMP) provides pollution prevention measures that will contain any spillages and prevent significant levels of run-off from entering watercourses. The terrestrial areas of this habitat (i.e. those furthest from the watercourse) are unlikely to be affected by this impact.	Measures to minimise pollution risk to aquatic habitats detailed in the CEMP and Table 17.	No additional mitigation is required.	With the implementation of the pollution protection mitigation measures detailed in the CEMP, the effects arising from this impacts are unlikely to reach this sensitive habitat. Any small amounts that do will be minor and the effects temporary so that there will be no significant residual effects.
	Effects relating to IAS	IAS located across areas of the OES may be accidentally spread into this habitat and may negatively affect its biodiversity as a result by outcompeting and limiting the natural growth and dispersal of native species. This habitat is particularly susceptible to IAS due to its aquatic nature allowing IAS to easily spread across its banks. The LSE caused	Management measures including general prevention measures, general containment measures, and species-specific treatment measures detailed in the ISMP and Table 17.	No additional mitigation is required.	With the implementation of mitigation measures detailed in the ISMP, IAS will be eradicated, and effective biosecurity measures will be implemented to ensure that IAS will not be spread. As such, there will be no significant residual effects.

Habitat	Potential impact	Potential effects	Project design measures and other avoidance and preventative measures	Proposed additional mitigation	Significance of residual effects
		to this habitat by IAS is likely to be significant on a county level.			
Scattered trees and parkland (WD5)	Effects relating to direct habitat loss, damage, and/or degradation	<p>The OES study area contained c. 3.06 ha of scattered trees and parkland located within Sectors 2 and 3. The open-cut trenching and groundworks will require the temporary removal of c. 0.09 ha during the construction phase. However, the route of the Onshore ECR has been planned to avoid losses of trees (where possible), and this impact will be limited mostly to the grassland within this habitat.</p> <p>The effects to the grassland habitat are not significant given the short-term nature of the works, and heavily managed nature of the habitat, and this habitat will quickly and easily recover following the completion of the construction phase.</p> <p>Most of the trenching has been designed to avoid the trees of highest value (refer to Tree Survey Report). Figure 6 shows all trees within the study area that may be potentially affected by the onshore ECR. Trees labelled in red are to be removed in the construction phase. Trees labelled in amber are to be retained where possible and monitored during the construction phase. There will be three trees within this habitat that will be felled including 0038, 0039, and 0200. These are two young rowans and one semi-mature dawn redwood.</p> <p>Other trees within this habitat are to be retained. However, they may be damaged where the onshore ECR encroaches within their RPA. This may cause damage to the tree to the point that it may not survive and may need removal, thus causing a reduction in quality of this habitat.</p> <p>The effects of any loss of mature trees will be adverse in the short and medium term in the absence of mitigation and replacement planting, as the loss of this habitat will disrupt ecological connectivity across the local landscape, and will require time to recover when lost.</p> <p>Overall, without appropriate mitigation and replacement planting measures, the impacts are assessed as being significant at a local level.</p>	The OES has been designed to minimise impacts on mixed the most sensitive habitats. Where the onshore ECR impacts this habitat, the route has been designed to avoid impacts to mature trees and most effects are limited to grassland areas. Necessary losses will be minimised and retained areas will be protected from incidental damage.	<p>Tree planting measures, as set out in Table 17 will replace the lost trees, this will comprise:</p> <p>The 2 No. young Rowan trees in the public green space west of Shanganagh Road (0038 and 0039) will be replaced like for like, i.e. 2 No. replacement trees.</p> <p>The 4 No. early-mature ash and one early-mature sycamore, located <u>are located</u> within the hedgerow west of Shanganagh Road (0062, 0067-0069 & 0073) will be replaced with 17 trees, which are a mix of native light standard trees (e.g. rowan, oak, hawthorn) in suitable locations along the hedgerow.</p> <p>The 5 No. early-mature maples along the footpath in Loughlinstown Linear Park (0288-0289, 0300 & 0302-0303) will be replaced with 11 trees, with a mix of native light standard trees (e.g. rowan, oak, hawthorn) in suitable locations within Loughlinstown Linear Park or another suitable location in consultation with DLRCC.</p> <p>The 1 No. semi-mature dawn redwood at the Eurofound site in a good condition (0200) will be relocated within the Eurofound site (if possible) and 3 No. replacement light standard trees will be planted.</p> <p>1 No. early-mature willow and two young whitebeam and ash in the public open space south of the R118 and west of the N11 will be replaced with 6 No. trees, which are a mix of native light standard trees (e.g. rowan, oak, hawthorn, willow) in suitable locations within the public open space or another suitable location to be agreed with the local authority.</p> <p>The 1 No. early-mature ash in the hedgerow along Glenamuck road will be replaced with 4 No. trees, which are mix of native light standard trees (e.g. rowan, oak, hawthorn) in a suitable location along the existing hedgerow or another suitable location to be agreed with the local authority.</p>	A short term adverse, and significant effect at a local level (significant in EIA terms) is predicted until the proposed replacement planting is sufficiently mature, however, it is anticipated that the medium to long-term residual effects will not be significant (not significant in EIA terms), once the planted trees have matured.

Habitat	Potential impact	Potential effects	Project design measures and other avoidance and preventative measures	Proposed additional mitigation	Significance of residual effects
	Effects relating to dust creation and air quality	Without appropriate mitigation, dust may accumulate within this habitat and affect the vegetation by inhibiting effective photosynthesis from occurring. The effect of this impact may cause a minor degradation of the habitat. However, mitigation provided through the CEMP provides dust control measures. Therefore, this is unlikely to cause a significant impact on any level.	Dust suppression measures identified in the CEMP and Table 17.	No additional mitigation is required.	With the implementation of the dust control measures as mitigation, the residual effects of dust on this habitat are unlikely to be significant. Natural weather conditions are likely to further mitigate the effects of this impact, as dust is naturally washed away from foliage. As such, there will be no significant residual effects.
	Effects relating to pollution events	Pollution events caused from accidental spillages and suspended sediments are unlikely to affect this habitat and cause any significant effects to this terrestrial habitat.	No mitigation is required.		There will be no significant residual effects.
	Effects relating to IAS	IAS located across areas of the OES may be accidentally spread into this habitat and may negatively affect its biodiversity as a result by outcompeting and limiting the natural growth and dispersal of native species. This habitat is particularly susceptible to IAS due to its aquatic nature allowing IAS to easily spread across its banks. The LSE caused to this habitat by IAS is likely to be significant on a county level.	Management measures including general prevention measures, general containment measures, and species-specific treatment measures detailed in the ISMP and Table 17.	No additional mitigation is required.	With the implementation of mitigation measures detailed in the ISMP, IAS will be eradicated, and effective biosecurity measures will be implemented to ensure that IAS will not be spread. As such, there will be no significant residual effects.
Scrub (WS1)	Effects relating to direct habitat loss, damage, and/or degradation	In total, c. 4.52 ha of scrub was recorded in the OES study area. Approximately 0.44 ha will be temporarily removed to facilitate the TCCs (0.42 ha within the Leopardstown TCC) and 0.03 ha will be excavated and removed to facilitate the Landfall Site. In total c. 0.47 ha of scrub habitat will be lost. The effects will be adverse and short to medium-term, and losses will disrupt ecological connectivity across the local landscape. This habitat is not considered overly adaptable or tolerant but is easily recoverable given the young age of the shrubs and the ease new planting could take place to recover those lost. The impacts to this habitat, without appropriate mitigation measures, are considered significant at a local level .	The OES has been designed to minimise impacts on the most sensitive habitats, including large areas of scrub by being prioritised under existing urban areas. The impacts to scrub have therefore been minimised. The necessary losses will be minimised and retained areas will be protected from incidental damage. Tree protection and planting measures, as set out in Table 17 will be employed during construction.	No additional mitigation is required	Impacts to scrub have been minimised, and this habitat will be able to quickly regenerate in affected areas. Overall, with the implementation of the mitigation, the residual effects will be minor, adverse, and short-term (i.e. 1 – 7 years). The residual effects will be not significant.
	Effects relating to dust	Without appropriate mitigation, dust may accumulate within this habitat and affect the vegetation by inhibiting effective photosynthesis	Dust suppression measures identified in the CEMP and Table 17.	No additional mitigation is required.	With the implementation of the dust control measures as mitigation, the residual effects of

Habitat	Potential impact	Potential effects	Project design measures and other avoidance and preventative measures	Proposed additional mitigation	Significance of residual effects
	creation and air quality	from occurring. The effect of this impact may cause a minor degradation of the habitat. However, mitigation provided through the CEMP provides dust control measures. Therefore, this is unlikely to cause a significant impact on any level.			dust on this habitat are unlikely to be significant. Natural weather conditions are likely to further mitigate the effects of this impact, as dust is naturally washed away from foliage. As such, there will be no significant residual effects.
	Effects relating to pollution events	Pollution events caused from accidental spillages and suspended sediments are unlikely to affect this habitat and cause any significant effects to this terrestrial habitat.	No mitigation is required.		There will be no significant residual effects.
	Effects relating to IAS	IAS located across areas of the OES may be accidentally spread into this habitat and may negatively affect its biodiversity as a result by outcompeting and limiting the natural growth and dispersal of native species. This habitat is particularly susceptible to IAS due to its aquatic nature allowing IAS to easily spread across its banks. The LSE caused to this habitat by IAS is likely to be significant on a county level.	Management measures including general prevention measures, general containment measures, and species-specific treatment measures detailed in the ISMP and Table 17.	No additional mitigation is required.	With the implementation of mitigation measures detailed in the ISMP, IAS will be eradicated, and effective biosecurity measures will be implemented to ensure that IAS will not be spread. As such, there will be no significant residual effects.
Sedimentary sea cliffs (CS3)	Effects relating to direct habitat loss, damage, and/or degradation	<p>In total, 0.34 km sedimentary sea cliffs were recorded within the OES study area. These were limited to the Landfall Site only.</p> <p>Across Ireland there is c. 24,000 km² of this habitat nationally (NPWS, 2019). The 0.34 km located within the study area, therefore, represents approximately 0.001% of the national total area of this habitat. The length of the sea cliffs is approximately 5 km (DLR, n.d.). The length of this habitat within the OES study area represents approximately 6.8% of the County Dublin length of sedimentary sea cliffs. Furthermore, the cliffs represent an important Annex I habitat vegetated sea cliffs of the Atlantic and Baltic Coasts [1230]. Therefore, any LSE to the cliffs is assessed to be significant on a county level.</p> <p>The proposed onshore ECR will be positioned under the cliffs using trenchless techniques. This will avoid any direct loss and damage to this habitat. Further, this methodology will avoid significant damage to the cliff habitat (refer to the Land, Soils and Geology chapter (Volume 5, Chapter 3). As such, effects arising as a result of this impact are assessed to be not significant.</p>	<p>As set out in Volume 2, Chapter 6 Project Description in order to avoid direct impacts to the cliffs at the Landfall Site, Dublin Array is proposing to use trenchless techniques to connect the Offshore ECR to the TJBs. As described in this chapter, two different methods are being considered, HDD and DPM. Both methods will involve installing the cables under the cliffs avoiding the habitat.</p> <p>The HDD/DPM activities will be located sufficiently far from the cliffs to avoid damage to them. These details are described fully in Volume 2, Chapter 6 Project Description.</p>	The cliff area will be appropriately protected from accidental damage from construction works with fencing at both the upper and lower levels, where appropriate, to ensure that no heavy machinery or plant can encroach close to the cliffs where accidental erosion or damage may occur.	With the implementation of the HDD technology as a project design feature, the residual effects will be not significant.

Habitat	Potential impact	Potential effects	Project design measures and other avoidance and preventative measures	Proposed additional mitigation	Significance of residual effects
	Effects relating to dust creation and air quality	This habitat is largely unvegetated and is unlikely to be affected by the low levels of dust created during the construction phase. Furthermore, mitigation will minimise dust levels and natural weather conditions, including regular high winds due to the coastal environment will disperse and dust created and will prevent any significant impacts from occurring.	Dust suppression measures identified in the CEMP and Table 17.	No additional mitigation is required.	With the implementation of the dust prevention measures as mitigation, there will be no significant residual effects.
	Effects relating to pollution events	Pollution events caused from accidental spillages and suspended sediments are unlikely to affect this habitat and cause any significant effects to this terrestrial habitat.	No mitigation is required.		With the implementation of the pollution prevention measures as mitigation, there will be no significant residual effects.
	Effects relating to IAS	IAS located across areas of the OES may be accidentally spread into this habitat and may negatively affect its biodiversity as a result by outcompeting and limiting the natural growth and dispersal of native species. This habitat is particularly susceptible to IAS due to its aquatic nature allowing IAS to easily spread across its banks. The LSE caused to this habitat by IAS is likely to be significant on a county level.	Management measures including general prevention measures, general containment measures, and species-specific treatment measures detailed in the ISMP and Table 17.	No additional mitigation is required.	With the implementation of mitigation measures detailed in the ISMP, IAS will be eradicated, and effective biosecurity measures will be implemented to ensure that IAS will not be spread. As such, there will be no significant residual effects.
Shingle and gravel shores (LS1)	Effects relating to direct habitat loss, damage, and/or degradation	There will be no direct loss or damage to this habitat through use of trenchless installation of the cable ducts that will pass beneath the beach area.	As set out in Volume 2, Chapter 6 Project Description the installation of the offshore export cable ducts under Shanganagh will employ trenchless installation methods that involves drilling at a minimum depth of 20 metres below the cliff edge and minimum 10 metres below the cliff base with either end of the drill profile set back sufficient distances (landside approximately 90 metres and seaside a minimum of 600 metres) from the cliff face. This will avoid any works within the beach area	No additional mitigation is required	With the implementation of the HDD technology as a project design feature, The residual effects will be not significant.
	Effects relating to dust creation and air quality	This habitat is largely unvegetated and is unlikely to be affected by the low levels of dust created during the construction phase. Furthermore, mitigation will minimise dust levels and natural weather conditions, including regular high winds due to the coastal environment will disperse and dust created and will prevent any significant impacts from occurring.	Dust suppression measures identified in the CEMP and Table 17.	No additional mitigation is required.	With the implementation of the dust prevention measures as mitigation, there will be no significant residual effects.
	Effects relating to pollution events	Pollution events caused from accidental spillages and suspended sediments are unlikely to affect this habitat and cause any significant effects to this terrestrial habitat.	No mitigation is required.		There will be no significant residual effects.
	Effects relating to IAS	IAS located across areas of the OES may be accidentally spread into this habitat and may negatively affect its biodiversity as a result by outcompeting and limiting the natural growth and	Management measures including general prevention measures, general containment measures, and species-specific treatment measures detailed in the ISMP and Table 17.	No additional mitigation is required.	With the implementation of mitigation measures detailed in the ISMP, IAS will be eradicated, and effective biosecurity

Habitat	Potential impact	Potential effects	Project design measures and other avoidance and preventative measures	Proposed additional mitigation	Significance of residual effects
		dispersal of native species. This habitat is particularly susceptible to IAS due to its aquatic nature allowing IAS to easily spread across its banks. The LSE caused to this habitat by IAS is likely to be significant on a county level.			measures will be implemented to ensure that IAS will not be spread. As such, there will be no significant residual effects.
Treelines (WL2)	Effects relating to direct habitat loss, damage, and/or degradation	<p>Approximately 3.12 km of treelines were recorded within the OES study area. Figure 6 shows all trees within the study area that may be potentially affected by the onshore ECR. Trees labelled in red are to be removed in the construction phase. Trees labelled in amber are to be retained where possible and monitored during the construction phase.</p> <p>The effects of any loss of treelines will be adverse and potentially medium-term. The loss of this habitat will disrupt ecological connectivity across the local landscape. Whilst this habitat is generally common and widespread, requires significant time to recover when lost.</p> <p>None of the trees labelled to be removed are located within the treelines as most of the trenching has been prioritised for existing roads, thus avoiding impacts to trees and treelines. However, treelines may be affected where the proposed onshore ECR and TCC areas encroaches within the RPA of a tree. This may damage the tree to the point that it may not survive and may need removal and thus causing a reduction in this habitat. It is unknown at this stage whether these trees will require removal or not during the construction phase as the true extent of the RPA to be damaged is not known. The effects arising from this impact, without appropriate mitigation measures, are considered significant at a local level.</p>	<p>The OES has been designed to minimise impacts on mixed treelines. Necessary losses will be minimised and retained areas will be protected from incidental damage.</p> <p>Tree protection and planting measures, as set out in Table 17 will be employed during construction.</p>	No additional mitigation is required.	With the implementation of the mitigation, it is anticipated that the residual effects will be not significant.
	Effects relating to dust creation and air quality	Without appropriate mitigation, dust may accumulate within this habitat and affect the vegetation by inhibiting effective photosynthesis from occurring. The effect of this impact may cause a minor degradation of the habitat. However, mitigation provided through the CEMP provides dust control measures. Therefore, this is unlikely to cause a significant impact on any level.	Dust suppression measures identified in the CEMP and Table 17.	No additional mitigation is required.	With the implementation of the dust control measures as mitigation, the residual effects of dust on this habitat are unlikely to be significant. Natural weather conditions are likely to further mitigate the effects of this impact, as dust is naturally washed away from foliage. As such, there will be no significant residual effects.

Habitat	Potential impact	Potential effects	Project design measures and other avoidance and preventative measures	Proposed additional mitigation	Significance of residual effects
	Effects relating to pollution events	Pollution events caused from accidental spillages and suspended sediments are unlikely to affect this habitat and cause any significant effects to this terrestrial habitat.	No mitigation is required.		There will be no significant residual effects.
	Effects relating to IAS	IAS located across areas of the OES may be accidentally spread into this habitat and may negatively affect its biodiversity as a result by outcompeting and limiting the natural growth and dispersal of native species. This habitat is particularly susceptible to IAS due to its aquatic nature allowing IAS to easily spread across its banks. The LSE caused to this habitat by IAS is likely to be significant on a county level.	Management measures including general prevention measures, general containment measures, and species-specific treatment measures detailed in the ISMP Table 17.	No additional mitigation is required.	With the implementation of mitigation measures detailed in the ISMP, IAS will be eradicated, and effective biosecurity measures will be implemented to ensure that IAS will not be spread. As such, there will be no significant residual effects.
O&M Base					
Open marine water (MW1)	Effects relating to direct habitat loss, damage, and/or degradation	Open marine habitat comprises c. 5.14 ha of the O&M Base study area, located outside the existing Dún Laoghaire harbour. None of this habitat will be lost as a result of all phases of the proposed development as the development will occur upon the existing harbour. The mitigation pollution control measures detailed in the CEMP will mitigate the potential effects of this impact. As such, the impacts to this habitat are considered to be not significant .	No mitigation is required.		There will be no significant residual effects.
	Effects relating to dust creation and air quality	Dust created during the construction and decommissioning phases. Dust is most likely to deposit within 100 m of its source. Therefore, it is likely to deposit within this habitat. Dust deposition in significant quantities can build-up to levels that may adversely affect water chemistry. However, this habitat is located outside the existing Dún Laoghaire harbour. The marine environment is highly transient, and it is unlikely that significant build-up of dust particle will occur. Furthermore, dust prevention measures are included as mitigation in the CEMP that will minimise the unintended dispersal of dust. Therefore, the effects arising from this impact are not significant.	Dust suppression measures identified in the CEMP and Table 17	No additional mitigation is required.	With the implementation of the dust prevention measures as mitigation through the CEMP, there will be no significant residual effects.
	Effects relating to pollution events	Potential pollution events caused by accidental spillages of hydrocarbons or run-off of suspended particles during all phases may enter this aquatic habitat. Accidental spillages of hydrocarbons may happen during all phases of the development; whereas run-off of suspended particles is more likely	Measures to minimise pollution risk to aquatic habitats detailed in the CEMP and Table 17.	No additional mitigation is required.	With the implementation of the pollution protection mitigation measures detailed in the CEMP, the effects arising from this impacts are unlikely to reach this sensitive habitat. Any small

Habitat	Potential impact	Potential effects	Project design measures and other avoidance and preventative measures	Proposed additional mitigation	Significance of residual effects
		<p>to occur during the construction and decommissioning phases.</p> <p>Accidental spillages of hydrocarbons may occur during all phases of the development. However, they are considered likely to be rare in occurrence and would be easily contained through the mitigation pollution prevention measures provided in the CEMP. It is unlikely that pollution spillages will reach this habitat, which is located outside Dún Laoghaire harbour and any pollution that enters the highly transient marine environment will be small in scale and will be quickly dispersed. Therefore, with the project design measures and other avoidance and preventative measures, the effects arising from this impact are not considered likely to be significant.</p> <p>Run-off of suspended particles is likely to occur during the construction and decommissioning phases in periods of wet weather. However, there will be no significant groundworks occurring at the O&M Base, and it is unlikely the run-off in significant quantities is likely to occur. In addition, any run-off that does occur will initially enter the sea inlets and bays (MW2) and will have been highly dispersed by the marine environment when they reach the open marine water. Therefore, the effects arising from this impact are considered to be not significant.</p> <p>As such, the effects arising from this impact are considered to be not significant.</p>			amounts that do will be minor and the effects are likely to be momentary (i.e. seconds to minutes) so that there will be no significant residual effects.
	Effects relating to IAS	There are no IAS in the O&M Base site and therefore, no risk of spreading IAS within this area or beyond.	No mitigation is required.		There will be no significant residual effects.
Sea inlets and bays (MW2)	Effects relating to direct habitat loss, damage, and/or degradation	Sea inlets and bays comprises c. 59.7 ha of the O&M Base study area, located inside the existing Dún Laoghaire harbour. None of this habitat will be lost as a result of all phases of the proposed development as the development will occur upon the existing harbour.	No mitigation is required.		There will be no significant residual effects.
	Effects relating to dust creation and air quality	<p>Dust created during the construction and decommissioning phases. Dust is most likely to deposit within 100 m of its source. Therefore, it is likely to deposit within this habitat.</p> <p>Dust deposition in significant quantities can build-up to levels that may adversely affect water chemistry.</p>	Measures to minimise pollution risk to aquatic habitats detailed in the CEMP and Table 17.	No additional mitigation is required.	With the implementation of the dust prevention measures as mitigation through the CEMP, there will be no significant residual effects.

Habitat	Potential impact	Potential effects	Project design measures and other avoidance and preventative measures	Proposed additional mitigation	Significance of residual effects
		<p>Typically, the marine environment is highly transient, and it is unlikely that significant build-up of dust particle will occur. However, the enclosed nature of the bays may allow dust to build up more than usual. It is still expected that the high tidal activity will naturally disperse any dust that may enter this habitat to levels that are not significant. Furthermore, dust prevention measures are included as mitigation in the CEMP that will minimise the unintended dispersal of dust. Therefore, the effects arising from this impact are considered to be not significant.</p>			
	<p>Effects relating to pollution events</p>	<p>Potential pollution events caused by accidental spillages of hydrocarbons or run-off of suspended particles during all phases may enter this aquatic habitat. Accidental spillages of hydrocarbons may happen during all phases of the development; whereas run-off of suspended particles is more likely to occur during the construction and decommissioning phases.</p> <p>Accidental spillages of hydrocarbons may occur during all phases of the development. However, they are considered likely to be rare in occurrence and would be easily contained through the mitigation pollution prevention measures provided in the CEMP. It is unlikely that pollution spillages will reach threshold levels to cause a significant effect. Furthermore, pollution prevention measures have been included as mitigation. As such, the effects arising from this impact are not considered likely to be significant.</p> <p>Run-off of suspended particles is likely to occur during the construction and decommissioning phases, particularly during wet weather conditions. However, there will be no significant groundworks at the O&M Base. Therefore, there is unlikely to be run-off in quantities that are likely to cause a significant effect to this habitat. Moreover, the frequent tidal events, even within the enclosed harbour, will quickly disperse any suspended sediments.</p> <p>The mitigation pollution control measures detailed in the CEMP will mitigate the potential effects of this impact. As such, the impacts to this habitat are considered to be not significant.</p>	<p>Measures to minimise pollution risk to aquatic habitats detailed in the CEMP and Table 17.</p>	<p>No additional mitigation is required.</p>	<p>With the implementation of the pollution protection mitigation measures detailed in the CEMP, the effects arising from this impact are unlikely to reach this sensitive habitat. Any small amounts that do will be minor and the effects are likely to be momentary (i.e. seconds to minutes) so that there will be no significant residual effects.</p>

Habitat	Potential impact	Potential effects	Project design measures and other avoidance and preventative measures	Proposed additional mitigation	Significance of residual effects
	Effects relating to IAS	There are no IAS in the O&M Base and therefore, no risk of spreading IAS within this area or beyond.	No mitigation is required.		There will be no significant residual effects.

Impact 3: Impacts on protected species or upon their resting or breeding sites

Potential impacts

2.10.11 This section details the protected species those listed under Nelson et al. (2019) 'Checklist of protected and threatened species in Ireland' that are considered likely to be impacted either directly or upon their resting or breeding places during the construction phase across the OES and O&M Base. The potential impacts to marine mammals have been detailed in the Marine Mammals chapter Volume 3 of the EIAR.

2.10.12 Where potential impacts on IEFs are described and characterised in this section, it is without the project design measures and other avoidance and preventative measures identified in Table 17 and the appropriate and necessary additional mitigation measures identified in Table 25 to avoid, prevent and reduce effects. The residual effects and their level of significance are then stated in Table 25 following the incorporation of these measures.

Amphibians

2.10.13 Common frog *Rana temporaria* is listed in Annex V of the Habitats Directive. Additionally, it is afforded national policy protection in Ireland's 4th National Biodiversity Action Plan 2023 – 2030 and local policy protection under DLRC policy GIB22 and the Wildlife Act 1976 (and the subsequent amendments).

2.10.14 The Onshore Biodiversity Technical Baseline Report assessed amphibians as having local level importance. According to the National Frog Survey of Ireland 2010/2011 this species was assessed as Favourable or 'good' (Reid, N., et al., 2013) following the current National Conservation Assessment for common frog and their populations are considered stable (NPWS, 2019b). The population of common frog in Ireland is estimated to be 165,000,000 frogs (Reid et al., 2013).

2.10.15 Smooth newt *Lissotriton vulgaris* is protected under the Wildlife Act 1976 (and subsequent amendments). Additionally, they are afforded national policy protection in Ireland's 4th National Biodiversity Action Plan 2023 – 2030 and local policy protection under Policy GIB22. The Onshore Biodiversity Technical Baseline report assessed this species as being of local importance. This species is considered widespread across Ireland, although gaps in their distribution do exist (Meehan, 2013). No population estimate was available for this species.

- 2.10.16 Only one waterbody (WB1) was located within 500 m of the OES (i.e. outside of the study area), at approximate ITM coordinates 720816 724142. WB1 comprised an artificial settlement pond, located c. 90 m north of the proposed OSS and is likely to support breeding amphibians, including common frog and smooth newts. WB1 will be retained and will not be directly impacted by the project. Therefore, there will be no reduction of suitable breeding habitat for these species across the study area. Due to the lack of suitable breeding waterbodies across the rest of the OES, the presence of common frog and smooth newts has been scoped out of these areas and only the OSS has been included in the assessment below.
- 2.10.17 Common frogs are known to range up to 500 m from a breeding pond (amphibian and reptile conservation (ARC), n.d.) and smooth newts can range up to 250 m from breeding ponds. Although most newts will remain relatively close to the breeding pond, provided that habitat quality immediately surrounding the breeding water body is optimal and connectivity is excellent (Mulkeen et al., 2017).
- 2.10.18 The proposed OSS will require the permanent loss of 1.7 ha of dry meadows and grassy verges. This grassland provides suitable terrestrial habitat for common frog and smooth newts and its loss could represent a permanent reduction of suitable terrestrial habitat for both species. The loss of suitable habitat may cause the reduction of the populations of both species on a local level. Furthermore, construction-related activities may cause direct mortality or harm to individual amphibians located within this habitat.
- 2.10.19 The presence of amphibians within the grasslands comprising the proposed OSS area is unknown. However, there was no amphibians recorded during any of the surveys. In addition, it should be noted that WB1 is separated from the proposed OSS by Ballyogan Stream, which likely provides an effective barrier to the dispersal of amphibians to the proposed OSS location. As such, the risk of direct harm to individuals caused by general works activities during the construction and decommissioning phases is considered low and is already mitigated through general construction mitigation methods detailed in the CEMP.
- 2.10.20 It is possible that dust creation from the construction and decommissioning phases of the OSS may reach WB1 as large dust particles (greater than 30 µm) will largely deposit within 100 m of sources (IAQM, 2016). However, dust creation is assessed as a negligible risk in the Air Quality chapter (Volume 5, Chapter 5.10) and mitigation provided through the CEMP (see Table 17), provides effective dust control measures that will minimise the risk of dust reaching or affecting WB1. Therefore, effects to amphibians are assessed as not significant.

Reptiles

- 2.10.21 Common lizards are protected under the Wildlife Act 1976 (and subsequent amendments). Additionally, it is afforded local policy protection under policy GIB22.
- 2.10.22 The presence of common lizards has been discounted from the O&M Base. There was no reptiles identified across the OES during the various field surveys. However, previous NBDC (2025) records indicate that they are present on Killiney and Dalkey Hill, located approximately 0.6 km from the closest point of the OES (i.e. the Landfall Site), which is outside of the study area.

2.10.23 The population size of common lizard in Ireland is unknown. They are broadly distributed across the country, however, large gaps in their distribution does exist. This may be due to lack of records rather than their absence. Reptiles can use a range of habitats including bog-land and rural gardens, with coastal dune and heathland systems deemed to be strongholds for the species (Marnell, 2002). They are unlikely to be present in heavily urbanised environments, due to the lack of protection from potential predators. Therefore, across the OES they are anticipated to be present only in highly isolated populations, and most likely limited to coastal areas where optimal coastal dune habitats are present.

2.10.24 As such, there will be a negligible risk to reptiles from the effects arising from various impacts caused by the project, including habitat loss and fragmentation, noise and lighting across all areas of the OES. The area which poses the highest likelihood of supporting this species is the proposed Landfall Site. However, here there are no coastal dunes present at this location, with only shingle beaches and sedimentary cliffs comprising the Landfall Site. Therefore, the likely impact to reptiles is considered to be negligible and not significant.

Birds

2.10.25 All nesting birds are protected under the Wildlife Act 1976 (and subsequent amendments) during the breeding bird season (i.e. 1st March to 31st August) and afforded local policy protection under policy GIB2.

OES

Amber-listed birds

2.10.26 The habitat at the Shanganagh cliffs (i.e. the cliff faces) is considered suitable for nesting sand martin. The scoping stage of the project identified the presence of nesting sand martin within the Shanganagh cliffs near the Landfall Site boundary. However, nesting sand martin were not recorded during the various surveys (undertaken in April 2023) completed. The construction phase of the project has the potential to cause disturbance and potential damage to nest sites without appropriate mitigation. Trenchless technology (i.e. HDD) will be employed to ensure no damage is caused to the cliffs and therefore, there will be no loss of suitable nesting habitat for this species.

General passerine bird assemblage

2.10.27 Across the OES, incidental sightings of common and widespread passerine birds were noted including magpie *Pica pica*, goldfinch *Carduelis carduelis*, great tit *Parus major*, blue tit *Cyanistes caeruleus*, blackbird *Turdus merula*.

2.10.28 Birds located across most of the OES will be largely habituated to existing levels of noise and vibration disturbance given the urban nature of the surrounding environment. Moreover, the increased levels of noise and vibrations created during the construction and decommissioning phases will be localised and the birds across the OES are anticipated to quickly habituate to the temporary increases in noise and vibrations. Therefore, the potential impacts from construction-related noise and vibration caused from traffic and excavation are not considered to pose a significant threat to local passerine birds.

- 2.10.29 Lighting may affect birds by altering their behaviours such as disturbance of roosting. Artificial lighting will be required throughout the OES. However, most of the proposed OES is already extensively illuminated by street lighting. Furthermore, night-works is not planned for any areas of the OES other than the trenchless crossing locations at TX-01, TX-06 and TX-07 and the HDD/DPM works at the Landfall Site. As such, the additional lighting required during the construction phase will not cause a significant effect as a result in these areas.
- 2.10.30 Artificial lighting will be required where night-works will be required at trenchless crossings (refer to Table 16). Lighting at the proposed compounds established to facilitate the trenchless crossings will cause additional illumination of more sensitive habitats (e.g. riparian habitats) that currently experience either less or no illumination by existing lighting. Without the project design measures and other avoidance and preventative measures identified in Table 17 and the additional design identified in Table 25 to avoid, prevent and reduce effects, the additional illumination of sensitive riparian habitats during trenchless activities during the construction phase may, cause disturbance to nesting birds within these habitats. With the measures identified in Table 17 and Table 25 the effect of artificial lighting on the general passerine bird assemblage is not significant.
- 2.10.31 Birds are most likely to be affected by losses of suitable breeding and foraging habitat required to facilitate the construction of the OES (refer to Impact 2 for further details of the extent of potential habitat losses). Habitat losses will be limited to the OES boundary (maximum extent) and will cause a reduction in suitable breeding, roosting, and foraging habitat for the local bird populations. Losses to grasslands, scrub, hedgerows and woodlands will pose the greatest risk of adverse effect to local birds and any reduction in habitat may cause local populations to decline as a result. This is the risk without the project design measures and other avoidance and preventative measures identified in Table 17 and the appropriate and necessary additional mitigation measures identified in Table 25 to avoid, prevent and reduce effects. Any such effect would be long-term (15 – 60 years) for habitats such as woodland and mature trees along the Onshore ECR, with the effect being temporary (<1 year) to short-term (1 – 7 years) for habitats that are able to quickly recover (e.g. grasslands and scrub). Permanent habitat loss will be limited to the grassland removal required to facilitate the OSS. The duration will begin with the habitat removal until there is natural regeneration of habitats (where applicable) following the completion of the construction phase. With the measures identified in Table 17 and Table 25 the effect of losses of suitable breeding and foraging habitat on the general passerine bird assemblage is not significant.

2.10.32 The effects to local bird species are likely to be adverse and cause a potential reduction in species populations. However, most of the species recorded along the Onshore ECR are common and widespread. For example, it is estimated that there are 1,800,000 pairs of blackbirds in Ireland (Jones, 2011), and goldfinch and magpie are listed as one of the 20 most widespread garden birds in Ireland (BirdWatch Ireland, 2024a; 2024b). Furthermore, these species are highly mobile and generally adaptable, and tolerant. They will be able to quickly recover from the limited areas of habitat removal and it is unlikely that the impact will cause any impact to their overall conservation status. Additionally, populations will be able to quickly recover following the natural regeneration of the lost habitats, with only a relatively small area (i.e. 1.7 ha of grassland) requiring permanent removal for the OSS. As such, the effects on passerine birds along the OES are considered to be not significant.

2.10.33 Any vegetation clearance that occurs during the nesting bird season (considered to be March to August inclusive) risks causing an offence under the Wildlife Acts from any disturbance or damage to nesting birds during the nesting bird season. Such activities may harm individual birds, damage nests, eggs or chicks. Vegetation clearance undertaken outside the nesting bird season will not cause an offence and the applicant has committed (see Table 17 to a project design measure to avoid vegetation clearance during the nesting bird season (March – September inclusive).

Shorebird assemblage

2.10.34 Shorebird surveys have been conducted from November 2019 to October 2020 and September 2023 to March 2024 at the proposed Landfall Site. Table 22 (extracted from Tables 8 of Intertidal Bird Surveys Reports Winter 2019/20) and Table 23 (extracted from Table 4-1 of the Intertidal Bird Surveys Report Winter 2023/2024), summarises the birds recorded during the surveys undertaken there. Peak counts are presented in relation to the most recent Republic of Ireland (ROI) non-breeding population (five year mean peak count 2011/12-2015/16) for each species (Lewis et al, 2019) and the percentage of the ROI population recorded in the study area.

Table 22 Peak counts of waterbird species recorded from Vantage Points (VPs) 1 and 2 across the survey period

Species	VP1 peak count	VP2 peak count	ROI population (five year mean peak 2011/12-2015/16)	% of the ROI population recorded from VP1	% of the ROI population recorded from VP2
Mute swan	11	-	7,032	0.2%	-
Brent goose	1	-	30,295	0.003%	-
Common scoter	22	14	10,607	0.2%	0.1%
Red-breasted merganser	4	2	1,913	0.1%	0.1%
Red-throated diver	4	4	657	0.6%	0.6%

Species	VP1 peak count	VP2 peak count	ROI population (five year mean peak 2011/12-2015/16)	% of the ROI population recorded from VP1	% of the ROI population recorded from VP2
Great northern diver	2	2	2,128	0.09%	0.09%
Great crested grebe	5	7	1,734	0.3%	0.4%
Northern fulmar	-	1	No data	-	-
Gannet	-	2	No data	-	-
Shag	14	9	1,943	0.1%	0.1%
Cormorant	6	2	7,967	0.07%	0.03%
Grey heron	2	2	1,943	0.1%	0.1%
Oystercatcher	17	19	42,875	0.04%	0.04%
Ringed plover	33	60	10,545	0.3%	0.6%
Knot	-	22	13,752	-	0.2%
Sanderling	9	-	7,572	0.1%	-
Redshank	0	3	16,812	-	0.02%
Greenshank	2	2	1,208	0.2%	0.2%
Bar-tailed godwit	-	7	13,385	-	0.05%
Turnstone	16	14	6,296	0.3%	0.2%
Mediterranean gull	5	3	439	1.1%	0.7%
Little gull	-	2	25	-	8%
Black-headed gull	184	120	57,892	0.3%	0.2%
Common gull	8	6	30,216	0.03%	0.01%
Black-legged kittiwake	4	11	No data	-	-
Lesser black-backed gull	7	12	20,832	0.03%	0.06%
Herring gull	29	27	13,959	0.2%	0.2%
Great black-backed gull	8	11	4,392	0.2%	0.3%
Sandwich tern	18	6	No data	-	-

Species	VP1 peak count	VP2 peak count	ROI population (five year mean peak 2011/12-2015/16)	% of the ROI population recorded from VP1	% of the ROI population recorded from VP2
Common guillemot	8	6	No data	-	-
Razorbill	-	2	No data	-	-
Unidentified auk	4	6	No data	-	-
Black guillemot	4	2	No data	-	-

Table 23 Peak counts of waterbird species recorded across the survey period²⁵

Species	Peak Count	ROI Population (five year mean peak 2011/12-2015/16)	% of the ROI Population Recorded from VP2	Dublin Bay Population (five year mean peak 2011/12-2015/16)	% of Dublin Bay Population Recorded from VP2
Bar-tailed godwit	1	13,385	0.007%	2,119	0.05%
Black guillemot	6	No data	-	Not SCI	Not SCI
Black-headed gull	29	57,892	0.05%	3,131	0.9%
Brent goose (light-bellied)	220	30,295	0.7%	3,747	5.9%
Common guillemot	2	No data	-	Not SCI	Not SCI
Common gull	5	30,216	0.02%	Not SCI	Not SCI
Common ringed plover	40	10,545	0.4%	168	23.8%
Common tern	2	No data	-	23	Calculation not possible using IWeBS data
Eurasian curlew	3	28,300	0.01%	Not SCI	Not SCI
Eurasian oystercatcher	29	42,875	0.07%	3,115	0.9%

²⁵ Presented in relation to the most recent Republic of Ireland (ROI) non-breeding population (five year mean peak count 2011/12-2015/16) for each species (Lewis et al, 2019) and the percentage of the ROI population recorded in the study area.

Species	Peak Count	ROI Population (five year mean peak 2011/12-2015/16)	% of the ROI Population Recorded from VP2	Dublin Bay Population (five year mean peak 2011/12-2015/16)	% of Dublin Bay Population Recorded from VP2
European herring gull	106	13,959	0.7%	Not SCI	Not SCI
European shag	15	1,948	0.8%	Not SCI	Not SCI
Great black-backed gull	6	4,392	0.1%	Not SCI	Not SCI
Great cormorant	6	7,967	0.07%	Not SCI	Not SCI
Grey heron	2	1,943	0.1%	Not SCI	Not SCI
Grey wagtail	1	No data	-	Not SCI	Not SCI
Lesser black-backed gull	2	20,832	-	Not SCI	Not SCI
Mediterranean gull	45	439	10%	Not SCI	Not SCI
Northern gannet	1	No data	-	Not SCI	Not SCI
Razorbill	3	No data	-	Not SCI	Not SCI
Red-throated diver	3	657	0.4%	Not SCI	Not SCI
Ruddy turnstone	15	6,296	0.2%	Not SCI	Not SCI
Sand martin	7	No data	-	Not SCI	Not SCI
Sandwich tern	45	No data	-	Not SCI	Not SCI

2.10.35 The report concludes that all species observed were <1% of the national populations other than Mediterranean gull from 2019/20 (1.1% of the national population from VP1) and 2023/24 (10% of the national population), and little gull from 2019/20 (8% of the national population from VP2). Additionally, brent geese and common ringed plover populations during surveys were assessed to comprise 5.9% and 23.8% of the nearby Dublin Bay population. Therefore, these four species were evaluated as being important on a national level and all other species recorded in Table 22 and Table 23 were assessed as being important on a county-level.

2.10.36 Shorebirds will likely only be affected by works at Shanganagh at the proposed Landfall location, as they are unlikely to occur throughout the other areas of the OES. The Landfall location could extend seawards for c. 700 m (depending on location of exit pits for the landfall trenchless duct installation), and shorebirds will be able to naturally disperse to other areas of the coastline to avoid the effects of temporary increases in noise, vibrations, and artificial lighting that will be caused during the construction phase at Shanganagh. The effects of these impacts will be localised and temporary. Shorebird populations are not expected to experience any significant effects as a result of the proposed works here, and impacts to these species have been scoped out as a result.

Raptors

2.10.37 Buzzards were recorded along the Onshore ECR, near Sector 4. There were no other raptors identified across the various surveys of the OES.

2.10.38 It is considered unlikely that the noise, vibrations, and artificial lighting will impact these species given the urban setting and existing high levels of noise and vibrations currently experienced across most of the OES. However, there is a risk, similar to general passerine birds that habitat losses will reduce the population of this species and other raptors that may be present across the OES. Woodland and tree losses will reduce potential breeding habitat; grassland losses will reduce foraging habitats. This impact will potentially be long-term, for habitats such as woodland, along the cable route, and permanent for grassland removal at the OSS. The duration will begin with the habitat removal until the natural recovery of habitats (where applicable) following the completion of the construction phase.

2.10.39 Without the project design measures and other avoidance and preventative measures identified in Table 17 and the appropriate and necessary additional mitigation measures identified in Table 25 to avoid, prevent and reduce effects, the impacts upon the raptor assemblage is likely to be significant at a local level (significant in EIA terms). Measures are identified in Table 17 and Table 25 that reduce effects to a non-significant level.

O&M Base

2.10.40 The Intertidal Bird Survey Report for the O&M Base provides results for bird surveys conducted on the O&M Base. A total of three species of nationally important birds have been recorded by IWeBS within the O&M Base study area in internationally important numbers: dunlin, great crested grebe and sanderling.

SPA birds

2.10.41 In total, 28 SCI bird species had populations within the study area that comprised QI species for the combined South Dublin Bay and River Tolka Estuary SPA and North Bull Island SPA populations. These included black-headed gull, black-tailed godwit, common gull, common scoter, common tern, cormorant, dunlin, great black-headed gull, great crested grebe, greenshank, grey heron, herring gull, kingfisher, lesser black-backed gull, little egret, little grebe, mallard, Mediterranean gull, moorhen, oystercatcher, purple sandpiper, red-breasted merganser, red-throated diver, ringed plover, sanderling, sandwich tern, shag, and turnstone.

- 2.10.42 In total, 18 bird species had populations within the study area that comprised important parts of the Dalkey Island SPA population including: black-headed gull, common gull, common scoter, cormorant, great black-backed gull, greenshank, grey heron, herring gull, lesser black-backed gull, light-bellied brent goose, Mediterranean gull, oystercatcher, redshank, red-throated diver, sandwich terns, shag, and turnstone.
- 2.10.43 There will be no direct habitat loss for these SCI birds from the proposed works at the O&M Base and no significant effects as a result.
- 2.10.44 The O&M Base is situated within an existing developed area that currently experiences high levels of artificial lighting, noise and vibrations. Birds are sensitive to noise and visual disturbance. However, they are most likely to experience disturbance from a single, sudden noise compared to an ongoing noise (Cutts et al., 2013). This is expected to be the case at the O&M Base, where the construction noise will be quickly habituated to by these birds, especially given then existing ambient baseline noise levels at the O&M Base. This increase in noise will also be temporary, for the duration of the construction of the O&M Base. Any acute and temporary disturbance will not be significant as the birds will be able to naturally disperse to other areas away from the O&M Base, where other foraging habitat exists.
- 2.10.45 Low levels of artificial lighting may be employed at the O&M Base during the construction phase during the hours of darkness for safety and security reasons. A detailed lighting scheme design will be undertaken as part of the detailed design and motion sensor lights will be used to ensure lighting on site is minimised only to when required. However, the surrounding environment is already illuminated due to its urban setting. Therefore, the effects of noise, vibration and lighting from the construction at the O&M Base is assessed to be not significant on these SPA birds.
- 2.10.46 Dust will be created during the construction phase and will deposit into the marine environment that provides foraging habitat for these species. This effect will last for the duration of the construction phase of the O&M Base. It is considered unlikely that dust will accumulate within the marine environment to levels that would affect the foraging of SPA birds here. Furthermore, the SPA birds will be able to naturally disperse to other areas away from the O&M Base to forage. Therefore, this effect is considered to be not significant.

Amber-listed birds

Herring gull

- 2.10.47 Amber-listed herring gull chicks were recorded on the roof of the existing building within the proposed O&M Base, indicating that gulls use the roof for nesting and breeding.

2.10.48 Without the project design measures and other avoidance and preventative measures identified in Table 17 and the appropriate and necessary additional mitigation measures identified in Table 25 to avoid, prevent and reduce effects, the demolition of existing buildings would cause a temporary reduction of nesting habitat for this species. With the measures identified in Table 17 and Table 25, effects on herring gulls are not significant. However, there are many other buildings located within the surrounding environment that the loss of the buildings to facilitate the construction of the O&M Base will not have a significant effect on the population of this species. Furthermore, this effect will be temporary as the construction of the new buildings at the O&M Base will likely provide suitable nesting habitat for this species following their completion. The demolition of the buildings during the nesting bird season (March – September inclusive) may also lead to the direct harm of nesting herring gulls. This would cause an offence under the Wildlife Act. The demolition of these buildings outside the nesting bird season, which the Applicant has committed to as a project design measure (see Table 17, will avoid causing an offence under the Wildlife Act.

2.10.49 In the absence of mitigation, dust and pollution spills from surface run-off could be created during the construction phase and could deposit into the marine environment that provides foraging habitat for this species. The effect of dust will last for the duration of the construction phase of the O&M Base; however, pollution spills are likely to be much more infrequent, one-off events. It is considered unlikely that dust will accumulate within the marine environment to levels that would affect the foraging of herring gull. Furthermore, this species will be able to naturally disperse to other areas away from the O&M Base to forage. Therefore, this effect is considered to be not significant.

House martin

2.10.50 The existing buildings at the O&M Base site were found to support historical nest sites for amber-listed house martin. Whilst these were inactive during the survey, house martin were recorded in the area on both survey dates. Therefore, their use of the Site for breeding purposes cannot be fully discounted and they may return to breed at this location in the future.

- 2.10.51 Without the project design measure and other avoidance and preventative measures identified in Table 17 and the appropriate and necessary additional mitigation measures identified in Table 25 to avoid, prevent and reduce effects, the demolition of existing buildings will cause a temporary reduction of nesting habitat for this species. However, there are many other buildings located within the surrounding environment that the loss of the buildings to facilitate the construction of the O&M Base will not have a significant effect on the population of this species. Furthermore, this effect will be temporary as the construction of the new buildings at the O&M Base will likely provide suitable nesting habitat for this species following their completion. With the measures identified in Table 17 and Table 25, effects on house martin are not significant. There will also be no demolition of the buildings during the nesting bird season (March – September inclusive) which could lead to the direct harm of nesting house martins. The demolition of these buildings outside the nesting bird season, which the applicant has committed to as a project design measure (see Table 17, will avoid causing an offence under the Wildlife Act.
- 2.10.52 The temporary increase in noise, vibrations and artificial lighting are not expected to significantly impact this species due to the existing high levels of disturbance attributed to the surrounding urban environment.
- 2.10.53 Dust, and pollution spills from surface run-off is not expected to cause a significant impact to this species, which forage whilst in flight and will likely continue to find foraging value within the study area throughout all phases of the development at the O&M Base.

Starling

- 2.10.54 St Michael's Pier was also found to support significant numbers of roosting, amber-listed starlings, with ca. 500 birds recorded roosting on the structure at the end of the pier. There are approximately 2,066,904 starlings in Ireland. The roosting population within the O&M Base study area represents a negligible percentage of the national and county populations.
- 2.10.55 Starlings will opportunistically use artificial structures with crevices and entrance holes for nesting purposes. These features do exist within the study area. However, potential breeding locations are limited in number, and it is considered unlikely that a breeding colony of ca. 500 birds could be supported within the study area. Therefore, it is assessed that while starlings could possibly breed in the study area, it could only be in low numbers, and the pier is likely only used for roosting purposes. This structure is being retained and there will be no loss of roosting habitat for starlings.
- 2.10.56 The temporary increase in noise, vibrations and artificial lighting are not expected to significantly impact this species due to the existing high levels of disturbance attributed to the surrounding urban environment and this species is tolerant and adaptable to urban environments.
- 2.10.57 Dust, and pollution spills from surface run-off is not expected to cause a significant impact to this species, suitable foraging areas outside the study area (i.e. outside 500 m) will remain unimpacted and this highly mobile species will be able to move away from the development and continue to find foraging value elsewhere.

House sparrow

2.10.58 A group (estimated <10 birds) of amber-listed house sparrow were heard within ornamental shrub habitats within the O&M Base study area. Given the limited vegetation within the study area, it is anticipated that house sparrow likely use these isolated vegetated habitats for breeding purposes. The vegetation supporting this species will not be impacted. Therefore, there will be no loss of suitable nesting or foraging habitat for house sparrow in the O&M Base study area.

2.10.59

2.10.60 Similarly, effects caused from noise, vibrations and artificial lighting may adversely affect this species temporarily (i.e. for the duration of the construction phase). However, this population is habituated to existing high levels of disturbance due to the current urban setting and the additional increase in disturbance is not expected to cause a significant effect.

Other amber-listed species

2.10.61 In addition, the surrounding marine and terrestrial habitats were found to support a range of other amber-listed birds, which are considered likely to use the study area for foraging and roosting purposes including: common guillemot, common tern, gannet, and great cormorant.

2.10.62 No habitat loss is expected as a result of all phases of the proposed development at the O&M Base, to impact these species. They are habituated to the current urban conditions; thus the artificial light, noise and vibrations are not expected to cause a significant impact to them. The main risk is from minor pollution events that may enter the marine habitats (i.e. their foraging habitat). However, these are anticipated to be rare occurrences of minor spillages of leaks. Any pollution that enters the marine habitat is likely to be quickly dispersed.

2.10.63 Given the international importance to several of these species, in the absence of project design features and other avoidance and preventative measures (identified in Table 17), the impacts to them from potential pollution events could be considered up to significant on an international level, depending on the severity of the pollution event. Measures are identified in Table 17 and Table 25 that reduce residual effects to a non-significant level.

2.10.64 The potential impacts from artificial light, noise and vibrations, dust creation, and potential pollution spills are not considered to pose a significant threat to these species as they already exist in a heavily urban environment and are habituated to such disturbance.

2.10.65 The proposed works at the O&M Base are unlikely to significantly impact these species due to the existing urban nature of the O&M Base and the surrounding area, including the high levels of artificial lighting already present in this location.

Black guillemot

- 2.10.66 The Intertidal Bird Survey Report for the O&M Base details that a peak count of 10 breeding black guillemot were confirmed present underneath Carlisle pier, which is located ca. 150 m from the proposed O&M Base. Assuming that one bird remained on the nest whilst the other left to forage, it is assessed that there are approximately 20 individuals. Black guillemot were not recorded using St Michael's Pier (on which the O&M Base will be situated) for nesting and they do not use this pier for breeding. However, the uptake of St. Michael's pier for breeding by the time construction commences cannot be discounted.
- 2.10.67 Black guillemot is an amber listed species (Gilbert et al., 2023). Data from 2015 to 2018 estimates that there are 3,917 individuals in Ireland (JNCC, 2024). Therefore, the 20 birds recorded at the O&M Base represents <1% of the national population. However, it is anticipated that the population in the study area for the O&M Base likely represents an important colony for the county. The long-term black guillemot population trend for the whole of Ireland is currently unknown. However, numbers in Northern Ireland more than doubled between the Seabird Colony Register and Seabird 2000 (JNCC, 2024).
- 2.10.68 There will be no loss of breeding or foraging habitat within the O&M Base study area as a result of the construction, operation, or decommissioning phases of the O&M Base.
- 2.10.69 The temporary increase in noise, vibrations and artificial light may cause disturbance to this species. However, the effects are unlikely to be significant as existing levels of disturbance already exist within the surrounding urban environment. Moreover, the noise will be continuous, and black guillemots will be able to quickly habituate to the increased levels. Therefore, this effect is considered to be not significant.
- 2.10.70 There will be no fuel storage at the O&M Base, however there will be a requirement for refuelling at the pontoon. There is therefore a risk of pollution spills entering the marine habitat upon which black guillemot relies on at least part of their foraging. There is a likelihood of this impact occurring and will be small in scale and localised. This impact may affect the availability of prey within the O&M Base study area for this species which could, if it were to occur, be adverse and temporary. The enclosed nature of the harbour may cause pollution to accumulate within the harbour area which may cause black guillemots to have to travel further to forage. The harbour area provides only a small foraging area for this species as the maximum foraging range for this species is 33 km (Dehnhard et al., 2023). There will be no effects arising from such pollution spills beyond the extent of the harbour and this species will be able to continue forage in the unaffected areas.
- 2.10.71 Dust will be created during the construction phase and will deposit into the marine environment that provides foraging habitat for this species. This effect will last for the duration of the construction phase of the O&M Base. It is considered unlikely that dust will accumulate within the marine environment to levels that would affect the foraging of black guillemots. Furthermore, this species will be able to naturally disperse to other areas away from the O&M Base to forage. Therefore, this effect is considered to be not significant.

Raptors

2.10.72 No raptors were identified during the Intertidal Bird Survey Report for the O&M Base and the habitats within the O&M Base study area are considered largely unsuitable for the raptors, although it should be noted that peregrines and kestrel can nest on buildings. Therefore, raptors are considered absent and have been reasonably discounted from the O&M Base.

Bats

2.10.73 All bats are listed in Annex IV of the Habitats Directive and afforded protection by the Wildlife Acts. Lesser horseshoe bats are listed in Annex II of the Habitats Directive. In addition, the DLRCC County Development Plan includes Policy Objective GIB22, which provides protection for species listed under the Wildlife Acts and Habitats Directive.

2.10.74 The Onshore Biodiversity Technical Baseline Report desk study found that the bat landscape scored highest for Leisler’s bat, followed by common pipistrelle, soprano pipistrelle, whiskered bat, Natterer’s bat, and brown long-eared bat (refer to the Onshore Technical Baseline Biodiversity Report, included in Volume 5, Chapter 5.2). The landscape scores were lowest for lesser horseshoe, Nathusius’ bat and Daubenton’s bat.

Roosting bats

2.10.75 A Preliminary Roost Assessment (PRA) provided in Annex 5 of the Onshore Technical Baseline Biodiversity Report identified a total of 15 trees across the OES with bat roosting potential and underwent two bat emergence surveys in 2023 and 2024 (where possible). The field survey results are presented in Annex 6 of the Onshore Biodiversity Technical Baseline Report.

2.10.76 The surveys recorded a total of seven species of bats either commuting or foraging near the survey locations. Commuting and foraging bats recorded are presented in Table 24 .

Table 24 Summary of the number of passes for each recorded bat species for each survey year.

Year	Numbers of bat recordings (passes)						
	<i>Nyctalus leisleri</i>	<i>Myotis nattereri</i>	<i>Myotis mystacinus</i>	<i>Pipistrellus nathusii</i>	<i>Pipistrellus pipistrellus</i>	<i>Pipistrellus pygmaeus</i>	<i>Plecotus auritus</i>
2023	256	0	0	1	472	80	1
2024	425	1	1	27	919	296	5

2.10.77 There were no roosts identified during the bat surveys on any of the 13 of the 15 trees and these have been scoped out from the assessment. Two trees (T14 and T15), located within Eurofound in Sector 2 east of the N11 at approximate ITM coordinates 724560 723425 and 724529 723384, only underwent one emergence survey due to access limitations. As such, the presence of bat roosts or bat species potentially present, in trees T14 and T15 cannot be confirmed, and it must be assumed that bat roosts exist within these trees.

2.10.78 Both trees will be retained if possible. However, the footprint of the temporary HDD compound will encroach within the RPA of both trees and significantly for T15 (refer to Drawing 005398695-01). Due to the encroachment of the RPA of both trees, there is potential for the necessary removal of both trees. The loss of T14 and T15 may cause the loss of a bat roost. Without the project design features and other avoidance and preventative measures identified in Table 17 and the appropriate and necessary additional mitigation measures identified in Table 25 to avoid, prevent and reduce effects to a not significant level, this would cause a significant impact as bats and their roosts are protected and could affect the conservation status of the bats at a county level. In addition, without appropriate and necessary mitigation measures to avoid, prevent and reduce effects, construction-related noise and light has the potential to disturb bat roosts in both trees. This may affect bats by entombing them within their roosts or preventing natural roosting or breeding behaviours that may occur here (ILP & BCT, 2024). This would last for the duration of the construction phase for the HDD works (i.e. 40 days). With the identified measures adopted in Table 17 and Table 25, which includes for a survey of T14 and T15 survey of T14 and T15 trees at an appropriate time in the bat roosting season, at the earliest available opportunity, the effect is reduced to a not significant level. In the event bat activity and/or roosts are identified in this further pre-construction verification survey, and the trees require removal, an application for the necessary derogation licence will be made to NPWS. Therefore, this effect is considered to be not significant.

Commuting and foraging bats

2.10.79 It was concluded that habitats present across the OES are mostly used by common pipistrelle and Leisler's bat, with soprano pipistrelle also frequent. These species are widespread across Ireland and are generally still present in urban and semi-urban areas compared to other more sensitive bat species.

2.10.80 All species of bats are affected by impacts such as habitat damage, fragmentation, and disturbance. Furthermore, the construction phase is anticipated to create high levels of temporary noise, vibrations and artificial light which affect all bats adversely (ILP & BCT, 2023; Siemers & Schaub, 2011), particularly the slower flying bats (Bonsen et al., 2015).

2.10.81 Construction-related noise and light occurring during the night may affect the natural foraging and commuting behaviours of bats, especially at special crossings of rivers. Rivers form vital commuting habitat for bats. therefore construction-related noise and light will form barriers to them for the duration of the works. This will adversely affect the bat species recorded by inhibiting their natural behaviour and may prevent them from reaching their regular foraging areas. However, this effect will be temporary, lasting for the duration of each special crossing (i.e. 15 days per crossing). Moreover, only one trenchless crossing will be ongoing at any one time. As such, bats will be able to naturally migrate away and use other unaffected areas of the river for commuting and foraging for the duration of the works, such that they can avoid disturbance.

Pipistrellus spp.

- 2.10.82 The majority of bat passes recorded across the Onshore ECR route comprised common pipistrelle and soprano pipistrelle.
- 2.10.83 Common pipistrelle are widespread and are the most tolerant and adaptable species of bat in Ireland, given that they are the most commonly recorded bat in urban environments. Short-term trends for this species are considered stable, with a national population estimate between 1,872,000 - 4,339,800 (Roche & Langton, 2024). They are considered to have favourable status in terms of range, population, habitat, and future prospects (NPWS, 2019c). This species prefers woodland edge habitat (ILP & BCT, 2023; Schnitzler & Kalko, 2001).
- 2.10.84** The bat surveys recorded 919 passes for common pipistrelle in 2024, representing a negligible proportion of the national population (i.e. <1%). No county-level population data was available for Dublin; however, they are well distributed across the county (BCI, 2024). Therefore, the impacts to common pipistrelle, in the absence of project design features and other avoidance and preventative measures (identified in Table 17), are assessed as being significant at a county level (significant in EIA terms). Measures are identified in Table 17 and Table 25 that reduce residual effects to a non-significant level.
- 2.10.85 Soprano pipistrelle are similar to common pipistrelle and are considered widespread and abundant across Ireland. Their national population is estimated to be approximately 1,204,800 – 2,709,600 individuals (Roche & Langton, 2024). Their overall conservation status is considered favourable (NPWS, 2019c).
- 2.10.86 The bat surveys recorded 296 passes for soprano pipistrelle, representing negligible percentage of the county population of soprano pipistrelle. No county-level population data was available for Dublin; however, they are well distributed across the county (BCI, 2024). Therefore, the impacts to common pipistrelle, in the absence of project design features and other avoidance and preventative measures (identified in Table 17), are assessed as being significant at a county level (significant in EIA terms). Measures are identified in Table 17 and Table 25 that reduce residual effects to a non-significant level.
- 2.10.87 Nathusius' pipistrelle are a rarer bat species, with only sporadic records returned for this species across Ireland. Their national population is estimated to be between 4,100 – 6,900 (Roche & Langton, 2024); and their short-term population trend is increasing according to Article 17 data (NPWS, 2019b). Records of their distribution in Dublin also exists. However, these are clustered along the centre of the county, with fewer records across the location of the OES (BCI, 2024).
- 2.10.88 A peak of 27 passes of this species were recorded during the bat surveys in 2024. This represents 0.96% of the national population, which is very close to the 1% threshold of significance. Moreover, several records of this species are clustered their distribution in Dublin. Therefore, under the precautionary principle, this species is evaluated as being important on a national level.

- 2.10.89 The biggest risks to these species include disruption to commuting and foraging behaviours through habitat loss, damage, and fragmentation and disturbance through artificial noise, vibrations, and light.
- 2.10.90 *Pipistrellus* spp. mostly utilise woodland edge habitats (Schnitzler & Kalko, 2001) and as a result can use a range of habitats such as woodland, hedgerows, grassland, farmland, suburban and also urban areas. The removal of habitats to facilitate the OES will cause fragmentation and will impact these species, potentially cutting off commuting habitats or removing foraging habitats. However, it is anticipated that these species can adapt to the changing conditions. The OES will only require the removal of c. 10 m of hedgerow and c. 0.01 ha of immature woodland. The project design has minimised the potential losses of the most ecologically valuable habitats. No mature woodland removal will be necessary and losses to hedgerows, scrub and grassland have been minimised, where possible, as the Onshore ECR is prioritised under existing roads. Removal of scrub and grasslands have also been minimised through the project design. As such, there will be a minor loss of foraging habitat; however, this is unlikely to lead to a significant effect.
- 2.10.91 Most habitat losses will be temporary, with grasslands and scrub quickly able to re-establish when lost. Only the OSS will require permanent grassland removal (1.69 ha). However, significant areas of grassland will be retained in the immediate surrounding area and pipistrelle bats will be able to continue to use these areas for foraging. Furthermore, with the habitat creation (detailed on the OSS Landscaping Plan, Drawing 229100714-MMD-00-XX-DR-C-0250 included in Part 2 Planning Drawings of the application) including tree planting, hedgerow creation, and a wildflower meadow the loss of grassland will be compensated for with higher value habitat.

Brown-long eared bats

- 2.10.92 Brown-eared bats are distributed across Ireland (NBDC, n.d.), although some gaps in their distribution do exist. This is likely due to a lack of records rather than lack of presence of this species. Records of this species are distributed across Dublin, including a significant cluster around the location of the Onshore ECR (BCI, 2024). Their national population is estimated to be approximately 62,000 individuals, and their overall conservation status is assessed to be favourable (NPWS, 2019b).
- 2.10.93 This species prefers cluttered habitats such as woodland. As such the losses to this habitat as well as connective habitats such as scrub, and hedgerow have the potential to affect the local population of this species through the reduction of commuting and foraging habitat.
- 2.10.94 A peak of 5 passes for brown-long eared bat were recorded in 2024 represents 0.2% of the county population a negligible proportion of the national population. Therefore, at a national and county level, the number recorded is not significant (i.e. <1%). However, caution must be applied for this species, as their call can often go unrecorded and the number is anticipated to be likely higher. However, given the very low numbers recorded, it is anticipated that the true population estimate would not meet the 1% threshold of the county population.

- 2.10.95 This species relies mostly on woodland, as it relies mostly on cluttered environments (Collins, 2023). No woodland losses are expected across the OES. Therefore, no significant impacts to this species are predicted from habitat loss. They will also be impacted to a lesser extent by the losses of other habitats, including scrub, hedgerows, and grasslands. However, the project design has minimised the necessary losses of these habitats, where possible. A full breakdown of expected habitat losses is provided in Impact 2. Moreover, tree planting at the OSS (see Drawing 229100714-MMD-00-XX-DR-C-0250) will provide additional optimal habitat for this species. Although the beneficial effects of this will not be provided until the long-term (i.e. 15 – 60 years) future.
- 2.10.96 Noise and light will be created during all phases. However, the biggest effects will be caused during the construction and decommissioning phases. Noise and artificial lighting will be temporary (i.e. for the duration of the works) and highly localised to the relevant construction area at the time, and this species will be able to use unimpacted areas for foraging. No woodland (i.e. the primary habitat for this species) will be illuminated. Given that most county records are clustered along the OES location, in the absence of measures identified in Table 17 and Table 25, the impacts are assessed as being significant on a county level (significant in EIA terms). Measures are identified in Table 17 and Table 25 that reduce residual effects to a non-significant level.

Myotis spp.

- 2.10.97 Two species of *Myotis* bats were recorded during the bat surveys, comprising single passes of whiskered bat and Natterer's bat in 2024. These species favour cluttered environments (ILP & BCT, 2023); and will be disproportionately affected by any significant woodland losses. Daubenton's bats were unrecorded during the surveys. However, several records of Daubenton's bat do exist along the Shanganagh River and its tributaries (BCI, 2024) and this species is known to rely more upon watercourses than other bat species. Therefore, they are likely present along the Shanganagh River and its tributaries and within the study area the OES.
- 2.10.98 Whiskered bats are a rare species of bat, estimated to be at 270 individuals nationally. The overall conservation status of this species is considered favourable (NPWS, 2019b). The passes recorded during the bat surveys indicate that approximately 0.37% of the national population and 10% of the county population.
- 2.10.99 Therefore, in the absence of project design features and other avoidance and preventative measures (identified in Table 17), the impacts to this species are assessed to be significant at a county level (significant in EIA terms). Measures are identified in Table 17 and Table 25 that reduce residual effects to a non-significant level.
- 2.10.100 Daubenton's bats are estimated to be at 55,200 - 72,500 individuals across Ireland (NPWS, 2019b). This species is well distributed across the country (NBDC, n.d.), including Dublin. Most records are clustered along river systems, a habitat on which this species heavily relies. Their overall conservation status is favourable (NPWS, 2019b).

2.10.101 Natterer's bat population is assessed to be low at 464 individuals nationally (i.e. 18 at the county level) (NPWS, 2019b). Therefore, it is considered a rare bat in Ireland. NPWS (2019b) details that the status of this species is favourable across its range, population, and future prospects.

2.10.102 The single pass recorded represents a negligible proportion of the national population and 5.5% of the county population. As such, in the absence of project design features and other avoidance and preventative measures (identified in Table 17), the impacts to this species are considered significant on a county level (significant in EIA terms). Measures are identified in Table 17 and Table 25 that reduce residual effects to a non-significant level.

2.10.103 No Daubenton's bats were recorded during the surveys. However, it is anticipated that they are present across the Shanganagh River and its tributaries, as this species relies heavily on aquatic habitats for foraging (Collins, 2023). River habitats will not be impacted by trenching as HDD will be implemented at special crossings. Temporary artificial light and noise from the HDD crossings may cause barriers to this species during night hours when they are active. This will cause potential disruption in their commuting and foraging behaviours. However, this impact will be highly localised and temporary at each location. The duration of each of which is as follows:

- ▲ TX-02 Shanganagh River – 15 days
- ▲ TX-04 Kill-o-the-Grange Stream – 15 days
- ▲ TX-05 Kill-o-the-Grange Stream – 15 days
- ▲ TX-06 N11, Carrickmines Stream – 40 days

2.10.104 This is unlikely to cause a significant effect on this species, as they will continue to use other unimpacted areas of the river.

2.10.105 *Myotis* spp. favour cluttered environments such as woodlands and hedgerows (Schnitzler & Kalko, 2001); although they will also use open meadows and waterbodies (Conserve Ireland, 2018). They will be affected greatest by the loss of these habitats. However, no woodland loss will occur, and hedgerow loss will be limited to c. 10 m. Therefore, no significant impact is likely to occur relating to habitat loss.

2.10.106 Similarly, to Daubenton's bats, works to support the trenchless crossings and the artificial light required for night works at the four special crossing on watercourses provided above.

- ▲ TX-02 Shanganagh River – 15 days;
- ▲ TX-04 Kill-o-the-Grange Stream – 15 days;
- ▲ TX-05 Kill-o-the-Grange Stream – 15 days; and
- ▲ TX-06 N11, Carrickmines Stream – 40 days.

2.10.107 This will impact the natural foraging behaviour of these species and may form a barrier to their commuting routes. However, this impact will be temporary and highly localised. *Myotis* spp. will be able to continue foraging along the remaining and unimpacted areas of the river. Therefore, this impact is not considered to be significant.

2.10.108 Given the low numbers of *Myotis* spp. recorded across the surveys, it is anticipated that only low numbers of these bats are present across the study area. NPWS (2019b) details that whiskered bat and Natterer's bat short-term populations are stable and both species are listed as least concern (Nelson et al., 2019).

Leisler's bat

2.10.109 Leisler's bat population is estimated to be between 112,800 and 202,300 individuals, nationally (Roche & Langton, 2024); and they are distributed across Dublin, including the OES location (BCI, 2024). Their overall conservation status is considered favourable (NPWS, 2019c).

2.10.110 The bat surveys recorded a peak of 425 passes for this species in 2024. This represents (taking the lower population estimates as a precaution) 0.7% of the national population and 17.5% of the county population. As such, the study area potentially supports a significant percentage of the county's population.

2.10.111 Similarly to the other bat species, Leisler's bats would be impacted by habitat loss and fragmentation, which may disrupt commuting and foraging behaviours and impact their conservation status. In the absence of project design features and other avoidance and preventative measures (identified in Table 17), the impacts are assessed to be significant at a county level (significant in EIA terms). Measures are identified in Table 17 and Table 25 that reduce residual effects to a non-significant level.

2.10.112 Leisler's bats prefer open areas for commuting and foraging (Collins, 2023). As a result, it is less likely to be impacted by woodland loss than other species and relies more on open grasslands and hedgerows. Habitat losses to grasslands, hedgerow, and scrub will cause an overall reduction of prey species within the study area, which may adversely affect the local and county population. The project design has retained habitats where possible and those lost will quickly recover. However, the OSS will require the permanent removal of c. 1.69 ha of grassland. Reinstatement habitats, including a wildflower meadow, have been provided in Drawing 229100714-MMD-00-XX-DR-C-0250. However, there will be a minor net loss of foraging habitat with the creation of the OSS. There remains significant potential foraging habitat for this species in the immediate surrounding area of the OSS as well as the OES that no significant impact is expected.

2.10.113 The OES is located within an existing urban area that is subjected to high levels of artificial lighting and noise impacts. Artificial lighting and noise is not expected to significantly impact this species, as large numbers of this species are currently able to tolerate the existing conditions.

Badger

- 2.10.114 Badgers are protected under the Wildlife Act 1976 and subsequent amendments. They are also afforded national policy protection under Ireland's 4th National Biodiversity Action Plan 2023 – 2030 and local policy protection under DLRCC Policy GIB22. The Onshore Biodiversity Technical Baseline Report assessed this species as important on a county level.
- 2.10.115 One badger sett was identified in the Onshore Biodiversity Technical Baseline Report, within the Eurofound land in Sector 2. Following a period of monitoring, this was found to be inactive. This sett will be retained; however, a TJB will encroach to within 10 m of this sett entrance and trenching is likely to encroach to c. 15 m.
- 2.10.116 This badger sett may become active by the time construction commences. In this event the trenchless crossing location at TX-06 located within the Eurofound land risks harming badgers and potentially damaging or destroying a badger sett, which would cause an offence under the Wildlife Acts (as amended).
- 2.10.117 The construction activities also risk causing a temporary reduction of suitable foraging habitat along the Onshore ECR and the permanent losses of 1.69 ha of grassland to facilitate the OSS. Badgers are widespread and adaptable to urban environments and, therefore, their presence across the OES is considered likely. The temporary and permanent losses of these habitats would cause a reduction of foraging habitat, potentially put pressure on the local populations, and may lead to an overall reduction in their local population. Additionally, there is a minor risk of accidental killing and injury to badgers through general construction activities (e.g. badgers falling into excavations, etc.). Mitigation provided in the CEMP provides general construction measures (refer to Table 17 and Table 25).
- 2.10.118 Despite the losses in suitable foraging habitat, a significant quantity of suitable habitat will remain for this species across the OES and badgers are well distributed across Ireland, with a population of ca. 200,000 in the Republic of Ireland (Smal, 1995) (i.e. c. 7,692 at the county level). Given the high population of this species across the country, it is anticipated that the effects on this species would be negligible to its conservation value.
- 2.10.119 Given the tolerance of urban conditions, badgers are not considered to be at risk of general noise and vibration disturbance, with the exception of the sett recorded in the Eurofound land (and any future setts that may be established between the time of writing and the commencement of the construction phase), which (if active) would require a derogation licence for disturbance.
- 2.10.120 Overall, badgers are considered adaptable and tolerant to disturbance and there is likely to be a negligible risk to the conservation status of badger. However, there is a minor risk of harming an individual badgers through the construction activities. In the absence of project design features and other avoidance and preventative measures (identified in Table 17), this impact is considered significant on a local level (significant in EIA terms). Measures are identified in Table 17 and Table 25 that reduce residual effects to a non-significant level. If required, an application will be made for a derogation licence to NPWS once the findings of pre-construction verification surveys are known.

Hedgehog

- 2.10.121 Hedgehogs are protected under the Wildlife Acts 1976 and subsequent amendments and are also afforded local policy protection under policy GIB22. They were assessed as being important on a local level in the Onshore Biodiversity Technical Baseline Report.
- 2.10.122 Hedgehog populations, although widely distributed across Ireland (NBDC, n.d.) with 10,780 records in total, have declined dramatically. In 1950 there was an estimated 30,000,000 in Ireland, dropping to 1,500,000 in 1990 (Haigh, 2024). It is anticipated that this could be significantly lower still in 2024, with another source suggesting the population could be as low as 500,000 (Collins, 2018). Taking the lowest figure, the county population would be estimated at 15,625.
- 2.10.123 Hedgehog are somewhat tolerant to semi-urban environments, able to take advantage of vegetated gardens and amenity grassland areas. However, they are susceptible to habitat fragmentation and accidental killing and/or injury, particularly when in hibernation.
- 2.10.124 The construction phase may lead to an overall reduction in suitable habitat for this species through the potential removal of improved agricultural grassland (0.29 ha), amenity grassland (1.28 ha), dry meadows and grassy verges (4.43 ha), scrub (0.14 ha), immature woodland (0.52 ha), and hedgerows (0.25 km)²⁶. However, this will be limited to the short-term and the population should be able to recover following the natural regeneration of these habitats following the completion of the construction phase.
- 2.10.125 There is a minor risk of accidental killing and injury to hedgehog through general construction activities (similar to badgers). However, the measures provided in the CEMP will mitigate for this, including the following:
- ▲ The ECoW will be present on the site for any removal of hedgerows, scrub, immature woodland, and dry meadows and grassy verges to search for the presence of hedgehogs within the proposed construction area;
 - ▲ Any hedgehogs found will be moved to suitably retained habitat located nearby; and
 - ▲ The general construction measures provided for badgers above will also benefit hedgehogs.
- 2.10.126 The predicted impacts will be generally short-term across the cable route, with permanent losses expected for the proposed OSS. However, these are relatively small in size and won't cause significant loss.
- 2.10.127 Overall, the impacts are considered not significant.

²⁶ Note that these are the upper limits of predicted habitat losses

Otter

2.10.128 Otters are protected under the Wildlife Acts 1976 and subsequent amendments and are listed on Annex II and IV of the Habitats Directive. They are afforded protection under local policy GIB22 and the Onshore Biodiversity Technical Baseline report assessed this species as having county-level importance.

2.10.129 Two potential otter holts were identified across the study area.

- ▲ One holt (Holt 1) was located c.120 m north-east of the proposed TCC at Clifton Park in Sector 1 (ITM coordinates 725712, 723223). Holt 1 was located >150 m from the proposed HDD activities. Without the project design measure and other avoidance and preventative measures identified in Table 17 and Table 25 to avoid, prevent and reduce effects, there is a risk that unmitigated construction works may cause disturbance to this holt and any otters that may be using it and any works that encroach within 150 m of a holt is likely to cause disturbance to it (NRA, 2008).
- ▲ A second holt (Holt 2) was identified at Dún Laoghaire Harbour (ITM coordinates 724132, 728965). This holt was situated approximately 330 m west of the proposed O&M Base. Considering that this holt was >150 m from the proposed O&M Base, it will not be destroyed or damaged and will not be affected by disturbance. Therefore, the holt at the O&M Base has been reasonably discounted from further assessment.

2.10.130 Holt 1 was located >150 m from the proposed HDD activities for the Onshore ECR. However, the proposed TCC at Clifton Park does encroach to approximately 10 m to Holt 1. *Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes* (NRA, 2005) recommends a buffer of 150 m to any active breeding otter holts to avoid potential disturbance to otters. Therefore, disturbance during the construction phase is possible, limited to the Clifton Park TCC area. The guidance (NRA, 2005) states that works likely to cause a disturbance (such as piling or blasting) would require an NPWS derogation licence to disturb a holt. No piling or blasting will occur at this location, and the general construction works, and HDD activities are not expected to cause significant disturbance to this holt. Moreover, the otters here are likely to experience high levels of disturbance caused from trains on the nearby railway line, the activities associated with the WWTP, and general disturbance from people and the urban nature of the surrounding area.

2.10.131 No river habitat (including associated riparian habitat) will be lost or damaged during the construction phase through the use HDD technology as a project design measure to cross under the riverbed. This will avoid any excavation works through the watercourse at the Shanganagh River (refer to Table 16 and will avoid any suspended sediments from entering the river that may affect the water quality and the prey for otters.

2.10.132 There is a minor risk of accidental killing and injury to otters through general construction activities. However, the measures provided in the CEMP will mitigate for this. Such measures will include:

- ▲ In advance of construction pre-construction faunal verification surveys will be undertaken to identify the presence of otter holt at suitable habitats in the study area;
- ▲ If a holt is identified within 150 m of proposed works (NRA, 2008), a NPWS license will be secured to progress with required mitigation measures;
- ▲ Retained habitats of value to otters (e.g. riparian woodlands and riverbanks) will be protected from accidental damage or removal by protected fencing; and
- ▲ General construction-related reasonable avoidance measures to avoid impacts to badgers detailed above will also benefit otters.

2.10.133 Otter are widespread in Ireland with otter signs found at 88% of sites surveyed nationally (NPWS, 2019b). Their population is considered stable, and their home ranges can extend over tens of kilometres (Chanin, 2003). Otters also tend to use multiple holts across their home range, so any temporary disturbance of one holt is unlikely to be significant. The estimated national population is considered to be between 7,218 – 10,186 (NPWS, 2019b; Reid, 2013); with another source suggesting 12,000 individuals (NPWS, n.d.) (i.e. 226 at the county level when using the lowest figure). As such, the unlikely event of an accidental death of an otter arising from the impacts of this project is unlikely to affect the overall population and is unlikely to affect its conservation status.

2.10.134 Overall, there is likely to be a negligible risk to the conservation status of otter. However, in the absence of the mitigation identified in in Table 17 and Table 25 to avoid, prevent and reduce effects, there is a minor risk of harming an individual otter through the construction activities from works across the OES that occur close to river habitats. In the absence of project design features and other avoidance and preventative measures (identified in Table 17), this impact is considered significant on a local level (significant in EIA terms). Measures are identified in Table 17 and Table 25 that reduce residual effects to a non significant level.

Small mammals

2.10.135 Small mammals considered include pygmy shrew, Irish hare, Irish stoat and red squirrel. All were assessed as being important on a local level in the Onshore Biodiversity Technical Baseline Report. Other protections are detailed separately below.

2.10.136 The main impact risk for all of the species listed in this section is habitat loss and fragmentation. This impact risks causing a reduction in the population of these species, which could affect their overall conservation status.

2.10.137 This impact of habitat losses will be temporary to long-term for the ECR. The duration being between the habitat loss and the length of time it requires for the habitat to re-establish itself. Habitat losses for the OSS will be permanent.

2.10.138 The effects of artificial noise, vibrations and light are anticipated to have a negligible effect on these species.

Pygmy shrew

2.10.139 Pygmy shrew are protected under the Wildlife Acts. In addition, the DLRC County Development Plan includes Policy Objective GIB22, which provides protection for species listed under the Wildlife Acts. This species is well distributed across Ireland (VWT, 2024), although gaps do exist, likely due to lack of records rather than lack of presence.

2.10.140 Habitat loss, especially of hedgerows, grasslands, woodlands will affect pygmy shrew likely causing its population to decline. However, it is considered unlikely that this will affect the conservation status of this species, which reproduces quickly. Its population would quickly recover from the temporary losses of the habitats. The main area of permanent habitat loss is limited to the OSS, which is a relatively small area that is not anticipated to significantly impact this species.

2.10.141 The impacts to this species are assessed as not significant.

Irish hare

2.10.142 Irish hare is protected under the Wildlife Acts and is also listed on the All-Ireland Species Action Plan. In addition, the DLRC County Development Plan includes Policy Objective GIB22, which provides protection for species listed under the Wildlife Acts. The national population of this species is estimated to range between 338,000 and 999,000 individuals (i.e. 10,563 at the county level) (NPWS, 2019b). Another source estimated the population for the Irish hare to be at 535, 000 in 2007 i.e. 20,577 per county) (Reid et al., 2007)

2.10.143 Irish hare are considered absent from the O&M Base due to the lack of suitable habitat present and effects to this species has been scoped out for this area. No incidental sighting of this species was recorded throughout the OES and the grasslands present here were also largely unsuitable for this species due to their small size and urban setting. Irish hare have been scoped out from Sectors 1, 2, 3, 5, 6 of the onshore ECR. However, larger extents of grassland and arable land were present in Sectors 4 & 7 and at the OSS site and Leopardstown TCC in which hares may be present.

2.10.144 Most grassland loss across Sectors 4 and 7 will be limited to relatively small areas to facilitate the construction of the Onshore ECR and this is unlikely to result in a significant effect for this species. Hares would be most at risk from the permanent loss of grassland to facilitate the construction of the OSS, which will require the removal of 1.7 ha of grassland. This would cause a reduction in potential foraging habitat that may reduce the population of hares on a local level.

2.10.145 The loss of this grassland would cause a reduction in suitable foraging habitat for hares and their local population may experience a small reduction as a result. However, given the population of this species at both a county and national level, this is not considered to be significant. Irish hares are well distributed across Ireland and their range is predicted to be 81,400 km² (i.e. 8,140,000 ha) (NPWS, 2019b; Reid et al., 2007) on a national level. Moreover, significant grassland habitat is present south of the OES (outside the application boundary) to continue to support this species on a local level. The losses to the habitats to facilitate the OSS represent a negligible percentage of this and any minor impact to their population as a result of the construction phase is not expected to impact their overall conservation status. Therefore, effects to this species are assessed as **not significant**.

2.10.146 Other effects such as disturbance from noise, vibrations and artificial light will be localised to the proposed development areas and are not expected to significantly affect this species and have been scoped out.

Irish stoat

2.10.147 Irish stoat is protected under the Wildlife Acts. In addition, the DLRCC County Development Plan includes Policy Objective GIB22, which provides protection for species listed under the Wildlife Acts. It is estimated the approximately 160,000 individuals exist in Ireland (i.e. 5,000 at a county level) and they are well distributed across Ireland (VWT, 2024).

2.10.148 Irish stoat are considered absent from the O&M Base due to the lack of suitable habitat present and effects to this species has been scoped out for this area. No incidental sighting of this species was recorded throughout the OES. Much of the OES will be set within urban location, which are unsuitable for this species and stoat's are unlikely to be present in these locations. This species is more likely to be present within the fragmented areas of suitable habitats such as woodland, hedgerows, and larger areas of grassland at the OSS and the presence of this species cannot be discounted.

2.10.149 Habitat losses to high value habitats such as woodland, hedgerows and grassland will result in a reduction in suitable habitat for this species and would adversely affect its overall population. Project design through the Onshore ECR and OSS siting has considered these valuable habitats for retention where possible, with only 0.25 km of hedgerow, 0.09 ha of broadleaved woodland, and 0.25 ha of riparian woodland (upper limits) to be possibly removed to facilitate the proposed development across the OES. Additional project design features (e.g. HDD technology) will be implemented to further minimise losses of these habitats (refer to Table 17). However, some reduction in suitable habitat for stoats is expected as a result of the construction phase of the OES. The effect of this would cause a reduction in suitable habitats that support this species and may cause a reduction in the population at a local level. Therefore, this impact is assessed to be significant on a local level (significant in EIA terms). Measures are identified in Table 17 and Table 25 reduce residual effects to a non-significant level.

2.10.150 Other effects such as disturbance from noise, vibrations and artificial light will be localised to the proposed development areas and are not expected to significantly affect this species and have been scoped out.

Red squirrel

2.10.151 Red squirrel is protected under the Wildlife Acts. In addition, the DLRCC County Development Plan includes Policy Objective GIB22, which provides protection for species listed under the Wildlife Acts.

2.10.152 The red squirrel translocation in Ireland survey (Waters and Lawton, 2011) details that the distribution of red squirrel across Ireland is fairly widespread, with only areas of the west not supporting this species. However, significant populations of grey squirrel *Sciurus carolinensis* are also noted, including for the study area, which will limit red squirrel distribution, with the red squirrel suffering a 20% decline in range since the introduction of the grey squirrel to Ireland due to competition for resources (Waters and Lawton, 2011). The all-Ireland species action plan (NPWS, 2008) states that there are an estimated 40,000 red squirrels left in Ireland, limited to woodland habitats on which they rely for foraging.

2.10.153 Considering their reliance on woodland habitat, red squirrel would be disproportionately affected by any woodland loss required on the site. The OES would require the potential removal of c. 0.09 ha of broadleaved woodland, and 0.25 ha of riparian woodland (upper limits). This would cause a reduction in the quantity of suitable habitat available for this species locally. Project design through the Onshore ECR and OSS siting has considered these valuable habitats for retention where possible. Moreover, the use of HDD technology will be implemented to further minimise losses of woodland habitats (refer to Impact 2). In the absence of project design features and other avoidance and preventative measures (identified in Table 17), the potential effect to this species are considered significant on a local level (significant in EIA terms). Measures are identified in Table 17 and Table 25 that reduce residual effects to a non-significant level.

2.10.154 Other effects such as disturbance from noise, vibrations and artificial light will be localised to the proposed development areas and are not expected to significantly affect this species and have been scoped out.

Fish

2.10.155 The aquatic ecology survey (see Annex 3 of the Onshore Biodiversity Technical Baseline Report in Volume 5, Appendix 6.5.2-1) confirmed the presence of lamprey (most likely brook lamprey) and European eel within the Shanganagh River and tributaries across the OES study area. The Onshore Biodiversity Technical Baseline Report assessed lamprey and European eel as being important on a county level. They are protected under local policy GIB22. Note that the marine environment has been considered within the offshore chapters of this EIAR.

- 2.10.156 The national population of brook lamprey is estimated to be 1,221 (across 1x1 km grids), stretching over a total surface area of 52,000 km². Rivers across the study area total approximately 2.95 km (NPWS, 2019b).
- 2.10.157 It is difficult to estimate the national population of eel within estuaries (Inland Fisheries Ireland (2014)); however, they are critically endangered (Nelson et al., 2019).
- 2.10.158 Similarly, the national population of brown trout could not be determined, and this species is not listed on the *Checklists of protected and threatened species in Ireland* (Nelson et al., 2019). Brown trout have been included in this assessment following consultation with IFI are assessed to be important at a local level.
- 2.10.159 No habitat loss or fragmentation is expected to occur that will impact these species directly due to the use of HDD technology or similar at trenchless crossings leaving the rivers unaffected (refer to Table 17). Therefore, there will be no significant impact relating to habitat loss.
- 2.10.160 Water temperature has a major impact on the distribution, migration, survival, physiology, feeding, growth, reproduction, and behaviour of all fish species (Environment Agency, 2008; Miñana-Albanell et al., 2024). This can be caused from the loss of riparian habitat providing canopy cover. This impact will therefore be avoided through the use of HDD as no loss of riparian habitat will occur from the HDD compounds, launch pit and reception pit being located sufficiently far from the riparian habitat.
- 2.10.161 Construction works will be set back from the river and stream channels, except for the two open-cut trenched crossings at Sector 7, and where it is not possible to maintain an adequate set back to prevent runoff going to the watercourse. Additional control measures such as silt fences will be deployed at these locations.
- 2.10.162 Noise related impacts to migratory and/or spawning fish could potentially be caused from HDD activities and general construction-related noise by plant and equipment during the construction phase across the OES near watercourses. This includes work activities in the HDD compounds and launch and receptor sites. This impact will last for the duration of the construction and decommissioning phases of the development at the four river crossings, which are detailed as follows:
- ▲ TX-02 Shanganagh River - 15 days;
 - ▲ TX-04 Kill-o-the-Grange Stream - 15 days;
 - ▲ TX-05 Kill-o-the-Grange Stream - 15 days; and
 - ▲ TX-06 N11, Carrickmines Stream - 40 days.

- 2.10.163 Fish can be negatively affected by noise impacts with de Jong et al. (2020) stating that that continuous sounds with irregular amplitude and/or frequency-content (e.g. heavy ship traffic) were most likely to cause stress, and continuous sounds were also most likely to induce masking and hearing-loss and depended on the ability of fish to relocate to other, quieter areas. Noise can also affect the reproductive success of fish (de Jong et al., 2020). Cox et al. (2018) found that anthropogenic noise can also negatively affects fish behaviour and physiology.
- 2.10.164 There are no generally accepted quantitative thresholds available for behavioural responses, largely due to a lack of experimental evidence and high levels of context specific variation in behaviour depending on factors such as sex, age, size and motivation (e.g. foraging) of individual fish. The preferred trenchless drilling technique along the onshore ECR is Horizontal Directional Drill (HDD) or similar. HDD uses rotary rather than percussive drilling methods which will limit the nature and extent of any ground borne vibration arising from the works. Further details on vibration from HDD use at trenchless crossings is provided in the Noise and Vibration chapter (Volume 5, Chapter 5).
- 2.10.165 As noted in Table 1, the IFI suggest that the trenchless technique is the preferred option for cable installation and that timing constraints do not apply to trenchless techniques which may take place at any time of year subject to agreement with IFI on a method statement and location of the crossing points.
- 2.10.166 In addition, lamprey are categorised as low hearing sensitivity fish species (Popper et al., 2014) because they lack specialist hearing structures and consequently their ear is relatively simple (they have no swim bladder or anatomical structure tuned to amplify sound signals). Instead, lamprey species are generally considered to be sensitive only to sound particle motion within a narrow band of frequencies. Indeed, some research indicates that they may only be sensitive to particle motion (Popper & Hawkins, 2019). Because of this physiology they are inherently resilient to the kinds of physical injury that other fish species can experience as result of adverse levels of underwater sound and vibration and therefore physical injury is highly unlikely to occur. Moreover, adverse changes in behaviour (e.g. behavioural changes that affect migration) as a result of underwater noise and vibration on lamprey are also not likely to occur. Lampreys would need to be very close to a powerful noise source for a behavioural response to occur (Popper, 2005; Popper and Hastings, 2009).
- 2.10.167 Therefore, effects arising from noise impacts are considered unlikely to have a significant effect on the conservation status of migratory fish.
- 2.10.168 The operational noise will not cause a significant effect to fish and effects during this phase have been scoped out.

2.10.169 The construction and decommissioning phases may cause potential pollution events, such as spillages and leakages of hydrocarbons, and run-off of suspended sediments entering the watercourse. The effects of this impact will be rare in occurrence, localised, and temporary as only small volumes of pollutants are likely to enter this habitat, and so are highly likely to be quickly dispersed downstream. Furthermore, the avoidance and preventative mitigation measures identified in the CEMP and Table 17 to minimise pollution risk to aquatic habitats minimise these impacts so that there will be no significant effect.

2.10.170 Similarly, dust creation caused during the construction and decommissioning phases. In areas of the OES that are within 100 m of any rivers, this is likely to deposit within the water and adversely affect fish by altering the water chemistry. This effect will be short-term (i.e. the duration of localised construction and decommissioning works) and will recover quickly. Impacts arising from dust are assessed to be negligible in the Air Quality chapter (Volume 5, Chapter 10). Furthermore, the avoidance and preventative mitigation measures identified in the CEMP and Table 17 to minimise pollution risk to aquatic habitats minimise these impacts so that there will be no significant effect.

Terrestrial invertebrates

2.10.171 Invertebrates were assessed in the Onshore Biodiversity Technical Baseline Report as being important on a local level. They are afforded local policy protection under policy GIB22. Notable invertebrates are also protected under the Wildlife Act 1976, as amended.

2.10.172 The majority of the OES and O&M Base study areas are built land of negligible value to invertebrates and the marine habitat adjacent is unlikely to be significantly impacted by the proposed works here. As such, significant effect arising to invertebrates at the O&M Base have been scoped out.

2.10.173 The OES and O&M Base study areas are not considered likely to support common and widespread invertebrates due to much of the study areas comprising built land and common and widespread habitats within an urban setting. The habitats most likely to support significant numbers or notable invertebrates comprise the grasslands, hedgerows, scrub, fragmented areas of woodland and the freshwater habitats (i.e. rivers and WB1).

2.10.174 Invertebrates are likely to be impacted by the loss of habitats area, habitat connectivity and habitat quality, with the loss of habitat area being the worst case for habitat loss. In addition, pollution events causing a reduction in water quality across the extent of the river catchment, which provides important habitat for aquatic invertebrates. However, any potential accidental spills are likely to be rare in occurrence and small in scale. The quantities of potential contaminants entering these watercourses are unlikely to be significant in quantity as a result. Therefore, this impact is assessed as not significant. Furthermore, the avoidance and preventative mitigation measures identified in the CEMP and Table 17 to minimise pollution risk to aquatic habitats minimise these impacts so that there will be no significant effect.

- 2.10.175 Increased noise, vibrations and lighting during all phases is considered to pose a negligible risk to invertebrates considering the semi-urban environment most of the project is situated across.
- 2.10.176 Habitat losses will occur once during the construction phase and their effects on invertebrates will be adverse, temporary - long term for the onshore ECR and Landfall Site (depending on the habitat to be lost). Habitat loss for the OSS will be permanent. This impact will not occur during the operational phase. Effects will be similar to the construction phase during the decommissioning phase but to a lesser degree.
- 2.10.177 Pollution events will be rare and limited to accidental spillages and leaks. The effects of this impact would be temporary and are expected to be infrequent and unlikely. The effects would be temporary and adverse, with aquatic habitats being most at risk. However, given the transient nature of these habitats, the effects are anticipated to quickly disperse.
- 2.10.178 Invertebrate tolerance varies, with some invertebrates being tolerant of changes whereas, other species act as indicator species are easily lost in habitats of poor quality. Given the urban nature of the project, it is anticipated that mostly common and widespread invertebrates will be present. Although aquatic habitats may support more sensitive and rarer species.
- 2.10.179 The overall result of the above impacts, in the absence of project design features and other avoidance and preventative measures (identified in Table 17), would be a likely decrease in the population of invertebrate species. The effects arising to invertebrates from these impacts is assessed to be significant at a local level (significant in EIA terms). Measures are identified in Table 17 and Table 25 that reduce residual effects to a non-significant level.

Proposed mitigation and residual effects

2.10.181 Table 25 details the proposed mitigation measures and the significance of any residual effects (if applicable) associated with these impacts.

Table 25 Project design measures, other avoidance and preventative measures and proposed additional mitigation and reinstatement with regards to Impact 3

Ecological feature	Project design and other avoidance and preventative measures	Proposed additional mitigation	Significance of residual effect
Amphibians	Dust suppression measures identified in the CEMP and Table 17.	No additional mitigation is required.	No significant residual effect on the local conservation status is considered likely.
Reptiles	No specific measures for reptiles are included	No mitigation is required.	No significant residual effect on the local conservation status is considered likely.
General passerine bird assemblage	The general construction measures set out in the CEMP and Table 17 will help alleviate potential impacts to birds during the construction phase. The habitats of highest value for birds have been retained through the route design (as detailed in Table 17) and any habitats that are lost will naturally regenerate and will be replanted where possible (e.g. reinstatement tree/hedgerow planting for those removed). Furthermore, high value nesting habitats such as woodland, hedgerows, and treelines, will be protected in areas where HDD is proposed rather than trenching, thus	No additional mitigation is required.	Temporary habitat loss will cause a minor adverse impact. Permanent habitat losses are limited to the OSS, comprising a relatively small area and reinstatement habitat will be provided. Therefore, no significant residual effects are expected

Ecological feature	Project design and other avoidance and preventative measures	Proposed additional mitigation	Significance of residual effect
	<p>avoiding further unnecessary losses to habitats.</p> <p>Vegetation which could support nesting birds (e.g. trees, scrub or long grass) will be cleared outside the main bird breeding season (March to August inclusive) to avoid damage to, or destruction of nests.</p>		
Black guillemot	<p>The nest site, located underneath Carlisle Pier near the O&M Base, will be retained under current proposals and no habitat losses are expected to impact this species.</p> <p>The general construction measures set out under the CEMP and Table 17 will help alleviate potential impacts to birds during the construction phase (e.g. avoiding, or minimising pollution events).</p> <p>Dust suppression measures identified in the CEMP and Table 17. These measures in the CEMP will mitigate the levels of dust creation caused by the construction and decommissioning phases from being created and potentially depositing into the marine environment that provide foraging</p>	<p>Black guillemot were recorded as not breeding or using St. Michael's pier (on which the O&M Base will be situated). However, the uptake of this location as a nesting location between the time of writing and the start of the construction phase cannot be discounted. A follow-up survey will be conducted in the breeding season immediately prior to the commencement of the construction of the O&M Base to confirm their continued absence. Further mitigation may be required in the event that this species is confirmed breeding in this location.</p>	No significant residual effects are expected

Ecological feature	Project design and other avoidance and preventative measures	Proposed additional mitigation	Significance of residual effect
	<p>habitat for this species. The use of dust suppression techniques will be employed during dry spells such as the use of a water bowser and wheel washing. Seasonal timing of works to avoid breeding bird season to be implemented. All necessary construction works will be undertaken outside the nesting bird season (which is from March to August inclusive).</p>		
Shorebird assemblage	<p>The avoidance of these areas in the route selection process for the OES avoids losses of habitat for these species.</p> <p>The general construction measures set out under the CEMP and Table 17 will help alleviate potential impacts to birds during the construction phase (e.g. avoiding, or minimising pollution events).</p>	<p>Artificial lighting during all phases will avoid the coastal habitats upon which these species rely.</p> <p>Shorebird surveys will be conducted following the completion of the proposed development to monitor the shorebird assemblage populations following the completion of the project. This will inform potential future impacts for similar developments.</p>	No significant residual effects are expected.
Raptor assemblage	<p>The habitats of highest value for birds have been retained through the Onshore ECR design avoidance (refer Table 17) and any habitats that are lost will be allowed to naturally regenerate</p>	No additional mitigation is required.	Permanent habitat loss is expected for the areas designated for the OSS. This will comprise mostly grassland and cannot be

Ecological feature	Project design and other avoidance and preventative measures	Proposed additional mitigation	Significance of residual effect
	<p>and, where possible, will be replanted (e.g. tree and hedgerow planting for those lost).</p> <p>High value nesting habitats located at watercourse crossings, such as riparian woodland will be retained by utilising HDD or similar technology rather than trenching, thus avoiding unnecessary losses to these habitats.</p> <p>Vegetation which could support nesting birds (e.g. trees, scrub or long grass) will be cleared outside the main bird breeding season (March to August inclusive) to avoid damage to, or destruction of nests.</p>		<p>suitably compensated for elsewhere. This will result in a minor loss of potential foraging area for raptors. However, this is not expected to lead to any significant residual effects.</p> <p>In summary, no significant residual effects are expected.</p>
Pipistrellus spp.	<p>The habitats of highest value for bats will be retained through the avoidance of these areas in the route selection process for the OES (as detailed in Table 17) and any habitats that are lost will be replanted, where possible.</p> <p>Where these habitats coincide with the trenchless crossing locations, high value habitats such as woodland, hedgerows, treelines, and rivers, will be retained by using HDD or similar techniques rather</p>	<p>Further enhancement will be achieved through the provision of two bat roosting boxes will be installed before construction commences for every mature tree that requires felling to compensate for any potential harm to T14 and T15. These will be located on suitable retained trees within Eurofound land, in agreement with the landowners.</p> <p>An NPWS derogation licence for the disturbance and potential loss of trees T14 and T15 in Sector 2 will be acquired if a bat roost is identified. Alternative roosting provisions must be in place prior to the loss of these trees (if required).</p> <p>A sound barrier will be erected to protect potential roost locations in T14 and T15 from potential effects of noise. This</p>	No significant residual effects are expected.
Brown-long eared			No significant residual effects are expected.
Myotis spp.			No significant residual effects are expected.
Leisler's bat			No significant residual effects are expected.

Ecological feature	Project design and other avoidance and preventative measures	Proposed additional mitigation	Significance of residual effect
	<p>than trenching, thus avoiding further unnecessary losses to habitats.</p> <p>Lighting will be minimised and directed away from valuable retained habitats for bats (including T14 & T15 in Sector 2 along the onshore ECR).</p>	<p>will also benefit the potential bat roosts by preventing accidental illumination of these potential roost sites.</p> <p>A survey of T14 and T15 trees will be undertaken at an appropriate time in the bat roosting season, at the earliest available opportunity.</p>	
Badger	<p>The project design has avoided valuable habitats where possible.</p> <p>Pre-commencement verification surveys will be undertaken to ensure that no new badger setts have been created between the time of baseline surveys and the commencement of the construction phase.</p> <p>Reasonable avoidance measures are set out under the CEMP, which will alleviate potential impacts to badgers during the construction phase. Such measures will include the following:</p> <ul style="list-style-type: none"> ▪ A pre-commencement survey of all vegetated habitats across the OES by the ECoW within a minimum of 3-4 months prior to any construction works commencing for the presence of new badger setts and the 	<ul style="list-style-type: none"> ▪ If any active badger setts are identified the implementation of a 50 m buffer and appropriate mitigation will be provided by the ECoW. ▪ An NPWS derogation licence will be applied for if required in advance of completing the works. ▪ No heavy machinery will be used within 30 m of the sett entrance or light machinery within 20 m (unless carried out under licence); ▪ Badger setts will be protected from all works through a 50 m buffer during the breeding season (December to June inclusive). ▪ All contractors/operators will be made fully aware of any new badger setts identified. Fell trees away from badger setts and avoid blocking any badger pathways; ▪ Any security lighting will be directed away from setts; and ▪ If new badger setts are identified, works will be prevented from occurring within 50 m and appropriate mitigation will be provided by the ECoW. 	<p>There will be permanent habitat loss for the OSS, which cannot be fully compensated for.</p> <p>Badgers will be excluded from potentially using sett 1 to avoid potential harm or disturbance to badgers during the construction phase.</p> <p>Overall, there will be minor adverse effect from loss of habitat. However, this is not expected to be significant, and no significant effects are expected.</p>

Ecological feature	Project design and other avoidance and preventative measures	Proposed additional mitigation	Significance of residual effect
	<p>activity status of the existing sett;</p> <ul style="list-style-type: none"> ▪ All excavations will either be covered overnight or prided an earth ramp to prevent the accidental entrapment of badgers; ▪ Cap exposed pipe systems >300 mm when contractors are off site and cover or provide exit ramps from exposed trenches or holes, to prevent badgers becoming trapped; ▪ Fell trees away from badger setts and avoid blocking any badger pathways; ▪ Direct any security lighting away from setts; ▪ Store chemicals in a safe place; and <p>Plant dense native shrubs around setts to provide added protection (e.g. gorse, blackthorn, holly and elder).</p>	<p>An NPWS license will be obtained where necessary in advance of undertaking the works,</p> <ul style="list-style-type: none"> ▪ Sett 1, located in Sector 2, will be monitored for a period of 5-days (minimum) immediately prior to the construction phase starting to check that it is still disused. If it is found to be active, then a derogation licence will be applied for from NPWS for disturbance and sett closure due to its proximity to the proposed construction area. If found to be active, sett 1 will require temporary closure using one-way gates²⁷ to avoid the accidental harm to badgers during the construction phase. Following the implementation of the one-way gates, the sett will be monitored for a minimum period of 21-days, to ensure that all badgers have vacated the sett. The gates will be removed following the completion of all construction activities within 30 m of this sett. 	

²⁷ Any active entrances should have one-way gates installed (plus proofing around sides of gates as illustrated) to allow badgers to exit but not to return, as recommend in 'Guidelines for the treatment of badgers prior to the construction of national road schemes', National Roads Authority (2009b).

Ecological feature	Project design and other avoidance and preventative measures	Proposed additional mitigation	Significance of residual effect
Hedgehog	<p>Reasonable avoidance measures and general construction measures are set out in the CEMP, which will alleviate potential impacts to hedgehogs during the construction phase, including measures to prevent hedgehogs becoming trapped in temporary excavations. Such measures include the following:</p> <ul style="list-style-type: none"> ▪ Pre-commencement surveys will be undertaken under the presence of the ECoW to ensure that hedgehogs are present within planned vegetation removal. ▪ Any hedgehogs found will be gently moved to a nearby area of similar/suitable retained habitat. ▪ Cap exposed pipe systems when contractors are off site and cover or provide exit ramps from exposed trenches or holes, to prevent hedgehogs becoming trapped; ▪ Good house-keeping through the use of pallets for 	<ul style="list-style-type: none"> ▪ No additional mitigation is required. 	<p>There will be permanent habitat loss for the OSS, which cannot be fully compensated for. Overall, there will be minor adverse effect from loss of habitat. However, this is not expected to be significant and no significant effects are expected.</p>

Ecological feature	Project design and other avoidance and preventative measures	Proposed additional mitigation	Significance of residual effect
	<p>construction materials and correct disposal of waste in appropriate skips etc.; and</p> <ul style="list-style-type: none"> Store chemicals in a safe place. 		
Otter	<p>Reasonable avoidance measures similar to those detailed above for badger and detailed within the CEMP would alleviate potential impacts to otter. Such measures include the following:</p> <ul style="list-style-type: none"> A pre-commencement check for otter holts will be undertaken by the ECoW. If a holt is found within 150 m of proposed works (NRA, 2008), all works within this 150 m buffer must temporarily cease and an NPWS license and advice will be sought. Cap exposed pipe systems when contractors are off site and cover or provide exit ramps from exposed trenches or holes, to prevent hedgehogs becoming trapped; Good house-keeping through the use of pallets for construction materials and 	<p>A minimum 150 m buffer zone will be implemented around known otter holts with protectional fencing, where appropriate to protect against the accidental encroachment of construction activities and staff into the location of the holt. Any works encroaching this buffer will require a derogation licence from NPWS.</p> <p>The project design has minimised potential impacts to the most valuable habitats (i.e. rivers and riparian habitats) through site selection and design.</p> <p>HDD or similar trenchless techniques will be implemented at trenchless crossings to avoid impacts to watercourses and associated riparian habitats which may support otters and their holts. Furthermore, the work of multiple HDD crossings simultaneously will be avoided (i.e. work on one HDD crossing at a time) to avoid creating multiple vectors of noise and disturbance and allow otters to naturally migrate away from a disturbance in either direction.</p>	No significant residual effects are expected.

Ecological feature	Project design and other avoidance and preventative measures	Proposed additional mitigation	Significance of residual effect
	<p>correct disposal of waste in appropriate skips etc.; and</p> <ul style="list-style-type: none"> ▪ Store chemicals in a safe place. <p>Avoid angling artificial lighting towards watercourses and associated riparian habitat</p>		
Other mammals (pygmy shrew, Irish hare, Irish stoat, red squirrel)	<p>Reasonable avoidance measures similar to those detailed above for badger and detailed within the CEMP would alleviate potential impacts to small mammals.</p> <p>The project design has minimised potential impacts to the most valuable habitats through its design.</p>	No additional mitigation is required.	<p>No significant effect is expected on the conservation status of local small mammal populations.</p> <p>Minor adverse effect from loss of foraging habitat is considered not significant.</p>
Fish (Brown trout, lamprey, European eel)	<p>Impacts to rivers and associated riparian habitat will be avoided through the implementation of HDD or similar techniques rather than trenching at watercourse crossings along the onshore ECR.</p> <p>Trenching work near smaller water courses and ditches is to cease at night, with the exception of TX-06 and TX-07 where 24-hour working is required and will include measures such that eels</p>	No additional is mitigation required.	No significant residual effects are expected.

Ecological feature	Project design and other avoidance and preventative measures	Proposed additional mitigation	Significance of residual effect
	<p>cannot become trapped within the work area.</p> <p>Pollution prevention measures are set out in the CEMP.</p>		
Invertebrates	<p>Retained habitats to be appropriately protected throughout the construction phase.</p> <p>Habitats to be reinstated following the completion of the construction phase.</p> <p>Areas of habitat that are lost (e.g. grassland and woodland etc.) will be allowed to naturally regenerate following the construction phase, where possible. Additional planting using species with known ecological benefits (i.e. good for pollinating invertebrates) will be planted to compensate for the permanent loss of habitats required for the OSS. A Landscaping Plan (Drawing 229100714-MMD-00-XX-DR-C-0250) has also been prepared for the OSS which includes a tree planting mix covering an area of approximately 1342 m² and a wildflower meadow to the north-east of the site in an area covering approximately 3836 m².</p>	No additional mitigation is required.	Habitat loss will be temporary, adverse at a local level in the short term until the habitats have become adequately re-established following the construction phase. No significant residual effects are expected.

Impact 4: Spread of invasive alien species

Potential Impacts

2.10.182 The Onshore Biodiversity Technical Baseline Report details that IAS are present on the Onshore ECR. These were identified and located to the east of the Onshore ECR, with the greatest abundance in Sector 1 and one stand of giant hogweed in an agricultural field boundary ditch in Sector 7. No IAS were recorded at the proposed O&M Base.

2.10.183 It is an offence under the Wildlife Act 1976 as amended to cause an exotic species of flora or fauna to grow in the wild anywhere in the State. S.I. No. 374 of 2024 – European Union (Invasive Alien Species) Regulations 2024 also makes it an offence to spread an IAS of national concern, Furthermore, IAS are addressed under Ireland’s 4th National Biodiversity Action Plan 2023 – 2030 and local policy GIB28, which states the following:

‘...ensure that proposals for development do not lead to the spread or introduction of invasive species. If developments are proposed on sites where invasive species are or were previously present, the applicants will be required to submit a control and management program for the particular invasive species as part of the planning process and to comply with the provisions of the European Communities Birds and Habitats Regulations 2011 (S.I. 477/2011).’

2.10.184 The following IAS were identified at the Landfall Site and Sectors 2, 3 and 7:

- ▲ Giant hogweed *Heracleum mantegazzianum*,
- ▲ Japanese knotweed *Reynoutria japonica*;
- ▲ Montbretia *Crococsmia x crocosmiiflora*; and
- ▲ Three-cornered garlic *Allium triquetrum*.

2.10.185 The construction works will present a potential risk of causing the accidental spread of IAS across the overall study area and beyond. The primary ways the Dublin Array onshore infrastructure could increase the spread of IAS is via:

- ▲ Disturbance to existing IAS within the construction footprint;
- ▲ Inadvertently importing IAS from elsewhere, primarily on vehicles, but also on other equipment and/or personnel; and
- ▲ Planting stock or planting substrate.

2.10.186 Any spread of IAS risks long-term (or permanent if left unmitigated) effects as IAS become established and are able to self-seed and spread further still. Areas can easily become dominated by IAS and recoverability of the original habitat is low.

2.10.187 The spread of IAS can reduce through the reduction of pollination of native flora (DLRCC, n.d.). Moreover, IAS have few natural controls and they can outcompete native flora. As a result, they are highly adaptable and tolerant of a range of conditions. IAS often do not support fauna in the same way as native flora, leading to further adverse effects to local fauna such as invertebrates (Stokes et al., 2004).

2.10.188 The impact could occur at any point during the construction period; however, there would be increased risk during any works immediately following high levels of rainfall or a storm. Without appropriate mitigation, the impact is considered likely to occur given the high abundance of IAS identified across the Onshore ECR.

2.10.189 In the absence of measures set out in Table 17 and Table 26 this impact is considered to be significant.

Proposed mitigation and residual effects

2.10.190 An Invasive Species Management Plan (ISMP) has been produced and presented with the CEMP in Volume 7 detailing biosecurity, management, and control measures to be implemented during the proposed works to minimise the potential risk of spreading IAS both within and beyond the overall study area. There is a commitment to implementation of the ISMP as an avoidance/preventative measure in Table 17.

Table 26 Control measures for IAS identified within the overall study area

IAS	Control measures	Residual effect
Giant hogweed	<p>The following general recommendations for giant hogweed will be adhered to as part of the plan.</p> <ul style="list-style-type: none"> ▪ Giant hogweed contains phototoxic sap which presents a serious health hazard to humans. A risk assessment will be prepared in advance of control measures and all site personnel will be made aware of the risks associated with the plant; ▪ Only competent and qualified personnel will be tasked with controlling giant hogweed, and they must wear personal protective equipment (PPE) including protective clothing, gloves and goggles or glasses; ▪ Where giant hogweed is present on public land, the area will be cordoned off and a sign explaining the risks of giant hogweed will be placed; ▪ Giant hogweed reproduces and spreads through seeds. Therefore, any physical control measures must only be employed before the plant has started to seed to prevent further spread. The plant does not reproduce through vegetative means; and ▪ Equipment, clothing and footwear will be checked following treatment operations and cleared of fruits/seeds as necessary. <p>In addition, five options for control of giant hogweed have been proposed. Any one or a combination of these five options will be used to eradicate giant hogweed from the OES and avoid the spread of the species:</p> <ol style="list-style-type: none"> 1. Cut the roots using a sharpened spade. The root will be cut at least 10 cm below soil level, but it may be required to cut further down (i.e. up to 25 cm) if additional soil is covering the plant. The plant will be removed from the soil and either destroyed or left to dry out. Such soil and all vegetative material should not be stock-piled within 10 m of any watercourse due to the risk of material being transferred by water. Cutting will take place in early spring and repeated in mid-summer. This method results in immediate death of the plant. However, it is not suitable for small plants and does not deal with the seed bank, therefore monitoring will be required to check for regrowth. 	<p>With the implementation of the mitigation measures, no significant adverse effects are predicted relating to the spread of IAS.</p>

IAS	Control measures	Residual effect
	<ol style="list-style-type: none"> 2. Pull the roots by hand. This method will only be used for small plants and seedlings as hand pulling large plants is likely to break the stem and leave the root intact. 3. Stems will be cut using a scythe. This method will be used before the plant has started flowering. Regrowth will occur from the base, so cutting should be repeated two to three times during the growing season. When repeated carefully, this method will deplete nutrient reserves and eradicate the population in several years. 4. Cut the flower heads. This method will be suitable for small plants. Cutting the plants in early to late summer will prevent seed production, but if the plant is cut too early it will stimulate production of secondary stems which can flower later in the season. Plants subject to flower head removal have a high potential to regenerate and produce new flowers, therefore it is recommended to use other means of physical control in the first instance. Flower head removal should only be used as an improvised solution where no other methods of control have been attempted earlier in the season and it is too late to employ these methods. The cut umbels must be collected and destroyed. 5. Use chemical control. The only herbicide recommended for control of giant hogweed is glyphosate. Glyphosate will be applied in early March or early April before the stem has fully elongated, and again in September to kill any regrowth or seedlings. Where sensitive native vegetation is present, herbicide will be injected into the stem as an alternative to spraying the plant. Herbicide application will not kill the seed bank, therefore monitoring and herbicide applications must be repeated annually over three to five years. 	
Japanese knotweed	<p>Prior to the construction phase/excavations at the Site, the following bio-security measures will be in place at the site:</p> <ul style="list-style-type: none"> ▪ A 7 m exclusion zone, measured horizontally from the nearest visible Japanese knotweed plant, will be established around all areas infested by Japanese knotweed; ▪ Where part of the exclusion zone encroaches onto an active public access, or beyond a site boundary, this section of the exclusion zone will be positioned as close as possible to the boundary; 	

IAS	Control measures	Residual effect
	<ul style="list-style-type: none"> ▪ The exclusion zone will be delineated with a secure temporary construction fence, such as Heras panels or timber post and netting, and be fitted with appropriate warning/advisory signage; ▪ Fencing will remain in place for the duration of construction works, and while the stand is being treated, allowing the rest of the fencing to be constructed. No fencing will be erected within this exclusion until treatment is completed and no new growth is detected; and ▪ Signs will be placed on the fence to advise site personnel that the area contains Japanese knotweed material, and that bio-security measures are actively in force. <p>Following this, all stands of Japanese knotweed will be controlled through a combination of physical and herbicide over a period (typically 3-5 years), until no growth is observed.</p>	
Montbretia	<p>Two options for the treatment of montbretia have been proposed. Either one or a combination of these two options shall be used to eradicate montbretia from the Site and avoid spread of the species:</p> <ol style="list-style-type: none"> 1. Excavate the entire stand and bury or dispose of to a licenced landfill or incineration facility. This method should be used before the flowering/seeding season to prevent re-infestation from seeds; or 2. Herbicide may be sprayed where the stand is away from native plants and watercourses. Wiping leaves with glyphosate will provide an accurate application to isolated plants and prevent damaging adjacent non-target plants via spray drift. A qualified and experienced contractor will be employed to carry out herbicide treatment, as described for giant hogweed. <ul style="list-style-type: none"> ▪ Any reproductive plant material will be carefully disposed of following NRA (2010) guidelines. Any equipment used will be inspected and thoroughly cleaned, as will the footwear and clothing of operatives removing invasive species material. Any material arising from cleaning of equipment and footwear will be disposed of in a manner which will not cause the spread of invasive species. 	

IAS	Control measures	Residual effect
<p>Three-cornered garlic</p>	<p>Three options are provided below for the removal of this species. Either one of a combination of these three options shall be used to eradicate three-cornered garlic from the Site and avoid spread of the species:</p> <ol style="list-style-type: none"> 1. Manual removal of bulbs is suitable for isolated plants. The bulbs will be disposed of by crushing or incineration. Removal must be repeated over several years in spring and autumn to ensure a high level of control; or 2. Use herbicide application. Spraying exposed bulbs with herbicide is suitable for larger areas, but it is likely to damage sensitive native fauna. Wiping leaves with glyphosate will provide an accurate application to isolated plants and prevent damaging adjacent non-target plants via spray drift. The most effective time to apply herbicide is at the bulb exhaustion stage, which normally occurs at early flowering. Three of the 11 locations where three-cornered garlic was recorded are near watercourses. As for giant hogweed, a licence is required for herbicide application and there are constraints for use around watercourses. <ul style="list-style-type: none"> ▪ Undertake mowing. This option is suitable where three-cornered garlic is growing on grassland or roadside verges and has not started to flower. The area should be mowed as low as possible before flowering and repeated a few weeks to control regrowth. This method should not be used if the plant has gone to seed because mowing can facilitate the spread and establishment of this species. <p>Any reproductive plant material will be carefully disposed of following NRA (2010) guidelines. Any equipment used will be inspected and thoroughly cleaned, as will the footwear and clothing of operatives removing invasive species material. Any material arising from cleaning of equipment and footwear will be disposed of in a manner which will not cause the spread of invasive species.</p>	

2.11 Environmental assessment: Operational phase

2.11.1 This section addresses the operation and maintenance phase impacts to the important ecological receptors identified in the Onshore Biodiversity Technical Baseline Report.

Impact 5: Disturbance or damage to important ecological features via maintenance, through increased noise, vibrations, and artificial lighting

Potential impacts

OES

- 2.11.2 The OES will be subject to regular local operation, inspection and maintenance intervals. Planned maintenance requires one visit to each cable joint bay per year by a team of two personnel. Unplanned maintenance may involve the repair of onshore cable faults. As set out in Volume 2, Chapter 6 Project Description this is extremely rare (indicatively 1-2 events per lifetime). Typically, this involves excavating the two adjacent joint bays, pulling the cable back through the ducting and pulling a new cable through. Alternatively, the area of the fault may be excavated (with an additional 40 m in both directions) and two new joints installed within this area. Methods for excavation and reburial will be similar to the original installation. There will be approximately six to eight visits per month are anticipated, typically involving two personnel and quarterly inspection site and maintenance visits as required.
- 2.11.3 These impacts will be localised and highly unlikely to cause significant disturbance to adjacent habitats and species.
- 2.11.4 For unplanned major maintenance, vehicles similar to those used for construction may also be required (e.g. rigid lorries delivering materials, low loaders delivering plants, and individual vehicles for personnel). Significant impacts may occur similar to those detailed in the construction phase.
- 2.11.5 Most maintenance will likely be during day-light hours and lighting will not be required. Lighting will only be required during winter for safe access in mornings and evenings. This will not affect bats due to them being in hibernation during winter. The presence of other nocturnal species is considered unlikely. It is possible that unplanned maintenance may be undertaken during night-time hours, however this is likely to be only on extremely rare occasions. Many of the impacts regarding disturbance or damage to IEFs via maintenance, noise and light during the operational phase will be similar to those detailed in Impact 2 & 3 with species such as bats and birds at most risk of being affected. Otters have also been considered at the OES due to the presence of potential otter holts identified near the Shanganagh WWTP (ITM coordinate 725712, 723223). The otter holt at the O&M Base is beyond 150 m from the O&M Base and will not be affected. Other fauna have been reasonably discounted from being affected by this impact.

Bats

- 2.11.6 Artificial lighting poses a risk to foraging and commuting bats, particularly for slower-flying species, broad-winged species such as brown long-eared and *Myotis* spp. (ILP and BCT, 2023). These species were recorded on the site during bat emergence surveys although in lower abundances than common pipistrelle and soprano pipistrelle, which are less likely to be affected (ILP & BCT, 2023). The result of this impact could be the competitive disadvantage and are less able to forage successfully and efficiently. This may have an impact upon fitness and breeding success.
- 2.11.7 After completion of the construction works of the Onshore ECR and the TJBs at the Landfall Site, the trench will be reinstated and the surface will be returned to its original condition. No significant levels of artificial lighting will be required here. Lighting will be required at the OSS. However, this will be limited to morning and evening times during winter to allow safe access. Bats are not active during this time and will suffer no significant impacts as a result.
- 2.11.8 Noise levels will typically be very low across the OES during this phase and will not be significant. Unplanned maintenance requiring vehicles similar to the construction phase may cause impacts similar to the construction phase.
- 2.11.9 Thus, allowing recoverability to the baseline conditions for this impact. The OSS and O&M Base will likely be the most affected, with the effects being more frequent and more long-term over the duration of Dublin Array onshore infrastructure. However, these are not considered to pose a significant threat to the conservation status of bats identified across the site. Therefore, no significant impacts relating to noise or lighting are expected during this phase.

Birds

- 2.11.10 No notable birds are expected to be impacted as a result of the onshore infrastructure during the operational phase. For example, nesting black guillemots and SPA qualifying birds recorded at Dún Laoghaire Harbour and the proposed site for the O&M Base are already exposed to significant levels of disturbance and are considered habituated to these effects.
- 2.11.11 The habitats comprising the OES study area typically support only common and widespread species, and this impact is not anticipated to significantly impact these species. The operation and maintenance phase of much of the onshore ECR, TJBs and the OSS, will not cause significant levels of light, noise, and vibrations. Furthermore, the TJBs and onshore ECR will be reinstated to its original condition and the light, noise, vibrations will be likely limited to unplanned and planned maintenance activities. Thus, allowing recoverability to the baseline conditions for this impact.
- 2.11.12 The impacts for these species are considered to be not significant.

Otter

- 2.11.13 Vibrations and noise could disturb normal behaviour of otters, with potential holts identified near the O&M Base and the Landfall Site.

2.11.14 The potential impacts caused by noise and vibrations are laid out in the Noise and Vibration chapter (Volume 5, Chapter 5). The operational noise levels predicted for the OSS are provided in Table 16 and detail the predicted daytime and night-time noise levels. The levels demonstrated are not anticipated to impact local fauna. The operation phase of Dublin Array onshore infrastructure is not anticipated to exceed current levels to a point that disturbance to this species is likely. Overall, the impacts are considered to be **not significant**.

O&M Base

2.11.15 It is anticipated that there will be approximately 80 staff utilising the main office building, comprising of permanent on-site management staff and external contractors.

2.11.16 Daily operations will include the delivery of spare parts, materials and supplies to the O&M building. There will not be any heavy engineering or manufacturing processes at the site. Deliveries to the O&M Base will generally consist of small loads delivered by light goods vehicles (on average 2 deliveries per day) with an occasional heavy goods vehicles expected on rare occasions. Traffic will access the internal O&M Base via the main harbour gates off Harbour Road. Deliveries will be moved to/from the warehouse area using a forklift truck.

2.11.17 These activities are not expected to cause any significant effects given the activity is consistent with other similar activities associated with the surrounding urban environment.

Proposed mitigation and residual effects

- 2.11.18 Details in respect to the sound levels generated by the operation of the OSS are detailed in the Noise and Vibration chapter. With reference to nearby ecological receptors, predicted increases of comparison to baseline noise levels have been assessed as minor adverse. It is considered unlikely that the operational noise will significantly affect the ecological features.
- 2.11.19 All lighting at the OSS will be designed to limit light spill ensuring that it is targeted downwards. All lighting will be directed away from important retained habitats such as river habitats, woodland, scrub, treelines, and hedgerows. Directional lighting will be employed for safety and security only. It is anticipated that there would be no light spill beyond the OSS site boundary and the lighting scheme will follow current guidance to minimise impacts to bat species, (e.g. BCT and Institute for Lighting Professionals (ILP) (2023)).
- 2.11.20 Following the implementation of this mitigation, no significant adverse effects are predicted as a result of the maintenance of the OES.
- 2.11.21 The operational phase at the O&M Base may lead to increased noise and vibration and lighting due to personnel and vehicles associated with the operation and maintenance. There is a risk that this may cause disturbance to local fauna, particularly the birds identified to nest there at present (i.e. herring gull, house martin, and black guillemot) and may impact SPA qualifying species as a result.
- 2.11.22 However, given the existing nature of the harbour, which is already experiencing high levels of human disturbance, noise, and lighting, the O&M Base it is not expected to cause any significant increase in the baseline levels. No significant adverse effects are predicted as a result of the maintenance of the O&M Base.

2.12 Environmental assessment: Decommissioning phase

Onshore Electrical System

- 2.12.1 The construction, operation and maintenance works associated with the OES will be managed by the Applicant until the end of the proving period and handover of ownership to EirGrid. As the enduring asset owner, EirGrid will become responsible for decommissioning of the transferring assets at the end of their deemed lifetime.
- 2.12.2 Accordingly, this planning application does not seek permission for decommissioning of the OES. However, for the purpose of enabling a comprehensive environmental impact assessment, we have set out below our recommended approach to decommissioning, should EirGrid choose to decommission any aspect of the OES. This approach is informed by the Applicant's experience of decommissioning onshore substations and onshore export cables on other projects and knowledge of how EirGrid typically do this.

2.12.3 In addition, we have set out below the factors which should inform any decision by EirGrid to decommissioning:

- ▲ The baseline environment at the time decommissioning works are carried out;
- ▲ Technological developments relating to decommissioning of onshore transmission infrastructure;
- ▲ Changes in what is accepted as best practice relating to decommissioning of onshore transmission infrastructure;
- ▲ Submissions or recommendations made by interested parties, organisations and other bodies concerned with decommissioning of onshore transmission infrastructure; and
- ▲ Any new relevant regulatory requirements.

2.12.4 Further, any decommissioning works must:

- ▲ Comply with any decommissioning specific conditions in the Development Consent;
- ▲ Ensure that the environmental impacts are consistent or less in scale and magnitude to those predicted in the EIAR, Natura Impact Statement and Water Framework Directive Assessment associated with the Development Consent or any amendment of the Development Consent or any subsequent consent EirGrid might be granted in respect of decommissioning; and
- ▲ Comply with the relevant health and safety regulations.

2.12.5 A decommissioning plan, along with an environmental management plan, should be prepared before any decommissioning works begin. If necessary, an application for consent should be made by EirGrid, and submitted to the relevant competent authority, in respect of any decommissioning works which require consent. We would expect any such application to involve further environmental assessment and public participation, and for any decision made by the competent authority to be judicially reviewable.

O&M Base

2.12.6 A Decommissioning and Restoration Plan has been included in Volume 7 Appendix 7.2 of the Environmental Impact Assessment Report. As outlined in the Decommissioning and Restoration Plan, the O&M building will be either re-purposed for an alternative use or demolished following the decommissioning of the offshore infrastructure.

2.12.7 Following the decommissioning of the offshore infrastructure the fencing and pontoon will be removed, and the hardstanding area will be taken over by DLRCC for general harbour operations.

2.12.8 Decommissioning activities for the OES and the O&M Base are not anticipated to exceed the construction phase design parameters which have been assessed in Section 2.10. Accordingly, it is anticipated that there would be the same level of impact and resulting level of effect and significance (or less) in comparison to the assessment of construction effects set out in Section 2.10 of this chapter.

Potential impacts

2.12.9 The decommissioning phase are expected to be similar to the construction phase (Impacts 1 to 4) but would be more limited in geographical extent and timescale.

2.12.10 Decommissioning activities are not anticipated to exceed the construction phase worst case criteria assessed; further to this in most cases impact magnitude will be much lower than during the construction phase. Similar to the construction phase, necessary vegetation losses will be minimised and retained areas will be protected from incidental damage.

Proposed mitigation

2.12.11 Given that the infrastructure is expected to be left in-situ, buried cables would be de-energized with the ends sealed and left in place to avoid ground disturbance, there will be no significant risk to ecological receptors and no mitigation measures are required. The decommissioning and demolition of the OSS is not anticipated to have significant effects and also required no further mitigation.

2.12.12 **No significant adverse effects** are predicted as a result of the decommissioning phase of the cable route or the OSS.

2.13 Environmental assessment: Cumulative effects

Onshore projects for cumulative assessment

2.13.1 The specific projects scoped into this cumulative impact assessment, and the tiers into which they have been allocated are presented in Table 27 below. The operational projects included within the table are included due to their completion/commission subsequent to the data collection process for Dublin Array and as such not included within the baseline characterisation.

Table 27 Tier descriptions

Tiers	Development Stage
Tier 1	<p>Project under construction. Those projects that are only partially constructed at the time that baseline characterisation is undertaken.</p> <p>Those that were only recently completed, during the development of the baseline characterisation, the full extent of the impacts arising from the development(s) may not be reflected in the baseline; and/or which may have consent or licences to undertake further work, such as maintenance dredging or notable maintenance works which may arise in additional effects.</p>

Tiers	Development Stage
Tier 2	Permitted application(s), but not yet implemented;
Tier 3	Submitted application(s), but not yet determined;
	Identified in the relevant development plan (and emerging development plans – with appropriate weight given as they move closer to adoption) recognising that much information on any relevant proposals will be limited; and
	Identified in other plans and programmes (as appropriate) which set the framework for future development consents/approvals, where such development is reasonably likely to come forward

2.13.2 Cumulative effects can result from individually insignificant but collectively significant actions taking place over a period or concentrated in a location. Cumulative effects can occur where a project results in individually insignificant impacts that, when considered in-combination with impacts of other proposed or permitted plans and projects, can result in significant effects (CIEEM, 2018).

2.13.3 In this regard Dublin Array notes the importance of the avoidance measures set out in the CEMP in respect of pollution control and general good working practices during the construction phase. Reference is made to Section 3.11 which sets out the relevant measures in the CEMP in this regard.

2.13.4 The following types of other development have the potential to result in cumulative effects:

- ▲ Other developments that could result in the loss or change (permanent or temporary) to important habitats, which could potentially also be affected by Dublin Array onshore infrastructure;
- ▲ Other developments that could result in loss or change (permanent or temporary) to habitats used by protected species populations, which could potentially also be affected by this project; and
- ▲ Other developments that could result in disturbance to important and/or protected fauna species populations, which could potentially also be affected by this Dublin Array onshore infrastructure.

Projects scoped in/out

2.13.5 The identification of other onshore developments considered sources as detailed in Annex 1 and Annex 2 of this chapter, based on the Zone of Influence detailed below. This list has been developed using Annex 1 of Volume 2, Chapter 4: Cumulative Effects Assessment Methodology, which is the screened long list, i.e. those projects screened in or out for further consideration on the basis of one or more of the screening criteria.

Scoped in

- 2.13.6 The Zone of Influence has been determined by the relatively small and localised nature of the construction, operation and decommissioning works for the Dublin Array onshore infrastructure and the largely localised effects that these will have on biodiversity.
- 2.13.7 The focus for this assessment was on the proximity, scale and nature of projects which could potentially create larger environmental effects and thus be of significance to the cumulative assessment. Particular attention was given to larger scale projects in proximity to the onshore application boundary. Those projects where EIA or NIS accompanied the applications were also given due regard at review stage. The databases were searched to identify and exclude minor applications that were not likely to have a significant cumulative environmental effect with the effects of the proposed development. Examples of applications which were excluded were applications to construct or demolish conservatories, house extensions, loft conversions, change of uses for single or small numbers of buildings, construction of outbuildings, modifications to driveways and retention applications.
- 2.13.8 All developments within 2 km of the OSS and 500 m from the onshore ECR and Landfall Site and 1 km from the O&M Base have been scoped into the shortlist. Additionally, all developments within proximity (i.e. 500 m) of the Shanganagh River catchment as well as projects with the potential to pollute the Shanganagh River catchment up to 13.2 km upstream of Dublin Array onshore infrastructure have been scoped in. Other windfarms within 20 km of the O&M base and Landfall Site have also been scoped in due to their possible cumulative impacts on mobile species such as shorebirds.
- 2.13.9 These distances have been chosen due to 500 m being the upper limit likely to be affected by dust creation as large dust particles (greater than 30 µm) will largely deposit within 100 m of sources, with intermediate particles (10 – 30 µm) likely to travel up to 200 – 500 m (IAQM, 2016). 13.2 km is considered the maximum otter territory length (Reid et al., 2013). The Core Sustainance Zones of SCI birds associated with SPA's located close to the O&M base and landfall locations (i.e. black-headed gull, black-tailed godwit, common gull, common scoter, common tern, cormorant, dunlin, great black-backed gull, great crested grebe, greenshank, grey heron, herring gull, kingfisher, lesser black-backed gull, little egret, little grebe, mallard, Mediterranean gull, moorhen, oystercatcher, purple sandpiper, red-breasted merganser, red-throated diver, ringed plover, sanderling, sandwich tern, shag, and turnstone for the O&M Base and goosander, long-tailed duck, ringed plover, and whooper swan for the Landfall area) have been considered (NatureScot, 2023). The status of the O&M Base site as an operational harbour and the Landfall Site being subject to recreational and residential disturbance has also been considered.

Scoped out

- 2.13.10 All other developments have been scoped out of the cumulative assessment for onshore biodiversity. The primary reason for scoping out other developments is that the risk of cumulative effects is considered unlikely. Factors that have influenced this include the following:

- ▲ Sufficient distance between the other development and Dublin Array onshore infrastructure;
- ▲ Small scale of the development (i.e. <0.5 ha);
- ▲ Where there is no source-receptor-pathway;
- ▲ Whether there is a spatial overlap which has the potential to result in significant effects; and

2.13.11 Whether there is a temporal overlap which has the potential to result in significant effects.

2.13.12 Granted/permitted and pending applications older than ten years were excluded on the basis that they would likely already have been built (and so would form part of the existing baseline) or are now unlikely to be progressed. Applications which have been refused or cancelled were discounted from the list on the basis that they are unlikely to progress, unless through successful appeal.

Potential impacts and significant effects

OES

2.13.13 Table 28 details the potential cumulative impacts identified to the IEFs from the Dublin Array onshore infrastructure in-combination with the other developments identified in Annex 1 for the OES.

Table 28 Cumulative onshore impacts and significance of effects caused by the onshore development in-combination with other developments in the zone of influence of the OES

Impact	Significance of effects	Residual effects after mitigation and/or monitoring
Construction and decommissioning phases		
<p>Impact 6: Permanent and temporary loss or damage of important habitat and designated sites (all phases)</p>	<p>All the other developments listed in Annex 1 will cause additional habitat losses or damage within the local area. Whilst each area of habitat loss may not cause a significant impact when considered in isolation, in-combination the habitat loss is likely significant on a county level. Especially as several projects may cause the loss of existing woodland, such as projects 3 and 8.</p> <p>Most habitat losses are anticipated to be permanent where buildings and artificial surfaces will replace them. There will likely be areas of retained habitats and temporary losses of other habitats during the construction phase that will be either replanted or allowed to re-establish following the completion of this phase. Several of the projects refer to additional planting as to compensate for areas lost (e.g. projects 1, 3, and 7). Damage to habitats will be temporary for habitats such as grasslands that can recover quickly, minor damage to habitats such as this is not expected to cause a significant effect. Damage to late-successional habitats such as woodland will be long-term and will require significant time to recover. Damage to woodlands is likely to cause a significant effect on a county level.</p> <p>Most other developments, similar to Dublin Array onshore infrastructure, have detailed that higher value habitat to biodiversity are to be retained, where possible, in their respective EIARs. The loss of lower value habitats to biodiversity (e.g. recolonising bare ground) will not cause a significant effect.</p> <p>Dust creation will be caused during the construction and decommissioning phases of the other developments. Large dust particles (greater than 30 µm) will largely deposit within 100 m of sources, with intermediate particles (10 – 30 µm) likely to travel up to 200 – 500 m (IAQM, 2016). As such, projects 27 – 76, which are located within 500 m of the Shanganagh River and tributaries, may cause an increase in dust levels that may enter this river system during the construction and</p>	<p>Significant at local level</p>

Impact	Significance of effects	Residual effects after mitigation and/or monitoring
	<p>decommissioning phases. Small levels of dust are unlikely to be harmful to the habitat. However, if significant levels of dust enter this habitat, it may alter the water chemistry and degrade the habitat for the flora and fauna that it supports.</p> <p>Each development is likely to create dust levels that may be of negligible significance alone. However, in-combination, may lead to a build-up of dust levels within the aquatic habitat that might cause a significant effect.</p> <p>Projects 1, 3, 7, 8, Cherrywood SDZ (i.e. 10, 11, 14, 15, 16), 33, 49, and 61 detail mitigation and/or monitoring measures provided in their respective EIA's or provided separately within an CEMP that will minimise impacts to air quality.</p> <p>This effect will be limited to the construction and decommissioning phases. No dust creation is anticipated for the operational phase of the projects. The effects will likely be temporary, as dust levels will be naturally dispersed due to the transient nature of this aquatic habitat. Furthermore, the river system will naturally flow downstream before entering the marine environment, whereby dust will be further dispersed.</p> <p>Only one designated site is located downstream of the Shanganagh River and tributaries, comprising Rockabill to Dalkey Island SAC. However, this is located c. 1.43 km east of the point where the river system meets the ocean. Therefore, it is considered highly unlikely that dust will reach and accumulate within this SAC as it will be naturally dispersed by the aquatic marine environment.</p> <p>In conclusion, permanent and temporary loss or habitat caused by the other developments may cause a significant effect through the in-combination loss of habitats on a county level.</p>	
Impacts 7: Impacts upon protected species or upon their resting or	All other projects will cause additional levels of artificial lighting, noise, and vibrations during their construction and decommissioning phases. Most other projects will also cause similar effects during their operational phase although to a lesser extent.	Not significant

Impact	Significance of effects	Residual effects after mitigation and/or monitoring
breeding places, including isolation through habitat fragmentation, artificial light, noise and vibrations, and dust (all phases)	<p>Artificial lighting may be limited only to the proposed HDD crossings for Dublin Array onshore infrastructure. However, other developments may not have similar restrictions and, as a result, lighting levels in the local area may be increased and retained habitats may be illuminated causing further disturbance to fauna potentially on a county level.</p> <p>These impacts may cause disturbance effects to fauna in the local area and these effects will be exacerbated by other developments to a point where they may cause a significant effect. Other developments may have effects on badger setts, roosting bat locations, and may disturb or harm nesting birds if their construction or decommissioning phases are within the nesting bird season.</p> <p>Habitat fragmentation will occur where there are any habitat losses to existing habitats. Other projects will lead to an increase of habitat fragmentation in addition to that caused by Dublin Array onshore infrastructure alone. This may affect local fauna, inhibiting their dispersal, particularly for, but not limited to, less mobile species.</p> <p>The OES and the local area is mostly urbanised and therefore already subjected to high levels of artificial lighting and noise.</p> <p>Many of the other developments will be/are subject to EIA and AA. Therefore, it is expected that mitigation measures contained in these assessments, and considering mitigation measures for Dublin Array onshore infrastructure, will not result in significant residual effects.</p>	
Impact 8: Spread of invasive species (construction phase)	<p>All other developments that contain invasive species may cause their spread within their respective site boundaries or offsite without appropriate mitigation and biosecurity measures. The spread of invasive species may degrade other existing habitats, especially valuable aquatic habitats such as the Shanganagh River and tributaries and its associated riparian habitats. And this effect will be exacerbated when considering the cumulative effect of the other developments listed in Annex 1.</p> <p>In addition, IAS may cause damage to Loughlinstown Woods pNHA, which comprises riparian habitat on this river system. Only European designated site is located downstream of the river</p>	Not significant

Impact	Significance of effects	Residual effects after mitigation and/or monitoring
	<p>system, comprising Rockabill to Dalkey Island SAC, located within the marine environment, c. 1.43 from the coast. It is anticipated that IAS will not survive in the marine habitat and will have no effect on this SAC.</p> <p>Most IAS relevant to the OES were located within Sectors 0, 1, and 2. No other developments overlap with the Dublin Array onshore infrastructure in these locations and so there will be no foreseeable effect relating to the spread of IAS.</p> <p>Project no. 7 is located within the proposed TCC area and project no. 2 is located adjacent. One stand of montbretia was identified. The spread of this INNS may be caused during the construction phase of these developments. The removal of IAS prior to development is detailed in the EIAR for this project and therefore, no significant effect is likely to occur.</p> <p>Many of the other developments will be/are subject to EIA and AA. Therefore, it is expected that mitigation measures contained in these assessments, and considering mitigation measures for Dublin Array onshore infrastructure, will not result in significant residual effects.</p>	
Operational phase		
Impact 9: Disturbance or damage to important ecological features via maintenance, noise, vibrations, and light	<p>The in-combination effects of the construction and decommissioning phases of the other developments listed in Table 28 and Table 29 are likely to cause an increased disturbance and potential displacement effect on local fauna. This effect is likely to be significant at a county level, due to the large extent of proposed developments and the cumulative areas impacted.</p> <p>These effects are likely to be limited to the construction and decommissioning phases. However, some will also have operational effects, such as operation disturbance from project no. 1 – BusConnects).</p>	Not significant

2.13.14 Other permitted and proposed projects relevant to the proposed development and potential cumulative impacts were assessed and where necessary mitigation measures specified relevant to the OES. This included an assessment of the offshore infrastructure and O&M Base. No significant cumulative effects will occur during the construction, operational or decommissioning phase.

O&M Base

2.13.15 Table 29 details the cumulative impacts for the O&M Base when considering the in-combination impacts caused by the Dublin Array onshore infrastructure with the other developments identified in Table 29.

Table 29 Cumulative onshore impacts and significance of effects caused by Dublin Array onshore infrastructure in-combination with other developments in the zone of influence of the O&M Base

Impact	Significance of effects	Residual effects after mitigation and/or monitoring
Construction and decommissioning phases		
<p>Impact 10: Permanent and temporary loss or damage of important habitat and designated sites</p>	<p>Habitats within the O&M base and the surrounding area are largely urban habitats, comprising mostly buildings and artificial surfaces. None of the other developments (i.e. 77-80 identified (Annex 2) required an EIAR or NIS as they all comprised minor developments, limited to existing urban habitats.</p> <p>There is a minor risk of pollution events and dust creation entering the marine habitats and nearby designated site (i.e. South Dublin Bay and River Tolka Estuary SPA and Dalkey Coastal Zone and Killiney Hill pNHA). However, given the low number of other projects identified, and the transient nature of this habitat, it is expected that no significant build-up will occur that could cause a significant effect. However, no EIAR or NIS were available to provide mitigation measures for any of these projects. The mitigation measure for Dublin Array onshore infrastructure will minimise any risk of a cumulative impact occurring.</p> <p>Overall, no significant effect is expected to occur to designated sites or valuable habitats at the O&M Base as a result of the cumulative effects caused by Dublin Array onshore infrastructure in-combination with the other developments no. 81 – 84.</p>	<p>Not significant</p>

Impact	Significance of effects	Residual effects after mitigation and/or monitoring
<p>Impacts 11: Impacts upon protected species or upon their resting or breeding places, including isolation through habitat fragmentation, artificial light, noise and vibrations, and dust</p>	<p>The construction and decommissioning phases of projects no. 81 – 84 may cause disturbance to a breeding place for amber-listed black guillemot. Project no. 1 and 84 pose the biggest risk of having this effect due to their proximity to the breeding location under the pier. The other developments are likely sufficiently distant to have no effect on the breeding black guillemot.</p> <p>Given that no EIAR and NIS are available for these projects, it is unknown whether any mitigation is provided. However, these developments are minor and therefore not considered to pose a risk of having a significant effect on the breeding black guillemots.</p> <p>Furthermore, the mitigation measures provided for this Dublin Array onshore infrastructure along with the habituation of this species to the existing urban environment, it is considered that no significant effect will occur. No other significant cumulative effects are expected to occur to any other protected species.</p>	<p>Not significant</p>
<p>Impact 4: Spread of invasive alien species during the construction phase</p>	<p>No IAS were identified at the O&M Base. Therefore, there will be no cumulative effect caused by the potential spread of IAS.</p>	<p>Not significant</p>
<p>Operational phase</p>		
<p>Impact 12: Disturbance or damage to important ecological features via maintenance, noise, vibrations, and light</p>	<p>Given the small-scale nature of project no. 81 – 84, not requiring EIAR or NIS, and the existing human activity and disturbance effects ongoing at the O&M base, it is anticipated that the in-combination effects will not lead to a significant effect on the protected fauna located here.</p>	<p>Not significant</p>

2.13.16 Other permitted and proposed projects relevant to the proposed development and potential cumulative impacts were assessed and where necessary mitigation measures specified relevant to the O&M Base. This included an assessment of the offshore infrastructure and OES. No significant cumulative effects will occur during the construction, operational or decommissioning phase.

2.14 Interactions of the environmental factors

- 2.14.1 A matrix illustrating the likely interactions of the foregoing arising from the proposed development on onshore biodiversity receptors is provided in Volume 8, Chapter 1: Interactions of the Environmental Factors.
- 2.14.2 Interactions of the foregoing are considered to be the effects and associated effects of different aspects of the proposal on the same receptor. These are considered to be:
- ▲ Project lifetime effects: Assessment of the scope for effects that occur throughout more than one phase of the project (construction, operation and decommissioning) to interact and potentially create a more significant effect on a receptor than if just assessed in isolation in these three project phases.
 - ▲ Receptor-led effects: Assessment of the scope for all effects to interact, spatially and temporally, to create inter-related effects on a receptor. For example, all effects on soil quality such as compaction, contamination, and changes in soil structure may interact to produce a different, or greater effect on this receptor than when the effects are considered in isolation. Receptor-led effects might be short-term, temporary or transient effects, or incorporate longer term effects.

Project lifetime effects

- 2.14.3 The potential effects on marine ecological receptors during construction, operation and maintenance, and decommissioning phases of the offshore infrastructure have been assessed in the following chapters:
- ▲ Chapter 3: Benthic Subtidal and Intertidal Ecology;
 - ▲ Chapter 4: Fish and Shellfish Ecology;
 - ▲ Chapter 5: Marine Mammals;
 - ▲ Chapter 6: Offshore and Intertidal Ornithology;
 - ▲ Chapter 7: Bats in the Offshore Environment; and
 - ▲ Chapter 8: Nature Conservation.
- 2.14.4 Therefore, the interactions between onshore and offshore infrastructure on ecological receptors during the Project's lifetime have been considered within the EIAR.
- 2.14.5 Table 30 lists the inter-related effects (project lifetime effects) that are predicted to arise during the construction, operation and maintenance phase, and decommissioning of the onshore infrastructure and also the inter-related effects (receptor-led effects) that are predicted to arise for onshore biodiversity receptors.

Table 30 Project lifetime effects assessment for potential inter-related effects on onshore biodiversity receptors

Impact Type	Effects (Assessment Alone)			Interaction Assessment Project lifetime effects
	C	O&M	D	
Impact 1: Permanent and temporary loss or damage of important habitat and designated sites (all phases)	✓	X	✓	When considering habitat loss or disturbance additively across construction and decommissioning, the impacts will be temporally separate such that there will be no interaction between the two. Due to this, and the recoverability of the species and habitats affected, the interaction of these impacts across all stages of the development is not predicted to result in an effect of any greater significance than those assessed in the individual project phases.
Impact 2: Permanent or temporary loss, damage, degradation or fragmentation of habitats	✓	X	✓	
Impact 3: Impacts on protected species or upon their resting or breeding sites	✓	X	✓	The majority of impacts from will be within the construction phase, with impacts during the decommissioning phase less than that described for the construction phase. The construction and decommissioning phases are also temporally separate such that there will be no interaction between the two. There will therefore be no inter-related effects of greater significance compared to the impacts considered alone.
Impact 4: Spread of invasive alien species	✓	X	X	The pathways by which IAS may be introduced are limited to the construction phase. In addition, the biosecurity measures outlined in the IASMP will ensure the removal of the risk of the introduction of IAS. Therefore, the interaction of these impacts across all phases of the development is not predicted to result in an effect of any greater significance than those assessed in the individual project.
Impact 5: Disturbance or damage to important ecological features via maintenance, through	X	✓	X	The likelihood of project lifetime effects arising is low given that the effects are limited to the operational and maintenance phase and the

Impact Type	Effects (Assessment Alone)			Interaction Assessment
	C	O&M	D	Project lifetime effects
increased noise, vibrations, and artificial lighting				project design measures that will be applied throughout the various project stages. Therefore, across the project lifetime, the effects are not anticipated to interact in such a way as to result in combined effects of greater significance than the assessments presented for each individual phase.

Receptor-led effects

2.14.1 There are linkages between the topic-specific chapters presented within this EIAR, whereby the effects assessed in one chapter have either the potential to result in secondary effects on another receptor (e.g. pollution effects on the water environment have the potential to result in secondary effects on onshore biodiversity receptors). Table 31 sets out inter-relationships between this chapter and others within the EIAR.

Table 31 Inter-relationships between the Biodiversity chapter and other chapters within the EIAR

Topic	Volume and chapter	Details
Hydrology	Volume 5, Chapter 4	This chapter considers the potential impacts to water courses located throughout the Dublin Array onshore infrastructure. It concludes that there will be no significant residual effects on water quality as a result of the Dublin Array onshore infrastructure.
Noise and vibration	Volume 5, Chapter 5	This chapter considers the potential noise and vibration impacts relating to the Dublin Array onshore infrastructure. It concludes that there will be no significant residual effects due to noise and vibrations as a result of the Dublin Array onshore infrastructure.
Air quality	Volume 5, Chapter 10	This chapter considers the air quality impacts during construction to sensitive ecological receptors as a result of dust and increased road traffic. It concludes that there will be no significant residual effects in terms of air quality as a result of the Dublin Array onshore infrastructure.

2.15 Transboundary statement

2.15.1 The OES and O&M Base are located wholly within the Republic of Ireland. Therefore, there are no transboundary effects associated with onshore biodiversity in relation to this proposed development as the onshore infrastructure would not be sited in proximity to any international boundaries.

2.16 Summary of residual effects

2.16.1 This section provides a summary of the residual effects from the identified impacts with the mitigation measures in place. The mitigation measures are established in a hierarchy and are designed where possible to avoid, reduce and where practicable remedy any significant adverse effects identified on a receptor (see Table 32).

2.16.2 The proposed development incorporates the necessary and appropriate mitigation measures to avoid, prevent and reduce as much as the possible, from the perspective of biodiversity, the risk of incidental killing, deliberate disturbance, deliberate destruction or damage or removal of nests and eggs and deterioration or destruction of breeding sites and resting places associated with Annex IV species and wild birds.

2.16.3 The onshore infrastructure has been designed in such a way as to ensure any impacts identified to occur on biodiversity will not affect the maintenance of the populations of the identified species at a favourable conservation status. Further, it has been concluded that the populations of the identified species will be maintained at a level, or adapted to a level, which corresponds to the ecological, scientific and cultural requirements for the species in question.

Table 32 Summary of residual effects

Ecological feature	Proposed mitigation	Significance of residual effect
European designated sites	<p>Refer to Table 17 - project design measures and other avoidance and preventative measures</p> <p>Trenchless techniques such as HDD or similar will be used to cross watercourses (with the exception of trenched crossings of the drainage ditches Glenamuck North stream and Jamestown 10 in Sector 7) along the onshore ECR so there will be no direct loss of foraging habitat within the river itself or creation of any barriers to passage. Multiple HDD crossings at any one time will be avoided to allow otters to naturally migrate away from any source of disturbance.</p> <p>Construction works will be set back from the river and stream channels, except for the two open-cut trenched crossings at Sector 7, and where it is not possible to maintain an adequate set back. Additional control measures such as silt fences will be deployed.</p> <p>HDD will avoid the loss of riparian habitat and ensure that no otter holts will be damaged or lost and therefore, no holt exclusion will be necessary.</p> <p>Silt fencing, or similar control measures, will be erected for any near-watercourse trenching works to prevent suspended sediments and pollution from entering nearby watercourses.</p> <p>HDD or similar trenchless techniques will be used to cross watercourses along the onshore ECR so there will be no risk of increased sediments entering any river habitats.</p> <p>The CEMP details the measures to minimise pollution risk to aquatic habitats including:</p> <p>An ISMP has been produced and included in this report detailing measures to control and eradicate the IAS identified on the site. a plan for dealing with spillage incidents will be designed prior to construction, and this will be adhered to should any incident occur, reducing the effect as far as practicable. This will be included in the CEMP for the proposed development.</p> <p>As detailed in the Hydrology, Hydrogeology and Flood Risk chapter (Volume 5, Chapter 4), a suitable buffer will be applied between watercourses and any proposed construction activities or infrastructure, except at proposed watercourse crossing locations.</p> <p>A pre-construction verification survey will aim to identify any changes in otter activity, holt locations, etc., since the original surveys. The pre-construction survey should be conducted no more than 10-12 months in advance of construction commencing. This will ensure that there will</p>	There will be no significant residual effects.

Ecological feature	Proposed mitigation	Significance of residual effect
	<p>be sufficient time to comply with all licensing and additional mitigation requirements (e.g. holt exclusion and/or the creation of artificial holts). Where holts are found and found to be inactive, they will be destroyed immediately using a mechanical digger, under the supervision of the holder of the NPWS derogation.</p> <p>Where holts are found that are likely to be disturbed, their activity level will be assessed to verify whether they are active or inactive.</p>	
<p>Nationally designated sites</p>	<p>Refer to Table 17 - project design measures and other avoidance and preventative measures</p> <p>The CEMP details measures for dust suppression, which will minimise the main adverse effects caused during the construction phase.</p> <p>An Outline ISMP has been produced and included in this report detailing measures to control and eradicate the IAS identified on the site.</p> <ul style="list-style-type: none"> ▪ Fencing will be erected around the temporary trenchless crossing compounds and will not encroach the RPAs of any of the trees comprising Loughlinstown Woods pNHA without suitable measures being put in place to protect tree roots. This will minimise the risk of accidental access or storage of materials here that may harm these trees. <p>Where access and/or storage of heavy equipment or materials is necessary then special measures such as the use of ground protection in accordance with the requirements of 6.2.3 of BS 5837:2012 capable of supporting any traffic entering or using the site without being distorted or causing compaction of underlying soil shall be used under arboricultural supervision.</p> <p>Trees identified as potentially affected by the ECR (see Figure 6) will be monitored throughout the construction phase by a suitably qualified Arboricultural consultant to oversee the implementation of all recommendations made in the Tree Survey Report. This person will advise the construction team on whether the proposed RPA encroachment by the works will damage the trees (refer to Volume 6, Appendix 6.5.7-2: Tree Survey Report).</p> <p>Silt fencing, or a similar control measure, will be erected for any near-watercourse trenching works to prevent suspended sediments and pollution from entering nearby watercourses.</p>	<p>The residual effects will be temporary, minor adverse. There will be no significant residual effects.</p>

Ecological feature	Proposed mitigation	Significance of residual effect
LIBS – Area north of Shanganagh Wastewater Treatment Plant and Shanganagh River	<p>Refer to Table 17 - project design measures and other avoidance and preventative measures HDD or similar trenchless techniques will be used to cross watercourses along the onshore ECR so there will be no direct loss or damage to the river or its associated riparian habitats.</p> <p>The CEMP details measures for dust suppression, which will minimise the main adverse effects caused during the construction phase.</p> <p>Management measures including general prevention measures, general containment measures, and species-specific treatment measures detailed in the ISMP and Table 17 Table 17. Table 20 Potential impacts, likely significant effects, project design measures, other avoidance and preventative measures, proposed additional mitigation and significance of residual effects for designated sites</p> <p>Suitable fencing will be erected between the boundary of the LIBS and the boundary of the nearby Clifton Park TCC with signs stating 'Sensitive Biodiversity Area' to avoid accidental damage or loss of the habitats attributed to the LIBS.</p>	<p>The effects will be temporary, minor adverse. There will be no significant residual effects.</p>
Depositing river (FW2)	<p>Refer to Table 17 - project design measures and other avoidance and preventative measures As set out in Volume 2, Chapter 6 Project Description in order to avoid direct impacts with river corridors including FW3 depositing river habitat, Dublin Array is proposing to use HDD or similar trenchless techniques to install the onshore ECR at river crossings.</p> <p>The CEMP includes a number of measures to manage pollution risk when construction works are taking place near to the river crossings and the construction of the OSS. These measures include general good practice construction techniques, wet weather protocols, and other good practice measures all outlined in the CEMP.</p> <p>Dust control measures have been detailed in the CEMP to minimise dust reaching this sensitive aquatic habitat. An ISMP has been produced and included in this report detailing measures to control and eradicate the IAS identified on the site.</p> <p>As detailed in the Hydrology, Hydrogeology and Flood Risk chapter (Volume 5, Chapter 4), a suitable buffer will be applied between watercourses and any proposed construction activities or infrastructure, except at proposed watercourse crossing locations.</p>	<p>With the implementation of the mitigation, it is anticipated that the residual effects will be temporary, minor adverse. No significant residual effects.</p>

Ecological feature	Proposed mitigation	Significance of residual effect
	<p>Silt fencing, or a similar control measure, will be erected for any near-watercourse trenching works to prevent suspended sediments and pollution from entering nearby watercourses.</p>	
<p>Drainage ditch (FW4)</p>	<p>Refer to Table 17 - project design measures and other avoidance and preventative measures</p> <p>The site selection and design of the OES has been revised to minimise the potential ecological impact. The length of drainage ditch to be impacted has also been minimised.</p> <p>The drainage ditches will be reinstated following the completion of the trenching works along the onshore ECR. They will be allowed to naturally revegetate.</p> <p>The CEMP includes a number of measures to manage pollution risk near to the water courses including general good practice construction techniques, wet weather protocols, and other good practice measures all outlined in the CEMP.</p> <p>Dust control measures have been detailed in the CEMP to minimise dust reaching this sensitive aquatic habitat.</p> <p>An ISMP has been produced and included in this report detailing measures to control and eradicate the IAS identified on the site.</p> <p>Silt fencing, or a similar control measure, will be erected for any near-watercourse trenching works to prevent suspended sediments and pollution from entering nearby watercourses.</p>	<p>With the incorporation of these design measures, it is anticipated that the effects will be temporary, minor adverse. No significant residual effects.</p>
<p>Dry calcareous grassland (GS1)</p>	<p>Refer to Table 17 Project design measures and other avoidance and preventative measures</p> <p>Refer to Table 21 Potential effects, proposed mitigation and residual effects of Impact 2</p> <p>Necessary losses or damage (e.g. caused by heavy plant used during the construction phase) will be minimised and retained areas will be protected from incidental damage or nutrient increase.</p> <p>As set out in Volume 2, Chapter 6: Project Description in order to avoid direct impacts to the cliffs at the Landfall Site, Dublin Array is proposing to use trenchless techniques to connect the offshore ECR to the TJBs. Two different methods are being considered, HDD and DPM. Both methods will involve installing the cable ducts under the cliffs avoiding the habitat.</p> <p>Suitable fencing will be erected around any areas of Dry calcareous grassland (GS1) to prevent the accidental access by heavy machinery or storage of construction materials</p>	<p>With the implementation of the mitigation, it is anticipated that the residual effects will be short-term, minor adverse. No significant residual effects.</p>

Ecological feature	Proposed mitigation	Significance of residual effect
	<p>Where damage does occur to this habitat, reinstatement planting through a suitable native wildflower seed mix planting, or seedbank collection, storage and replanting, following the completion of the construction phase.</p>	
<p>Dry meadow and grassy verges (GS2)</p>	<p>Refer to Table 17 - Project design measures and other avoidance and preventative measures As set out in Volume 2, Chapter 6: Project Description in order to avoid direct impacts to the cliffs at the Landfall Site, Dublin Array is proposing to use trenchless techniques to connect the offshore ECR to the TJBs. Two different methods are being considered, HDD and DPM. Both methods will involve installing the cable ducts under the cliffs avoiding the habitat. However, the Landfall Site TCC will be temporarily stripped of topsoil and laid with crushed stone while in use. Dust control measures have been detailed in the CEMP to minimise dust reaching this sensitive aquatic habitat.</p> <p>An ISMP has been produced and included in this report detailing measures to control and eradicate the IAS identified on the site. Refer to Table 21 Potential effects, proposed mitigation and residual effects of Impact 2</p> <p>Necessary losses or damage (e.g. caused by heavy plant used during the construction phase) will be minimised and retained areas will be protected from incidental damage or nutrient increase. Areas of this habitat that is to be retained and located adjacent to the proposed development area will be protected through the erection of Heras fencing to prevent the accidental encroachment of works activities into the retained habitat.</p> <p>The habitat will be replanted following the completion of the construction phase; however, this would require time to meet the condition of the habitat that is lost/damaged.</p> <p>A suitable seed mix will be used for replanting to avoid the risk of a less biodiverse grassland being created.</p> <p>Reinstatement planting will be created within the lost grassland habitat (as shown on the OSS Landscaping Plan, Drawing 229100714-MMD-00-XX-DR-C-0250), subject to agreement with DLRCC.</p>	<p>The effects will be short-term, minor adverse. No significant residual effects.</p>

Ecological feature	Proposed mitigation	Significance of residual effect
Hedgerow (WL1)	<p>Refer to Table 17 - Project design measures and other avoidance and preventative measures</p> <p>The proposed development has been designed to minimise impacts on hedgerows. Where this is present near special crossing locations, the habitat will be avoided through the use of HDD or similar trenchless technology, minimising the risk of damaging or disturbing this habitat.</p> <p>Retained hedgerows located close to construction activities (e.g. within 10 m) will be appropriately protected during the construction phase through the erection of suitable fencing (e.g. Heras fencing). This will include their RPA, which will protect potential harm from soil compaction by heavy machinery and materials.</p> <p>Necessary losses will be minimised and retained areas will be protected from incidental damage.</p> <p>Dust control measures have been detailed in the CEMP to minimise dust reaching this sensitive aquatic habitat.</p> <p>An ISMP has been produced and included in this report detailing measures to control and eradicate the IAS identified on the site.</p> <p>Necessary hedgerow losses will be minimised and retained areas will be protected from incidental damage.</p> <p>Retained hedgerows located close to construction activities (e.g. within 10 m) will be appropriately protected during the construction phase through the erection of suitable fencing. This will include their RPA, which will protect potential harm from soil compaction by heavy machinery and materials.</p> <p>Refer to Table 21 Potential effects, proposed mitigation and residual effects of Impact 2</p> <p>The full extent of potential losses will be replanted/reinstated, using suitable native woody species.</p> <p>Dead hedging will be implemented where losses to this habitat are necessary. This will involve putting the cut branches and foliage from necessary hedgerow removal back.</p> <p>New hedgerow will be created surrounding the proposed OSS to reinstate for the loss of c. 10 m hedgerow during the construction phase (refer to the Landscaping Plan shown on Drawing</p>	<p>With the implementation of the mitigation, it is anticipated that the residual effects will be not significant.</p>

Ecological feature	Proposed mitigation	Significance of residual effect
	229100714-MMD-00-XX-DR-C-0250 included in Part 2 Planning Drawings of the application), to be agreed in consultation with DLRCC.	
Immature woodland (WS2)	<p>Refer to Table 17 - Project design measures and other avoidance and preventative measures</p> <p>The OES has been designed to minimise impacts on immature woodland. Where this is present near trenchless crossing locations, the habitat will be avoided through the use of HDD or similar trenchless technology, minimising the risk of damaging or disturbing this habitat.</p> <p>Dust control measures have been detailed in the CEMP to minimise dust reaching this sensitive aquatic habitat.</p> <p>An ISMP has been produced and included in this report detailing measures to control and eradicate the IAS identified on the site.</p> <p>Refer to Table 21 Potential effects, proposed mitigation and residual effects of Impact 2</p> <p>Necessary losses will be minimised and retained areas will be protected from incidental damage.</p> <p>The potential losses will be replaced through replanting, where possible with new tree planting using native species.</p>	With the implementation of the mitigation, it is anticipated that the residual effects will be not significant.
Mixed broadleaved woodland (WD1)	<p>Refer to Table 17 - Project design measures and other avoidance and preventative measures</p> <p>The OES has been designed to minimise impacts on mixed broadleaved woodland. Where this is present near trenchless crossing locations, the habitat will be avoided through the use of HDD or similar trenchless technology, minimising the risk of damaging or disturbing this habitat.</p> <p>Dust control measures have been detailed in the CEMP to minimise dust reaching this sensitive aquatic habitat.</p> <p>An ISMP has been produced and included in this report detailing measures to control and eradicate the IAS identified on the site.</p> <p>Fencing will be erected around the temporary trenchless crossing compounds and will not encroach the RPAs of any of the trees comprising Loughlinstown Woods pNHA without suitable control measures being put in place to protect tree roots. This will minimise the risk of accidental access or storage of materials here that may harm these trees.</p>	With the implementation of the mitigation, it is anticipated that the residual effects will not be significant.

Ecological feature	Proposed mitigation	Significance of residual effect
	<p>Trees identified as potentially affected by the ECR (see Figure 6) will be monitored throughout the construction phase by a suitably qualified Arboricultural consultant to oversee the implementation of all recommendations made in the Tree Survey Report. This person will advise the construction team on whether any RPA encroachment by works will damage trees (refer to Volume 6, Appendix 6.5.7-2: Tree Survey Report).</p> <p>Where access and/or storage of heavy equipment or materials is necessary then special measures such as the use of ground protection in accordance with the requirements of 6.2.3 of BS 5837:2012 capable of supporting any traffic entering or using the site without being distorted or causing compaction of underlying soil shall be used under arboricultural supervision. For further detail, refer to Refer to Volume 6, Appendix 6.5.7-2: Tree Survey Report.</p> <p>Refer to Table 21 Potential effects, proposed mitigation and residual effects of Impact 2</p> <p>Necessary losses will be minimised and retained areas will be protected from incidental damage. The full extent of potential losses will be replanted/reinstated with tree planting, where possible.</p>	
Other artificial lakes and ponds (FL8)	<p>Refer to Table 17 - Project design measures and other avoidance and preventative measures</p> <p>Dust control measures have been detailed in the CEMP to minimise dust reaching this sensitive aquatic habitat.</p> <p>An ISMP has been produced and included in this report detailing measures to control and eradicate the IAS identified on the site.</p>	No significant residual effects.
Riparian woodland (WN5)	<p>Refer to Table 17 - Project design measures and other avoidance and preventative measures</p> <p>As set out in Volume 2, Chapter 6 Project Description in order to avoid direct impacts with river corridors including WN5 Riparian woodland, Dublin Array is proposing to use HDD or similar trenchless techniques to install the onshore ECR at river crossings. The use of this trenchless technique at river crossings will ensure that the WN5 Riparian woodland habitat is avoided.</p> <p>Dust control measures have been detailed in the CEMP to minimise dust reaching this sensitive aquatic habitat.</p>	The residual effects will not be significant.

Ecological feature	Proposed mitigation	Significance of residual effect
	<p>The CEMP includes a number of measures to manage pollution risk near to the water courses including general good practice construction techniques, wet weather protocols, and other good practice measures all outlined in the CEMP.</p> <p>An ISMP has been produced and included in this report detailing measures to control and eradicate the IAS identified on the site.</p> <p>Trees identified as potentially affected by the ECR (see Figure 6) will be monitored throughout the construction phase by a suitably qualified Arboricultural consultant to oversee the implementation of all recommendations made in the Tree Survey Report. This person will advise the construction team on whether any RPA encroachment by works will damage trees (refer to Volume 6, Appendix 6.5.7-2: Tree Survey Report).</p> <p>Refer to Table 21 Potential effects, proposed mitigation and residual effects of Impact 2</p> <p>Where access and/or storage of heavy equipment or materials is necessary then special measures such as the use of ground protection in accordance with the requirements of 6.2.3 of BS 5837:2012 capable of supporting any traffic entering or using the site without being distorted or causing compaction of underlying soil shall be used under arboricultural supervision. For further detail, refer to Refer to Volume 6, Appendix 6.5.7-2: Tree Survey Report.</p>	
<p>Scattered trees and parkland (WD5)</p>	<p>Refer to Table 17 - Project design measures and other avoidance and preventative measures</p> <p>The OES has been designed to minimise impacts on mixed the most sensitive habitats. Where the onshore ECR impacts this habitat, the route has been designed to avoid impacts to mature trees and most effects are limited to grassland areas. Necessary losses will be minimised and retained areas will be protected from incidental damage.</p> <p>Dust control measures have been detailed in the CEMP to minimise dust reaching this sensitive aquatic habitat.</p> <p>An ISMP has been produced and included in this report detailing measures to control and eradicate the IAS identified on the site.</p> <p>Tree protection and planting measures, as set out in Table 17 will be employed during construction.</p>	<p>A short term adverse, and significant effect is predicted until the proposed replacement planting is sufficiently mature, however, it is anticipated that the medium to long-term residual effects will not be significant, once the planted trees have matured (in isolation and cumulatively).</p>

Ecological feature	Proposed mitigation	Significance of residual effect
	<p>Trees identified as potentially affected by the ECR (see Figure 6) will be monitored throughout the construction phase by a suitably qualified Arboricultural consultant to oversee the implementation of all recommendations made in the Tree Survey Report. This person will advise the construction team on whether any RPA encroachment by works will damage trees (refer to Volume 6, Appendix 6.5.7-2: Tree Survey Report).</p> <p>Refer to Table 21 Potential effects, proposed mitigation and residual effects of Impact 2</p> <p>The full extent of potential losses will be replanted/reinstated with tree planting, where possible. However, any planting will require significant time to meet the habitat condition that would be lost (i.e. medium to long-term).</p> <p>Where access and/or storage of heavy equipment or materials is necessary then special measures such as the use of ground protection in accordance with the requirements of 6.2.3 of BS 5837:2012 capable of supporting any traffic entering or using the site without being distorted or causing compaction of underlying soil shall be used under arboricultural supervision.</p> <p>Grassland habitat removed during the construction phase will be reseeded using an appropriate native seed mix.</p> <p>For further detail, refer to Refer to Volume 6, Appendix 6.5.7-2: Tree Survey Report.</p>	
Scrub (WS1)	<p>Refer to Table 17 - Project design measures and other avoidance and preventative measures</p> <p>The OES has been designed to minimise impacts on the most sensitive habitats, including large areas of scrub. The impacts to scrub have therefore been minimised.</p> <p>The necessary losses will be minimised and retained areas will be protected from incidental damage.</p> <p>Dust control measures have been detailed in the CEMP to minimise dust reaching this sensitive aquatic habitat.</p> <p>An ISMP has been produced and included in this report detailing measures to control and eradicate the IAS identified on the site.</p> <p>Refer to Table 21 Potential effects, proposed mitigation and residual effects of Impact 2</p>	<p>With the implementation of the mitigation, it is anticipated that the residual effects will be not significant.</p>

Ecological feature	Proposed mitigation	Significance of residual effect
	<p>The full extent of potential losses will be replanted/reinstated, using suitable native woody species, where possible. Other areas will be able to naturally regenerate. However, it will take several years before the replanted areas reach a similar habitat quality as the baseline (i.e. short-term 1 – 7 years).</p> <p>For further detail, refer to Refer to Volume 6, Appendix 6.5.7-2: Tree Survey Report.</p>	
Sedimentary sea cliffs (CS3)	<p>Refer to Table 17 - Project design measures and other avoidance and preventative measures As set out in Volume 2, Chapter 6 Project Description in order to avoid direct impacts to the cliffs at the Landfall Site, Dublin Array is proposing to use trenchless techniques to connect the Offshore ECR to the TJBs. As described in this chapter, two different methods are being considered, HDD and DPM. Both methods will involve installing the cable ducts under the cliffs avoiding the habitat.</p> <p>The HDD/DPM activities will be located sufficiently far from the cliffs to avoid damage to them. These details are described fully in Volume 2, Chapter 6: Project Description.</p> <p>Dust control measures have been detailed in the CEMP to minimise dust reaching this sensitive aquatic habitat.</p> <p>An ISMP has been produced and included in this report detailing measures to control and eradicate the IAS identified on the site.</p> <p>Refer to Table 21 Potential effects, proposed mitigation and residual effects of Impact 2</p> <p>The cliff area will be appropriately protected from accidental damage from construction works with fencing to ensure that no heavy machinery or plant can encroach close the cliffs where accidental erosion or damage may occur.</p> <p>The HDD/DPM activities will be located sufficiently far from the cliffs to avoid damage to them. These details are described fully in Volume 2, Chapter 6: Project Description.</p>	<p>With the implementation of the mitigation, it is anticipated that the residual effects will be not significant.</p>
Shingle and gravel shores (LS1)	<p>Refer to Table 17 - Project design measures and other avoidance and preventative measures As set out in Volume 2, Chapter 6: Project Description in order to avoid direct impacts to the shoreline, Dublin Array is proposing to use a trenchless technique to connect the Offshore ECR to the TJB. As described in this chapter, two different methods are being considered, HDD and DPM.</p>	<p>With the implementation of the mitigation, it is anticipated that the residual effects will be not significant.</p>

Ecological feature	Proposed mitigation	Significance of residual effect
	<p>Both methods will involve installing the onshore ECR under the shoreline and emerging in the inter-tidal area. This will avoid any direct impact upon the beach area.</p> <p>Dust control measures have been detailed in the CEMP to minimise dust reaching this sensitive aquatic habitat.</p> <p>An ISMP has been produced and included in this report detailing measures to control and eradicate the IAS identified on the site.</p> <p>Refer to Table 21 Potential effects, proposed mitigation and residual effects of Impact 2</p> <p>Construction access to the shoreline will be limited and will only occur within demarcated areas which will be selected in order to minimise direct impacts on this habitat type. Least sensitive areas will be prioritised.</p>	
<p>Treelines (WL2)</p>	<p>Refer to Table 17 - Project design measures and other avoidance and preventative measures</p> <p>The OES has been located and designed to minimise impacts on mixed treelines. Necessary losses will be minimised and retained areas will be protected from incidental damage.</p> <p>Necessary losses will be minimised and retained areas will be protected from incidental damage.</p> <p>Dust control measures have been detailed in the CEMP to minimise dust reaching this sensitive aquatic habitat.</p> <p>An ISMP has been produced and included in this report detailing measures to control and eradicate the IAS identified on the site.</p> <p>Refer to Table 21 Potential effects, proposed mitigation and residual effects of Impact 2</p> <p>The full extent of potential losses will be replanted/reinstated with tree planting, where possible. However, any reinstatement planting will require significant time to meet the habitat condition that would be lost (i.e. medium to long-term).</p> <p>Trees identified as potentially affected by the ECR (see Figure 6) will be monitored throughout the construction phase by a suitably qualified Arboricultural consultant to oversee the implementation of all recommendations made in the Tree Survey Report. This person will advise</p>	<p>With the implementation of the mitigation, it is anticipated that the residual effects will be not significant.</p>

Ecological feature	Proposed mitigation	Significance of residual effect
	<p>the construction team on whether any RPA encroachment by works will damage trees (refer to Volume 6, Appendix 6.5.7-2: Tree Survey Report).</p> <p>Where access and/or storage of heavy equipment or materials is necessary then special measures such as the use of ground protection in accordance with the requirements of 6.2.3 of BS 5837:2012 capable of supporting any traffic entering or using the site without being distorted or causing compaction of underlying soil shall be used under arboricultural supervision.</p> <p>For further detail, refer to Refer to Volume 6, Appendix 6.5.7-2: Tree Survey Report.</p>	
Open marine water (MW1)	<p>Refer to Table 17 - Project design measures and other avoidance and preventative measures</p> <p>Dust control measures have been detailed in the CEMP to minimise dust reaching this sensitive aquatic habitat.</p> <p>The CEMP includes a number of measures to manage pollution risk near to the water courses including general good practice construction techniques, wet weather protocols, and other good practice measures all outlined in the CEMP.</p>	With the implementation of the mitigation measures, the residual effects will be not significant.
Sea inlets and bays (MW2)	<p>Refer to Table 17 - Project design measures and other avoidance and preventative measures</p> <p>The CEMP includes a number of measures to manage pollution risk. These measures include general good practice construction techniques, wet weather protocols, and other good practice measures all outlined in the CEMP. Dust control measures have been detailed in the CEMP to minimise dust reaching this sensitive aquatic habitat.</p> <p>The CEMP includes a number of measures to manage pollution risk near to the water courses including general good practice construction techniques, wet weather protocols, and other good practice measures all outlined in the CEMP.</p>	With the implementation of the mitigation measures, the residual effects will be not significant.
Fauna		
Amphibians	<p>Refer to Table 17 - Project design measures and other avoidance and preventative measures</p> <p>Dust suppression measure CEMP will mitigate the levels of dust creation caused by the construction and decommissioning phases from being able to reach WB1, located 90 m north of the proposed OSS.</p>	No significant residual effect on the local conservation status is considered likely.

Ecological feature	Proposed mitigation	Significance of residual effect
Reptiles	<p>Refer to Table 17 - Project design measures and other avoidance and preventative measures</p> <p>The habitats of highest value for this species have been retained within the design of the onshore infrastructure. It is considered likely that reptiles are limited to isolated coastal sand dune habitats across the OES and therefore will not be impacted by the proposed development.</p>	<p>No significant residual effect on the local conservation status is considered likely.</p>
General passerine bird assemblage	<p>Refer to Table 17 - Project design measures and other avoidance and preventative measures</p> <p>Habitats of highest value for birds have been retained through the route design (as detailed in Table 17) and any habitats that are lost will be replanted where possible. Furthermore, high value nesting habitats such as woodland, hedgerows, and treelines, will be protected in areas where HDD is proposed rather than trenching, thus avoiding further unnecessary losses to habitats.</p> <p>Permanent habitat loss is expected for the site of the proposed OSS. This will comprise grassland and can be offset through additional planting of trees and scrub to create additional nesting and foraging locations.</p> <p>The general construction measures set out in the CEMP will help alleviate potential impacts to birds during the construction phase.</p> <p>Seasonal timing of works to avoid breeding bird season to be implemented. All necessary vegetation removal will be undertaken outside the nesting bird season (which runs from March to August inclusive).</p> <p>Refer to Table 21 Potential effects, proposed mitigation and residual effects of Impact 2</p> <p>The size of the buffer zone will be determined by the ECoW and will remain in place until the chicks have fledged.</p>	<p>Temporary habitat loss will cause a minor adverse impact. Permanent habitat losses are limited to the OSS, comprising a relatively small area and habitat will be provided. Therefore, no significant residual effects are expected.</p>
Black guillemot	<p>Refer to Table 17 - Project design measures and other avoidance and preventative measures</p> <p>The nest site will be retained under current proposals and no habitat losses are expected to impact this species.</p> <p>The general construction measures set out under the CEMP will help alleviate potential impacts to birds during the construction phase (e.g. avoiding, or minimising pollution events).</p>	<p>No significant residual effects are expected.</p>

Ecological feature	Proposed mitigation	Significance of residual effect
	<p>Refer to Table 21 Potential effects, proposed mitigation and residual effects of Impact 2</p> <p>Construction works will be planned to avoid the most sensitive breeding seasonal timings (i.e. March to August inclusive). Where construction activities are required during this time, an ECoW will be employed to monitor potential effects to black guillemot and cease works activities is disturbance is deemed to be too great. Alternatively, the ECoW will create an appropriate buffer zone for the birds (e.g. from identified breeding locations) in which construction activities cannot occur.</p>	
Shorebird assemblage	<p>Refer to Table 17 - Project design measures and other avoidance and preventative measures</p> <p>The OES location and design avoids losses of habitat for these species.</p> <p>The general construction measures set out under the CEMP will help alleviate potential impacts to birds during the construction phase (e.g. avoiding, or minimising pollution events).</p>	<p>No significant residual effects are expected.</p>
Raptor assemblage	<p>Refer to Table 17 - Project design measures and other avoidance and preventative measures</p> <p>The habitats of highest value for birds have been (refer to Table 17) and any habitats that are lost will be replanted where possible.</p> <p>Where these habitats coincide with the trenchless crossing locations high value nesting habitats such as woodland, hedgerows, and treelines, will be retained through HDD or similar trenchless techniques rather than trenching, thus avoiding further unnecessary losses to habitats.</p> <p>Refer to Table 21 Potential effects, proposed mitigation and residual effects of Impact 2</p> <p>All necessary vegetation removal is required outside the nesting bird season (which runs from March to August inclusive).</p>	<p>Permanent habitat loss is expected for the areas designated for the OSS. This will comprise mostly grassland and cannot be suitably compensated for elsewhere. This will result in a minor loss of potential foraging area for raptors. However, this is not expected to lead to any significant residual effects.</p> <p>In summary, no significant residual effects are expected.</p>

Ecological feature	Proposed mitigation	Significance of residual effect
<p>Pipistrellus spp. Brown-long eared Myotis spp. Leisler's bat</p>	<p>Refer to Table 17 - Project design measures and other avoidance and preventative measures</p> <p>The habitats of highest value for bats have been retained through the site selection and design of the OES (as detailed in Table 17) and any habitats that are lost will be replanted, where possible.</p> <p>Where these habitats coincide with the trenchless crossing locations, high value habitats such as woodland, hedgerows, treelines, and rivers, will be retained through HDD or similar trenchless techniques rather than trenching, thus avoiding further unnecessary losses to habitats.</p> <p>Lighting will be minimised and directed away from valuable retained habitats for bats (including T14 & T15).</p> <p>Refer to Table 21 Potential effects, proposed mitigation and residual effects of Impact 2</p> <p>Further enhancement will be achieved through the provision of two bat roosting boxes will be installed before construction commences for every mature tree that requires felling to offset potential harm to T14 and T15. These will be located on suitable retained trees within the grounds of the Eurofound site.</p> <p>An NPWS derogation licence will be applied for, if a bat roost is identified in T14 or T15, for the disturbance and potential loss of these trees. Alternative roosting provisions must be in place prior to the loss of these trees (if required).</p> <p>A sound barrier will be erected protected potential roost locations in T14 and T15 from potential effects of noise. This will also benefit the potential bat roosts by preventing accidental illumination of these potential roost sites.</p>	<p>No significant residual effects are expected.</p>
<p>Badger</p>	<p>Refer to Table 17 - Project design measures and other avoidance and preventative measures</p> <p>The project design has avoided valuable habitats where possible.</p> <p>Pre-commencement surveys will be undertaken to ensure that no new badger setts have been created between the time of baseline surveys and the commencement of the construction phase.</p> <p>Reasonable avoidance measures are set out under the CEMP, which will alleviate potential impacts to badgers during the construction phase.</p> <p>Refer to Table 21 Potential effects, proposed mitigation and residual effects of Impact 2</p>	<p>There will be permanent habitat loss for the OSS, which cannot be fully compensated for. Overall, there will be minor adverse effect from loss of habitat. However, this is not expected to be significant, and no</p>

Ecological feature	Proposed mitigation	Significance of residual effect
	<p>If any active badger setts are identified:</p> <ul style="list-style-type: none"> ▪ The implementation of a 50 m buffer and appropriate mitigation will be provided by the ECoW. ▪ An NPWS license will be applied for where required. ▪ No heavy machinery will be used within 30 m of the sett entrance or light machinery within 20 m (unless carried out under licence); ▪ Badger setts must be protected from all works through a 50 m buffer during the breeding season (December to June inclusive). ▪ All contractors/operators will be made fully aware of any new badger setts identified. Fell trees away from badger setts and avoid blocking any badger pathways; ▪ Security lighting will be directed away from setts; ▪ If new badger setts are identified, works will not occur within 50 m and appropriate mitigation will be provided by the ECoW. An NPWS license will be applied for where required. 	<p>significant residual effects are expected.</p>
Hedgehog	<p>Refer to Table 17 - Project design measures and other avoidance and preventative measures Reasonable avoidance measures and general construction measures are set out in the CEMP, which will alleviate potential impacts to hedgehogs during the construction phase, including measures to prevent hedgehogs becoming trapped in temporary excavations.</p>	<p>There will be permanent habitat loss for the OSS, which cannot be fully compensated for. Overall, there will be minor adverse effect from loss of habitat. However, this is not expected to be significant and no significant effects residual effects are expected.</p>
Otter	<p>Refer to Table 17 - Project design measures and other avoidance and preventative measures Reasonable avoidance measures detailed within the CEMP would alleviate potential impacts to otter.</p>	<p>No significant residual effects are expected.</p>

Ecological feature	Proposed mitigation	Significance of residual effect
Other mammals (pygmy shrew, Irish hare, Irish stoat, red squirrel)	<p>Refer to Table 17 - Project design measures and other avoidance and preventative measures</p> <p>Reasonable avoidance measures similar to those detailed above for badger and detailed within the CEMP would alleviate potential impacts to small mammals.</p> <p>The project design has minimised potential impacts to the most valuable habitats through its design.</p>	<p>No significant residual effect is expected on the conservation status of local small mammal populations.</p> <p>Minor adverse effect from loss of foraging habitat is considered not significant.</p>
Fish (Brown trout, lamprey, European eel)	<p>Refer to Table 17 - Project design measures and other avoidance and preventative measures</p> <p>Impacts to rivers and associated riparian habitat will be avoided through the implementation of HDD rather than trenching.</p> <p>Trenching work near smaller water courses and ditches to cease at night, and to include measures such that eels cannot become trapped within the work area.</p> <p>Pollution prevention measures are set out in the CEMP.</p>	<p>No significant residual effects are expected.</p>
Invertebrates	<p>Refer to Table 17 - Project design measures and other avoidance and preventative measures</p> <p>Retained habitats to be appropriately protected throughout the construction phase.</p> <p>Habitats to be reinstated following the completion of the construction phase.</p> <p>Areas of habitat that are lost (e.g. grassland and woodland etc.) will be allowed to naturally regenerate following the construction phase, where possible. Additional planting using species with known ecological benefits (i.e. good for pollinating invertebrates) will be planted to offset the permanent loss of habitats required for the OSS. A Landscaping Plan (Drawing 229100714-MMD-00-XX-DR-C-0250) has also been prepared for the OSS which includes a tree planting mix and a wildflower meadow to the north-east of the site will be agreed with DLRCC.</p>	<p>Habitat loss will be temporary, adverse in the short term until the habitats have become adequately re-established following the construction phase. No significant residual effects are expected.</p>
IAS		
Giant hogweed, Japanese knotweed,	<p>Refer to Table 17 - Project design measures and other avoidance and preventative measures</p> <p>An ISMP has been produced and included in this report detailing measures to control and eradicate the IAS identified on the site.</p>	<p>With the implementation of the mitigation measures, no significant adverse effects</p>

Ecological feature	Proposed mitigation	Significance of residual effect
Montbretia, Three-cornered garlic	Refer to Table 26 Control measures for IAS identified within the overall study area	are predicted relating to the spread of IAS.

2.17 References

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Annex 1 Other developments relevant to the OES included in the cumulative assessment

The following table details the other developments within the Zone of Influence that have been assessed with the project for cumulative impacts at the OES.

Ref. Case No.	Details	Address	Site area	Comments/Actions
Pre-application stage	The East Coast Railway Infrastructure Protection Project (ECRIPP): The Dalkey Tunnel to Shanganagh Wastewater Treatment Plant	The Dalkey Tunnel to Shanganagh Wastewater Treatment Plant	Pre-application stage	Coastal protection measures post 2027.
Pre-application stage	The Deansgrange Flood Relief Scheme at Glenavon Park	Glenavon Park	Pre-application stage	Post 2025 timeframe.
Pre-application stage	Dublin Replacement Underground Cable Programme CP1146 Carrickmines to Poolbeg Cable Replacement	Carrickmines to Poolbeg, South Dublin	Pre-application stage	Post 2026 timeframe. Optioneering details in the public domain.
Pre-application stage	National Watersports Campus	Dun Laoghaire Harbour, Dun Laoghaire, County Dublin.	Pre-application stage	National Watersports Centre - proposed development of a watersports centre in the harbour area. Pre-application post 2026.

Ref. Case No.	Details	Address	Site area	Comments/Actions
1	317742	Local Authority Projects SID Dublin City Council/Wicklow County Council: BusConnects Bray to City Centre Core Bus Corridor Scheme	Bray to Dublin City Centre via M50	72.6 ha Local Authority Projects SID Due to be decided ABP July 2024 EiAR and NIS produced (Jacobs et al., 2023a; Jacobs, 2023b)
2	D02A/0698/E	10 year planning permission for development comprising alterations and modifications to the Racecourse and will consist of the construction of: 1. A 2,112 sq.m. replacement stable complex. 2. A 1,532 sq.m. track and golf course maintenance depot (workshop and storage areas). 3. A 1,942 sq.m. replacement golf clubhouse including 65 no. bay driving range and a 220 no. space car park (including space for 80 no. vehicles for the stable complex). 4. A new 7-furlong sprint racetrack including an access tunnel for golfers, horses and ambulances. 5. A new slip lane vehicular access to the site from the Carickmines Interchange of the South Eastern Motorway and four lane link road serving the main spectator area and	Leopardstown Racecourse, Foxrock, Dublin 18.	104 ha Temporary annual development EiAR and NIS not required

Ref. Case No.	Details	Address	Site area	Comments/Actions
	<p>access to the parking area to the south of the Motorway. 6. A new vehicular access across the existing racing track to the Foxrock Gates and reinstatement of track at existing crossing. 7. A new car park located between the motorway and the new sprint track to provide approximately 2,400 no. spaces. 8. A new 11.6 million litre capacity on-site water reservoir. And alterations to the existing: 1. Internal circulation road network. 2. Golf-course, incorporating a zone for helicopter landing and parking. 3. On-site water reservoir to form a capacity of 4,3 million litres. 4. Foxrock vehicle entrance onto Westminster Road. 5. Parking areas for Racecourse use including surfacing, fencing, gates, landscaping and lighting. An Environment Impact Statement will be submitted.</p>			
3	303945	Glenamuck District Roads Scheme which will connect the existing R117 Enniskerry Road with the Glenamuck Road and new link distributor road which will connect to the Ballycorus	Lands in vicinity of Glenamuck Road, Ballycorus Road and R117 (Enniskerry Road) in the townlands of Carrickmines Great, Glenamuck South,	16.3 ha Construction has started EIAR produced (OPENFIELD, 2019a)

Ref. Case No.	Details	Address	Site area	Comments/Actions
	Road and the R117 Enniskerry Road (alternative north-south route).	Glenamuck North, Jamestown, Kingstown and Kiltiernan.		
4	D07A/0936	Mixed use development on a 6.9 hectares (17 acre) site	The Park, Brookfield, Glenamuck Road, Carrickmines Great & Jamestown, Dublin 18	7.35 ha Construction has not started EAIR and NIS not required
5	303978	30 no. houses and 173 no. apartments with all associated site works.	Glenamuck Road South, Kiltiernan, Dublin 18.	4.3 ha Construction has started EAIR and NIS not required
6	301522	927 no. residential units (355 no. houses and 572 no. apartments), a neighbourhood centre containing a childcare facility and 2 no. retail units, the associated section of the Clay Farm Loop Road from the bridge road link with Phase 1 to the south western site boundary, associated internal roads, pedestrian and cycle paths, open space, and all associated site and infrastructural works. The application site includes the possible linear earthworks (DU026-087), a Recorded Monument, located along the northern site boundary.	Clay Farm, Ballyogan Road, Dublin 18.	20.6 ha Construction has started EAIR and NIS required but not available

Ref. Case No.	Details	Address	Site area	Comments/Actions
7	313322	443 no. residential units (41 no. houses, 402 no. apartments), creche and all associated site works.	Priorsland, within the townlands of Carrickmines Great and Brennanstown, Dublin 18. (www.priorslandshd.ie)	8.59 ha Case due to be decided by 02/08/2022 but no ABP update by 23/10/2024 EIAR produced (McGill Planning, 2022)
8	309026	482 no. apartments, creche and associated site works.	Golf Lane, Carrickmines, Dublin 18. (www.golflaneshd2020.ie)	2.56 ha Construction has started EIAR available (Scott Cawley, 2020)
9	308753	Proposed Amendment No. 7 of the Cherrywood Planning Scheme 2014 (as amended) - Beckett Road Re-alignment and Ancillary Amendments.	Cherrywood, Co. Dublin	8.11 ha Construction has not started –scheduled for June, likely September EIAR and NIS not required
10	Unknown within Cherrywood SDZ	418 Build-to-rent apartment units, 1,597 sq.m. cafe/restaurant/services, 821 sq.m. community uses, 427 sq.m. retail uses and associated development	Townland of Cherrywood, Dublin 18 (also Co. Dublin)	Within 360 ha Cherrywood SDZ Site cleared – Construction has not started EIAR for Cherrywood SDZ available: (CAAS Ltd., 2014)

Ref. Case No.	Details	Address	Site area	Comments/Actions	
11	Unknown within Cherrywood SDZ	192 apartment units, childcare facility, office development of 12,223 sq.m., 1,242 sq.m. non-retail commercial space and associated development	Townland of Cherrywood, Dublin 18 (also Co. Dublin)	Within 360 ha Cherrywood SDZ	EIAR for Cherrywood SDZ available: (CAAS Ltd., 2014)
12	DZ17A/0862	The proposed development will comprise a total of 191,115sq.m (gross floor area - GFA) in 15 blocks including: 1,269 no. residential units (115,332 sqm), Retail Gross (20,284 sqm), High Intensity Employment (HIE) uses (22,946 sqm), Non-retail uses (31,115 sqm), Community uses (1,437 sqm) and associated work	Glenamuck Road South, Kiltarnan, Dublin 18.	Within 360 ha Cherrywood SDZ	Site cleared - Construction has not started
13	2021068	The proposed development comprises 482 no. residential units in a mix of apartments, duplexes, triplexes and houses ranging from 3 to 5 storeys.	In the Townlands of Laughanstown, Brennanstown and Cherrywood, Dublin 18.	Within 360 ha Cherrywood SDZ	Unknown
14	2023166	Planning application for the provision of 162 no. residential units in development area 2 - Cherrywood within the Cherrywood SDZ Planning Scheme.	In the Townlands of Laughanstown and Cherrywood, Dublin 18.	Within 360 ha Cherrywood SDZ	EIAR for Cherrywood SDZ available: (CAAS Ltd., 2014)

Ref. Case No.	Details	Address	Site area	Comments/Actions
15	Cherrywood SDZ	184 no. residential units (134 no. apartments 14 no. duplex units and 36 no. houses), local neighbourhood road and associated site works.	Townland of Laughanstown, Dublin 18 (lands generally bounded by Bishop Street to the south, the Luas green line to the east and Tully Park to the north).	Within 360 ha Cherrywood SDZ Site cleared - Construction has not started EIAR for Cherrywood SDZ available: (CAAS Ltd., 2014)
16	Unknown within Cherrywood SDZ	Mixed-use Village Centre and residential development comprising 402 no. apartments, 41 houses, retail, commercial, creche, community, offices, gym, park, open spaces.	Priorsland, located within the townlands of Carrickmines Great and Brennanstown, Dublin 18.	Within 360 ha Cherrywood SDZ EIAR for Cherrywood SDZ available: (CAAS Ltd., 2014)
17	D07A/0161/E	Rotal of 158 no. dwellings; 25 no. detached houses	Barrington Tower, Brennanstown Road, Cabinteely, Dublin 18	3.16 ha Grant extension of duration of permission No EIAR or NIS required
18	304396	Retail/Commercial Development comprising a neighbourhood centre, retail warehouses, cinema and other leisure space, residential units, creche, office space, car showroom, medical centre, linear park and associated works.	Site of 105 ha at lands known as Quadrant 3, The Park, Brookfield Glenamuck Link Road, (also known as Glenamuck Road), and Ballyogan Road, Carrickmines Great and Jamestown, Dublin 18.	10.29 ha Construction has not started EIAR and NIS required but not available

Ref. Case No.	Details	Address	Site area	Comments/Actions
19	307994	Demolition of all existing buildings (1985sq.m) on site and the construction of a 4 storey Primary Care Centre and General Practitioner (GP) Surgery with a gross floor area of 4,267sq.m.	Lands at Loughlinstown Drive (0.5685ha), Loughlinstown, Co. Dublin comprising Loughlinstown Industrial Estate and part of HSE Health Centre	0.51 ha Existing structures demolished – construction currently not ongoing EIAR and NIS not required
20	308418	193 no. Build to rent apartments and associated site works.	Site to the south of Abingdon, Shanganagh Road, Shankill, Dublin 18	1.49 ha Grant permission with conditions NIS required but not available
21	247812	Demolition of Barn Close Lodge, refurbishment of Beechlands House, Barn Close and Shanganagh Castle. Provision of 61 no. residential units and associated works. Barn Close Lodge, Beechlands and	Shanganagh Castle, Shankill, Dublin 18.	1.5 ha Grant permission with revised conditions EIAR and NIS not required
22	317775	Construction of 43 no. residential units and all associated site works. The site includes an existing protected structure (RPS 1800), a two storey dwelling house known as Saint Annes and this application does not consist of any works to the protected structure.	Saint Annes, Dublin Road, Shankill, Dublin 18, D18 H9V3	0.61 ha Case is due to be decided by 14/12/23 but no update as of 23/10/2024. EIAR and NIS not required

Ref. Case No.	Details	Address	Site area	Comments/Actions
23	315449/D21A/1082	Construction of 32 apartments, with all relevant associated site works	Conna, Abingdon Park, Shanganagh Road, Shanganagh, Shankill. Co. Dublin, D18WF54	0.32 ha Grant permission with revised conditions EAIR and NIS not required
24	D17A/0381	Construction of 42 no. residential units,	Loughlinstown Wood (lands part of playing pitches), Loughlinstown, Glenageary, Co Dublin (west of Cois Cualann, Ballybrack, Glenageary, Co. Dublin)	0.84ha Grant permission EIAR and NIS not required
25	308612/D20A/0582	Northumberland Avenue (with fronting to Lee's Lane), Dun Laoghaire, Co. Dublin Residential development consisting of 14 residential units.	1 Northumberland Avenue (with fronting to Lee's Lane), Dun Laoghaire, Co. Dublin	0.04 ha Grant permissions with conditions EAIR and NIS not required
26	313321	Demolition of the existing structures on site, construction of 101 no. residential units (32 no. houses, 69 no. apartments), creche and associated site works.	Blackglen Road, Balally and Woodside, Sandyford, Dublin 18. (www.blackglenroadshd.com)	1.95 ha Grant permission with conditions No EIAR or NIS required

Ref. Case No.	Details	Address	Site area	Comments/Actions
27	302954/D17A/1003	Permission for a residential development consisting of the demolition of the existing dwelling house and sheds and the construction of 67 no. apartments in 3 no. three storey plus penthouse blocks (Blocks A, B & C) containing in total 5 no. one bed units, 48 no. two bed units and 14 no. three bed units. The development will also include a basement (under blocks B & C), on surface car parking, the construction of a new site entrance from the public road and all associated site and landscaping works on a 1.09 hectare site.	Site known as Whinsfield, Sandyford, Dublin 18.	1.67 ha Grant permission with revised conditions No EIAR or NIS required
28	312990/D21A/0595	Permission for development. The development will principally consist of the demolition of the single storey dwelling known as 'The Pastures' and ancillary garage (241 sq m) and the construction of a residential development comprising 33 no. apartments (10 no. one bedroom units, 20 no. two bedroom units and 3 no. three bedroom units) in 2 no. apartment blocks ranging in height from part 3 no.	The Pastures, Sandyford Road, Dublin 18, D18K0V5	0.31 ha Grant permission with conditions No EIAR or NIS required

Ref. Case No.	Details	Address	Site area	Comments/Actions
	to part 5 no. storeys. The development proposes a total gross floor area of 3,112 sq m. The development also proposes public and communal open space, 26 no. car parking spaces; bicycle parking; hard and soft landscaping; and all other associated site works above and below ground			
29	313443	Permission for a strategic housing development. Demolition of dwellings known as 'Glenina' and 'Karuna'. construction of 137 no. apartments and associated site works.	'Karuna' and 'Glenina', Sandyford Road, Dublin 18. (www.sandyfordroadshd.ie)	0.91 ha Grant permission with conditions No EIAR or NIS required
30	305142/D18A/1047	Permission for development at the infill site to the rear of Sandyford House a Protected Structure (No 1629). Development will consist of the construction of 12 no. detached houses comprising of 1 no. 1.5 storey 3-bedroom dwelling (Type A), 1 no. 1.5 storey 3-bedroom dwelling (Type E), 1 no. 1.5 storey 3-bedroom dwelling (Type F), 1 no. 1.5 storey 4-bedroom dwelling (Type D), 1 no. 2 storey 4-bedroom dwelling (Type G), 2 no. 2.5 storey 5-bedroom dwellings (Type B) and 5 no.	Lands at the rear of Sandyford House, Sandyford House, Sandyford, Dublin 18.	0.43 ha Grant permission with conditions No EIAR or NIS required

Ref. Case No.	Details	Address	Site area	Comments/Actions
	2.5 storey 5-bedroom dwellings (Type C) with access from the Sandyford Road (Coolkill), including all associated site development works, services provision, access roads, car parking, soft and hard landscaping and boundary treatment works, all on overall application site circa 0.43 ha.			
31	313344/D21A/0923	Permission is sought for demolition of the existing detached dwellings known as "The Gables" and "Whitethorn" (Total GFA c.497sqm). The construction of a five storey apartment building containing 48 no. apartments and comprising 17 no. 1 bedroom apartments, 27 no. 2 bedroom apartments, 4 no. 3 bedroom apartments, northwest and southeast facing balconies, circulation spaces and lift/stair cores throughout. The construction of a single storey plant room including sprinkler tank and switchroom, a single storey ESB sub-station accessed from Leopardstown Road, a single storey bicycle shed serving 50 no. spaces, a single storey bin store	The Gables, Leopardstown Road, Dublin 18, D18H9X5 & Whitehorn, Leopardstown Road, Dublin 18, D18W2W4	0.42 ha Grant permission with revised conditions No EIAR or NIS required

Ref. Case No.	Details	Address	Site area	Comments/Actions
	with integrated covered visitor bicycle parking serving 10 no. spaces, the closure of the existing vehicular and pedestrian entrance to Whitehorn and the widening of the existing vehicular and pedestrian entrance to The Gables, the construction of 48 no. car parking spaces and all ancillary site development works, services provision, open space and landscaping			
32	311669	112 no. Build to Rent apartments and associated site works.	Rocklawn, Leopardstown Road, Dublin 18. (www.rocklawnsd.ie)	0.84 ha Grant permission with revised conditions No EIAR or NIS required
33	305940/DAC063/2020	Housing development which will have a Gross Floor Area of 49,342 sq.m., consist of: the demolition of the existing structures on site and the provision of a Build-to-Rent residential development, comprising 564 No. apartments in 6 No. blocks. Construction of a New Building.	Former Aldi Site, Carmanhall Road, Sandyford Business District, Dublin 18. (www.sandyfordcentralshd.ie)	1.55 ha Grant permission with conditions EIAR available (OPENFIELD, 2019b)
34	303467	706 no. bed space student accommodation and all associated site services.	Avid Techonology International, Carmanhall Road, Sandyford Industrial Estate, Dublin 18.	1.03 ha Grant permission with conditions EIAR and NIS not required

Ref. Case No.	Details	Address	Site area	Comments/Actions
35	301661/D17A/1060	<p>Permission for development comprising the following: Demolition of existing commercial building on site (c. 4600 sqm Gross Floor Area (GFA)). Construction of an office development totalling c. 36617 sqm within 3 no. buildings ranging in height from 5 to 6 storeys (with enclosed roof plan). Including ground floor caf? (c. 172 sqm) at Block 1. A total of 346 no. car parking spaces at basement; 188 no. long-stay and 183 no. short stay bicycle spaces and 14 no. motorcycle spaces. Bin storage areas and shower/changing facilities. 3 no. substations (total 117.9 sqm). Provision of landscaping/open space/circulation routes including a new Pocket Park. Modifications alongside Burton Hall Road including redesign of the existing site access and provision of an additional left turning lane onto Leopardstown Road. All associated site development, services provision and landscaping works</p>	Site of c. 1.768 ha at the Former FAAC Site, Leopardstown Road and Burton Hall Road, Sandyford, Dublin 18	1.77 ha Grant permission with revised conditions EIAR and NIS not required

Ref. Case No.	Details	Address	Site area	Comments/Actions
36	308227	249 no. apartments, childcare facilities and associated site works.	Lands at Murphystown Way, Dublin 18. (www.murphystownwayshd.ie)	2.54 ha Grant permission with conditions EIAR and NIS not required
37	302580	Demolition of an existing house and outbuildings. Construction of 243 no. apartments, 98 no. houses, childcare facility and associated site works.	Glencairn (Glencairn House, a protected structure), Murphystown Way, Dublin 18.	9.59 ha Grant permission with conditions EIAR and NIS required but not available
38	307415/LRD23A/0718	200 no. apartments, creche and associated site works.	Lisieux Hall, Murphystown Road, Leopardstown, Dublin 18.	1.20 ha Grant permission with conditions EIAR and NIS not required
39	304843/D18A/1171	Permission is sought for; the construction of a new part 1-storey; part 2-storey and part 3-storey, 11256 sqm Post-Primary School (RN68241F) including a 4-classroom Special Needs Unit, incorporating Sports Hall; Classrooms; General Purpose Hall and all ancillary pupil and staff facilities; with all associated site works; a new sub-station; 100 number car parking spaces; ballcourts; hard and soft play areas and landscaping; including an access point off Ballyogan Avenue and a new pedestrian access off the linear park in	The former HRI lands at Ballyogan Road, Leopardstown, Dublin 18.	2.94 ha Grant permission with conditions EIAR and NIS not required

Ref. Case No.	Details	Address	Site area	Comments/Actions
		front of National School. With a future greenway extending north to the M50.		
40	303695/D18A/0074	Residential Development	Site (c.1.39ha) at Riverside Cottage, Kilgobbin Road, Newtown Little, Stepside, Co. Dublin.	1.34 ha Grant permission with revised conditions EIAR and NIS not required
41	313430/D21A/0439	Permission for the construction of a shared pedestrian/cycle path to connect the existing Cruagh Greenway with Stepside Park and Enniskerry Road. The development includes all associated site works including landscaping, public lighting, and drainage.	Lands of area 0.62ha bounding Stepside Park, Wingfield, Enniskerry Road, and no. 30 Enniskerry Road	0.62 ha Grant permission with revised conditions EIAR and NIS not required
42	312214	130 no. residential units (55 no. houses, 75 no. apartments) and associated site works.	Lands at Shaldon Grange, located off Enniskerry Road (R117), Kilternan, Dublin 18.	3.33 ha Grant permission with conditions EIAR and NIS not required
43	309846	203 no. residential units (109 no. houses, 94 no. apartments), creche and associated site works.	Lands immediately adjoining Bishop's Gate housing development, Townland of Kiltiernan Domain, Enniskerry Road, Kiltiernan, Dublin 18.	4.97 ha Grant permission with conditions EIAR and NIS not required
44	307043/ABP30704320	116 no. residential units (85 no. houses, 31 no. apartments), childcare facility and associated site works.	Suttons Fields, Ballybetagh Road, Kilternan, Dublin 18.	3.87 ha Grant permission with conditions EIAR and NIS not required

Ref. Case No.	Details	Address	Site area	Comments/Actions
45	306160	Demolition of 'Greenmount' and 'Dun Oir', construction of 197 no. residential units (62 no. houses, 135 no. apartments) and associated site works.	Glenamuck Road, Enniskerry Road, Kiltiernan, Dublin 18.	4.52 ha Grant permission with conditions EIAR and NIS not required
46	303491	Demolition of dwelling and construction of 20 residential units, comprising houses, duplex and apartments and all associated site works.	Slievenamon, Ballybetagh Road, Glencullen, Kiltiernan, Co Dublin	0.55 ha Grant permission with revised conditions EIAR and NIS not required
47	318418/D22A/1028	The development seeking retention permission consists of amendments to the development granted under permission PL.06.D.246501, comprising of retention of stable and agricultural building, retention of dungstead, retention of gallops and retention of associated site works.	Lands at the rear of Kiltiernan Hotel, Aparthotel and Leisure Complex, Enniskerry Road, Kiltiernan and Ballybetagh townlands, Dublin 18	18.96 ha Grant permission with conditions EIAR and NIS not required
48	311428/D20A/0884	Demolition of buildings and construction of 2 retail units and 20 apartments with car and bicycle parking. Associated site works.	Site at, The Mart, Old Bray Road & Mart Lane, Cornelscourt, Dublin 18	0.27 ha Grant Permissions with Conditions EIAR and NIS not required

Ref. Case No.	Details	Address	Site area	Comments/Actions	
49	312132	419 no. residential units (7 no. houses, 412 no. apartments), creche and associated site works.	Old Bray Road, Cornelscourt, Dublin 18.	2.15 ha	Grant Perm. w Conditions EIAR available (Biosphere Environmental Services, 2021)
50	304719/D18A/0763	34 residential units, 24 car parking spaces, cycle parking, vehicular and pedestrian access from Old Bray Road and 1 pedestrian entrance from Brennanstown Road.	0.55 hectare site on the western side of the junction of Old Bray Road and Brennanstown Road, Cabinteely Village, Dublin 18	0.57 ha	Grant permission with revised conditions EIAR and NIS not required.
51	305859	Demolition of 'Benoni' and extant single storage buildings, construction of 234 no. apartments, creche and associated site works.	Former Doyles Nursery and Garden Centre and 'Benoni', Brennanstown Road, Cabinteely, Co. Dublin.	2.31 ha	Grant permission with conditions EIAR and NIS not required
52	303675/D18A/0551	Permission for 72 Dwellings	Site (c.1.46ha) at Ards, Cartref and lands to the rear of Foxley, Old Bray Road, Dublin 18.	1.47 ha	Grant permission with revised conditions EIAR and NIS not required

Ref. Case No.	Details	Address	Site area	Comments/Actions
53	305629/D19A/0181	Construction of a pedestrian footbridge. Construction of an additional 2 floors, of office accommodation over the 'The Highline' building , resulting in a five-storey over basement office building. Demolition of 'Mentec House' and construction of a six-storey over basement 'Building-to-Rent' housing development providing 78 apartments.	Clonkeen Park, Dún Laoghaire, Co Dublin: & 'the Highlone' (Eircode A96 KW29) & 'Mentec House' (Eircode A96 K6P3) Dúnlaoghaire Industrial Estate, Pottery Road, Dún Laoghaire, Co Dublin	1.33 ha Grant permission with revised conditions EIAR and NIS not required
54	307332	Demolition of existing buildings, construction of 151 no. apartments and associated site works.	Dean's Grange Road, (also known as Deansgrange Road), Deansgrange, Blackrock, Co. Dublin.	0.80 ha Grant permission with conditions EIAR and NIS not required
55	316279/D22A/0142	Retention permission of 295 sq. m. roof canopy (c. 4.75 m high over ground level) to cover part of the service yard and for permission to amend the permitted hours of operation pursuant to Condition No. 6 of Reg. Ref. D01A/0920.	Dun Laoghaire Industrial Estate, Pottery Road, Dun Laoghaire, Co. Dublin, A96 E5W9	0.84 ha Grant permission with revised conditions EIAR and NIS not required
56	311329	299 no. apartments, creche and associated site works.	Lands adjoining Clonkeen College, Clonkeen Road, Blackrock, Co. Dublin. (www.clonkeenshd.com)	3.36 ha Grant permission with conditions EIAR not required. NIS required but not available

Ref. Case No.	Details	Address	Site area	Comments/Actions
57	D20A/0541	0.4939ha site at nos. 60 (Cois Cnoc), 61, 62 & 63 (Innisfree), Stepside Lane, Stepside, Dublin 18.	0.50 ha	Grant permission with conditions EIAR and NIS not required

Ref. Case No.	Details	Address	Site area	Comments/Actions	
		associated site works above and below ground.			
58	D14A/0515	Permission for development at Belmont, bounded to the north and west by the rear boundaries of residences accessed of Hillcrest Road and Old Kilgobbin Road; to the east by open space associated with Ferncarrig/Fernleigh and Sandyford Hall residential estates; to the south and south-west by Aiken's Village residential development and Village Road, Aiken's Village. Permission is sought for amendments to existing permission D10A/0440 (ABP Ref. PL06D.239332), comprising rear extensions and changes to the rear elevations of the following 70 of the 93 no. permitted houses in Sector 2: Nos. 1-7, 10, 11, 14-16, 19-22 Atkinson Drive; Nos. 1-4, 6, 7 Thornberry Road; Nos. 1-5, 7-10, 12-17, 19-23 Thornberry Close; Nos. 1-7 Thornberry Drive; Nos. 1, 2, 4, 5 Darley Drive; Nos. 6 & 7 Darley Lane; Nos. 5-19 Hyde Road. The proposed extensions comprise the following: 6 sqm to each Type B1 unit (10 no. 3-bed,	Belmont residential scheme, in the Townlands of, Murphystown And Woodside, Stepside, Co Dublin.	2.57 ha (within D10A/0440)	Granted permission No EIAR or NIS required

Ref. Case No.	Details	Address	Site area	Comments/Actions
	<p>2-storey) now 108 sqm each; 6sqm to each Type B2 unit (5 no. 3-bed, 2 storey), now 108 sqm each; 19 sqm to each Type C2 unit (previously Type C) (6no. 3-bed, 2-storey) now 114 sqm each; 9.5 sqm to each Type JA unit (18 no. 4-bed, 3-storey), now 134 sqm each; 15 sqm to each Type J2A unit (8 no. 4-bed, 3-storey), now 150 sqm; 19 sqm to the Type L unit (1 no. 4-bed, 3-storey), now 162 sqm; 5 sqm to each Type P unit (previously Type C) (21 no. 3-bed, 2-storey), now 100 sqm; 5 sqm to the Type Q unit (previously Type L) (1 no. 4-bed, 3-storey), now 148 sqm. The finished floor levels of the proposed houses are altered from those permitted. All other associated site development works, landscaping and services provision are as per permission D10A/0440. No modifications to the remaining permitted 23 no. houses or 8 no. apartments (Block 13) within Sector 2.</p>			

Ref. Case No.	Details	Address	Site area	Comments/Actions
59	D15A/0677	Permission for development at the permitted and constructed School (Reg. Ref.	Rosemont Secondary School, Enniskerry Road, Sandyford, Dublin 18	4.11 ha Granted permission EIAR and NIS not required
60	312782/D18A/0419	Part (a) - Retention permission or the sub-division and amalgamation of part of the ground floor of unit C01 into the wider store and part change of use from retail warehouse to ancillary 'pick store'. Part (b): permission for the amalgamation of the ground floor of unit C01 from Retail Warehouse to an extended Dunnes Stores food sales area.	Units C01-C05, Beacon South Quarter, Sandyford Industrial Estate, Sandyford, Dublin 18	0.60 ha Grant Permissions with Conditions EIAR and NIS not required
61	304405	428 no. apartments, creche, 4 no. local/neighbourhood retail units and associated site works.	Rockbrook, Carmanhall Road, Sandyford Business District, Sandyford, Dublin 18.	2.02 ha Grant permission with conditions EIAR and NIS required (Scott Cawley, 2019)
62	301428	Residential development of 460 no. apartments in six 5 to 14 storey blocks, ancillary on-site facilities, basement car parking and bicycle parking, 2 new vehicular accesses and all associated site works.	The former Aldi site, Carmanhall Road, Sandyford Business District, Dublin 18.	1.55 ha Grant permission with conditions EIAR and NIS not required

Ref. Case No.	Details	Address	Site area	Comments/Actions
	hard and soft landscaping, lighting, boundary treatment, gates/access control and road signage.			
64	D98A/0886/E2	Construction of a mixed-use development of 163,159 sq.m.	Central Park, Leopardstown Road, Dublin 18	8.98 ha Grant extension of duration of permission EAIR and NIS not required
65	D15A/0328	Permission for a reorganisation and upgrade of existing facilities on site	Leopardstown Racecourse, Leopardstown, Dublin 18	2.05 ha Grant permission EAIR and NIS not required
66	249420/D16A/0542	Amendments to a permitted primary school, which include amendments to site's permitted boundary treatments, signage and permission to amend condition no. 14 of reg. ref. D16A/0542 with associated site.	works. Site area of 1.14 ha off Belarmine Vale, Stepside, D. 18.	1.15 ha Grant permission with conditions EAIR and NIS not required
67	246601/D15A/0247	A seven year planning permission for a residential development of 410 no. residential units and a childcare facility with all associated site works.	Clay Farm, Ballyogan Road, Dublin 18	13.59 ha Grant permission with conditions EAIR and NIS required but not available
68	246537/D16A/0090	Permission for a mixed-use development which includes the partial demolition of a public house, change of use of 1st floor to office Construct 39	Golden Ball Public House, Enniskerry Road, Kilternan, Dublin 18	1.71 ha Grant permission with conditions EAIR and NIS not available

Ref. Case No.	Details	Address	Site area	Comments/Actions	
	no. residential, 7no retail units and site works.				
69	246501/D15A/0453	Permission for development of a centre of excellence for equine breeding and training and all associated site works. The proposed development is within the curtilage of a Protected Structure.	Site adjacent to the Kiltarnan Hotel, Enniskerry Rd, Co. Dublin	120.29 ha	Grant permission with conditions EIAR and NIS not required
70	301044	Demolition of 'Benoni' together with the extant single storey buildings associated with the former Doyle's Nursery and Gardens. Construction of 115 residential units, upgrade of the Brennanstown Road, pedestrian footbridge over the Cabinteely Stream and associated site works.	Former Doyles Nurseries and Garden Centre and Benoni, Brennanstown Road, Cabinteely, Dublin 18.	2.31 ha	Grant permission EAIR and NIS not available
71	300194/D15A/0385	Permission for development of a residential scheme on a site comprising the lands of Woodbrook (8 Beech Park), Foinavan (7 Beech Park), Lynwood, Corrente, Dun Baoi (4 Beech Park), Teely Lodge, The Galliard, El Dorado, Capard, Greenhills and Silver Slope and the road area and associated open spaces at Beech Park, Bray Road, Cabinteely,	Site of 5.295 ha approximately at Beech Park, Cabinteely, Dublin 18/Loughlinstown, Co Dublin and its connection with the N11.	5.27 ha	Grant permission EIAR and NIS not required

Ref. Case No.	Details	Address	Site area	Comments/Actions
	<p>Dublin 18/Loughlinstown, Co Dublin and its connection with the N11. The site includes some 0.7892 ha forming part of Development Area 5 (Druid's Glen) of the Cherrywood Strategic Development Zone Planning Scheme (April 2014). (The balance of the site is located within the lands designated by Government for the establishment of a Strategic Development Zone (SI No. 535 of 2010 but is outside the Planning Scheme area). The site is principally bounded by an ESSO petrol station to the north, the N11 to the east, Nos. 2-4 Sunnyhill Park, Loughlinstown to the south and partly by the Cabinteely Stream and open space to the west (the property identified as Wood Haven, Beech Park, Cabinteely, Dublin 18 between Silver Slope and El Dorado, does not form part of this development). The development will consist of the demolition of 11 no. residential units and ancillary structures and the construction of a scheme comprising 164 no. residential units (comprising 60 no. 4-bed semi-detached houses (with the option to provide</p>			

Ref. Case No.	Details	Address	Site area	Comments/Actions
	<p>combinations of House Type A (3 no. storey) and/or House Type A1 (2 no. storey)); 2 no. 4-bed, 3 no. storey detached houses (House Type A2); 12 no. 4-bed, 3 no. storey plus study semi-detached houses (House Type B); 2 no. 3-bed, 2 no. storey semi-detached houses (House Type C); 12 no. 3-bed, 2 no. storey terrace houses (House Type C1) and 76 no. 2-bed and 3-bed, 2 and 3 no. storey duplex apartments (Blocks D, E, F & G). The development will also consist of the construction of part of the Planning Scheme's Druid's Glen Road.</p>			

Ref. Case No.	Details	Address	Site area	Comments/Actions
72	300107/D17A/0580	<p>Permission is sought for development at existing manufacturing facility comprising extension to provide new single storey main entrance (45 m²) at ground floor of Production Module 1 building; two storey staircase from ground to first floor together with link corridor (170 m²) to rear of existing Personnel Support Facility building; staff changing 1 area extension (126 m²) at first floor of Production Module 2 building; alteration and extension (1,330 m²) of existing internal mezzanine of Production Module 1 building to provide for office/laboratory and other ancillary use; alterations to elevations including new cladding, glazing, visual and solar screening and roof lights; demolition of existing projecting staircase on south elevation together with associated alterations to existing hard and soft landscape areas. The development will include the removal of some existing temporary 'cabin' office accommodation. The application consists of a variation to a Previously permitted development of an activity</p>	Pottery Road, Dun Laoghaire, Co. Dublin	<p>9.75 ha</p> <p>Grant permission with revised conditions EIAR and NIS not available</p>

Ref. Case No.	Details	Address	Site area	Comments/Actions
		for which a license under Part IV on the Environmental Protection Agency Act 1992 is required and will be notified to the Environmental Protection Agency.		
73	247023/D16A/0343	Residential development of 48 no. dwellings with all associated site works.	Yellow Nook Avenue, Johnstown Road, Cabinteely, Dublin 18. 1.09 ha	Grant permission with conditions EAIR and NIS not required

Annex 2 Other developments relevant to the O&M Base included in the Cumulative Assessment

The following table details the other developments within the Zone of Influence that have been assessed with the project for cumulative impacts at the O&M Base.

Ref.	Case No.	Details	Address	Site area	Comments/Actions
74	306746	Removal/Deletion of condition number 2 of the Grant of Planning Permission Register Ref No. D18A/0078 and redesign of ground floor restaurant to be substituted by a food court.	Dún Laoghaire Harbour, Dun Laoghaire, County Dublin.	1.00 ha	Grant permission with revised conditions. No EIAR or NIS required.
75	311210	Demolition of existing building on site and the construction of 3-5 storey over basement apartment building containing 25 no. apartments, car parking spaces, bicycle spaces and all associated site works	Site of 0.13ha at 7-9 Clarence Street and George's Place, Dún Laoghaire, Co. Dublin.	0.13 ha	Grant permissions with conditions. No EIAR or NIS required.
76	245603	Demolition of vacant factory building, construction of 14 no. apartments over underground car park and refurbishment and extension to number 4 Bentley Villas.	Site adjacent to no. 4 Bentley Villas, Dun Laoghaire, Co. Dublin	0.07 ha	Grant permission with conditions. No EIAR or NIS required.

Ref.	Case No.	Details	Address	Site area	Comments/Actions
77	318088	Whether the proposed Coastal Mobility Scheme development to urban public realm, public and non-public roads is or is not development and/or is or is not exempted development.	Temple Road/Newtown Avenue to junction of Sandycove Avenue West/Sandycove Point	7.30 ha	Case was due to be decided by ABP on 05/02/2024 but no update as of 23/10/2024. No EIAR or NIS required



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