Orsted Onshore Ireland Midco Limited

Proposed Oatfield Wind Farm

Appropriate Assessment Screening Report

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RSK

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1.1 Introduction

This Screening for Appropriate Assessment Report presents a review of relevant internationally designated sites of nature conservation value (termed 'European Sites' or 'Natura 2000 sites') and identifies any potential Likely Significant Effects (LSE) from the Proposed Development on these internationally designated sites.

The Proposed Development comprises an 11-turbine wind farm on a site located within forested and agricultural lands. It also comprises a Grid Connection Route (GCR) for connection to the national grid, and temporary accommodating works along a Turbine Delivery Route (TDR) to the wind farm, to facilitate the delivery of large components from the port of delivery. The GCR and TDR are both assessed in this EIAR and form part of the planning application.

The key components that are described throughout the EIAR are listed below:

- The wind farm which consists of 11 wind turbines (4 turbines across the Eastern Development Area (Eastern DA) and 7 turbines across the Western Development Area (Western DA));
- The grid connection route and underground cables (also referred to as GCR and UGC); and,
- The turbine delivery route (TDR).

The term 'Proposed Development' collectively describes the above three components. Further information about the Proposed Development is presented in **EIAR Chapter 5: Project Description.**

If potential LSE on a European Site are identified, an Appropriate Assessment must be undertaken to identify any adverse effects on the integrity of the European Site; a report to inform this (the Natura Impact Statement report) has also been prepared by RSK Biocensus and Inis Environmental Consultants. These reports accompany **EIAR Chapter 7 Biodiversity** and **EIAR Chapter 8 Ornithology** for the Proposed Development.

This document provides background information to support a 'Screening for Appropriate Assessment' for the Proposed Development. It includes a description of the development, a review of the Proposed Development environmental setting, details of European Sites within the Zone of Influence of the Proposed Development (i.e., the potential zone of impact), an appraisal of source-pathway-receptor relationships, and an assessment of potential impacts.

The purpose of the screening stage is to determine, on the basis of best scientific knowledge and objective criteria, whether a plan or project, alone or in combination with other plans of projects, could have a significant effect on a European Site in view of the site's conservation objectives. There is no necessity to establish such an effect; instead, it is only necessary for the Competent Authority to determine that there may be such an

effect. The need to apply the precautionary principle in making key decisions in relation to undertaking an Appropriate Assessment has been confirmed by the case law of the Court of Justice of the European Union. Plans or projects that have no appreciable effect on a European Site can be excluded.

This report has been prepared in accordance with the following legislation and best practice guidance:

- OPR Practice Note PN01. Appropriate Assessment Screening for Development Management (Office of the Planning Regulator, 2021);
- Directive 92/43/EC (as amended) of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (the "Habitats Directive");
- Directive 2009/147/EC (as amended) of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (the "Birds Directive");
- European Communities (Birds and Natural Habitats) Regulations 2011-2021 (as amended);
- Assessment of Plans and Projects significantly affecting Natura 2000 Sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC (European Commission, 2021);
- Appropriate Assessment of Plans and Projects in Ireland: Guidance for Planning Authorities. Department of the Environment, Heritage and Local Government (DoEHLG, 2010); and
- Managing Natura 2000 Sites: The Provisions of Article 6 of the 'Habitats Directive' 92/43/EEC, (European Commission, 2018).

1.1.1 Legislative Context and Relevant Guidance

Approximately 10% of the land area of Ireland is included within the network of European Sites, which includes Special Protection Areas (SPAs) to protect important areas for birds, and Special Areas of Conservation (SACs) to protect a range of habitats and species. Legal protection for these sites is provided by the Birds Directive and Habitats Directive, as amended), which are jointly transposed into Irish law by the European Communities (Birds and Natural Habitats) Regulations 2011, as amended).

Article 6(3) of the Habitats Directive requires that, in relation to internationally designated sites (SACs, SPAs and Ramsar sites, and candidate sites for these designations), "*any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives*".

The assessment is based on a four-stage approach, where the outcome at each successive stage determines whether a further stage in the process is required (see Section 1.4.1).

A Competent Authority (e.g., a Local Authority) can only agree to a plan or project after having determined that it will not adversely affect the integrity of the European Site concerned unless the derogation under the article 6(4) of the Directive applies.

For the purposes of this assessment, and in accordance with EU case law (e.g., *Commission of the European Communities v Ireland* Case C-418/04), Important Bird Areas (IBAs) have also been considered herein due to their importance to the conservation of bird populations at an international level. For ease of reporting, all relevant internationally designated sites, including SPAs, SACs, Ramsar sites, IBA and candidate sites for these designations are collectively referred to as 'European Sites' within the remainder of this report.

Appropriate Assessment of Plans and Projects in Ireland: Guidance for Planning Authorities. Department of Environment, Heritage and Local Government (DoEHLG, 2010);

Communication from the Commission on the Precautionary Principle (European Commission, 2000);

Managing Natura 2000 Sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC (known as MN2000), Office for Official Publications of the European Communities, Luxembourg (European Commission, 2018);

Nature and biodiversity cases: Ruling of the European Court of Justice (European Commission, 2006);

Interpretation Manual of European Union Habitats. Version EUR 28. European Commission (European Commission, 2013); and

For the purposes of this assessment, national legislation was considered. S177U of the Planning and Development Act 2000 (as amended): "177U.— (*1) A screening for appropriate assessment of a draft Land use plan or application for consent for proposed development shall be carried out by the competent authority to assess, in view of best scientific knowledge, if that Land use plan or proposed development, individually or in combination with another plan or project is likely to have a significant effect on the European site.*

(4) The competent authority shall determine that an appropriate assessment of a draft Land use plan or a proposed development, as the case may be, is required if it cannot be excluded, on the basis of objective information, that the draft Land use plan or proposed development, individually or in combination with other plans or projects, will have a significant effect on a European site.

(5) "The competent authority shall determine that an appropriate assessment of a draft Land use plan or a proposed development, as the case may be, is not required if it can be excluded, on the basis of objective information, that the draft Land use plan or proposed development, individually or in combination with other plans or projects, will have a significant effect on a European site. "

1.1.2 Statement of Authority

This report has been prepared by RSK Biocensus and Inis Environmental Consultants Ltd (INIS) ecologists who are experienced in undertaking field surveys and assessments of relevant habitats and species. Personnel are listed below:

Andrew Whitfield MA BA CEnv CEcol (Associate Consultant): Andrew has over 30 years of experience in undertaking and co-ordinating ecological and environmental impact assessments across a wide variety of infrastructure projects. These include

projects of varying type and scale, ranging from new nuclear power generation facilities and housing developments to major road and rail construction schemes. Andrew has undertaken Habitat Regulations Assessments (HRA) of various plans and projects including transport improvement options for the Scottish Government, water supply options for Greater London, and the Heads of the Valleys road improvements in South Wales. Andrew has also given evidence at approximately 20 planning inquiries/hearings in the UK, Ireland and Africa.

Howard Williams BSc CEnv CBiol MRSB MIFM (Principal Ecologist and CEO INIS): Chartered Environmentalist and Chartered Biologist who has authored and managed Ecological Impact Assessments (EcIA), Construction Environmental Management Plans and Article 6 Appropriate Assessments for over 50 wind farm projects. Howard is an expert in the field of avian ecology and has extensive knowledge and experience of providing management recommendations for a range of terrestrial and aquatic protected species.

Dr Alex Copland BSc PhD (Principal Ecologist, INIS): experienced conservation scientist specialising in the conservation of wild birds and biodiversity in the wider countryside, particularly in agricultural, upland and peatland landscapes. Alex is proficient in data analysis and has studied bird populations in Ireland for over 18 years. He has managed several large-scale, multi-disciplinary conservation projects including research and conservation work for species of conservation concern. Alex has also worked with NGOs at EU-level and EU institutions (European Commission and European Parliament).

Peter O Connor BA MSc (Lead GIS Specialist, INIS): lead GIS Specialist experienced in overseeing the completion of mapping for multiple windfarm projects. Peter has experience in conducting Viewshed Analysis in support of selected Vantage Points for ornithological surveys, involving the complex use of Digital Terrain Models and/or Digital Elevations Models in addition to bespoke Viewshed Analysis plugins for QGIS. Peter also has experience with field data capture and integration into project mapping (e.g., for habitats, birds, bats and invasive species), including for figures supporting EIAR chapters and associated reports.

Cillian Burke BSc (Assistant Ecologist, INIS): ecologist with a BSc (Hons) in Environmental Science from the University of Galway. Cillian has experience in undertaking multi-disciplinary surveys including habitat classification, ornithology Vantage Point surveys, breeding wader surveys, Ecological Clerk of Works and bat surveys, and has authored ecological reports including AA Screening Reports, NIS, EcIA and Biodiversity Net Gain (BNG) Reports.

James O'Connell BSc (Hons) (Ecologist, INIS): James was awarded a BSc (Hons) in Wildlife Biology from IT Tralee. James regularly conducts ornithological surveys for various projects across Ireland. He has a broad range of ecological survey experience including Vantage Point surveys, transect surveys, habitat classification and bat surveys. James led a wide a range of ornithological field surveys to inform this AA Screening Report.

Chris McKiernan BSc (Hons) (Ecologist, INIS): Chris has over three years of experience of carrying out professional ornithology surveys in Ireland on a variety of projects. They received a BSc in Ecology and Environmental Biology from UCC in 2020 and is a Qualifying member of CIEEM. Chris was heavily involved in carrying out and

coordinating ornithological field surveys to inform this NIS report, including Vantage Point surveys, transect surveys, breeding and wintering raptor surveys, and surveys for wintering waterbirds.

Emily Marsh BSc (Hons) PGDip MSc (Ecologist, INIS): Emily has an MSc in Sustainable Resource Management awarded jointly from the University of Galway and University of Limerick, a Postgraduate Diploma in Climate Change Science & Policy from University of Bristol, and a BSc (Hons) in Environmental & Earth System Science from University College Cork. Emily's expertise is primarily in ornithological surveys, terrestrial mammal surveys and habitat assessment. She is experienced in delivering ecological fieldwork and reporting for renewable energy projects in accordance with industry best practice standards. Emily completed ornithological survey work informing this AA Screening Report including; Vantage Point surveys and surveys for breeding and wintering raptors.

Darren McCartney BSc (Ecologist and GIS Specialist, INIS): Darren has worked in both the field ecology and GIS teams at INIS and is a Qualifying member of CIEEM. He has experience of undertaking ornithological field surveys in relevant habitats, and completed various surveys to inform this AA Screening Report including Vantage Point surveys, transect surveys, surveys for breeding waders, surveys for breeding and wintering raptors, and surveys for wintering waterbirds. As a member of the INIS GIS team, Darren also contributed to figure production and habitat calculations for this Screening Report.

Michael Whelan (Consultant Ornithologist): Micheal is a field ecologist based in Co. Offaly, and has been working for INIS since 2018. Michael has substantial experience of many relevant ornithological surveys types, and led varied surveys to inform this AA Screening Report including Vantage Point surveys, transect surveys, surveys for breeding waders, surveys for breeding and wintering raptors, and surveys for wintering waterbirds.

Ross Macklin B.Sc. (Hons), MIFM, HDip GIS, PDip IPM is an ecologist with over 16 years' professional experience in Ireland. He specialises in freshwater fisheries ecology, biology and water quality. He has considerable experience in a wide range of ecological and environmental projects including EIAR, EcIA, AA/NIS, CEMP reporting, as well as biodiversity, water quality monitoring, invasive species and fisheries management. Ross was involved in all aquatic surveys undertaken for the Proposed Development used to inform this AA Screening Report He also has expert identification skills in macrophytes, freshwater invertebrates, protected aquatic habitats and protected aquatic species including freshwater pearl mussel. His diverse project list includes work on renewable energy developments, flood relief schemes, road schemes, blueways/greenways, biodiversity projects, fisheries management projects and catchment wide water quality management. He is currently completing his Ph.D. on the ecology and impact of Common Carp (*Cyprinus carpio*) in Irish waters.

Bill Brazier B.Sc. (Hons) MIFM is an aquatic ecologist with over 10 years' professional experience in Ireland. He specialises in freshwater fisheries ecology, biology and water quality. He has considerable experience in a wide range of ecological and environmental projects including EIAR, EcIA and AA/NIS reporting, as well as biodiversity, invasive species and fisheries management. Bill was involved in all aquatic surveys undertaken for the Proposed Development used to inform this AA Screening Report. His diverse

project list includes work on renewal energy developments, flood relief schemes, road schemes, blueways/greenways and biodiversity projects. He is currently completing his Ph.D. on the genetics, reproductive biology and invasive potential impact of Common Carp (*Cyprinus carpio*) in Irish waters. Additionally, Bill runs the highly respected *Off the Scale* magazine, Ireland's most-read recreational angling publication and is the national coordinator for the novel Anglers National Line Recycling Scheme (ANLRS).

Nick Henson CEnv MCIEEM (Associate Director, RSK Biocensus): Nick has a wealth of experience from over 18 years as an ecological consultant. Nick has produced and reviewed numerous Appropriate Assessment Screening and NIS reports, and he has a technical specialism in ornithology which he has used to provide support to various projects including wind farms, for which he has extensive experience of providing technical advice and leadership in the UK and Ireland.

George Wilkinson BSc MSc MCIEEM (Senior Ornithologist, RSK Biocensus): George has over five years of consultancy experience and over 15 years of birdwatching experience. His work has primarily focused on ornithological surveys, impact assessment and habitat management in the UK, during which he has frequently led ornithological assessments and surveys for a variety of species and development types including wind farms. This has included work on wind farms and other development types in Ireland. George has also authored and reviewed multiple HRA and NIS reports.

1.2 Consultation

Consultees and their responses are listed in full in EIAR **Chapter 3 EIAR Scoping Consultations, Community Engagement and Key Issues**. Regarding potential impacts on features of potential relevance to European Sites, the following bodies were consulted in relation to the Proposed Development:

- An Bord Pleanála pre-application consultation;
- National Parks and Wildlife Service (NPWS): sensitive data request issued 24/02/2023, response received 06/03/2023 (areas searched: R56 and R57);
- NPWS Development Applications Unit (DAU): request for recommendations and observations issued 21/02/2023, response received 30/03/2023. The DAU made no comment on this referral (areas searched: Proposed Development (see **Figure 1.2**).
- Inland Fisheries Ireland: contacted 24/02/2023, response received 13/04/2023 (areas searched).

Whilst Bat Conservation Ireland was contacted, no comment was made on the Proposed Development (05/12/2023).

1.3 Proposed Development Description

The site of the Proposed Development is located in the Oatfield and Gortacullin areas. At the nearest point, the Proposed Development site is approximately 1.3km to the South of Broadford, 4.7km to the East of Sixmilebridge, 7.6km North of Ardnacrusha, 9.2km North of Limerick, and 19.7km South of Ennis.

The Proposed Development site boundary (which is the planning boundary) includes:

- Two distinct areas containing the wind farm infrastructure, including turbines and on-site substation. Each distinct area is referred to as the Western DA and the Eastern DA (comprising principally of conifer plantation, transitional woodland scrub, mixed forest, pastures, agricultural lands, and peat lands.
- An IPP connection route from the Eastern DA to the 110kV substation located in the Western DA. The IPP cables will be installed within the body of the local public road network and public access trackway on approach to the Western DA. The overall length of this interconnecting IPP cable route is ca. 10.6km.
- Electrical energy generated from the wind farm will be exported to the national grid via double circuit underground grid connection cables to the proposed 110kV loop-in masts at Ballycar North, County Clare, where it will connect to the existing overhead 110kV line. Two options for the interconnection with the OHL are proposed.
    - The first is a loop-in to the existing Ardnacrusha – Ennis 110kV OHL at Ballycar North (ca. 3.83km cable length) and the second is a loop-in to the existing Ardnacrusha – Drumline 110kV OHL, also at Ballycar North (ca. 4.16km cable length).
    - Once the 110kV double circuit export cable leaves the Proposed Development site, the grid connection infrastructure will be installed within the body of the public road network along the route until it reaches third party lands where the loop-in towers will be located, beneath the existing OHL in the townland of Ballycar North.
- An area of land take required for accommodation works along the proposed turbine delivery route from Foynes Port to the Proposed Development site (see **EIAR Chapter 5: Project Description** for further details).

1.4 Methodology

1.4.1 Stages of the Appropriate Assessment Process

Guidance on the Appropriate Assessment (AA) process was produced by the European Commission (EC) in 2002, which was subsequently developed into guidance specifically for Ireland by the Department of Environment, Heritage and Local Government (DEHLG) (2010). These guidance documents identify a staged approach to conducting an AA, as shown in Figure 1.1**.** Each step or stage in the assessment process precedes and provides a basis for other steps. The four stages in an AA are further described below.

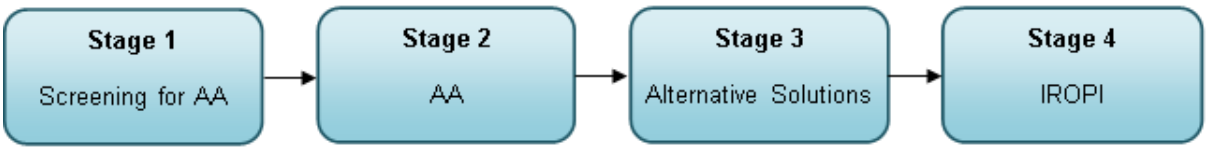

Figure 1.1: The Appropriate Assessment Process (from *Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities, DEHLG, 2010*)

1.4.1.1 Stage 1 – Screening for AA

This stage examines the likely effects of a project either alone or in combination with other projects upon any European Site and considers whether it can be objectively concluded that these effects will be significant.

The threshold for a LSE is treated in the screening exercise as being above a de minimis level. The opinion of the Advocate General in CJEU case C-258/11 outlines:

"the requirement that the effect in question be 'significant' exists in order to lay down a de minimis threshold. Plans or projects that have no appreciable effect on a European site are thereby excluded. If all plans or projects capable of having any effect whatsoever on the site were to be caught by Article 6(3), activities on or near the site would risk being impossible by reason of legislative overkill".

As such, 'relevant' European Sites in this report are those within the potential ZoI of activities associated with the Proposed Development (see Section 0), where impact pathways to European Sites were identified through the source-pathway-receptor model.

Screening for AA has been undertaken in reference to relevant case law; notably *Case C-323/17 People Over Wind and Sweetman,* which established that a Screening for AA exercise cannot take account of mitigation procedures when making any assessment of likely significant impact on a European Site. To quote the determination: "*Article 6(3) of Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora must be interpreted as meaning that, in order to determine whether it is necessary to carry out, subsequently, an appropriate assessment of the implications, for a site concerned, of a plan or project, it is not appropriate, at the screening stage, to take account of the measures intended to avoid or reduce the harmful effects of the plan or project on that site*".

1.4.1.2 Stage 2 – Appropriate Assessment

If LSE of any project cannot be screened out in Stage 1, the process moves to Stage 2. *Stage Two AA is a focused and detailed examination, analysis and evaluation carried out by the competent authority of the implications of the plan or project, alone and in-combination with other plans and projects, on the integrity of a European site in view of that site's conservation objectives. Case law has established that such an Appropriate Assessment, to be lawfully conducted, in summary:*

(i) must identify, in the light of the best scientific knowledge in the field, all aspects of the proposed development which can, by itself or in-combination with other plans or projects, affect the conservation objectives of the European site;

(ii) must contain complete, precise and definitive findings and conclusions and may not have lacunae or gaps; and

(iii) may only include a determination that the proposed development will not adversely affect the integrity of any relevant European site where the competent authority decides (on the basis of complete, precise and definitive findings and conclusions) that no reasonable scientific doubt remains as to the absence of the identified potential effects. If adverse impacts can be satisfactorily avoided or successfully mitigated at this stage, so that no reasonable doubt remains as to the absence of the identified potential effects, then the process is complete. If the assessment is negative, i.e. adverse effects on the

integrity of a site cannot be excluded, then the process must proceed to stage three and, if necessary, stage four.

Determining the Zone of Influence

Following consideration of the Proposed Development and its potential source-pathway-receptor model (i.e., based on its geographical location and potential scope for impacts), European Sites designated within the Natura 2000 network occurring within 15 km of the Proposed Development were subject to detailed consideration herein. As such, a preliminary Zone of Influence (ZoI) of 15 km was adopted within this assessment. Sites that were further away from the proposed development were also considered and no complete source-pathway-receptor chain for significant effect was identified for any European Site that was further than 15 km from the site.

The proximity of the Proposed Development to European Sites is important when identifying potential LSE. A conservative 15 km ZoI was adopted to ensure comprehensive assessment of potential impact pathways. When identifying potential impact pathways, the complete list of all Qualifying Interests (QIs) and Special Conservation Interests (SCIs) of European Sites in Ireland (i.e., potential receptors) was considered, in accordance with Irish departmental guidance on AA:

> "*For projects, the distance could be much less than 15 km, and in some cases less than 100m, but this must be evaluated on a case-by-case basis with reference to the nature, size and location of the project, and the sensitivities of the ecological receptors, and the potential for in combination effects*" (DoEHLG, 2010, p. 32).

Following the guidance set out by the National Roads Authority (NRA) (2009) and the Office of the Planning Regulator (2021), the Proposed Development has been evaluated based on an identified ZoI with regards to the potential source-pathway-receptor model for the development. The likely ZoI for mobile species (e.g., birds, mammals, fish) and static species and habitats (e.g., saltmarshes, woodlands, flora) is considered differently. Mobile species have a 'range' outside of the designated sites for which they are QIs and SCIs. The range of mobile QI/SCI species varies considerably, from several metres (e.g., in the case of whorl snails *Vertigo* spp.), to hundreds of kilometres (in the case of migratory wetland birds). Whilst static species and habitats are generally considered to have ZoIs in close proximity to a development, they can be significantly affected at considerable distances from an effect source; for example, where an aquatic QI habitat or species is located many kilometres downstream from a pollution source.

Hydrological linkages between developments and statutory designated sites (and their QIs/SCIs) can occur over significant distances; however, any effect will be site-specific depending on the receiving aquatic environment and nature of the potential impact. A reasonable worst-case ZoI for water pollution from a development is considered to be the hydrological pathway from the development until it reaches the first lenthic water body (i.e., lake) or transitional water body (e.g., estuary), as the depositional nature of these waterbodies would limit the transport capacity of any potential influences from the development to downstream designated sites.

1.4.2 Source-Pathway-Receptor Model

The source-pathway-receptor model is a standard tool used in environmental assessment. For an effect to be likely, all three elements of this mechanism must be in

place. The absence or removal of one of the elements of the mechanism results in no likelihood for the effect to occur. The source-pathway-receptor model was used to identify a list of European Sites, and their QIs/SCIs, with potential links to European Sites. These are termed as 'relevant' European Sites/QIs/SCIs throughout this report.

Within the source-pathway-receptor model, through which the likely effects of the Proposed Development on European Sites have been appraised:

- A 'source' is defined as the individual element of the project that has the potential to impact on a European Site, its qualifying features and its Conservation Objectives;
- A 'pathway' is defined as the means or route by which a source can affect the ecological receptor; and
- A 'receptor' is defined as the QIs and SCIs for which Conservation Objectives have been defined for the European Sites being screened.

1.4.3 Determining the Ecological Baseline

This Screening for Appropriate Assessment Report has been informed by the detailed ecological baseline for the Proposed Development established during desk-based reviews and field surveys undertaken between 2021 and 2023 inclusive. This is presented in full in EIAR Chapters 7 and 8, which should be referred to for detailed methods and results regarding sensitive receptors (i.e., habitats and species). Methods for establishing the ecological baseline are summarised below.

1.4.3.1 Desk Study

A Desk Study was completed on 17/10/2023 to assess the potential for all QIs and SCIs of relevant European Sites to occur within and near the Proposed Development. This was undertaken in reference to their ecological requirements as identified by Balmer et al. (2013) (for SCIs) and the National parks and Wildlife Service (NPWS) (for QIs). As mobile qualifying features (e.g., birds, bats, aquatic features) can travel many kilometres from their core areas, the Desk Study assessed the potential presence of such species beyond the European Sites for which they are QIs/SCIs. The Desk Study was informed by the following:

- Tabulated lists of SCIs and QIs for all relevant European Sites, obtained from NPWS;
- Details of QIs/SCIs of relevant European Sites within the National Biodiversity Action Plan 2017-2021 (DoCHG, 2017);
- Information on the ranges of mobile QI populations, obtained from Volume 1 of NPWS's Status of EU Protected Habitats and Species in Ireland (NPWS, 2019a), including associated digital shapefiles;
- Information on the ranges of mobile SCI bird species, from the Bird Atlas 2007–11 (Balmer et al., 2013) and (for raptors) Hardey et al. (2013);
- Mapping of European Site boundaries and Conservation Objectives for relevant sites, available online from the NPWS (mapping completed on 01/12/2023,

sensitive data request issued 24/02/2023, response received 06/03/2023 **(Section 1.2)**, areas searched: R56 and R57);

- Distribution records for QI and SCI species of European Sites, held online by the National Biodiversity Data Centre (NBDC) (accessed on 02/10/2023, area searched include R56 and R57 10 km grid squares within which the Proposed Development is located;
- National Biodiversity Network (NBN) Atlas (accessed on 02/10/2023, areas searched include the Proposed Development;
- Northern Ireland Environment Agency (NIEA) Catchment Data Map Viewer.
- Data including surface and ground water quality status, and river catchment boundaries, available from the online database of the Environmental Protection Agency (EPA) (accessed on 15/10/2023, areas searched include groundwater bodies and river catchment boundaries within which the Proposed Development is located);
- Information on groundwater aquifers, recharge, and vulnerability available from the online database of Geological Survey Ireland (GSI) (accessed on 15/10/2023, areas searched include groundwater GSI vulnerability and GSI aquifer boundaries within which the Proposed Development is located;
- National and regional surveys of semi-natural habitats, including grasslands (O'Neill et al., 2013), saltmarsh (McCorry & Ryle, 2009; Devaney & Perrin, 2015), and woodland (Perrin et al., 2008); and
- Boundaries for catchments with confirmed or potential Freshwater Pearl Mussel (FWPM) (*Margaritifera margaritifera*) populations in GIS format, available online from the NPWS.

1.4.3.2 Field Surveys

Multidisciplinary ecological field surveys including birds, bats, reptiles, amphibians, invertebrates and aquatic features were undertaken by INIS ecologists (see Section 1.1.2) within the Proposed Development site and appropriate buffers (up to 10 km) between October 2021 and October 2023 inclusive. Ecological field surveys of the TDR were undertaken in November 2023. These surveys were conducted to inform the ecological baseline of the Proposed Development, and to provide information on all habitats and species relevant to nearby European Sites. The methods for these field surveys are summarised below. Full details of these survey methods are provided in EIAR Chapters 7 and 8.

Habitats

The study area was selected based on professional judgement and as per best practice (CIEEM, 2019b) and all habitats within the likely zone of influence of this study area were surveyed and mapped according to best practice methods (Fossitt, 2000; Smith et al., 2011). The surveys were carried out in good weather with no constraints. Habitat surveys were undertaken for the study area for the Proposed Development site (i.e. boundary of the Proposed Development site plus a 50 m buffer) on August 11th and 28th 2023. Only areas of the TDR with proposed works were subject to habitat surveys.

Avifauna

Detailed ornithological field surveys of the Proposed Development and appropriate buffers were undertaken between 2021 and 2023 inclusive to identify the bird populations present, and to gather supporting data to enable detailed impact assessment (e.g., through collision risk modelling) (see EIAR Chapter 8, Section 8.3.2 for detailed ornithological survey methods). Surveys undertaken to inform the Proposed Development were as follows:

- Countryside Bird Survey (CBS) transect surveys during the breeding seasons (i.e., April to September inclusive) 2022 and 2023, and during the winter season (i.e., October to March inclusive) 2022/23 (CBS, 2012).
- Vantage Point (VP) surveys during the breeding seasons 2022 and 2023, and during the winter seasons 2021/22 and 2022/23, plus a minimum 500 m buffer around all proposed turbines was used in accordance to best practice (SNH, 2017);
- Breeding Woodcock (*Scolopax rusticola*) surveys plus a 500 m buffer was used during the breeding seasons 2022 and 2023. These surveys were informed by the best practice guidelines provided by Hoodless et al. (2009), Heward et al. (2015) and Brewin et al., (2022).;
- Breeding wader surveys during the breeding seasons 2022 and 2023. All suitable peatland and wetland habitat was surveyed within the Proposed Development and 500 m buffer. These were undertaken in accordance with relevant best practice guidance (Brown & Shepherd, 1993);
- Breeding raptor surveys (notably for Hen Harrier (*Circus cyaneus*)) during the breeding seasons 2022 and 2023. Based on best practice disturbance buffers and core foraging zones for these species (SNH, 2016; Goodship & Furness, 2022). These surveys covered all suitable raptor breeding habitat within a 2 km buffer around the Proposed Development turbines (Gilbert et al., 1998; Hardey et al., 2013);
- Breeding Barn Owl (*Tyto alba*) surveys during the breeding seasons 2022 and 2023, with a 1 km buffer, with any buildings and other artificial habitats (e.g., quarries) identified as having high suitability for nesting and roosting Barn Owls subject to further surveys (SNH, 2017);
- Red Grouse (*Lagopus lagopus*) surveys during the winter season (January and February 2023). A pair of observers, 250 m apart, walked four transects across a 1 km^2 area at a steady pace in suitable weather conditions (e.g., clear, dry weather) in accordance with best practice methodology (Cummins et al., 2010b);
- Kingfisher (*Alcedo atthis*), Dipper (*Cinclus cinclus*) and Grey Wagtail (*Motacilla cinerea*) surveys during the breeding season 2023. A standard transect survey methodology was used (Cummins et al., 2010a; Crowe et al. 2008).;
- Wintering Wetland Bird Surveys (WeBS) during the winter season 2022/23, within a study area of 5 km (SNH, 2016) from the Proposed Development turbines; and
- Wintering Hen Harrier roost surveys during the winter season 2022/23. Best practice guidance recommends that data for Hen Harrier should be collected for roosting sites within 2km of wind farm sites (SNH, 2017). In addition, Hen Harriers have a typical foraging range of up to 10 km (SNH, 2016).

All surveys for sensitive breeding and wintering birds (e.g., raptors, waders) were undertaken in accordance with current legislation and best practice guidance regarding the avoidance of disturbance during surveys, and were conducted by suitably experienced ornithologists (see Section 1.1.2).

The survey approach adopted was based on best practice guidance and professional judgement, in reference to known bird-habitat associations and in accordance with best practice survey methods for target species. The geographical scope of the field surveys was determined in reference to Scottish Natural Heritage (SNH) and CIEEM guidance (SNH, 2017; CIEEM, 2018).

Certain bird species were identified as 'target species' for consideration in relation to the Proposed Development, with survey methods designed to aid recording of these target species. Selection of target species took into consideration:

- Their known or likely presence within or in close proximity to the Proposed Development;
- Their likely sensitivity to the Proposed Development; particularly their potential collision risk and susceptibility to disturbance (Nairn & Partridge, 2013);
- Their level of legislative protection and conservation concern; and
- Their relevance to any nearby designated sites (e.g., as QIs/SCIs).

The following species were identified as target species for this assessment. As such, all observations of these species during the field surveys described below were recorded and mapped, with emphasis on accurate recording of flight lines and heights, wintering aggregations and breeding territories/nest locations. Where these species were recorded during surveys targeting other species (e.g., observations of raptors during wintering wetland bird surveys) these are referred to as 'incidental sightings'. Target species comprised:

- All species of waterfowl;
- All species of raptor;
- All species of owl;
- All species of grouse;
- All species of wader; and
- All species of gull.

Otter

Otter *(Lutra lutra)* surveys followed the NRA *Guidelines for Treatment of Otters During Construction of National Road Schemes* (NRA, 2006), which state that, although there are no seasonal constraints for Otter surveys, any dense vegetation (especially in summer) can reduce success in the identification of Otter holts or couches. Hence the confirmatory surveys were carried out in spring 2022 in order to optimize detection of otters.

Guidance on the extent of the study area for Otters was taken from the *British Highways Agency's Nature Conservation Advice in Relation to Otters HA8199* (Highways Agency, 1999) which dictates a linear search of 300m upstream and downstream of each watercourse crossing is undertaken.

The presence of otter was determined through the recording of otter signs within 150m radius of each survey site. Notes on the age and location of signs (ITM coordinates) were made, in addition to the quantity and visible constituents of spraint (i.e. remains of fish, crustaceans, molluscs etc.).

Bats

The landscape surrounding the Proposed Development is predominantly improved agricultural landscapes and forestry, with hedgerows / treelines along roadsides, in addition to low-density houses and farm buildings. The aims of the bat surveys carried out on site were to assess the bat roost suitability of bridges, buildings and mature trees that could be directly affected and identify potential indirect effects on bats, e.g. from disruption of commuting routes, or lighting. The TDR work areas were not assessed as designs were not yet finalised. Field surveys undertaken to inform this report were carried out by suitably experienced ecologists (see Section 1.1.2) and are as follows (see EIAR Chapter 7, Section 7.11 for detailed survey methods):

- Preliminary roost assessments for buildings within the Proposed Development site in addition to suitable trees and watercourse crossing structures such as bridges and culverts;
- Bat Activity Surveys at the site of the Proposed Development were undertaken using automated Anabat Express bat detectors;
- Spring, Summer and Autumn Transect surveys were conducted within the Proposed Development site in 2023;
- A preliminary ecological appraisal was carried out for all buildings within 250m of the Proposed Development Turbines in 2023 (Collins, 2016);
- Ground-level roost assessments were carried out for all trees with moderate or low bat suitability within 250m of the Proposed Development Turbines (as explained for the buildings surveys), using binoculars (Steiner SkyHawk 3.0 10x42);
- Roost surveys (carried out within the Proposed Development in April 2023); and
- Emergence/Re-entry surveys (carried out within the Proposed Development between July-September 2023).

Aquatics

Aquatic surveys of the watercourses within the vicinity of the Proposed Development were conducted on the 21st, 22nd, 23rd, and 29th August and 1st September 2023. All aquatic surveys were carried out by Ross Macklin and Bill Brazier (see Section 1.1.2). Survey effort focused on both instream and riparian habitats at each aquatic sampling location, the furthest sampling location is B17, located 4.7 km southeast of the gird connection. Surveys at each of these sites were as follows (see EIAR Chapter 7 for detailed aquatic surveys):

- Fisheries assessment (electro-fishing and fisheries habitat appraisal);
- White-clawed Crayfish (*Austropotamobius pallipes*) survey;
- Macrophyte and aquatic bryophyte survey;
- Biological water quality sampling (Q-sampling);

- Macro-invertebrate sweep sampling;
- Fish Stock Assessment (Electro-Fishing);
- Freshwater Pearl Mussel survey (eDNA only); and
- General eDNA analysis.

1.5 Relevant European Sites

Relevant European Sites of nature conservation importance, including SPAs, SACs and Ramsar sites, are summarised in Table 1.1 below.

A precautionary approach was adopted when identifying relevant European Sites, assessing all European Sites within a 15 km radius of the Proposed Development as well as more distant sites where potential hydrological linkage exists (OPR, 2021).

As presented in Table 1.1 below, 23 European Sites were identified for assessment in relation to the Proposed Development; specifically four SPAs and 19 SACs. The distance to the nearest element of the Proposed Development is stated below. Where this is significantly different to the distance from the Proposed Development turbines, this is stated. The locations of these European Sites are presented in Annex A, Figure 1.11**.** with the distances from the Proposed Development provided in Table 1.1**.**

As indicated in below, three IBAs were identified within the ZoI of the Proposed Development. These overlap with other European Sites. No other relevant IBAs were identified.

The Proposed Development Turbines and Grid connection route do not overlap with any IBA boundaries. The nearest IBA, Shannon and Fergus Estuaries IBA, is located approximately 6.4 km from the Proposed Development.

Table 1.1: Proximity of relevant European Sites to the Proposed Development, including Grid connection route and TDR.

No.	European site	Distance from Proposed Development	Distance from Proposed Development turbines	Hydrological connectivity (yes/no)
1	Lower River Shannon SAC (002165)	0 m (from closest point of TDR)	7.2 km	TDR spans the SAC via the Killaloe Bypass
2	River Shannon and River Fergus Estuaries SPA (004168)	380 m (from closest point of TDR)	9.1 km	Yes, SPA is located 17.3 km downstream from gird connection
3	Glenomra Wood SAC (001013)	1.3 km	4.5 km	No
4	Danes Hole, Poulnalecka SAC (000030)	2.0 km	2.1 km	No
5	Lough Derg (Shannon) SPA (004165)	2.1 km	12.6 km	No
6	Slieve Bernagh Bog SAC (002312)	3.5 km	4.1 km	No

No.	European site	Distance from Proposed Development	Distance from Proposed Development turbines	Hydrological connectivity (yes/no)
7	Slievefelim to Silvermines Mountains SPA (004058)	3.8 km	>15 km	No
8	Ratty River Cave SAC (002316)	4.3 km	4.4 km	No
9	Kilkishen House SAC (002319)	5.1 km	5.1 km	No
10	Clare Glen SAC (000930)	5.7 km	>15 km	No
11	Silvermines Mountains West SAC (002258)	6.9 km	>15 km	No
12	Glenstal Wood SAC (001432)	7.8 km	>15 km	No
13	Keeper Hill SAC (001197)	8.5 km	>15 km	No
14	Tory Hill SAC (000439)	10.8 km	>15 km	No
15	Poulnagordon Cave (Quin) SAC (000064)	11.3 km	11.4 km	No
16	Askeaton Fen Complex SAC (002279)	11.7 km	>15 km	No
17	Slieve Aughty Mountains SPA (004077)	11.8 km	11.9 km	No
18	Lough Gash Turlough SAC (000051)	12.1 km	13 km	No
19	Silvermine Mountains SAC (000939)	12.2 km	>15 km	No
20	Newgrove House SAC (002157)	13.3 km	13.4 km	No
21	Curraghchase Woods SAC (000174)	13.6 km	>15 km	No
22	Bolingbrook Hill SAC (002124)	13.7 km	>15 km	No
23	Old Domestic Building (Keevagh) SAC (002010)	14.1 km	14.2 km	No

The Proposed Development does not overlap with any European Sites, with the exception of Lower River Shannon SAC, for which the TDR spans over the SAC via the Killaloe Bypass. No TDR works will be required at this section of the TDR, and the SAC is approximately 3.4 km from the Proposed Development turbines. The nearest SPA, River Shannon and River Fergus Estuaries SPA, is located approximately 380 m from

the TDR, and approximately 6.4 km from the Proposed Development turbines. As such, European Sites were carried forward for consideration as Key Ornithological Features.

There are no Ramsar sites within 15 km of the Proposed Development, with the nearest Ramsar site (Ballyallia Lough, site number: 845) located approximately 18.9 km from the Proposed Development. Considering this distance, and the scope for impacts from the Proposed Development, no Ramsar sites were carried forward for further assessment.

Table 1.2: Proximity of relevant Important Bird Areas to the Proposed Development, including Grid connection route and TDR

No.	Name	Distance from the Proposed Development	Distance from Proposed Development turbines	Hydrological connectivity (yes/no)
1	Shannon and Fergus Estuaries	7.9 km	11.6 km	Yes (downstream of Proposed Development)
2	Slieve Aughty Mountains	11.9 km	12 km	No
3	Lough Derg (Shannon)	12.1 km	13.1 km	No

The Qualifying Interest (QI) and Special Conservation Interests (SCI) for each site identified within the ZoI of the Proposed Development is presented in **Table 1.3.**

Table 1.3: Qualifying Interests of European Sites within 15 km of the Proposed Development*

European Site Name and Code	Qualifying Interest /Special Conservation Interest and Code (*denotes a priority habitat)	Summary Description (from Site Synopsis)
Danes Hole, Poulnalecka SAC [000030]	Caves not open to the public [8310] Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0] *Rhinolophus hipposideros* (Lesser Horseshoe Bat) [1303]	This site consists of a small fossil cave in the banks of the Ahaclare River situated within a wood approximately 4 km west of Broadford, Co. Clare. It is a winter hibernation site and also a mating site of the Lesser Horseshoe Bat. A nearby summer roost for the bat and the commuting routes between the two are also included.
Glenomra Wood SAC [001013]	Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0]	Glenomra Wood is a deciduous woodland located in south-east Co. Clare, about 10 km north of Limerick city. The dominant tree in Glenomra Wood is Downy Birch (*Betula pubescens*), which attains a height of about 20 m in places. This is mixed with Sessile

European Site Name and Code	Qualifying Interest /Special Conservation Interest and Code (*denotes a priority habitat)	Summary Description (from Site Synopsis)
		Oak (*Quercus petraea*), Ash (*Fraxinus excelsior*) and Beech (*Fagus sylvatica*) throughout. Holly (*Ilex aquifolium*) is abundant and is the main understorey species. Hazel (*Corylus avellana*), regenerating Birch, Gorse (*Ulex europaeus*) and Bramble (*Rubus fruticosus agg.*) are other understorey species. Willow (*Salix spp.*) occurs in the wetter areas. This site supports multiple mammal and amphibian species of national importance to Ireland's biodiversity.
Ratty River Cave SAC [002316]	Caves not open to the public [8310] *Rhinolophus hipposideros* (Lesser Horseshoe Bat) [1303]	This site lies approximately 2.5km north of Sixmilebridge in Co. Clare. It consists of a cave, and also an important winter roost and a breeding site of the Lesser Horseshoe Bat. The cave in Ratty River Cave SAC is a natural fossil limestone cave set into the east facing bank of Ratty River (also known as Owenogarney River). The cave entrance is overgrown with Bramble (*Rubus fruticosus agg*.). Inside the entrance there is a low crawl, but the cave opens into a main chamber before diverging into two tunnels. Lesser Horseshoe Bats have been using the cave beside the Ratty River as a hibernation site for some years. During the winter of 2001, 187 bats were recorded here making it a site of international importance. A stretch of river and the bankside vegetation are included in the site as these are used by commuting bats. A derelict cottage which is situated nearby is also included as it contains a maternity roost of Lesser Horseshoe Bats. A total of 65 bats were recorded here in July 1998. The foraging areas used by these bats have yet to be established. Neither roost is subject to disturbance and there are no other known threats to this site at present.
Lower River Shannon SAC [002165]	Sandbanks which are slightly covered by sea water all the time [1110] Estuaries [1130]	This very large site stretches along the Shannon valley from Killaloe in Co. Clare to Loop Head/ Kerry Head, a distance of some 120 km. The site thus encompasses the Shannon, Feale, Mulkear and Fergus estuaries, the freshwater lower reaches of the River Shannon (between Killaloe and

European Site Name and Code	Qualifying Interest /Special Conservation Interest and Code (*denotes a priority habitat)	Summary Description (from Site Synopsis)
	Mudflats and sandflats not covered by seawater at low tide [1140] Coastal lagoons [1150]* Large shallow inlets and bays [1160] Reefs [1170] Perennial vegetation of stony banks [1220] Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] Salicornia and other annuals colonising mud and sand [1310] Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330] Mediterranean salt meadows (*Juncetalia*) [1410] Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation [3260] Molinia meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) [6410] Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae*) [91E0]* *Margaritifera margaritifera* (Freshwater Pearl Mussel) [1029] *Petromyzon marinus* (Sea Lamprey) [1095] *Lampetra planeri* (Brook Lamprey) [1096]	Limerick), the freshwater stretches of much of the Feale and Mulkear catchments and the marine area between Loop Head and Kerry Head. Rivers within the sub-catchment of the Feale include the Galey, Smearlagh, Oolagh, Allaughaun, Owveg, Clydagh, Caher, Breanagh and Glenacarney. Rivers within the sub-catchment of the Mulkear include the Killeenagarriff, Annagh, Newport, the Dead River, the Bilboa, Glashacloonaraveela, Gortnageragh and Cahernahallia.

European Site Name and Code	Qualifying Interest /Special Conservation Interest and Code (*denotes a priority habitat)	Summary Description (from Site Synopsis)
	Lampetra fluviatilis (River Lamprey) [1099] *Salmo salar* (Salmon) [1106] *Tursiops truncates* (Common Bottlenose Dolphin) [1349] *Lutra lutra* (Otter) [1355]	
Slieve Bernagh Bog SAC [002312]	Northern Atlantic wet heaths with *Erica tetralix* [4010] European dry heaths [4030] Blanket bogs (* if active bog) [7130]	Slieve Bernagh Bog is situated to the west of Lough Derg, in the south-east of Co. Clare. The site comprises the Slieve Bernagh mountain range, with the highest peaks at Moylussa (532 m) and Cragnamurragh (526 m), and the surrounding peatlands that flank its northern slopes. Several species of birds, typical of open moorland, have been recorded from this site. These include Skylark, Meadow Pipit, Red Grouse, Wheatear and Raven. At least two pairs of Hen Harriers are known to occur within the Slieve Bernagh to Keeper Hill region, and birds use the cSAC for foraging habitat. This species is listed on Annex I of the E.U. Birds Directive.
Lough Gash Turlough SAC [000051]	Turloughs [3180]* Rivers with muddy banks with *Chenopodion p.p.* and *Bidention p.p.* vegetation [3270]	Lough Gash Turlough lies in the low landscape west of Newmarket-on-Fergus, Co. Clare. The turlough has a very flat basin and is overlooked by houses to the east and pasture to the west. The shore of the turlough rises as a stony slope on the west side, where outcropping rocks are visible. Water rises mainly from the rocks at the southern end, but there is overground flow also – one stream discharges from the town's sewage works. It is also of considerable ecological interest for its Eutrophic nutrient status. The annual flora found at the site is highly distinctive and well-developed; there are only fragments of such vegetation at other turloughs. The presence of an abundance of the rare Northern Yellow-cress and of the protected Orange Foxtail (in its only Clare site) is notable.
Kilkishen House SAC [002319]	*Rhinolophus hipposideros* (Lesser Horseshoe Bat) [1303]	Kilkishen House is an 18th century, two-storey over basement mansion situated approximately 7 km

European Site Name and Code	Qualifying Interest /Special Conservation Interest and Code (*denotes a priority habitat)	Summary Description (from Site Synopsis)
		north of Sixmilebridge in Co. Clare. It contains an important winter roost of the Lesser Horseshoe Bat. At Kilkishen House SAC, 78 Lesser Horseshoe Bats were counted in November 2001, making it a site of international importance. Most of these were hibernating in the basement, but some were also present in the attic. The building also contains a colony of Natterers' Bats (*Myotis nattereri*) and acts as a summer roost for a smaller number of Lesser Horseshoe Bats (19 were counted emerging from the building in June 1999). The exact foraging areas used by the bats have yet to be established, but areas of woodland and wetland nearby would provide suitable habitat.
River Shannon and River Fergus Estuaries SPA [004077]	Cormorant (*Phalacrocorax carbo*) [A017] Whooper Swan (*Cygnus cygnus*) [A038] Light-bellied Brent Goose (*Branta bernicla hrota*) [A046] Shelduck (*Tadorna tadorna*) [A048] Wigeon (*Anas penelope*) [A050] Teal (*Anas crecca*) [A052] Pintail (*Anas acuta*) [A054] Shoveler (*Anas clypeata*) [A056] Scaup (*Aythya marila*) [A062] Ringed Plover (*Charadrius hiaticula*) [A137] Golden Plover (*Pluvialis apricaria*) [A140] Grey Plover (*Pluvialis squatarola*) [A141]	The estuaries of the River Shannon and River Fergus form the largest estuarine complex in Ireland. The site comprises the entire estuarine habitat from Limerick City westwards as far as Doonaha in Co. Clare and Dooneen Point in Co. Kerry. The site has vast expanses of intertidal flats which contain a diverse macroinvertebrate community, e.g. *Macoma-Scrobicularia-Nereis*, which provides a rich food resource for the wintering birds. Salt marsh vegetation frequently fringes the mudflats and this provides important high tide roost areas for the wintering birds. Elsewhere in the site the shoreline comprises stony or shingle beaches. The site is the most important coastal wetland site in the country and regularly supports in excess of 50,000 wintering waterfowl (57,133 – five year mean for the period 1995/96 to 1999/2000), a concentration easily of international importance. The site has internationally important populations of Light-bellied Brent Goose (494), Dunlin (15,131), Black-tailed Godwit (2,035) and Redshank (2,645). A further 17 species have populations of national importance ,i.e. Cormorant (245), Whooper Swan (118), Shelduck (1,025), Wigeon (3,761), Teal (2,260), Pintail (62), Shoveler (107), Scaup (102), Ringed Plover (223), Golden Plover (5,664), Grey Plover (558), Lapwing (15,126), Knot (2,015), Bar-

European Site Name and Code	Qualifying Interest /Special Conservation Interest and Code (*denotes a priority habitat)	Summary Description (from Site Synopsis)
	Lapwing (*Vanellus vanellus*) [A142] Knot (*Calidris canutus*) [A143] Dunlin (*Calidris alpina*) [A149] Black-tailed Godwit (*Limosa limosa*) [A156] Bar-tailed Godwit (*Limosa lapponica*) [A157] Curlew (*Numenius arquata*) [A160] Redshank (*Tringa totanus*) [A162] Greenshank (*Tringa nebularia*) [A164] Black-headed Gull (*Chroicocephalus ridibundus*) [A179] Wetland and Waterbirds [A999]	tailed Godwit (460), Curlew (2,396), Greenshank (61) and Black-headed Gull (2,681) – figures are five year mean peak counts for the period 1995/96 to 1999/2000. The site is among the most important in the country for several of these species, notably Dunlin (13 % of national total), Lapwing (6% of national total) and Redshank (9% of national total).
Poulnagordon Cave (Quin) SAC [000064]	Caves not open to the public [8310] *Rhinolophus hipposideros* (Lesser Horseshoe Bat) [1303]	This site is a natural limestone cave situated in a field south of Quin, Co. Clare. The cave is used as a hibernation site by the Lesser Horseshoe Bat. The number of Lesser Horseshoe Bats hibernating here varies from over 50 to less than 20. As over 50 have been recorded, the site is of international importance. This site is also important as it is at the eastern limit of the species' distribution in Ireland.
Newgrove House SAC [002157]	*Rhinolophus hipposideros* (Lesser Horseshoe Bat) [1303]	This site, situated near Tulla, Co. Clare, consists of the remains of a former mansion called Newgrove House, as well as some of the surrounding countryside. It is used as a hibernating site by the Lesser Horseshoe Bat. In February 1996, more than 150 Lesser Horseshoe Bats were recorded at this site, making it a site of international importance. This site is not threatened at present.

European Site Name and Code	Qualifying Interest /Special Conservation Interest and Code (*denotes a priority habitat)	Summary Description (from Site Synopsis)
Slieve Aughty Mountains SPA [004168]	Hen Harrier (*Circus cyaneus*) [A082] Merlin (*Falco columbarius*) [A098]	The Slieve Aughty Mountains SPA is a very large site that extends southwards from just south of Lough Rea, County Galway to Scariff in County Clare. The peaks are not notably high or indeed pronounced; the site rises to a maximum 400 m at Maghera west of Lough Graney. The site includes many small- and medium-sized lakes, notably Lough Graney and Lough Atorick; several important rivers rise in the site, including the Owendalulleegh and Graney. Lough Derg occurs immediately to the south-east. The Slieve Aughty Mountains are predominantly comprised of Old Red Sandstone, but outliers of Lower Palaeozoic rocks provide occasional outcrops capping the hills.
Slievefelim to Silvermines Mountains SPA (004058)	Hen Harrier *(Circus cyaneus)* [A082]	The site consists of a variety of upland habitats, though approximately half is afforested. The site is also a traditional breeding site for a pair of Peregrine. Merlin has been recorded within the site but further survey is required to determine its status. Red Grouse is found on some of the unplanted areas of bog and heath – this is a species that has declined in Ireland and is now Red-listed. The Slievefelim to Silvermines Mountains SPA is of ornithological importance because it provides excellent nesting and foraging habitat for breeding Hen Harrier and is one of the top sites in the country for the species. The presence of three species, Hen Harrier, Merlin and Peregrine, which are listed on Annex I of the E.U. Birds Directive is of note.
Lough Derg (Shannon) SPA [004058]	Cormorant (*Phalacrocorax carbo*) [A017] Tufted Duck (*Aythya fuligula*) [A061] Goldeneye (*Bucephala clangula*) [A067] Common Tern (*Sterna hirundo*) [A193] Wetland and Waterbirds [A999]	Lough Derg lies within counties Tipperary, Galway and Clare and is the largest of the River Shannon Lakes, being some 40 km long. Its maximum breadth across the Scarriff Bay -Youghal Bay transect is 13 km but for most of its length it is less than 5 km wide. The lake is relatively shallow at the northern end being mostly 6 m in depth but in the middle region it has an axial trench and descends to over 25 m in places. Lough Derg (Shannon) SPA is of high ornithological importance as it supports nationally important breeding populations of Cormorant and Common Tern. In winter, it has nationally important

European Site Name and Code	Qualifying Interest /Special Conservation Interest and Code (*denotes a priority habitat)	Summary Description (from Site Synopsis)
		populations of Tufted Duck and Goldeneye, as well as a range of other species including Whooper Swan. The presence of Whooper Swan, Greenland White-fronted Goose, Hen Harrier and Common Tern is of particular note as these are listed on Annex I of the E.U. Birds Directive. Parts of Lough Derg (Shannon) SPA are a Wildfowl Sanctuary.

** Data Source last accessed online www.npws.ie on 13/11/2023*

The majority of SAC sites within the ZoI list Lesser Horseshoe Bat and its corresponding roost and foraging habitats. As such, assessment of effects on these SACs must take into consideration potential effects on qualifying Lesser Horseshoe Bat populations using land within or in close proximity to the Proposed Development, outside of the SAC boundaries. According to best practice guidance provided in the Lesser Horseshoe Bat Species Action Plan 2022-2026 (NPWS & VWT, 2022), based on the known foraging ranges of this species, the presence of suitable commuting and foraging habitat within a radius of at least 2.5 km from the roost is important to the integrity of the roost. In addition, linear landscape features should preferably be retained within a 5 km radius of roosts with 20 or more Lesser Horseshoe Bats. As such, any developments with the potential to affect Lesser Horseshoe Bat commuting habitat within 5 km of a known important roost should be subject to detailed consideration of potential effects on the integrity of the roost.

Potential connectivity with a European Site was evaluated using a conceptual site model which identifies potential impact sources and pathways between the Proposed Development and the European Sites. The conceptual model (based on source-pathway-receptor connectivity) is a standard tool used in environmental assessment.

1.5.1 Conservation Objectives

The standard conservation objective for all SACs and SPAs in Ireland is "*to maintain or restore the favourable conservation condition of the qualifying interests for which the SAC/SPA has been selected*". In addition, the Department of Culture, Heritage and the Gaeltacht has produced detailed conservation objectives for the sites listed in Table 1-4. These can be viewed on the NPWS website (http://www.npws.ie/protected-sites).

In a generic sense, 'favourable conservation status' of a habitat is achieved when:

- Its natural range, and area it covers within that range, are stable or increasing;
- The specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future; and
- The conservation status of its typical species is favourable.

Favourable conservation status of species is typically achieved when:

- Population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats;
- The natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and
- There is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis. In addition, European Sites may have site-specific conservation objectives.

1.6 Ecological Baseline

1.6.1 Habitats

The planning boundary for the Proposed Development primarily comprises two areas covering approximately 292 ha: the Western DA (covering approximately 153 ha), and the Eastern DA (covering approximately 139 ha). The habitats on-site in 2023, as per Fossitt (2000), predominantly comprise conifer plantation, transitional woodland scrub, mixed forest, pasture, agricultural lands and peatlands. Habitats identified on-site and their Fossitt codes (Fossitt, 2000) are outlined in Table 1.4**.**

Table 1.4: Baseline habitats within the Proposed Development site

Fossitt Code	Area_(ha)
BL3 Buildings and artificial surfaces	16.697
BL3/ ED2 Buildings and artificial surfaces/ Spoil and bare ground	0.113
BL3/ ED3 Buildings and artificial surfaces/ Recolonising bare ground	0.095
BL3/ GA1 Buildings and artificial surfaces/ Improved agricultural grassland	0.917
BL3/ GA2 Buildings and artificial surfaces/ Amenity Grassland	11.62
BL3/GA2/WD5 Buildings and artificial surfaces/ Amenity Grassland/ Scattered trees and parkland	0.632
BL3/ GS4 Buildings and artificial surfaces/ Wet grassland	0.251
BL3 /WS1 Buildings and artificial surfaces/ Scrub	0.188
BL3 /WS2 Buildings and artificial surfaces/ Immature Woodland	0.891
ED2 Spoil and bare ground	0.38
ED2/GM1 Spoil and bare ground/ Marsh	0.703
ED3 Recolonising bare ground	0.364
GA1 Improved agricultural grassland	51.406
GA1/GS4 Improved agricultural grassland/ Wet Grassland	0.266

Fossitt Code	Area_(ha)
GA1/WS1 Improved agricultural grassland/ Scrub	2.637
GM1 Marsh	0.34
GS1/GS3 Dry calcareous and neutral grassland/ Dry-humid acid grassland	0.035
GS2 Dry meadows and grassy verges	0.786
GS3/HH1	0.590
GS2/HD1 Dry meadows and grassy verges/ Dense bracken	0.066
GS3 Dry-humid acid grassland	5.764
GS3/GS4 Dry-humid acid grassland/ Wet grassland	1.039
GS3/GS4/HH1 Dry-humid acid grassland/ Wet grassland/ Dry siliceous heath	0.033
GS3/HH1 Dry-humid acid grassland/ Dry siliceous heath	0.59
GS3/WS1 Dry-humid acid grassland/ Scrub	5.302
GS4 Wet grassland	30.02
GS4/HH2 Wet grassland/ Dry calcareous heath	0.199
GS4/HH3 Wet grassland/ Wet heath	0.154
GS4/HH3/PB2 Wet grassland/ Wet heath/ Lowland blanket bog	0.075
GS4/PB2 Wet grassland/ Lowland blanket bog	0.299
GS4/WS1 Wet grassland/ Scrub	3.064
HD1 Dense bracken	0.122
HD1/WS1 Dense bracken/ Scrub	0.593
HH3 Wet heath	14.058
HH3/WD4 Wet heath/Conifer plantation	3.044
HH3/WS1 Wet heath/Scrub	1.11
WD1 (Mixed) broadleaved woodland	2.156
WD2 Mixed broadleaved woodland/ conifer plantation	1.984
WN6 Wet willow-alder-ash woodland	1.374
WD3 (Mixed) conifer woodland	1.168

Fossitt Code	Area_(ha)
WD4 Conifer plantation	62.186
WD4/WS1 Conifer plantation/Scrub	2.74
WS1 Scrub	13.234
WS1/WD2 Scrub/ Mixed broadleaved woodland/ conifer plantation	0.023
WS1/WS2 Scrub/ Immature woodland	1.436
WS2 Immature woodland	0.584
WS3 Ornamental/non-native shrub	0.431
WS5 Recently-felled woodland	10.46
Fossitt Code	**Length (m)**
BL1 Stone walls and other stonework	1029.05
BL2 Earth banks	4935.04
BL2/WL1 Earth banks/ Hedgerows	791.96
BL2/WL1/WL2 Earth banks/ Hedgerows/ Treelines	251.86
BL2/WL2 Earth banks/ Treelines	329.27
FW1 Eroding/upland rivers	97.63
FW4 Drainage ditches	3553.18
WL1 Hedgerows	7836.29
WL1/WL2 Hedgerows/ Treelines	7094.51
WL2 Treelines	5461.43

1.6.1.1 Buildings and artificial surfaces (BL3)

This broad category incorporates areas of built land that do not fit elsewhere in the classification. It includes all buildings (domestic, agricultural, industrial and community) other than derelict stone buildings and ruins (see stone walls and other stonework - BL1). It also includes areas of land that are covered with artificial surfaces of tarmac, cement, paving stones, bricks, blocks or astroturf (e.g., roads, car parks, pavements, runways, yards, and some tracks, paths, driveways and sports grounds). This habitat consists of existing roads within the Proposed Development, IPP connection route and grid connection route, the area is 16.697 ha.

This habitat forms mosaics with habitats including amenity grassland (11.62ha), improved agricultural grassland (0.92 ha), scattered trees and parkland (0.63ha), wet grassland (0.25 ha) and immature woodland (0.89 ha). These mosaic habitats collectively occur along the grid connection route, IPP connection route and TDR.

1.6.1.2 Spoil and bare ground (ED2)

This category includes heaps of spoil and rubble, and other areas of bare ground that are either very transient in nature or persist for longer periods of time because of ongoing disturbance or maintenance. Spoil is generally associated with the excavation or construction of roads and buildings, or with drainage and dredging activities. Once the disturbance ends, spoil is readily colonised by plants. This habitat occurs within the Proposed Development site, adjacent to T1, 86 m north of T7 and adjacent to the grid connection route, this land cover has an area of 0.38 ha.

1.6.1.3 Recolonising bare ground (ED3)

This category is used for any areas where bare or disturbed ground, derelict sites or artificial surfaces of tarmac, concrete or hard core have been invaded by herbaceous plants. Vegetation cover should be greater than 50% for inclusion in this category. Most of the typical colonisers are ruderals or opportunistic plants. Common species identified include perennial ryegrass *(Lolium perenne)* and nettle *(Urtica dioica)*. This habitat occurs within proposed site roads, adjacent to T7 and adjacent to the IPP connection route and TDR, the area of this habitat is 0.36ha.

1.6.1.4 Improved agricultural grassland (GA1)

This category is used for intensively managed or highly modified agricultural grassland that has been reseeded and/or regularly fertilised and is now heavily grazed and/or used for silage making. It includes regularly reseeded monoculture grasslands and rye-grass leys that are planted as part of an arable rotation. Species identified include perennial ryegrass, creeping buttercup *(Ranunculus repens),* broad leaved dock *(Rumex obtusifolius),* white clover *(Trifolium repens),* thistle *(Cirsium spp.)* and nettle. This habitat occurs predominantly along the IPP connection route/TDR and 93m south of T7. This habitat has a total area of 51.4 ha.

This habitat forms mosaics with other habitats including wet grassland (0.26 ha) and scrub (2.66 ha).

1.6.1.5 Dry meadows and grassy verges (GS2)

Dry meadows that are rarely fertilised or grazed and are mown only once or twice a year for hay are now rare in Ireland. Most have been improved for agriculture and this type of grassland is now best represented on grassy roadside verges, on the margins of tilled fields, on railway embankments, in churchyards and cemeteries, and in some neglected fields or gardens. These areas are occasionally mown (or treated with herbicides in the case of some railway embankments), and there is little or no grazing or fertiliser application. This pattern of management produces grasslands with a high proportion of tall, coarse and tussocky grasses such as False Oat-grass *(Arrhenatherum elatius)* and Cock's-foot *(Dactylis glomerata).* This habitat occurs along the margins of existing roads adjacent to the IPP connection route/TDR, 0.78ha in total.

1.6.1.6 *Conifer Plantation (WD4)*

Conifer plantation within the Proposed Development includes areas that support dense stands of planted conifers, with a broadleaved component of less than 25%. The overriding management interest for these areas is commercial timber production. This habitat is characterised by even-aged stands of trees planted in regular rows, often forming angular blocks. Species diversity is low and single species stands are common. Blocks of conifer plantation are present throughout the receiving environment including within the Proposed Development. The most dominant species of conifer identified was Sitka spruce *(Picea sitchensis*). Occurrences of this habitat include the footprints of all turbines and the grid connection route. This habitat covers a combined area of 62.18 ha.

1.6.1.7 *Scrub (WS1)*

This broad category includes areas that are dominated by at least 50% cover of shrubs, stunted trees or brambles. The canopy height is generally less than 5m, or 4m in the case of wetland areas. Scrub frequently develops as a precursor to woodland and is often found in inaccessible locations, or on abandoned or marginal farmland. In the absence of grazing and mowing, scrub can expand to replace grassland or heath vegetation. Trees are included as components of scrub if their growth is stunted as a result of exposure, poor soils or waterlogging. Species identified within the habitat include bramble *(Rubus fruticosus agg.),* nettle*,* gorse *(Ulex europaeus),* willow *(Salix spp.)*, common hazel *(Corylus avellana)* and thistle *(Cirsium spp.).* Scrub habitat is prominent within the Western DA, other areas of where this habitat occurs include adjacent to the IPP connection route, TDR and grid connection route, this habitat has a total area of 13.23 ha.

This habitat forms mosaic habitats which include wet heath, which is present within the Western DA: specifically, between T5 and T6, 163 m east of the proposed on-site substation, and in the vicinity of T10. This habitat covers a combined area of 1.11 ha.

Scrub forms a mosaic habitat with wet grassland, which occurs adjacent to the proposed site roads located within the Proposed Development, 250 m north of T4, adjacent to the eastern boundary of the Western DA and adjacent to the IPP connection route, TDR and the grid connection route. It also forms a mosaic habitat with dense bracken (HD1) adjacent to the grid connection route (0.25 ha). This habitat covers a combined area of 3.06 ha.

1.6.1.8 *Immature woodland (WS2)*

Immature woodland includes areas that are dominated by young or sapling trees that have not yet reached the threshold heights (5m, or 4m in the case of wetland areas) for inclusion in the woodland categories previously described. Recently planted areas and young plantations are also included here, with the exception of conifer plantations - WD4. This habitat occurs adjacent to the grid connection route, the area of this habitat is 0.58 ha.

1.6.1.9 *Ornamental/non-native shrub (WS3)*

This category is used for areas that are dominated by ornamental and non-native shrubs. Most of these originate from planting and can be found in formal beds and borders in gardens, parks and other landscaped areas. It also includes areas where non-native

shrubs have escaped and become naturalised in urban and rural situations. This habitat occurs adjacent to the footprint of the IPP connection route and TDR. The area of the habitat is 0.43 ha.

1.6.1.10 Stone walls and other stonework (BL1)

This category incorporates stone walls and most other built stone structures in rural and urban situations, apart from intact buildings (see buildings and artificial surfaces - BL3) and coastal constructions made of stone. This habitat is located 265 m south of the proposed on-site substation. The total length of this habitat is 1029 m.

1.6.1.11 Earth banks (BL2)

Earth banks are a common type of field boundary in many parts of Ireland. Constructed from local materials such as peat, earth, gravel or stone, these narrow linear ridges are often bordered by drainage ditches. Most are completely vegetated when intact and feature elements of a range of habitats, including grassland, heath, hedgerow and scrub. This habitat occurs along the IPP connection route/TDR,grid connection route and adjacent to existing roads at the entrance of the Proposed Development. The total length of the habitat is 4935 m.

Earth banks form mosaics with other habitats including hedgerows and treelines (1373 m), occurring along the IPP connection route/TDR and grid connection route. These habitats have significant overlap with aforementioned non-mosaic Earth banks habitat.

1.6.1.12 Eroding/upland rivers (FW1)

This category includes natural watercourses, or sections of these, that are actively eroding, unstable and where there is little or no deposition of fine sediment. Eroding conditions are typically associated with the upland parts of river systems where gradients are often steep, and water flow is fast and turbulent. Rivers in spate are included. For some rivers on the seaward side of coastal mountains, particularly in the west of Ireland, eroding conditions persist to sea level because of comparatively steep gradients over short distances, and high rainfall. Small sections of other lowland rivers may also be eroding where there are waterfalls, rapids or weirs. The beds of eroding/upland rivers are characterised by exposed bedrock and loose rock. Pebbles, gravel and coarse sand may accumulate in places, but finer sediments are rarely deposited. An unnamed river is located on the Western DA 72.5 m east of T7. The total length of the habitat is 98 m.

The Oatfield River (EPA Code: 25O07) (1040.85 m) and Snaty River (EP Code: 25S34) (918.21 m) are both located within the Proposed Development site (Western DA), running through it.

1.6.1.13 Drainage ditches (FW4)

This category includes linear water bodies or wet channels that are entirely artificial in origin, and some sections of natural watercourses that have been excavated or modified to enhance drainage and control the flow of water. This habitat occurs within the Western DA, adjacent to T4 and T7, the on-site substation and intersecting with the grid connection route. The total length of the habitat is 3553 m.

1.6.1.14 *Hedgerows (WL1)*

Linear strips of shrubs and occasionally low scrub, often with occasional trees, typically forming field boundaries. Common species identified within this habitat include willow, ash *(Fraxinus excelsior)*, hawthorn *(Crataegus monogyna)*, gorse and bracken.

This habitat is present throughout the Proposed Development, including the IPP grid connection route, TDR and grid connection route. Hedgerows extend for a total length of 7836 m.

1.6.1.15 *Treelines (WL2)*

Narrow rows or single lines of trees greater than 5m in height and typically occurring along field boundaries. Common species identified include ash, sycamore *(Acer pseudoplatanus)*, ivy *(Hedera helix)* and downy birch *(Betula pubescens).*

This habitat occurs throughout the Proposed Development, including areas adjacent to proposed site roads and crossing the footprint of T4. Treelines delineate other elements of the Proposed Development including thegrid connection route and proposed IPP connection route/TDR. The total length of this habitat is 5461 m.

1.6.1.16 *Hedgerows/Treelines (WL1/WL2)*

A mosaic of these two aforementioned linear habitats is present along the footprint of thegrid connection route and the IPP connection route/TDR. The total length of this habitat is 7094 m.

1.6.1.17 *Wet Willow-alder-ash Woodland (WN6)*

Includes woodlands of permanently waterlogged sites that are dominated by Willows (*Salix* spp.), Alder (*Alnus glutinosa*) and/or Ash. This habitat is present within the footprint of T8 and 166 m southeast of T4, and is also present along the grid connection route. This habitat covers a combined area of 1.37 ha.

1.6.1.18 *Wet Heath (HH3)*

Vegetation with at least 25% cover of dwarf shrubs on peaty soils and shallow wet peats with an average depth of 15-50cm. Species identified include cross-leaved heath (*Erica tetralix*) (>5%), common heather (*Calluna vulgaris*) (>5%), bell heather *(Erica cinerea)* (15%), gorse (10%), purple moor grass *(Molinia caerulea)* (80%), bog asphodel *(Narthecium ossifragum)* (>5%) and *Sphagnum spp.* (40%). This habitat corresponds to Appendix I habitat, ‘northern Atlantic wet heaths with *Erica tetralix* (4010)’.

This habitat occurs within the footprints of T2-T3 and T5-T11, and adjacent to proposed site roads and the IPP connection route and TDR. This habitat covers a combined area of 14.06 ha.

1.6.1.19 *Dry siliceous heath (HH1)*

Dry siliceous heath can be found on flat to steeply sloping ground in upland and lowland areas. This habitat was identified on the eastern boundary of the Western DA, the area of the habitat is 0.23 ha. It forms a mosaic habitat with dry-humid acid grassland along the IPP connection route, the area of this habitat is 0.59 ha.

1.6.1.20 *Upland Blanket Bog (PB2)*

Upland blanket bog occurs on flat or gently sloping ground above 150 m. The 150 m limit serves to distinguish upland from lowland blanket bog but is loosely applied. Peat depths vary and normally fall in the range of 1-2 m. This habitat occurs along the western boundary of the Eastern DA, 77 m west of T11 and is located within the Gortaculllin Bog NHA. This habitat forms a mosaic with wet grassland and wet heath. The total area of these habitats is 1.04 ha.

1.6.1.21 *Wet Grassland (GS4)*

Occurs on wet or waterlogged mineral or organic soils that are poorly drained or subject to periodic flooding. Species identified include perennial ryegrass, soft rush *(Juncus effusus),* thistle *(Cirsium spp.),* nettle, common St. Johnswort *(Hypericum spp.),* creeping buttercup, tormentil *(Potentilla erecta),* white clover, devil's bit-scabious *(Succisa pratensis)* and yarrow *(Achillea millefolium).* Wet grassland is present within the footprints of T3-T5, T7 and T10, and within the footprint of the proposed on-site substation and site roads. Significant areas are present adjacent to the IPP connection route/TDR, the northern boundary of the Eastern DA and the southern boundary of the Western DA. Wet grassland is also present along the grid connection route. This habitat covers a combined area of 29.13 ha.

1.6.1.22 *(Mixed) Broadleaved Woodland (WD1)*

Areas of woodland with 75-100% cover of broadleaved trees and 0-25% cover of conifers which cannot be classified as semi-natural, with a minimum canopy height of 4m. This habitat is located adjacent to the IPP connection route/TDR, the grid connection route and the footprint of T10, covering a total area of 2.16 ha.

1.6.1.23 *Mixed Broadleaved/conifer Woodland (WD2)*

Includes woodland areas with mixed stands of broadleaved trees and conifers, where both types have a minimum cover of 25% and a maximum cover of 75%, and canopy height is at least 4m. Species identified include sycamore, beech (*Fagus salvation*), hawthorn, yew *(Taxus baccata),* ivy *(Hedera hibernica)* and cherry laurel *(Prunus laurocerasus).*

This habitat was recorded adjacent to the IPP connection route/TDR and within the Proposed Development site adjacent to site roads south of T5. This habitat covers a combined area of 1.96 ha.

1.6.1.24 *(Mixed) Conifer Woodland (WD3)*

Includes woodland areas with 75-100% cover of conifers that are not conifer plantations (WD4), typically dominated by non-native tree species. This habitat is present along the grid connection route, IPP connection route/TDR and Western DA, 269m south of the proposed on-site substation. This habitat covers a combined area of 1.18 ha.

1.6.1.25 Dry-humid Acid Grassland (GS3)

Unimproved or semi-improved grassland occurring on free-draining acid soils that are dry to humid (but not waterlogged). This habitat frequently grades into, or forms mosaics with, dry siliceous heath.

This habitat is present within the footprint of T7, on the northern boundary of the Eastern DA, with an area of 11.47 ha.

This habitat forms mosaics with other habitats including scrub, which occurs within the footprint of proposed site roads south of T7 and west of T3. This habitat is also present within the IPP connection route and TDR. This habitat covers a combined area of 5.29 ha.

A mosaic of dry-humid acid grassland with dry siliceous heath is present along the IPP connection route/TDR, covering a total area of 0.59 ha.

Dry-humid acid grassland recorded within the Proposed Development forms mosaic habitats with wet grassland. This habitat mosaic is present within the footprint of site roads located at the entrance to the Eastern DA. A small section is also located 530 m east of T9. This habitat covers a combined area of 0.84 ha.

1.6.1.26 Occurrence of Flora Protection Order Species & QI Species

The proposed windfarm lies within Ordnance Survey National Grid 10km Squares R46, R56 and R57. No Flora Protection Order (FPO) species are present within, or in close proximity to, construction works areas.

1.6.1.27 Occurrence of Invasive Species

Seven Invasive Species plants are recorded in the NBDC records for OS Grid reference R46, R56 and R57, within which the site of the Proposed Development is located. These species are “High Impact Invasive Species” (Regulation S.I. 477).

Butterfly bush was recorded adjacent to the IPP cable, of which the closest stand is located approximately 1.5km southwest of T4.

Himalayan Knotweed was recorded approximately 664m south of T4.

Japanese Knotweed was recorded along the proposed site roads within the Proposed Development site between T1 and T3.

Common Rhododendron (*Rhododendron ponticum*) was recorded along the IPP cable connection route.

1.6.2 Avifauna

1.6.2.1 Cormorant

Cormorant (*Phalacrocorax carbo*) is an Annex I species of the EC Birds Directive, and a designated SCI of the River Shannon and River Fergus Estuaries SPA. An estimated population of thirty-eight registered counts of Cormorant was recorded during the winter 2022/23 wetland bird surveys. All sightings were confined to two main territories approximately 2.6 km and 3.7 km north of the site boundary. No sightings were registered within the site boundary. Behaviours include resting on the shore, fishing and roosting.

1.6.2.2 *Whooper Swan*

Whooper Swan (*Cygnus cygnus*) is an Annex I species of the EC Birds Directive, and a designated SCI of the River Shannon and River Fergus Estuaries SPA. Whooper Swan was observed on two occasions, with counts of four and seven birds for each sighting during the winter 2022/23 wetland bird surveys. Behaviours observed included foraging and resting on the shore approximately 4.1 km north of the site boundary at Clonlea Lough and 3.4 km north of the site boundary at Doon Lough.

1.6.2.3 *Wigeon*

Wigeon (*Anas penelope*) is an Annex I species of the EC Birds Directive, and a designated SCI of the River Shannon and River Fergus Estuaries SPA. Wigeon was observed on one occasion when four birds were counted during the winter 2022/23 wetland bird surveys. Behaviour observed included resting on the lake shore approximately 3.4 km north of the site boundary.

1.6.2.4 *Golden Plover*

Golden Plover (*Pluvialis apricaria*) is an Annex I species of the EC Birds Directive and a designated SCI of the nearby River Shannon and River Fergus Estuaries SPA.

A peak count of 146 Golden Plovers were observed during the winter season 2022/23 VP surveys. No other observations of Golden Plover were recorded throughout the bird survey period. Flightline activity suggests most activity occurs outside of the Proposed Development boundary, within the Gortacullin Bog NHA, although some activity was recorded near the footprint of T11. No Golden Plovers were observed during the breeding seasons of 2022 and 2023.

1.6.2.5 *Merlin*

Merlin (*Falco columbarius*) is included on Annex I of the EC Birds Directive and an SCI of the Slieve Aughty Mountains SPA.

One individual was observed hunting small passerines during the breeding season 2022 VP surveys approximately 94 m west of the IPP connection route. No Merlin were identified during breeding Merlin surveys, although plucked feathers suggestive of Merlin feeding activity were recorded near the Proposed Development boundary.

1.6.2.6 *Lapwing*

Lapwing (*Vanellus vanellus*) is a designated SCI of the River Shannon and River Fergus Estuaries SPA.

Lapwing were observed twice during the 2022/23 wintering wetland bird surveys. These sightings were recorded near Clonlea Lough approximately 4.1 km north of the Proposed Development boundary. No Lapwings were recorded during the breeding seasons in 2022 and 2023.

1.6.2.7 *Curlew*

Curlew (*Numenius arquata*) is a designated SCI of the River Shannon and River Fergus Estuaries SPA.

Curlew was observed twice during the 2022 breeding season VP surveys, including a sighting approximately 1.6 km east of the IPP connection route. No Curlews were observed in the 2023 breeding season or 2022/23 winter season.

1.6.2.8 Redshank

Redshank (*Tringa totanus*) is a designated SCI of the River Shannon and River Fergus Estuaries SPA.

Redshank was observed once during the 2022/23 wintering wetland bird surveys, along the banks of the Ardnacrusha Headrace Canal adjacent to the Turbine Delivery Route.

1.6.2.9 Black-headed Gull

Black-headed Gull (*Chroicocephalus ridibundus*) is a designated SCI of the River Shannon and River Fergus Estuaries SPA.

The species was observed on 12 occasions during the 2022 breeding season VP surveys, with all observations recorded outside the Proposed Development boundary. Black-headed Gull was recorded once during the 2023 breeding season VP surveys. The species was observed on 20 occasions during the 2022/23 wintering wetland bird surveys, with all sightings confined to one area along the banks of the Ardnacrusha Headrace Canal, adjacent to the Turbine Delivery Route.

1.6.2.10 Hen Harrier

Hen Harrier is included on Annex I of the EC Birds Directive and an SCI of the Slievefelim to Silvermines Mountains SPA and the Slieve Aughty Mountains SPA.

Twenty-five Hen Harrier observations were recorded during the 2022 breeding season VP surveys. Eighteen Hen Harrier sightings were recorded during the 2023 breeding season VP surveys. High levels of activity recorded during these breeding seasons included multiple territories, including within the footprint of the Proposed Development and north of the Proposed Development boundary, the IPP connection route and Gortacullin Bog NHA located west of the Eastern DA.

A total of 63 Hen harrier observations were recorded during breeding Hen Harrier surveys in 2022 and 2023. Territories were identified overlapping with the Eastern and Western DA, north and northeast of the Western DA, the Gortacullin Bog NHA and IPP connection route. Observations included juveniles and birds exhibiting breeding behaviour including food passes between adults, hunting, diving, calling, perching and carrying prey to potential nest sites.

Three active Hen Harrier nest sites were recorded in 2022:

- 616 m north of T3;
- 356 m north of T7; and
- 1 km west of T11.

Two active Hen Harrier nest sites were recorded in 2023:

- 970 m west of T11; and
- 487 m south of T8.

Twelve sightings of Hen Harrier were recorded during the 2021/22 winter season VP surveys, with no flight activity recorded within the Proposed Development site. Four main wintering areas were recorded; east and west of the IPP connection route, on the northern boundary of the Western DA, approximately 862 m southwest of the Western DA and approximately 642 m west of the Eastern DA.

Four Hen Harrier observations were recorded during the 2022/23 winter season VP surveys. One male was recorded flying over the footprint of the IPP connection route, whilst another male sighting was recorded approximately 624 m west of the IPP connection route. One female was recorded approximately 309 m west of T11, and a ringtail (immature) Hen Harrier was recorded hunting over heath and forestry approximately 614 m north of the site boundary, circling over Knockanuarha Mountain.

Wintering Hen Harrier roost surveys undertaken during the 2022/23 winter season returned 11 observations comprising ten observations of males and one observation of a female. Key areas used for foraging included land just south of Gortacullin Bog NHA, and north of the Western DA. One female was observed within the Western DA (approximately 176 m west of T5), and one male was observed hunting over the footprint of T7. No roosts were identified during these surveys.

1.6.2.11 Otter

There are 17 records for Otter sightings in the National Biodiversity Data Centre's 10 km grid square references (R56 and R57) within which the Proposed Development is located. The last recorded sighting was from 13/01/2014.

Areas of suitable habitat for Otter, i.e., watercourses with fisheries value, are present in the area of the Proposed Development. However, the results of camera trap deployments in the Study Area returned no sightings of Otters.

Records of secondary evidence (e.g. mammal crossing/potential trail into stream/ potential couch/rest spot/spraints) were recorded during Otter surveys.

Two mammal crossings were identified within or within close proximity to the Proposed Development. One mammal crossing was located on the banks of the East Cloontra River (EPA Code: 25E28), approximately 124 m west of the IPP connection route. The second mammal crossing was identified on the banks of the Blackwater (Clare) River (EPA Code: 25B06), approximately 107 m west of the grid connection route (see **Annex A, Figure 1.10).**

Two Otter spraints were identified, with one spraint located on the banks of the Oatfield River (EPA Code: 25O07), approximately 55 m west of the Loop-In gird connection and another older spraint, recorded within the site boundary, along the banks of the Snaty River (EPA Code: 25S34), approximately 208 m east of T6 (**see Annex A, Figure 1.10**).

1.6.3 Bats

Bat activity surveys within the Proposed Development site show it is used regularly (High Activity) by Common Pipistrelle (*Pipistrellus pipistrellus*), Soprano Pipistrelle (*Pipistrellus pygmaeus*) and Leisler's Bat (*Nyctalus leisleri*).

Other bat species recorded with Negligible to Low Activity within the Proposed Development site include Nathusius' Pipistrelle *(Pipistrellus nathusii),* Myotis Species and Brown Long Eared Bat (*Plecotus auritus*).

Negligible to Low activity of Lesser Horseshoe *(Rhinolophus hipposideros)*, an SCI species of several SACs within the ZoI*,* was also recorded during bat activity surveys (see EIAR Chapter 7, Appendix C for detailed results).

1.6.4 Aquatics

The following outlines the available water quality data for the watercourses in context of the Proposed Development. Only recent water quality (i.e., since 2015) is summarised below.

1.6.4.1 Owenogarney River

There are a number of contemporary EPA biological monitoring stations located on the Owenogarney River (27O01) in the downstream vicinity of the Proposed Development. At Agouleen Bridge (station RS27O010600) the river achieved Q4 (good status) in 2022. However, at Pollagh Bridge (station RS27O010700) and Annagore Bridge (station RS27O010900, survey site A7), located 2.7 km north of the Proposed Development, and Old Mill Bridge (station RS27O011100, downstream of Sixmilebridge) this rating fell to Q3-4 (moderate status) in the same period.

In the vicinity of the Proposed Development, the Owengarney River (Owenogarney_030 and _040 river waterbodies), located 3.6 km west of the Proposed Development, was of good ecological status in the 2016-2021 period. Both were considered 'not at risk' of failing to achieve good ecological status (WFD Risk 3rd cycle). The Snaty Stream, Clashduff Stream, Gortadroma Stream, Belvoir Stream and Ballyvorgal North Stream are all located within these river catchments.

1.6.4.2 Mountrice River

A single contemporary EPA biological monitoring station is located on the Mountrice River (25M03) located 3.7 km west of the Proposed Development. The river achieved Q4-5 (high status) at Clogher Bridge (station RS25M030300, survey site B12) in 2021.

The Mountrice River (Mountrice_010 river waterbody) was of good status in the 2016-2021 period, the river waterbody was considered 'not at risk' of failing to achieve good ecological status (WFD Risk 3rd cycle). However, agriculture and forestry are recognised pressures within the wider catchment (EPA, 2022).

1.6.4.3 River Blackwater

A single contemporary EPA biological monitoring station was located on the River Blackwater located 3 km east of the Proposed Development. At station RS25B060120, downstream of survey site B13, the river achieved Q4 (good status) in 2021.

The upper reaches of the river (Blackwater (Clare)_010 river waterbody) were good status in the 2016-2021 period but were considered 'at risk' of not achieving good ecological status due to significant sediment pressures from agriculture and forestry (EPA, 2022). Downstream of Killaly's Bridge (Survey site B13), the river (Blackwater

(Clare)_020 river waterbody) was of moderate status in the 2016-2021 period but was not considered at risk.

1.6.4.4 Gourna River

A single contemporary EPA biological monitoring station was located on the Gourna River in the located 1.7 km west of the Proposed Development. At station RS27G020600, in the lower reaches, the river achieved Q4-5 (high status) in 2021.

The Gourna_010 river waterbody achieved good status in the 2016-2021 period and was considered 'not at risk' of failing to achieve good ecological status (WFD Risk 3rd cycle).

1.6.4.5 Salmonids

Atlantic Salmon *(Salmon salar)* is an Annex II species under the EU Habitats Directive and a QI species of the Lower River Shannon SAC.

Salmonid populations were widespread in the vicinity of the Proposed Development with Atlantic salmon recorded at a total of ten sites on the Owenogarney River, River Blackwater and associated tributaries (sites A4, A7, A11, B6, B7, B15, B16, D6, D20 & E1). The nearest sites from the Proposed Development are B6 and B7, located in the Oatfield River (25O07) and West Cloontra River (25W36), both rivers intersect with the footprint of the Proposed Development (IPP connection route). The highest salmon parr densities and highest quality habitats were present at sites on the Clashduff Stream (A7), Owenogarney River (A11), Gourna River (D6) and the Clovemill Stream (E1), located to the south-west of the Proposed Development site (see EIAR Chapter 7, Appendix D for detailed results).

1.6.4.6 Lamprey

Lamprey species *(Lampetra planeri, L. fluviatilis, Petromyzon marinus)* are an Annex II species under the EU Habitats Directive and QI species of the Lower River Shannon SAC.

Lamprey ammocoetes (*Lampetra* sp.) were recorded from six sites. The nearest site to the Proposed Development is the West Cloontra Stream (B7) and O'Neill's Stream (B8), both sites intersect with the IPP connection route. The remaining sites include Knockshanvo Stream (B9), River Blackwater (B16 & B17), and Island River (D16). With the exception of site B17 on the lower reaches of the Blackwater (12.8 per m^2), densities of ammocoetes were low (<1 per m^2) and habitats were sub-optimal for *Lampetra* sp. (see EIAR Chapter 7, Appendix D). Only single examples of *Lampetra* sp. Transformers were recorded at sites B9 and D16 (see EIAR Chapter 7, Appendix D).

1.6.4.7 White-clawed crayfish

No white-clawed crayfish were recorded via hand-searching or sweep netting of instream refugia during the survey of 56 sites.

1.6.4.8 eDNA analysis

White-clawed crayfish eDNA was detected in the composite water sample collected from the lower reaches of the River Blackwater (site B17) (three positive qPCR replicates out of 12) located 4.7 km southeast of the Proposed Development. This result was

considered as evidence of the species' presence at and or upstream of the sampling location, and supports the historical records for the River Blackwater (NPWS & Triturus data). White-clawed crayfish were not detected in the Broadford River (A4), Owenogarney River (A11) or the Gourna River (D6), in keeping with the known distribution of the species in the wider survey area.

Sites on the Owengarney River (site A11), River Blackwater (site B17) and Gourna River (site D6) tested positive for crayfish plague (*Aphanomyces astaci*) (2, 1 & 11 positive qPCR replicates out of 12, respectively). No crayfish plague was detected in the Broadford River (site A4) (0 positive qPCR replicates out of 12).

No freshwater pearl mussel eDNA was detected at the three sampling locations. This result is in keeping with the known absence of records for the species from the respective catchments (Ross, 2017 and NPWS data).

Table 1.5: eDNA results in the vicinity of the Proposed Development (positive qPCR replicates out of 12 in parentheses)

Site	Watercourse	Freshwater pearl mussel	White-clawed crayfish	Crayfish plague
A4	Broadford River	Negative (0/12)	Negative (0/12)	Negative (0/12)
A11	Owenogarney River	Negative (0/12)	Negative (0/12)	**Positive (2/12)**
B17	River Blackwater	Negative (0/12)	**Positive (3/12)**	**Positive (1/12)**
D6	Gourna River	Negative (0/12)	Negative (0/12)	**Positive (11/12)**

1.7 Identification of Potential Impacts

Potential direct and indirect impacts on European Sites in relation to the Proposed Development are described below. These impact sources and pathways were evaluated for connectivity to the European Sites within the ZoI of the Proposed Development and were subsequently considered during the screening exercise undertaken in Section 1.8.

1.7.1 Potential Impacts on SAC Sites

1.7.1.1 Impact Sources

The Proposed Development has the potential to cause impacts via: excavations, earthworks and storage of overburden material; removal of vegetation; groundworks and reinstatement works; importation of aggregate (stone) and other materials; increased extent of built/artificial surfaces; use and movement of machinery; use of hydrocarbons and cementitious material; instream works; trenching works in close proximity to watercourses; reinstatement works; maintenance works; noise and presence of humans, and waste generation.

1.7.1.2 Connectivity Pathways to European Sites

Physical/direct contact, surface water and ground-water flow paths; movement of soils, vehicles, machinery and personnel; air, vibration and visibility.

1.7.1.3 Description of the Potential Effects

SAC Effect A: Loss, fragmentation or degradation, or loss/reduction in connectivity, of QI habitats or plant species within an SAC due to physical landcover change at works locations: direct effects to QI habitats or plant species as a result of physical land cover change within an SAC can only occur if the location of the Proposed Development occurs within the boundary of the SAC and overlaps with the extent of the QI habitat.

SAC Effect B: Loss, fragmentation or degradation, or loss/reduction in connectivity, of QI habitats or plant species ex-situ of an SAC due to physical landcover change at Project works locations: indirect effects to QI habitats or plant species as a result of physical land cover change could occur where the Proposed Development overlaps with the extent of QI habitat or plant species which occurs ex-situ of an SAC.

SAC Effect C: Loss, fragmentation or degradation, or loss/reduction in connectivity, of QI habitats or plant species within or ex-situ of an SAC due to reductions in water quality or the spread of invasive species: indirect effects to QI habitats or plant species as a result of reductions in water quality has the potential to occur within downstream catchments of the Proposed Development. Invasive species can also be spread downstream or upstream within a catchment, and via machinery/vehicle/personnel movements along transport routes.

SAC Effect D: Loss, degradation, fragmentation or reduction/loss of connectivity of suitable habitats for QI species or their prey or host species, within or ex-situ of an SAC due to physical landcover change or damage or via reductions in water quality or the spread of invasive species: habitat loss or degradation of suitable (positively selected) habitat for QI Species within or ex-situ of an SAC may reduce species populations within an SAC through reduced breeding success or reductions in supporting source populations outside the SAC. Habitat loss or degradation may also reduce the availability of prey items or host fish species for QI species which in turn can negatively affect breeding success/survival. The potential for habitat effects as a result of physical landcover change is limited to the works locations associated with the Proposed Development, whereas habitat effects via reductions in water quality have the potential to occur within downstream catchments associated with the Proposed Development. Habitat effects via the spread of invasive species has the potential to occur either downstream or upstream within a catchment, and via machinery/vehicle movements along transport routes.

SAC Effect E: Mortality, disturbance or displacement of QI species or their prey or host species within or ex-situ of an SAC: potential for mortality to occur within an SAC where QI species or their prey/host species may be present within the SAC boundary and exposed to potential mortality through contact with moving vehicles or active construction or decommissioning works. Ex-situ mortality, disturbance or displacement of QI species has the potential to occur at works locations which are hydrologically

connected to, or at locations such as bridge crossings. While outside the natural location of animals, some pathways exist for mortality through contact with operational machinery or traffic. Regarding the Proposed Development this is potentially relevant to Otter and Lesser Horseshoe Bat. QI species within an SAC present near project works/activities have the potential to be disturbed/displaced by the works and presence of personnel. Mortality, disturbance or displacement of prey or host species for QI species (e.g., fish) may also reduce the availability of prey/host species for QI species which in turn can negatively affect breeding success/survival.

1.7.2 Potential Impacts on SPA sites

1.7.2.1 Impact Sources

The Proposed Development has the potential to cause impacts via: excavations, earthworks and storage of overburden material; removal of vegetation; groundworks and reinstatement works; instream works and works in close proximity to watercourses; importation of aggregate (stone) and other materials; increase extent of built/artificial surfaces; use and movement of machinery; use of hydrocarbons and cementitious materials; noise and presence of humans, waste generation, maintenance works, operating turbines and the presence of wind turbines and met mast structures during the operational lifetime of the windfarm.

1.7.2.2 Connectivity Pathways to European Sites

The impact sources described above could potentially lead to effects on European Sites due the level and type of connectivity between the Proposed Development and these European Sites. Notably, construction effects could have connectivity through physical landcover (regarding the loss and fragmentation of habitats), through air and/or visibility (e.g., for additional noise and visual disturbance and potential air quality effects), and through hydrological connectivity via surface and groundwater flow paths.

1.7.2.3 Description of Potential Effects

SPA Effect A: Loss, degradation, fragmentation or reduction/loss of connectivity of suitable habitats for SCI species or their prey species, within or ex-situ of an SPA due to physical landcover change: habitat loss or degradation of suitable (positively selected) nesting or foraging habitat for SCI species within or ex-situ of an SPA may reduce species numbers within an SPA through reduced breeding success or reductions in supporting source populations outside the SPA. Habitat loss or degradation may also reduce the availability of prey species causing secondary effects to foraging SCIs, where these prey species occur within any positively selected foraging habitat of the SCI. The potential for habitat effects as a result of physical landcover change is limited to the works locations associated with the Proposed Development.

SPA Effect B: Loss, degradation, fragmentation or reduction/loss of connectivity of suitable habitats for SCI species or their prey species, within or ex-situ of an SPA due to reductions in water quality or the spread of invasive species: the potential for habitat effects as a result of reductions in water quality have the potential to occur within downstream catchments associated with the Proposed Development. Habitat effects via the spread of invasive species has the potential to occur either

downstream or upstream within a catchment, and via machinery/vehicle/personnel movements along transport routes.

SPA Effect C: Disturbance/displacement or mortality of SCI species within an SPA: direct effects via disturbance or displacement have the potential to occur within an SPA where SCI bird species may be present in close proximity to project works, activities or personnel occurring within or in close proximity to the SPA. Direct effects via mortality have the potential to occur within an SPA where SCI bird species may be present within the SPA boundary and exposed to potential mortality through contact with moving machinery, wind turbines and/or other built structures within the SPA.

SPA Effect D: Disturbance/displacement or mortality of SCI species ex-situ of an SPA: disturbance or displacement effects to SCI species (such as when foraging/migrating) outside SPAs may indirectly affect breeding success or general survival rates for these species once within SPA sites. Indirect effects via mortality of SCI species outside of an SPA could occur where works/ground clearance associated with the Proposed Development occur in suitable nesting, roosting or foraging habitat, or could occur inadvertently through contact with operational wind turbines and/or other built structures.

SPA Effect E: Disturbance/displacement or mortality of SCI prey species within or ex-situ of an SPA: mortality, disturbance or displacement of prey species for QI species may also reduce the availability of prey items for QI species which in turn can negatively affect QI species populations. Disturbance/displacement or mortality has the potential to occur at project works locations where watercourse crossing works are taking place.

Note on SPA Impact A & B: mortality of SCI species due to collision with moving vehicles (road haulage) is considered extremely unlikely with no precedent in the literature for this resulting in population level/significant effects; therefore, this impact pathway (mortality due to collision with moving vehicles) is screened out.

1.8 Screening of Likely Significant Effects

1.8.1 Screening Process

The Screening process examines the likely effects of the Proposed Development as described, either alone or in combination with other projects or plans, on a European Site and considers whether it can be objectively concluded that these effects will not be significant. The likely effects of the Proposed Development on European Sites have been appraised using a source-pathway-receptor model (as detailed in Section 1.4.2).

1.8.2 Initial Screening of SAC Sites

Initial screening of SACs in relation to the Proposed Development is presented in **Table 1.6** below. As indicated below, based on the presence of potential impact pathways between the Proposed Development and designated features of relevant SACs, the following SACs have been screened in for further assessment (i.e., progressing to the next assessment stage):

- Lower River Shannon SAC [002165];
- Danes Hole, Poulnalecka SAC [000030]; and

- Ratty River Cave SAC [002316].

Table 1.6: Initial screening of SAC sites

European Site (Receptor)	SAC Impact A: Loss, fragmentation or degradation, or loss/reduction in connectivity, of QI habitats or plant species within an SAC due to physical landcover change at works locations. SAC Impact B: Loss, fragmentation or degradation, or loss/reduction in connectivity, of QI habitats or plant species ex-situ of an SAC due to physical landcover change at works locations. SAC Impact C: Loss, fragmentation or degradation, or loss/reduction in connectivity, of QI habitats or plant species within or ex-situ of an SAC due to reductions in water quality or the spread of invasive species. SAC Impact D: Loss, degradation, fragmentation or reduction/loss of connectivity of suitable habitats for QI species or their prey/host species, within or ex-situ of an SAC due to physical removal or damage or via reductions in water quality or the spread of invasive species. SAC Impact E: Mortality, disturbance or displacement of QI species or their prey/host species within or ex-situ of an SAC.
Lower River Shannon SAC [002165]	A: No, due to the distance between the SAC and the Proposed Development there is no potential for effects through habitat/plant species loss/fragmentation or degradation due to physical landcover change within the SAC. **B, C, D & E: Yes**, there is connectivity with this SAC due to the proximity of the Proposed Development to the SAC, connectivity via watercourses within/near works locations associated with the Proposed Development, connectivity via watercourse crossing works along the cabling routes, and connectivity via transport routes near the SAC.
Danes Hole, Poulnalecka SAC [000030]	A & B: No, due to the distance between the SAC and the Proposed Development, and the QI features of the SAC (sessile oak woods and Lesser Horseshoe Bat), there is no potential for effects through habitat/plant species loss/fragmentation or degradation due to physical landcover change within or adjacent to the SAC. **C, D & E: Yes**, there is connectivity with this SAC due to elements of the Proposed Development being within the commuting/foraging range of its QI species Lesser Horseshoe Bat.
Ratty River Cave SAC [002316]	A & B: No, due to the distance between the SAC and the Proposed Development, and the QI features of the SAC (Lesser Horseshoe Bat), there is no potential for effects through habitat/plant species loss/fragmentation or degradation due to physical landcover change within or adjacent to the SAC. **C, D & E: Yes**, there is connectivity with this SAC due to elements of the Proposed Development being within the potential commuting/foraging range of its QI species Lesser Horseshoe Bat.
Glenomra Wood SAC [001013] **Slieve Bernagh Bog SAC [002312]** **Kilkishen House SAC [002319]**	A: No, due to the distance between these SACs and the Proposed Development there is no potential for effects through habitat/plant species loss/fragmentation or degradation due to physical landcover change within these SACs. B: No, due to the distance between these SACs and the Proposed Development, and the QI features of these SACs, there is no potential for

European Site (Receptor)	SAC Impact A: Loss, fragmentation or degradation, or loss/reduction in connectivity, of QI habitats or plant species within an SAC due to physical landcover change at works locations. SAC Impact B: Loss, fragmentation or degradation, or loss/reduction in connectivity, of QI habitats or plant species ex-situ of an SAC due to physical landcover change at works locations. SAC Impact C: Loss, fragmentation or degradation, or loss/reduction in connectivity, of QI habitats or plant species within or ex-situ of an SAC due to reductions in water quality or the spread of invasive species. SAC Impact D: Loss, degradation, fragmentation or reduction/loss of connectivity of suitable habitats for QI species or their prey/host species, within or ex-situ of an SAC due to physical removal or damage or via reductions in water quality or the spread of invasive species. SAC Impact E: Mortality, disturbance or displacement of QI species or their prey/host species within or ex-situ of an SAC.
Clare Glen SAC [000930] **Silvermines Mountain West SAC [002258]** **Glenstal Wood SAC [001432]** **Keeper Hill SAC [001197]** **Tory Hill SAC [000439]** **Poulnagordon Cave (Quin) SAC [000064]** **Askeaton Fen Complex SAC [002279]** **Lough Gash Turlough SAC [000051]** **Silvermine Mountains SAC [000939]** **Newgrove House SAC [002157]** **Curraghchase Woods SAC [000174]** **Bolingbrook Hill SAC [002124]** **Old Domestic Building (Keevagh) SAC [002010]**	effects through habitat/plant species loss/fragmentation or degradation due to physical landcover change adjacent to these SACs. C, D & E: No, due to (i) the lack of hydrological connectivity, (ii) the considerable overland separation distance; and (iii) the lack of works or machinery movement within or in close proximity to these SACs, there is no potential for such effects.

As described in **Table 1.6** above, LSE on the following 16 SACs within the potential ZoI of the Proposed Development were screened out and therefore do not require further assessment in relation to the Proposed Development:

- Glenomra Wood SAC [001013];
- Slieve Bernagh Bog SAC [002312];

- Kilkishen House SAC [002319];
- Clare Glen SAC [000930];
- Silvermines Mountains West SAC [002258];
- Glenstal Wood SAC [001432];
- Keeper Hill SAC [001197];
- Tory Hill SAC [000439];
- Poulnagordon Cave (Quin) SAC [000064];
- Askeaton Fen Complex SAC [002279];
- Lough Gash Turlough SAC [000051];
- Silvermine Mountains SAC [000939];
- Newgrove House SAC [002157];
- Curraghchase Woods SAC [000174];
- Bolingbrook Hill SAC [002124]; and
- Old Domestic Building (Keevagh) SAC [002010].

In relation to the remaining three SAC sites, the Lower River Shannon SAC [002165], Danes Hole, and Ratty River Cave SAC [002316], LSE from the Proposed Development could not be screened out. Further screening context on these three European Sites is provided in Sections 1.8.4-1.8.6.

1.8.3 Initial Screening of SPA Sites

Initial screening of SPAs in relation to the Proposed Development is presented in **Table 1.7** below. As indicated below, based on the presence of potential impact pathways between the Proposed Development and SPA designated features, the following SPAs have been screened in for further assessment (i.e., progressing to the next assessment stage):

- River Shannon and River Fergus Estuaries SPA [004077];
- Lough Derg (Shannon) SPA [004165]; and
- Slievefelim to Silvermines Mountains SPA [004058].

The bird populations of River Shannon and River Fergus Estuaries SPA are also included within the designation of Shannon and Fergus Estuaries IBA. Considering the interest features and geographical coverage of the IBA are also included within the SPA designation, further consideration of effects on River Shannon and River Fergus Estuaries SPA in relation to the Proposed Development is sufficient to also address potential effects on Shannon and Fergus Estuaries IBA.

Table 1.7: Initial Screening of SPA sites

European Site (Receptor)	**SPA Impact A: Disturbance/displacement or mortality of SCI bird species within SPA site.** **SPA Impact B: Disturbance/displacement of SCI bird species ex-situ of an SPA site.** **SPA Impact C: Mortality of SCI bird species ex-situ of an SPA site.** **SPA Impact D: Loss, degradation, fragmentation or reduction/loss of connectivity of suitable habitats, or reduction in prey species, within an SPA site.** **SPA Impact E: Loss, degradation, fragmentation or reduction/loss of connectivity of suitable habitats, or reduction in prey species, ex-situ of an SPA site.**
River Shannon and River Fergus Estuaries SPA [004077]	**A: Yes**, due to the distance between the SPA and the Proposed Development there is potential for effects through disturbance of bird species within the SPA.
	B: Yes, there is connectivity with this SPA due to elements of the Proposed Development being within the typical ranges (e.g., for foraging, migrating) of SCI species, and the potential hydrological connectivity between the Proposed Development and the SPA.
	C: Yes, there is connectivity with this SPA due to the proximity of Proposed Development to the SPA and the typical ranges (e.g., for foraging, migrating) of SCI species, which could potentially bring them into contact with new Proposed Development turbines.
	D: No, as there is no overlap between the SPA and the Proposed Development there is no potential for effects through habitat loss, degradation or fragmentation within the SPA.
	E: Yes, there is connectivity with this SPA due to the proximity of Proposed Development to the SPA and the typical ranges (e.g., for foraging, migrating) of SCI species, for which habitat within/adjacent to the Proposed Development could potentially comprise Functionally Linked Land.
Slievefelim to Silvermines Mountains SPA [004058] **Lough Derg (Shannon) SPA [004058]**	A: No, due to the distances between these SPAs and the Proposed Development there is no potential for effects.
	B: Yes, there is potentially connectivity with these SPAs due to elements of the Proposed Development being within the typical ranges (e.g., for foraging, migrating) of SCI species, and the potential hydrological connectivity between the Proposed Development and the SPA.
	C: Yes, whilst these designated sites are over 12km from the Proposed Development turbines, considering the distances between the Proposed Development and the SPAs, and the known typical movement patterns of relevant qualifying species (e.g., for foraging, migrating), significant effects on Lough Derg (Shannon SPA) cannot be ruled out at this stage.
	D: No, as there is no overlap between these SPAs and the Proposed Development there is no potential for effects through habitat loss, degradation or fragmentation within the SPAs.
	C: Yes, considering the distances between the Proposed Development and the SPAs, and the known typical movement patterns of relevant qualifying species, significant effects on these SPAs cannot be ruled out at this stage.
Slieve Aughty Mountains SPA [004168]	A: No, due to the distance between the SPA and the Proposed Development there is no potential for effects. Note that breeding Hen Harriers have a core foraging range of 2km and a maximum foraging range of 10km (SNH, 2016).

	B: No, due to the distance between the SPA and the Proposed Development there is no potential for effects.
	C, D & E: No, due to (i) the lack of hydrological connectivity, (ii) the considerable overland separation distance; and (iii) the lack of works or machinery movement within or in close proximity to the SPA, there is no potential for such effects.

As described in **Table 1.7** above, due to their distance from the Proposed Development and relevant best practice guidance (notably SNH, 2016), LSE on the following SPAs were screened out and therefore do not require further assessment in relation to the Proposed Development:

- Slieve Aughty Mountains SPA [004168].

Regarding the remaining SPAs, River Shannon and River Fergus Estuaries SPA, Slievefelim to Silvermines Mountains SPA, and Lough Derg (Shannon) SPA, LSE from the Proposed Development could not be screened out. Further screening context on these European Sites is provided in Sections 1.8.7-1.8.8.

1.8.4 Potential Effects on Lower River Shannon SAC [002165]

The Proposed Development is potentially linked to the Lower River Shannon SAC with connectivity via watercourses with drain works locations associated with the Proposed Development, connectivity via watercourse crossing works along the cabling routes, and connectivity via transport routes through or in close proximity to this SAC.

Windfarm Effects during Construction, Operation and Decommissioning

Indirect impacts can occur if there is a viable pathway between the source (the site) and the receptor (the habitats and species for which a European Site has been designated). The most common pathway for impacts is surface water; such as if a pollutant reaches a river and is carried downstream into a European Site. Other potential pathways are groundwater, air (e.g., airborne dust or sound waves), or land (e.g., flow of liquids, vibration). The potential for hydrological impacts can be several kilometres, but for air and land it is considered to be rarely more than approximately 100 m.

The magnitude of a pollution event can depend on the size of the pollutant release (larger releases tend to disperse further). It is therefore important to consider the scale and impact of the Proposed Development. The development size equates to large quantities of materials (i.e., soil or construction materials) being involved, which makes large pollutant spills possible.

The Proposed Development will involve large scale works during the construction phase which have the potential (in the absence of mitigation) to cause significant effects on the aquatic interests within the Lower River Shannon SAC as a result of pollution of watercourses with suspended solids and other substances (fuels, waste, concrete, etc.). The potential for effects, via the identified pathway, cannot be excluded in the absence of mitigation. Consequently, the SAC is within the potential zone of influence and further assessment is required.

Grid connection route (GCR) Effects

The GCR does not cross the Lower River Shannon SAC, or extend in sufficient proximity to the SAC such that LSE are anticipated.

Turbine Delivery Route (TDR) Effects

The TDR spans directly over Lower Riven Shannon SAC via the new Killaloe Bypass. Whilst the TDR will use existing roads, these may require temporary accommodating works (cutting back vegetation, installing temporary road surface, removing signage, street furniture etc). One land take requirement along this route has been identified at the turn from R463 to the R471 in County Clare. This will involve the temporary loss of agricultural lands and some hedgerow. Due to the limited work required to widen small sections of the TDR, these impacts are predicted to be minimal. However, due to the proximity of the TDR to the SAC, and the potential hydrological connectivity, impacts on Lower River Shannon SAC cannot be ruled out at this stage.

1.8.5 Potential Effects on Danes Hole, Poulnalecka SAC [000030]

Windfarm Effects during Construction, Operation and Decommissioning

Lesser Horseshoe Bats are a qualifying feature for Danes Hole, Poulnalecka SAC which is located approximately 2 km north of the Proposed Development site. As the typical foraging range of Lesser Horseshoe Bats is approximately 2 km, these bats could potentially use habitat within and in close proximity to the Proposed Development. The Proposed Development contains habitat that is suitable for this species for foraging and commuting. As such, effects on this SAC through Lesser Horseshoe Bat foraging habitat loss require further assessment.

GCR and TDR Effects

There is unlikely to be significant removal or disturbance to bat foraging habitat along the GCR and TDR. Any habitat removed will be minimal and unlikely to impact on foraging bats. Both the GCR and TDR are over 3 km from the SAC when measured at the closest point and comprise less optimal foraging habitat compared with the windfarm site. Therefore, the TDR and cabling routes are unlikely to have impacts on Danes Hole, Poulnalecka SAC.

1.8.6 Potential Effects on Ratty River Cave SAC [002316]

Windfarm Effects during Construction, Operation and Decommissioning

Lesser Horseshoe Bats are the qualifying feature for Ratty River Cave SAC, with a hibernation roost recorded in the caves and a maternity roost situated nearby. Foraging areas for this colony are yet to be confirmed. However, there is suitable habitat featured within the SAC and suitable bat foraging habitat is also present within the Proposed Development. Core foraging habitat for Lesser Horseshoe Bats in the winter is approximately 1.2 km. Whilst the Proposed Development is approximately 4.3 km from the SAC, and therefore falls outside of the core winter foraging habitat, suitable habitat within the Proposed Development may be used in the summer by the maternity roost. Use of the Proposed Development and nearby land by these Lesser Horseshoe Bats therefore cannot be ruled out at this stage. Therefore, effects on this SAC through loss of Lesser Horseshoe Bat foraging habitat require further assessment.

GCR and TDR Effects

There is unlikely to be significant removal or disturbance to bat foraging habitat along the GCR and TDR. Any habitat removed will be minimal and unlikely to impact on foraging bats. Both the GCR and TDR are over 3 km from the SAC and comprise less optimal foraging habitat compared with the windfarm site. As such, the TDR and GCR are unlikely to have significant effects on the qualifying features of Ratty River Cave SAC.

1.8.7 Potential Effects on River Shannon and River Fergus Estuaries SPA [004077]

Windfarm Effects during Construction, Operation and Decommissioning

The River Shannon and River Fergus Estuaries SPA provides one of the most important areas in Ireland for wintering wetland birds and supports internationally important populations of species including, amongst others, Golden Plover. The Proposed Development falls within the typical ranges for foraging and migration for many of the SCI bird species of the SPA and species including Golden Plover have been recorded within the vicinity of the Proposed Development site. As such, potential effects from habitat loss, disturbance/displacement and mortality as a result of potential collisions with the Proposed Development Turbines cannot be ruled out and require further assessment.

GCR and TDR Effects

There is unlikely to be significant removal or disturbance to wetland bird habitat along the GCR and TDR. Any potentially suitable habitat removed will be minimal and unlikely to impact on foraging, roosting or migrating wetland birds that are associated with the River Shannon and River Fergus Estuaries SPA. As such, the TDR and GCR are unlikely to have significant effects on the qualifying features of the River Shannon and River Fergus Estuaries SPA.

1.8.8 Potential Effects on Lough Derg (Shannon) SPA and Slievefelim to Silvermines Mountains SPA

Windfarm Effects during Construction, Operation and Decommissioning

Lough Derg (Shannon) SPA is designated for its important breeding and wintering waterbird populations, whilst Slievefelim to Silvermines Mountains SPA is designated for its important breeding population of Hen Harrier. As Slievefelim to Silvermines Mountains SPA is over 15km from the Proposed Development turbines, based on best practice guidance (SNH, 2016), the Proposed Development turbines are outside of the likely foraging range (up to 10km) of any Hen Harriers associated with Slievefelim to Silvermines Mountains SPA. As such, there is no potential for significant impacts on Slievefelim to Silvermines Mountains SPA during the construction, operation and decommissioning phases of the Proposed Development.

Lough Derg (Shannon) SPA is approximately 12.1km from the Proposed Development turbines. Whilst this is outside of the typical foraging distances of species forming qualifying features of this SPA, if there was a significant flight route (e.g., during migration) for relevant species through the Proposed Development turbines, this could potentially result in a significant effect on the SPA. As such, potential effects on Lough Derg (Shannon) SPA through disturbance/displacement and mortality as a result of potential

collisions with the Proposed Development turbines cannot be ruled out and require further assessment.

GCR and TDR Effects

Lough Derg (Shannon) SPA and Slievefelim to Silvermines Mountains SPA are sufficiently distant from the GCR and TDR that, in the context of the proposed activity along these routes, there is no potential for significant impacts on these designated sites. However, the TDR will extend approximately 2.1km from Lough Derg (Shannon) SPA and approximately 3.8km from Slievefelim to Silvermines Mountains SPA. Whilst the potential for effects from proposed use of the TDR is lower, considering these distances in the context on relevant best practice guidance (notably SNH (2016), potential effects through disturbance, displacement and other effects on habitats used by qualifying bird populations ex-situ to the SPAs cannot be ruled out at this stage.

1.9 Potential In-combination Effects

As described in EIAR Chapter 20 Impact Interactions and Cumulative Effects, a planning search was carried out to identify permitted and constructed projects in the wider receiving environment which could potentially contribute to cumulate effects with the Proposed Development. Cumulative effects are defined by CIEEM (2018) as: *"Additional changes caused by a proposed development in conjunction with other developments or the combined effect of a set of developments taken together"*. This identified various windfarms and other development types with the potential for cumulative effects with the Proposed Development (see EIAR Chapters 7 and 8 for further information). Based on the presence of these nearby developments and their potential effects, and the potential effects identified in the Screening exercise described above, these developments will be brought forward for further consideration to Stage 2 of the Appropriate Assessment. Existing, planned and proposed wind farm projects within 20km of the Proposed Development, and other projects within 10km of the Proposed Development, are summarised in **Annex B**.

1.10 Screening Statement

In **Section 3.2.5** of Appropriate Assessment of Plans and Projects in Ireland (NPWS, 2010), it is stated that the first stage of the AA process can have three possible conclusions:

- AA is not required - Screening, followed by consultation and agreement with the NPWS, establishes that the plan or project is directly connected with or necessary to the nature conservation management of the site;
- No potential for significant effects / AA is not required - Screening establishes that there is no potential for significant effects and the project or plan can proceed as proposed; or
- Significant effects are certain, likely or uncertain - The plan or project must either proceed to Stage 2 (AA), or be rejected.

Having considered the indicative proposals, it is concluded that this application meets the third conclusion, because **significant effects are likely or uncertain** on European Sites.

This conclusion is relevant to all turbine options under consideration within the Proposed Development design (see EIAR Appendix 8.1 for further information). In accordance with best practice guidance, measures intended to reduce or avoid adverse effects from the Proposed Development on European Sites (i.e. “mitigation measures”) have not been taken into consideration within the Screening stage.

Therefore, with regard to Section 177U(4) of the Planning and Development Act 2000 (as amended), it can be concluded on the basis of objective scientific information, that the Proposed Development, individually or in combination with other plans or projects, could, in the absence of mitigation, have LSE on the European Sites listed below. Consequently, it is concluded that Stage 2 Appropriate Assessment is required with respect to the following European Sites only:

- Lower River Shannon SAC [002165];
- Danes Hole, Poulnalecka SAC [000030];
- Ratty River Cave SAC [002316];
- River Shannon and River Fergus Estuaries SPA [004077] (including Shannon and Fergus Estuaries IBA)
- Lough Derg (Shannon) SPA; and
- Slievefelim to Silvermines Mountains SPA.

As such, it can be excluded, on the basis of objective scientific information, that the Proposed Development, individually or in combination with other plans or projects, will not have a significant effect on any other European Site. It is noted that the competent authority (An Bord Pleanála) will make its determination on whether an Appropriate Assessment is required for the European Sites listed above.

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Annex A. Figures

Figure 1.2: Proposed Development Layout

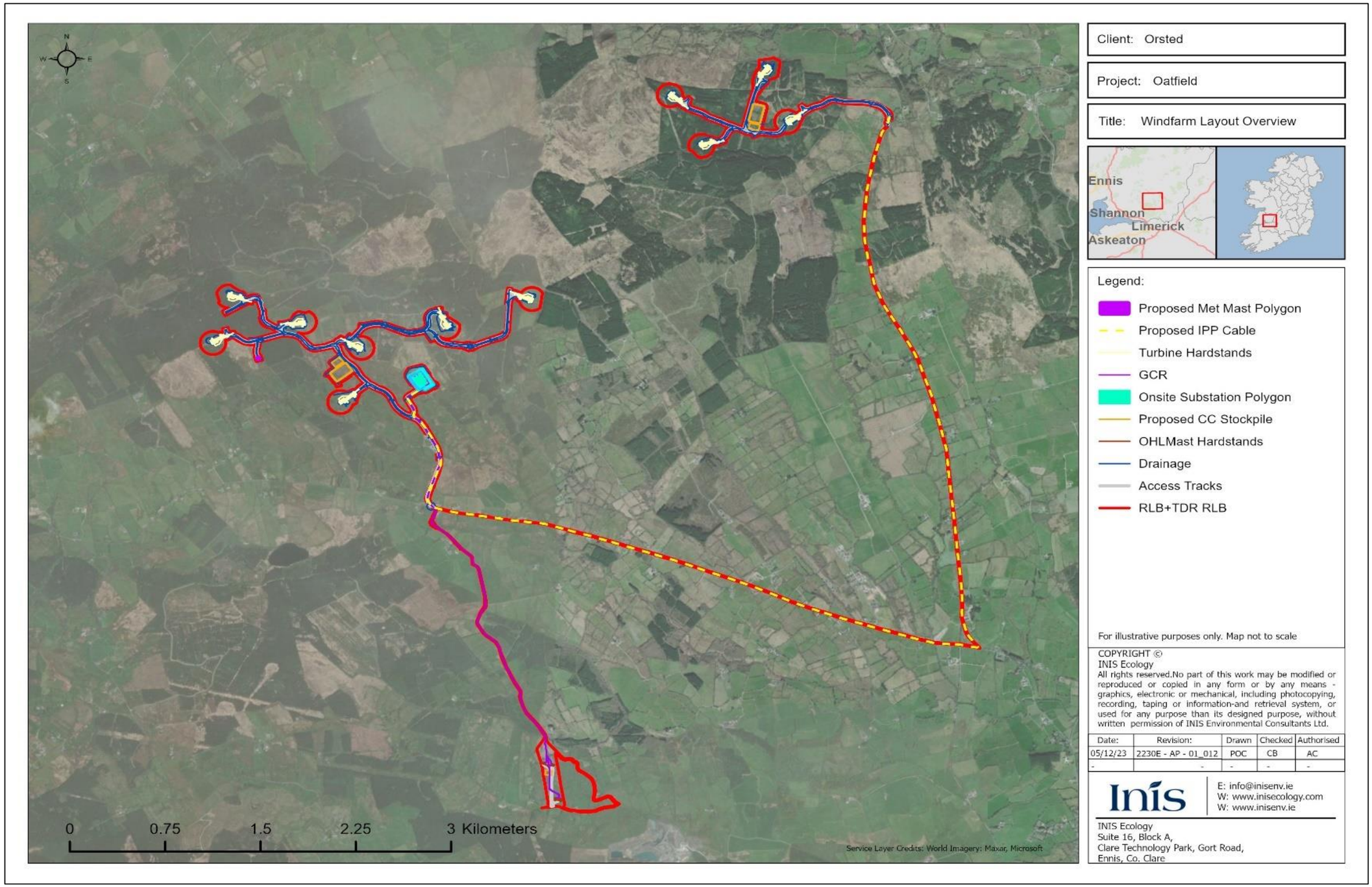


Figure 1.3: Proposed Development Habitat Map, Eastern DA

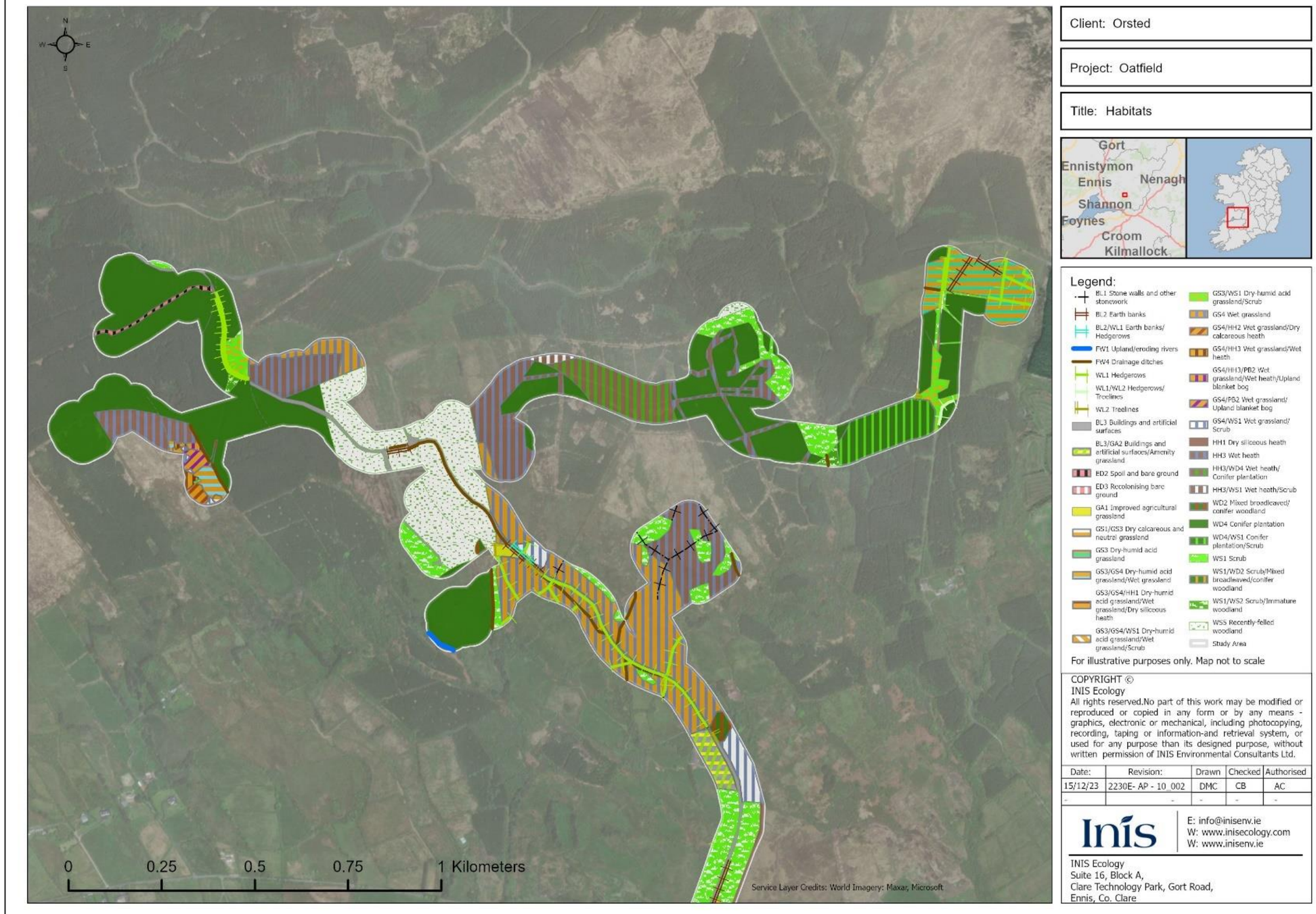


Figure 1.4: Proposed Development Habitat Map, Western DA

Figure 1.5: IPP Connection route/TDR

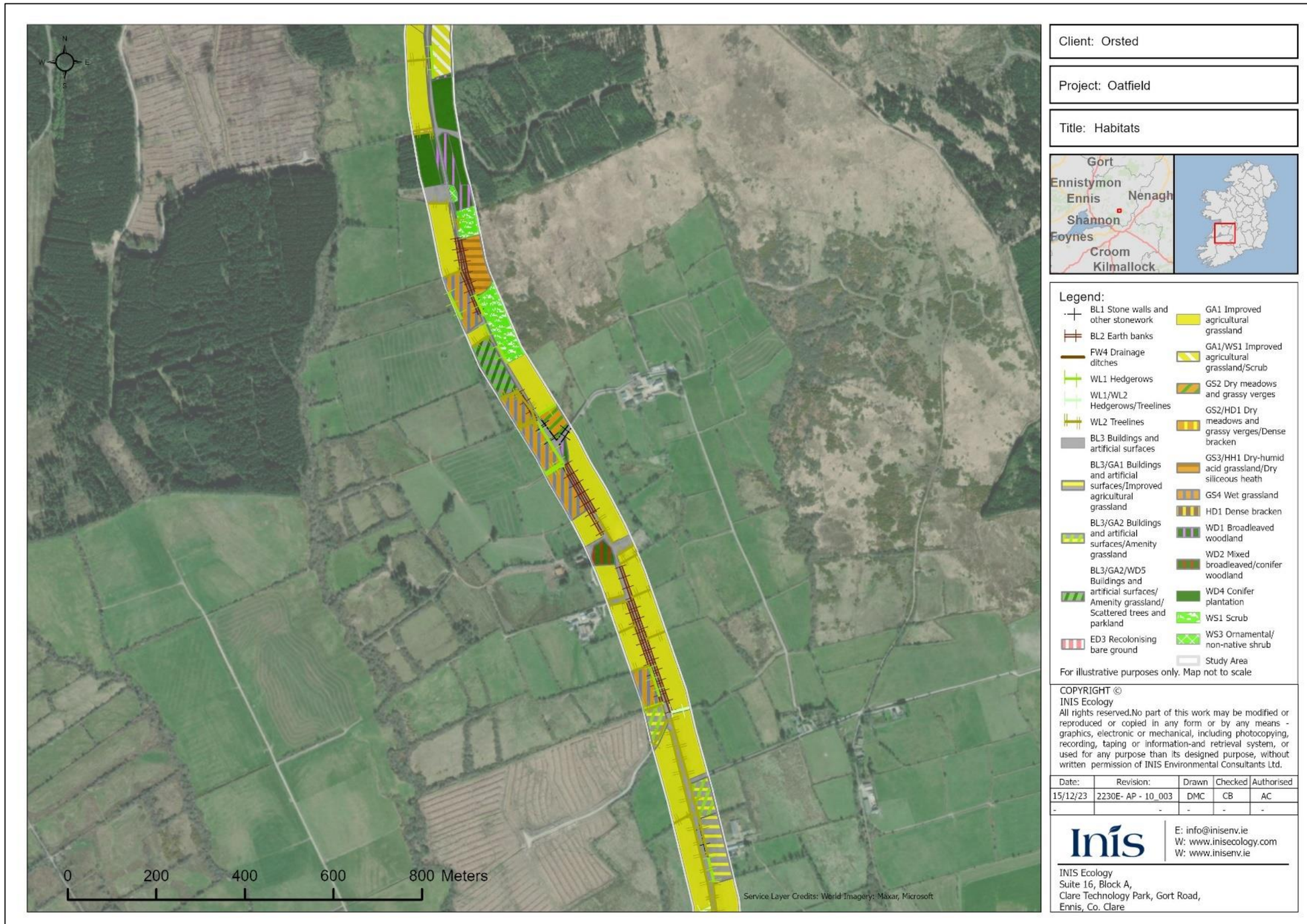


Figure 1.6: IPP Connection route/TDR

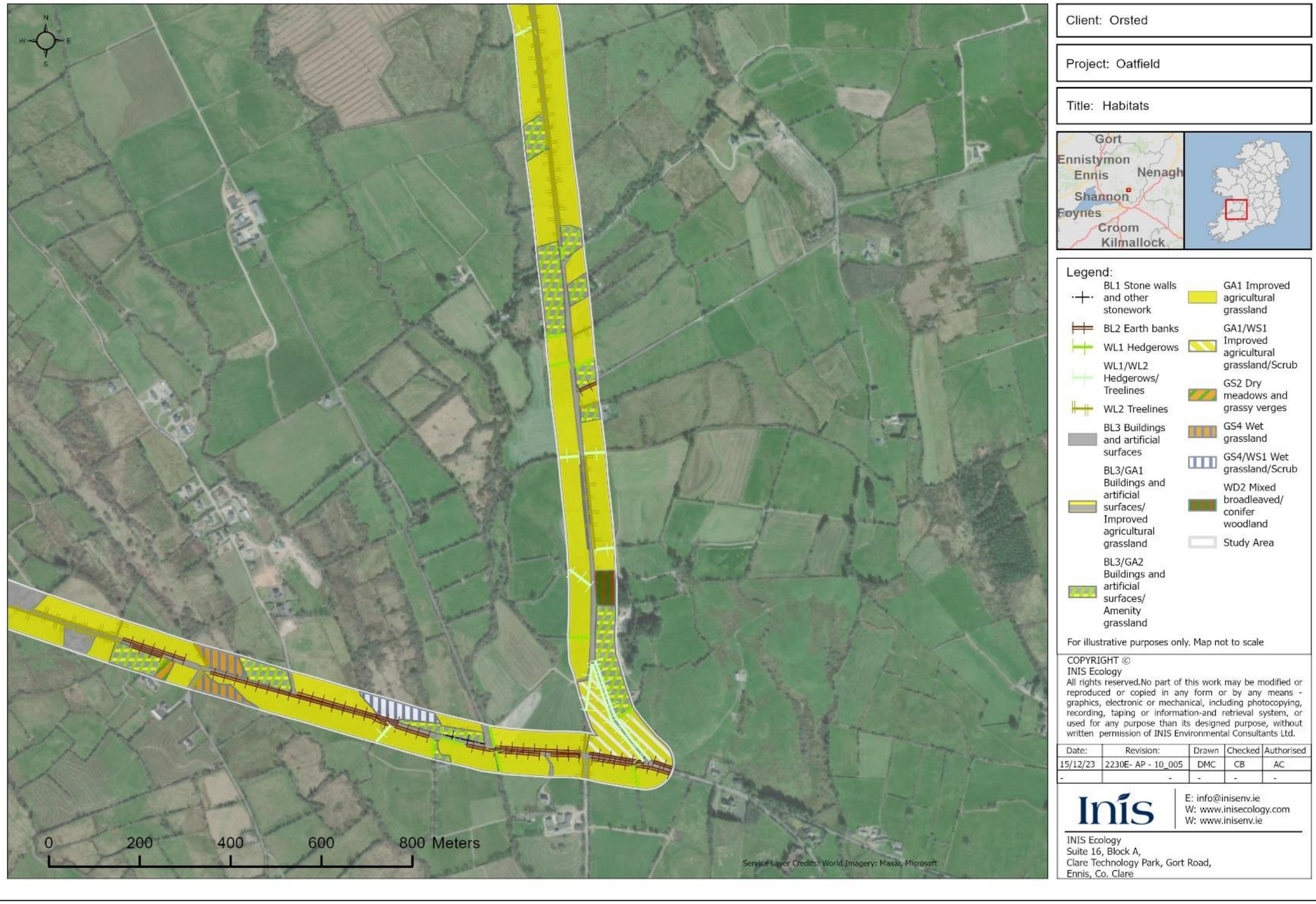


Figure 1.7: IPP Connection route/TDR

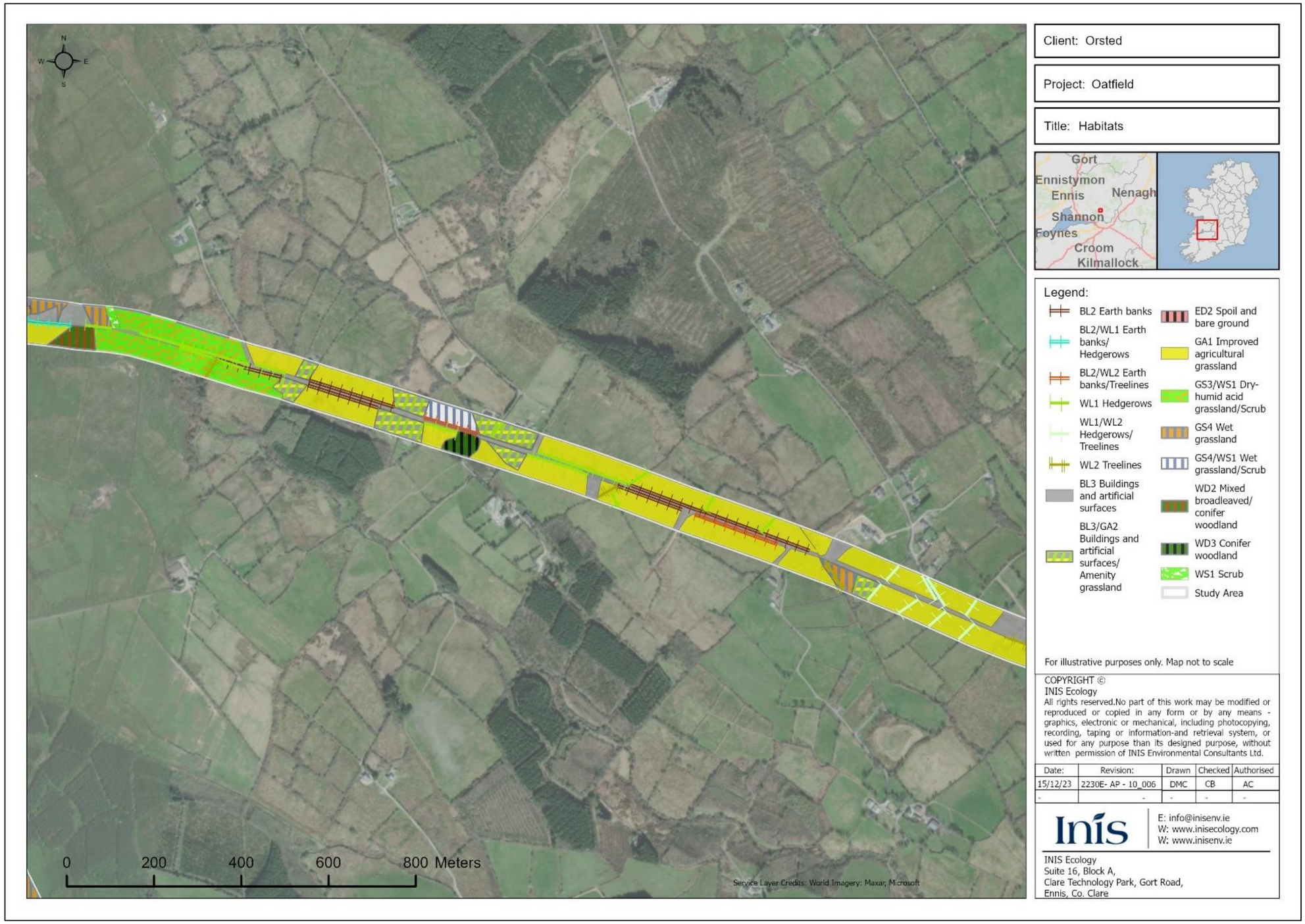


Figure 1.8: IPP Connection route/TDR/Grid connection route

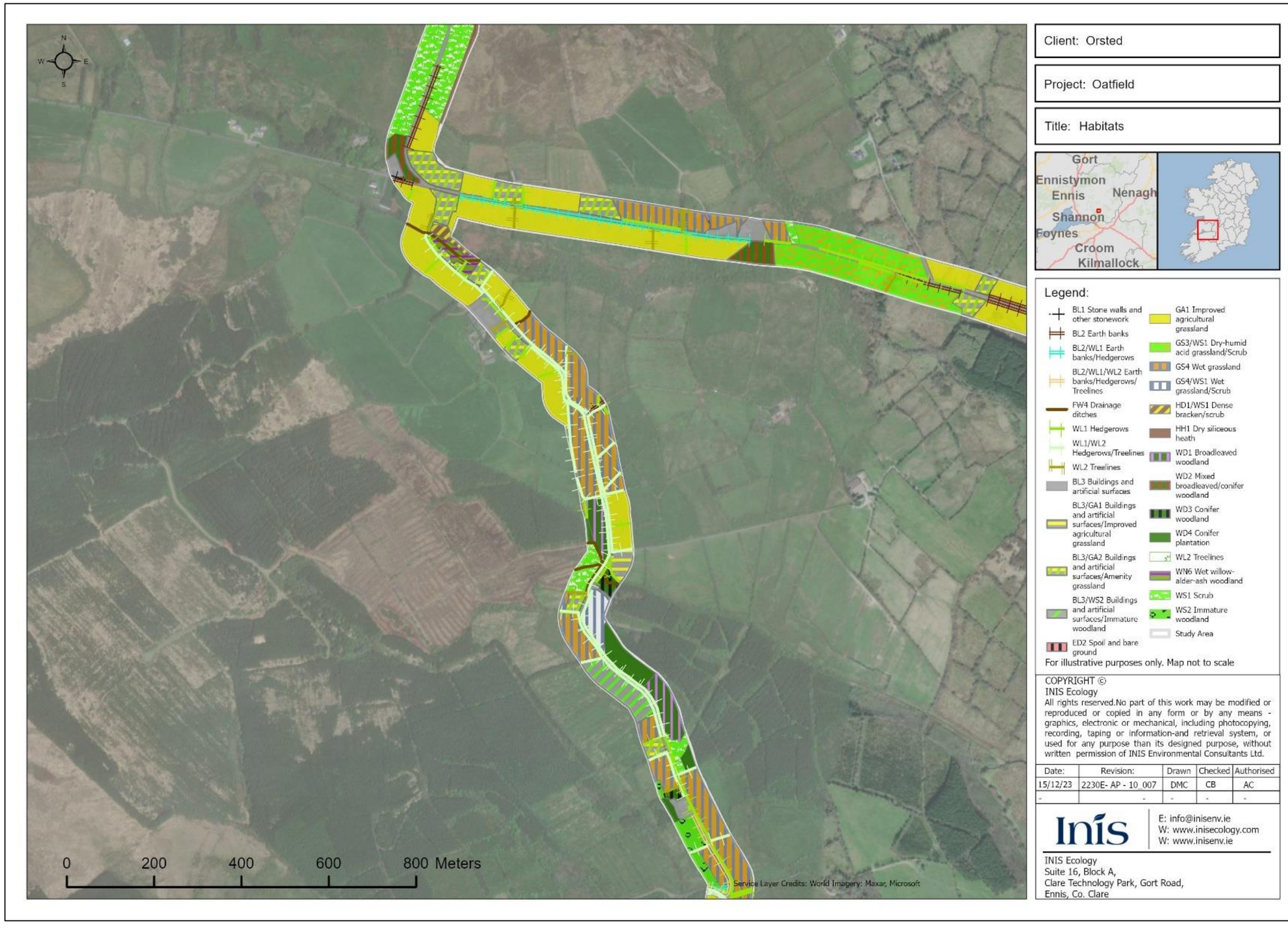


Figure 1.9: Grid connection route

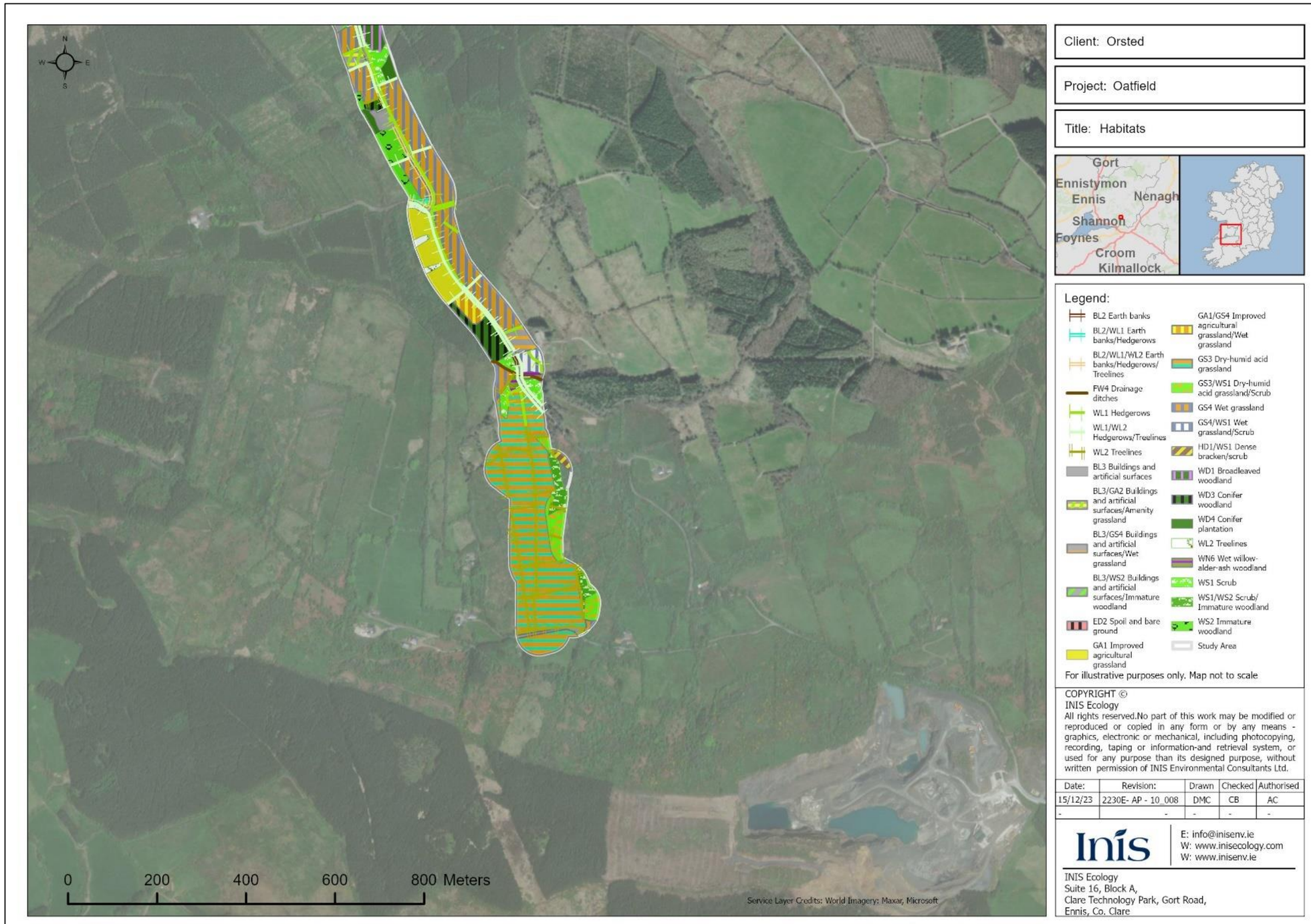


Figure 1.10: Otter Survey Results

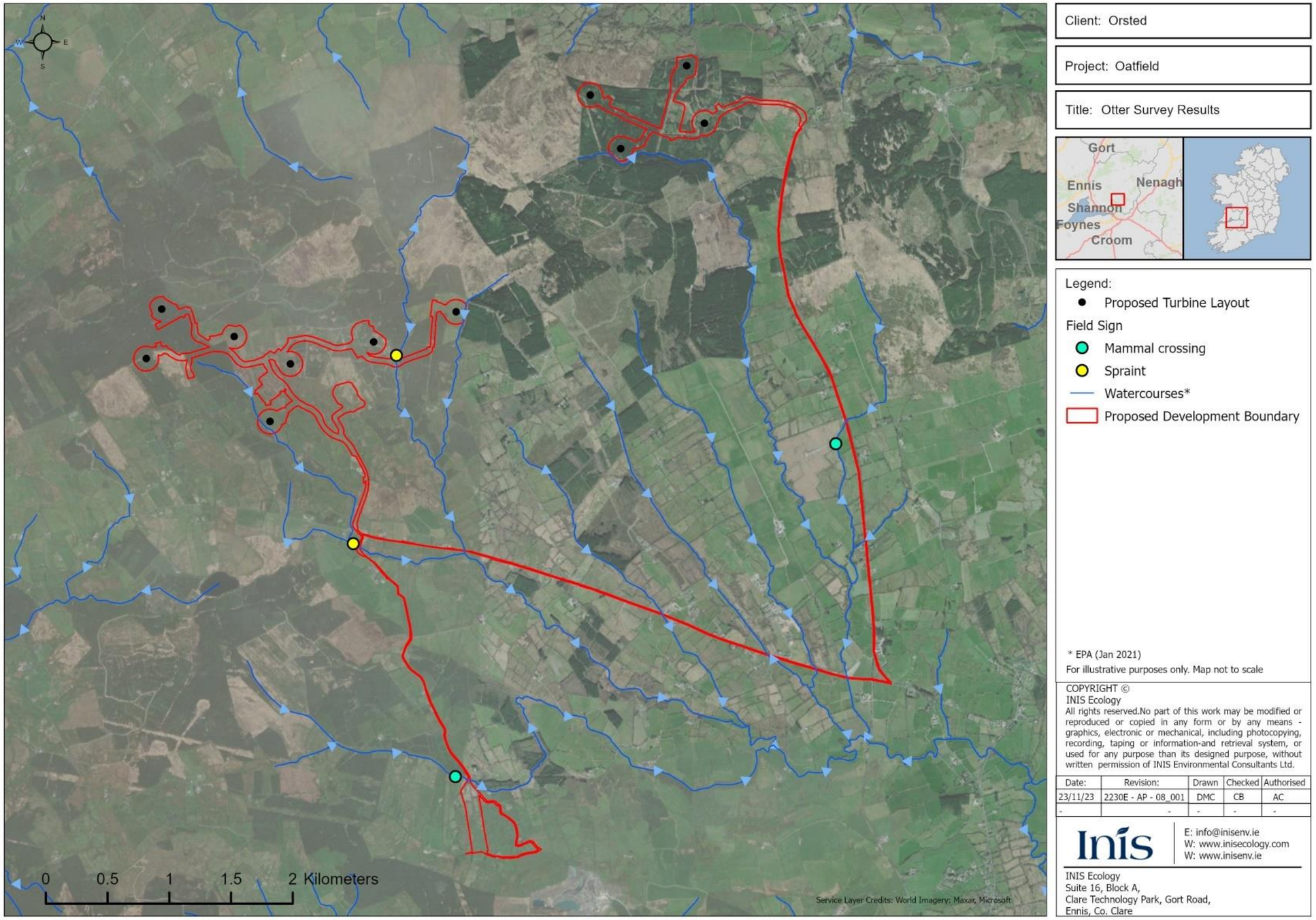
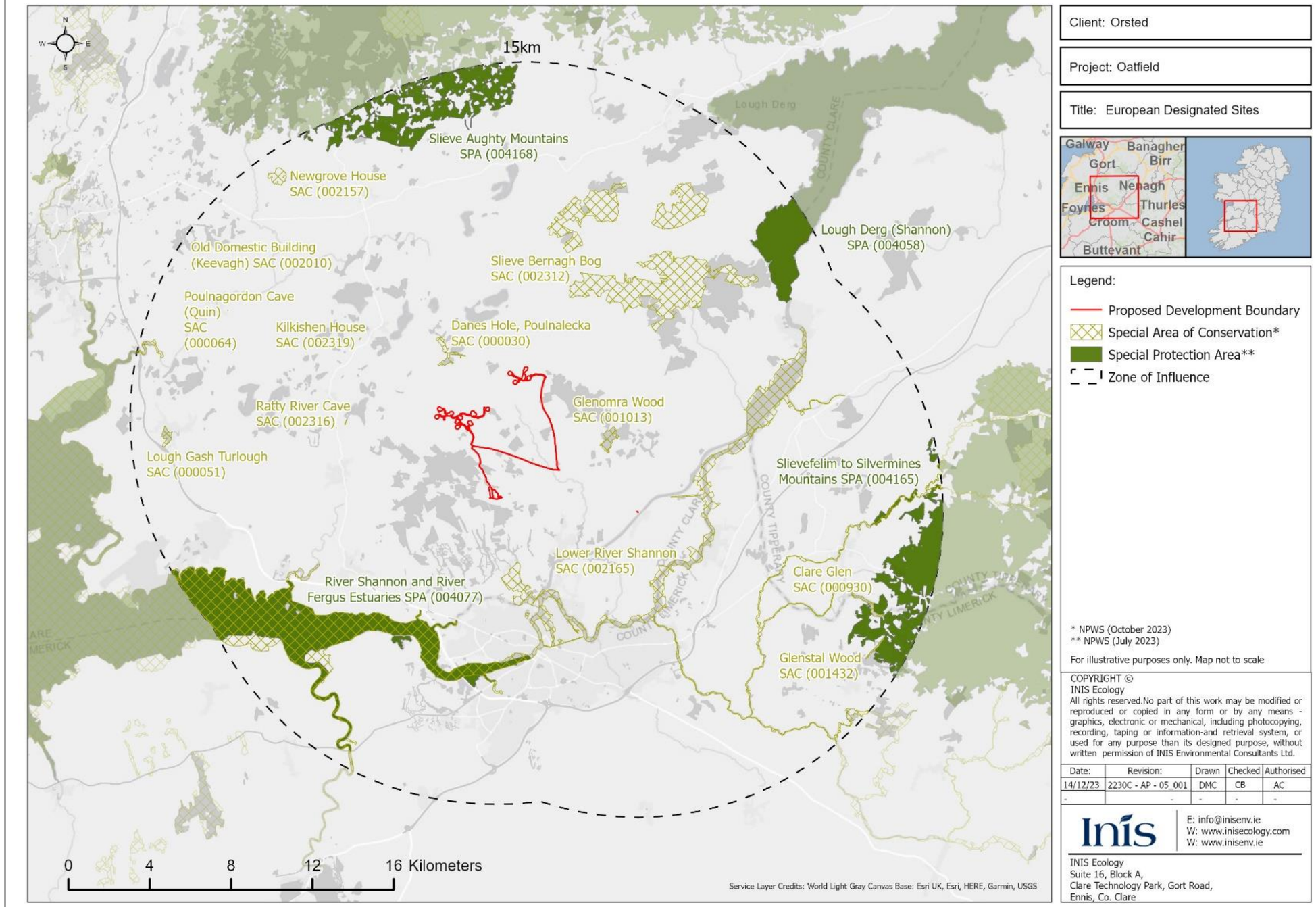


Figure 1.11: European Sites within the ZoI of the Proposed Development



Annex B. Other Projects Considered for Cumulative Effects

Wind farm developments within 20km of the Proposed Development turbines

Wind farm	Status	Distance from Proposed Development	No. of turbines	Blade tip height	Max. rotor diameter
Knockshanvo	Pre-planning	0.5 km N	9	179.5-185 m	149-163 m
Ballyclar	Pre-planning	4.7 km S	12	150-158 m	NA
Carrownagowan	Granted	5.1 km NE	19	169 m	136 m
Fahybeg Onshore Wind Farm	Planning (appealed)	6.0 km E	8	169-176.5 m	131-138 m
Lackareagh	Pre-planning	6.4 km NE	7	N/A	N/A
Parteen Turbine	Operational	9.4 km SE	1	N/A	53 m
Vision Care Turbine	Operational	13.7 km NE	1	N/A	Radius 40 m

Other development types within 10km of the Proposed Development

Project	Planning / Project Ref.	Nearest Distance to the Proposed Development Site	Description	Scoped in / out for cumulative assessment
Within 10km from the Proposed Development				
Solar Farm	2360249 Clare County Council	Approximately 4.5km West from the Proposed Development site	A solar farm on a site of 70 hectares consisting of the following: 309,008 sq. m. of solar photovoltaic panels on ground mounted steel frames; a 38 kV electrical substation with electrical control building and associated compound with palisade fence; the installation of 21 electrical	Permission was granted on the 10th of October 2023 with 14 No. conditions. From examination of the online planning file, it is our understanding that this project has not yet commenced.

Project	Planning / Project Ref.	Nearest Distance to the Proposed Development Site	Description	Scoped in / out for cumulative assessment
			skids within 7 no. electrical compounds (with acoustic barrier fencing); underground power and communication cables and ducts, including underground cabling along the L3056 public road; new and upgraded internal access tracks (including stream crossings as required); 3 no. upgraded site entrances to the public road (one entrance to L-3054 (Lackyle Heights), and 2 no. entrances to L-30541); boundary fencing (including 607m of acoustic barrier fencing on the eastern boundary); landscaping and biodiversity enhancement measures; and all associated ancillary development, site works and services. The solar farm will be operational for 40 years. A Natura Impact Statement (NIS) has been prepared in respect of the proposed development and will be submitted to the planning authority with the application. Permission was granted on the 10th of October 2023.	This development is scoped in for cumulative assessment due to its proximity to the Proposed Development.
Quarry	18818 Clare County Council	Approximately 4km South from the Proposed Development site	For development which will consist of an expansion to an existing quarry consisting of 10 hectares located adjacent to the existing working quarry including extraction of rock by blasting means down to 150mOD; Extracted rock will be processed at the existing working quarry; Landscaping of the quarry during the operational phase and restoration of	Clare County Council issued notification to grant planning permission subject to nineteen conditions on the 13th of December 2019. The facility is currently operational. This operational quarry, which is identified as a source of materials for

Project	Planning / Project Ref.	Nearest Distance to the Proposed Development Site	Description	Scoped in / out for cumulative assessment
			the quarry on completion of extraction; All associated ancillary facilities / works; The applicant is seeking a 16 year permission as part of the application. The application is accompanied by an Environmental Impact Assessment Report (EIAR) Application was submitted on the 17th of October 2018 and was granted on the 13th of December 2019.	construction of the Proposed Development, is scoped in for cumulative assessment due to its proximity to the Proposed Development.
Residential Development	2023065 EIAR Portal Reference 22959 Limerick County Council	Approximately 8.8km South from the Proposed Development site	Proposed development of 98 no. residential units and a significant Biodiversity area, on a site of 9.45 hectares, which comprises Phase 3 of an overall Masterplan site.	Granted permission with 27 No. Conditions on the 28th of June 2023. An appeal was submitted on the 24th of July 2023. This development, which is yet to be determined, is scoped in for cumulative assessment due to its proximity to the Proposed Development.
Restoration of Old Quarry Site	18995 Clare County Council	Approximately 6km East from the Proposed Development site	For the restoration of 3.76 hectares of an extant sand and gravel quarry to agricultural grassland. The development is necessary to comply with condition no. 4 of substitute consent 03.SU.0127 and will include importation of inert material and all associated development works. Permission was granted on the 9th of March 2023.	Permission was granted on the 9th of March 2023. Condition 2b states that the maximum annual rate of intake shall not exceed 18,000 metric tonnes. This development is scoped in for cumulative assessment due to its proximity to the Proposed Development.

Project	Planning / Project Ref.	Nearest Distance to the Proposed Development Site	Description	Scoped in / out for cumulative assessment
Residential Development	2023143 EIAR Portal Reference 221114 Limerick County Council	Approximately 8.8km South from the Proposed Development site	Proposed development of 54 no. residential units which comprises Phase 4 of an overall Masterplan site	Permission was granted on the 11th of October 2023 with 30 No. Conditions. From examination of the online planning file, it is our understanding that this project has not yet commenced. This development is scoped in for cumulative assessment due to its proximity to the Proposed Development.
Solar Farm	22591 Clare County Council	Approximately 5km Southeast from the Proposed Development site and within 350m of TDR	For a 10-year planning permission for a solar array at Ballyglass, Coolderry, Dromintobin North, Reanabrone, and Oakfield (townlands) Ardnacrusha, Co Clare. The development will consist of c265,000 m2 of solar panels on ground mounted frames, 8 no. single storey control cabins with associated electrical transformer units and hardstand areas, 2 no. ring main units, underground cabling within the solar array site and within the L70382 public road to connect solar array field parcels, security fencing, CCTV, access tracks (upgrade of existing and new), upgrades to four existing agricultural field entrances on the R463, l3046 and L70382 and creation of new entrance on L70382, temporary construction compound, landscaping and all associated ancillary apparatus and development works. The solar array will connect to the national grid and will have	The application was submitted on the 4th of July 2022 and was granted on the 17th of February 2023 with 13 conditions. This development is scoped in for cumulative assessment due to its proximity to the Proposed Development.

Project	Planning / Project Ref.	Nearest Distance to the Proposed Development Site	Description	Scoped in / out for cumulative assessment
			an operational lifespan of 35 years. A Natura Impact Statement (NIS) has been prepared in respect of the proposed development and will be submitted to the planning authority with the application. The application was submitted on the 4th of July 2022 and was granted on the 17th of February 2023 with 13 conditions.	
Solar Farm	16368 Clare County Council	Approximately 9km Southwest from the Proposed Development site	For a 10-year permission for the development of a solar PV panel array consisting of up to 29,225.37 sq.m of solar panels on ground mounted steel frames, 1 No. substation, 3 No. inverter cabins, underground cable ducts, a temporary site compound area and ancillary facilities, boundary security fencing, site landscaping, a site entrance and access track, CCTV and all associated site works located in the townland of Ballymorris. The application was granted on the 24th of April 2017 with 17 conditions.	The application was granted on the 24th of April 2017 with 17 conditions. This development is scoped in for cumulative assessment due to its proximity to the Proposed Development.
Solar Farm	1731 Clare County Council	Approximately 9.1km South West from the Proposed Development site	For a 10-year permission for the development of a solar PV farm consisting of up to 34,334 sq.m of solar panels on ground mounted steel frames, 1 no. substation, 2 no. inverter cabins, a battery storage container, underground cable ducts, a temporary site compound area and ancillary facilities, boundary	"Construction on the Terra project is expected to commence mid next year, creating 60 jobs during the 12-week build." – Clare Champion reports on July 14th, 2017. From examination of the online article, it is our understanding that this project has

Project	Planning / Project Ref.	Nearest Distance to the Proposed Development Site	Description	Scoped in / out for cumulative assessment
			security fencing, site landscaping, upgrade to existing farm track and new internal access track, CCTV and all associated site works. The development includes the demolition of the existing ruined cottage on site. The proposed solar farm will be connected to the National Grid. Permission was granted by Clare County Council on 11th of August 2017.	commenced construction as of mid-2018. This development is scoped in for cumulative assessment due to its proximity to the Proposed Development.
Ballymorris South Solar Farm	17411 Clare County Council	Approximately 9.8km Southwest	The development will consist of a 10-year permission for the construction of a Solar PV Energy development within a total site area of up to 9.4 hA, to include one single storey electrical substation building, electrical transformer/inverter station modules, solar PV ground mounted on steel support structures, access roads, fencing, CCTV, and associated electrical cabling, ducting and ancillary infrastructure. Permission was granted as of 22nd of June 2018.	From examination of the online planning file, it is our understanding that this project has commenced construction as of Q1 2021. This development is scoped in for cumulative assessment due to its proximity to the Proposed Development.
Within 350m of TDR and GCR				
Road Works	198000 Limerick County Council	Within 350m of TDR	The proposed improvement works will be carried out within the existing 60kph speed limit zone over a length of 750m between L6135 Curraghchase Junction and the L6125 Junction. The improvement works proposed comprise a reduction of the N69 carriageway width to 6.5m over the 750m length of the	The improvement works are planned along the N69, which is a large part of the Proposed Development's TDR. This development is therefore scoped in for cumulative assessment.

Project	Planning / Project Ref.	Nearest Distance to the Proposed Development Site	Description	Scoped in / out for cumulative assessment
			scheme with a footway installed on the southern side (school side) and kerbing and a grass verge on the northern side of the carriageway. The proposed works also include for the installation of LED public lighting on the northern side of the carriageway, road lining and signage as well as surface water drainage along both sides of the N69 carriageway and pavement improvement works. Accommodation works will be undertaken as required including improvement works in and around the community hub of the national school and GAA club grounds. The implementation of the works proposed will result in a rearrangement of the existing road network in the vicinity of the scheme. Changes to the existing road network will include the reduction of road width to 6.5m over a 750m length and the installation of a kerbed footway abutting the westbound carriageway and kerbing and a verge abutting the eastbound carriageway over the scheme length. The application for planning permission was submitted on 31st of January 2019.	
Residential Development	201114 and 211328 Limerick County Council	Within 350m of TDR	Construction on Site 1 of 96no. residential units: 2no. 4-bedroom detached units, 20no. 4 bedroom semi-detached units, 8no. 3 bedroom semi-detached units, 32no. 3 bedroom terraced units, 13no. 2 bedroom terraced	From examination of the online planning file, it is our understanding that this project has commenced construction as of 21st of February 2022.

Project	Planning / Project Ref.	Nearest Distance to the Proposed Development Site	Description	Scoped in / out for cumulative assessment
			units, 17no. 2 bedroom duplex units, 4no. 1 bedroom duplex units. Provision of Creche and Community Building including external play area (Gross Floor Area - 787 sq.m, Creche 610 sq.m & Community Building 177 sq.m). Provision of shared communal and private open space, car parking, bicycle storage, bin storage, vehicular and pedestrian access, public lighting, site landscaping, services, signage, ESB substation and all associated site development works. Development to include access onto the Mungret Road(R859). The planning application is accompanied by a Natura Impact Statement. Planning permission was granted on the 27th of May 2021.	This development is scoped in for cumulative assessment based on its proximity to the TDR.
Residential Development	211152 Limerick County Council	Within 350m of TDR	A residential development comprising 89 no. residential units, (9 no. detached houses, 36 no. semi-detached houses, 20 no. terraced houses, 24 no. duplex units), demolition of existing farm buildings, additional parallel parking along the Castletroy College road, accessed via a new entrance onto the Castletroy College road and all ancillary site development works. Ancillary site development works include a new connection to the public water main, foul and surface water drainage, access roads, footpaths, vehicle parking,	From examination of the online planning file, it is our understanding that this project has not yet commenced. This development is scoped in for cumulative assessment based on its proximity to the TDR.

Project	Planning / Project Ref.	Nearest Distance to the Proposed Development Site	Description	Scoped in / out for cumulative assessment
			landscaping, boundary treatments and site development works above and below ground. The planning application is accompanied by an EIAR (Environmental Impact Assessment Report) and an NIS (Natura Impact Statement). Planning permission was granted on the 20th of April 2022.	
Residential Development	191236 Limerick County Council	Within 350m of TDR	A residential development comprising 92 no. residential units, (60 no. houses, 32 apartments) This includes 1 no block of 32 apartments specifically intended to accommodate independent living for older persons. The planning application is accompanied by an EIAR and NIS. There is also additional parallel parking along the Castletroy College road, accessed via a new entrance onto the Castletroy College road and all ancillary site development works. Ancillary site development works include a new connection to the public water main, foul and surface water drainage, access roads, footpaths, vehicle parking, landscaping, boundary treatments and site development works above and below ground. Planning permission was granted on the 4th of March 2021 by Limerick County Council.	From examination of the online planning file construction is ongoing. This development is scoped in for cumulative assessment based on its proximity to the TDR.

Project	Planning / Project Ref.	Nearest Distance to the Proposed Development Site	Description	Scoped in / out for cumulative assessment
Residential Development	19547 Limerick County Council	Within 350m of TDR	A residential development comprising 70 no. residential units, (16 no. semi-detached houses, 6 no. terrace houses, 4 no. duplex units, 1 no. 4 storey apartment block over basement), 2 storey Creche and community playing pitch, accessed via the Castletroy College road and all ancillary site development works. Planning permission was granted on 28th of May 2020 by Limerick County Council.	From examination of the online planning file construction is ongoing. This development is scoped in for cumulative assessment based on its proximity to the TDR.
Road Works	306146 An Bord Pleanála (ABP)	Within 350m of TDR	Foynes to Limerick Road (including the Adare Bypass) including all ancillary and consequential works. The application was approved with conditions on the 30th of August 2022 by ABP.	The improvement works are planned along the N69, which is a large part of the Proposed Development's TDR. This development is therefore scoped in for cumulative assessment.
Road Works	306199 ABP	Within 350m of TDR	Foynes to Rathkeale Protected Road Scheme 2019, Rathkeale to Attyflin Motorway Scheme 2019 and Foynes Service Area Scheme 2019 (forming the Foynes to Limerick Road (including Adare Bypass)). The application was approved with modifications on the 30th of August 2022 by ABP.	The improvement works are planned along the N69, which is a large part of the Proposed Development's TDR. This development is therefore scoped in for cumulative assessment.
Residential Development	20256 Limerick County Council	Within 350m of TDR	A residential development comprising 57units (comprising 21 no. semi-detached houses, 3 no terrace, 2 duplex units) and 1 four storey apartment block over basement comprised of 31	From examination of the online planning file construction commenced in May 2021 and was completed as of February 2022.

Project	Planning / Project Ref.	Nearest Distance to the Proposed Development Site	Description	Scoped in / out for cumulative assessment
			apartments revisions to development granted under planning 18/698 consisting of alteration to a portion of the open space area, all accessed via existing entrance onto the Kilmurry Road and all ancillary site development works including connections to the public water main, foul and surface water drainage, access roads, footpaths, vehicle parking, landscaping, boundary treatments and site development works above and below ground. The planning application is accompanied by a Natura Impact Statement. Planning permission was granted on 8th of December 2020.	The construction phase of the residential is complete and should therefore have no interaction with the Proposed Development. This development is therefore scoped out of the cumulative assessment.
Residential Development	211400 Limerick County Council	Within 350m of TDR	A residential development comprising 96 no. residential units, (16 no. semi-detached houses, 6 no. terrace houses, 2 detached units along with 2 no. 5 storey apartment blocks over basement, comprised of 72 no. apartments and basement parking), bin & bike stores, demolition of existing farm buildings, additional parallel parking along the Castletroy College road, accessed via a new entrance onto the Castletroy College road and all ancillary development works. Ancillary site development works include a new connection to the public water main, foul and surface water drainage, access roads, footpaths, vehicle parking,	From examination of the online planning file, it is our understanding that this project has not yet commenced. This development is scoped in for cumulative assessment based on its proximity to the TDR.

Project	Planning / Project Ref.	Nearest Distance to the Proposed Development Site	Description	Scoped in / out for cumulative assessment
			landscaping, boundary treatments and site development works above and below ground. The planning application is accompanied by a NIS (Natura Impact Statement). Planning permission was granted on the 9th of June 2022.	
Residential Development	21311588 Limerick County Council	Within 350m of TDR	Application - Construction of 371 residential units, proposed access road and two storey childcare facility. Planning permission was granted on the 26th of May 2022.	From examination of the online planning file, it is our understanding that this project has commenced as of February 2023. This development is scoped in for cumulative assessment based on its proximity to the TDR.
Residential Development	21350 Limerick County Council	Within 350m of TDR	A residential development comprising 62no. residential units(14no. semi-detached house, 10no. terrace houses, 4no. duplex units, 2no. 5 storey apartment blocks over basement, comprised of 34no. apartments and basement parking), revisions to development granted under planning reference 20/256 consisting of alteration of portion of the open space area and alterations to the visitor drop off area, all accessed via existing entrance onto the Kilmurry Road and all ancillary site development works on lands at Newtown, Castletroy, Co. Limerick. Ancillary site development works include connections to the public water main, foul and surface water drainage, access	From examination of the online planning file, it is our understanding that this project has not yet commenced. This development is scoped in for cumulative assessment based on its proximity to the TDR.

Project	Planning / Project Ref.	Nearest Distance to the Proposed Development Site	Description	Scoped in / out for cumulative assessment
			roads, footpaths, vehicle parking, landscaping, bin & bike store, boundary treatments and site development works above and below ground. The planning application is accompanied by an EIAR (Environmental Impact Assessment Report) and an NIS(Natura Impact Statement). Planning permission was granted on the 3rd of December 2021.	
Road Works	218001 Limerick County Council	Within 350m of TDR	The construction of an overflow channel and new culvert under the N69 in the vicinity of Marine Cove Road.	The improvement works are planned under the N69, which is a large part of the Proposed Development's TDR. This development is therefore scoped in for cumulative assessment.
Residential Development	22313124 Limerick County Council	Within 350m of TDR	A 10-year permission for the construction of 384no. residential units (202 no. houses, 182 no. apartments), creche and associated site works. The application was submitted for planning on the 31st of March 2022.	This development, which is yet to be determined, is scoped in for cumulative assessment based on its proximity to the TDR.
Road Works	228018 Limerick County Council	Within 350m of TDR	Development works that will consist of upgrades/reconstruction works commencing on the R526 (north-east of Ballykeefe Roundabout), along South Circular Rd, Henry St and terminating at Mill Lane in Limerick City Centre.	The R526 is a fly over which runs over the N18 (along the Turbine Delivery Route of the Proposed Development). The works associated with this road development should not interact with the N18 road and is therefore scoped out of the cumulative assessment.
Quarry	23294	Within 350m of TDR	The development will consist of the restoration and infilling of the existing and future void over an area of (c. 17.2 ha) of	This development is scoped in for cumulative assessment based on its proximity to the TDR.

Project	Planning / Project Ref.	Nearest Distance to the Proposed Development Site	Description	Scoped in / out for cumulative assessment
	Limerick County Council		existing permitted quarry (05/7029 and ABP 13.QC.2098) using approximately 2,464,000m3 or 4,435,200 tonnes of inert soil and stone material or stone by-product, or river dredge spoil. The application was submitted for planning on the 6th of June 2023.	
Land Disturbance	2337 Clare County Council	Within 350m of TDR	To fill land with topsoil, subsoil, stone and inorganic construction material to raise the level of the land for agricultural purposes. A Natura Impact Statement is included with the application. The application was submitted for planning on the 25th of January 2023.	The principal road used is to be the R465 from Limerick City. Material will also be brought from Killaloe via the R471 and R463. The TDR of the Proposed Development runs along the R471 which intersects with R463. This development is scoped in for cumulative assessment based on its use of common roads and proximity to the Proposed Development site.
Road Works	238002 Limerick County Council	Within 350m of TDR	The development works will consist of and extension of the existing embankment on the landowner's side and various other road upgrade works including a shared raised footpath and cycleway and footway with fencing. The application was submitted for planning on the 27th of February 2023.	This development is therefore scoped in for cumulative assessment due to its proximity to the TDR of the Proposed Development.
Road Works	238004 Limerick County Council	Within 350m of TDR	The proposed improvement works that comprise of 550m of revised road layout on the N69 and 90m of realigned side road L1403 and will provide for various additional road upgrade features	The improvement works are planned along the N69, which is a large part of the Proposed Development's TDR. This development is therefore scoped in for cumulative assessment.

Project	Planning / Project Ref.	Nearest Distance to the Proposed Development Site	Description	Scoped in / out for cumulative assessment
			including a footway, signal-controlled pedestrian crossings, kerbing and hardscaping, etc. The application was submitted for planning on the 20th of April 2023.	
Residential Development	314013 ABP	Within 350m of TDR	The construction of 21 no. dwellings and all associated site works. The application is accompanied by a Natura Impact Statement (NIS). The application was submitted to ABP on the 6th of July 2022 and the case was due to be decided on the 8th of November 2022.	This development, which is yet to be determined, is scoped in for cumulative assessment due to its proximity to the TDR of the Proposed Development.
Port Works	2018007 EIAR Portal Reference 301561 ABP	Within 350m of TDR	Port capacity extension to consist of modifications to the existing jetties and quays, phased expansion of the port estate and all associated site development works. The application was granted permission on the 21st of December 2018 by ABP.	This development is scoped out for cumulative assessment on the basis that the indicative construction schedule in the planning file was ca. 3 years (assumed to end in early 2022) and that this development will therefore have no interactions with the Proposed Development.
Road Works	2019214 EIAR Portal Reference 306146 ABP	Within 350m of TDR	Approximately 15.6km of Type 2 dual carriageway express road extending from Foynes to Rathkeale, approx. 17.5km of dual carriageway motorway from Rathkeale to Attyflin and a service area for Heavy Goods Vehicles approximately 5ha in size near Foynes. The application was approved on the 30th of August 2022.	The improvement works will have potential interactions with a section of the N69, which is a part of the Proposed Development's TDR. This development is therefore scoped in for cumulative assessment.

Project	Planning / Project Ref.	Nearest Distance to the Proposed Development Site	Description	Scoped in / out for cumulative assessment
Port Works	2020031 EIAR Portal Reference	Within 350m of TDR	Jetty Extension between East Jetty and West Quay of area 0.361ha. Pontoon relocation and landing structures with access to West Quay of area 0.0071ha. The foreshore lease was granted on the 11th of January 2022 Foreshore Ref: FS006837.	This development is scoped out for cumulative assessment on the basis that it is a foreshore application and will therefore have no interactions with the Proposed Development.
Solar Farm	248066 ABP	Within 350m of TDR	10-year permission. for the development. of a solar PV farm consisting of up to 35,582m^2 of solar panels on mounted steel frames, 1 no. substation; 3 no. inverter cables, underground cable ducts and all associated works. Planning permission was granted on the 5th of April 2018 by ABP.	This development is scoped out for cumulative assessment on the basis that its construction schedule will not coincide with that of the Proposed development, having been granted planning permission in April 2018. It is assumed that this development will therefore have no interactions with the Proposed Development.