

Ballinlee Green Energy Ltd.

Ballinlee Wind Farm

Appropriate Assessment (AA) Screening Report

James O'Connor



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STATEMENT OF AUTHORITY

APEM Group Woodrow, trading as Woodrow Sustainable Solution Limited, is an established and accomplished environmental consultancy committed to delivering robust ecological assessment services for clients in the private and public sectors. APEM Group Woodrow provides an in-house team of ecologists and environmental professionals whose primary specialisms include botany, habitats, birds, bats, mammals, invertebrates and aquatic ecology. APEM Group Woodrow's investment in high-technology field equipment and software, and the development of our own field-data collection app (Eco-Log), ensures reliability and confidence in our work. APEM Group Woodrow staff are fully conversant with wildlife legislation in both Ireland and the UK, and work to exacting standards, according to established guidelines issued by the Chartered Institute of Ecology and Environmental Management (CIEEM).

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1. INTRODUCTION

1.1. Background

APEM Group Woodrow was engaged by Ballinlee Green Energy Ltd., to undertake a Screening for Appropriate Assessment (hereinafter referred to as AA) for the proposed Wind Farm at Ballinlee, Co. Limerick, and associated infrastructure (hereinafter referred to as the Proposed Development).

1.2. Site Description

The proposed Wind Farm site under consideration, is located on predominantly agricultural lands within the townlands of Ballincurra, Ballinlee South, Ballingayrour, Ballinrea, Knockuregare, Ballinlee North, Carrigeen and Camas South, c. 18 km south of Limerick City and c. 3 km southwest of Bruff, Co. Limerick. The site itself is intersected by the L1414 minor road (Convent Road), with sections of the Planning Application Boundary extending both north and south of L1414 (**Figure 1**).

The area is rural in nature, characterised by agricultural holdings and one-off residential dwellings, with some small pockets of forestry. Land is managed for agriculture at varying levels of intensity, with hedgerows and drainage ditches scattered throughout the proposed Wind Farm site.

1.3. Purpose of this Document

The aim of this report is to provide supporting information to assist the Competent Authority, in this case An Coimisiún Pleanála, to carry out AA screening of the Proposed Development, in accordance with the requirements of Article 6 of the EU Habitats Directive (92/43/EEC). The purpose of this AA screening is to determine the potential Likely Significant Effects (LSE), if any, that the Proposed Development may have, alone or in combination with other plans or projects, on European Sites in view of their conservation objectives. This report focuses on the works associated with the Proposed Development, as outlined in **Section 3**.

The report sections, paragraphs and tables relate in sequence to the process of assessing the potential impact of the Proposed Development in the context of sequential requirements of Article 6 of the EU Habitats Directive.

1.4. Brief Description of the Proposed Development

The current proposal comprises a 17-turbine Wind Farm, encompassing all associated site infrastructure, the Grid Connection Route (GCR) from the onsite substation to the existing Killonan 220/110 kV substation in Co. Limerick, and all works required on the Turbine Delivery Route (TDR) (herein referred to as the Proposed Development).

The GCR is c. 27.6km in length and extends along existing regional and local roads from the proposed Wind Farm substation to Killonan 220/110 kV substation, which is located on the Tipperary Road (N24) east of Limerick City, c. 17.4 km to the north of the Wind Farm site (**Figure 2**).

The proposed TDR departs Foynes port before travelling along the N69 as far as the N18 bypass. The route then follows the M20 before turning left at the N20 junction in Ballbronnouge and continuing toward Croom. Here, it follows the R516 road for c. 15 km until it terminates at the northern Planning Application Boundary. The route only passes through one town (Croom), with the rest of the route being predominantly rural (**Figure 3**).

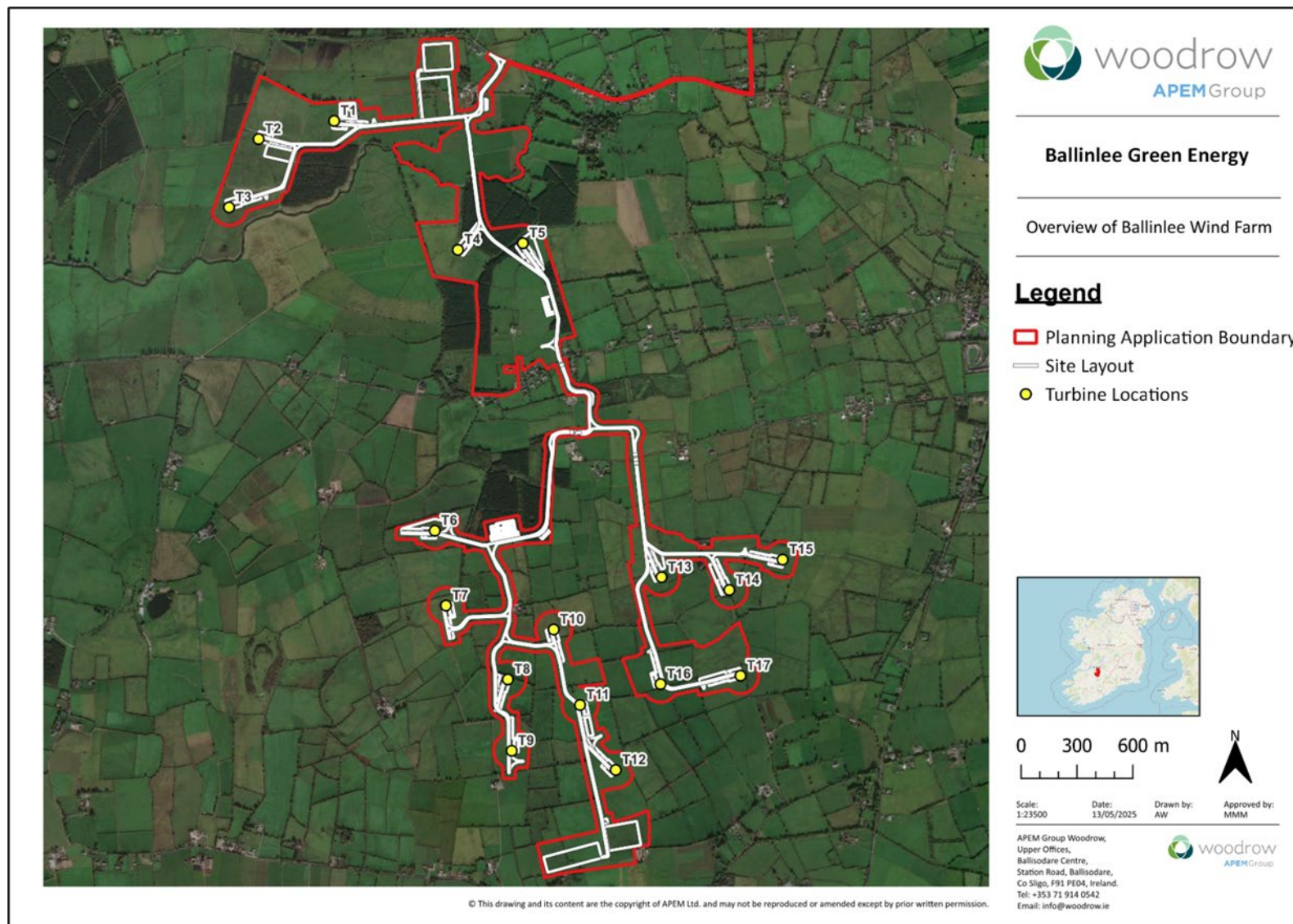


Figure 1: Overview of the Proposed Development showing the Planning Application Boundary and site layout

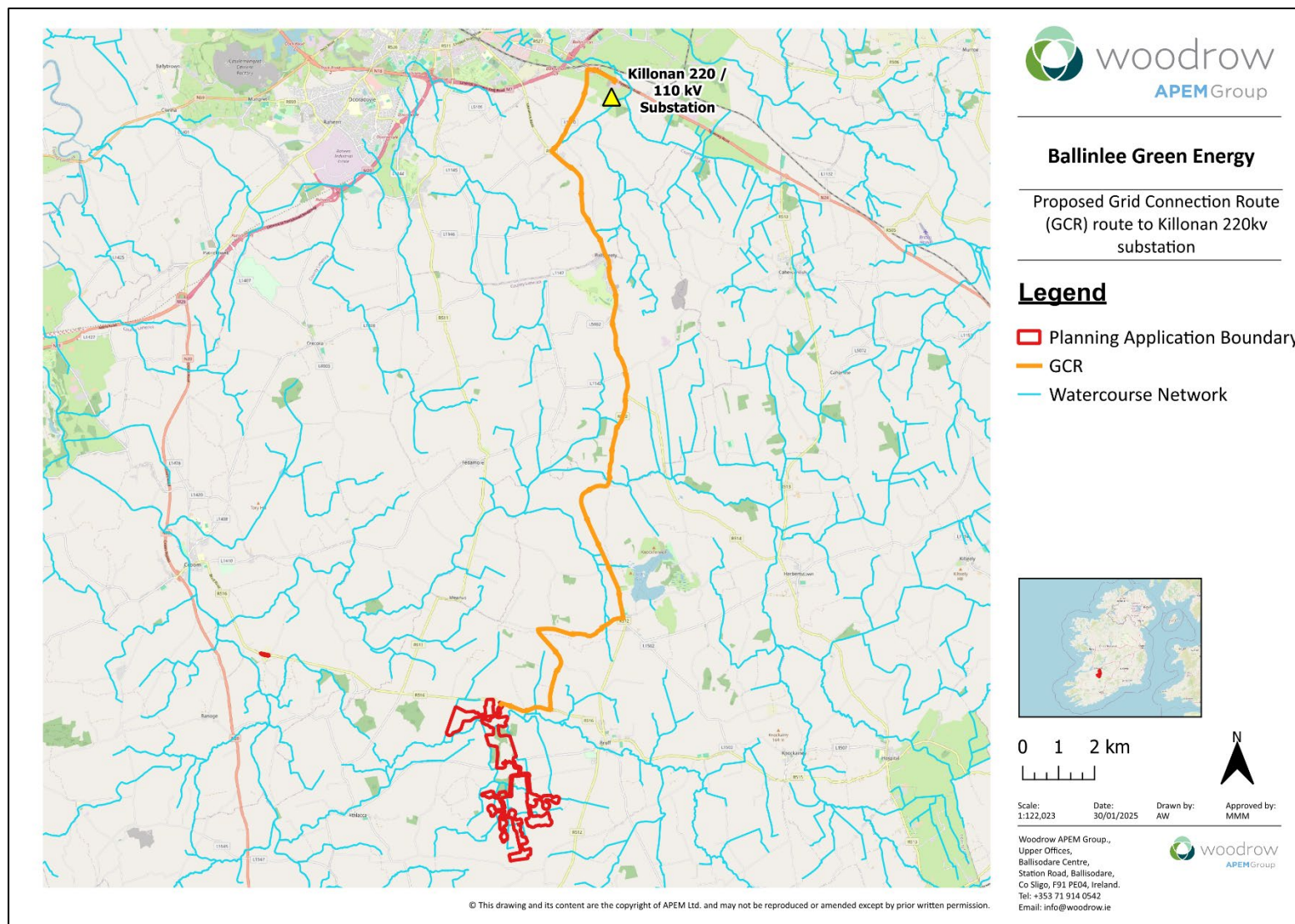


Figure 2: Grid Connection Route (GCR) for the Proposed Development

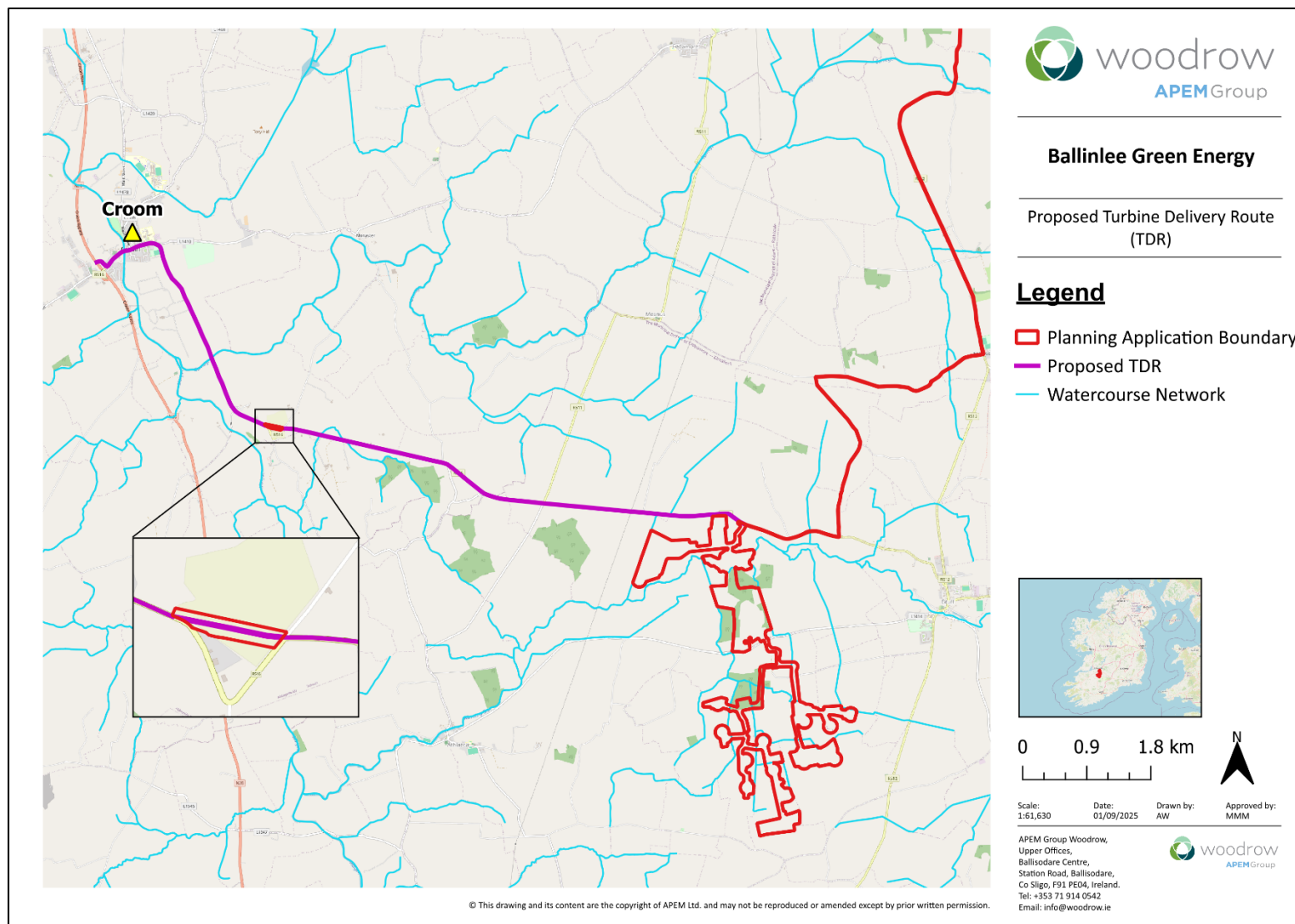


Figure 3: Turbine Delivery Route (TDR) (from Croom) of the Proposed Development

1.5. Objectives of the Appropriate Assessment Approach

The AA approach in Ireland is driven by the Habitats Directive (92/43/EEC) which is transposed into Irish Law by Part XAB of the Planning and Development Act, 2000 (the "PDA 2000") in respect of land use plans and proposed development requiring development consent and the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011), as amended for all other activities, plans or projects. The objective of AA is to safeguard the long-term survival of habitats and species designated under European Sites, as defined in the PDA 2000, including Special Areas of Conservation (SACs) designated under the Habitats Directive and Special Protection Areas (SPAs) designated under the Birds Directive (2009/147/EC).

The Habitats Directive promotes a hierarchy of avoidance, mitigation and compensatory measures to be addressed in the AA process (OPR, 2021) as follows:

- Firstly, a plan / project should aim to avoid any potential for negative impacts on European Sites;
- Secondly, mitigation measures should be applied during the AA process to the point where no adverse impacts on the site(s) remain;
- Thirdly, a plan / project may have to undergo an assessment of alternative solutions. Under this stage of the assessment, compensatory measures are required for any remaining adverse effects, but they are permitted only if (a) there are no alternative solutions and (b) the plan / project is required for Imperative Reasons of Overriding Public Interest (the 'IROPI test'). European case law highlights that consideration must be given to alternatives outside the plan / project boundary area in carrying out the IROPI test.

1.6. Stages of Article 6 Assessment

The European Commission's guidance promotes a staged process, as set out below, the need for each being dependent upon the outcomes of the preceding stage.

- 1 Screening For Appropriate Assessment
- 2 Appropriate Assessment
- 3 Assessment of Alternative Solutions
- 4 Assessment where no alternative solutions remain and where adverse impacts remain.

The final stage is the Imperative Reason of Overriding Public Interest (IROPI) test and requirement for compensatory measures.

1.6.1. Stage 1: Screening for Appropriate Assessment

Stage 1 of the process is intended to identify whether the project is 'likely to have a significant effect' either alone or in combination with other plans and projects, upon a European Site, referred to as 'Screening for AA'.

If the screening process identifies effects to be significant, potentially significant, or uncertain, or if the screening process becomes overly complicated, then the process must proceed to Stage 2 of AA. Screening is undertaken without taking into account any mitigation aimed at avoiding or reducing impacts the Proposed Development may have on European Sites.

1.6.2. Stage 2: Appropriate Assessment (Natura Impact Statement)

This stage considers whether the plan or project, alone or in combination with other projects or plans, will have adverse effects on the integrity of a European Site with respect to the site's structure and

function and its conservation objectives after having taken account of any mitigation measures proposed to avoid, reduce or offset negative effects.

The proponent of the plan or project will be required to submit a NIS, i.e. the report of a targeted professional scientific examination of the plan or project and the relevant European Sites, to identify and characterise any possible effects on the site in view of the site's conservation objectives, taking account of in-combination effects. This should provide information to enable the competent authority to carry out the AA. If the assessment is negative, i.e. adverse effects on the integrity of a European Site cannot be excluded, then the process must proceed to Stage 3, or the plan or project should be abandoned.

1.6.3. Stage 3: Assessment of Alternative Solutions

If adverse effects upon the site's integrity cannot be ruled out, then Stage 3 will need to be undertaken to assess whether alternative solutions exist. If no alternatives exist that have a lesser effect upon the European Site(s) in question, the project can only be implemented if there are IROPI as detailed in Article 6(4).

1.6.4. Stage 4: Imperative Reasons of Over-riding Public Interest

If a plan or project is found to have adverse effects on the integrity of European Sites and there are no other options available, the plan can only proceed if it can be proven that there are imperative reasons of overriding public interest that supersede the negative effects. In such cases, compensatory measures will be necessary.

1.7. Legislative Context

The legislation relevant to this report is as follows:

- The Habitats Directive 92/43/EEC;
- The Birds Directive 2009/147/EC;
- European Communities (Birds and Natural Habitats) Regulations 2011; and
- Planning and Development Acts 2000 (as amended) – PART XAB.
- Planning and Development Act 2024
- Planning and Development (Amendment) Act 2025
- Planning and Development Regulations 2001 to 2025
- Limerick Development Plan, 2022-2028
- Limerick Biodiversity Action Plan 2025–2030

1.7.1. Requirement for Appropriate Assessment

The requirement for AA is set out in Article 6(3) of the Habitats Directive (92/43/EEC). Article 6(3) of the Habitats Directive requires:

Any plan or project not directly connected with or necessary to the management of the [Natura 2000] site but likely to have a significant effect thereon, either individually or in combination with other plans and projects, shall be subjected to appropriate assessment of its implications for the site in view of the site's conservation objectives. In the light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public.

The Court of Justice of the European Union (CJEU) has issued several rulings relating to AA. These rulings cover when it is necessary, what it should aim to achieve, and the standards it must adhere to. These rulings have considered the developments in the interpretation and application of directives and national laws resulting as of case law of the European and Irish courts, with regard to Article 6 of the Habitats Directive.

1.7.2. Screening for Appropriate Assessment

An AA Screening report provides the information necessary to allow a screening assessment to be completed in accordance with the requirements of Article 6 of the EU Habitats Directive 1992 and Section 177U of the PDA 2000.

Section 177U(1) of this Act states that:

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.

Section 177U(4) of this Act states that:

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.

If, following the screening process, a Likely Significant Effect is predicted or cannot be ruled out; under s177U(4) of the Planning and Development Acts 2000 (as amended), an AA is required in order to determine the potential for impact on the integrity of a European Site.

1.8. Case Law

This AA screening was undertaken with consideration of case law, including judgments of the Irish and European Courts. Significant cases and their respective outcomes were reviewed and adapted in compiling this report.

Case law¹ has established that measures designed to avoid or reduce the harmful effects of a development on a European Site (i.e. specific mitigation measures) cannot be considered at the screening stage of the AA process (i.e. Stage 1) and where this arises, the plan or project must be assessed fully. However, a 2023 ruling on the Eco Advocacy CLG v An Bord Pleanála and Keegan Land Holdings Limited [2021] IEHC 265² has clarified that standard design features inherent to a project, such as drainage systems that remove contaminants, may be considered at the screening stage, provided they are not specifically introduced to mitigate impacts on a European Site. Hence, while specific mitigation measures aimed at avoiding or reducing impacts the Proposed Development may have on European Sites may not be taken into account at the screening stage, built-in standard design elements with the incidental effect of reducing the harmful effects of the plan or project, can be considered as part of the screening process.

1 People Over Wind and Peter Sweetman v Coillte Teoranta (C-323/17); and Heather Hill Management Company clg v An Bord Pleanála [2019] IEHC 450.

2 Mason, Hayes & Curran (MHC) (2023). Mitigating Standard Design Features to be Considered at Stage 1 Appropriate Assessment? Confirmation from Europe's Highest Court. [online] 29 June. Available at: <https://www.mhc.ie/latest/insights/mitigating-standard-design-features-to-be-considered-at-stage-1-appropriate-assessment> [Accessed February 2025].

2. METHODS

2.1. Data Collection

2.1.1. Desk Study

On determining the ZoI (see **Section 2.2.1**), a desk study was carried out to collate information available on European Sites within this ZoI. The following legislation, regulatory documents, and relevant sources of information were consulted:

- Department of Environment, Heritage and Local Government (2009 as amended in 2010). Appropriate Assessment of Plans and Projects in Ireland: Guidance for Planning Authorities.
- Appropriate Assessment under Article 6 of the Habitats Directive: Guidance for Planning Authorities. Circular NPWS 1/10 & PSSP 2/10.
- European Community Habitats Directive (92/43/EEC) – The Habitats Directive (European Commission 1992).
- European Commission (2021) Commission Notice - Assessment of plans and projects in relation to Natura 2000 sites - Methodological guidance on Article 6(3) and (4) of the Habitats Directive 92/43/EEC.
- European Commission (2021) ANNEX to the Commission Notice - Assessment of plans and projects in relation to Natura 2000 sites - Methodological guidance on Article 6(3) and (4) of the Habitats Directive 92/43/EEC.
- European Communities (Natural Habitats) Regulations 1997 (European Commission 1997).
- Managing Natura 2000 Sites: The Provisions of Article 6 of the Habitat's Directive 92/43/EEC (EC, 2019).
- Office of the Planning Regulator (OPR) (2021) OPR Practice Note PN01 Appropriate Assessment Screening for Development Management.
- Environmental Protection Agency (EPA) Maps³.
- National Parks and Wildlife Services online Map Viewer⁴.
- Ireland's National Geospatial Data Hub online Map Viewer⁵.
- Inland Fisheries Ireland (IFI) Open Data Hub⁶.
- Geological Survey of Ireland (GSI) Data and Maps⁷.

2.1.2. Site Visits

Surveys of the Proposed Development and its surrounding area were carried out between October 2021 and May 2025 to establish an ecological baseline. These included several extended Phase 1-type surveys (covering habitats and mammals) as well as bird surveys. An aquatic ecology study was conducted by Malachy Walsh & Partners (MWP) in July and September 2022 on watercourses within the Proposed Development boundary and downstream within the receiving environment. Follow-up water quality sampling was undertaken by MWP in January 2025. Additionally, in May 2025, Woodrow APEM Group carried out surveys at four watercourse crossings intersected by the GCR to establish baseline aquatic conditions and identify any potential ecological constraints. These surveys assisted in establishing potential connectivity with European Sites, the presence of Invasive Alien Species (IAS),

3 EPA Maps. Available at: <https://gis.epa.ie/EPAMaps/> [Accessed February 2025].

4 NPWS Designations Viewer. Available at: <https://dahg.maps.arcgis.com/apps/webappviewer/> [Accessed February 2025].

5 Geohive Map Viewer. Available at: <https://www.arcgis.com/apps/webappviewer/> [Accessed February 2025].

6 IFI Open Data Hub: Available at: <https://opendata-ifigeo.hub.arcgis.com/> [Accessed February 2025].

7 GSI Data and Maps: Available at: <https://www.gsi.ie/en-ie/data-and-maps/> [Accessed February 2025].

and any Qualifying Interests (QIs) or Special Conservation Interests (SCIs) that may occur within the Planning Application Boundary or within the immediate vicinity of the Proposed Development.

2.2. Approach to Screening for Appropriate Assessment

Section 3.2.3 of the Guidance for Planning Authorities (DoEHLG, 2010) states a screening assessment should include any European Site within or adjacent to the plan or project area and any European Site within the likely 'Zone of Influence' (Zol) of the plan or project.

The approach taken in preparing the AA screening is summarised as follows:

- Identify European Sites within the potential Zol of the project;
- Identify the Qualifying Interests (QI) of the European Sites and review their conservation objectives;
- Review whether there is potential for the QI to be affected by the project based on information such as the vulnerabilities of the European Site, proximity to the Site and the nature and scale of the works associated with the project;
- Consider the likelihood of the identified potential impacts, in the absence of mitigation, occurring based on the information collated and professional judgement;
- Consider the likelihood of cumulative effects arising from the project in-combination with other plans and projects; and
- Identify the likelihood of significant effects on European Sites occurring because of the project.

Following the above process, for each European Site (and their QIs) considered within the AA screening, it will be concluded that either:

- There are no likely significant effect on the European Site(s) and their QIs, and therefore no further assessment is required; or,
- The potential for likely significant effects on the European site(s) and their QIs cannot be discounted and therefore Stage 2 AA (Natura Impact Assessment (NIS)) is necessary.

A precautionary approach is applied and so if the potential for likely significant effects cannot be excluded beyond reasonable scientific doubt, then the relevant site and QI will be screened into the subsequent stages of the NIS process.

2.2.1. Zone of Influence

The Zol for a project is the area over which ecological features may be affected by biophysical changes as a result of the Proposed Development and associated activities. This is likely to extend beyond the Proposed Development, for example where there are ecological or hydrological links beyond the site boundaries. The Zol will vary for different ecological features depending on their sensitivity to an environmental change (CIEEM, 2018).

Guidance from the Office of the Planning Regulator (OPR, 2021) states that the Zol for a project should be established on a case-by-case basis using the Source-Pathway-Receptor (SPR) model. The SPR model is applied to this assessment with reference to the nature, size and location of the project, the sensitivities of the ecological receptors, and the potential for in-combination effects.

In order to identify potential pathways between the Proposed Development and European Sites, the following data and information were consulted:

- Catchment data was used to establish or discount potential hydrological connectivity.
- Groundwater and bedrock information was used to establish or discount potential hydrogeological connectivity.

- Air and land connectivity was assessed based on the project description and proximity to European Sites.

Additionally, the ZoI includes consideration of collision risk to SCI bird species within 20 km (SNH, 2016), particularly where proposed infrastructure may pose a risk to bird flight paths both within the project boundary and in the surrounding area. This includes potential indirect pathways such as impacts to flight lines of migratory species and connectivity with *ex situ* habitats.

To assess the potential for significant effects arising from the Proposed Development, a number of key indicators were considered, including:

- Loss of habitat area or alteration.
- Habitat/species fragmentation.
- Disturbance and/or displacement of species.
- Changes in population density.
- Changes in water quality and resource.

No limitations were encountered that would preclude a robust assessment of the potential impacts of the Proposed Development on European Sites.

2.2.2. In-Combination Effects

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

Other plans and projects to be considered would include the following types of future development within the same ZoI:

- Proposals for which consent has been applied which are awaiting determination in any regulatory process (not necessarily limited to planning permission);
- Projects which have been granted consent (not limited to planning permissions) but which have not yet been started, or which have been started but are not yet completed (i.e. under construction);
- Other operational, approved, or proposed major developments; and
- Proposals which have been refused permission, but which are subject to appeal, and the appeal is undetermined.

In addition to future developments identified through the Limerick City & County Council Planning Portal⁸, relevant local planning policies such as the Limerick Development Plan 2022–2028⁹, Limerick Biodiversity Action Plan 2025–2030¹⁰ and the Strategic Integrated Framework Plan for the Shannon Estuary¹¹ were also considered.

8 Limerick County Council Planning Portal. Available at: <https://www.limerick.ie/council/services/planning-and-placemaking/> [Accessed February 2025].

9 Limerick Development Plan 2022–2028. Available at: <https://www.limerick.ie/council/services/planning-and-placemaking/development-plan> [Accessed February 2025].

10 Limerick City and County Council (2025). Limerick Biodiversity Action Plan 2025–2030. Adopted 31st March 2025. <https://mypoint.limerick.ie/en/system/files/materials/7275/Draft%20Limerick%20Biodiversity%20Action%20Plan%202025-2030%20LOW%20Res%202024.11.18.pdf> [Accessed February 2025].

11 Strategic Integrated Framework Plan for the Shannon Estuary. Available at: <https://www.limerick.ie/council/services/planning-and-placemaking/development-plan-strategies/strategic-integrated> [Accessed March 2025].

3. DETAILED DESCRIPTION OF THE PROPOSED DEVELOPMENT

The proposed development is located in a rural area of east Limerick approximately 18km south of Limerick City and 3km southwest of Bruff. **Figure 1** outlines the location of the proposed development and indicates the planning application boundary included in the planning application. The area within this boundary is approximately 255.12 ha.

The current proposal comprises of the following components:

- Seventeen (17) No. wind turbines (turbine tip height of 160m, and 150m (T6 only)) with associated foundations and crane hardstand areas.
- One (1) No. Permanent Meteorological Mast (92m height) and associated foundation, hardstand area and ancillary main crane hardstand area.
- One (1) No. Electrical Substation (110kV) including Eirgrid compound, IPP, maintenance compounds, ancillary building, security fencing and all associated works.
- Nine (9) No. site entrances.
- New and upgraded internal site service tracks (approximately 10.8km of new internal access tracks to be constructed).
- New clear span bridge over the Morningstar River.
- Underground electric collector cable systems between turbines within the wind farm site.
- New temporary access track via R516 to facilitate turbine delivery route located in the townland of Tullovin.
- Three (3) No. temporary construction site compounds (one approximately 95m x 50m and two approximately 55m x 25m).
- Two (2) No. borrow pits to be used as a source of stone material during construction and for storage of excess excavated materials.
- Nine (9) No. permanent and two (2) temporary deposition areas.
- Associated surface water management systems.
- Tree felling required for wind farm infrastructure.
- Whooper Swan Management Works
- Habitat Enhancement Works
- Landscaping, fencing and all associated works.

The proposed TDR departs Foynes port before travelling along the N69 as far as the N18 bypass. The route then follows the M20 before turning left at the N20 junction in Ballbronouge and continuing toward Croom. Here, it follows the R516 road for c. 15 km until it terminates at the northern Planning Application Boundary. The route only passes through one town (Croom), with the rest of the route being predominantly rural (**Figure 3**).

General construction works will involve tree removal, vegetation stripping, excavation, grading, aggregate placement, geogrid/geotextile installation, drainage, backfilling, concrete pouring, fencing, and landscaping. No in-stream works are required in any EPA mapped watercourses; however works will be required within 50 m of the watercourse. Minor works will be required to existing land drains as part of the construction phase. Existing watercourse crossing construction activities include widening using pre-cast piping, debris removal, cleaning and silt fence installation. Three temporary construction compounds will be established during construction for material storage, welfare facilities, and office space. Facilities will include meeting rooms, canteen areas, mobile sanitary units, and a wastewater management system.

Included within the Planning Application Boundary are lands designated for a Whooper Swan (*Cygnus cygnus*) Management Plan and a Habitat and Species Management Plan (HSMP). These areas are located within the main Wind Farm site. While they are not considered Key Components of the Proposed Development, they are integral associated project elements aimed at supporting the management and enhancement of biodiversity on site.

The Proposed Development is designed for a 35-year lifespan and will operate within wind speeds of 4-25 m/s. Regular maintenance will be carried out by the turbine manufacturer or service company. At the end of its lifespan, the developer will decommission the site, the turbines will be removed, and foundations covered with soil. Access tracks will remain for agricultural use, while the grid connection will become a permanent part of the national electricity grid.

4. RECEIVING ENVIRONMENT

The Proposed Development is located within the Shannon hydrological catchment in a rural agricultural setting. The landscape consists almost entirely of improved grassland, interspersed with hedgerows, treelines, small area of commercial forestry and areas of scrub. An extensive drainage network, characteristic of improved agricultural land, channels much of the landholding's surface runoff into a series of 1st and 2nd order streams. These streams ultimately discharge into the Morningstar River (EPA Code: IE_SH_24M020800) (**Figure 2, 3 and 4**), which flows east to west across the northern section of the Proposed Development site and constitutes part of the wider River Maigue network (EPA Code: IE_SH_24M010500), which drains into the Maigue Estuary north of Adare Co. Limerick. As such, a clear yet distant hydrological link connects the Proposed Development site to the Lower River Shannon SAC (Site Code: 0026165), as well as the River Shannon and River Fergus Estuaries SPA (Site Code: 004077), which are located respective distances of c. 24.2 and c. 36.9 river kilometres (rkm)¹² downstream.

The bedrock aquifer beneath most of the Proposed Development site is classified by the GSI¹³ as a Locally Important Aquifer, with moderate productivity limited to local zones. In contrast, parts to the north of the site and some parts to the south lie on Regionally Important Aquifers, with the northern portion consisting of karstified aquifers that play a key role in both discharge and recharge processes.

The GSI has assigned a "Moderate" groundwater vulnerability rating to most of the Proposed Development site, while portions of the northern, central, and southern areas are rated "High". Additionally, two small regions in the north and south have been classified as "Extreme" or as areas with "rock at or near the surface or karst" (see **Figure 5**).

The GCR extends from the north-east boundary of the Proposed Development site. From here, it travels north along the existing road network for a distance of c. 24.4 km (total length 27.6km from Wind Farm substation), through a predominantly agricultural landscape, intersecting a total of four watercourses, all hydrologically connected to the River Maigue network. At its nearest point (i.e. the point of termination at Killonan substation), the GCR extends to within 190 m of the Groody River (EPA Code: IE_SH_25S012600), c. 5.3 km upstream of the Lower River Shannon SAC, and c. 12.6 km upstream of the River Shannon and River Fergus Estuaries SPA at Limerick City.

4.1. Site Visits

Site visits comprising extended Phase 1 type surveys confirmed that the Proposed Development landscape is predominantly composed of Improved Agricultural Grassland, Conifer Plantation, Hedgerows, and Treelines, while Drainage Ditches, provide hydrological connectivity between much of the Proposed Development and the existing river network. No Annex I habitats were identified within the Planning Application Boundary or its immediate vicinity.

Two invasive alien plant species were found within the Planning Application Boundary, namely Japanese knotweed (*Fallopia japonica*) as well as giant rhubarb (*Gunnera* sp.), both of which are listed under the Third Schedule of the European Communities Regulations 2011 (S.I. 477 of 2015). While giant rhubarb was exclusive to the banks of the Morningstar River, two large stands of Japanese knotweed were recorded in the southern section of the Proposed Development site, c. 50 m from a proposed access track.

Signs of otter (*Lutra lutra*), a QI of the Lower River Shannon SAC, were evident throughout the Study Area, with site visits confirming frequent activity concentrated along the Morningstar River. Field signs consisting of spraints, prints, slides, and trail camera footage indicated regular use of the river for

¹² River kilometres (rkm) is a measure of distance, in kilometres, along the path of a watercourse

¹³ GSI Data and Maps: Available at: <https://www.gsi.ie/en-ie/data-and-maps/> [Accessed February 2025]

commuting and foraging. However, no breeding sites or holts were identified within the Planning Application Boundary.

Aquatic surveys were completed in 2022 on waterbodies within, and downstream of the Proposed Development. This involved biotic assessments of macroinvertebrate communities, as well as fish habitat and fisheries surveys (i.e. electrofishing) within the immediate vicinity of the Planning Application Boundary. Subsequent surface water samples were obtained in January 2025 for physico-chemical water quality analysis. Coverage included the upstream extent of the Morningstar River (i.e. upstream of the Planning Application Boundary), and the 1st and 2nd order streams draining the site. The study found that most of the watercourses surveyed were slow, low gradient streams dominated by pool or glide habitat. Based on macroinvertebrate assemblages, the EPA scheme and Water Framework Directive (2000/60/EC) (WFD) intercalibration, "Poor" ecological conditions were recorded at all locations apart from two sites on the Morningstar River, which scored "Moderate". Moderate to heavy siltation was present at all sites, except at these locations.

Available nutrient data for the Morningstar River, collected as part of WFD surface water monitoring (2022-2024), recorded maximum orthophosphate levels of 0.16 mg/L. Within the current study, orthophosphate levels generally ranged between 0.04 and 0.07 mg/L, although one site recorded a maximum level of 0.10 mg/L. While physico-chemical analysis confirmed that BOD⁵ values at all survey locations remained within the tolerance limits for salmonids (≤ 5 mg/L), elevated orthophosphate concentrations suggest episodic pollution, most likely from agricultural sources.

Atlantic salmon (*Salmo salar*) and lamprey spp. (unidentified) were recorded during the electrofishing surveys, but only at one site, upstream of the Planning Application Boundary. Salmon yielded good numbers (exclusively juveniles) and were the most frequently caught species at this site. Only two lamprey were recorded, and given the life stage, could not be distinguished as brook (*Lampetra planeri*) or river lamprey (*Lampetra fluviatilis*). Overall, the availability of salmon spawning and/or nursery habitat within the study area was limited. While the Morningstar River showed the greatest potential in terms of nursery habitat, no holding pools were available for adult fish, and so these habitats are most likely just mixed juvenile (fry/parr) areas.

Aquatic surveys of watercourses intersected by the GCR and not previously assessed as part of the main aquatic ecology study by MWP were undertaken in May 2025. These included the Camoge River and three of its tributaries. The Camoge exhibited generally good chemical water quality; however, biotic assessment based on the macroinvertebrate assemblage indicated a "Moderate" ecological status. Incidental sightings of juvenile salmonids and a lamprey transformer (an intermediate stage between larva and adult) confirmed that this reach is in use by both species' groups, despite spawning habitat being suboptimal due to siltation and algal growth. In contrast, the tributary streams exhibited poorer conditions, with elevated nutrient concentrations, low dissolved oxygen levels, and degraded ecological status. Habitat suitability across these tributaries was considered poor overall.

SCI species of the River Shannon and River Fergus Estuaries SPA recorded utilising the Proposed Development site consist of whooper swan (*Cygnus cygnus*), teal (*Anas crecca*), golden plover (*Pluvialis apricaria*), lapwing (*Vanellus vanellus*), dunlin (*Calidris alpina*), curlew (*Numenius arquata*), and black-headed gull (*Chroicocephalus ridibundus*). While there was no evidence of these species breeding within the Planning Application Boundary, records from the winter non-breeding period, show regular use of the Proposed Development site by lapwing, golden plover and whooper swan, in particular. Swan foraging activity generally concentrated around the northern proportion of the site, on agricultural fields adjacent to the Morningstar River, as well as the Camoge River, c. 6 km to the north of the Planning Application Boundary. Although not associated with the River Shannon and River Fergus Estuaries SPA, this flock (maximum size of 51 birds) annually occurs in these lands and makes regular flights to and from their roosting grounds at Lough Gur.

Lapwing and golden plover were recorded during non-breeding surveys, primarily in the northern section of the Proposed Development site, where they were associated with temporary standing

water and, in the case of golden plover, agricultural land. Records of teal, dunlin, and curlew were infrequent, consisting of only a handful of observations. Black-headed gull was among the most frequently recorded gull species, with flocks observed flying over the proposed Wind Farm and landing in the area of temporary standing water along the northern boundary.

Of all of the SCIs for the River Shannon and River Fergus Estuaries SPA, the species with the largest core foraging range belongs to whooper swan which have a recorded core foraging range in winter of less than 5 km (SNH, 2016)¹⁴. As such, the Proposed Development is considered to lie outside of any reported core or maximum foraging ranges for SCIs of this SPA (SNH, 2016). Therefore, any recorded incidence of these species within or adjacent to the Proposed Development is not considered to be associated with the SPA.

¹⁴ SNH (2016) (NatureScot). Assessing Connectivity with Special Protection Areas (SPAs) – Guidance, version 3. Scottish Natural Heritage.

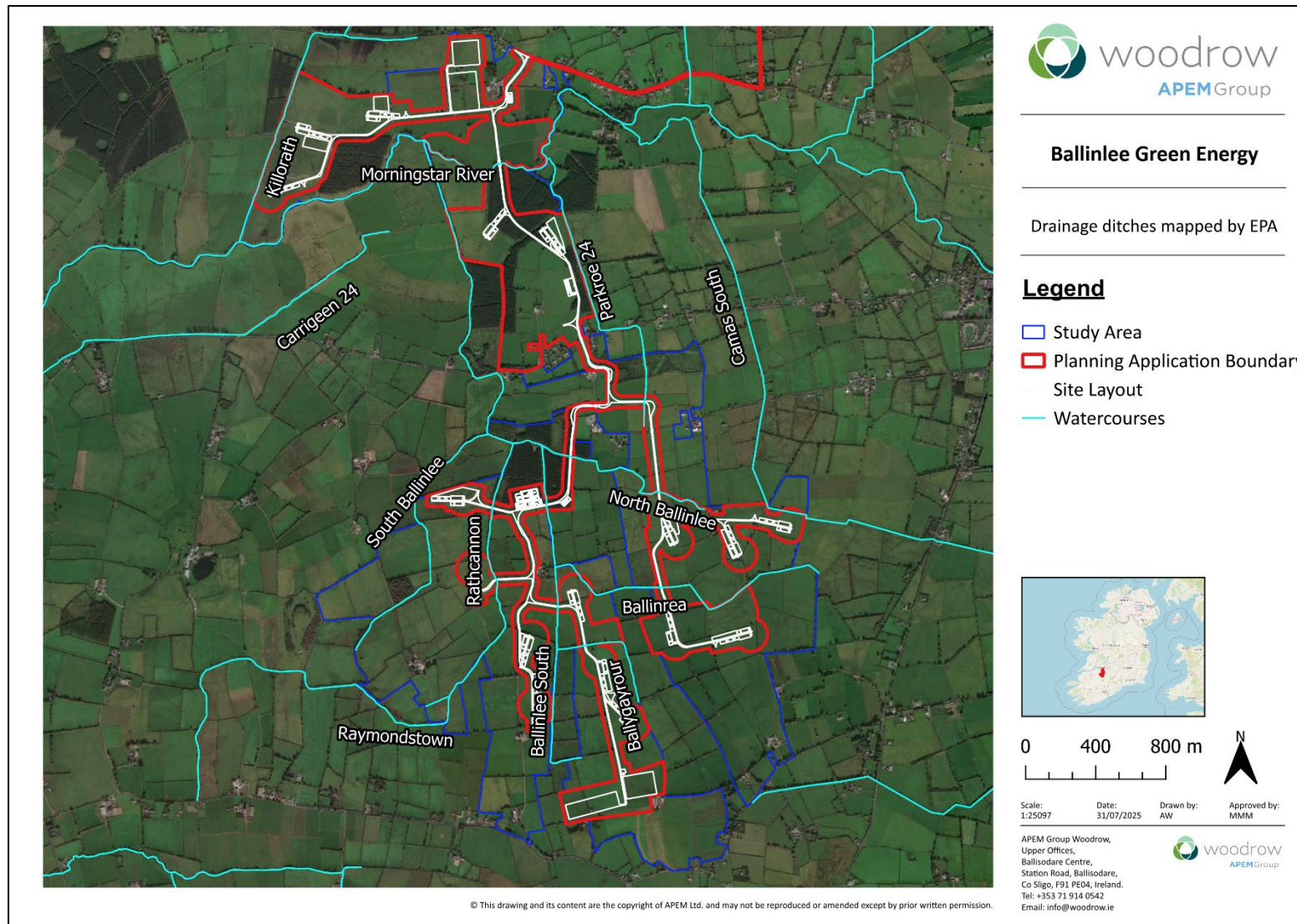


Figure 4: Surface water network within the Proposed Development

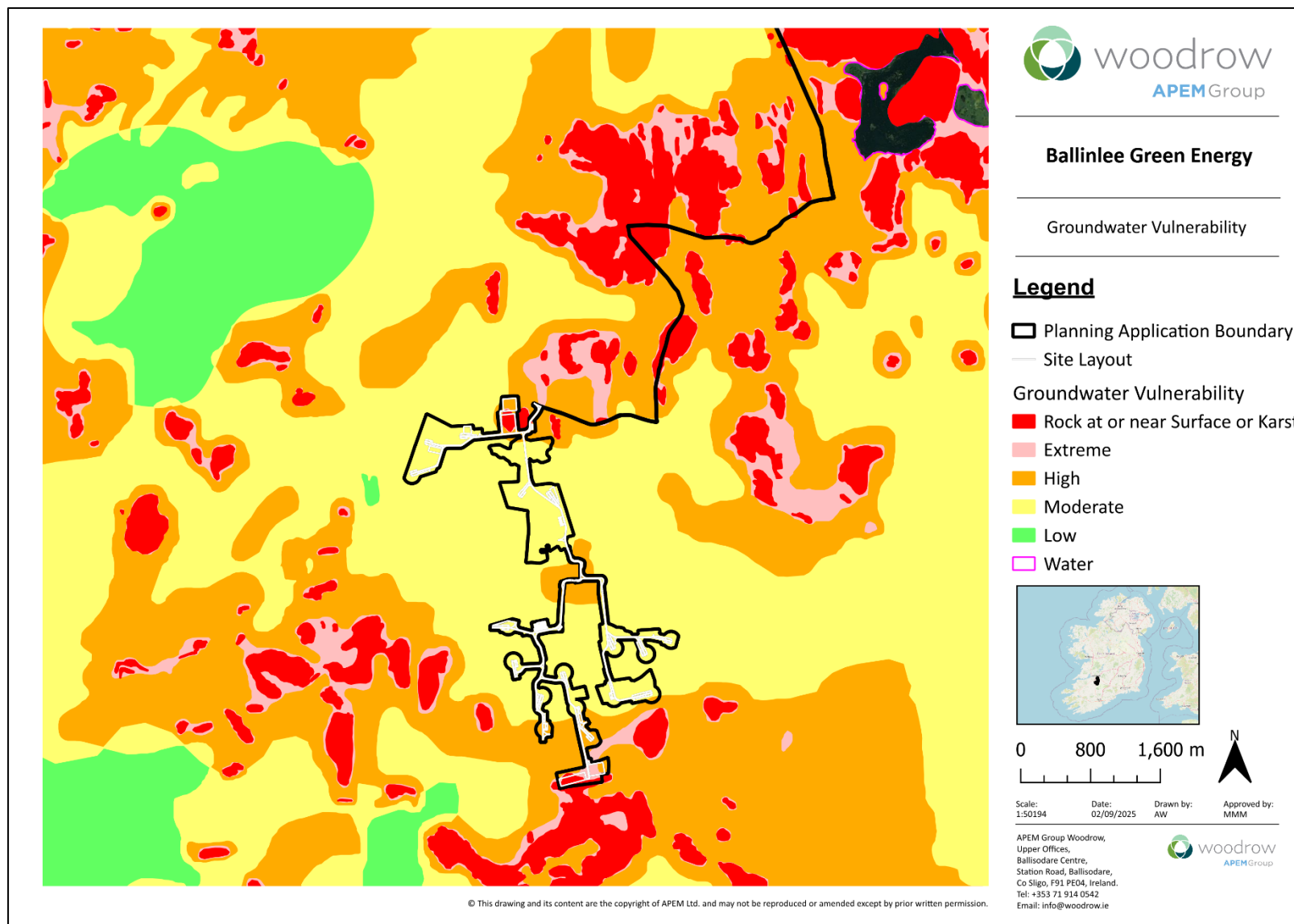


Figure 5: Groundwater vulnerability in the context of the Proposed Development

5. SCREENING FOR APPROPRIATE ASSESSMENT

This section of the report identifies the potential Zol of the Proposed Development, provides information on the European Sites within the identified Zol and sets out the potential impacts and the likelihood of significant effects.

5.1. Potential Sources of Impacts

The Proposed Development is not directly connected with or necessary to the management of any European Site. However, the following elements of the Proposed Development were considered for their potential to result in likely significant effects.

5.1.1. Construction Phase

- Uncontrolled releases of sediments and/or other pollutants to air due to earthworks;
- Surface water run-off containing sediments and/or other pollutants (e.g. hydrocarbons) into nearby waterbodies or surface water network;
- Surface water run-off containing sediments and/or other pollutants into the local groundwater;
- Uncontrolled release of drilling fluid (frac-out) into surface water network;
- Loss of riparian habitat for semi-aquatic species such as otter;
- Elevated levels of noise, airborne particles, and ground disturbance associated with excavation, rock blasting, drilling, or similar groundworks;
- Additional artificial lighting introduced to the area during construction, potentially affecting light-sensitive species;
- Heightened levels of human activity and site traffic during the construction phase, which may lead to disturbance of nearby fauna;
- Spread of invasive alien species.

5.1.2. Operation Phase

- While surface water will be managed through SuDS, there is a limited risk of contaminated runoff to watercourses, particularly from hardstanding areas;
- Emission of foul effluent from improper management of welfare facilities;
- Additional artificial lighting during the operational phase, potentially affecting light sensitive species;
- Regular human presence and activity for maintenance purposes, potentially leading to disturbance of fauna in the area.

5.1.3. Decommissioning Phase

Potential impacts arising from the decommissioning phase are expected to be broadly similar to those outlined for the construction phase, despite occurring at reduced levels (e.g. excavation). These activities may result in disturbance due to elevated noise levels and increased artificial lighting, as well as potential deterioration of water quality in receiving watercourses arising from groundworks, refuelling operations, or improper storage of hazardous materials on site.

5.2. Potential Pathways

Potential impacts arising from the construction, operation and decommissioning of the Proposed Development may effect European Sites *via* one or more direct or indirect pathways. Examples of such pathways are outlined below.

5.2.1. Direct Pathways

- Hydrological connectivity *via* streams or drains that flow from the Proposed Development into surface waters linked to a European Site;
- Land-based transmission, including the movement of machinery or spoil across land surfaces that may lead to contamination, habitat damage, or the spread of invasive species.

5.2.2. Indirect Pathways

- Disruption to flightlines or commuting corridors used by mobile species (birds) between roosting and foraging grounds within or near a European Site;
- Visual or acoustic disturbance arising from human activity, lighting, or turbine operation, which may alter species behaviour even at a distance;
- Changes to hydrological regimes (e.g. groundwater drawdown), which may gradually alter the ecological character of a wetland connected to a European Site.
- Airborne emissions such as dust that travel through the atmosphere and impact habitats or species in nearby watercourses;
-

5.3. Identification of European Sites

The nearest European Site to the Proposed Development is the Glen Bog SAC (Site Code: 001430) (see **Figure 6**), located c. 5 km to the east of the Proposed Development, and c. 2.3 km east of the GCR at its nearest point. This SAC is designated for Alluvial Forests, which occur on the site of a former lake and are hydrologically isolated from the Proposed Development. Hence, despite its proximity, this site is not connected to the Proposed Development, and as such is not considered to fall within the ZoI. Similarly, Ballyhoura Mountains SAC (Site Code: 002036) is located c. 13.7 km south of the Proposed Development. Here, wet heath occurs in mosaic with blanket bog and dry heath. As these ombrotrophic habitats (i.e. reliant solely on precipitation for water and nutrients) are hydrologically isolated from the Proposed Development and lack ecological or landscape connectivity, this European Site is also not considered to fall within the ZoI.

The proximity between the Lower River Shannon SAC (Site Code: 0026165) and the Proposed Development, given the inclusion of the GCR to the north, is c. 5.3 rkm at its nearest point (see **Figure 6**). In addition to this physical hydrological link, albeit distant, intervening watercourses such as the River Maigue support key functional requirements for QI species. These include foraging and spawning areas for salmon and lamprey, as well as riparian corridors used by otter for commuting and feeding. Accordingly, the Lower River Shannon SAC, as well as the River Shannon and River Fergus Estuaries SPA (Site Code: 004077), are deemed to be the primary European Sites with the potential to be affected by the Proposed Development based on the Source-Pathway-Receptor model.

Tory Hill SAC (Site Code: 000439) is located c. 7.6 km northwest of the Proposed Development site. While the GSI Groundwater Vulnerability Map classifies portions of the Proposed Development as having "Extreme" vulnerability¹⁵(see **Figure 5**), regionally, groundwater flow is generally in a north-westerly direction toward the Shannon Estuary, while local groundwater flows are directed toward surface waterbodies within the immediate sub-catchment. Therefore, there is no hydraulic

¹⁵ GSI Data and Maps: Available at: <https://www.gsi.ie/en-ie/data-and-maps/> [Accessed February 2025].

connectivity to this SAC. Karstified aquifers in the area exhibit a high degree of interconnection between groundwater and surface water. Additionally, groundwater storage in karstified bedrock is low, limiting contaminant attenuation. As such, while any impacts on the underlying aquifer environment may be negative and significant, they would remain localised, with contaminants rapidly migrating towards receiving watercourses including the Morningstar River, rather than Tory Hill SAC.

Other European Sites within the area, but not considered to fall within the ZoI of the Proposed Development, either due to their proximity and/or lack of ecological, hydrological or landscape connectivity, include Curraghchase Woods SAC (Site Code: 000174), Askeaton Fen Complex SAC (Site Code: 002279), Barrigone SAC (Site Code: 000432), Moanour Mountain SAC (Site Code: 002257), Carrigeenamronety Hill SAC (Site Code: 002307), Blackwater River (Cork/Waterford) SAC (Site Code: 002170), Galtee Mountains SAC (Site Code: 000646), and Slievefelim to Silvermines Mountains SPA (Site Code: 004165).

A list of European Sites, their distances from the Proposed Development, and an assessment of their connectivity is provided in **Table 1**. The potential LSE arising from the Proposed Development with potential to affect habitats and species listed as QIs/SCIs of European Sites are outlined in **Table 2**.

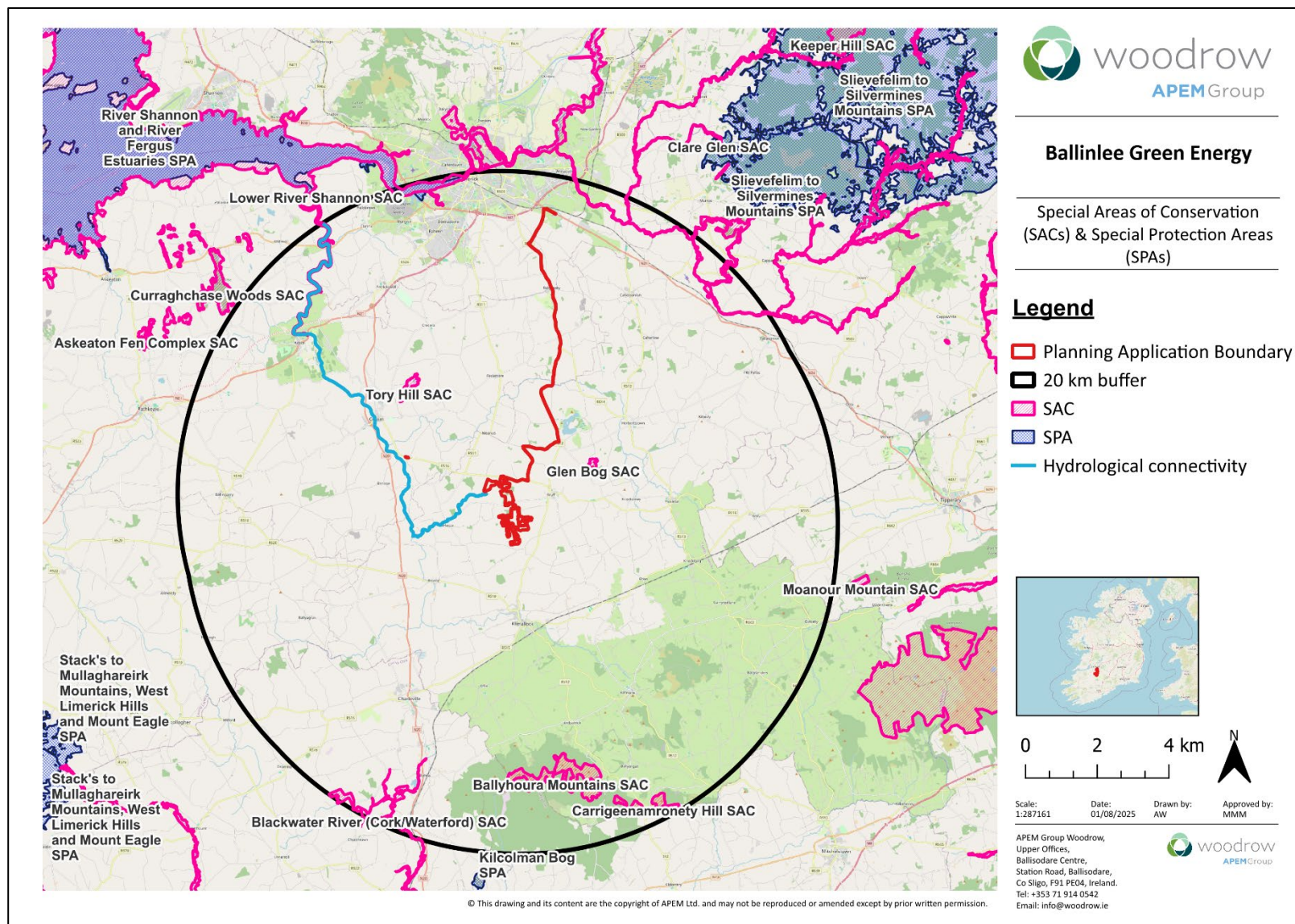


Figure 6: Location of the Proposed Development in relation to European Sites, with hydrological connectivity also depicted

Table 1: European Sites with potential connectivity to the Proposed Development

European Site (Site Code)	List of QI/SCI [Relevant Code] * = A priority habitat ¹⁶	Distance from the Proposed Development ¹⁷		Connections (Source-Pathway-Receptor)	Considered Further in Screening Y/N
		Wind Farm	GCR (nearest point)		
Glen Bog SAC (001430)	Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i>, <i>Alnion incanae</i>, <i>Salicion albae</i>) [91E0]	c. 5 km east	c. 2.3 km east	No There is no ecological, hydrological or landscape connectivity between this SAC and the Proposed Development. Any direct emissions arising from the construction phase (e.g. dust) will settle out over such a distance.	No
Tory Hill SAC (000439)	- Semi-natural dry grasslands and scrubland facies on calcareous substrates (<i>Festuco-Brometalia</i>) (* important orchid sites) [6210] - Calcareous fens with <i>Cladium mariscus</i> and species of the <i>Caricion davallianae</i>* [7210] - Alkaline fens [7230]	c. 7.6 km north-west	c. 8.0 km north-west	No No hydraulic connectivity, with local groundwater flows directed to surface waterbodies in the immediate sub-catchment. As such, there is no ecological, hydrological, or landscape connectivity between this SAC and the Proposed Development.	No
Ballyhoura Mountains SAC (002036)	- Northern Atlantic wet heaths with <i>Erica tetralix</i> [4010] - European dry heaths [4030] - Blanket bogs (* if active bog) [7130]	c. 13.7 km south	c. 18.1 km south	No There is no ecological, hydrological or landscape connectivity between this SAC and the Proposed Development. Any direct emissions arising from the construction phase (e.g. dust) will settle out over such a distance. QI habitats associated with this SAC are rainwater fed regardless.	No

¹⁶ Priority habitats – habitats which are in danger of disappearing within the EU territory, are highlighted with an asterisk.

¹⁷ Hydrological connections indicated in river kilometers, 'rkm'.

European Site (Site Code)	List of QI/SCI [Relevant Code] * = A priority habitat ¹⁶	Distance from the Proposed Development ¹⁷		Connections (Source-Pathway-Receptor)	Considered Further in Screening Y/N
		Wind Farm	GCR (nearest point)		
Lower River Shannon SAC (0026165)	- Sandbanks which are slightly covered by sea water all the time [1110] - Estuaries [1130] - 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 (<i>Glauco-Puccinellietalia maritima</i>) [1330] - Mediterranean salt meadows (<i>Juncetalia maritimi</i>) [1410]	c. 24.2 rkm	c. 5.3 rkm	Yes A weak hydrological connection exists between this European Site and the proposed Development via the River Mague network (c. 24.2 rkm). The GCR also intersects four hydrologically connected watercourses and extends to within 190 m of the River Groody at its point of termination, c.5.3 rkm upstream of the SAC. While no holts or resting places for otter were observed within the Planning Application Boundary during the site visits, frequent otter activity was observed along the Morningstar River. Although it is unlikely that the SAC population extends as far as the proposed Development (given a hydrological distance of c. 24.2 rkm) ecological connectivity cannot be ruled out. Given the distance between the SAC and the Proposed Development there is no risk from any other impact pathway e.g. via air emissions.	Yes – see Table 2 for QI features potentially affected, as well as an assessment of 'Likely Significant Effects' (LSE)

European Site (Site Code)	List of QI/SCI [Relevant Code] * = A priority habitat ¹⁶	Distance from the Proposed Development ¹⁷		Connections (Source-Pathway-Receptor)	Considered Further in Screening Y/N
		Wind Farm	GCR (nearest point)		
	- Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation [3260] - Molinia meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinion caeruleae</i>) [6410] - Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i>, <i>Alnion incanae</i>, <i>Salicion albae</i>) [91E0] <i>Margaritifera margaritifera</i> (Freshwater Pearl Mussel) [1029] <i>Petromyzon marinus</i> (Sea Lamprey) [1095] <i>Lampetra planeri</i> (Brook Lamprey) [1096] <i>Lampetra fluviatilis</i> (River Lamprey) [1099] <i>Salmo salar</i> (Salmon) [1106] <i>Tursiops truncatus</i> (Common Bottlenose Dolphin) [1349] <i>Lutra lutra</i> (Otter) [1355]				

European Site (Site Code)	List of QI/SCI [Relevant Code] * = A priority habitat ¹⁶	Distance from the Proposed Development ¹⁷		Connections (Source-Pathway-Receptor)	Considered Further in Screening Y/N
		Wind Farm	GCR (nearest point)		
River Shannon and River Fergus Estuaries SPA (004077)	• Cormorant (<i>Phalacrocorax carbo</i>) [A017] • Whooper Swan (<i>Cygnus cygnus</i>) [A038] • Light-bellied Brent Goose (<i>Branta bernicla hrota</i>) [A046] • Shelduck (<i>Tadorna tadorna</i>) [A048] • Wigeon (<i>Anas penelope</i>) [A050] • Teal (<i>Anas crecca</i>) [A052] • Pintail (<i>Anas acuta</i>) [A054] • Shoveler (<i>Anas clypeata</i>) [A056] • Scaup (<i>Aythya marila</i>) [A062] • Ringed Plover (<i>Charadrius hiaticula</i>) [A137] • Golden Plover (<i>Pluvialis apricaria</i>) [A140] • Grey Plover (<i>Pluvialis squatarola</i>) [A141] • Lapwing (<i>Vanellus vanellus</i>) [A142] • Knot (<i>Calidris canutus</i>) [A143] • Dunlin (<i>Calidris alpina</i>) [A149]	c. 36.9 rkm	c. 12.6 rkm	Yes A weak hydrological connection exists between this European Site and the proposed Development via the River Maigue network (c. 36.9 rkm). The GCR also intersects four hydrologically connected watercourses and extends to within 190 m of the River Groody at its point of termination, c. 12.6 rkm upstream of the SPA. A population of whooper swan has been recorded within the Proposed Development. Extensive survey effort has confirmed the birds do not form part of the SPA population but are instead associated with Lough Gur. Regular wintering flocks were recorded within the Proposed Development and surrounding landscape, with observed movement patterns indicating a functional link to Lough Gur and nearby wet grasslands. No direct functional link has been established between the River Shannon and River Fergus Estuaries SPA population of whooper swan and those using Lough Gur and the Proposed Development. While nine SCI species of the River Shannon and River Fergus Estuaries SPA, including cormorant, whooper swan, light-bellied brent goose, teal, golden plover, lapwing, dunlin, curlew and black-headed gull, were recorded during baseline surveys, there is no evidence to suggest functional connectivity between the Proposed Development, and this designated site. This conclusion is based on the absence of directional flight lines observed between the Proposed Development and the SPA, the lack of sustained or regular use by SPA-	Yes – see Table 2 for SCIs potentially affected, as well as an assessment of 'Likely Significant Effects' (LSE)

European Site (Site Code)	List of QI/SCI [Relevant Code] * = A priority habitat ¹⁶	Distance from the Proposed Development ¹⁷		Connections (Source-Pathway-Receptor)	Considered Further in Screening Y/N
		Wind Farm	GCR (nearest point)		
	- Black-tailed Godwit (<i>Limosa limosa</i>) [A156] - Bar-tailed Godwit (<i>Limosa lapponica</i>) [A157] - Curlew (<i>Numenius arquata</i>) [A160] - Redshank (<i>Tringa totanus</i>) [A162] - Greenshank (<i>Tringa nebularia</i>) [A164] - Black-headed Gull (<i>Chroicocephalus ridibundus</i>) [A179] - Wetland and Waterbirds [A999]			qualifying populations, and the considerable distance involved (>15 km), which exceeds typical foraging or core-use ranges for these species (Cutts et al., 2013; SNH, 2016). In the absence of pathways such as known flight corridors, staging or feeding behaviour linked to the SPA, or ex situ habitat use by site-feature populations, the Proposed Development is not considered ecologically linked to the SPA. Given the distance between the SPA and the Proposed Development there is no risk of disturbance impacts to the SPA populations, or from any other impact pathways e.g. via air emissions.	

Table 2: Assessment of Likely Significant Effects

European Site (Site Code)	QI/SCI Potentially Affected [Relevant Code] *= A priority habitat – habitats which are in danger of disappearing within the EU territory, are highlighted with an asterisk	Distance from the Proposed Development		Pathway	Likely Significant Effects (LSE)
		Development	GCR (nearest point)		
Lower River Shannon SAC (0026165)	- Estuaries [1130] - Mudflats and sandflats not covered by seawater at low tide [1140] - Coastal lagoons* [1150] - Reefs [1170] - Atlantic salt meadows (<i>Glauco-Puccinellietalia maritima</i>) [1330] - Mediterranean salt meadows (<i>Juncetalia maritimi</i>) [1410] <i>Salicornia</i> and other annuals colonising mud and sand [1310] - Water courses of plain to montane levels with the <i>Ranunculus fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation [3260] <i>Petromyzon marinus</i> (Sea Lamprey) [1095]	c. 24.2 rkm	c. 5.3 rkm	Hydrological – downstream surface water pathway via existing river network.	QI habitats in this SAC may be negatively affected by alterations in water quality arising from surface runoff, as well as localised groundwater contamination. Sediment deposition and associated nutrient enrichment within the estuary could promote the growth of more dominant plant species, such as common cordgrass and common reed, potentially leading to habitat loss, particularly in salt meadows as well as mudflats and sandflats. The Development may result in direct and indirect impacts on QI habitats (e.g. water courses of plain to montane levels with the <i>Ranunculus fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation) and fish species associated with the SAC, which complete part of their life cycle in the River Maigue network (e.g. Atlantic salmon and lamprey spp.). The discharge of contaminated surface runoff may elevate nutrient concentrations and degrade downstream water quality. Sedimentation of spawning redds, would reduce the overall habitat extent for fish species, associated with the European Site. LSE on otter, may arise as a result of reduced prey biomass (e.g. fish). In the event of a hydrocarbon spill, the ingestion of prey items contaminated with

European Site (Site Code)	QI/SCI Potentially Affected [Relevant Code] *= A priority habitat – habitats which are in danger of disappearing within the EU territory, are highlighted with an asterisk	Distance from the Proposed Development		Pathway	Likely Significant Effects (LSE)
		Development	GCR (nearest point)		
	• <i>Lampetra planeri</i> (Brook Lamprey) [1096] • <i>Lampetra fluviatilis</i> (River Lamprey) [1099] • <i>Salmo salar</i> (Atlantic Salmon) [1106] • <i>Tursiops truncatus</i> (Common Bottlenose Dolphin) [1349] • <i>Lutra lutra</i> (Otter) [1355]				Polycyclic Aromatic Hydrocarbons (PAHs), which have a propensity to bioaccumulate in fatty tissue, could biomagnify through respective food webs, possibly promoting toxic effects in these top-level predators. Otter may also be at risk of indirect impacts such as disturbance due to potential ecological connectivity.
River Shannon and River Fergus Estuaries SPA (004077)	• Cormorant (<i>Phalacrocorax carbo</i>) [A017] • Whooper Swan (<i>Cygnus cygnus</i>) [A038] • Light-bellied Brent Goose (<i>Branta bernicla hrota</i>) [A046] • Shelduck (<i>Tadorna tadorna</i>) [A048] • Wigeon (<i>Anas penelope</i>) [A050] • Teal (<i>Anas crecca</i>) [A052]	c. 36.9 rkm	c. 12.6 rkm	Hydrological – downstream surface water pathway via existing river network.	On a precautionary basis, while impacts are unlikely, LSE on SCIs of this SPA cannot be excluded. Water quality changes could affect eelgrass (<i>Zostera</i> spp.), a key food source for light-bellied brent goose, and reduce the abundance of invertebrate prey for waders. Contaminants such as PAHs could also cause sub-lethal effects, including potential reproductive impairments.

European Site (Site Code)	QI/SCI Potentially Affected [Relevant Code] *= A priority habitat – habitats which are in danger of disappearing within the EU territory, are highlighted with an asterisk	Distance from the Proposed Development		Pathway	Likely Significant Effects (LSE)
		Hydrological connections indicated in river kilometers, ‘rkm’			
		Development	GCR (nearest point)		
	• Pintail (<i>Anas acuta</i>) [A054] • Shoveler (<i>Anas clypeata</i>) [A056] • Scaup (<i>Aythya marila</i>) [A062] • Ringed Plover (<i>Charadrius hiaticula</i>) [A137] • Golden Plover (<i>Pluvialis apricaria</i>) [A140] • Grey Plover (<i>Pluvialis squatarola</i>) [A141] • Lapwing (<i>Vanellus vanellus</i>) [A142] • Knot (<i>Calidris canutus</i>) [A143] • Dunlin (<i>Calidris alpina</i>) [A149] • Black-tailed Godwit (<i>Limosa limosa</i>) [A156] • Bar-tailed Godwit (<i>Limosa lapponica</i>) [A157] • Curlew (<i>Numenius arquata</i>) [A160]				

European Site (Site Code)	QI/SCI Potentially Affected [Relevant Code] *= A priority habitat – habitats which are in danger of disappearing within the EU territory, are highlighted with an asterisk	Distance from the Proposed Development		Pathway	Likely Significant Effects (LSE)
		Hydrological connections indicated in river kilometers, ‘rkm’			
		Development	GCR (nearest point)		
	- Redshank (<i>Tringa totanus</i>) [A162] - Greenshank (<i>Tringa nebularia</i>) [A164] - Black-headed Gull (<i>Chroicocephalus ridibundus</i>) [A179] - Wetland and Waterbirds [A999]				

5.4. In-combination Effects

This section outlines the plans or projects for consideration and subsequently assesses the potential for in-combination effects with QIs/SCIs listed as potential to be impacted by the Proposed Development. The key search areas are;

- Small (domestic, recreational and agricultural) development planning applications within 3km of the Proposed Development during the last 5 years
- Wind Farm developments within 20km of the Proposed Development
- Other energy developments within 20km of the Proposed Development

Plan or projects have been screened as:

- Those under construction;
- Those projects that are only partially constructed at the time that baseline characterisation is undertaken;
- Projects in operation that have ongoing effects, e.g. collision risk;
- Projects that were only recently completed and so the full extent of the impacts arising from the development(s) may not be reflected in the baseline;
- Those plans and projects which may have consent or licences to undertake further work, such as maintenance dredging or notable maintenance works which may arise in additional effects.
- Permitted application(s), but not yet implemented;
- Submitted application(s), but not yet determined;
- Projects on the An Coimisiún Pleanála website including those at pre-application stage;
- Identified in the relevant development plan (and emerging development plans - with appropriate weight given as they move closer to adoption) recognising that much information on any relevant proposals will be limited; and
- Identified in other plans and programmes (as appropriate) which set the framework for future development consents/approvals, where such development is reasonably likely to come forward

There are six wind farms within 20 km of the Proposed Development site in operation and one in the planning system as outlined in **Table 3** and nine other wind energy applications within 20 km outlined in **Table 4**.

Table 3: Wind farms within 20 km of the Development

Planning Ref. ¹⁸	Applicant	Wind Farm Name	Location	No. of Turbines	Grant date	Distance to Development	Operational
PC91.319139	Garrane Green Energy Limited	Garrane Wind Farm	Ballynagoul, Co. Limerick	9	In planning	8.2	N
031367	John Clery	NA – operational single turbine	Glenbrohane, Kilfinane, Co Limerick	1	25/09/2003	14.7 km	Y
124446	Aerie Renewables Ltd	Rathnacally wind farm	Rathnacally, Charleville, Co. Cork	2	20/06/2012	14.8 km	Y
PL04.240434	SB Wind Developments	Castlepeak Wind Farm	Castlepeak North, Carker North, Ballyhoura, Co. Cork	14	In Planning	16.2 km	y
135885	DP Energy Ireland Ltd	Ballyhoura Wind Farm	Streamhill East, Streamhill West, Doneraile, Co. Cork	6	30/09/2013	17.3 km	y
125997	Aerie Renewables Ltd	Boolard Wind Farm	Boolard, Dromina, Co. Cork	2	09/11/2012	17.5 km	y
PL13.238964	Kilmeedy Wind Farm Limited	Kilmeedy Wind Farm Limited	Ballinruane and Ballyhahil, Kilmeedy, Co. Limerick.	2	23/09/2011	19.6 km	Y

¹⁸ Limerick CoCo Planning Viewer. Available at: <https://maps.limerick.ie/planningenquiry>

Table 4: Wind Energy Related Planning Applications within 20km

Planning Reference	Applicant	Description	Location	Planning Authority Decision
PC91.319139	Garrane Green Energy Limited	9 no. wind turbines, grid connection, an energy storage facility and all associated site works.	Ballynagoul, Co. Limerick	Is a Strat. Infrast. Dev.
2360016	John Cleary	The development consists of continuing the use of the wind energy development as constructed, beyond the time limit specified under condition no.3 planning reference no. 08/2124, originally granted planning permission under planning reference no. 03/1367 (extended under planning reference no. 06/3269). The wind energy development as permitted and constructed comprises 1 no. turbine with an overall height of 99.5m; hardstand area; substation and control room building; and extension of existing forest road to provide access)	Glenaree Sliabh Reagh Mountain Kilfinane, Co Limerick	Granted, Conditional (13/03/2023)
154155	DP Energy Ireland Ltd.	Permission for minor modifications to the previously approved Buttevant Wind Farm development comprising 6 no. wind turbines (Planning Ref. No. 13/5885). The development will consist of an increase in the maximum overall dimensions of the 6 no. permitted wind turbines (from 126m to 135m) alterations to the permitted site boundaries resulting in a reduction in site area and omission of permitted southern access to site and all associated site works above and below ground.	Streamhill East & Streamhill West Doneraile, Co. Cork	Granted, Conditional 01/12/2015
175292	B&R Wind Limited	Works to connect the permitted Boolard Wind Farm (Reg. Refs. 12/5997 and 15/5521/PL.04.245560) to the existing Charleville 110kv ESNB substation comprising as follows: installation of approximately 5.694 km of 20kv underground electricity cable and fibre communications cable in ducting; 12 no. joint bays, 12 no. communications chambers and 2 no. earth link boxes (all underground); access covers to chambers and boxes at finished surface level; ancillary marker posts and marker plates as necessary; the replacement of an existing concrete pipe with a box culvert under an existing agricultural track and the construction of new parapet walls above the track; and all associated site development and reinstatement works. The development will consist of alterations to permitted wind farm site layout (as per Reg. Ref. 12/5997 and 15/5521 / PL.04.245560) as follows i) widening of permitted vehicular site entrance, ii) provision of 2 no. turning areas/overrun areas for turbine delivery/construction vehicles off the permitted wind farm site road iii) localized realignment and refinement of internal wind farm site road network, iv) increased crane pad size at both permitted turbine locations, and v) also, construction of control building (minor change of location from Reg. Ref. 15/5521/PL.04.245560)	Boolard, Shinanagh, Clyderragh, Cloghanughera, Killaree, Ardmore, Kiltass, Milltown, Garrynagranoge, Ballypierce, Clashganniv, Rathnacally, Charleville, Co Cork.	Granted permission by ABP with revised conditions 04/02/2019. ABP ref: 301000

Planning Reference	Applicant	Description	Location	Planning Authority Decision
166718	B&R Wind Ltd.	The installation of 458m of 20kV underground electricity cable, to be contained within ducting; ancillary marker posts; and all associated site development and reinstatement works. The works are required to connect the permitted Rathnacally Wind Farm (Pl. Reg. Nos. 12/4446 and 15/5525) to the existing Charleville 110kV ESBN substation.	Rathnacally and Garrynagranoge Charleville Co. Cork	Granted, conditional 21/12/2016
155521	Aerie Renewables Ltd	Construction of control building for wind turbine development (change of plan from that permitted under planning reg. No. 12/5997) to meet new ESB Networks standard.	Boolard, Dromina, Co. Cork.	Granted permission by ABP with revised conditions 02/02/2016. ABP ref: 245560
155525	Aerie Renewables Ltd	Construction of control building for wind turbine development (change of plan from that permitted under planning reg. No. 12/4446) to meet new ESB Network standard.	Rathnacally, Charleville, Co. Cork.	Granted, Conditional 03/09/2015
191250	EirGrid plc, with the consent and approval of the ESB	Minor modifications to a previously permitted development (Ref. 12/1002). The proposed development comprises the extension of the existing Killonan 220/110 kV Electrical Substation compound by approx. 0.5ha along and adjacent to its existing western boundary. This will facilitate the proposed siting of a previously permitted Line Cable Interface Mast (LCIM) development includes the associated erection of 2.6m high palisade fencing along the extended western boundary of the substation compound and all associated and ancillary development at the existing Killonan 220/110 kV Electrical Substation	Milltown & Coolyhenan, Co. Limerick	Granted, Conditional 18/02/2020
166718	B&R Wind Ltd.	The installation of 458m of 20kV underground electricity cable, to be contained within ducting; ancillary marker posts; and all associated site development and reinstatement works. The works are required to connect the permitted Rathnacally Wind Farm (Pl. Reg. Nos. 12/4446 and 15/5525) to the existing Charleville 110kV ESBN substation.	Rathnacally and Garrynagranoge Charleville Co. Cork	Granted, Conditional 21/12/2016
146379	ESB Wind Development Limited, Coillte Teoranta	Modifications to previously approved Castlepook Wind Farm development comprising an increase in the overall dimensions, substitution of anemometer masts and associated works.	Castlepook North, Carker North, Ballyhoura, Co. Cork	Planning appeal withdrawn from the board. ACBP ref: 244741 Granted, Conditional 18/03/2015

In-combination effects from the Proposed Development and other wind farm proposals include:

- Downstream water quality effects within the catchment that, while imperceptible or not significant for the individual wind farm, result in a significant effect when viewed on a larger or catchment basis
- Disturbance and displacement of fauna
- Collision and barrier to migration

Without the introduction of mitigation measures for the Proposed Development, there are likely significant effects in-combination with other renewable projects.

Apart from single-dwelling developments there are no projects that are within the 3km search radius for small projects, however, there are five projects that have been finalised and that occur within the same catchment, sub-catchment or sub-basin as the Proposed Development that have been included for assessment of potential in-combination effects. Refer to **Table 5**.

Three projects, (the construction of five dwellings within an existing housing estate, a solar farm with an underground cable near the Mague River, and the demolition of farm buildings, decommissioning of a slurry storage facility, and erection of new farm structures) are all a minimum of 3.3 km from the Proposed Development and the potential for in-combination construction phase effects will not be significant, even if construction of these projects run parallel to the construction phase of the Proposed Development. The likelihood of cumulative effects arising from the construction of Ballysimon Bridge over the River Groody are considered not significant, given that virtually all works along the GCR will be confined to existing infrastructure. Additionally, due to the minor modifications to the existing Killonan 220/110 kV substation, these works are not considered to result in in-combination effects with the Proposed Development.

Overall, due to the nature and scale of other developments, described above, such dispersed projects are not expected to result in in-combination effects with the Proposed Development.

Table 5: Projects and plans considered for cumulative impact assessment from 2019 onwards, excluding retention, withdrawn and refused applications

Project (Planning Reference)	Applicant	Brief Description	Location	Distance from the Development	Granted
Solar Farm System (19455)	Cappamore Kilmallock Area Planner	Construction of 114KWP solar farm system, underground cable, an inventor building and all site works	Garrooe, Bruree House, Bruree, Co. Limerick.	c. 15 km upstream of the Development <i>via</i> the River Mague c. 6 km direct distance	2019
Farm Buildings (22457)	Fergal Hanrahan	Demolition of existing buildings and decommissioning of existing slurry storage. Construction of agricultural buildings	Coolboy, Athlacca, Co. Limerick	c. 3.7 km downstream of the Development	2022
Dwelling Houses (2360796)	OMC Houses	Construction of 5-dwelling houses, access off existing housing estate	The Grove, Bruff, Co. Limerick	c. 3.3 km upstream of the Development	2024
Bridge (218006)	-	Demolition of Ballysimon Bridge over the River Groody, and	Golf Links Road, Ballysimon, Ballysimon	c. 2 km downstream of the GCR <i>via</i>	2021

Project (Planning Reference)	Applicant	Brief Description	Location	Distance from the Development	Granted
		construction of a new bridge.	(Staunton), Garryglass, Co. Limerick	the River Groody	
Substation (191250)	EirGrid plc, with the consent and approval of the ESB	Minor modifications to a previously permitted development. Extension of the existing Killonan 220/110 kV substation compound	Milltown and Coolyhenan, Co. Limerick	Located at the termination of the GCR	2020

5.5. Description of European Sites within the ZoI of the Proposed Development

The European Sites identified as being within the potential ZoI of the Proposed Development are described below. These European Sites include those where a Source-Pathway-Receptor connection has been identified between the Proposed Development and the Site for which like significant effects could occur (**Table 1**). Site descriptions have been prepared and summarised using information from the site synopses and conservation objectives documents, which are available on the NPWS designations website¹⁹.

5.5.1. Lower River Shannon SAC (Site Code: 002165)

This extensive site stretches along the Shannon Valley from Killaloe in Co. Clare to Loop Head/Kerry Head, covering a distance of some 120 km. It includes the Shannon, Feale, Mulkear, and Fergus estuaries, the lower freshwater reaches of the River Shannon (from Killaloe to Limerick), the freshwater sections of much of the Feale and Mulkear catchments, and the marine area between Loop Head and Kerry Head.

The Shannon and Fergus Estuaries form Ireland's largest estuarine complex, stretching from the upper tidal limits of the Shannon and Fergus Rivers to the mouth of the Shannon Estuary. Within this main unit, several tributaries create their own sub-estuaries, such as the Deel, Mulkear, and Mague Rivers.

Both the Fergus and inner Shannon Estuaries feature vast intertidal mudflats, often fringed with saltmarsh vegetation. The smaller estuaries also have mudflats but exhibit unique characteristics. Plant species are generally scarce on the mudflats, though eelgrass (*Zostera* spp.) beds and patches of green algae (e.g. *Ulva* sp. and *Enteromorpha* sp.) are present. The primary macro-invertebrate community in the inner Shannon and Fergus estuaries includes *Macoma-Scrobicularia-Nereis* species.

In the transition zone between mudflats and saltmarsh, specialised colonisers of mud predominate. For example, swards of common cordgrass (*Spartina anglica*) frequently occur in the upper parts of the estuaries. Less common are swards of glasswort (*Salicornia europaea* agg.). In the innermost parts of the estuaries, the tidal channels or creeks are fringed with species such as common reed (*Phragmites australis*) and club-rushes (*Scirpus maritimus*, *S. tabernaemontani* and *S. triquetrus*). In addition to the nationally rare triangular club-rush (*Scirpus triquetrus*), two scarce species are found in some of these creeks (e.g. Ballinacurra Creek): lesser bulrush (*Typha angustifolia*) and summer snowflake (*Leucojum aestivum*).

19 NPWS Designation. Available at: <https://www.npws.ie/protected-sites> [Accessed February 2025].

Over twenty areas of estuarine saltmarsh have been identified within the site, with the most important located around the Fergus Estuary and Ringmoylan Quay. The dominant type of saltmarsh is Atlantic salt meadow on mud. Characteristic species include common saltmarsh-grass (*Puccinellia maritima*), sea aster (*Aster tripolium*), thrift (*Armeria maritima*), sea-milkwort (*Glaux maritima*), sea plantain (*Plantago maritima*), red fescue (*Festuca rubra*), creeping bent (*Agrostis stolonifera*), saltmarsh rush (*Juncus gerardi*), long-bracted sedge (*Carex extensa*), lesser sea-spurrey (*Spergularia marina*), and sea arrowgrass (*Triglochin maritima*).

Occasionally, Mediterranean salt meadows with clumps of sea rush (*Juncus maritimus*) are found. Two rare species are found in the saltmarshes near the Fergus Estuary: a robust saltmarsh-grass (*Puccinellia foucaudii*), sometimes considered a variety of common saltmarsh-grass, and hard-grass (*Parapholis strigosa*).

The intertidal reefs of the Shannon Estuary are exposed or moderately exposed to wave action, with moderate tidal streams. Known sites exhibit steep slopes and a well-developed zonation down the shore, with lichen zones and rich littoral reef communities. The sublittoral fringe supports strong populations of the purple sea urchin (*Paracentrotus lividus*).

The site also includes freshwater rivers, particularly the Feale and Mulkear catchments, the Shannon from Killaloe to Limerick (including some tributaries like the Kilmastulla River), the Fergus up to Ennis, and the Cloon River. Semi-natural habitats such as wet grassland, wet woodland, and marsh are found along the rivers, but improved grassland is the most common habitat. A grassland type of particular conservation significance, *Molinia* meadows, is present in several areas, with notable examples at Worldsend on the River Shannon. These wet meadows, dominated by rushes (*Juncus* spp.) and sedges (*Carex* spp.), support diverse and species-rich vegetation, including uncommon species like blue-eyed grass (*Sisyrinchium bermudiana*) and pale sedge (*Carex pallescens*).

Five fish species listed under Annex II of the EU Habitats Directive are found within the site: Sea lamprey (*Petromyzon marinus*), brook lamprey (*Lampetra planeri*), river lamprey (*Lampetra fluviatilis*), twaite shad (*Alosa fallax fallax*), and Atlantic salmon (*Salmo salar*). Lamprey and salmon spawn in the lower Shannon or its tributaries, with the Fergus being especially important for spring salmon, while the Mulkear is notable for its grilse fishery. The Feale supports both types. Twaite shad is not believed to spawn within the site. Few other river systems in Ireland support all three lamprey species. Two additional fish species of note, listed in the Irish Red Data Book, also occur: smelt (*Osmerus eperlanus*) and pollan (*Coregonus autumnalis pollan*). Only smelt has been observed spawning in the Shannon.

The Shannon Estuary hosts a resident population of bottle-nosed dolphin (*Tursiops truncatus*), the only known resident population of this Annex II species in Ireland. The population was estimated in 2006 to be around 140 individuals. Otter (*Lutra lutra*), also listed under Annex II of the EU Habitats Directive, are commonly found in the site.

This site is of significant ecological interest, supporting a wide range of habitats and species listed under Annexes I and II of the EU Habitats Directive. These include priority habitats like lagoons and alluvial woodlands, as well as the only known resident population of bottle-nosed Dolphins in Ireland and all three species of Irish lamprey. Additionally, several Red Data Book species are present, including thriving populations of triangular club-rush.

5.5.2. River Shannon and River Fergus Estuaries SPA (Site Code: 004077)

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 macro-invertebrate 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 a SPA under the EU Birds Directive, of Special Conservation Interest (SCI) for the following species: cormorant (*Phalacrocorax carbo*), whooper swan (*Cygnus cygnus*), light-bellied brent goose (*Branta bernicla hrota*), shelduck (*Tadorna tadorna*), wigeon (*Mareca penelope*), teal (*Anas crecca*), pintail (*Anas acuta*), shoveler (*Spatula clypeata*), scaup (*Aythya marila*), ringed plover (*Charadrius hiaticula*), golden plover (*Pluvialis apricaria*), grey plover (*Pluvialis squatarola*), lapwing (*Vanellus vanellus*), knot (*Calidris canutus*), dunlin (*Calidris alpina*), black-tailed godwit (*Limosa limosa*), bar-tailed godwit (*Limosa lapponica*), curlew (*Numenius arquata*), redshank (*Tringa totanus*), greenshank (*Tringa nebularia*), and black-headed gull (*Chroicocephalus ridibundus*). It is also of special conservation interest for holding an assemblage of over 20,000 wintering waterbirds. The EU Birds Directive pays particular attention to wetlands and, as these form part of this SPA, the site and its associated waterbirds are of special conservation interest for wetland and waterbirds.

The site has internationally important populations of light-bellied brent goose, dunlin, black-tailed godwit, and redshank. A further 17 species have populations of national importance, including cormorant, whooper swan, shelduck, wigeon, teal, pintail, shoveler, scaup, ringed plover, golden plover, grey plover, lapwing, knot, bar-tailed godwit, curlew, greenshank, and black-headed gull. 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). The site also supports a nationally important breeding population of cormorant (93 pairs in 2010).

The River Shannon and River Fergus Estuaries SPA is an internationally important site that supports an assemblage of over 20,000 wintering waterbirds. Of particular note is that three of the species which occur regularly are Annex I species, i.e. whooper swan, golden plover and bar-tailed godwit. Apart from the wintering birds, large numbers of some species also pass through the site whilst on migration in spring and/or autumn. Parts of the River Shannon and River Fergus Estuaries SPA are wildfowl sanctuaries.

6. CONCLUSION OF SCREENING FOR APPROPRIATE ASSESSMENT

The Development is not within a European Site, therefore there is no predicted direct loss or destruction of habitat associated with a European Site. Furthermore, the Proposed Development is not associated with or necessary for the management of any European Site.

In accordance with Article 6(3) of the Habitats Directive, this AA Screening has been undertaken with a precautionary approach, considering the best available scientific evidence and the conservation objectives of relevant European Sites. Despite the absence of direct impacts, the potential for a Likely Significant Effect on the Lower River Shannon SAC and the River Shannon and River Fergus Estuaries SPA, either alone or in combination with other plans or projects, cannot be definitively excluded.

Given this uncertainty and in line with the precautionary principle, it is concluded that a Stage 2 Appropriate Assessment is required to robustly assess whether the integrity of these sites may be adversely affected, with full consideration of their conservation objectives.

7. REFERENCES

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